

Appendix 13

Traffic Assessment

HODGSON QUARRY PRODUCTS PTY LTD

**TRAFFIC IMPACT ASSESSMENT FOR
S75W MODIFICATION TO CONSENT 267-11-99
LOT 2, D.P. 312327 AND LOTS 1 AND 2, D.P. 228308
CNR. ROBERTS ROAD AND OLD NORTHERN ROAD,
MARROOTA.**

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EXECUTIVE SUMMARY:

- The applicant Hodgson Quarry Products Pty Ltd seeks a Modification to extend the life of the existing consent for **10** years from **31st May 2015** to **31st May 2025** to complete sand extraction from the site.
- The existing consent gives approval for a maximum of *50 truck movements in and out on a weekday* and *25 truck movements in and out on Saturday*. The average load per truck is **33.5** tonnes. Daily haulage is **1675** tonnes per day and based upon **5.5** days per week extraction equates to **286** days per annum and a maximum of **479,050** tonnes per annum extracted. There will be **no increase** over the approved **50** truck movements *in and out* on weekdays and **25** truck movements *in and out* on Saturdays.
- The Traffic Study has addressed the RMS written requirements, the transport requirements of Baulkham Hills Shire Council and the Secretary's requirements, NSW Department of Planning and Infrastructure.
- About **20** percent of the trucks carrying processed material will travel south along Old Northern Road and **80** percent will travel west on Wisemans Ferry Road. The *maximum* number of truck movements per hour is estimated to be **17**.
- Assuming an annual growth in through traffic of **1%** in Old Northern Road, the intersection of Roberts Road and Old Northern Road will continue to operate at **Level of Service A** in *Region A of Austroads Figure 5.23a*. No improvements are required.
- A twelve hour traffic count was made on **5/08/14** in Roberts Road and totaled **261** movements including **85** heavy truck movements.
- Automatic Counters were placed in Old Northern Road south of Roberts Road (**Station 4**), in Wisemans Ferry Road west of Old Northern Road (**Station 3**) and in Roberts Road east of Old Northern Road (**Station 5**) to record *hourly traffic volumes* by *direction* and vehicle classification on *week days* and *weekend days*. At Stations **4** and **3** the *average number of heavy vehicles* on a *weekday* was **233** and **453** respectively.
- About **91** and **86.2** percent of the *24 hour daily truck movements* occurred between **6:00am** and **6:00pm** at the *two Stations 3 and 4* respectively. The number of truck movements on Saturdays was **75** and **64** percent of the average weekday total at Stations **3** and **4** respectively.
- Old Northern Road and Wisemans Ferry Road have sealed pavements **6.4** metres wide plus sealed shoulders about **1** metre wide and unsealed gravel shoulders varying in width from **0.5** to **1.5** metres and carry *average daily volumes* of **1762** and **2034** respectively and carry **13** and **22 percent** heavy vehicles respectively.
- Roberts Road has a sealed pavement **5.7** metres wide for its full length.
- The Roberts Road / Old Northern Road intersection is operating in **Region A** for right-turns and **Region B** for left-turns (**Austroads Figure 5.23a**) and provides a *satisfactory Level of Service*. **SIDRA** Analysis of the existing and future **AM** and **PM** peak hour traffic volumes shows that the intersection is and will *continue to operate* at **Level of Service A**.

1.0 INTRODUCTION

1.1 Background

This report on traffic and transportation aspects of the proposed **S.75W** Modification to Consent **267-11-99** for an approved extractive industry on **Lot 2 D.P. 312327** and **Lots 1 and 2 D.P. 228308** at Maroota, has been prepared for the Environmental Assessment being undertaken by Nexus Environmental Planning Pty Ltd. Maroota is located some 40Km north of Parramatta, as shown in **Figure 1**, Regional Location Map. Hodgson Quarry Products Pty Ltd currently operates the approved extractive industry on the site.

The site of the approved extractive industry is shown in **Figure 2** Locality Plan.

1.2 Scope of Report

This report addresses the transport issues described in Section 3.0 of this report and describes our investigation and findings in respect of the following matters:-

- Existing traffic volumes on the proposed haul routes.
- Hourly and daily truck movements generated by the existing operations.
- Distribution of trucks to the State Arterial Road System.
- Proposed Access to and from the site.
- Performance of Roberts Road / Old Northern Road intersection. Standard of internal access road.
- Standard of internal access road.
- Impacts of increased truck traffic on the State Roads and nearby residential areas.
- Safety issues and measures to improve safety.

1.3 Proposed Modification

As stated in the Environmental Assessment prepared by Nexus Environmental Planning Pty Ltd *"It is proposed to modify the consent to not only modify the approved method of extraction but also to extend the life of the approved extraction to accommodate the additional material which has been determined as existing on the Site."*

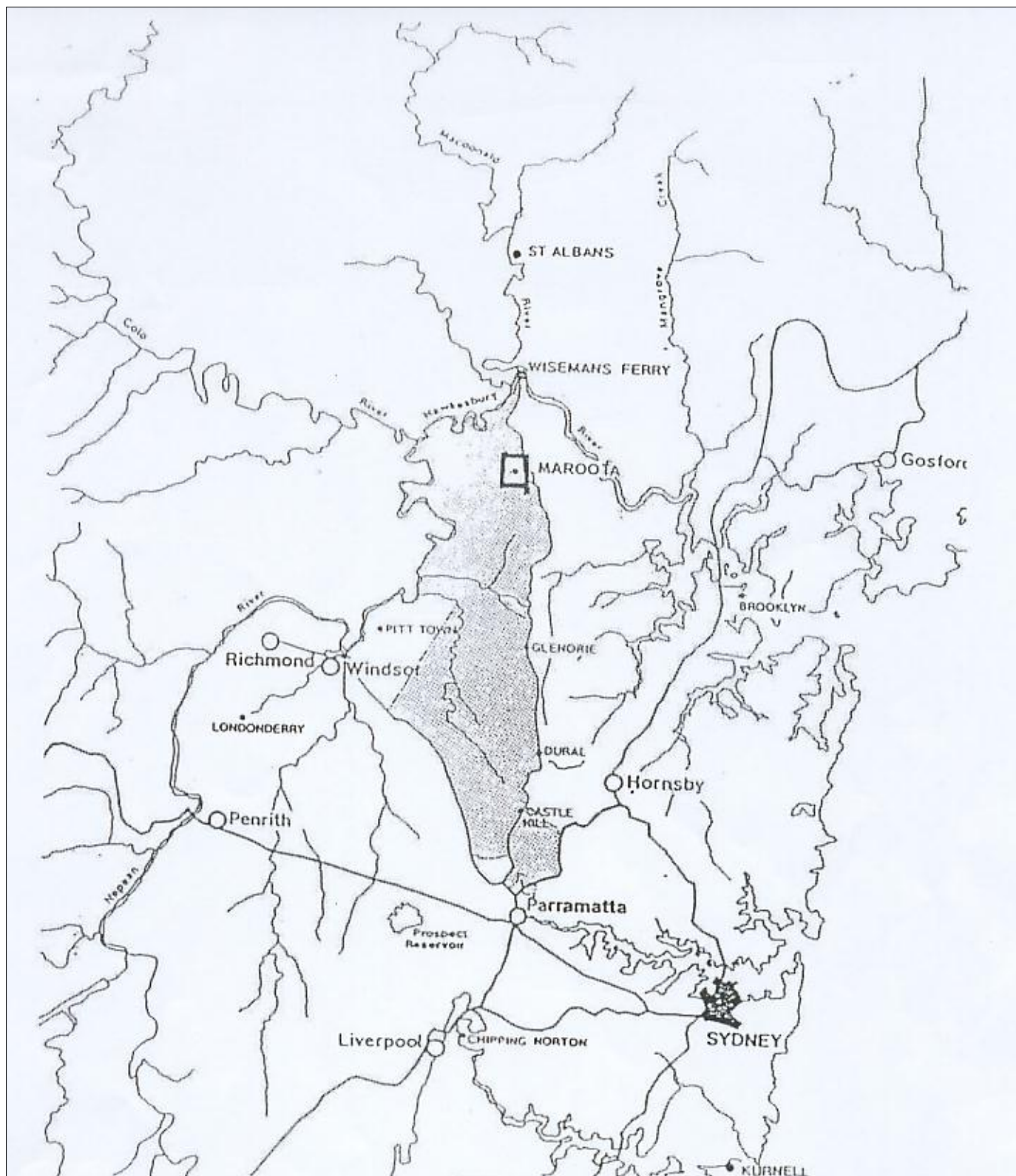
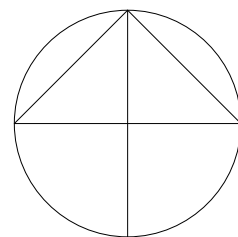


FIGURE 1
REGIONAL LOCATION MAP

HILLS SHIRE COUNCIL
SCALE 1:2000



NORTH



LOCALITY MAROOTA

FIGURE 2
LOCALITY PLAN LOTS 1&2 DP 228308
AND LOT 2 DP312327

1.3 (Continued)

Advice from the applicant is that a conservative estimate of 2 tonnes per m³ should be applied to determine the tonnage of material on the Site. Applying that conversion rate, there is 9,215,644 tonnes of material on the Site. The applicant has advised that a figure of 60% sand to 40% clay/gravel is generally obtained. As such, 5,529,386 tonnes of the volume calculated by VGT would be sand product.

The applicant has advised that approximately 1,000,000 tonnes of sand has been exported from the Site during the life of the extraction to date which means that approximately 4.5 million tonnes of sand product remains to be extracted.

Using the above formula for the rate of extraction contained in the EIS, the following applies:

- *maximum 50 trucks per day (approved).*
- *average load per truck 33.5 tonnes.*
- *1,675 tonnes per day.*
- *5.5 days per week extraction = 286 days per annum.*
- *maximum 479,050 tonnes per annum extracted.*
- *9.4 years of extraction remaining.*

Allowing from the 1 year remaining for the approved extraction, it is estimated that a further 10 years of extraction would be required after 31 May 2015 to complete the extraction of the Site.

Having regard to the errors in the original calculations undertaken by Woodward Clyde, it is now proposed to modify the consent based on the volume figures calculated by VGT.

The applicant seeks a modification to the life of the consent from 31 May 2015 to 31 May 2025”.

2.0 EXISTING TRAFFIC CONDITIONS

2.1 Existing Traffic Volumes

1) Old Northern Road / Roberts Road Intersection

Twelve hour Traffic Volume and Classification Counts were made at the intersection of Old Northern Road and Roberts Road to determine the highest hourly volumes and turning movements at the intersection in order to assess the performance of the intersection.

12 Hour Volume & Heavy Trucks. Count 5/8/14

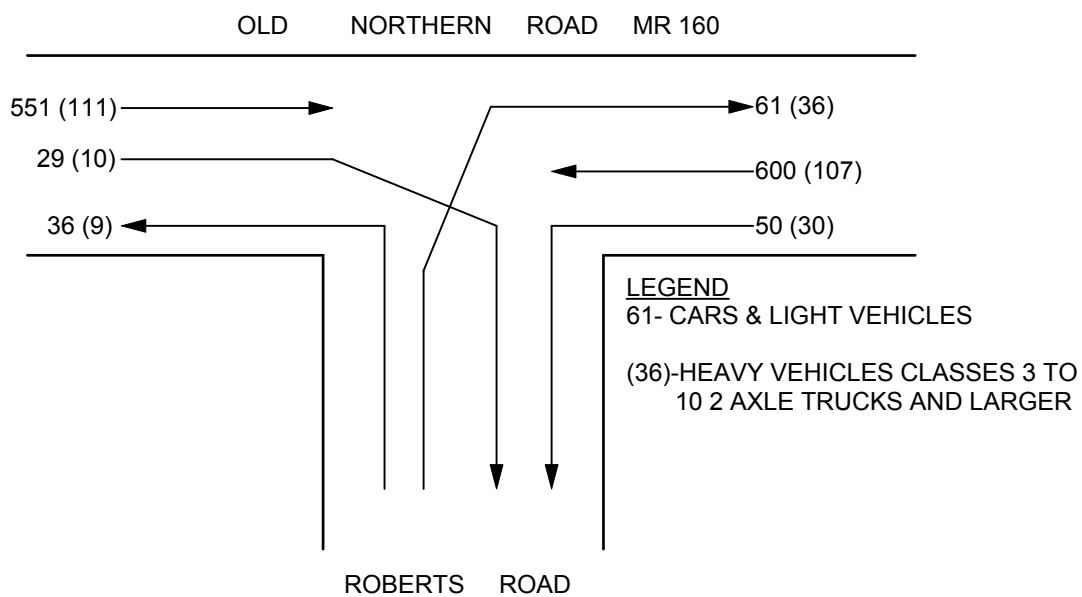
The 12 hour two-way traffic volume was **261** in Roberts Road, a marginal increase of **10** since the count in 1998. The number of heavy vehicles Austroad Classes 3 to 9 was **85** and amounted to **32.6%** of total vehicles. In 1998 the number of heavy vehicles was **78** and amounted to **31%** of total vehicles. The number of heavy vehicles Austroads Class 9 (truck and dog trailer) was **37** and amounted to **14.2%** of total vehicles.

Peak Hour Volumes

The AM and PM peak hours were from **6.30-7.30am** and **4.00-5.00pm**. The peak hour two-way through traffic volumes in Old Northern Road were **149** vphr and **154** vphr respectively. The twelve hour count showing cars and light vehicles and heavy trucks and the two *peak hour counts* are shown in **Figures 3A** and **3B** respectively.

Week Day and Weekend Volumes on Roberts Road

An automatic counter was placed in Roberts Road (see **Figure 4**) to determine the time pattern and volumes of light and heavy vehicles over 7 days including a weekend. *Light vehicles* are vehicles *Classes 1 and 2* and *heavy vehicles* are *Classes 3 to 10*. Heavy vehicles Class 9 (truck and dog trailer) are used for the transport of sand from extractive industries in the area. A Classification Chart is included in **Appendix D**. The average week day and weekend two-way traffic volumes at **Station 5** were as follows:-



12 HOUR INTERSECTION TRAFFIC
VOLUME COUNT 6:00am-6:00pm
TUES 5-8-14

FIGURE 3A
12 HOUR TRAFFIC VOLUMES

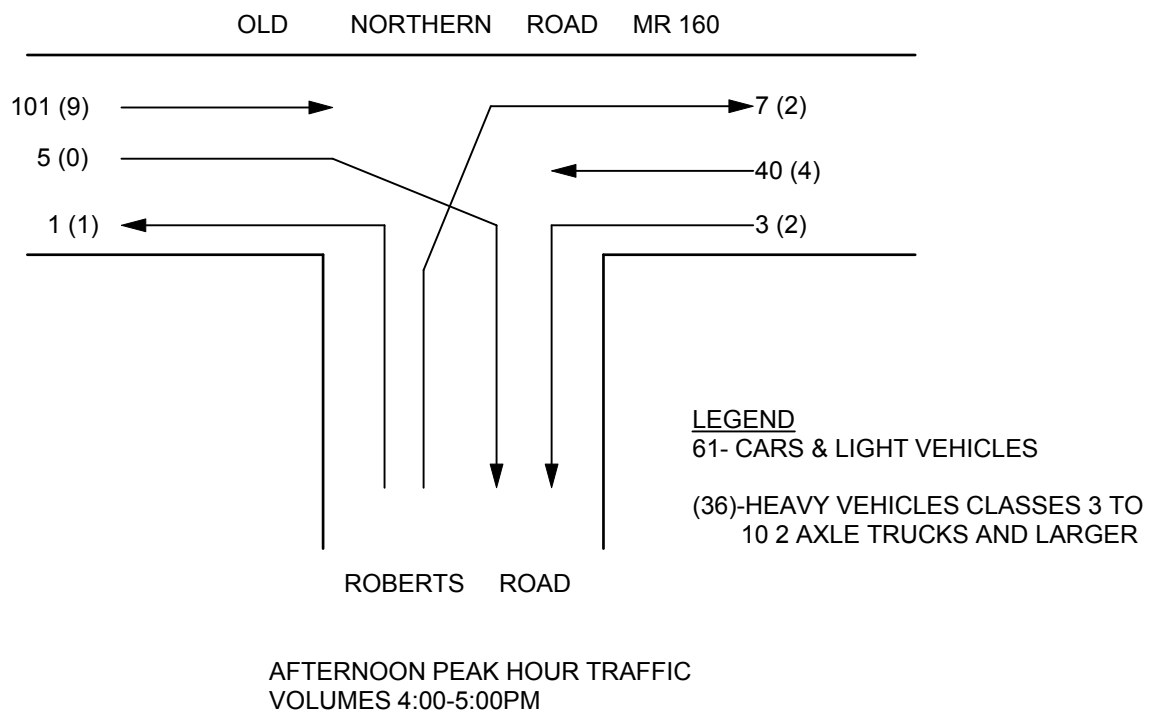
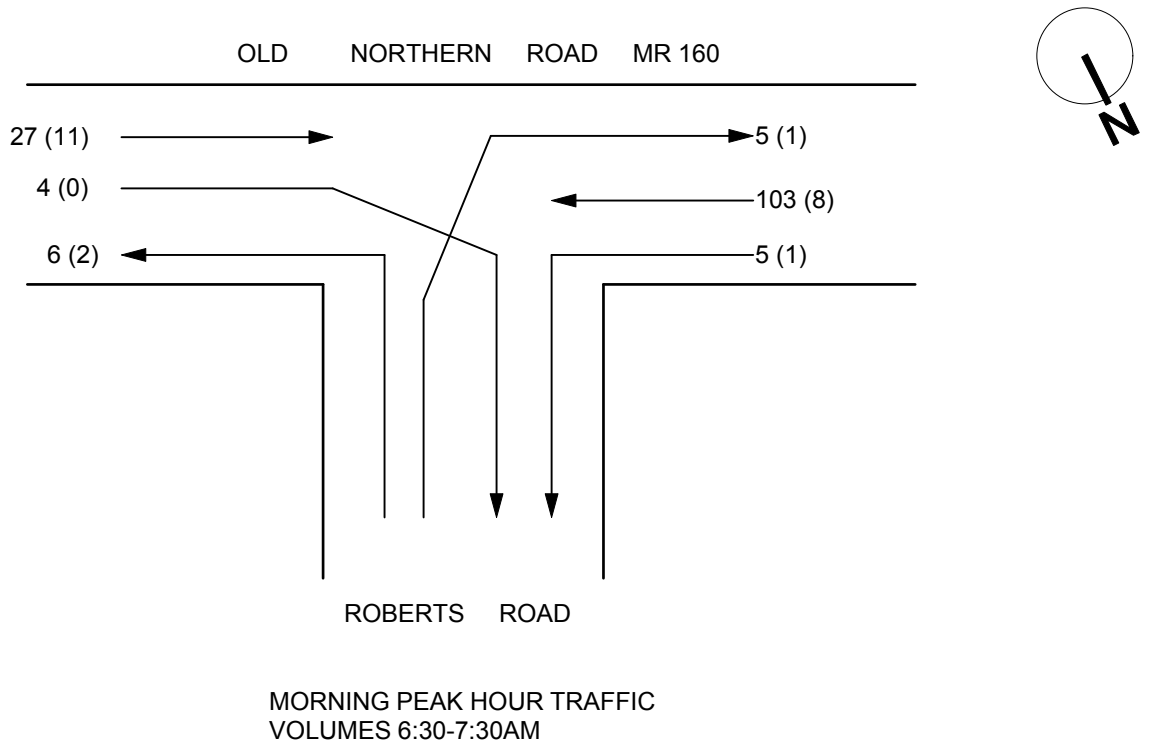


FIGURE 3B
EXISTING PEAK HOUR TRAFFIC
VOLUMES
TUES 5-8-14

2.1 (Continued)

Average Daily Volumes	Roberts Road
Average Weekday	
Total vehicles	324.4
Light vehicles	242.8
Heavy vehicles	81.6
Heavy vehicles Class 8, 9, 10	34.8
Average Weekend	
Total vehicles	199.5
Light vehicles	190.5
Heavy vehicles	9
Heavy vehicles Classes 8,9,10	0

2) Weekday and Weekend Volumes on State Main Roads

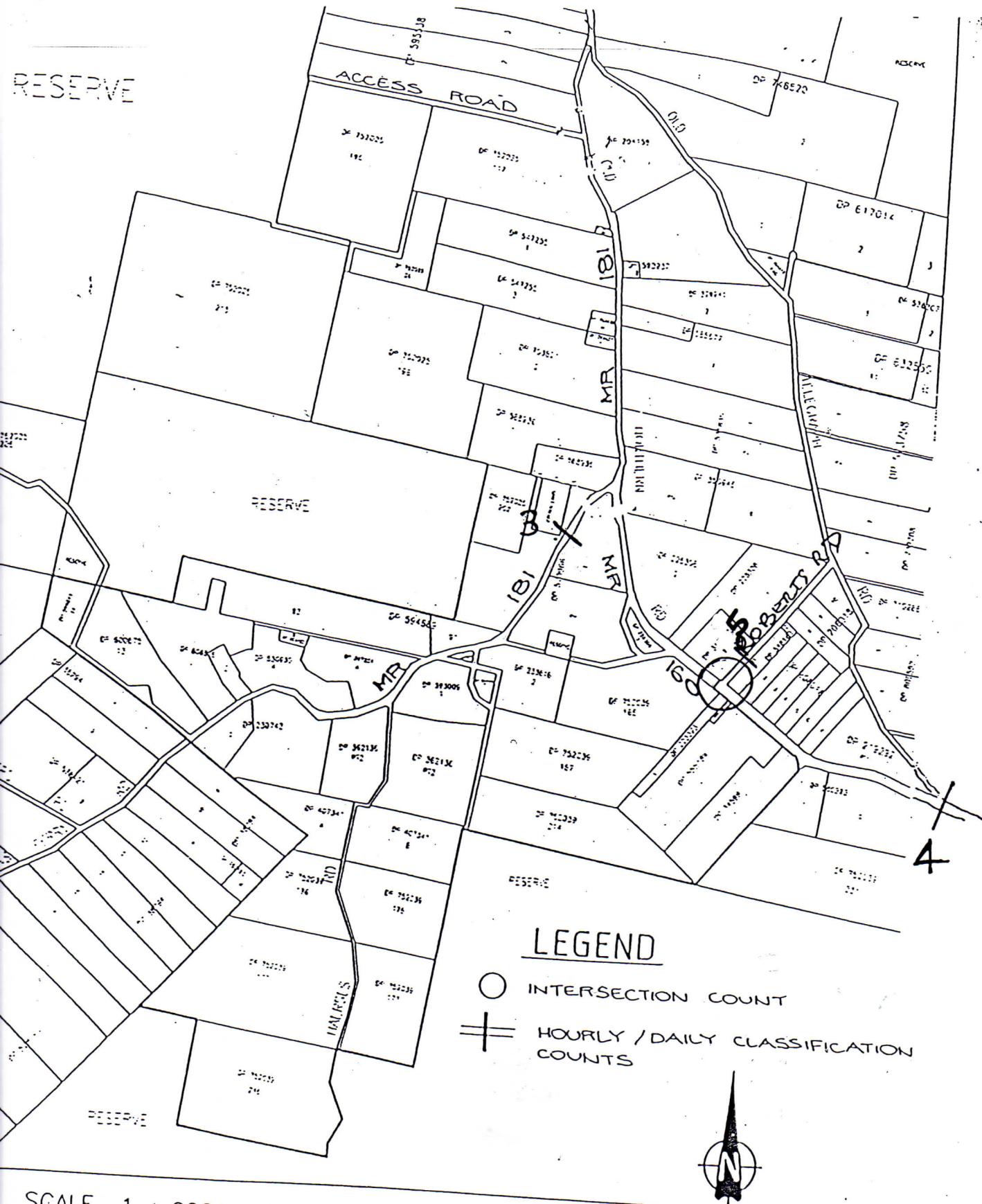
Automatic counters were placed at two locations (see **Figure 4**) on the haul road network from the subject site to determine the time pattern and volumes of light vehicle and heavy truck movements over 7 days including a weekend. A Classification Chart is included in **Appendix D**. The location of **Counting Station 4** is in Old Northern Road, a few metres south of the tee intersection where Old Telegraph Road joins Old Northern Road as shown in **Figure 4**.

The average week day and weekend two-way daily traffic volumes at **Station 3** and **4** were as follows:-

Average Daily Volumes	Old Northern Road MR160 Station 4	Wisemans Ferry Road MR181 Station 3
<u>Average Week day</u>		
Total vehicles	1761.6 (1923)	2034.2 (1706)
Light vehicles	1528.8 (1710)	1581.2 (1495)
Heavy vehicles	232.8 (213)	453.0 (211)
HV classes 9,10	74.4	229.4
<u>Average Weekend</u>		
Total vehicles	2010 (2285)	1882.5 (1927)
Light vehicles	1945.5 (2178)	1739.5 (1824)
Heavy vehicles	64.5 (107)	143.0 (103)
HV classes 9,10	11.5	38.0

A Tube Count was carried out over 7 days in **October 1997** for our Traffic Report 28/99 at **Location 4** in Old Northern Road. The average week day volume was **1923**. From the tube count at the same location over 7 days in **August 2014**, the average week day volume was **1761.6**. The average weekday traffic volume fell by **10.72%**. The annual compound decrease per annum over the 17 year period was **0.6%**. The Count in 1997 is in **Appendix C**.

The Counts taken in **October 1997** are shown in *brackets* for comparison with the current traffic volumes. In Wisemans Ferry Road total vehicles have increased by **1%** per annum compound and heavy vehicle growth has been **4.5%** per annum compound. In Old Northern Road total vehicles have fallen by **0.6%** per annum compound and heavy vehicles have increased by **0.5%** per annum compound.



SCALE 1 : 20000

LOCALITY MAROOTA

FIG 4
TRAFFIC COUNTING STATIONS

2.2 Pattern of Truck Movements on Transport Routes in Maroota

The complete counts of light and heavy vehicles for each hour of the day by direction for one week in August/September 2014 at survey Stations 3, 4 and 5 are included in **Appendix B**.

The average number of heavy truck movements Monday to Friday by hour of day from **6:00am to 6:00pm** and for the *24 hour period* at each survey location are contained in **Table C1** in **Appendix C**.

Similar data for Saturday is contained in **Table C3** in **Appendix C**. The main findings were:-

Station 3 -

Wisemans Ferry Road

Total heavy truck movements over 24 hours on weekdays averaged 219.2 eastbound and 233.8 westbound. However, the average truck movements over 12 hours were similar to westbound (208.6) and eastbound (204). The peak hourly movement westbound (average over 5 days) was 24.2 between 6:00 – 7:00am and the peak hourly movement eastbound (average over 5 days) was 19.4 between 10:00 and 11:00am.

Station 4 -

Old Northern Road

The average heavy week day truck volumes northbound and southbound were similar over 24 hours (115.4 compared with 117.4) and also over 12 hours between 6:00am and 6:00pm.

The peak hourly volume was 13.0 (average over 5 days) southbound from 6:00am to 7:00am. The peak hourly volume northbound (average over 5 days) was 11.6 from 12:00pm to 1:00pm.

The counts show that about **91** percent and **86.2** percent of the *24 hour daily truck movements* occurred between **6:00am** and **6:00pm** at **survey locations 3** and **4** respectively. The *total number of truck movements on Saturday* was **36.2** percent of the *daily Monday to Friday total* at Station **3** and **32.7** percent at Station **4**. The number of light vehicles was significantly greater southbound on Sundays (**Appendix B**) at Station **4** than on other days.

Major Changes 1997 – 2014

Heavy vehicle volumes have doubled in both directions in Wisemans Ferry Road whereas the increase is marginal in both directions in Old Northern Road.

2.3 Road Inventory

Old Northern Road has a sealed pavement about **6.5** to **6.7** metres wide, sealed shoulders about **1** metre wide and unsealed gravel shoulders beyond which vary in width from about **0.5** to **1.5** metres. Wisemans Ferry Road is of a similar standard to Old Northern Road. The edges of the sealed pavement are subject to higher loading by heavy vehicles travelling near the edges of the road pavement and require higher maintenance to repair the broken edges. The road pavement is generally in reasonable condition.

Based upon *Table 4.1 in Austroads Rural Road Design* the desirable sealed pavement width in Old Northern Road and Wisemans Ferry Road is **7.0** metres because the **AADT** Traffic Volumes are well in excess of **1000 veh/day**.

Photographs P1 and **P3**, indicate the general pavement conditions, shoulders and line marking in Old Northern Road, in the vicinity of Roberts Road.

Roberts Road is a sealed local road and has a pavement width of **5.7** metres. The pavement condition, geometric alignment and line marking are shown in **Photographs P2, P6** and **P7**. The internal access road to the sand extraction site is located on the northern side of Roberts Road about **290** metres east of Old Northern Road and is shown in **Photograph P5**.

2.4 Operation of Roberts Road/Old Northern Road Intersection

This intersection was *up-graded prior* to October 1997 to provide a sheltered right-turn-bay in Old Northern Road, as shown in **Photograph P1**. The pavement striping continues on the northern side of Roberts Road, as shown in **Photograph P3**. The full extent of pavement markings south and north of Roberts Road can be seen in the *photographs*.

A layout of Roberts Road and Old Northern Road Intersection has been compiled from site measurements and is drawn to scale in **Figure 5**.

On Tuesday 5th August 2014, there were **16** truck movements into the quarry and **16** movements out. The **SIDRA** analysis of existing traffic was made using the turning volumes in **Figures 3A** and **3B** from the *Count* made on 5/8/2014.

The traffic counts show that there is **considerable variation** in truck movements from *hour to hour* and *day to day* due to *weather conditions* and *market requirements*.

An analysis of the performance of the intersection under existing am and pm peak hour volumes from **Figures 3A** and **Figure 3B** has been made using **SIDRA** Version 5.0. The intersection is operating at **Level of Service A** in both peak hours as shown in **Table 2.4**. This is the *highest* and *best Level of Service*, as shown in **Table 4.2** from the **RMS Guide to Traffic Generating Developments**.



PHOTO P1 VIEW SOUTH OF OLD NORTHERN ROAD FROM ROBERTS ROAD. 14.8.14



PHOTO P2 VIEW EAST OF ROBERTS ROAD FROM OLD NORTHERN ROAD.



PHOTO P3 VIEW NORTH OF OLD NORTHERN ROAD FROM ROBERTS ROAD.



PHOTO P5 VIEW OF CONCRETE PAVED ENTRANCE ROAD TO HODGSON QUARRY PRODUCTS FROM ROBERTS ROAD.

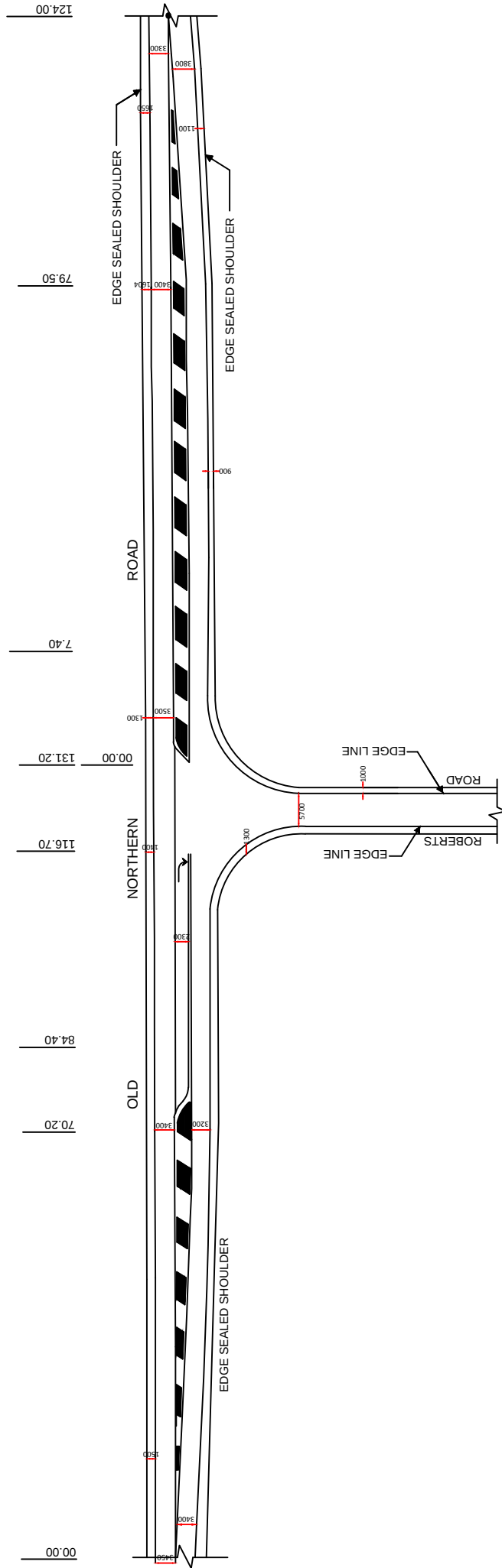
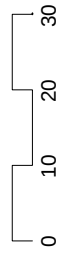


FIGURE 5
LAYOUT OF ROBERTS ROAD AND
OLD NORTHERN ROAD INTERSECTION
SCALE 1:1000



2.4 (Continued)**SIDRA ANALYSIS
Old Northern Road / Roberts Road**

Scenario	Peak Hour	DoS	LoS	Max Delay (sec/veh)	Critical Movement
Existing	AM	.005	A	8.1	Right Turn from Old Northern Road
	PM	0.027	A	8.3	Left turn from Old Northern Road

NOTE: DoS Degree of Saturation
LoS Level of Service.

However, since the maximum number of movements *in* and *out* on a weekday is capped at 50 and as the Level of Service at the Roberts Road / Old Northern Road intersection is **A** with **20** truck movements *in* and *out* per day, the *highest* truck movements in the *morning peak hours*, as shown in **Table C2**, will *not* change the Level of Service.

The *hourly* distribution at **Station 5** in Roberts Road shows a similar pattern over the 5 weekday count (**Appendix B**) during the AM peak hours **6:00 – 7:00** and **7:00 – 8:00am**.

	EASTBOUND		WESTBOUND	
	Highest	Lowest	Highest	Lowest
6:00 – 7:00AM	4	2	7	3
7:00 – 8:00AM	8	3	7	2

Adoption of the highest truck volumes will *not* change the Level of Service.

Table 4.2
(RTA Guide to Traffic Generating Developments)
Level of Service criteria for intersections.

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

2.5 Vehicle Access to Site

The site entry gate is on the northern side of Roberts Road and is located some **290** metres east of Old Northern Road. The sight distance from the entry road is excellent in both directions along Roberts Road, as shown in **photographs P6 and P7**.

The entry road is a concrete paved road in good condition as shown in **photograph P5**. The layout of the concrete paved entrance road to the weighbridge is drawn to scale in **Figure 6**.

The entrance road shown in **Figure 6** was measured during my inspection and is drawn to scale. The concrete Layback is **17** metres wide and the width at the boundary fence is **14.4** metres wide. The driveway entrance is *considerably wider* than the minimum design shown in *attached Figure 3.1* in **AS 2890.2** which caters for **AV's** (articulated vehicles).

2.6 Quarry Employees On Site

There are a *maximum* of **6** employees on site. This will *not change*. Adequate parking spaces are available on the concrete hardstand to the left of the gate to the weigh bridge as indicated in **Figure 6**.



PHOTO P6 VIEW WEST ALONG ROBERTS ROAD FROM ENTRANCE ROAD



PHOTO P7 VIEW ALONG ROBERTS ROAD FROM ENTRANCE ROAD.

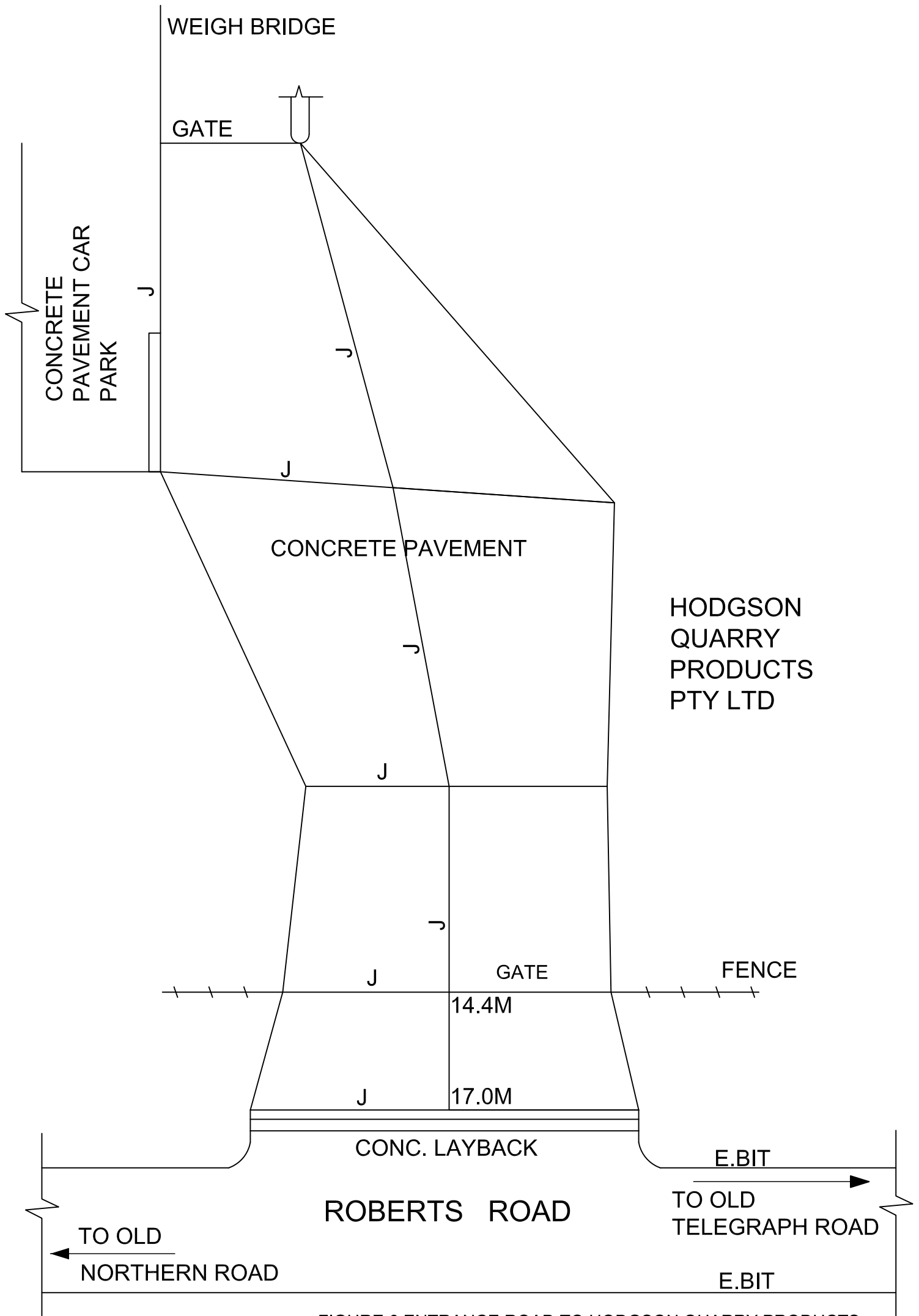
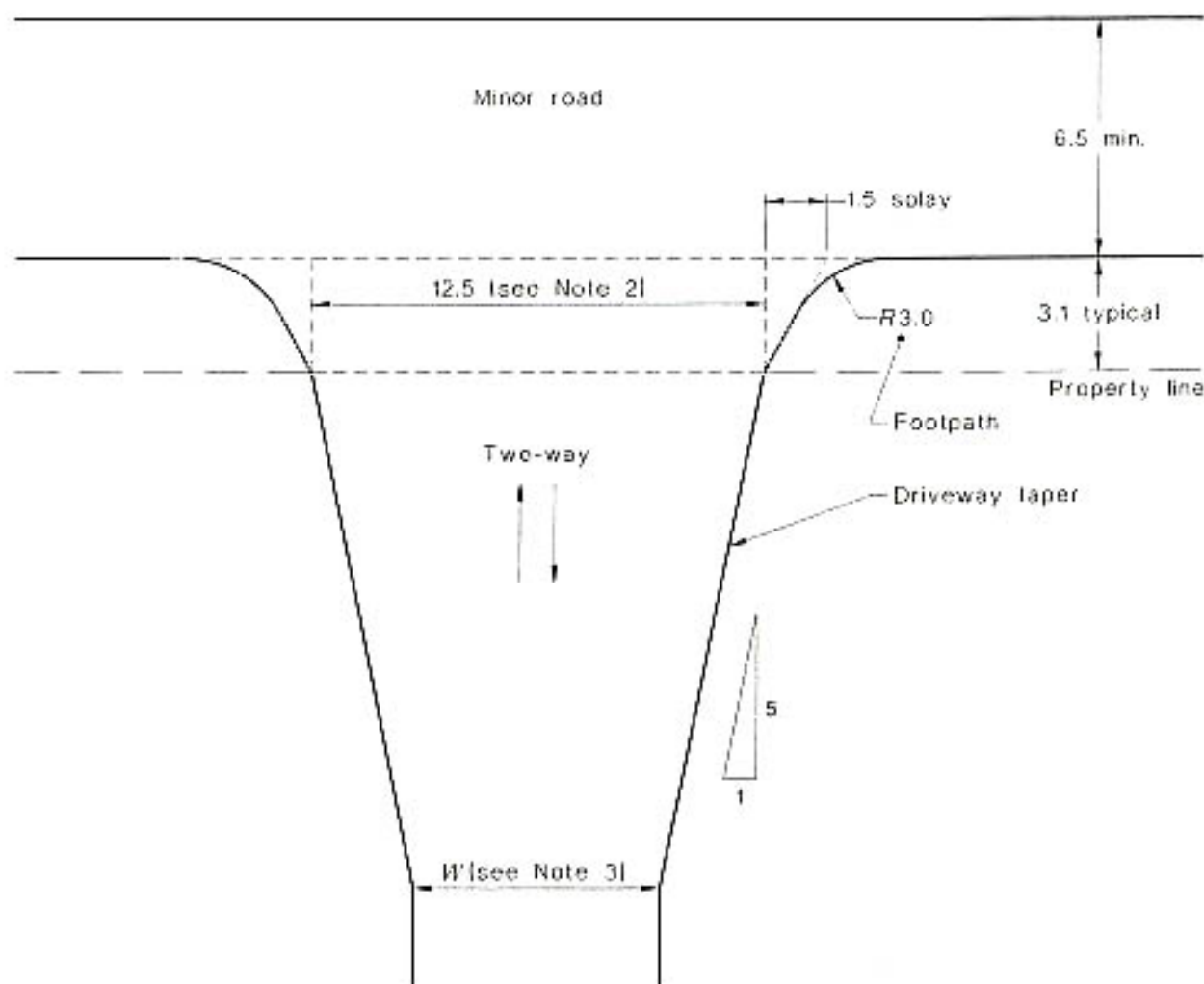


FIGURE 6 ENTRANCE ROAD TO HODGSON QUARRY PRODUCTS
SCALE 1:20



NOTES:

- 1 In the case illustrated the HRV can turn left into the driveway from the left hand side of the public road. The design (19.0 m long) AV will take up most of the public road width when turning left into or out of the driveway, as will the HRV when turning out.
- 2 Corresponding dimensions for the MRV and SRV are 9 m and 6 m respectively. Larger vehicles may be able to use these narrower driveways depending on the width of public road available for manoeuvring in or out.
- 3 W = width of circulation roadway (see Table 3.1).

DIMENSIONS IN METRES

FIGURE 3.1 MINIMUM DESIGN FOR AN ACCESS DRIVEWAY ON A MINOR ROAD CATERING FOR HRVs AND AVs

3.0 TRANSPORT ISSUES TO BE ADDRESSED

3.1 RMS Requirements

In a letter dated 28/4/2014 from the Acting Senior Land Use Planner, Network and Safety Section RMS, the following issues were required to be addressed in the Transport and Traffic impact assessment of the proposed development:-

1. Daily and peak traffic movements likely to be generated by the proposed development including the impact on nearby intersections and the need/associated funding for upgrading or road improvement works (if required).
2. Details of the proposed accesses and the parking provisions associated with the proposed development including compliance with the requirements of the relevant Australian Standards (ie: turn paths, sight distance requirements, aisle widths, etc).
3. Proposed number of car parking spaces and compliance with the appropriate Parking Codes.
4. Details of service vehicle movements (including vehicle type and likely arrival and departure times).
5. Roads and Maritime will require in due course the provision of a traffic management plan for all demolition/construction activities, detailing vehicle routes, number of trucks, hours of operation, access arrangements and traffic control measures.

3.2 Baulkham Hills Shire Council

The principal *Executive Planner, Baulkham Hills Shire Council* in a letter dated 23/4/14 to the *NSW Department of Planning and Infrastructure* provided comments under points **1** to **6** for your incorporation into the requirements of which point **6** is *relevant to this report* namely:-

“ 6. The submission of a detailed traffic impact assessment report addressing the increased maximum number of truck movements associated with the operation”.

3.3 Secretary's Requirements, NSW Department of Planning and Infrastructure

These requirements were set out in a letter from the Director, Mining Projects, NSW Department of Planning and Environment to Mr. M Hodgson, Hodgson Quarry Products Pty Ltd on 29/5/2014. The relevant requirements relating to traffic were as follows:-

- **Traffic** - including an assessment of the likely traffic impacts of the development on the capacity, condition, safety and efficiency of the local and State road network, having regard to the RMS's requirements (See attachment 2);

4.0 TRAFFIC IMPACTS OF PROPOSED S.75W MODIFICATION

As stated in *Section 1.3* truck movements associated with the haulage of sand from the site would be using the road network for an additional *10 years* from **31/5/2015** to **31/5/2025**.

4.1 Distribution of Trucks to Main Road System

We have been advised that **20** per cent of trucks carrying processed material from the site will travel south along Old Northern Road. These trucks will pass through survey **Counting Station 4** in Old Northern Road.

The remaining **80** percent of trucks will travel west on Wisemans Ferry Road and pass through **Counting Station 3**.

4.2 Maximum Hourly and Daily Truck Movements from Hodgson Quarry Products

The site was not operating at full approved capacity of **50** truck movements *in and out per day* when the traffic volume and classification counts included in **Appendix B** were carried out.

Based upon the distribution and time pattern of truck classes **8**, **9** and **10** to the road network, the *estimated hourly truck movements* from the site and distribution to Old Northern Road and Wisemans Ferry Road are contained in **Table C2** in **Appendix C**. Since the site is currently generating some **20** movements *in and out* on a *weekday* the increase in hourly truck movements and distribution to the road network when the site is operating at its maximum approved capacity are shown in **Table C4**.

The Traffic Counts show that there is considerable *variation* in truck movements from *hour to hour* and *day to day* due to *weather conditions* and *market requirements*.

4.3 Section 94 Contribution

Since there is no increase over the approved **50** truck movements *in and out* on weekdays and **25** truck movements *in and out* on Saturday, it is assumed that the current **Section 94 Contribution** for road maintenance on the haulage routes will continue for a further 10 years.

A maximum of **50** truck movements per day has been allowed for in the current **Section 94 Contribution** for road maintenance. It is assumed that the current contribution will continue for a further 10 years. The road pavement in Old Northern Road, Wisemans Ferry Road and Roberts Road are in reasonable condition. There are *no road safety issues*.

4.4 Operation of Roberts Road / Old Northern Road Intersection

Allowing for variations in weather and market demand, the resource extraction is likely to be completed within 10 years. Traffic volumes in Old Northern Road at Counting **Station 4** have fallen at **0.6%** per annum compound over the past 17 years. It is reasonable to expect that the current trend will continue. However, for the analysis it has been assumed that *traffic volumes* in Old Northern Road will *increase* at **1%** per annum over the *10 year period*. Based upon the maximum approved **50 daily movements in and out** and the hourly pattern based upon current counts the heavy vehicle movements when the site is operating at its maximum approved capacity are shown in **Figure 7**.

The *estimated maximum future peak hour volumes in 10 years*, expressed in (passenger car units) pcu's at the intersection of Roberts Road and Old Northern Road are shown in **Figure 7**.

Using **SIDRA** Analysis the intersection will continue to operate at Level of Service **A**. The results are as tabulated below:-

Scenario	Peak Hour	DoS	LoS	Max Delay (sec/veh)	Critical Movement
Existing	AM	.01	A	9.4	Right Turn from Old Northern Road
	PM	0.027	A	9.0	Right Turn from Roberts Road

NOTE: EACH TRUCK FACTORED BY 2 TO ACHIEVE EQUIVALENT PASSENGER UNITS FOR ANALYSIS.

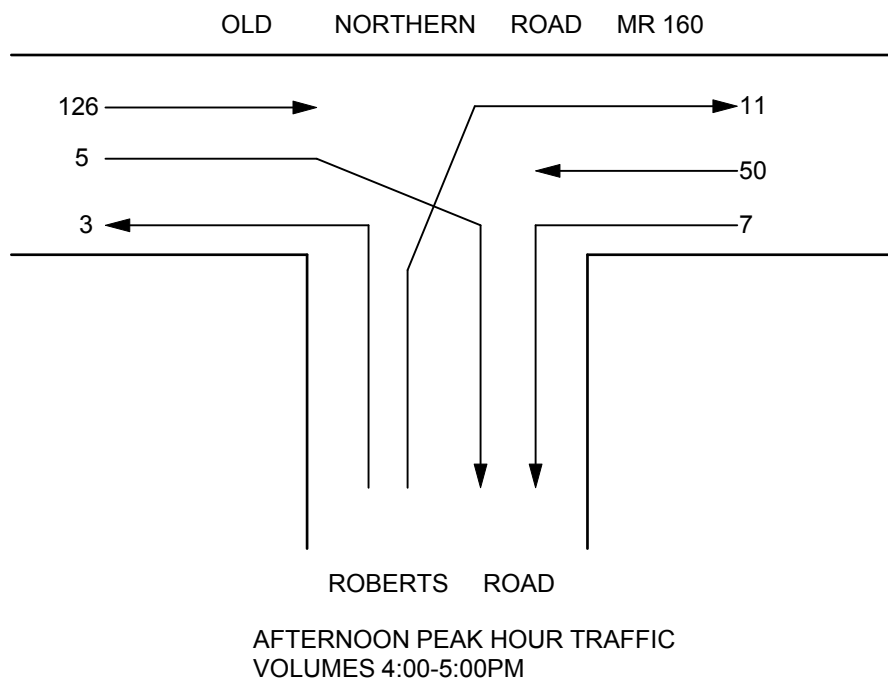
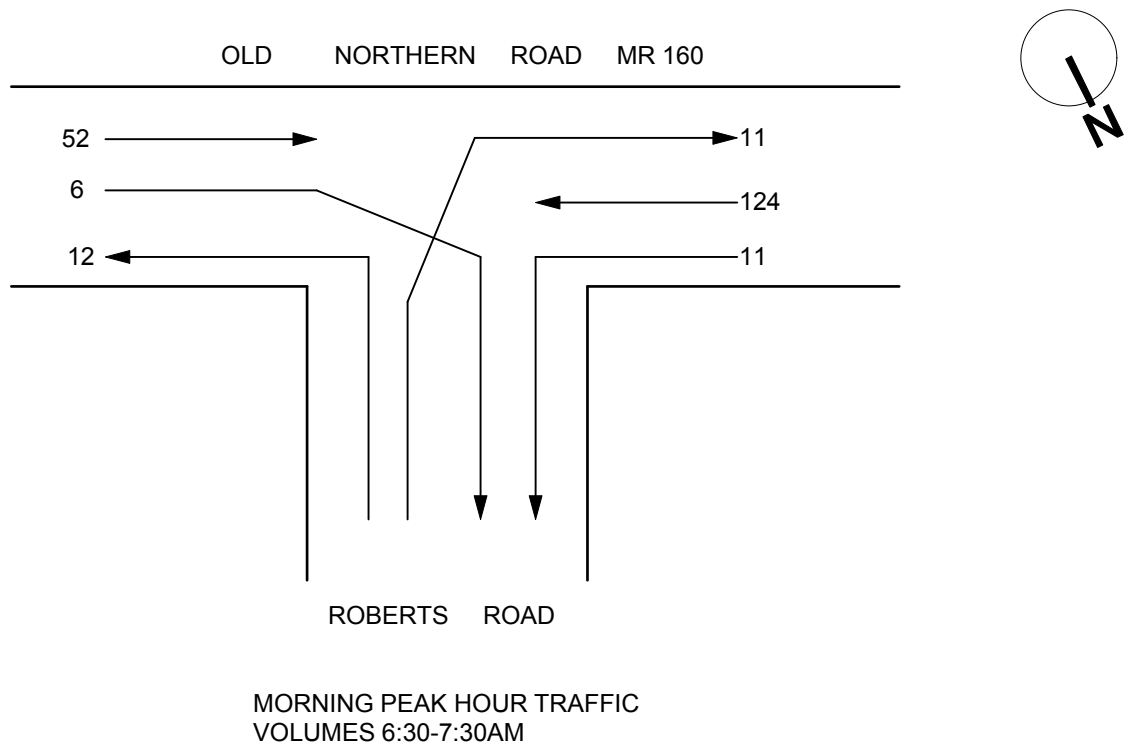
The **SIDRA** analysis shows the *Level of Service* and *Maximum Delay* for the critical movement which is the *right-turn movement* from Roberts Road in the **PM** peak hour and the right turn movement from Old Northern Road in the **AM** peak hour (*Section 4.4*). The Level of Service is **A** for the *critical movements* under *existing* and *future traffic conditions*. The intersection as a whole will have a *lower delay* and **Level of Service A**.

4.5 Operation of Old Northern Road / Wisemans Ferry Road Intersection

A maximum of **50** truck movements per day *in and out* was approved. The number of truck movements *turning left* from Old Northern Road into Wisemans Ferry Road and *turning right* from Wisemans Ferry Road into Old Northern Road in the AM and PM peak hours is *very small* (refer **Table C2** in **Appendix C**). A *SIDRA Analysis* was not considered necessary.

4.6 Internal Access Road

The internal concrete pavement access road and concrete layback crossing are in good condition and considered satisfactory for the approved truck movements over the proposed 10 year period to 2025.



NOTE:
THE FUTURE TRAFFIC VOLUMES ASSUME AN ANNUAL
INCREASE OF 1% WHEREAS THERE WAS AN ANNUAL
DECREASE FROM 1997 TO 2014 OF 0.6% 1 HEAVY
VEHICLE EQUALS 2 PCU's

LEGEND
PASSENGER CAR UNITS PCU's

FIGURE 7
FUTURE PEAK HOUR TRAFFIC
VOLUMES 2025

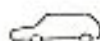
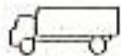
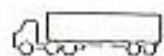
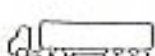
APPENDICES

APPENDIX A

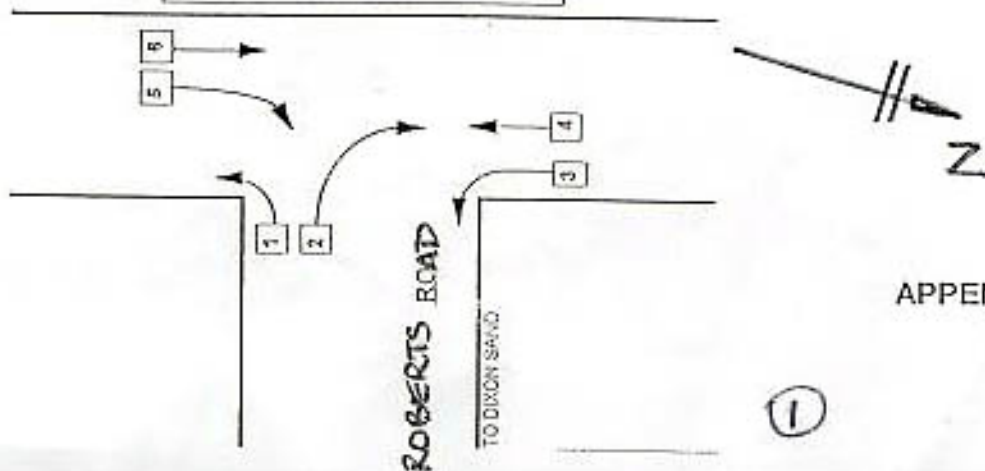
DATE: 5.08.14

WEATHER: FINE

COUNTER NAME: B. HALDEY

TYPE OF VEHICLE								
A		B	C	D				
Cars, Utilities, Station Wagons, Panel Vans, Motor Bikes.		Light Commercial vehicles 2-AXLE up to 6.4m long. Vans, Flat Top Trucks.	2-AXLE RIGID TRUCKS & VANS, TANKERS. OVER 6.4m long.	3-AXLE RIGID TRUCKS VANS & TANKERS	4-AXLE SEMI-TRAILERS.	5-AXLE SEMI-TRAILERS	6-AXLE SEMI-TRAILERS, TRUCK & DOG TRAILER	
 								
MOVEMENT								
TIME AM/	VEH TYPE	1	2	3	4	5	6	TOTALS
6.00am	A	1	1	1	43	-	11	57
to	B	-	-	-	-	-	-	-
6.30am	C	2	-	-	4	-	2	8
	D	-	2	2	7	-	2	13
6.30	A	4	2	3	38	2	8	57
to	B	1	-	-	-	-	2	3
7.00	C	-	1	-	-	-	3	4
	D	-	-	-	4	-	4	8
7.00	A	2	3	2	65	2	19	93
to	B	1	-	1	-	-	-	2
7.30	C	-	-	-	3	-	-	3
	D	-	-	-	1	-	2	3
7.30	A	1	4	5	40	-	11	61
to	B	-	1	-	-	-	1	2
8.00	C	-	-	1	-	1	2	4
	D	-	-	1	2	-	-	3
8.00	A	2	1	3	36	-	16	58
to	B	-	-	-	-	-	1	1
8.30	C	1	-	-	2	-	-	3
	D	-	1	-	-	-	-	1
8.30	A	2	5	3	28	2	17	57
to	B	-	-	-	1	1	2	4
9.00	C	-	-	-	1	-	1	2
	D	-	-	1	2	-	-	3

OLD NORTHERN ROAD

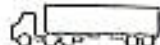
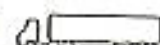


APPENDIX A

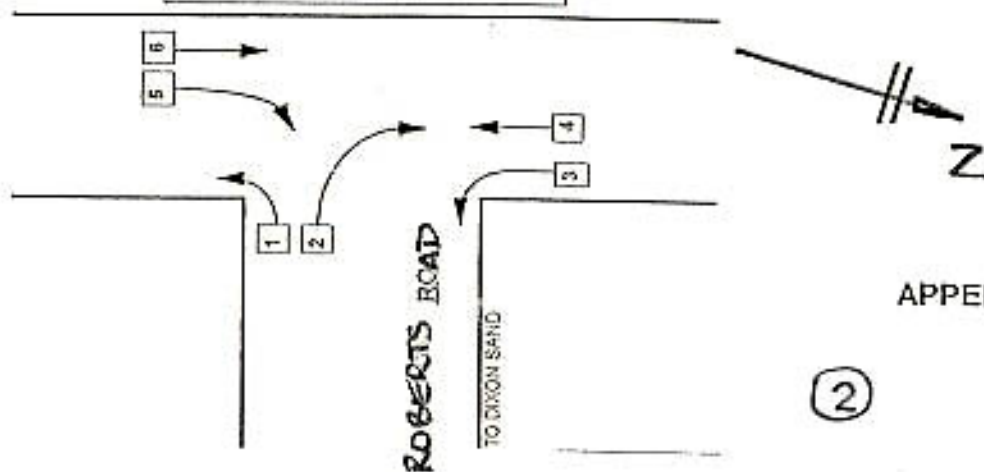
DATE: 5.08.16

WEATHER: FINE

COUNTER NAME: B. HALDEY

TYPE OF VEHICLE								
A		B		C		D		
Cars, Utilities, Station Wagons, Panel Vans, Motor Bikes.		Light Commercial vehicles, 2-AXLE up to 6.4m LONG. Vans, Flat Top Trucks.		2-AXLE RIGID TRUCKS, 4 VANS, TANKERS, RIGID 6.4m LONG.		4-AXLE SEMI-TRAILERS, 5-AXLE SEMI-TRAILERS, 6-AXLE SEMI-TRAILERS, TRUCK & DOG TRAILER		
 						  		
TIME AM	VEH TYPE	1	2	3	4	5	6	TOTALS
9.00	A	2	2	3	27	-	23	57
to	B	1	1	1	1	-	2	6
9.30	C	-	-	-	-	-	-	-
	D	-	1	-	1	-	6	8
9.30	A	4	3	3	27	2	17	56
to	B	-	-	-	-	-	1	1
10.00	C	-	1	-	-	-	-	1
	D	-	-	1	-	-	2	3
10.00	A	2	1	6	22	1	22	54
to	B	-	2	-	3	-	1	6
10.30	C	-	-	1	1	-	3	5
	D	-	1	2	3	1	2	9
10.30	A	-	6	2	23	2	11	44
to	B	-	1	-	1	1	1	4
11.00	C	-	1	-	1	-	8	10
	D	-	2	3	5	-	3	13
11.00	A	4	2	2	17	1	18	44
to	B	-	1	-	-	-	-	1
11.30	C	-	-	2	3	-	1	6
	D	1	2	-	-	1	1	5
11.30	A	-	3	3	17	1	17	41
to	B	-	-	-	-	-	1	1
12.00	C	-	1	1	1	-	-	3
	D	-	-	-	4	-	2	6

OLD NORTHERN ROAD



APPENDIX A

(2)

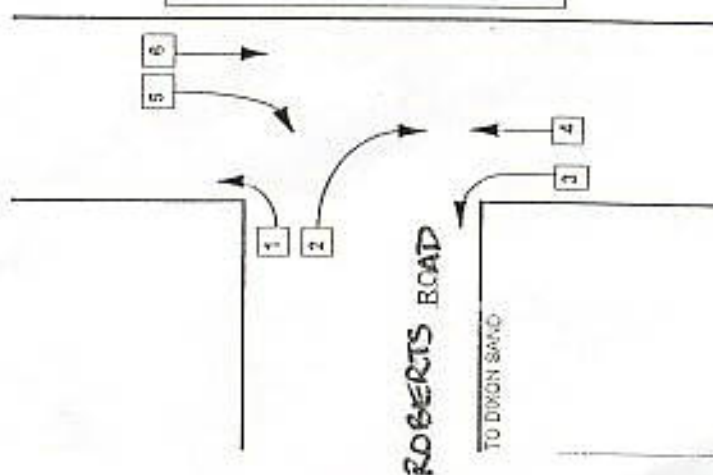
DATE: 5.08.14

WEATHER: FINE

COUNTER NAME: B. HALDEN

TYPE OF VEHICLE									
A		B	C	D					
Cars, Utilities, Station Wagons, Panel Vans, Motor Bikes.		Light Commer- cial Vehicles 2-AXLE up to 6.4m LONG. Vans, Flat Top Trucks.	2-AXLE RIGID TRUCKS & VANS, TANKERS OVER 6.4m LONG.	3-AXLE RIGID TRUCKS VANS & TANKERS	4-AXLE SEMI- TRAILERS.	5-AXLE SEMI- TRAILERS.	6-AXLE SEMI- TRAILERS, TRUCK & DOG TRAILER		
 									
MOVEMENT									
TIME	PM	VEH TYPE	1	2	3	4	5	6	TOTALS
12:00		A	-	5	1	18	1	20	45
to		B	-	-	-	-	-	2	2
12:30		C	-	-	-	2	1	1	4
		D	-	-	-	2	-	2	4
12:30		A	1	2	1	15	-	20	39
to		B	-	1	1	-	1	-	3
1:00		C	1	-	1	1	-	2	5
		D	-	-	1	2	-	3	6
1:00		A	2	1	1	19	2	19	44
to		B	-	-	-	1	-	4	5
1:30		C	-	1	2	6	-	1	10
		D	-	2	1	6	-	4	13
1:30		A	1	1	-	14	1	22	39
to		B	-	-	-	1	-	-	1
2:00		C	-	1	-	2	-	-	3
		D	-	1	-	2	-	5	7
2:00		A	1	2	2	16	1	18	40
to		B	1	1	-	1	1	-	4
2:30		C	-	-	1	4	-	3	8
		D	-	2	1	3	-	4	10
2:30		A	2	3	2	19	3	29	58
to		B	-	1	-	1	-	-	2
3:00		C	-	1	-	2	-	-	3
		D	-	1	-	2	-	-	3

OLD NORTHERN ROAD



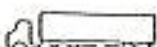
APPENDIX A

(3)

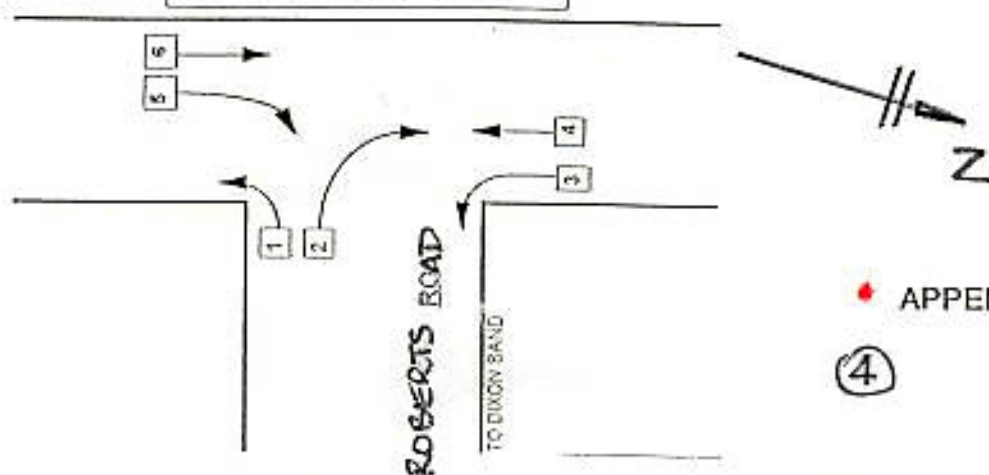
DATE: 5.08.14

WEATHER: FINE

COUNTER NAME: B. HALDEN

TYPE OF VEHICLE									
A		B	C	D					
Cars, Utilities, Station Wagons, Panel Vans, Motor Bikes.		Light Commercial Vehicles, 2-AXLE up to 6.4m LONG, Vans, Flat Top Trucks.	2-AXLE RIGID TRUCKS & VANS, TANKERS, 6.4m LONG.	3-AXLE RIGID TRUCKS, VANS & TANKERS.	4-AXLE SEMI-TRAILERS.	5-AXLE SEMI-TRAILERS.	6-AXLE SEMI-TRAILERS, TRUCK & DOG TRAILER		
 									
MOVEMENT									
TIME	JPM	VEH TYPE	1	2	3	4	5	6	TOTALS
3.00		A	1	-	3	23	-	19	46
to		B	-	-	-	1	1	3	5
3.30		C	-	-	-	4	-	1	1
		D	-	-	2	5	1	2	10
3.30		A	-	3	-	22	2	37	64
to		B	1	-	-	1	-	3	5
4.00		C	-	-	1	2	-	1	4
		D	-	2	-	2	-	3	7
4.00		A	-	5	-	18	2	58	83
to		B	1	-	1	2	-	2	6
4.30		C	-	1	-	-	-	-	1
		D	-	-	1	-	-	2	3
4.30		A	1	2	3	22	3	43	74
to		B	-	-	-	1	-	2	3
5.00		C	-	-	-	-	-	2	2
		D	-	1	-	1	-	1	3
5.00		A	2	3	1	19	-	49	74
to		B	-	1	-	-	-	-	1
5.30		C	-	-	-	-	-	1	1
		D	-	-	-	1	-	-	1
5.30		A	1	1	-	12	1	27	42
to		B	-	-	-	1	-	-	1
6.00		C	-	-	-	1	-	-	1
		D	-	-	-	-	-	1	1

OLD NORTHERN ROAD



APPENDIX A

(4)

APPENDIX B

CFE INFORMATION TECHNOLOGY(02) 9740 8600
 Hourly Volume By Day
 Week commencing : Wednesday, 27/8/2014

Site: OLD NORTHERN ROAD
 Location: 4
 Direction: SOUTH bound

Day Time	Tue 27/8		Wed 28/8		Thur 29/8		Fri 30/8		Sat 31/8		Sun 1/9	
	C	T	C	T	C	T	C	T	C	T	C	T
00.00	0	2	1	1	1	3	3	0	4	0	1	1
01.00	2	0	2	3	1	2	3	2	1	0	1	3
02.00	0	0	0	0	0	0	5	0	2	0	1	0
03.00	1	1	1	3	1	0	4	0	4	0	2	2
04.00	7	2	10	0	8	0	3	0	2	0	4	1
05.00	56	10	48	9	52	6	43	7	8	1	50	9
06.00	96	11	85	11	76	17	87	14	11	0	91	12
07.00	99	8	90	13	88	6	78	8	29	2	101	11
08.00	84	13	69	7	72	9	83	10	51	1	86	16
09.00	53	13	64	12	51	7	62	13	66	0	44	13
10.00	48	8	38	3	46	8	36	13	59	1	45	8
11.00	40	9	39	8	38	8	46	1	72	3	42	10
12.00	37	9	30	13	38	4	40	6	95	3	40	7
13.00	44	11	35	17	27	10	30	11	126	3	53	10
14.00	49	9	50	5	34	2	55	8	155	1	44	5
15.00	33	9	41	3	37	6	61	5	200	3	50	5
16.00	49	5	37	6	39	4	51	5	170	0	43	7
17.00	28	2	29	3	26	3	34	3	126	4	64	1
18.00	22	1	21	2	18	1	33	2	52	3	25	0
19.00	7	2	9	0	15	2	19	0	20	1	11	0
20.00	12	0	6	1	9	2	12	0	14	1	4	0
21.00	1	1	6	0	3	1	9	1	14	0	9	0
22.00	2	1	2	1	7	0	6	0	2	1	2	1
23.00	2	3	3	0	1	2	9	0	4	4	3	0
TOTAL	772	130	716	121	690	103	807	112	1287	32	816	121

* Legend

C: light Vehicles
 T: Heavy Vehicles
 CLASSES 192
 CLASSES 3 to 10

CFE INFORMATION TECHNOLOGY(02) 9740 8600
 Hourly Volume By Day
 Week commencing : Wednesday, 27/8/2014

Site: OLD NORTHERN ROAD
 Location: 4
 Direction: NORTH bound

Day Time	Tue 27/8		Wed 28/8		Thur 29/8		Fri 30/8		Sat 31/8		Sun 1/9	
	C	T	C	T	C	T	C	T	C	T	C	T
00.00	2	0	2	0	3	1	2	0	6	0	9	0
01.00	2	0	3	1	1	0	3	1	0	0	1	0
02.00	0	1	2	1	2	0	0	2	3	0	1	0
03.00	3	0	2	1	2	0	2	1	1	0	3	0
04.00	1	0	1	0	1	2	1	0	3	1	2	0
05.00	5	4	7	6	6	2	12	2	5	1	2	0
06.00	18	4	14	1	16	2	14	2	13	1	27	0
07.00	18	10	30	9	19	9	29	8	19	6	57	1
08.00	30	11	30	7	32	6	28	7	39	2	56	2
09.00	33	11	28	5	33	10	32	6	49	2	64	2
10.00	43	9	32	11	41	6	48	6	76	4	86	1
11.00	38	13	45	11	32	5	51	11	82	2	134	2
12.00	38	12	31	9	43	11	46	18	94	1	125	0
13.00	37	13	35	10	32	10	51	7	88	3	105	0
14.00	50	7	44	9	57	10	74	13	60	2	64	1
15.00	65	13	53	7	72	7	86	5	56	1	62	3
16.00	97	8	88	13	84	5	103	5	56	3	50	5
17.00	101	12	86	1	85	2	112	6	50	1	44	0
18.00	58	0	65	0	62	3	66	5	39	0	45	1
19.00	34	2	32	1	37	5	78	2	30	1	22	0
20.00	20	0	31	2	29	1	41	1	19	0	15	1
21.00	19	2	24	1	17	1	22	0	23	0	9	1
22.00	9	0	10	0	15	0	25	0	22	0	9	0
23.00	7	2	5	0	7	0	14	0	10	0	3	1
TOTAL	728	134	700	106	728	98	940	108	843	31	995	21
* Legend												

C: light Vehicles
 T: Heavy Vehicles
 CLASSES 1 to 2
 CLASSES 3 to 10

CFE INFORMATION TECHNOLOGY(02) 9740.8600
Hourly Volume By Day
Week commencing : Wednesday, 27/8/2014

Site: WISEMAN'S FERRY ROAD
Location: 3
Direction: West bound

Day	Tue		Wed		Thur		Fri		Sat		Sun		Mon	
Time	27/8		27/8		28/8		29/8		30/8		31/8		1/9	
	C	T	C	T	C	T	C	T	C	T	C	T	C	T
00.00	1	1	2	1	0	2	1	1	4	3	2	0	2	1
01.00	1	1	2	0	2	0	1	2	4	1	0	0	2	0
02.00	0	0	0	0	0	1	0	0	2	0	2	0	1	0
03.00	1	0	0	0	2	0	1	0	0	0	3	0	0	0
04.00	9	3	10	0	10	1	10	2	3	1	2	0	6	4
05.00	50	25	37	16	38	15	32	16	14	6	6	0	35	21
06.00	77	27	68	31	64	17	67	23	27	11	17	0	66	23
07.00	75	29	61	19	64	18	73	23	20	9	15	3	75	19
08.00	75	23	71	17	83	21	68	23	42	7	49	5	78	26
09.00	47	22	47	25	37	15	41	27	63	2	83	17	38	28
10.00	39	22	40	20	51	17	48	22	56	8	102	15	43	24
11.00	51	25	41	15	38	19	41	15	44	4	108	8	47	11
12.00	45	16	42	20	42	13	45	21	67	3	95	7	53	14
13.00	45	18	28	14	48	13	58	15	59	1	100	2	43	15
14.00	52	15	62	13	53	18	72	17	61	3	100	3	56	13
15.00	42	17	47	11	43	11	65	14	58	7	91	5	58	8
16.00	56	16	52	8	48	7	77	12	76	4	66	2	50	11
17.00	52	3	45	3	43	4	66	9	52	4	45	3	47	5
18.00	34	3	41	6	44	1	56	5	36	3	32	2	28	1
19.00	16	0	15	0	22	3	32	0	29	0	21	2	17	0
20.00	15	2	10	1	18	0	15	1	20	2	9	1	10	2
21.00	7	1	11	1	20	0	23	0	16	1	12	0	7	1
22.00	5	1	7	0	5	1	11	1	12	0	3	0	2	1
23.00	5	2	4	0	3	2	9	1	7	0	3	1	7	0
TOTAL	800	272	743	221	778	199	913	249	772	80	966	76	771	228

* Legend

C: light Vehicles
Classes 1 to 2
T: Heavy Vehicles
Classes 3 to 10

CFE INFORMATION TECHNOLOGY(02) 9740 8600
Hourly Volume By Day
Week commencing : Wednesday, 27/8/2014

Site: WISEMAN'S FERRY ROAD
Location: 3
Direction: East bound

Day	Tue		Wed		Thur		Fri		Sat		Sun		Mon	
Time	27/8		28/8		29/8		30/8		31/8		1/9		2/9	
	C	T	C	T	C	T	C	T	C	T	C	T	C	T
00.00	2	0	1	0	4	0	1	0	5	1	4	0	2	0
01.00	1	0	1	1	1	0	1	1	1	0	5	0	2	1
02.00	2	1	1	0	0	0	1	1	1	1	2	0	0	1
03.00	1	1	2	0	1	1	0	1	2	0	2	0	1	1
04.00	5	1	7	0	6	1	4	1	4	1	2	0	5	0
05.00	21	1	18	2	18	2	25	2	12	2	3	1	27	1
06.00	33	22	39	15	30	18	25	20	20	10	24	2	35	19
07.00	53	21	43	17	42	13	38	19	24	11	42	2	36	17
08.00	58	16	55	21	42	15	49	17	35	9	49	2	59	18
09.00	58	16	42	17	51	21	57	14	58	6	58	2	45	24
10.00	44	18	49	20	42	17	43	22	58	18	70	4	40	20
11.00	40	23	34	23	45	14	52	18	59	5	74	2	37	16
12.00	24	16	44	20	39	14	43	26	52	4	103	15	51	14
13.00	34	24	41	15	35	17	67	22	69	6	119	4	44	15
14.00	40	16	57	19	62	14	70	20	61	3	86	1	44	15
15.00	74	29	54	23	73	17	79	19	53	7	128	6	82	25
16.00	84	16	85	12	80	15	83	11	60	3	83	1	91	17
17.00	75	12	61	5	71	4	73	10	47	1	72	0	83	10
18.00	55	0	37	0	45	4	55	4	29	0	37	3	37	2
19.00	22	0	19	1	14	2	36	1	21	0	21	1	17	1
20.00	6	0	15	1	16	2	18	2	16	0	7	0	11	0
21.00	14	1	23	1	24	0	16	0	9	1	12	0	12	0
22.00	7	0	7	1	20	0	17	0	26	0	6	0	7	0
23.00	3	0	3	0	6	0	14	0	7	0	3	0	3	1
TOTAL	756	244	740	212	767	191	867	231	729	84	1012	46	771	216

* Legend

C: light Vehicles
CLASSES 1 to 10
T: Heavy Vehicles
CLASSES 11 to 10

CFE INFORMATION TECHNOLOGY(02) 9740 8600
 Hourly Volume By Day
 Week commencing : Wednesday, 27/8/2014

Site: ROBERTS ROAD
 Location: 5
 Direction: East bound

Day Time	Tue 2/9		Wed 27/8		Thur 28/8		Fri 29/8		Sat 30/8		Sun 31/8		Mon 1/9	
	C	T	C	T	C	T	C	T	C	T	C	T	C	T
00.00	1	0	1	0	1	1	0	0	0	0	1	0	0	0
01.00	0	1	0	0	0	0	2	0	0	0	0	0	0	0
02.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03.00	0	0	0	0	0	0	0	0	0	0	1	0	0	1
04.00	0	1	0	0	0	0	1	2	0	0	0	0	1	2
05.00	0	7	0	2	1	5	2	2	1	0	0	0	1	2
06.00	11	3	5	2	8	4	11	2	8	0	1	0	11	3
07.00	8	7	12	6	9	3	9	8	4	0	4	0	7	6
08.00	10	4	8	4	15	4	8	5	3	0	8	0	6	3
09.00	11	7	6	1	6	3	0	5	12	0	6	0	7	8
10.00	12	4	6	2	7	1	10	2	9	0	9	0	10	10
11.00	5	1	9	2	8	4	3	2	6	2	7	0	6	5
12.00	5	4	7	1	4	7	6	2	4	0	9	1	8	7
13.00	10	2	5	4	5	3	8	4	9	0	9	0	7	2
14.00	10	1	8	2	10	4	11	3	10	0	9	0	11	5
15.00	12	1	5	0	8	1	13	1	4	1	11	1	12	2
16.00	7	3	18	3	13	1	9	2	6	1	8	1	7	2
17.00	15	1	9	0	12	2	10	1	2	1	7	0	13	5
18.00	1	0	10	2	8	0	6	1	3	0	6	1	4	0
19.00	4	1	0	1	3	1	3	1	3	0	0	0	4	1
20.00	1	0	2	0	1	0	1	0	0	0	1	0	1	0
21.00	2	1	2	0	3	0	1	0	3	0	2	1	3	0
22.00	1	1	1	0	0	0	1	0	0	0	0	0	0	0
23.00	0	0	1	0	0	1	1	1	1	0	0	0	2	0
TOTAL	126	50	115	32	122	45	116	44	88	5	99	5	121	64

* Legend

C: light Vehicles
 T: Heavy Vehicles
 CLASSES 1 to 10
 CLASSES 3 to 10

CFE INFORMATION TECHNOLOGY(02) 9740.8600
 Hourly Volume By Day
 Week commencing : Wednesday, 27/8/2014-

Site: ROBERTS ROAD
 Location: 5
 Direction: West bound

Day Time	Tue 2/9		Wed 27/8		Thur 28/8		Fri 29/8		Sat 30/8		Sun 31/8		Mon 1/9	
	C	T	C	T	C	T	C	T	C	T	C	T	C	T
00.00	0	1	0	1	0	1	0	1	0	0	0	0	0	1
01.00	1	0	1	0	1	0	1	0	0	0	0	0	0	1
02.00	0	0	0	0	0	0	0	0	1	0	1	0	0	0
03.00	0	0	0	1	0	0	0	0	0	0	1	0	0	0
04.00	0	0	0	0	0	0	1	0	0	0	0	0	0	1
05.00	3	1	3	0	3	0	3	0	1	0	0	0	4	0
06.00	10	7	2	3	2	6	5	4	2	0	0	0	7	5
07.00	14	5	11	4	10	2	7	6	5	1	3	0	9	7
08.00	6	4	9	4	13	2	9	5	6	0	8	0	10	3
09.00	14	3	8	2	10	5	8	5	13	0	5	1	10	3
10.00	9	3	7	0	4	4	9	1	12	1	6	0	7	6
11.00	7	1	7	4	11	2	4	1	8	0	8	0	6	4
12.00	7	3	5	0	4	1	5	2	10	0	10	0	16	3
13.00	12	2	4	0	6	5	8	2	9	0	10	0	10	3
14.00	5	0	11	2	13	3	13	2	7	0	9	0	11	3
15.00	17	1	10	0	10	1	21	0	4	1	7	1	10	2
16.00	3	3	15	3	13	2	7	2	6	1	13	0	11	1
17.00	12	0	6	2	14	1	7	1	4	0	9	0	11	0
18.00	3	0	7	0	6	0	6	1	6	0	4	1	5	0
19.00	1	0	3	0	2	0	1	0	1	0	3	1	6	0
20.00	0	1	3	0	3	0	0	1	0	0	1	0	1	0
21.00	0	0	1	0	1	0	0	0	0	0	0	0	1	0
22.00	0	0	0	0	0	0	1	0	0	0	1	0	0	0
23.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	124	35	113	26	126	35	116	34	95	4	99	4	135	43

* Legend

C: light Vehicles
 T: Heavy Vehicles
 CLASSES 192
 CLASSES 3 to 10

Traffic Counting Supplies & Service (02) 476-6266

Hourly Volume By Day

Week commencing : Wednesday, 15/10/1997

Site: 140

Location: 4 OLD NORTHERN ROAD

Direction: South Bound

Day Time	Tue 21/10		Wed 15/10		Thur 16/10		Fri 17/10		Sat 18/10		Sun 19/10		Mon 20/10	
	C	T	C	T	C	T	C	T	C	T	C	T	C	T
00.00	0	0	3	0	0	0	3	1	1	0	16	0	5	2
01.00	2	0	5	2	5	1	3	1	2	0	18	0	4	1
02.00	2	0	6	1	1	0	5	0	3	0	11	0	5	2
03.00	4	1	1	0	4	1	4	1	1	1	11	1	3	1
04.00	7	0	7	1	10	4	10	2	3	0	8	0	9	1
05.00	36	2	33	0	36	3	36	4	11	1	10	1	30	0
06.00	92	13	82	19	84	18	95	19	35	1	18	1	88	17
07.00	115	5	123	5	117	6	94	5	38	1	28	1	114	3
08.00	84	6	88	18	90	12	91	11	54	3	55	3	83	12
09.00	65	15	50	3	49	6	43	4	57	4	49	4	62	6
10.00	39	8	54	3	51	11	62	12	51	2	59	2	57	13
11.00	41	12	38	7	44	10	34	8	49	4	69	4	46	11
12.00	44	8	47	8	54	8	43	5	40	1	66	1	31	7
13.00	36	8	39	14	52	14	52	13	72	5	104	5	34	9
14.00	47	13	45	2	54	9	55	2	70	9	123	9	54	7
15.00	57	2	46	3	66	6	63	3	71	5	151	5	41	6
16.00	43	3	44	4	54	5	61	4	105	14	222	14	48	5
17.00	44	0	30	1	48	0	33	1	100	3	172	3	39	1
18.00	23	1	26	1	49	3	45	3	59	4	135	4	35	1
19.00	9	2	13	0	20	1	29	1	38	0	43	0	13	2
20.00	6	0	13	1	12	0	13	0	17	0	33	0	8	0
21.00	4	0	7	0	8	0	3	0	18	0	18	0	6	0
22.00	3	0	7	0	3	0	9	0	23	0	5	0	5	1
23.00	0	0	0	0	5	0	6	0	18	0	3	0	1	0
TOTAL	803	88	807	93	916	118	892	100	936	53	1427	58	821	108

* Legend

C : Cars and light Vehicles

T : Heavy Trucks

Traffic Counting Supplies & Service (02) 476-6266

Hourly Volume By Day

Week commencing : Wednesday, 15/10/1997

Site: 140

Location: 4 OLD NORTHERN ROAD

Direction: NorthBound

Day Time	Tue 21/10		Wed 15/10		Thur 16/10		Fri 17/10		Sat 18/10		Sun 19/10		Mon 20/10	
	C	T	C	T	C	T	C	T	C	T	C	T	C	T
00.00	5	0	8	0	2	0	3	0	14	0	12	0	5	0
01.00	2	0	2	0	4	0	1	0	5	0	10	2	1	0
02.00	2	0	1	0	2	0	1	0	5	0	5	0	0	0
03.00	2	0	0	0	2	0	2	1	1	0	4	0	0	0
04.00	1	0	4	1	6	2	6	2	5	0	8	0	7	1
05.00	11	5	17	7	9	4	9	5	12	3	10	0	15	6
06.00	18	3	15	1	20	4	19	2	13	4	12	0	12	0
07.00	25	5	36	8	48	12	41	8	47	4	23	0	34	11
08.00	33	10	54	14	34	8	36	7	53	12	50	3	32	5
09.00	45	17	37	6	49	4	48	7	79	12	72	2	36	8
10.00	35	5	41	10	50	12	62	17	88	12	100	5	50	19
11.00	58	14	59	11	60	15	55	9	95	8	141	2	44	10
12.00	45	9	48	10	52	13	51	10	80	3	104	3	49	8
13.00	49	14	43	12	54	13	63	7	95	9	82	2	41	10
14.00	54	9	49	10	52	11	66	7	106	3	61	0	66	15
15.00	49	8	58	6	56	7	81	10	85	4	50	0	57	7
16.00	78	2	81	5	79	9	66	2	62	1	42	1	85	5
17.00	94	6	69	2	87	6	119	5	52	2	37	0	93	5
18.00	73	3	77	1	86	2	103	4	41	0	24	1	79	0
19.00	41	0	42	0	43	0	64	4	39	3	19	0	29	0
20.00	16	1	23	0	42	0	49	2	30	1	23	1	20	1
21.00	26	0	25	1	30	1	30	0	26	0	16	0	15	0
22.00	13	0	16	1	19	0	27	0	16	0	10	0	11	0
23.00	11	0	13	0	14	0	15	0	19	0	9	0	10	0
TOTAL	786	111	818	106	900	123	1017	109	1068	81	924	22	791	111

* Legend

C : Cars and light Vehicles

T : Heavy Trucks

APPENDIX C

TABLE C1 **EXISTING AVERAGE HOURLY HEAVY VEHICLE VOLUMES**
MONDAY TO FRIDAY ON MAIN ROADS AND
ROBERTS ROAD **PERIOD 27-08-14 TO 02-09-14**

Time	Wisemans Ferry Road		Old Northern Road		Roberts Road	
	Station 3		Station 4		Station 5	
	East Bound	West Bound	North Bound	South Bound	East Bound	West Bound
6.00 - 7.00 am	18.8	24.2	2.6	13.0	2.8	5.0
7.00 - 8.00 am	17.4	21.6	9.4	9.2	6.0	4.8
8.00 - 9.00 am	17.4	22.0	7.6	11.0	4.0	3.6
9.00 - 10.00 am	18.4	23.4	9.4	11.6	4.8	3.6
10.00-11.00 am	19.4	21.0	9.0	8.0	3.8	2.8
11.00-12.00 am	18.8	17.0	9.8	7.2	2.8	2.4
12.00 - 1.00 pm	18.0	16.8	11.6	7.8	4.2	1.8
1.00 - 2.00 pm	18.6	15.0	9.4	11.8	3.0	2.4
2.00 - 3.00 pm	16.8	15.2	11.0	5.8	3.0	2.0
3.00 - 4.00 pm	22.6	12.2	8.8	5.6	1.0	0.8
4.00 - 5.00 pm	14.2	10.8	8.4	5.4	2.2	2.2
5.00 - 6.00 pm	8.2	4.8	5.0	2.4	1.8	0.8
(6.00am to 6.00 pm) TOTAL	208.6	204	102	98.8	39.4	32.2
(24 hours) TOTAL	219.2	233.8	115.4	117.4	47.0	34.6

TABLE C2

MAXIMUM DAILY
HEAVY TRUCKS GENERATED BY DEVELOPMENT AND
HOURLY DISTRIBUTION TO MAIN ROADS AND ROBERTS
ROAD.

MONDAYS TO FRIDAY

Time	Roberts Road		Wisemans Ferry Road Station 3		Old Northern Road Station 4	
	Eastbound	Westbound	Westbound	Eastbound	Southbound	Northbound
6.00 - 7.00 am	3	6	5	3	1	0
7.00 - 8.00 am	4	2	2	3	0	1
8.00 - 9.00 am	5	2	5	4	1	1
9.00 - 10.00 am	7	6	5	5	1	2
10.00-11.00 am	10	7	6	8	1	2
11.00-12.00 am	3	5	5	2	6	1
12.00 - 1.00 pm	4	2	2	4	1	0
1.00 - 2.00 pm	4	6	5	4	1	1
2.00 - 3.00 pm	4	6	5	3	0	1
3.00 - 4.00 pm	1	2	2	3	0	1
4.00 - 5.00 pm	1	1	1	1	0	0
5.00 - 6.00 pm	1	0	1	1	0	0
TOTAL	50	50	43	41	7	9

TABLE C-3

EXISTING HEAVY TRUCK VOLUMES ON MAIN ROADS
AND ROBERTS ROAD.

SATURDAY 30-8-14

Time	Roberts Road STATION 5		Wisemans Ferry Road Station 3		Old Northern Road Station 4	
	East Bound	West Bound	West Bound	East Bound	North Bound	South Bound
6.00 - 7.00 am	0	0	11	10	1	5
7.00 - 8.00 am	0	1	9	11	6	2
8.00 - 9.00 am	0	0	7	9	2	6
9.00 - 10.00 am	0	0	2	6	2	1
10.00-11.00 am	0	1	8	18	4	4
11.00-12.00 am	2	0	4	5	2	2
12.00-1.00 pm	0	0	3	4	1	4
1.00-2.00 pm	0	0	1	6	3	4
2.00-3.00 pm	0	0	3	3	2	1
3.00-4.00 pm	1	1	7	2	1	3
4.00-5.00 pm	1	1	4	3	3	4
5.00-6.00 pm	1	0	4	1	1	2
(6.00am - 6.00 pm) TOTAL	5	4	63	78	28	38
(24 Hours) TOTAL	5	4	80	84	31	45

APPENDIX C

TABLE C4 INCREASE IN HEAVY TRAFFIC ON MAIN ROADS AND ROBERTS ROAD WHEN DEVELOPMENT GENERATES MAXIMUM DAILY TRUCK MOVEMENTS 50 IN AND 50 OUT

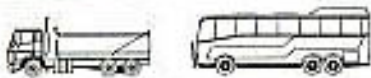
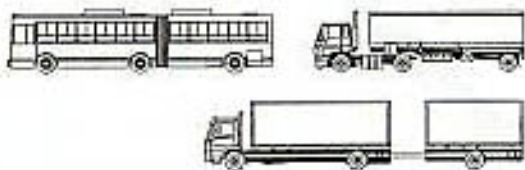
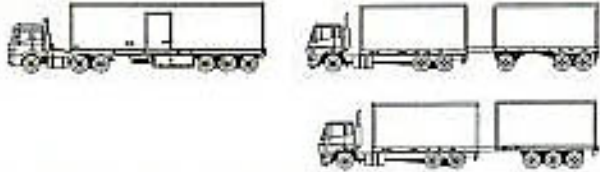
MONDAY TO FRIDAY

Time	Roberts Road		Wisemans Ferry Road Station 3		Old Northern Road Station 4	
	East Bound	West Bound	West Bound	East Bound	North Bound	South Bound
6.00 - 7.00 am	1	4	3	1	0	1
7.00 - 8.00 am	4	2	2	3	1	0
8.00 - 9.00 am	4	5	4	3	1	1
9.00 - 10.00 am	6	5	4	4	2	1
10.00-11.00 am	4	4	3	3	1	1
11.00-12.00 am	2	3	3	2	0	0
12.00-1.00 pm	3	2	2	3	0	0
1.00-2.00 pm	3	3	2	3	0	1
2.00-3.00 pm	3	3	2	2	1	1
3.00-4.00 pm	1	0	0	1	0	0
4.00-5.00 pm	0	0	0	0	0	0
5.00-6.00 pm	1	0	0	1	0	0
(6.00am - 6.00 pm) TOTAL	32	31	25	26	6	6

APPENDIX D

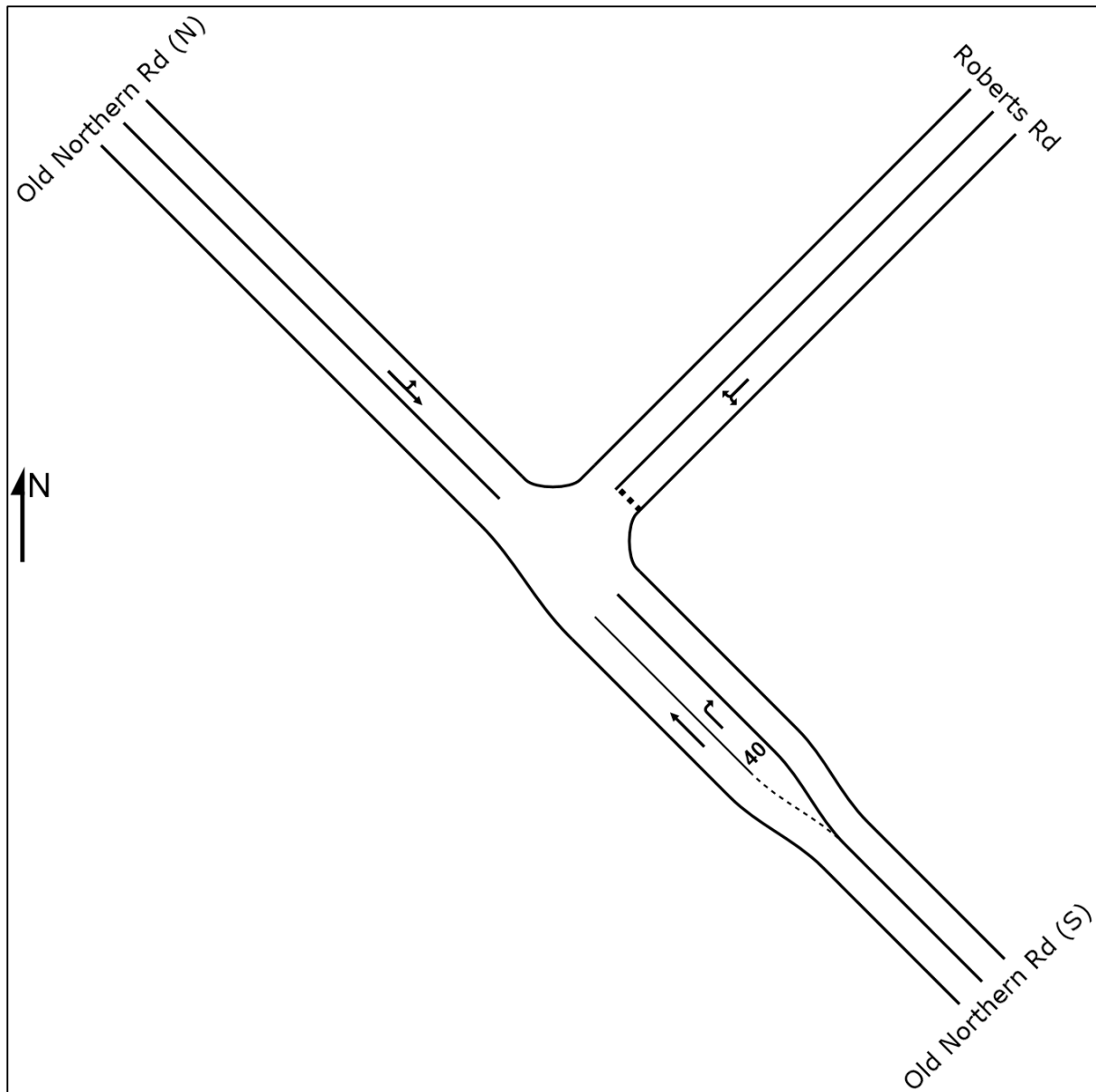
VEHICLE CLASSIFICATION SYSTEM

AUSTROADS : January 1994

Class	LIGHT VEHICLES
1	SHORT Car, Van, Wagon, 4WD, Utility, Bicycle, Motorcycle 
2	SHORT - TOWING Trailer, Caravan, Boat 
HEAVY VEHICLES	
3	TWO AXLE TRUCK OR BUS (2 axles) 
4	THREE AXLE TRUCK OR BUS (3 axles, 2 groups) 
5	FOUR AXLE TRUCK (4 axles, 2 groups) 
6	THREE AXLE ARTICULATED (3 axles, 3 groups) 
7	FOUR AXLE ARTICULATED (4 axles, 3 or 4 groups) 
8	FIVE AXLE ARTICULATED (5 axles, 3 to 5 groups) 
9	SIX AXLE ARTICULATED (6 axles, 3 to 6 groups 7+ axles, 3 groups) 
10	B DOUBLE (7+ axles, 4 groups) 
11	DOUBLE ROAD TRAIN (7+ axles, 5 or 6 groups) 
12	TRIPLE ROAD TRAIN (7+ axles, 7+ groups) 

APPENDIX E

Old Northern Road / Roberts Road Site Layout



MOVEMENT SUMMARY

Site: Old Northern Road / Roberts Road AM EXISTING

Old Northern Road / Roberts Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMo v	Demand Flows Total	Deg. Satn HV %	Average Delay v/c	Level of Service	95% Back of Queue Vehicles	Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	sec		veh	m		per veh	km/h
SouthEast: Old Northern Rd (S)										
22	T1	38	28.9	0.023	0.0	LOS A	0.0	0.00	0.00	90.0
23	R2	4	0.0	0.005	8.1	LOS A	0.0	0.28	0.60	55.2
Approach		42	26.2	0.023	0.8	NA	0.0	0.03	0.06	84.9
NorthEast: Roberts Rd										
24	L2	8	25.0	0.018	5.4	LOS A	0.1	0.28	0.53	49.7
26	R2	6	16.7	0.018	6.5	LOS A	0.1	0.28	0.53	50.9
Approach		14	21.4	0.018	5.9	LOS A	0.1	0.28	0.53	50.2
NorthWest: Old Northern Rd (N)										
27	L2	6	16.7	0.063	7.8	LOS A	0.0	0.00	0.03	73.9
28	T1	111	7.2	0.063	0.0	LOS A	0.0	0.00	0.03	89.2
Approach		117	7.7	0.063	0.4	NA	0.0	0.00	0.03	88.3
All Vehicles		173	13.3	0.063	0.9	NA	0.1	0.03	0.08	82.4

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 is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: Old Northern Road / Roberts Road AM EXISTING

Old Northern Road / Roberts Road
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows	Cap. Adj.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV					Veh	Dist			
	veh/h	% veh/h	v/c	%	sec			m	m	%	%
SouthEast: Old Northern Rd (S)											
Lane 1	38	28.9	1641	0.023	100	0.0	LOS A	0.0	0.0	Full	0.0
Lane 2	4	0.0	753	0.005	100	8.1	LOS A	0.0	0.1	Short	NA
Approach	42	26.2		0.023		0.8	NA	0.0	0.1		
NorthEast: Roberts Rd											
Lane 1	14	21.4	778	0.018	100	5.9	LOS A	0.1	0.5	Full	0.0
Approach	14	21.4		0.018		5.9	LOS A	0.1	0.5		
NorthWest: Old Northern Rd (N)											
Lane 1	117	7.7	1851	0.063	100	0.4	LOS A	0.0	0.0	Full	0.0
Approach	117	7.7		0.063		0.4	NA	0.0	0.0		
Intersection	173	13.3		0.063		0.9	NA	0.1	0.5		

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

Lane LOS values are based on average delay per lane.

Minor Road Approach LOS values are based on average delay for all lanes.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: Old Northern Road / Roberts Road PM EXISTING

Old Northern Road / Roberts Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMo v	Demand Flows Total	Deg. Satn HV	Average Delay	Level of Service	95% Back of Queue Vehicles	Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed	
		veh/h	%	v/c	sec	veh	m		per veh	km/h	
SouthEast: Old Northern Rd (S)											
22	T1	110	8.2	0.059	0.0	LOS A	0.0	0.00	0.00	90.0	
23	R2	5	0.0	0.006	7.5	LOS A	0.0	0.17	0.60	55.5	
Approach		115	7.8	0.059	0.3	NA	0.0	0.01	0.03	87.6	
NorthEast: Roberts Rd											
24	L2	2	50.0	0.017	5.3	LOS A	0.1	0.27	0.55	45.1	
26	R2	9	22.2	0.017	6.7	LOS A	0.1	0.27	0.55	49.5	
Approach		11	27.3	0.017	6.4	LOS A	0.1	0.27	0.55	48.6	
NorthWest: Old Northern Rd (N)											
27	L2	5	40.0	0.027	8.3	LOS A	0.0	0.00	0.07	65.1	
28	T1	44	9.1	0.027	0.0	LOS A	0.0	0.00	0.07	88.8	
Approach		49	12.2	0.027	0.9	NA	0.0	0.00	0.07	85.7	
All Vehicles		175	10.3	0.059	0.9	NA	0.1	0.02	0.07	82.9	

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 is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: Old Northern Road / Roberts Road PM EXISTING

Old Northern Road / Roberts Road
Giveway / Yield (Two-Way)

Lane Use and Performance													
	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV						Veh	Dist				
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
SouthEast: Old Northern Rd (S)													
Lane 1	110	8.2	1852	0.059	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	5	0.0	836	0.006	100	7.5	LOS A	0.0	0.2	Short	40	0.0	NA
Approach	115	7.8		0.059		0.3	NA	0.0	0.2				
NorthEast: Roberts Rd													
Lane 1	11	27.3	653	0.017	100	6.4	LOS A	0.1	0.5	Full	500	0.0	0.0
Approach	11	27.3		0.017		6.4	LOS A	0.1	0.5				
NorthWest: Old Northern Rd (N)													
Lane 1	49	12.2	1791	0.027	100	0.9	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	49	12.2		0.027		0.9	NA	0.0	0.0				
Intersection	175	10.3		0.059		0.9	NA	0.1	0.5				

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

Lane LOS values are based on average delay per lane.

Minor Road Approach LOS values are based on average delay for all lanes.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: Old Northern Road / Roberts Road AM FUTURE 2025

Old Northern Road / Roberts Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMo v	Demand Flows Total veh/h	Deg. Satn HV %	Average Delay v/c sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Old Northern Rd (S)										
22	T1	76	28.9	0.046	0.0	LOS A	0.0	0.0	0.00	90.0
23	R2	6	0.0	0.010	9.4	LOS A	0.0	0.2	0.41	54.1
Approach		82	26.8	0.046	0.7	NA	0.0	0.2	0.03	85.8
NorthEast: Roberts Rd										
24	L2	12	25.0	0.038	6.3	LOS A	0.1	1.1	0.43	48.5
26	R2	11	18.2	0.038	9.1	LOS A	0.1	1.1	0.43	49.4
Approach		23	21.7	0.038	7.6	LOS A	0.1	1.1	0.43	49.0
NorthWest: Old Northern Rd (N)										
27	L2	11	18.2	0.126	7.8	LOS A	0.0	0.0	0.00	73.3
28	T1	222	7.2	0.126	0.0	LOS A	0.0	0.0	0.00	89.3
Approach		233	7.7	0.126	0.4	NA	0.0	0.0	0.00	88.4
All Vehicles		338	13.3	0.126	0.9	NA	0.1	1.1	0.04	83.2

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

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: Old Northern Road / Roberts Road AM FUTURE 2025

Old Northern Road / Roberts Road
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows		Cap. HV	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total							Veh	Dist				
	veh/h	% veh/h											
SouthEast: Old Northern Rd (S)													
Lane 1	76	28.9	1641	0.046	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	6	0.0	617	0.010	100	9.4	LOS A	0.0	0.2	Short	40	0.0	NA
Approach	82	26.8		0.046		0.7	NA	0.0	0.2				
NorthEast: Roberts Rd													
Lane 1	23	21.7	602	0.038	100	7.6	LOS A	0.1	1.1	Full	500	0.0	0.0
Approach	23	21.7		0.038		7.6	LOS A	0.1	1.1				
NorthWest: Old Northern Rd (N)													
Lane 1	233	7.7	1851	0.126	100	0.4	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	233	7.7		0.126		0.4	NA	0.0	0.0				
Intersection	338	13.3		0.126		0.9	NA	0.1	1.1				

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

Lane LOS values are based on average delay per lane.

Minor Road Approach LOS values are based on average delay for all lanes.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: Old Northern Road / Roberts Road PM FUTURE 2025

Old Northern Road / Roberts Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMo v	Demand Flows Total	Deg. Satn HV	Average Delay	Level of Service	95% Back of Queue Vehicles	Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed	
		veh/h	%	v/c	sec	veh	m		per veh	km/h	
SouthEast: Old Northern Rd (S)											
22	T1	220	8.2	0.119	0.0	LOS A	0.0	0.00	0.00	89.9	
23	R2	5	0.0	0.006	7.9	LOS A	0.0	0.25	0.60	55.3	
Approach		225	8.0	0.119	0.2	NA	0.0	0.01	0.01	88.7	
NorthEast: Roberts Rd											
24	L2	3	33.3	0.027	5.4	LOS A	0.1	0.39	0.61	46.7	
26	R2	11	18.2	0.027	9.0	LOS A	0.1	0.39	0.61	49.0	
Approach		14	21.4	0.027	8.3	LOS A	0.1	0.39	0.61	48.5	
NorthWest: Old Northern Rd (N)											
27	L2	7	42.9	0.053	8.4	LOS A	0.0	0.00	0.05	64.3	
28	T1	88	9.1	0.053	0.0	LOS A	0.0	0.00	0.05	89.2	
Approach		95	11.6	0.053	0.6	NA	0.0	0.00	0.05	86.7	
All Vehicles		334	9.6	0.119	0.6	NA	0.1	0.02	0.05	85.2	

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

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: Old Northern Road / Roberts Road PM FUTURE 2025

Old Northern Road / Roberts Road
Giveway / Yield (Two-Way)

Lane Use and Performance													
	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV						Veh	Dist				
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
SouthEast: Old Northern Rd (S)													
Lane 1	220	8.2	1852	0.119	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	5	0.0	778	0.006	100	7.9	LOS A	0.0	0.2	Short	40	0.0	NA
Approach	225	8.0		0.119		0.2	NA	0.0	0.2				
NorthEast: Roberts Rd													
Lane 1	14	21.4	527	0.027	100	8.3	LOS A	0.1	0.8	Full	500	0.0	0.0
Approach	14	21.4		0.027		8.3	LOS A	0.1	0.8				
NorthWest: Old Northern Rd (N)													
Lane 1	95	11.6	1802	0.053	100	0.6	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	95	11.6		0.053		0.6	NA	0.0	0.0				
Intersection	334	9.6		0.119		0.6	NA	0.1	0.8				

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

Lane LOS values are based on average delay per lane.

Minor Road Approach LOS values are based on average delay for all lanes.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.