

**NEPEAN BUSINESS PARK  
LAND REHABILITATION PROCESS  
OLD CASTLEREAGH ROAD AND LUGARD STREET,  
PENRITH  
*Traffic Impact Assessment***

February 2020  
(Issue C)

Reference 18210

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## 1. INTRODUCTION

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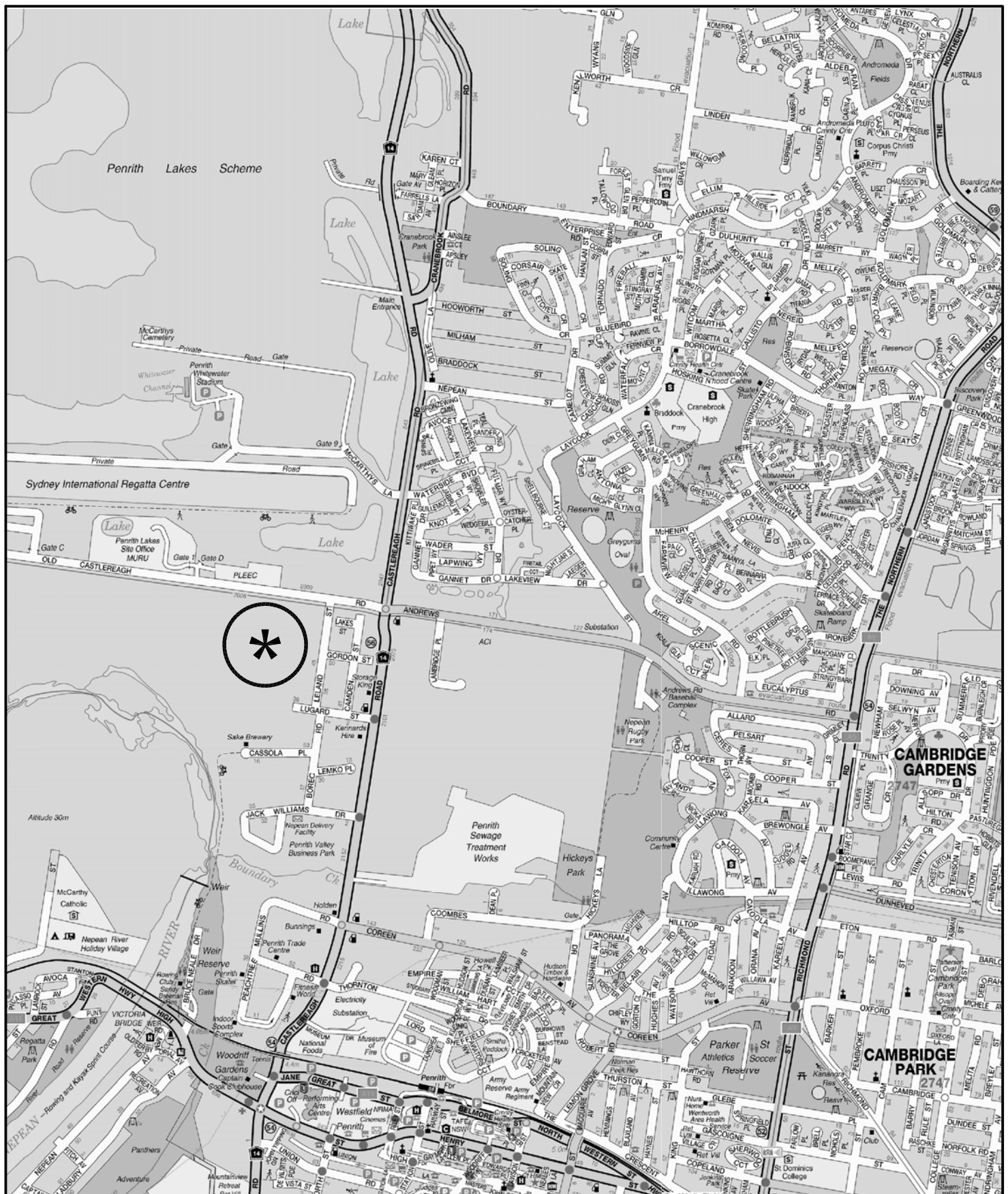
This report has been prepared to accompany an Application to the Department of Planning to seek consent to undertake an extensive site rehabilitation works on the Nepean Business Park land which is bounded by Old Castlereagh Road and Castlereagh Road at Penrith (Figure 1).

The previously mined land comprises former tailing dams which will need to be rehabilitated first prior to accommodating the envisaged employment uses on the land. The site rehabilitation process will necessitate the importation of approximately 3 million tonnes of VENM/ENM to provide a cap/raft across the site forming solid footings for future buildings to sit within.

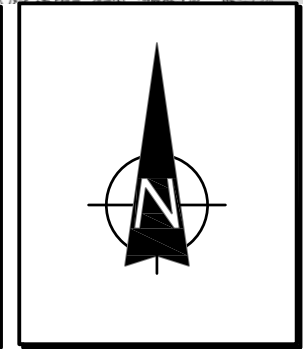
The proposed rehabilitation process will operate on a 24 hours and 7 days basis and it is envisaged that the import of fill will take up to 2 years to complete, subject to market supply of materials.

The purpose of this report is to:

- \* describe the site, its context, and the proposed rehabilitation process
- \* describe the existing road network serving the site and the prevailing traffic conditions
- \* describe the proposed upgrade for the arterial road system
- \* assess the suitability of the proposed access strategy
- \* assess the potential traffic implications associated with the truck movements
- \* propose, if necessary, any required upgrade/treatments to the surrounding intersections to accommodate the envisaged traffic



**LEGEND**



**LOCATION**

**FIG 1**

## 2. PROPOSED DEVELOPMENT SCHEME

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### 2.1 SITE, CONTEXT, AND EXISTING CIRCUMSTANCES

The site (Figure 2) has frontage to the southern side of Old Castlereagh Road just to the west of Castlereagh Road and occupies an irregular shaped area of 46.36ha. The site, which is located approximately 2 km north of the Penrith CBD, is relatively level and is also accessed by Lugard Street which connects to Castlereagh Road and terminates at the eastern boundary.

The site is cleared and vacant with sparse grassland, scattered trees/shrubs and an unsealed “track” which runs across the southern part and connects to Lugard Street.

Land uses in the vicinity of the site include:

- \* the small light industrial buildings adjoining to the east and south
- \* the Penrith Lakes facilities extending to the north and west
- \* the Nepean River which runs immediately to the south-west
- \* the industrial area which extends to the east and south
- \* the residential precinct which extends to the north along the eastern side of Castlereagh Road.

### 2.2 PRECINCT PLANNING

State Environmental Planning Policy (Penrith Lakes Scheme 1989 as amended) is the planning policy for the precinct. The aims of this policy are as follows:

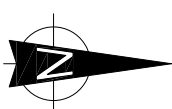
- a) *to provide a development control process that ensures that environmental and technical matters are considered in the implementation of the Penrith Lakes Scheme,*
- b) *to identify and protect items of the environmental heritage,*





LEGEND

SITE



SITE

FIG 2



- c) *to identify certain land that may be rezoned for employment, environmental, parkland, residential, tourism and waterway purposes and land that will be rezoned as unzoned land,*
- d) *to permit interim development that will not detrimentally impact on the implementation of the Penrith Lakes Scheme,*
- e) *to ensure that the implementation of the Penrith Lakes Scheme does not detrimentally impact on the ongoing operation and use of Olympic legacy infrastructure, including the Sydney International Regatta Centre and the Penrith Whitewater Stadium.*

## 2.3 PROPOSED REHABILITATION PROCESS

The former tailing dams which resulted from the previous mining activities on the site will need to be rehabilitated first prior to accommodating the various envisaged development and uses on the land. The site rehabilitation process will necessitate the importation of approximately 3 million tonnes of VENM/ENM to the site in order to provide a cap/raft across the site providing sufficiently solid footings for future buildings to sit within.

It is understood that the existing consent (DA2), originally granted in 1987 and subsequently modified several times, allows for the import of 13 million tonnes into the Penrith Lakes Scheme at a maximum of three (3) tonnes per year. The proposed rehabilitation will require a total of approximately 3 million tonnes of fill, with actual volume dependent on final settlement of the fill materials. The baseline traffic survey data and modelling include the current traffic generation from filling operations taking place at the Penrith Lakes Scheme. An estimate of fill volume is provided in the following summary:

| <b>Fill Volume Range</b> | <b>Volume (m<sup>3</sup>)</b> | <b>Tonne (based on 2.2 t/m<sup>3</sup>)</b> |
|--------------------------|-------------------------------|---------------------------------------------|
| Lower range              | 1,245,624                     | 2,740,373                                   |
| Best estimate            | 1,356,415                     | 2,984,113                                   |
| Upper range              | 1,454,424                     | 3,199,733                                   |

It is understood that the NSW Government infrastructure projects are approved to remove the excavated material from their construction sites 24 hours per day, seven days per week. To allow these projects to achieve this, Great River NSW Pty Ltd proposes to receive, place and compact this fill material 24 hours per day, seven days per week.

Vehicle accesses for the site will be provided via Lugard Street and/or Old Castlereagh Road.

Details of the scheme are reflected on the plans which are reproduced in Appendix A.



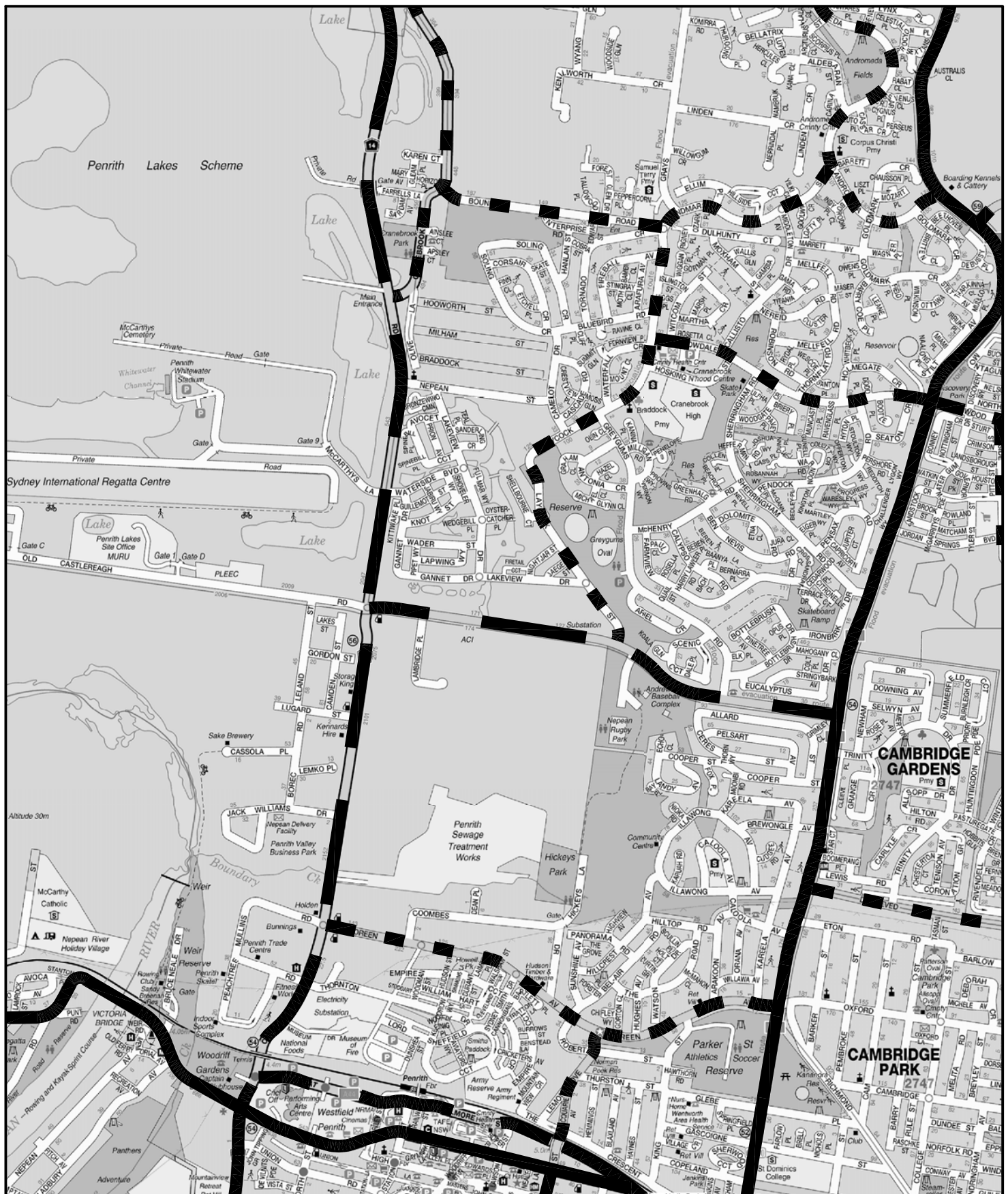
### 3. ROAD NETWORK AND TRAFFIC CONDITIONS

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#### 3.1 ROAD NETWORK

The road network serving the site (Figure 3) comprises:

- \* *Great Western Highway and M4 Western Motorway* – a State Road and east-west arterial routes which run to the South of Penrith to/from the Blue Mountains crossing.
- \* *Parker Street / Richmond Road / The Northern Road* – a State Road and arterial route which connects between Richmond and Camden
- \* *Castlereagh Road* – a State Road and arterial route which connects between Penrith and Richmond
- \* *Cranebrook Road* – a State Road and collector road route which connects between Castlereagh Road and Richmond Road providing a link to Windsor
- \* *Andrews Road* – a Regional Road and collector route linking between Castlereagh Road and The Northern Road
- \* *Old Castlereagh Road* – a local road providing access into the Penrith Lakes precinct which connects to Castlereagh Road
- \* *Lugard Street, Leland Street, and Camden Street* – local access roads serving the industrial area on the western side of Castlereagh Road.



## LEGEND

- ARTERIAL
- SUB-ARTERIAL
- COLLECTOR



## ROAD NETWORK

**FIG 3**

### 3.2 TRAFFIC CONTROLS

The traffic controls, which have been applied to the road system serving the site, (Figure 4) comprise:

- \* the traffic signals at the Castlereagh Road / Lugard Street intersection. Details of this intersection arrangement are provided on the signal design plan reproduced overleaf
- \* the roundabout at the Castlereagh Road / Old Castlereagh Road / Andrews Road intersection
- \* the traffic signals at other intersections along Castlereagh Road including Jack Williams Drive, Jane Street, and High Street
- \* the 60 kmph speed limit on Castlereagh Road and 50 kmph on the local access road system
- \* the NHVR approved B Double routes along roads in the area including Castlereagh Road, Old Castlereagh Road, and Lugard Street (see details overleaf)

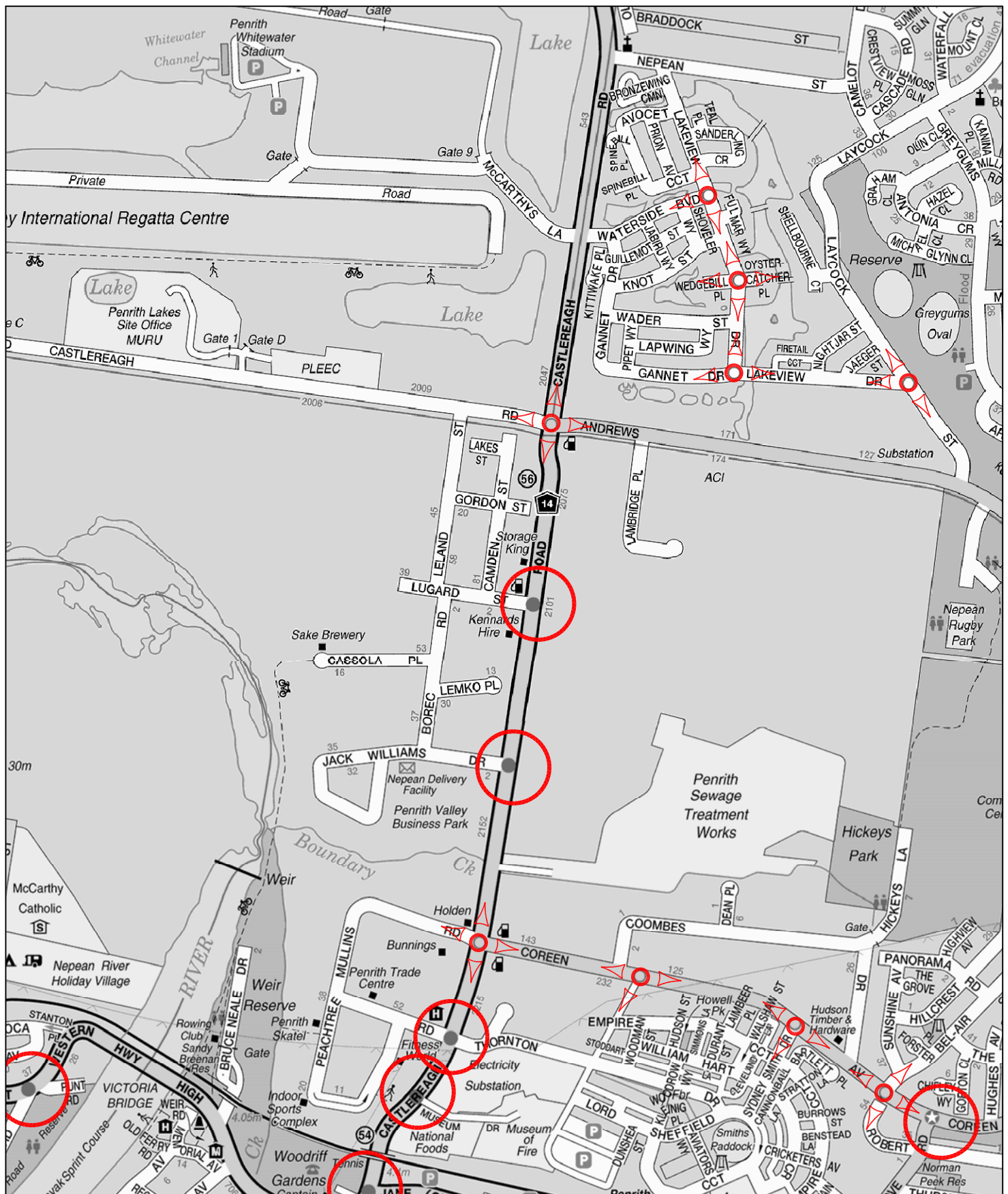
### 3.3 TRAFFIC CONDITIONS

An indication of the prevailing traffic conditions on the road system serving the development site is provided in data<sup>1</sup> published by RMS and surveys undertaken for this study. The data published by RMS is provided in the following:

| Location                                     | AADT   | Heavy Vehicles |
|----------------------------------------------|--------|----------------|
| Castlereagh Road, north of Jack Williams Dr. | 31,823 | 3,491 (11%)    |

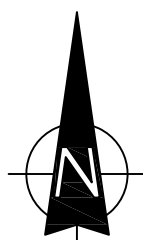
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<sup>1</sup> *Traffic Volume Data for Sydney Region  
Roads and Maritime Services*



## LEGEND

-  TRAFFIC SIGNAL CONTROL
-  ROUNDABOUT
-  RESTRICTED TURNING MOVEMENT



## TRAFFIC CONTROLS

**FIG 4**

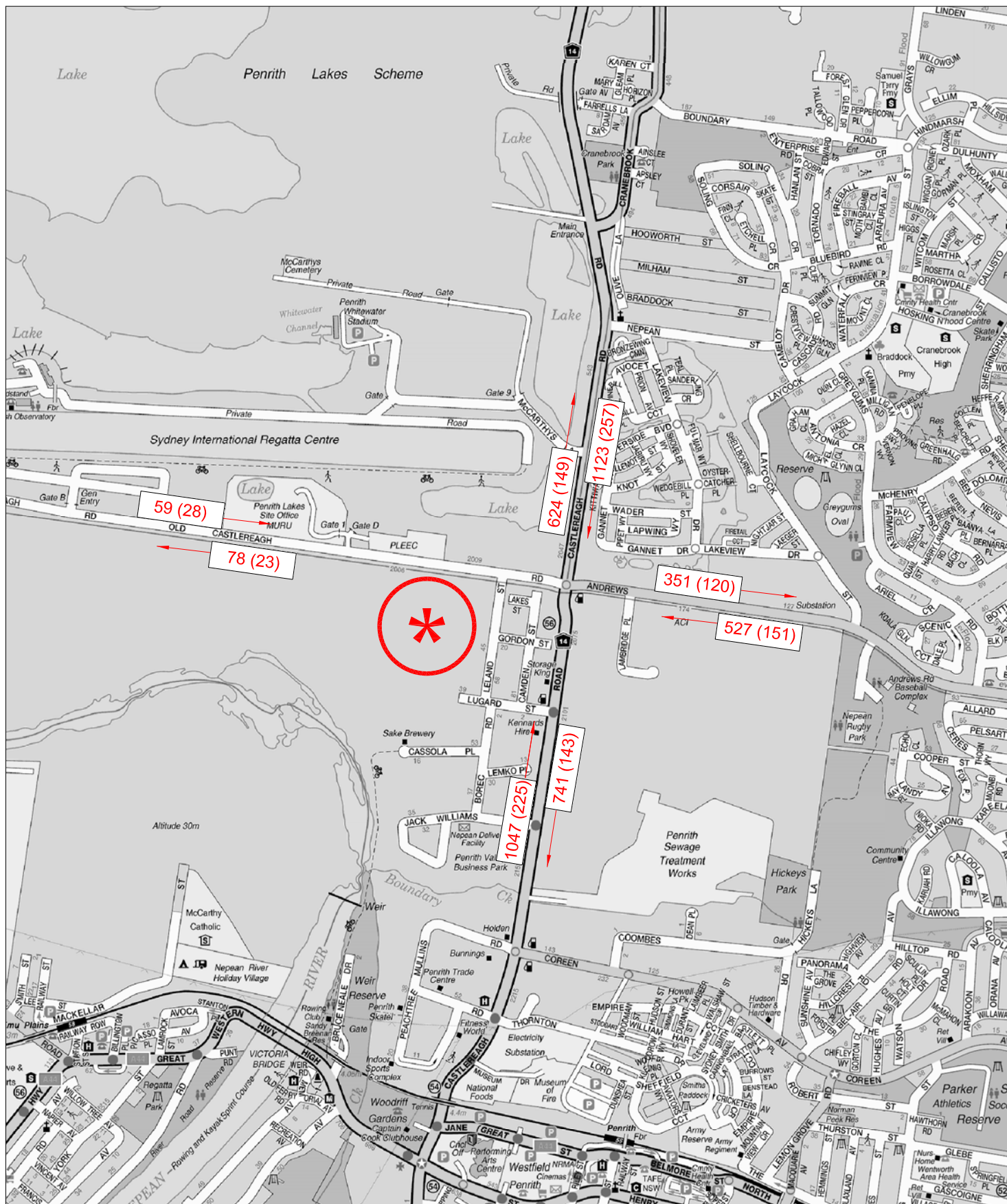
In addition to the above, an indication of the mid-block traffic volumes, including heavy vehicles, at Castlereagh Road and Old Castlereagh Road are provided in Figure 5.

The results of recent traffic surveys undertaken at the Castlereagh Road / Old Castlereagh Road / Andrews Road and Castlereagh Road / Lugard Street intersections during the morning and afternoon peak traffic period are provided in Appendix B and summarised in the following:

|                      |    | <b>AM</b> | <b>PM</b> |
|----------------------|----|-----------|-----------|
| Castlereagh Road     | NB | 580       | 893       |
|                      | RT | 350       | 479       |
|                      | LT | 10        | 1         |
|                      | SB | 1,261     | 645       |
|                      | RT | 16        | 9         |
|                      | LT | 111       | 96        |
| Old Castlereagh Road | EB | 14        | 47        |
|                      | RT | 7         | 14        |
|                      | LT | 14        | 42        |
| Andrews Road         | WB | 54        | 29        |
|                      | RT | 91        | 98        |
|                      | LT | 589       | 463       |
| <hr/>                |    |           |           |
| Castlereagh Road     | NB | 836       | 1,386     |
|                      | LT | 49        | 57        |
|                      | SB | 1,743     | 1,204     |
|                      | RT | 67        | 67        |
| Lugard Street        | LT | 26        | 71        |
|                      | RT | 59        | 89        |

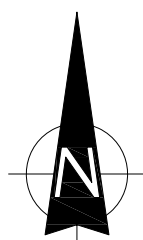
The operational performance of these intersections under the projected 2020 and 2023 traffic demands (1.5%) has been assessed using the SIDRA model. The results of that assessment are provided in Appendix C and summarised in the following table.





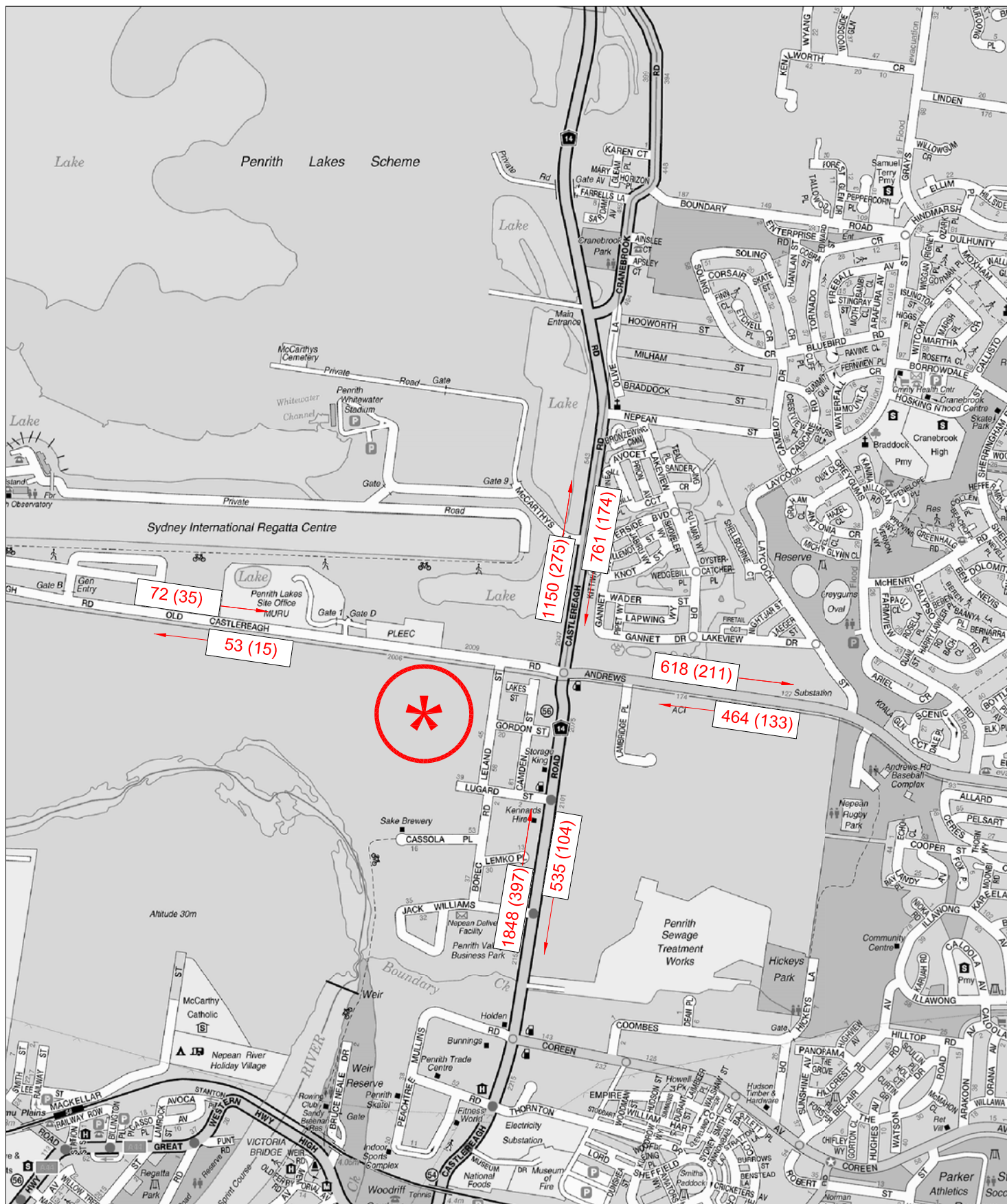
## LEGEND

LIGHT VEHICLE (HEAVY VEHICLE)

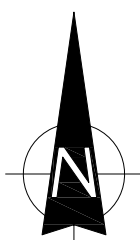


**5-DAY AVERAGE  
PEAK HOUR FLOW  
(AM)**

**FIG 5**



## LEGEND



**5-DAY AVERAGE  
PEAK HOUR FLOW  
(PM)**

**FIG 6**

|                                         | AM  |       | PM  |       |
|-----------------------------------------|-----|-------|-----|-------|
|                                         | LOS | AVD   | LOS | AVD   |
| <b>2020 Background Traffic</b>          |     |       |     |       |
| Castlereagh / Lugard                    | B   | 19.7s | C   | 22.4s |
| Castlereagh / Andrews / Old Castlereagh | A   | 12.9s | A   | 13.0s |
| <b>2023 Background Traffic</b>          |     |       |     |       |
| Castlereagh / Lugard                    | B   | 20.1s | B   | 23.0s |
| Castlereagh / Andrews / Old Castlereagh | A   | 13.3s | A   | 13.4s |

The results of this SIDRA modelling indicate that these intersections are expected to operate satisfactorily with adequate reserve capacity under the 2020 and 2023 background traffic demand.

### 3.4 TRANSPORT SERVICES

The existing bus network servicing the area is identified on the diagrams overleaf with 673, 783 and 784 services along Castlereagh Road connecting to Penrith CBD and Railway Station.



## 4. FUTURE CIRCUMSTANCES

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RMS, with Federal and State funding, propose to upgrade the 6.5km long Mulgoa Road/Castlereagh Road route between Glenmore Park and Andrews Road at Penrith to support the future traffic demands resultant to expected urban development in the area. The Mulgoa Road/Castlereagh Road Corridor Upgrade is part of a plan to progressively upgrade a number of major arterial roads in Western Sydney to deliver a more efficient, reliable network that meets the future needs of the community and the economy.

There are a number of key developments served by Mulgoa Road/Castlereagh Road that will contribute to increased population/employment and traffic movements in its immediate vicinity. These include:

- Penrith Panthers Entertainment precinct
- Penrith Station precinct
- Riverlink and Nepean River precincts
- Penrith Stadium
- Penrith Lakes Scheme
- Penrith Homemaker Centre
- New urban land releases at Glenmore Park and Thornton.

Related to the proposed is “Jane Street and Mulgoa Road Infrastructure Upgrade” and while it is a separate proposal, planning and staging of these two projects are being coordinated. The diagram overleaf shows the location of both the proposal and the Jane Street and Mulgoa Road Infrastructure Upgrade.

Details of the assessments undertaken for the upgrade and the identified Preferred Option are provided in a Preferred Options Report<sup>2</sup> which includes a Traffic and

Transport Assessment Study<sup>3</sup>. The preferred upgrade option is to widen the roadway to provide 3 lanes in each direction plus turning lanes at intersections. Details of the proposal for the Jack Williams Drive to Andrews Road section are provided in Appendix D and include:

- Replacement of the roundabout at the Andrews Road/Old Castlereagh Road intersection with a traffic signal controlled arrangement
- Provision for bus bays and bus “start up” arrangements
- Widening along the eastern side of Old Castlereagh Road.

The traffic modelling undertaken took into account the projected future traffic growth, including development in the Penrith Lakes Scheme, both for a normal growth scenario (i.e. 1.3% p.a.) and an accelerated growth scenario (i.e. 2.0% p.a.) as follows:

**Daily Volumes Andrews Road – Museum Drive Section**

|                    | <b>2015</b> | <b>2026</b> | <b>2036</b> |
|--------------------|-------------|-------------|-------------|
| Normal Growth      | 36,700      | 53,000      | 60,000      |
| Accelerated Growth | 36,700      | 55,000      | 65,000      |

The assessed operational performance outcome with the upgrade works completed was as follows:

|                                     | <b>2020</b> |            |            |            | <b>2026</b> |            |            |            | <b>2036</b> |            |            |            |
|-------------------------------------|-------------|------------|------------|------------|-------------|------------|------------|------------|-------------|------------|------------|------------|
|                                     | <b>AM</b>   |            | <b>PM</b>  |            | <b>AM</b>   |            | <b>PM</b>  |            | <b>AM</b>   |            | <b>PM</b>  |            |
|                                     | <b>LOS</b>  | <b>AVD</b> | <b>LOS</b> | <b>AVD</b> | <b>LOS</b>  | <b>AVD</b> | <b>LOS</b> | <b>AVD</b> | <b>LOS</b>  | <b>AVD</b> | <b>LOS</b> | <b>AVD</b> |
| Andrews Road / Old Castlereagh Road | C           | 33         | C          | 34         | C           | 37         | C          | 39         | C           | 38         | C          | 41         |

<sup>2</sup> *Mulgoa Road/Castlereagh Road Corridor Upgrade Preferred Option Report Hills Environmental April 2017*

<sup>3</sup> *Mulgoa Road/Castlereagh Road Corridor Upgrade Transport & Traffic Assessment Study Arcadis January 2017*



|                           |   |    |   |    |   |    |   |    |   |    |   |    |
|---------------------------|---|----|---|----|---|----|---|----|---|----|---|----|
| Jack<br>Williams<br>Drive | A | 13 | B | 16 | B | 26 | B | 19 | B | 20 | B | 17 |
|---------------------------|---|----|---|----|---|----|---|----|---|----|---|----|

Details of modelling for the Lugard Street intersection are not provided. The proposed staging plan reproduced overleaf indicates that the Andrews Road/Old Castlereagh Road intersection works and the widening between Andrews Road and Lugard Street will be undertaken as the first “short term” stage.

In relation to bus services, pedestrians and cyclists, the upgrade scheme will:

- provide bus priority measures as “start-up lanes” at intersections and bus bays and this will ensure optimised bus travel lines for the expected increased bus services required to meet the urban development needs
- provide a Shared Path along the eastern side of Castlereagh Road as well as a normal pathway on the western side and signalised pedestrian crossings at intersections

## **5. ACCESS, INTERNAL CIRCULATION, AND PARKING**

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### **5.1 ACCESS**

The site will be accessed via the following 2 locations:

- Old Castlereagh Road via a left in, right out only arrangement; and/or
- Lugard Street via a right in, left out only arrangement at the intersection of Castlereagh Road and Lugard Street.

The accesses will be formalised to accommodate the necessary access manoeuvres of the largest truck (i.e. 17.5m Truck & Dog unit) and will be constructed with appropriate pavement strength to accommodate the anticipated truck loadings and frequency of movements.

### **5.2 INTERNAL CIRCULATION & PARKING**

Trucks and workers' vehicles will be able to circulate the vast site with no undue difficulty during the rehabilitation process. Designated workers' car parking areas will be provided at locations with proximity to the site offices to minimise pedestrian activities in the site compound.

## 6. TRAFFIC IMPACT ASSESSMENT

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### 6.1 TRAFFIC PROJECTIONS

The intended fill importation is based on:

- 24 hours and 7 days of operation
- 365 days of operation a year
- Average truck tonnage 35 tonnes
- 2 access locations i.e. Old Castlereagh Road and Lugard Street

Based on the above operating parameters the hourly traffic projection is calculated as follows:

$$3,000,000 \text{ tonnes} / 365 \text{ days} = 8,219 \text{ tonnes per day}$$

$$8,219 \text{ tonnes per day} / 35 \text{ tonnes per truck} = 235 \text{ trucks per day}$$

$$235 \text{ trucks per day} / 24 \text{ hours per day} = \mathbf{9-10 \text{ trucks per hour}}$$

However, to provide a conservative basis to this assessment, the following 'scaled up' operating parameters are considered:

- 11 hours per day operation i.e. 45% of the full 24-hour day
- 264 days of operation per year i.e. 70% of the full operating year
- 1 access location i.e. either Old Castlereagh Road or Lugard Street only

Based on the above conservative operating parameters the hourly traffic projection is calculated as follows:

$$3,000,000 \text{ tonnes} / 264 \text{ days} = 11,364 \text{ tonnes per day}$$

$$11,364 \text{ tonnes per day} / 35 \text{ tonnes per truck} = 325 \text{ trucks per day}$$

$$325 \text{ trucks per day} / 11 \text{ hours per day} = \mathbf{29 \text{ trucks per hour (one-way)}}$$

$$= \mathbf{58 \text{ trucks per hour (two-way)}}$$

## **6.2 ACCESS SCENARIOS**

The following site access scenarios are considered for the purpose of this assessment:

Option 1      via Old Castlereagh Road (left in and right out only)

Option 2      via Lugard Street (right in and left out only to/from Castlereagh Road)

## **6.3 TRAFFIC MODELLING**

SIDRA modelling program has been used to assess the operating circumstances at the 2 site accesses during the network traffic peak. The Old Castlereagh Road traffic flows are adopted from the surveyed link flows while the recent traffic flows at the intersection of Castlereagh Road and Lugard Street are based on the turning count surveys.

The outcome of the SIDRA modelling assessment indicates a satisfactory operating level of service for both accesses under the conservative truck projections. Further to the current year assessment, a sensitivity analysis based on a conservative annual background traffic growth of 1.5% has also been undertaken to provide an indication of how the intersections will operate over the course of the rehabilitation works program.

Details of the SIDRA model results are provided in Appendix C and summarised in the following:

|                            | AM Peak |       | PM Peak |       |
|----------------------------|---------|-------|---------|-------|
|                            | LOS     | AVD   | LOS     | AVD   |
| <b>2020 DEVELOPMENT</b>    |         |       |         |       |
| <u>Option 1</u>            |         |       |         |       |
| Lugard St/Castlereagh Rd   | B       | 19.7s | B       | 22.8s |
| Andrews/Castlereagh RAB    | A       | 12.9s | A       | 13.9s |
| Old Castlereagh Rd. Access | A       | 7.9s  | A       | 7.9s  |
| <u>Option 2</u>            |         |       |         |       |
| Lugard St/Castlereagh Rd   | B       | 20.0s | B       | 22.4s |
| Andrews/Castlereagh RAB    | A       | 12.9s | A       | 13.0s |
| <b>2023 DEVELOPMENT</b>    |         |       |         |       |
| <u>Option 1</u>            |         |       |         |       |
| Lugard St/Castlereagh Rd   | B       | 20.0s | B       | 23.7s |
| Andrews/Castlereagh RAB    | A       | 13.3s | B       | 14.3s |
| Old Castlereagh Rd. Access | A       | 7.9s  | A       | 7.9s  |
| <u>Option 2</u>            |         |       |         |       |
| Lugard St/Castlereagh Rd   | B       | 20.3s | A       | 23.1s |
| Andrews/Castlereagh RAB    | B       | 13.4s | A       | 13.4s |

The assessment outcome indicates that the relevant access and road intersections will operate with ample reserve capacities when assessed under conservative circumstances. Particularly, it is noted that the intersections level of service is not adversely impacted even when projected with a conservative growth rate across the entire period of the project.

On this basis, it is assessed that the traffic generation and implications resulting from the proposed site rehabilitation works will be acceptable and that no additional road/intersection upgrade and/or treatment will be necessary.



## 7. CONCLUSION

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The traffic assessment undertaken for the proposed site rehabilitation works to prepare the site for the delivery of the Nepean Business Park Scheme has concluded that:

- \* the largest delivery vehicle will be on average of 35-tonne (payload) truck & dog articulated truck
- \* the trucks will approach and depart the site via Old Castlereagh Road and/or Lugard Street
- \* the anticipated operating circumstance will involve some 9-10 vtpm or 20 vtpm (two way)
- \* the assessment adopts a highly conservative basis which projects the truck movements from 10 vtpm to 29 vtpm or 58 vtpm (two way)
- \* the assessment is underpinned by SIDRA traffic modelling which indicates a satisfactory post-development operating circumstance
- \* the sensitivity analysis adopting a conservative background traffic growth rate of 1.5% indicates that the Castlereagh Road/Lugard Street intersection and the Old Castlereagh Road access intersection will continue to operate satisfactorily over the course of 3 years
- \* based on the modelling outcome the proposed access road system will be appropriate and that there is no immediate need to upgrade or treat the existing intersection and roadways.

# APPENDIX A

## SITE PLANS

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# PENRITH LAKES EMPLOYMENT LAND

OLD CASTLEREAGH ROAD, CASTLEREAGH

## TWO YEAR PLAN

DRAWING SCHEDULE

| DWG No. | SHEET TITLE              | REV |
|---------|--------------------------|-----|
| C2000   | COVER SHEET              | 3   |
| C2001   | GENERAL ARRANGEMENT PLAN | 3   |
| C2002   | PLAN SHEET (1 OF 2)      | 3   |
| C2003   | PLAN SHEET (2 OF 2)      | 3   |
| C2004   | SITE SECTIONS (1 OF 2)   | 3   |
| C2005   | SITE SECTIONS (2 OF 2)   | 3   |



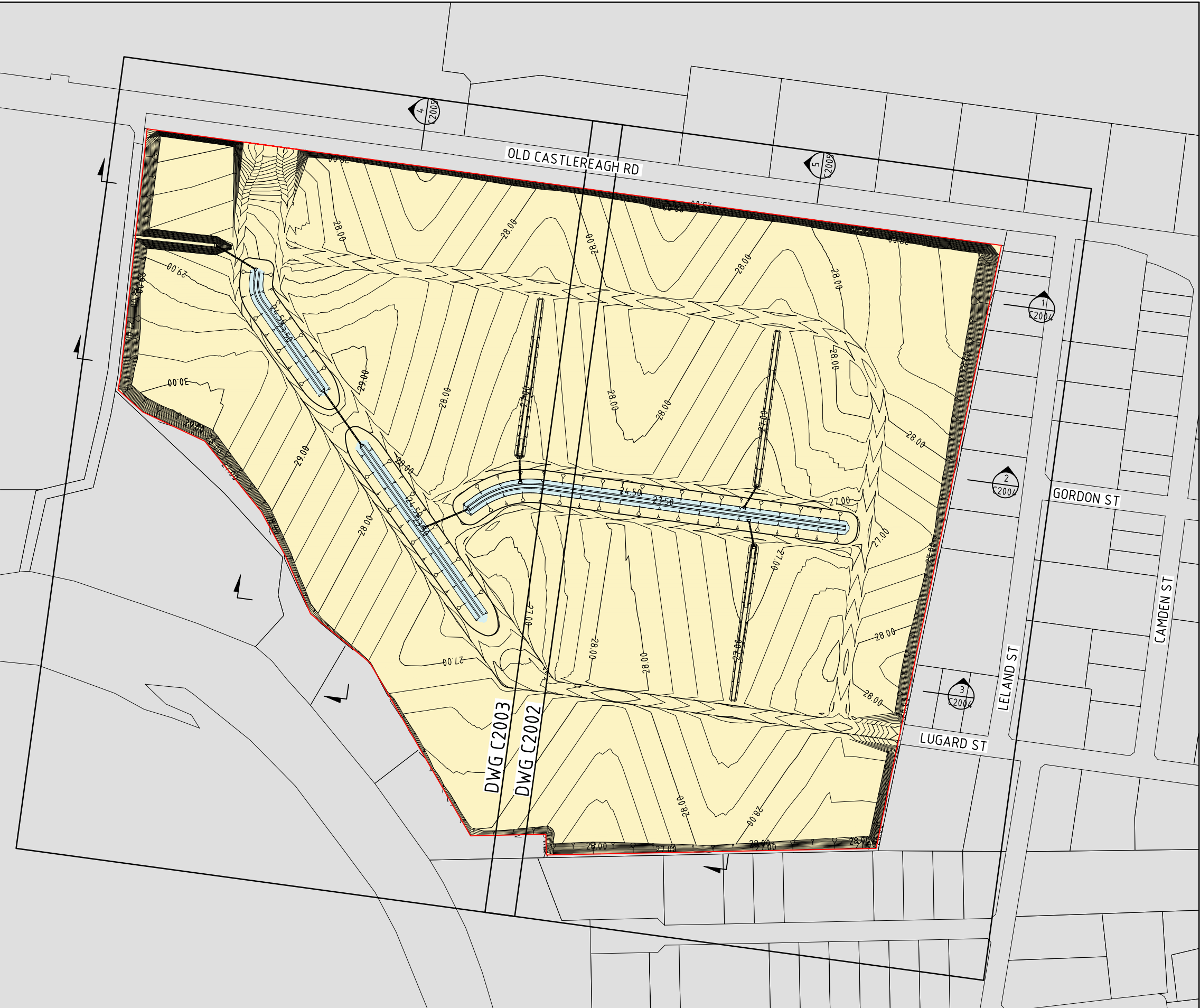
A.B.N. 92 086 017 745  
1 HARTLEY DRIVE, THORNTON NSW 2322  
PO BOX 3337, THORNTON NSW 2322  
PHONE: (02) 4964 1811 ♦ FAX: (02) 4964 1822

GENERAL NOTES:

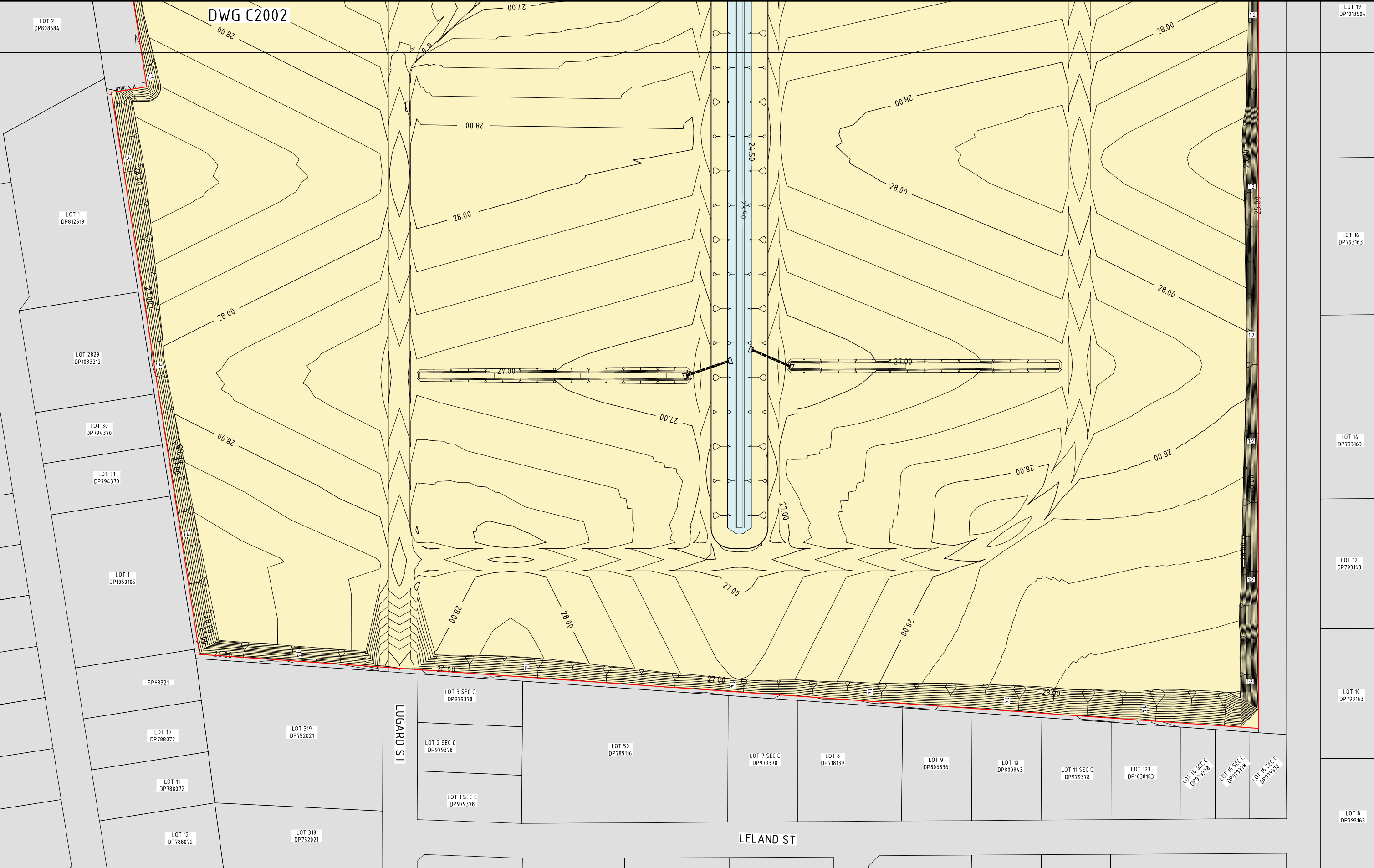
1. ALL EXISTING UNDERGROUND SERVICES MUST BE LOCATED AND EXPOSED PRIOR TO EARTHWORKS COMMENCING AND IT IS THE RESPONSIBILITY OF THOSE PERSONS USING THIS PLAN TO CONFIRM BOTH POSITION & LEVEL OF THESE UTILITIES IN CONJUNCTION WITH THE APPROPRIATE AUTHORITY.
2. WORKING HOURS ON SITE SHALL BE IN ACCORDANCE WITH THE CONDITIONS OF CONSENT.
3. SITE ACCESS SHALL BE OBTAINED USING EXISTING ACCESS POINTS.
4. VEHICULAR ACCESS AND ALL SERVICES ARE TO BE MAINTAINED AT ALL TIMES TO ADJOINING PROPERTIES AFFECTED BY CONSTRUCTION WORKS.
5. TRAFFIC CONTROL MEASURES TO BE IN ACCORDANCE WITH AS 1742.3-1996.
6. ALL LEVELS MUST BE OBTAINED FROM ESTABLISHED BENCH MARKS AS DIRECTED BY THE SUPERVISOR.
7. ALL EARTHWORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH:
  - LETTER FROM PELLIS SULLIVAN MEYNINK (PSM) TO GREAT RIVER NSW PTY LTD DATED 15 MARCH 2019, TITLED "ADDITIONAL DETAILS REGARDING PROPOSED GEOTECHNICAL REHABILITATION WORKS FOR THE PROPOSED INDUSTRIAL DEVELOPMENT OF SOUTHERN WETLANDS SIDE, PENRITH LAKES"
  - PENRITH LAKES, SOUTHERN WETLANDS GEOTECHNICAL DESIGN, GROUND TREATMENT (PELLIS SULLIVAN MEYNINK, 25 MARCH 2019, REF: PSM3688-013R REV 1)
7. THE WORKS AREA IS TO BE REVEGETATED PROGRESSIVELY (TO THE EXTENT PRACTICAL) IN ACCORDANCE WITH THE PLAN(S) PREPARED BY CLOUSTON ASSOCIATES.

EROSION AND SEDIMENT CONTROL

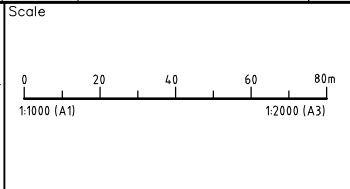
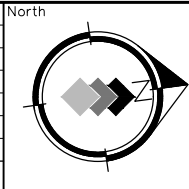
1. SITE EROSION AND SEDIMENT CONTROLS SHALL BE PLANNED AND IMPLEMENTED IN ACCORDANCE WITH THE LAND REHABILITATION MANUAL 1987.
2. CAPACITIES OF DRAINAGE AND EROSION CONTROL WORKS ARE TO BE DETERMINED IN ACCORDANCE WITH THE AUSTRALIAN RAINFALL AND RUNOFF MANUAL
3. MINIMUM STORM RETURN PERIODS ARE TO BE:
  - LATERAL DRAINS - 5 YEARS
  - WATERWAYS - 20 YEARS



|           |                 |       |       |          |                                                                                     |                                                                                      |                                                                                                                                                                                                                                                                                                                                        |                                                                 |                                 |        |                                                                                                                                                                                                                                              |                               |                      |                     |               |
|-----------|-----------------|-------|-------|----------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----------------------|---------------------|---------------|
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|           |                 |       |       |          |                                                                                     |                                                                                      |                                                                                                                                                                                                                                                                                                                                        | Scale<br>1:2000                                                 | A1 SHEET                        |        |                                                                                                                                                                                                                                              |                               |                      | Drawing No<br>C2001 | Revision<br>3 |
|           |                 |       |       |          |                                                                                     |                                                                                      |                                                                                                                                                                                                                                                                                                                                        | Project Approval<br>IAN HILL (B.E)<br>Consulting Civil Engineer |                                 |        |                                                                                                                                                                                                                                              |                               |                      |                     |               |
|           |                 |       |       |          |                                                                                     |                                                                                      |                                                                                                                                                                                                                                                                                                                                        |                                                                 |                                 |        |                                                                                                                                                                                                                                              |                               |                      |                     |               |
| 3         | CLIENT COMMENTS | A.S.  | A.S.  | 13.05.19 |                                                                                     |                                                                                      |                                                                                                                                                                                                                                                                                                                                        |                                                                 |                                 |        |                                                                                                                                                                                                                                              |                               |                      |                     |               |
| 2         | TWO YEAR PLAN   | A.S.  | A.S.  | 07.05.19 |                                                                                     |                                                                                      |                                                                                                                                                                                                                                                                                                                                        |                                                                 |                                 |        |                                                                                                                                                                                                                                              |                               |                      |                     |               |
| 1         | ORIGINAL ISSUE  | KS    | AS    | 26.04.19 |                                                                                     |                                                                                      |                                                                                                                                                                                                                                                                                                                                        |                                                                 |                                 |        |                                                                                                                                                                                                                                              |                               |                      |                     |               |
| Amendment | Description     | Drawn | App'd | Date     |                                                                                     |                                                                                      |                                                                                                                                                                                                                                                                                                                                        |                                                                 |                                 |        |                                                                                                                                                                                                                                              |                               |                      |                     |               |



| Amendment | Description     | Drawn | App'd | Date     |
|-----------|-----------------|-------|-------|----------|
| 3         | CLIENT COMMENTS | A.S.  | A.S.  | 13.05.19 |
| 2         | TWO YEAR PLAN   | A.S.  | A.S.  | 07.05.19 |
| 1         | ORIGINAL ISSUE  | KS    | AS    | 26.04.19 |



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|                                                                 |                                 |
|-----------------------------------------------------------------|---------------------------------|
| Designed<br>KS                                                  | Cad Reference<br>18255 C2001 r3 |
| Scale<br>1:2000                                                 | <b>A1 SHEET</b>                 |
| Project Approval<br>IAN HILL (B.E)<br>Consulting Civil Engineer |                                 |

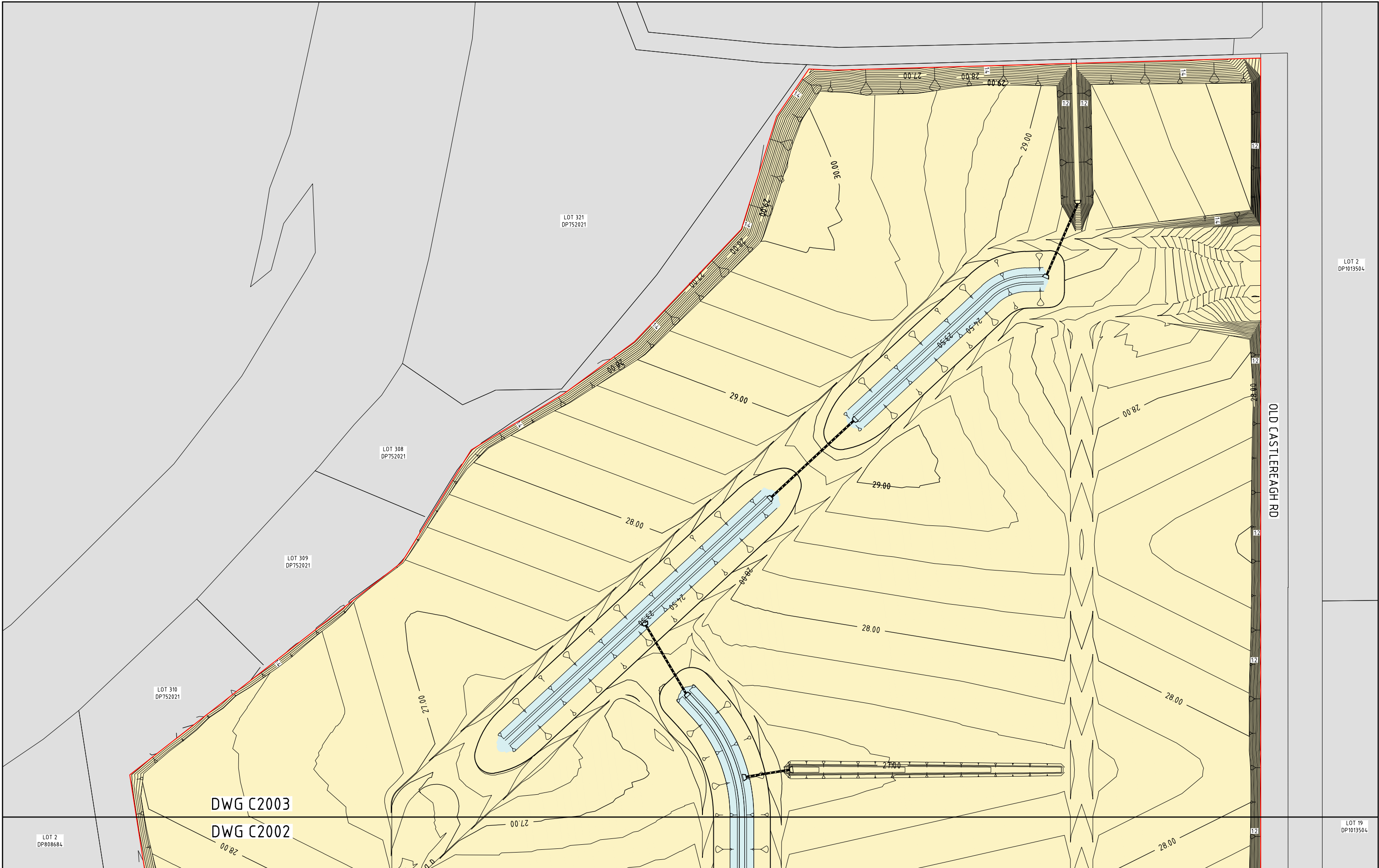
|        |
|--------|
| Client |
|--------|

**GCA**  
ENGINEERING SOLUTIONS  
A.B.N. 92 086 017 745  
1 HARTLEY DRIVE, THORNTON NSW 2322  
PO BOX 3337, THORNTON NSW 2322  
PHONE: (02) 4964 1811 ♦ FAX: (02) 4964 1822

**PENRITH LAKES EMPLOYMENT LAND**  
  
**TWO YEAR PLAN**  
SITE PLAN - SHEET 1 OF 2

|                             |                      |
|-----------------------------|----------------------|
| Project No<br><b>18255C</b> | Revision<br><b>3</b> |
| Drawing No<br><b>C2002</b>  |                      |

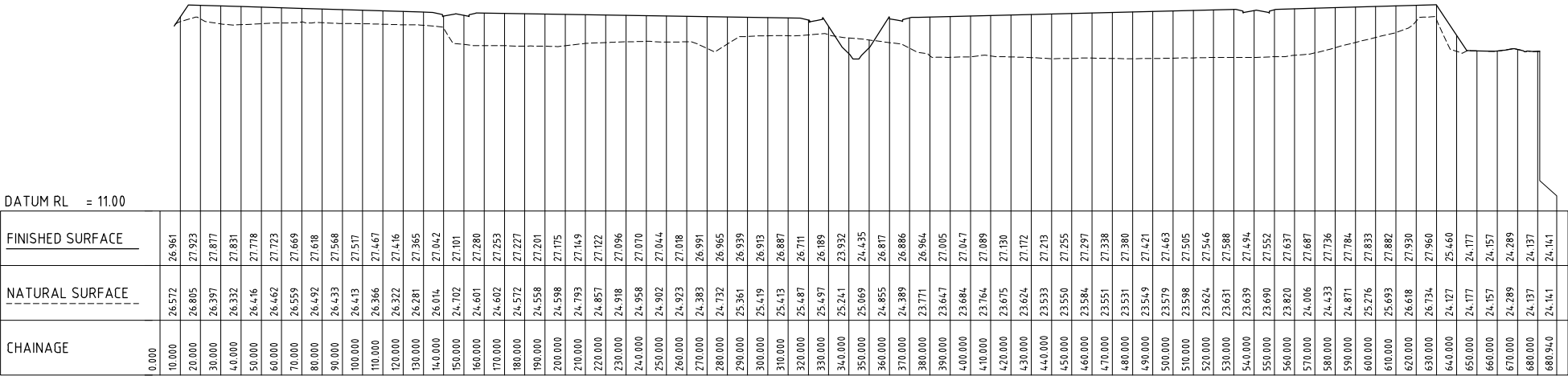




|           |                 |       |       |          |  |  |                                                                                                                                                                                                                                                                                                                                        |                                                                 |                                 |        |                                                                                                                                                                              |                                               |                             |                      |
|-----------|-----------------|-------|-------|----------|--|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-----------------------------|----------------------|
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|           |                 |       |       |          |  |  |                                                                                                                                                                                                                                                                                                                                        | Scale<br>1:2000                                                 | <b>A1 SHEET</b>                 |        |                                                                                                                                                                              |                                               |                             |                      |
|           |                 |       |       |          |  |  |                                                                                                                                                                                                                                                                                                                                        | Project Approval<br>IAN HILL (B.E)<br>Consulting Civil Engineer |                                 |        |                                                                                                                                                                              |                                               |                             |                      |
|           |                 |       |       |          |  |  |                                                                                                                                                                                                                                                                                                                                        |                                                                 |                                 |        |                                                                                                                                                                              |                                               |                             |                      |
|           |                 |       |       |          |  |  |                                                                                                                                                                                                                                                                                                                                        |                                                                 |                                 |        |                                                                                                                                                                              |                                               |                             |                      |
| 3         | CLIENT COMMENTS | A.S.  | A.S.  | 13.05.19 |  |  |                                                                                                                                                                                                                                                                                                                                        |                                                                 |                                 |        |                                                                                                                                                                              | TWO YEAR PLAN<br><br>SITE PLAN - SHEET 2 OF 2 | Drawing No<br><b>C2003</b>  | Revision<br><b>3</b> |
| 2         | TWO YEAR PLAN   | A.S.  | A.S.  | 07.05.19 |  |  |                                                                                                                                                                                                                                                                                                                                        |                                                                 |                                 |        |                                                                                                                                                                              |                                               |                             |                      |
| 1         | ORIGINAL ISSUE  | KS    | AS    | 26.04.19 |  |  |                                                                                                                                                                                                                                                                                                                                        |                                                                 |                                 |        |                                                                                                                                                                              |                                               |                             |                      |
| Amendment | Description     | Drawn | App'd | Date     |  |  |                                                                                                                                                                                                                                                                                                                                        |                                                                 |                                 |        |                                                                                                                                                                              |                                               |                             |                      |

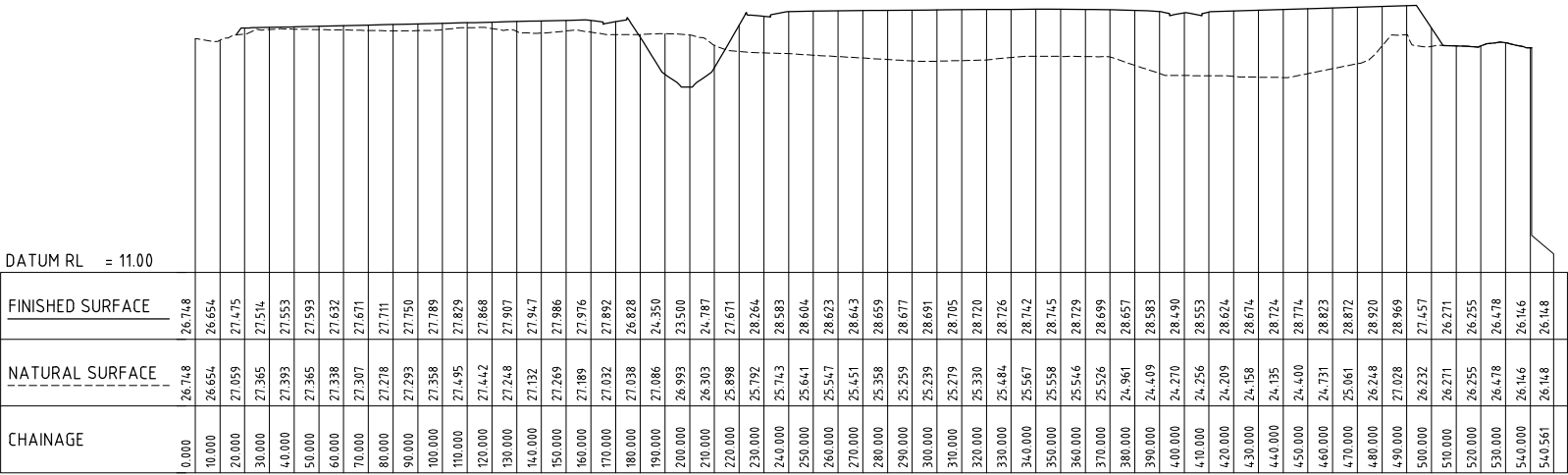






A1 SCALE: HORIZONTAL 1:1500, VERTICAL 1:250

SITE SECTION 5



A1 SCALE: HORIZONTAL 1:1500, VERTICAL 1:250

SITE SECTION 4

|           |                 |       |       |      |          |       |       |                                                                                                                                                                                                                                                                                                                         |                 |                                 |        |                                                                                                                                                                                                                                                                                  |                               |               |                      |                              |  |
|-----------|-----------------|-------|-------|------|----------|-------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------------------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------|----------------------|------------------------------|--|
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|           |                 |       |       |      |          |       |       |                                                                                                                                                                                                                                                                                                                         | Scale<br>1:2000 | A1 SHEET                        |        |                                                                                                                                                                                                                                                                                  | Drawing No<br>C2005           | Revision<br>3 |                      |                              |  |
| 3         | CLIENT COMMENTS |       | K.S.  | A.S. | 13.05.19 |       |       |                                                                                                                                                                                                                                                                                                                         |                 |                                 |        |                                                                                                                                                                                                                                                                                  |                               |               |                      |                              |  |
| 2         | TWO YEAR PLAN   |       | A.S.  | A.S. | 07.05.19 |       |       |                                                                                                                                                                                                                                                                                                                         |                 |                                 |        |                                                                                                                                                                                                                                                                                  |                               |               |                      |                              |  |
| 1         | ORIGINAL ISSUE  |       | KS    | AS   | 26.04.19 |       |       |                                                                                                                                                                                                                                                                                                                         |                 |                                 |        |                                                                                                                                                                                                                                                                                  |                               |               |                      |                              |  |
| Amendment | Description     | Drawn | App'd | Date |          |       |       |                                                                                                                                                                                                                                                                                                                         |                 |                                 |        |                                                                                                                                                                                                                                                                                  |                               | TWO YEAR PLAN |                      | SITE SECTIONS - SHEET 2 OF 2 |  |

## **APPENDIX B**

### **TRAFFIC SURVEY RESULTS**

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Count Number **7387** Ref : **TPPA**  
 Street **CASTLEREIGH ROAD, CRANEBROOK : From ANDREWS ROAD to GREAT WESTERN HIGHWAY : SOUTH BOUND**  
 Location **Combined Counts (7382,7383,7384,7385) South of Andrews Road** *Carriageway*

Start Date 20-MAY-19  
 Start Time 100  
 Duration 7 DAYS  
 Interval 1 HOUR

Weekly 50th Percentile Speed 58  
 Weekly 85th Percentile Speed 67  
 Five Day AADT 9302  
 Seven Day AADT 8042

**TOTAL COUNT MATRIX**

|                 | MON<br>20TH | TUE<br>21ST | WED<br>22ND | THU<br>23RD | FRI<br>24TH | SAT<br>25TH | SUN<br>26TH | 5 Day<br>Total Average |      | 7 Day<br>Total Average |      |
|-----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------------------|------|------------------------|------|
| Midnight - 1am  | 17          | 24          | 24          | 25          | 31          | 48          | 42          | 121                    | 24   | 211                    | 30   |
| 1am - 2am       | 12          | 18          | 27          | 28          | 27          | 23          | 27          | 112                    | 22   | 162                    | 23   |
| 2am - 3am       | 33          | 22          | 17          | 17          | 37          | 35          | 19          | 126                    | 25   | 180                    | 26   |
| 3am - 4am       | 53          | 46          | 54          | 60          | 47          | 32          | 13          | 260                    | 52   | 305                    | 44   |
| 4am - 5am       | 160         | 182         | 177         | 159         | 151         | 54          | 30          | 829                    | 166  | 913                    | 130  |
| 5am - 6am       | 379         | 384         | 370         | 382         | 345         | 129         | 43          | 1860                   | 372  | 2032                   | 290  |
| 6am - 7am       | 630         | 667         | 633         | 645         | 629         | 178         | 81          | 3204                   | 641  | 3463                   | 495  |
| 7am - 8am       | 817         | 902         | 859         | 877         | 841         | 305         | 115         | 4296                   | 859  | 4716                   | 674  |
| 8am - 9am       | 844         | 913         | 868         | 892         | 904         | 487         | 208         | 4421                   | 884  | 5116                   | 731  |
| 9am - 10am      | 613         | 615         | 627         | 633         | 620         | 540         | 341         | 3108                   | 622  | 3989                   | 570  |
| 10am - 11am     | 554         | 488         | 513         | 539         | 540         | 477         | 346         | 2634                   | 527  | 3457                   | 494  |
| 11am - Midday   | 484         | 537         | 493         | 539         | 557         | 550         | 373         | 2610                   | 522  | 3533                   | 505  |
| Midday - 1pm    | 483         | 491         | 513         | 511         | 549         | 210         | 359         | 2547                   | 509  | 3116                   | 445  |
| 1pm - 2pm       | 447         | 432         | 490         | 482         | 481         | 329         | 425         | 2332                   | 466  | 3086                   | 441  |
| 2pm - 3pm       | 468         | 494         | 541         | 506         | 538         | 334         | 344         | 2547                   | 509  | 3225                   | 461  |
| 3pm - 4pm       | 645         | 670         | 610         | 648         | 620         | 306         | 337         | 3193                   | 639  | 3836                   | 548  |
| 4pm - 5pm       | 510         | 532         | 527         | 653         | 557         | 258         | 295         | 2779                   | 556  | 3332                   | 476  |
| 5pm - 6pm       | 494         | 543         | 555         | 639         | 558         | 314         | 308         | 2789                   | 558  | 3411                   | 487  |
| 6pm - 7pm       | 414         | 444         | 498         | 594         | 538         | 287         | 226         | 2488                   | 498  | 3001                   | 429  |
| 7pm - 8pm       | 315         | 302         | 326         | 381         | 368         | 182         | 147         | 1692                   | 338  | 2021                   | 289  |
| 8pm - 9pm       | 171         | 204         | 263         | 254         | 223         | 98          | 140         | 1115                   | 223  | 1353                   | 193  |
| 9pm - 10pm      | 121         | 137         | 158         | 153         | 167         | 91          | 86          | 736                    | 147  | 913                    | 130  |
| 10pm - 11pm     | 80          | 81          | 95          | 110         | 97          | 91          | 46          | 463                    | 93   | 600                    | 86   |
| 11pm - Midnight | 43          | 34          | 48          | 49          | 75          | 50          | 26          | 249                    | 50   | 325                    | 46   |
| Total           | 8787        | 9162        | 9286        | 9776        | 9500        | 5408        | 4377        | 46511                  | 9302 | 56296                  | 8042 |

Count Number **7387** Ref : **TTPA**  
 Street **CASTLEREIGH ROAD, CRANEBROOK : From GREAT WESTERN HIGHWAY to ANDREWS ROAD : NORTH BOUND**  
 Location **Combined Counts (7382,7383,7384,7385) South of Andrews Road** *Carriageway*

Start Date 20-MAY-19  
 Start Time 100  
 Duration 7 DAYS  
 Interval 1 HOUR

Weekly 50th Percentile Speed 59  
 Weekly 85th Percentile Speed 68  
 Five Day AADT 20921  
 Seven Day AADT 17758

**TOTAL COUNT MATRIX**

|                 | MON<br>20TH | TUE<br>21ST | WED<br>22ND | THU<br>23RD | FRI<br>24TH | SAT<br>25TH | SUN<br>26TH | 5 Day  |         | 7 Day  |         |
|-----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------|---------|--------|---------|
|                 |             |             |             |             |             |             |             | Total  | Average | Total  | Average |
| Midnight - 1am  | 41          | 52          | 62          | 59          | 68          | 80          | 71          | 282    | 56      | 433    | 62      |
| 1am - 2am       | 45          | 26          | 41          | 50          | 42          | 39          | 42          | 204    | 41      | 285    | 41      |
| 2am - 3am       | 40          | 31          | 36          | 25          | 39          | 26          | 17          | 171    | 34      | 214    | 31      |
| 3am - 4am       | 44          | 38          | 46          | 48          | 48          | 20          | 23          | 224    | 45      | 267    | 38      |
| 4am - 5am       | 126         | 109         | 119         | 127         | 121         | 40          | 30          | 602    | 120     | 672    | 96      |
| 5am - 6am       | 508         | 513         | 437         | 393         | 379         | 72          | 21          | 2230   | 446     | 2323   | 332     |
| 6am - 7am       | 999         | 984         | 979         | 893         | 916         | 159         | 59          | 4771   | 954     | 4989   | 713     |
| 7am - 8am       | 1199        | 1187        | 1102        | 1124        | 1105        | 281         | 106         | 5717   | 1143    | 6104   | 872     |
| 8am - 9am       | 1333        | 1381        | 1236        | 1171        | 1237        | 497         | 212         | 6358   | 1272    | 7067   | 1010    |
| 9am - 10am      | 1119        | 1095        | 925         | 993         | 1134        | 847         | 278         | 5266   | 1053    | 6391   | 913     |
| 10am - 11am     | 1070        | 951         | 904         | 918         | 1103        | 1327        | 316         | 4946   | 989     | 6589   | 941     |
| 11am - Midday   | 1117        | 998         | 1091        | 1050        | 1107        | 1582        | 422         | 5363   | 1073    | 7367   | 1052    |
| Midday - 1pm    | 1185        | 1080        | 1083        | 1168        | 1203        | 1588        | 659         | 5719   | 1144    | 7966   | 1138    |
| 1pm - 2pm       | 1144        | 1096        | 1208        | 1066        | 1288        | 1400        | 748         | 5802   | 1160    | 7950   | 1136    |
| 2pm - 3pm       | 1426        | 1288        | 1384        | 1329        | 1534        | 1058        | 916         | 6961   | 1392    | 8935   | 1276    |
| 3pm - 4pm       | 1759        | 1784        | 1821        | 1769        | 1885        | 699         | 942         | 9018   | 1804    | 10659  | 1523    |
| 4pm - 5pm       | 2121        | 2015        | 2097        | 1995        | 2099        | 511         | 891         | 10327  | 2065    | 11729  | 1676    |
| 5pm - 6pm       | 2399        | 2258        | 2299        | 2267        | 2004        | 543         | 699         | 11227  | 2245    | 12469  | 1781    |
| 6pm - 7pm       | 1347        | 1445        | 1525        | 1572        | 1477        | 322         | 440         | 7366   | 1473    | 8128   | 1161    |
| 7pm - 8pm       | 782         | 843         | 990         | 1100        | 802         | 177         | 351         | 4517   | 903     | 5045   | 721     |
| 8pm - 9pm       | 547         | 574         | 714         | 942         | 559         | 120         | 312         | 3336   | 667     | 3768   | 538     |
| 9pm - 10pm      | 381         | 497         | 542         | 768         | 416         | 128         | 215         | 2604   | 521     | 2947   | 421     |
| 10pm - 11pm     | 179         | 216         | 236         | 315         | 112         | 110         | 139         | 1058   | 212     | 1307   | 187     |
| 11pm - Midnight | 86          | 96          | 91          | 173         | 91          | 69          | 98          | 537    | 107     | 704    | 101     |
| Total           | 20997       | 20557       | 20968       | 21315       | 20769       | 11695       | 8007        | 104606 | 20921   | 124308 | 17758   |

Count Number 7382 Ref : TTPA Lat/Long : S33 43.719 / E150 41.685  
 Street CASTLEREIGH ROAD, CRANEBROOK : From CRANEBROOK ROAD to ANDREWS ROAD : SOUTH BOUND  
 Location Combined Counts (7378,7379,7380,7381) North of Andrews Road Carriageway

Start Date 20-MAY-19  
 Start Time 100  
 Duration 7 DAYS  
 Interval 1 HOUR

Weekly 50th Percentile Speed 66  
 Weekly 85th Percentile Speed 79  
 Five Day AADT 11778  
 Seven Day AADT 10231

## TOTAL COUNT MATRIX

|                 | MON<br>20TH | TUE<br>21ST | WED<br>22ND | THU<br>23RD | FRI<br>24TH | SAT<br>25TH | SUN<br>26TH | 5 Day<br>Total Average |       | 7 Day<br>Total Average |       |
|-----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------------------|-------|------------------------|-------|
| Midnight - 1am  | 15          | 14          | 18          | 20          | 25          | 41          | 50          | 92                     | 18    | 183                    | 26    |
| 1am - 2am       | 14          | 17          | 27          | 28          | 20          | 26          | 31          | 106                    | 21    | 163                    | 23    |
| 2am - 3am       | 25          | 18          | 22          | 19          | 29          | 31          | 23          | 113                    | 23    | 167                    | 24    |
| 3am - 4am       | 59          | 49          | 43          | 63          | 47          | 22          | 12          | 261                    | 52    | 295                    | 42    |
| 4am - 5am       | 155         | 164         | 175         | 151         | 144         | 45          | 35          | 789                    | 158   | 869                    | 124   |
| 5am - 6am       | 447         | 489         | 497         | 492         | 437         | 141         | 38          | 2362                   | 472   | 2541                   | 363   |
| 6am - 7am       | 843         | 853         | 898         | 872         | 803         | 234         | 103         | 4269                   | 854   | 4606                   | 658   |
| 7am - 8am       | 1138        | 1205        | 1143        | 1185        | 1063        | 411         | 141         | 5734                   | 1147  | 6286                   | 898   |
| 8am - 9am       | 1402        | 1389        | 1425        | 1413        | 1269        | 625         | 273         | 6898                   | 1380  | 7796                   | 1114  |
| 9am - 10am      | 794         | 801         | 839         | 826         | 814         | 629         | 455         | 4074                   | 815   | 5158                   | 737   |
| 10am - 11am     | 587         | 634         | 630         | 624         | 661         | 650         | 477         | 3136                   | 627   | 4263                   | 609   |
| 11am - Midday   | 574         | 553         | 568         | 643         | 623         | 657         | 540         | 2961                   | 592   | 4158                   | 594   |
| Midday - 1pm    | 528         | 524         | 564         | 599         | 664         | 561         | 453         | 2879                   | 576   | 3893                   | 556   |
| 1pm - 2pm       | 531         | 548         | 566         | 569         | 578         | 452         | 505         | 2792                   | 558   | 3749                   | 536   |
| 2pm - 3pm       | 648         | 641         | 681         | 656         | 657         | 437         | 442         | 3283                   | 657   | 4162                   | 595   |
| 3pm - 4pm       | 945         | 933         | 936         | 927         | 934         | 405         | 437         | 4675                   | 935   | 5517                   | 788   |
| 4pm - 5pm       | 737         | 835         | 785         | 911         | 798         | 370         | 409         | 4066                   | 813   | 4845                   | 692   |
| 5pm - 6pm       | 674         | 750         | 765         | 823         | 720         | 445         | 351         | 3732                   | 746   | 4528                   | 647   |
| 6pm - 7pm       | 417         | 532         | 543         | 621         | 568         | 353         | 235         | 2681                   | 536   | 3269                   | 467   |
| 7pm - 8pm       | 254         | 292         | 327         | 363         | 338         | 223         | 172         | 1574                   | 315   | 1969                   | 281   |
| 8pm - 9pm       | 160         | 163         | 239         | 222         | 205         | 143         | 159         | 989                    | 198   | 1291                   | 184   |
| 9pm - 10pm      | 118         | 131         | 169         | 142         | 179         | 130         | 97          | 739                    | 148   | 966                    | 138   |
| 10pm - 11pm     | 71          | 72          | 90          | 97          | 119         | 125         | 37          | 449                    | 90    | 611                    | 87    |
| 11pm - Midnight | 41          | 31          | 42          | 47          | 74          | 72          | 22          | 235                    | 47    | 329                    | 47    |
| Total           | 11177       | 11638       | 11992       | 12313       | 11769       | 7228        | 5497        | 58889                  | 11777 | 71614                  | 10230 |



Count Number **7382** Ref : **TTPA** Lat/Long : **S33 43.719 / E150 41.685**  
 Street **CASTLEREIGH ROAD, CRANEBROOK : From ANDREWS ROAD to CRANEBROOK ROAD : NORTH BOUND**  
 Location **Combined Counts (7378,7379,7380,7381) North of Andrews Road** Carriageway

Start Date 20-MAY-19  
 Start Time 100  
 Duration 7 DAYS  
 Interval 1 HOUR

Weekly 50th Percentile Speed 63  
 Weekly 85th Percentile Speed 72  
 Five Day AADT 12681  
 Seven Day AADT 10932

**TOTAL COUNT MATRIX**

|                 | MON<br>20TH  | TUE<br>21ST  | WED<br>22ND  | THU<br>23RD  | FRI<br>24TH  | SAT<br>25TH | SUN<br>26TH | 5 Day<br>Total Average |              | 7 Day<br>Total Average |              |
|-----------------|--------------|--------------|--------------|--------------|--------------|-------------|-------------|------------------------|--------------|------------------------|--------------|
| Midnight - 1am  | 23           | 32           | 37           | 32           | 40           | 54          | 74          | 164                    | 33           | 292                    | 42           |
| 1am - 2am       | 38           | 16           | 27           | 31           | 23           | 28          | 35          | 135                    | 27           | 198                    | 28           |
| 2am - 3am       | 25           | 21           | 25           | 18           | 17           | 14          | 16          | 106                    | 21           | 136                    | 19           |
| 3am - 4am       | 37           | 29           | 37           | 41           | 36           | 25          | 17          | 180                    | 36           | 222                    | 32           |
| 4am - 5am       | 63           | 58           | 57           | 74           | 51           | 25          | 24          | 303                    | 61           | 352                    | 50           |
| 5am - 6am       | 279          | 234          | 249          | 223          | 198          | 43          | 18          | 1183                   | 237          | 1244                   | 178          |
| 6am - 7am       | 572          | 588          | 596          | 573          | 532          | 107         | 55          | 2861                   | 572          | 3023                   | 432          |
| 7am - 8am       | 709          | 674          | 705          | 699          | 665          | 145         | 84          | 3452                   | 690          | 3681                   | 526          |
| 8am - 9am       | 776          | 776          | 738          | 789          | 786          | 289         | 196         | 3865                   | 773          | 4350                   | 621          |
| 9am - 10am      | 590          | 551          | 560          | 585          | 551          | 417         | 232         | 2837                   | 567          | 3486                   | 498          |
| 10am - 11am     | 539          | 509          | 533          | 572          | 568          | 627         | 296         | 2721                   | 544          | 3644                   | 521          |
| 11am - Midday   | 564          | 580          | 669          | 590          | 630          | 925         | 370         | 3033                   | 607          | 4328                   | 618          |
| Midday - 1pm    | 572          | 625          | 656          | 737          | 707          | 1135        | 488         | 3297                   | 659          | 4920                   | 703          |
| 1pm - 2pm       | 635          | 668          | 724          | 711          | 774          | 783         | 510         | 3512                   | 702          | 4805                   | 686          |
| 2pm - 3pm       | 857          | 852          | 970          | 906          | 1047         | 572         | 602         | 4632                   | 926          | 5806                   | 829          |
| 3pm - 4pm       | 1115         | 1132         | 1194         | 1156         | 1295         | 489         | 615         | 5892                   | 1178         | 6996                   | 999          |
| 4pm - 5pm       | 1289         | 1304         | 1415         | 1372         | 1371         | 433         | 563         | 6751                   | 1350         | 7747                   | 1107         |
| 5pm - 6pm       | 1411         | 1478         | 1507         | 1474         | 1254         | 414         | 469         | 7124                   | 1425         | 8007                   | 1144         |
| 6pm - 7pm       | 720          | 812          | 885          | 941          | 817          | 287         | 274         | 4175                   | 835          | 4736                   | 677          |
| 7pm - 8pm       | 403          | 485          | 578          | 636          | 477          | 182         | 237         | 2579                   | 516          | 2998                   | 428          |
| 8pm - 9pm       | 320          | 366          | 399          | 522          | 340          | 135         | 190         | 1947                   | 389          | 2272                   | 325          |
| 9pm - 10pm      | 201          | 306          | 328          | 469          | 286          | 161         | 128         | 1590                   | 318          | 1879                   | 268          |
| 10pm - 11pm     | 118          | 139          | 139          | 198          | 128          | 131         | 82          | 722                    | 144          | 935                    | 134          |
| 11pm - Midnight | 55           | 57           | 60           | 93           | 80           | 77          | 47          | 345                    | 69           | 469                    | 67           |
| <b>Total</b>    | <b>11911</b> | <b>12292</b> | <b>13088</b> | <b>13442</b> | <b>12673</b> | <b>7498</b> | <b>5622</b> | <b>63406</b>           | <b>12681</b> | <b>76526</b>           | <b>10932</b> |

Count Number **7377** Ref : **TTPA** Lat/Long : **S33 43.787 / E150 41.558**  
 Street **OLD CASTLEREAGH ROAD, CRANE BROOK : From CASTLEREAGH ROAD to CUL DE SAC (CEMETERY) : WEST BOUND**  
 Location **Just west of Castlereigh Road** *Carriageway*

Start Date 20-MAY-19  
 Start Time 200  
 Duration 7 DAYS  
 Interval 1 HOUR

Weekly 50th Percentile Speed 56  
 Weekly 85th Percentile Speed 67  
 Five Day AADT 973  
 Seven Day AADT 928

**TOTAL COUNT MATRIX**

|                 | MON<br>20TH / 27TH | TUE<br>21ST | WED<br>22ND | THU<br>23RD | FRI<br>24TH | SAT<br>25TH | SUN<br>26TH | 5 Day<br>Total Average |            | 7 Day<br>Total Average |            |
|-----------------|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|------------------------|------------|------------------------|------------|
| Midnight - 1am  | 0                  | 0           | 0           | 0           | 2           | 13          | 3           | 2                      | 0          | 18                     | 3          |
| 1am - 2am       | 3                  | 2           | 4           | 2           | 4           | 6           | 2           | 15                     | 3          | 23                     | 3          |
| 2am - 3am       | 1                  | 2           | 0           | 6           | 2           | 1           | 1           | 11                     | 2          | 13                     | 2          |
| 3am - 4am       | 2                  | 0           | 3           | 3           | 1           | 2           | 0           | 9                      | 2          | 11                     | 2          |
| 4am - 5am       | 8                  | 9           | 6           | 7           | 9           | 8           | 1           | 39                     | 8          | 48                     | 7          |
| 5am - 6am       | 29                 | 27          | 29          | 33          | 27          | 8           | 1           | 145                    | 29         | 154                    | 22         |
| 6am - 7am       | 64                 | 60          | 65          | 57          | 69          | 38          | 10          | 315                    | 63         | 363                    | 52         |
| 7am - 8am       | 123                | 108         | 94          | 88          | 93          | 206         | 18          | 506                    | 101        | 730                    | 104        |
| 8am - 9am       | 106                | 96          | 91          | 93          | 90          | 60          | 30          | 476                    | 95         | 566                    | 81         |
| 9am - 10am      | 63                 | 101         | 73          | 74          | 176         | 43          | 99          | 487                    | 97         | 629                    | 90         |
| 10am - 11am     | 56                 | 67          | 64          | 43          | 188         | 42          | 171         | 418                    | 84         | 631                    | 90         |
| 11am - Midday   | 64                 | 57          | 54          | 53          | 134         | 74          | 85          | 362                    | 72         | 521                    | 74         |
| Midday - 1pm    | 58                 | 51          | 62          | 70          | 97          | 132         | 51          | 338                    | 68         | 521                    | 74         |
| 1pm - 2pm       | 65                 | 55          | 52          | 66          | 46          | 101         | 64          | 284                    | 57         | 449                    | 64         |
| 2pm - 3pm       | 64                 | 50          | 58          | 56          | 51          | 43          | 53          | 279                    | 56         | 375                    | 54         |
| 3pm - 4pm       | 84                 | 59          | 76          | 59          | 62          | 39          | 34          | 340                    | 68         | 413                    | 59         |
| 4pm - 5pm       | 53                 | 60          | 72          | 66          | 56          | 56          | 22          | 307                    | 61         | 385                    | 55         |
| 5pm - 6pm       | 31                 | 56          | 32          | 42          | 38          | 32          | 6           | 199                    | 40         | 237                    | 34         |
| 6pm - 7pm       | 18                 | 41          | 39          | 20          | 33          | 16          | 5           | 151                    | 30         | 172                    | 25         |
| 7pm - 8pm       | 17                 | 19          | 24          | 11          | 11          | 9           | 7           | 82                     | 16         | 98                     | 14         |
| 8pm - 9pm       | 13                 | 17          | 10          | 7           | 1           | 11          | 6           | 48                     | 10         | 65                     | 9          |
| 9pm - 10pm      | 4                  | 4           | 5           | 7           | 5           | 2           | 2           | 25                     | 5          | 29                     | 4          |
| 10pm - 11pm     | 3                  | 1           | 2           | 5           | 2           | 7           | 0           | 13                     | 3          | 20                     | 3          |
| 11pm - Midnight | 3                  | 3           | 4           | 3           | 2           | 9           | 1           | 15                     | 3          | 25                     | 4          |
| <b>Total</b>    | <b>932</b>         | <b>945</b>  | <b>919</b>  | <b>871</b>  | <b>1199</b> | <b>958</b>  | <b>672</b>  | <b>4866</b>            | <b>973</b> | <b>6496</b>            | <b>928</b> |

Count Number **7377** Ref : **TTPA** Lat/Long : **S33 43.787 / E150 41.558**  
 Street **OLD CASTLEREAGH ROAD, CRANE BROOK : From CUL DE SAC (CEMETERY) to CASTLEREAGH ROAD : EAST BOUND**  
 Location **Just west of Castlereigh Road** *Carriageway*

Start Date 20-MAY-19  
 Start Time 200  
 Duration 7 DAYS  
 Interval 1 HOUR

Weekly 50th Percentile Speed 57  
 Weekly 85th Percentile Speed 72  
 Five Day AADT 921  
 Seven Day AADT 880

**TOTAL COUNT MATRIX**

|                 | MON<br>20TH / 27TH | TUE<br>21ST | WED<br>22ND | THU<br>23RD | FRI<br>24TH | SAT<br>25TH | SUN<br>26TH | 5 Day<br>Total Average |            | 7 Day<br>Total Average |            |
|-----------------|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|------------------------|------------|------------------------|------------|
| Midnight - 1am  | 2                  | 2           | 4           | 1           | 4           | 19          | 17          | 13                     | 3          | 49                     | 7          |
| 1am - 2am       | 3                  | 2           | 2           | 5           | 7           | 6           | 2           | 19                     | 4          | 27                     | 4          |
| 2am - 3am       | 3                  | 4           | 1           | 4           | 2           | 1           | 1           | 14                     | 3          | 16                     | 2          |
| 3am - 4am       | 2                  | 2           | 2           | 7           | 1           | 2           | 1           | 14                     | 3          | 17                     | 2          |
| 4am - 5am       | 4                  | 5           | 7           | 4           | 4           | 1           | 0           | 24                     | 5          | 25                     | 4          |
| 5am - 6am       | 7                  | 7           | 6           | 8           | 6           | 6           | 1           | 34                     | 7          | 41                     | 6          |
| 6am - 7am       | 14                 | 18          | 11          | 11          | 13          | 5           | 4           | 67                     | 13         | 76                     | 11         |
| 7am - 8am       | 21                 | 32          | 41          | 25          | 33          | 9           | 4           | 152                    | 30         | 165                    | 24         |
| 8am - 9am       | 32                 | 41          | 34          | 39          | 34          | 51          | 9           | 180                    | 36         | 240                    | 34         |
| 9am - 10am      | 45                 | 54          | 43          | 58          | 56          | 167         | 18          | 256                    | 51         | 441                    | 63         |
| 10am - 11am     | 47                 | 70          | 39          | 37          | 43          | 67          | 33          | 236                    | 47         | 336                    | 48         |
| 11am - Midday   | 67                 | 87          | 67          | 68          | 144         | 86          | 54          | 433                    | 87         | 573                    | 82         |
| Midday - 1pm    | 63                 | 60          | 61          | 76          | 208         | 104         | 54          | 468                    | 94         | 626                    | 89         |
| 1pm - 2pm       | 67                 | 53          | 62          | 60          | 198         | 71          | 135         | 440                    | 88         | 646                    | 92         |
| 2pm - 3pm       | 86                 | 63          | 74          | 79          | 78          | 40          | 202         | 380                    | 76         | 622                    | 89         |
| 3pm - 4pm       | 89                 | 77          | 98          | 80          | 87          | 38          | 35          | 431                    | 86         | 504                    | 72         |
| 4pm - 5pm       | 107                | 117         | 112         | 99          | 98          | 83          | 73          | 533                    | 107        | 689                    | 98         |
| 5pm - 6pm       | 81                 | 99          | 95          | 81          | 59          | 19          | 19          | 415                    | 83         | 453                    | 65         |
| 6pm - 7pm       | 39                 | 32          | 31          | 31          | 27          | 11          | 5           | 160                    | 32         | 176                    | 25         |
| 7pm - 8pm       | 18                 | 14          | 17          | 13          | 14          | 14          | 13          | 76                     | 15         | 103                    | 15         |
| 8pm - 9pm       | 10                 | 22          | 21          | 21          | 8           | 14          | 4           | 82                     | 16         | 100                    | 14         |
| 9pm - 10pm      | 13                 | 27          | 10          | 12          | 19          | 11          | 3           | 81                     | 16         | 95                     | 14         |
| 10pm - 11pm     | 2                  | 16          | 36          | 6           | 9           | 21          | 1           | 69                     | 14         | 91                     | 13         |
| 11pm - Midnight | 7                  | 5           | 7           | 5           | 3           | 21          | 1           | 27                     | 5          | 49                     | 7          |
| <b>Total</b>    | <b>829</b>         | <b>909</b>  | <b>881</b>  | <b>830</b>  | <b>1155</b> | <b>867</b>  | <b>689</b>  | <b>4604</b>            | <b>920</b> | <b>6160</b>            | <b>880</b> |

Count Number 7376 Ref : TTPA Lat/Long : S33 43.812 / E150 41.763

Street ANDREWS ROAD, CRANE BROOK : From CASTLEREIGH ROAD to RICHMOND ROAD : EAST BOUND

Location Just east of Castlereigh Road

Carriageway

Start Date 20-MAY-19  
 Start Time 200  
 Duration 7 DAYS  
 Interval 1 HOUR

Weekly 50th Percentile Speed 58  
 Weekly 85th Percentile Speed 74  
 Five Day AADT 7896  
 Seven Day AADT 7188

## TOTAL COUNT MATRIX

|                 | MON<br>20TH / 27TH | TUE<br>21ST | WED<br>22ND | THU<br>23RD | FRI<br>24TH | SAT<br>25TH | SUN<br>26TH | 5 Day<br>Total Average |      | 7 Day<br>Total Average |      |
|-----------------|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|------------------------|------|------------------------|------|
| Midnight - 1am  | 14                 | 26          | 32          | 29          | 34          | 42          | 43          | 135                    | 27   | 220                    | 31   |
| 1am - 2am       | 8                  | 10          | 18          | 24          | 21          | 27          | 23          | 81                     | 16   | 131                    | 19   |
| 2am - 3am       | 10                 | 10          | 11          | 17          | 16          | 22          | 15          | 64                     | 13   | 101                    | 14   |
| 3am - 4am       | 17                 | 20          | 21          | 21          | 20          | 21          | 14          | 99                     | 20   | 134                    | 19   |
| 4am - 5am       | 65                 | 53          | 68          | 57          | 63          | 34          | 20          | 306                    | 61   | 360                    | 51   |
| 5am - 6am       | 211                | 240         | 211         | 231         | 222         | 74          | 21          | 1115                   | 223  | 1210                   | 173  |
| 6am - 7am       | 333                | 338         | 365         | 329         | 317         | 130         | 60          | 1682                   | 336  | 1872                   | 267  |
| 7am - 8am       | 376                | 400         | 386         | 409         | 410         | 184         | 89          | 1981                   | 396  | 2254                   | 322  |
| 8am - 9am       | 431                | 488         | 514         | 459         | 462         | 383         | 137         | 2354                   | 471  | 2874                   | 411  |
| 9am - 10am      | 406                | 445         | 399         | 412         | 476         | 628         | 228         | 2138                   | 428  | 2994                   | 428  |
| 10am - 11am     | 396                | 376         | 356         | 391         | 384         | 782         | 217         | 1903                   | 381  | 2902                   | 415  |
| 11am - Midday   | 383                | 370         | 392         | 407         | 410         | 862         | 292         | 1962                   | 392  | 3116                   | 445  |
| Midday - 1pm    | 426                | 382         | 435         | 436         | 495         | 832         | 289         | 2174                   | 435  | 3295                   | 471  |
| 1pm - 2pm       | 407                | 426         | 436         | 450         | 473         | 687         | 411         | 2192                   | 438  | 3290                   | 470  |
| 2pm - 3pm       | 532                | 479         | 454         | 467         | 520         | 587         | 472         | 2452                   | 490  | 3511                   | 502  |
| 3pm - 4pm       | 654                | 663         | 658         | 633         | 713         | 350         | 369         | 3321                   | 664  | 4040                   | 577  |
| 4pm - 5pm       | 778                | 781         | 804         | 724         | 749         | 300         | 365         | 3836                   | 767  | 4501                   | 643  |
| 5pm - 6pm       | 870                | 838         | 837         | 840         | 762         | 286         | 279         | 4147                   | 829  | 4712                   | 673  |
| 6pm - 7pm       | 523                | 591         | 595         | 582         | 537         | 212         | 194         | 2828                   | 566  | 3234                   | 462  |
| 7pm - 8pm       | 314                | 332         | 376         | 413         | 315         | 90          | 161         | 1750                   | 350  | 2001                   | 286  |
| 8pm - 9pm       | 211                | 221         | 311         | 349         | 220         | 88          | 131         | 1312                   | 262  | 1531                   | 219  |
| 9pm - 10pm      | 159                | 206         | 182         | 266         | 164         | 85          | 90          | 977                    | 195  | 1152                   | 165  |
| 10pm - 11pm     | 73                 | 89          | 112         | 108         | 53          | 70          | 48          | 435                    | 87   | 553                    | 79   |
| 11pm - Midnight | 36                 | 48          | 40          | 63          | 47          | 58          | 36          | 234                    | 47   | 328                    | 47   |
| Total           | 7633               | 7832        | 8013        | 8117        | 7883        | 6834        | 4004        | 39478                  | 7895 | 50316                  | 7188 |

Count Number 7376

Ref : TTPA

Lat/Long : S33 43.812 / E150 41.763

Street ANDREWS ROAD, CRANE BROOK : From RICHMOND ROAD to CASTLEREIGH ROAD : WEST BOUND

Location Just east of Castlereigh Road

Carriageway

Start Date 20-MAY-19  
 Start Time 200  
 Duration 7 DAYS  
 Interval 1 HOUR

Weekly 50th Percentile Speed 53  
 Weekly 85th Percentile Speed 62  
 Five Day AADT 7872  
 Seven Day AADT 7065

## TOTAL COUNT MATRIX

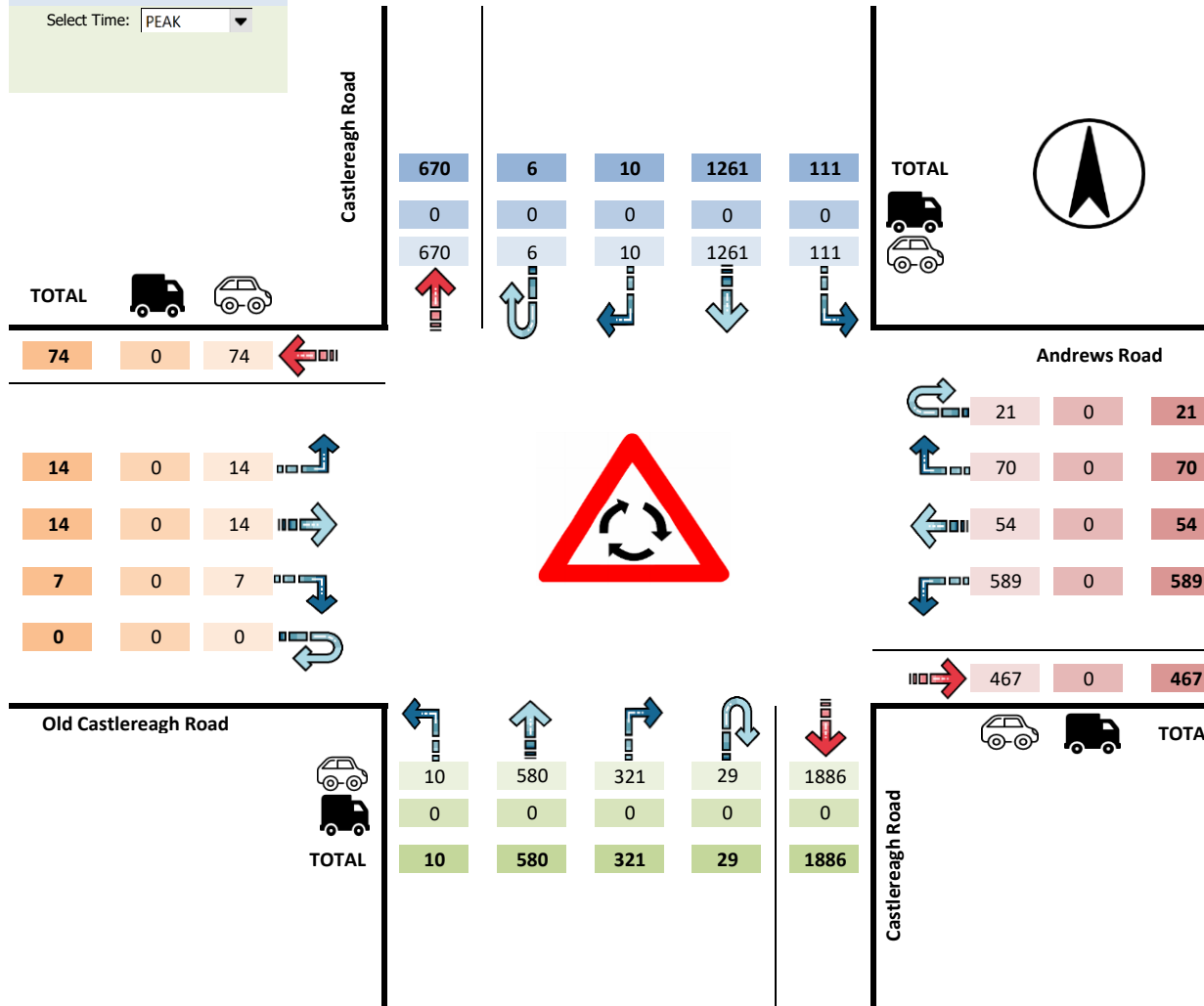
|                 | MON<br>20TH / 27TH | TUE<br>21ST | WED<br>22ND | THU<br>23RD | FRI<br>24TH | SAT<br>25TH | SUN<br>26TH | 5 Day<br>Total Average |      | 7 Day<br>Total Average |      |
|-----------------|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|------------------------|------|------------------------|------|
| Midnight - 1am  | 13                 | 26          | 17          | 16          | 15          | 44          | 55          | 87                     | 17   | 186                    | 27   |
| 1am - 2am       | 11                 | 11          | 23          | 12          | 13          | 32          | 20          | 70                     | 14   | 122                    | 17   |
| 2am - 3am       | 18                 | 12          | 22          | 14          | 22          | 22          | 17          | 88                     | 18   | 127                    | 18   |
| 3am - 4am       | 23                 | 31          | 35          | 33          | 26          | 43          | 13          | 148                    | 30   | 204                    | 29   |
| 4am - 5am       | 110                | 122         | 117         | 111         | 99          | 48          | 16          | 559                    | 112  | 623                    | 89   |
| 5am - 6am       | 290                | 244         | 280         | 261         | 253         | 79          | 34          | 1328                   | 266  | 1441                   | 206  |
| 6am - 7am       | 494                | 528         | 517         | 513         | 471         | 171         | 59          | 2523                   | 505  | 2753                   | 393  |
| 7am - 8am       | 683                | 721         | 686         | 660         | 638         | 384         | 123         | 3388                   | 678  | 3895                   | 556  |
| 8am - 9am       | 628                | 588         | 634         | 639         | 660         | 473         | 222         | 3149                   | 630  | 3844                   | 549  |
| 9am - 10am      | 481                | 529         | 523         | 528         | 582         | 529         | 353         | 2643                   | 529  | 3525                   | 504  |
| 10am - 11am     | 493                | 409         | 428         | 481         | 468         | 578         | 448         | 2279                   | 456  | 3305                   | 472  |
| 11am - Midday   | 362                | 447         | 412         | 419         | 482         | 747         | 426         | 2122                   | 424  | 3295                   | 471  |
| Midday - 1pm    | 376                | 406         | 420         | 428         | 437         | 683         | 355         | 2067                   | 413  | 3105                   | 444  |
| 1pm - 2pm       | 410                | 371         | 391         | 415         | 411         | 385         | 368         | 1998                   | 400  | 2751                   | 393  |
| 2pm - 3pm       | 474                | 448         | 470         | 452         | 509         | 328         | 282         | 2353                   | 471  | 2963                   | 423  |
| 3pm - 4pm       | 564                | 598         | 627         | 600         | 595         | 337         | 255         | 2984                   | 597  | 3576                   | 511  |
| 4pm - 5pm       | 555                | 542         | 543         | 607         | 566         | 287         | 200         | 2813                   | 563  | 3300                   | 471  |
| 5pm - 6pm       | 529                | 559         | 522         | 575         | 494         | 270         | 210         | 2679                   | 536  | 3159                   | 451  |
| 6pm - 7pm       | 419                | 481         | 469         | 478         | 478         | 243         | 169         | 2325                   | 465  | 2737                   | 391  |
| 7pm - 8pm       | 321                | 286         | 305         | 350         | 282         | 126         | 114         | 1544                   | 309  | 1784                   | 255  |
| 8pm - 9pm       | 169                | 230         | 221         | 226         | 188         | 92          | 81          | 1034                   | 207  | 1207                   | 172  |
| 9pm - 10pm      | 112                | 113         | 138         | 122         | 103         | 100         | 61          | 588                    | 118  | 749                    | 107  |
| 10pm - 11pm     | 69                 | 63          | 64          | 78          | 100         | 93          | 31          | 374                    | 75   | 498                    | 71   |
| 11pm - Midnight | 28                 | 33          | 34          | 45          | 79          | 58          | 29          | 219                    | 44   | 306                    | 44   |
| Total           | 7632               | 7798        | 7898        | 8063        | 7971        | 6152        | 3941        | 39362                  | 7872 | 49455                  | 7065 |

Location Castlereagh Road  
Andrews Road  
Castlereagh Road  
Old Castlereagh Road  
 Suburb PENRITH

Duration 0700 - 0900  
1500 - 1800  
-  
 Day/Date Tuesday, October 16, 2018  
 Weather -

**DATA SELECTION**  
 Select Time:

| TIME RANGE |   |      |
|------------|---|------|
| PEAK       | - | AM   |
| PEAK       |   |      |
| 7:45       | - | 8:45 |



**Traffic Information Specialists**

ABN: 42 613 389 923

Email [info@trafficinfospecialist.com.au](mailto:info@trafficinfospecialist.com.au)

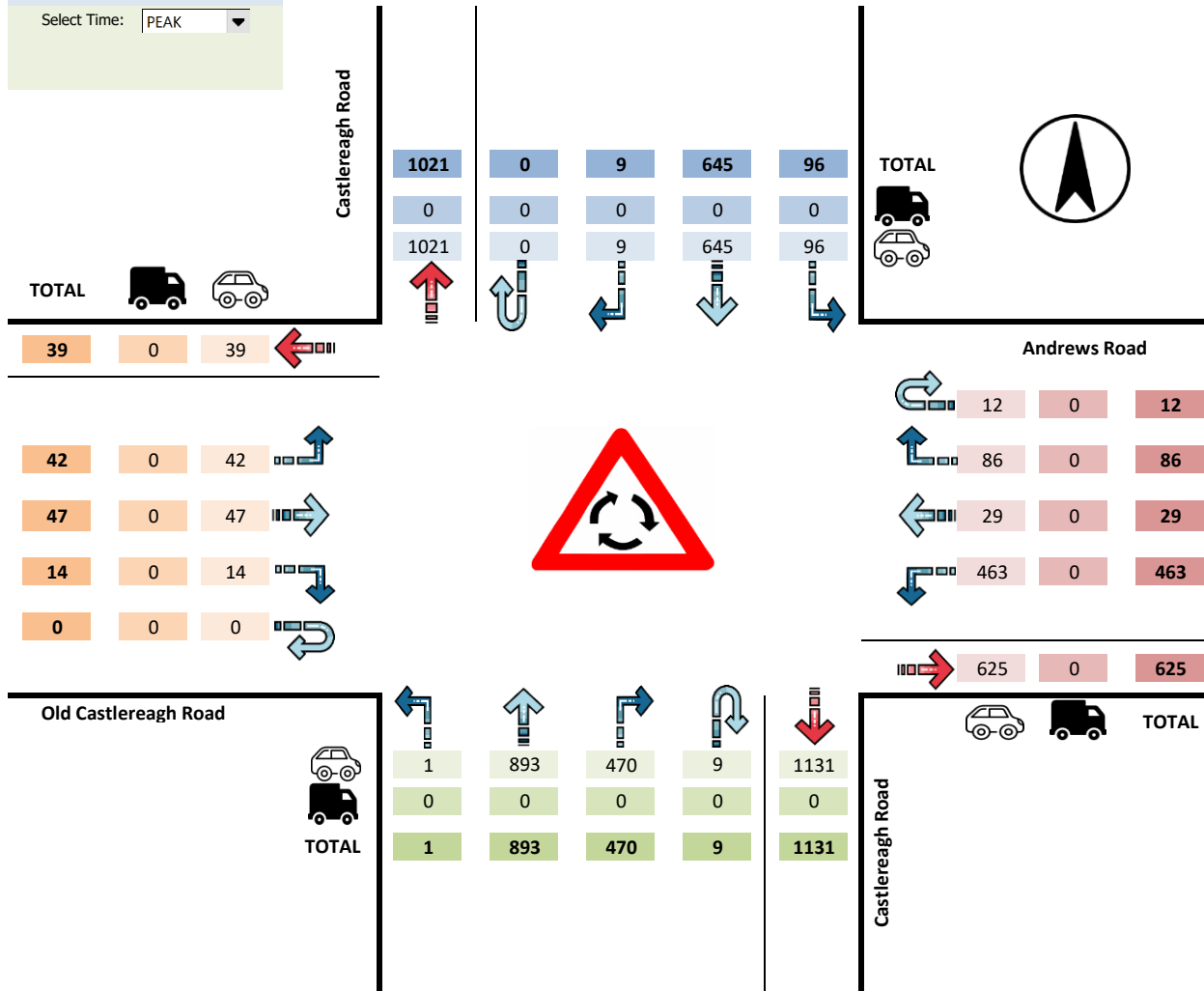


Location Castlereagh Road  
Andrews Road  
Castlereagh Road  
Old Castlereagh Road  
 Suburb PENRITH

Duration 0700 - 0900  
1500 - 1800  
-  
 Day/Date Tuesday, October 16, 2018  
 Weather -

**DATA SELECTION**  
 Select Time:

| TIME RANGE |   |       |
|------------|---|-------|
| PEAK       | - | PM    |
| PEAK       |   |       |
| 15:45      | - | 16:45 |



**Traffic Information Specialists**

ABN: 42 613 389 923

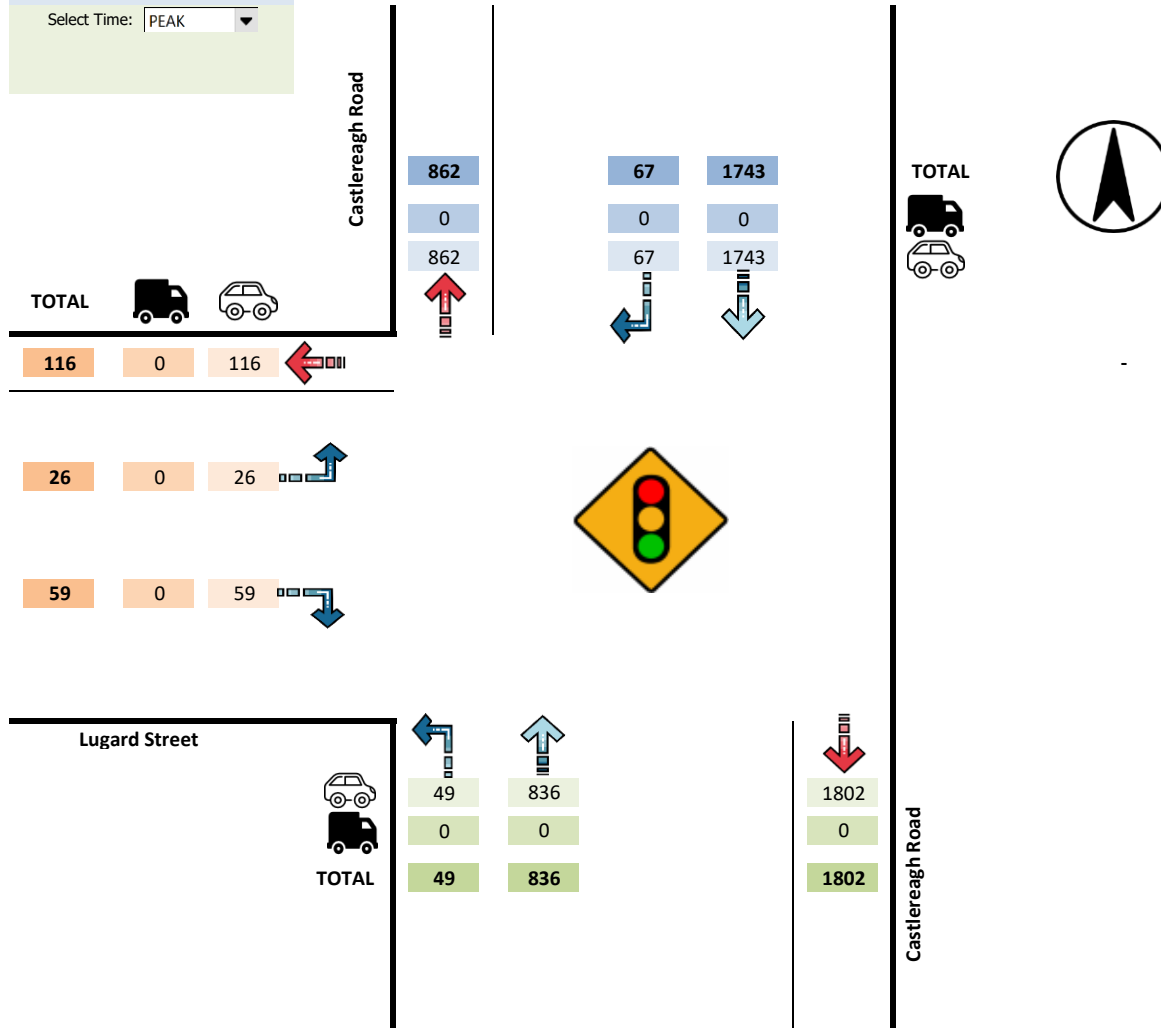
Email [info@trafficinfospecialist.com.au](mailto:info@trafficinfospecialist.com.au)

Location Castlereagh Road  
-  
Castlereagh Road  
Lugard Street  
 Suburb PENRITH

Duration 0700 - 0900  
1500 - 1800  
-  
 Day/Date Tuesday, October 16, 2018  
 Weather -

**DATA SELECTION**  
 Select Time:

| TIME RANGE |   |      |
|------------|---|------|
| PEAK       | - | AM   |
| PEAK       |   |      |
| 7:45       | - | 8:45 |



**Traffic Information Specialists**

ABN: 42 613 389 923

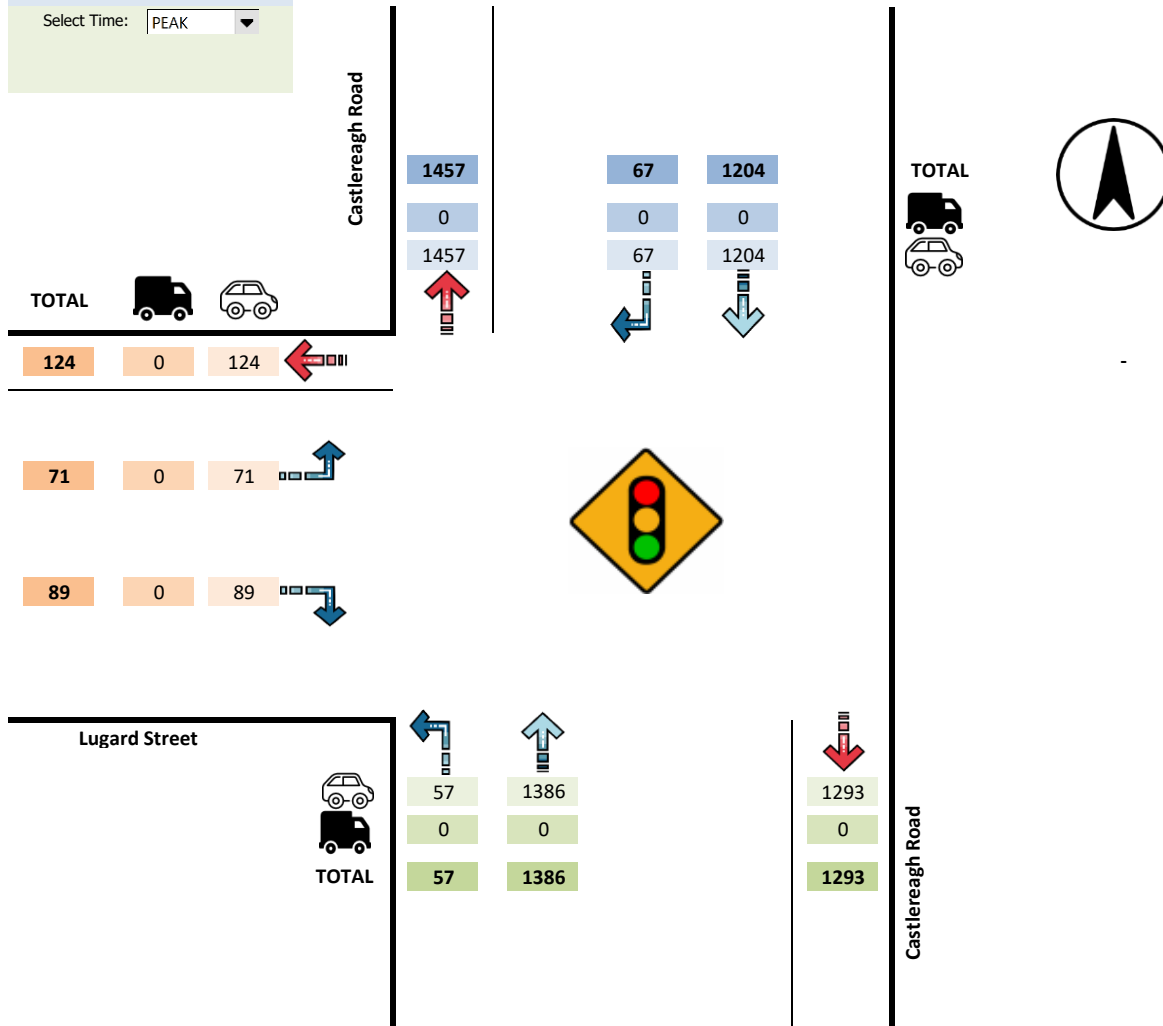
Email [info@trafficinfospecialist.com.au](mailto:info@trafficinfospecialist.com.au)

Location Castlereagh Road  
-  
Castlereagh Road  
Lugard Street  
 Suburb PENRITH

Duration 0700 - 0900  
1500 - 1800  
-  
 Day/Date Tuesday, October 16, 2018  
 Weather -

**DATA SELECTION**  
 Select Time:

| TIME RANGE |   |       |
|------------|---|-------|
| PEAK       | - | PM    |
| PEAK       |   |       |
| 15:30      | - | 16:30 |



**Traffic Information Specialists**

ABN: 42 613 389 923

Email [info@trafficinfospecialist.com.au](mailto:info@trafficinfospecialist.com.au)

## **APPENDIX C**

### **SIDRA RESULTS**

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# MOVEMENT SUMMARY

 Site: 1 [EX AM LUGARD - CASTLEREAGH 2020]

 Network: N101 [EX AM 2020]

18210 - PENRITH LAKES, PENRITH

Site Category: PENRITH LAKES

Signals - Fixed Time Isolated Cycle Time = 140 seconds (Site User-Given Phase Times)

| Movement Performance - Vehicles |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
|---------------------------------|------|--------------|------|---------------|------|-----------|---------------|------------------|---------------------|--------------|---------------------|------------------|---------------|------|
| Mov ID                          | Turn | Demand Flows |      | Arrival Flows |      | Deg. Satn | Average Delay | Level of Service | Aver. Back of Queue | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |      |
|                                 |      | Total veh/h  | HV % | Total veh/h   | HV % | v/c       | sec           |                  | Vehicles veh        | Distance m   |                     |                  | km/h          |      |
| South: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 1                               | L2   | 52           | 0.0  | 52            | 0.0  | 0.485     | 31.1          | LOS C            | 12.6                | 88.1         | 0.72                | 0.67             | 0.84          | 37.3 |
| 2                               | T1   | 880          | 0.0  | 880           | 0.0  | 0.485     | 25.3          | LOS C            | 12.8                | 89.4         | 0.72                | 0.65             | 0.78          | 30.3 |
| Approach                        |      | 932          | 0.0  | 932           | 0.0  | 0.485     | 25.6          | LOS C            | 12.8                | 89.4         | 0.72                | 0.65             | 0.78          | 30.8 |
| North: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 8                               | T1   | 1835         | 0.0  | 1835          | 0.0  | 0.751     | 15.1          | LOS B            | 26.6                | 186.5        | 0.68                | 0.63             | 0.68          | 46.8 |
| 9                               | R2   | 71           | 0.0  | 71            | 0.0  | 0.165     | 17.9          | LOS B            | 1.1                 | 7.6          | 0.59                | 0.70             | 0.59          | 42.7 |
| Approach                        |      | 1905         | 0.0  | 1905          | 0.0  | 0.751     | 15.2          | LOS B            | 26.6                | 186.5        | 0.68                | 0.64             | 0.68          | 46.6 |
| West: LUGARD STREET             |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 10                              | L2   | 27           | 0.0  | 27            | 0.0  | 0.092     | 44.5          | LOS D            | 1.4                 | 10.1         | 0.77                | 0.72             | 0.77          | 19.0 |
| 12                              | R2   | 62           | 0.0  | 62            | 0.0  | 0.092     | 47.7          | LOS D            | 1.4                 | 10.1         | 0.79                | 0.73             | 0.79          | 28.8 |
| Approach                        |      | 89           | 0.0  | 89            | 0.0  | 0.092     | 46.7          | LOS D            | 1.4                 | 10.1         | 0.79                | 0.73             | 0.79          | 26.5 |
| All Vehicles                    |      | 2926         | 0.0  | 2926          | 0.0  | 0.751     | 19.5          | LOS B            | 26.6                | 186.5        | 0.69                | 0.64             | 0.71          | 41.7 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

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

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

| Movement Performance - Pedestrians |                     |             |               |                  |                       |              |                     |      |
|------------------------------------|---------------------|-------------|---------------|------------------|-----------------------|--------------|---------------------|------|
| Mov ID                             | Description         | Demand Flow | Average Delay | Level of Service | Average Back of Queue | Prop. Queued | Effective Stop Rate |      |
|                                    |                     | ped/h       | sec           |                  | Pedestrian ped        | Distance m   |                     |      |
| P3                                 | North Full Crossing | 53          | 64.3          | LOS F            | 0.2                   | 0.2          | 0.96                | 0.96 |
| P4                                 | West Full Crossing  | 53          | 64.3          | LOS F            | 0.2                   | 0.2          | 0.96                | 0.96 |
| All Pedestrians                    |                     | 105         | 64.3          | LOS F            |                       |              | 0.96                | 0.96 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Organisation: TRANSPORT AND TRAFFIC PLANNING ASSOCIATES | Processed: Friday, 31 January 2020 9:56:27 AM

Project: T:\WORK18\18210 - PENRITH LAKES, PENRITH\MODELLING\18210 - PENRITH LAKES, PENRITH 29JAN20.sip8

# MOVEMENT SUMMARY

 Site: 1 [EX PM LUGARD - CASTLEREAGH 2020]

 Network: N101 [EX PM 2020]

18210 - PENRITH LAKES, PENRITH

Site Category: PENRITH LAKES

Signals - Fixed Time Isolated Cycle Time = 140 seconds (Site User-Given Phase Times)

| Movement Performance - Vehicles |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
|---------------------------------|------|--------------|------|---------------|------|-----------|---------------|------------------|---------------------|--------------|---------------------|------------------|---------------|------|
| Mov ID                          | Turn | Demand Flows |      | Arrival Flows |      | Deg. Satn | Average Delay | Level of Service | Aver. Back of Queue | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |      |
|                                 |      | Total veh/h  | HV % | Total veh/h   | HV % | v/c       | sec           |                  | Vehicles veh        | Distance m   |                     |                  | km/h          |      |
| South: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 1                               | L2   | 60           | 0.0  | 60            | 0.0  | 0.769     | 36.1          | LOS D            | 25.1                | 175.9        | 0.87                | 0.82             | 1.02          | 35.0 |
| 2                               | T1   | 1459         | 0.0  | 1459          | 0.0  | 0.769     | 30.0          | LOS C            | 25.3                | 176.9        | 0.87                | 0.81             | 0.95          | 27.7 |
| Approach                        |      | 1519         | 0.0  | 1519          | 0.0  | 0.769     | 30.3          | LOS C            | 25.3                | 176.9        | 0.87                | 0.81             | 0.95          | 28.1 |
| North: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 8                               | T1   | 1267         | 0.0  | 1267          | 0.0  | 0.460     | 9.3           | LOS A            | 11.2                | 78.5         | 0.47                | 0.43             | 0.47          | 51.1 |
| 9                               | R2   | 71           | 0.0  | 71            | 0.0  | 0.215     | 23.6          | LOS C            | 1.2                 | 8.4          | 0.73                | 0.73             | 0.73          | 39.4 |
| Approach                        |      | 1338         | 0.0  | 1338          | 0.0  | 0.460     | 10.1          | LOS B            | 11.2                | 78.5         | 0.48                | 0.44             | 0.48          | 50.4 |
| West: LUGARD STREET             |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 10                              | L2   | 75           | 0.0  | 75            | 0.0  | 0.184     | 45.0          | LOS D            | 3.0                 | 21.1         | 0.79                | 0.75             | 0.79          | 18.9 |
| 12                              | R2   | 94           | 0.0  | 94            | 0.0  | 0.184     | 52.3          | LOS D            | 3.0                 | 21.1         | 0.85                | 0.75             | 0.85          | 27.5 |
| Approach                        |      | 168          | 0.0  | 168           | 0.0  | 0.184     | 49.1          | LOS D            | 3.0                 | 21.1         | 0.82                | 0.75             | 0.82          | 24.5 |
| All Vehicles                    |      | 3025         | 0.0  | 3025          | 0.0  | 0.769     | 22.4          | LOS C            | 25.3                | 176.9        | 0.70                | 0.64             | 0.74          | 38.0 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

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

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

| Movement Performance - Pedestrians |                     |             |               |                  |                       |              |                     |      |
|------------------------------------|---------------------|-------------|---------------|------------------|-----------------------|--------------|---------------------|------|
| Mov ID                             | Description         | Demand Flow | Average Delay | Level of Service | Average Back of Queue | Prop. Queued | Effective Stop Rate |      |
|                                    |                     | ped/h       | sec           |                  | Pedestrian ped        | Distance m   |                     |      |
| P3                                 | North Full Crossing | 53          | 64.3          | LOS F            | 0.2                   | 0.2          | 0.96                | 0.96 |
| P4                                 | West Full Crossing  | 53          | 64.3          | LOS F            | 0.2                   | 0.2          | 0.96                | 0.96 |
| All Pedestrians                    |                     | 105         | 64.3          | LOS F            |                       |              | 0.96                | 0.96 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Project: T:\WORK18\18210 - PENRITH LAKES, PENRITH\MODELLING\18210 - PENRITH LAKES, PENRITH 29JAN20.sip8



# MOVEMENT SUMMARY

 Site: 2 [EX AM OLD CASTLEREAGH - CASTLEREAGH - ANDREWS 2020]

 Network: N101 [EX AM 2020]

CASTLEREAGH - CASTLEREAGH - ANDREWS  
Site Category: PENRITH LAKES  
Roundabout

| Movement Performance - Vehicles |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
|---------------------------------|------|-------------|-------|-------------|-------|-----------|---------------|------------------|---------------------|--------------|---------------------|------------------|---------------|------|
| Mov ID                          | Turn | Demand      | Flows | Arrival     | Flows | Deg. Satn | Average Delay | Level of Service | Aver. Back of Queue | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |      |
|                                 |      | Total veh/h | HV %  | Total veh/h | HV %  | v/c       | sec           |                  | Vehicles veh        | Distance m   |                     |                  | km/h          |      |
| South: CASTLEREAGH ROAD         |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 1                               | L2   | 11          | 0.0   | 11          | 0.0   | 0.352     | 3.4           | LOS A            | 0.8                 | 5.7          | 0.33                | 0.29             | 0.33          | 56.5 |
| 2                               | T1   | 611         | 0.0   | 611         | 0.0   | 0.352     | 2.8           | LOS A            | 0.8                 | 5.7          | 0.33                | 0.33             | 0.33          | 58.4 |
| 3                               | R2   | 368         | 0.0   | 368         | 0.0   | 0.352     | 10.3          | LOS B            | 0.8                 | 5.5          | 0.34                | 0.59             | 0.34          | 56.0 |
| Approach                        |      | 989         | 0.0   | 989         | 0.0   | 0.352     | 5.6           | LOS A            | 0.8                 | 5.7          | 0.33                | 0.43             | 0.33          | 57.4 |
| East: ANDREWS ROAD              |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 4                               | L2   | 620         | 0.0   | 620         | 0.0   | 0.701     | 8.5           | LOS A            | 2.4                 | 16.5         | 0.90                | 1.05             | 1.23          | 47.3 |
| 5                               | T1   | 57          | 0.0   | 57          | 0.0   | 0.238     | 5.5           | LOS A            | 0.5                 | 3.2          | 0.75                | 0.80             | 0.75          | 54.0 |
| 6                               | R2   | 96          | 0.0   | 96          | 0.0   | 0.238     | 12.9          | LOS B            | 0.5                 | 3.2          | 0.75                | 0.80             | 0.75          | 55.2 |
| Approach                        |      | 773         | 0.0   | 773         | 0.0   | 0.701     | 8.8           | LOS A            | 2.4                 | 16.5         | 0.87                | 1.00             | 1.13          | 49.6 |
| North: CASTLEREAGH ROAD         |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 7                               | L2   | 117         | 0.0   | 117         | 0.0   | 0.593     | 5.0           | LOS A            | 2.1                 | 14.7         | 0.68                | 0.48             | 0.69          | 54.6 |
| 8                               | T1   | 1327        | 0.0   | 1327        | 0.0   | 0.593     | 4.8           | LOS A            | 2.1                 | 14.8         | 0.69                | 0.52             | 0.71          | 49.3 |
| 9                               | R2   | 17          | 0.0   | 17          | 0.0   | 0.593     | 12.6          | LOS B            | 2.1                 | 14.8         | 0.70                | 0.56             | 0.74          | 57.9 |
| Approach                        |      | 1461        | 0.0   | 1461        | 0.0   | 0.593     | 4.9           | LOS A            | 2.1                 | 14.8         | 0.69                | 0.52             | 0.71          | 50.1 |
| West: OLD CASTLEREAGH ROAD      |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 10                              | L2   | 15          | 0.0   | 15          | 0.0   | 0.017     | 5.2           | LOS A            | 0.0                 | 0.2          | 0.58                | 0.58             | 0.58          | 55.5 |
| 11                              | T1   | 15          | 0.0   | 15          | 0.0   | 0.019     | 3.9           | LOS A            | 0.0                 | 0.3          | 0.57                | 0.51             | 0.57          | 56.2 |
| 12                              | R2   | 7           | 0.0   | 7           | 0.0   | 0.019     | 11.3          | LOS B            | 0.0                 | 0.3          | 0.57                | 0.51             | 0.57          | 48.7 |
| Approach                        |      | 37          | 0.0   | 37          | 0.0   | 0.019     | 5.9           | LOS A            | 0.0                 | 0.3          | 0.57                | 0.54             | 0.57          | 54.9 |
| All Vehicles                    |      | 3260        | 0.0   | 3260        | 0.0   | 0.701     | 6.0           | LOS A            | 2.4                 | 16.5         | 0.62                | 0.61             | 0.69          | 52.9 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

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 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: 2 [EX PM OLD CASTLEREAGH - CASTLEREAGH - ANDREWS 2020]

 Network: N101 [EX PM 2020]

CASTLEREAGH - CASTLEREAGH - ANDREWS  
Site Category: PENRITH LAKES  
Roundabout

| Movement Performance - Vehicles |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
|---------------------------------|------|-------------|-------|-------------|-------|-----------|---------------|------------------|---------------------|--------------|---------------------|------------------|---------------|------|
| Mov ID                          | Turn | Demand      | Flows | Arrival     | Flows | Deg. Satn | Average Delay | Level of Service | Aver. Back of Queue | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |      |
|                                 |      | Total veh/h | HV %  | Total veh/h | HV %  | v/c       | sec           |                  | Vehicles veh        | Distance m   |                     |                  | km/h          |      |
| South: CASTLEREAGH ROAD         |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 1                               | L2   | 1           | 0.0   | 1           | 0.0   | 0.496     | 3.4           | LOS A            | 1.4                 | 9.6          | 0.31                | 0.29             | 0.31          | 56.6 |
| 2                               | T1   | 940         | 0.0   | 940         | 0.0   | 0.496     | 2.8           | LOS A            | 1.4                 | 9.6          | 0.31                | 0.34             | 0.31          | 58.5 |
| 3                               | R2   | 504         | 0.0   | 504         | 0.0   | 0.496     | 10.3          | LOS B            | 1.3                 | 9.2          | 0.33                | 0.57             | 0.33          | 56.3 |
| Approach                        |      | 1445        | 0.0   | 1445        | 0.0   | 0.496     | 5.4           | LOS A            | 1.4                 | 9.6          | 0.32                | 0.42             | 0.32          | 57.7 |
| East: ANDREWS ROAD              |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 4                               | L2   | 487         | 0.0   | 487         | 0.0   | 0.417     | 4.5           | LOS A            | 1.0                 | 6.7          | 0.65                | 0.56             | 0.66          | 50.2 |
| 5                               | T1   | 31          | 0.0   | 31          | 0.0   | 0.169     | 4.5           | LOS A            | 0.3                 | 2.1          | 0.59                | 0.74             | 0.59          | 54.2 |
| 6                               | R2   | 103         | 0.0   | 103         | 0.0   | 0.169     | 11.8          | LOS B            | 0.3                 | 2.1          | 0.59                | 0.74             | 0.59          | 55.3 |
| Approach                        |      | 621         | 0.0   | 621         | 0.0   | 0.417     | 5.7           | LOS A            | 1.0                 | 6.7          | 0.64                | 0.60             | 0.64          | 51.8 |
| North: CASTLEREAGH ROAD         |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 7                               | L2   | 101         | 0.0   | 101         | 0.0   | 0.361     | 5.7           | LOS A            | 1.2                 | 8.4          | 0.70                | 0.55             | 0.70          | 54.5 |
| 8                               | T1   | 679         | 0.0   | 679         | 0.0   | 0.361     | 5.4           | LOS A            | 1.2                 | 8.4          | 0.70                | 0.57             | 0.70          | 49.2 |
| 9                               | R2   | 9           | 0.0   | 9           | 0.0   | 0.361     | 13.0          | LOS B            | 1.1                 | 7.6          | 0.70                | 0.59             | 0.70          | 57.9 |
| Approach                        |      | 789         | 0.0   | 789         | 0.0   | 0.361     | 5.5           | LOS A            | 1.2                 | 8.4          | 0.70                | 0.57             | 0.70          | 50.4 |
| West: OLD CASTLEREAGH ROAD      |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 10                              | L2   | 44          | 0.0   | 44          | 0.0   | 0.059     | 6.8           | LOS A            | 0.1                 | 0.9          | 0.72                | 0.69             | 0.72          | 54.7 |
| 11                              | T1   | 49          | 0.0   | 49          | 0.0   | 0.061     | 5.3           | LOS A            | 0.2                 | 1.1          | 0.73                | 0.59             | 0.73          | 55.6 |
| 12                              | R2   | 15          | 0.0   | 15          | 0.0   | 0.061     | 12.6          | LOS B            | 0.2                 | 1.1          | 0.73                | 0.59             | 0.73          | 47.8 |
| Approach                        |      | 108         | 0.0   | 108         | 0.0   | 0.061     | 6.9           | LOS A            | 0.2                 | 1.1          | 0.73                | 0.63             | 0.73          | 54.5 |
| All Vehicles                    |      | 2964        | 0.0   | 2964        | 0.0   | 0.496     | 5.6           | LOS A            | 1.4                 | 9.6          | 0.50                | 0.50             | 0.50          | 55.0 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

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 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: 1 [EX AM LUGARD - CASTLEREAGH 2023]

 Network: N101 [EX AM 2023]

18210 - PENRITH LAKES, PENRITH

Site Category: PENRITH LAKES

Signals - Fixed Time Isolated Cycle Time = 140 seconds (Site User-Given Phase Times)

| Movement Performance - Vehicles |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
|---------------------------------|------|--------------|------|---------------|------|-----------|---------------|------------------|---------------------|--------------|---------------------|------------------|---------------|------|
| Mov ID                          | Turn | Demand Flows |      | Arrival Flows |      | Deg. Satn | Average Delay | Level of Service | Aver. Back of Queue | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |      |
|                                 |      | Total veh/h  | HV % | Total veh/h   | HV % | v/c       | sec           |                  | Vehicles veh        | Distance m   |                     |                  | km/h          |      |
| South: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 1                               | L2   | 54           | 0.0  | 54            | 0.0  | 0.508     | 31.5          | LOS C            | 13.4                | 93.6         | 0.73                | 0.68             | 0.86          | 37.1 |
| 2                               | T1   | 920          | 0.0  | 920           | 0.0  | 0.508     | 25.6          | LOS B            | 13.6                | 94.9         | 0.73                | 0.66             | 0.79          | 30.0 |
| Approach                        |      | 974          | 0.0  | 974           | 0.0  | 0.508     | 26.0          | LOS B            | 13.6                | 94.9         | 0.73                | 0.66             | 0.79          | 30.6 |
| North: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 8                               | T1   | 1919         | 0.0  | 1919          | 0.0  | 0.786     | 15.8          | LOS B            | 29.3                | 205.4        | 0.71                | 0.66             | 0.71          | 46.3 |
| 9                               | R2   | 74           | 0.0  | 74            | 0.0  | 0.178     | 18.2          | LOS B            | 1.1                 | 7.9          | 0.60                | 0.70             | 0.60          | 42.5 |
| Approach                        |      | 1993         | 0.0  | 1993          | 0.0  | 0.786     | 15.9          | LOS B            | 29.3                | 205.4        | 0.71                | 0.67             | 0.71          | 46.2 |
| West: LUGARD STREET             |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 10                              | L2   | 29           | 0.0  | 29            | 0.0  | 0.097     | 44.6          | LOS D            | 1.5                 | 10.6         | 0.77                | 0.73             | 0.77          | 19.0 |
| 12                              | R2   | 65           | 0.0  | 65            | 0.0  | 0.097     | 47.7          | LOS D            | 1.5                 | 10.6         | 0.80                | 0.73             | 0.80          | 28.8 |
| Approach                        |      | 94           | 0.0  | 94            | 0.0  | 0.097     | 46.8          | LOS D            | 1.5                 | 10.6         | 0.79                | 0.73             | 0.79          | 26.5 |
| All Vehicles                    |      | 3061         | 0.0  | 3061          | 0.0  | 0.786     | 20.1          | LOS B            | 29.3                | 205.4        | 0.72                | 0.67             | 0.74          | 41.3 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

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

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

| Movement Performance - Pedestrians |                     |             |               |                  |                       |              |                     |      |
|------------------------------------|---------------------|-------------|---------------|------------------|-----------------------|--------------|---------------------|------|
| Mov ID                             | Description         | Demand Flow | Average Delay | Level of Service | Average Back of Queue | Prop. Queued | Effective Stop Rate |      |
|                                    |                     | ped/h       | sec           |                  | Pedestrian ped        | Distance m   |                     |      |
| P3                                 | North Full Crossing | 53          | 64.3          | LOS F            | 0.2                   | 0.2          | 0.96                | 0.96 |
| P4                                 | West Full Crossing  | 53          | 64.3          | LOS F            | 0.2                   | 0.2          | 0.96                | 0.96 |
| All Pedestrians                    |                     | 105         | 64.3          | LOS F            |                       |              | 0.96                | 0.96 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Project: T:\WORK18\18210 - PENRITH LAKES, PENRITH\MODELLING\18210 - PENRITH LAKES, PENRITH 29JAN20.sip8

# MOVEMENT SUMMARY

 Site: 1 [EX PM LUGARD - CASTLEREAGH 2023]

 Network: N101 [EX PM 2023]

18210 - PENRITH LAKES, PENRITH

Site Category: PENRITH LAKES

Signals - Fixed Time Isolated Cycle Time = 140 seconds (Site User-Given Phase Times)

| Movement Performance - Vehicles |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
|---------------------------------|------|--------------|------|---------------|------|-----------|---------------|------------------|---------------------|--------------|---------------------|------------------|---------------|------|
| Mov ID                          | Turn | Demand Flows |      | Arrival Flows |      | Deg. Satn | Average Delay | Level of Service | Aver. Back of Queue | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |      |
|                                 |      | Total veh/h  | HV % | Total veh/h   | HV % | v/c       | sec           |                  | Vehicles veh        | Distance m   |                     |                  | km/h          |      |
| South: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 1                               | L2   | 63           | 0.0  | 63            | 0.0  | 0.804     | 37.0          | LOS C            | 27.1                | 189.6        | 0.90                | 0.84             | 1.05          | 34.6 |
| 2                               | T1   | 1526         | 0.0  | 1526          | 0.0  | 0.804     | 30.9          | LOS C            | 27.2                | 190.7        | 0.90                | 0.83             | 0.97          | 27.3 |
| Approach                        |      | 1589         | 0.0  | 1589          | 0.0  | 0.804     | 31.2          | LOS C            | 27.2                | 190.7        | 0.90                | 0.84             | 0.98          | 27.7 |
| North: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 8                               | T1   | 1326         | 0.0  | 1326          | 0.0  | 0.487     | 9.5           | LOS A            | 12.2                | 85.7         | 0.48                | 0.44             | 0.48          | 50.9 |
| 9                               | R2   | 74           | 0.0  | 74            | 0.0  | 0.231     | 25.0          | LOS B            | 1.3                 | 9.3          | 0.76                | 0.74             | 0.76          | 38.7 |
| Approach                        |      | 1399         | 0.0  | 1399          | 0.0  | 0.487     | 10.4          | LOS A            | 12.2                | 85.7         | 0.50                | 0.46             | 0.50          | 50.2 |
| West: LUGARD STREET             |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 10                              | L2   | 78           | 0.0  | 78            | 0.0  | 0.193     | 45.1          | LOS D            | 3.2                 | 22.2         | 0.79                | 0.76             | 0.79          | 18.9 |
| 12                              | R2   | 98           | 0.0  | 98            | 0.0  | 0.193     | 52.4          | LOS D            | 3.2                 | 22.2         | 0.85                | 0.76             | 0.85          | 27.4 |
| Approach                        |      | 176          | 0.0  | 176           | 0.0  | 0.193     | 49.2          | LOS D            | 3.2                 | 22.2         | 0.82                | 0.76             | 0.82          | 24.5 |
| All Vehicles                    |      | 3164         | 0.0  | 3164          | 0.0  | 0.804     | 23.0          | LOS B            | 27.2                | 190.7        | 0.72                | 0.66             | 0.75          | 37.7 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

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

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

| Movement Performance - Pedestrians |                     |             |               |                  |                       |              |                     |      |
|------------------------------------|---------------------|-------------|---------------|------------------|-----------------------|--------------|---------------------|------|
| Mov ID                             | Description         | Demand Flow | Average Delay | Level of Service | Average Back of Queue | Prop. Queued | Effective Stop Rate |      |
|                                    |                     | ped/h       | sec           |                  | Pedestrian ped        | Distance m   |                     |      |
| P3                                 | North Full Crossing | 53          | 64.3          | LOS F            | 0.2                   | 0.2          | 0.96                | 0.96 |
| P4                                 | West Full Crossing  | 53          | 64.3          | LOS F            | 0.2                   | 0.2          | 0.96                | 0.96 |
| All Pedestrians                    |                     | 105         | 64.3          | LOS F            |                       |              | 0.96                | 0.96 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Project: T:\WORK18\18210 - PENRITH LAKES, PENRITH\MODELLING\18210 - PENRITH LAKES, PENRITH 29JAN20.sip8

# MOVEMENT SUMMARY

 Site: 2 [EX AM OLD CASTLEREAGH - CASTLEREAGH - ANDREWS 2023]

 Network: N101 [EX AM 2023]

CASTLEREAGH - CASTLEREAGH - ANDREWS  
Site Category: PENRITH LAKES  
Roundabout

| Movement Performance - Vehicles |      |             |      |             |      |         |       |           |               |                  |                     |              |                     |                  |               |
|---------------------------------|------|-------------|------|-------------|------|---------|-------|-----------|---------------|------------------|---------------------|--------------|---------------------|------------------|---------------|
| Mov ID                          | Turn | Demand      |      | Flows       |      | Arrival | Flows | Deg. Satn | Average Delay | Level of Service | Aver. Back of Queue | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |
|                                 |      | Total veh/h | HV % | Total veh/h | HV % |         |       | v/c       | sec           |                  | Vehicles veh        | Distance m   |                     |                  | km/h          |
| South: CASTLEREAGH ROAD         |      |             |      |             |      |         |       |           |               |                  |                     |              |                     |                  |               |
| 1                               | L2   | 11          | 0.0  | 11          | 0.0  | 0.371   |       | 3.4       | LOS A         |                  | 0.9                 | 6.2          | 0.34                | 0.29             | 56.4          |
| 2                               | T1   | 639         | 0.0  | 639         | 0.0  | 0.371   |       | 2.8       | LOS A         |                  | 0.9                 | 6.2          | 0.34                | 0.34             | 58.3          |
| 3                               | R2   | 385         | 0.0  | 385         | 0.0  | 0.371   |       | 10.3      | LOS A         |                  | 0.8                 | 5.9          | 0.36                | 0.36             | 55.9          |
| Approach                        |      | 1035        | 0.0  | 1035        | 0.0  | 0.371   |       | 5.6       | LOS A         |                  | 0.9                 | 6.2          | 0.35                | 0.43             | 57.4          |
| East: ANDREWS ROAD              |      |             |      |             |      |         |       |           |               |                  |                     |              |                     |                  |               |
| 4                               | L2   | 649         | 0.0  | 649         | 0.0  | 0.770   |       | 10.1      | LOS A         |                  | 2.9                 | 20.3         | 0.94                | 1.12             | 45.4          |
| 5                               | T1   | 59          | 0.0  | 59          | 0.0  | 0.258   |       | 5.7       | LOS A         |                  | 0.5                 | 3.6          | 0.77                | 0.81             | 53.9          |
| 6                               | R2   | 100         | 0.0  | 100         | 0.0  | 0.258   |       | 13.0      | LOS A         |                  | 0.5                 | 3.6          | 0.77                | 0.81             | 55.1          |
| Approach                        |      | 808         | 0.0  | 808         | 0.0  | 0.770   |       | 10.2      | LOS A         |                  | 2.9                 | 20.3         | 0.91                | 1.06             | 48.2          |
| North: CASTLEREAGH ROAD         |      |             |      |             |      |         |       |           |               |                  |                     |              |                     |                  |               |
| 7                               | L2   | 122         | 0.0  | 122         | 0.0  | 0.628   |       | 5.6       | LOS A         |                  | 2.5                 | 17.5         | 0.72                | 0.56             | 54.3          |
| 8                               | T1   | 1388        | 0.0  | 1388        | 0.0  | 0.628   |       | 5.4       | LOS A         |                  | 2.5                 | 17.5         | 0.73                | 0.60             | 48.9          |
| 9                               | R2   | 18          | 0.0  | 18          | 0.0  | 0.628   |       | 13.3      | LOS A         |                  | 2.5                 | 17.4         | 0.74                | 0.65             | 57.6          |
| Approach                        |      | 1528        | 0.0  | 1528        | 0.0  | 0.628   |       | 5.5       | LOS A         |                  | 2.5                 | 17.5         | 0.73                | 0.60             | 49.7          |
| West: OLD CASTLEREAGH ROAD      |      |             |      |             |      |         |       |           |               |                  |                     |              |                     |                  |               |
| 10                              | L2   | 15          | 0.0  | 15          | 0.0  | 0.018   |       | 5.3       | LOS A         |                  | 0.0                 | 0.2          | 0.59                | 0.59             | 55.4          |
| 11                              | T1   | 15          | 0.0  | 15          | 0.0  | 0.020   |       | 4.0       | LOS A         |                  | 0.0                 | 0.3          | 0.59                | 0.52             | 56.1          |
| 12                              | R2   | 8           | 0.0  | 8           | 0.0  | 0.020   |       | 11.4      | LOS A         |                  | 0.0                 | 0.3          | 0.59                | 0.52             | 48.6          |
| Approach                        |      | 39          | 0.0  | 39          | 0.0  | 0.020   |       | 6.0       | LOS A         |                  | 0.0                 | 0.3          | 0.59                | 0.55             | 54.8          |
| All Vehicles                    |      | 3410        | 0.0  | 3410        | 0.0  | 0.770   |       | 6.7       | LOS A         |                  | 2.9                 | 20.3         | 0.66                | 0.66             | 52.4          |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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: 2 [EX PM OLD CASTLEREAGH - CASTLEREAGH - ANDREWS 2023]

 Network: N101 [EX PM 2023]

CASTLEREAGH - CASTLEREAGH - ANDREWS  
Site Category: PENRITH LAKES  
Roundabout

| Movement Performance - Vehicles |      |             |      |             |         |       |           |               |                  |                     |              |                     |                  |               |
|---------------------------------|------|-------------|------|-------------|---------|-------|-----------|---------------|------------------|---------------------|--------------|---------------------|------------------|---------------|
| Mov ID                          | Turn | Demand      |      | Flows       | Arrival | Flows | Deg. Satn | Average Delay | Level of Service | Aver. Back of Queue | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |
|                                 |      | Total veh/h | HV % | Total veh/h | HV %    |       | v/c       | sec           |                  | Vehicles veh        | Distance m   |                     |                  | km/h          |
| South: CASTLEREAGH ROAD         |      |             |      |             |         |       |           |               |                  |                     |              |                     |                  |               |
| 1                               | L2   | 1           | 0.0  | 1           | 0.0     | 0.522 |           | 3.4           | LOS A            | 1.5                 | 10.5         | 0.32                | 0.29             | 56.5          |
| 2                               | T1   | 983         | 0.0  | 983         | 0.0     | 0.522 |           | 2.9           | LOS A            | 1.5                 | 10.5         | 0.32                | 0.34             | 58.4          |
| 3                               | R2   | 527         | 0.0  | 527         | 0.0     | 0.522 |           | 10.4          | LOS A            | 1.4                 | 10.0         | 0.34                | 0.58             | 56.3          |
| Approach                        |      | 1512        | 0.0  | 1512        | 0.0     | 0.522 |           | 5.5           | LOS A            | 1.5                 | 10.5         | 0.33                | 0.42             | 57.6          |
| East: ANDREWS ROAD              |      |             |      |             |         |       |           |               |                  |                     |              |                     |                  |               |
| 4                               | L2   | 510         | 0.0  | 510         | 0.0     | 0.446 |           | 4.7           | LOS A            | 1.1                 | 7.6          | 0.68                | 0.60             | 50.0          |
| 5                               | T1   | 32          | 0.0  | 32          | 0.0     | 0.180 |           | 4.5           | LOS A            | 0.3                 | 2.2          | 0.60                | 0.76             | 54.1          |
| 6                               | R2   | 108         | 0.0  | 108         | 0.0     | 0.180 |           | 11.9          | LOS A            | 0.3                 | 2.2          | 0.60                | 0.76             | 55.3          |
| Approach                        |      | 650         | 0.0  | 650         | 0.0     | 0.446 |           | 5.9           | LOS A            | 1.1                 | 7.6          | 0.66                | 0.63             | 51.7          |
| North: CASTLEREAGH ROAD         |      |             |      |             |         |       |           |               |                  |                     |              |                     |                  |               |
| 7                               | L2   | 106         | 0.0  | 106         | 0.0     | 0.386 |           | 6.1           | LOS A            | 1.3                 | 9.4          | 0.74                | 0.58             | 54.3          |
| 8                               | T1   | 710         | 0.0  | 710         | 0.0     | 0.386 |           | 5.7           | LOS A            | 1.3                 | 9.4          | 0.74                | 0.60             | 48.9          |
| 9                               | R2   | 10          | 0.0  | 10          | 0.0     | 0.386 |           | 13.4          | LOS A            | 1.2                 | 8.5          | 0.74                | 0.62             | 57.6          |
| Approach                        |      | 826         | 0.0  | 826         | 0.0     | 0.386 |           | 5.9           | LOS A            | 1.3                 | 9.4          | 0.74                | 0.60             | 50.1          |
| West: OLD CASTLEREAGH ROAD      |      |             |      |             |         |       |           |               |                  |                     |              |                     |                  |               |
| 10                              | L2   | 46          | 0.0  | 46          | 0.0     | 0.064 |           | 7.2           | LOS A            | 0.1                 | 1.0          | 0.74                | 0.71             | 54.4          |
| 11                              | T1   | 52          | 0.0  | 52          | 0.0     | 0.066 |           | 5.6           | LOS A            | 0.2                 | 1.2          | 0.77                | 0.62             | 55.4          |
| 12                              | R2   | 15          | 0.0  | 15          | 0.0     | 0.066 |           | 12.9          | LOS A            | 0.2                 | 1.2          | 0.77                | 0.62             | 47.5          |
| Approach                        |      | 113         | 0.0  | 113         | 0.0     | 0.066 |           | 7.2           | LOS A            | 0.2                 | 1.2          | 0.76                | 0.65             | 54.3          |
| All Vehicles                    |      | 3101        | 0.0  | 3101        | 0.0     | 0.522 |           | 5.7           | LOS A            | 1.5                 | 10.5         | 0.52                | 0.52             | 54.8          |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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: 1 [DEV AM LUGARD - CASTLEREAGH OPT 1 2020]



Network: N101 [OPT 1 AM 2020]

18210 - PENRITH LAKES, PENRITH

Site Category: PENRITH LAKES

Signals - Fixed Time Isolated Cycle Time = 140 seconds (Site User-Given Phase Times)

| Movement Performance - Vehicles |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
|---------------------------------|------|--------------|------|---------------|------|-----------|---------------|------------------|---------------------|--------------|---------------------|------------------|---------------|------|
| Mov ID                          | Turn | Demand Flows |      | Arrival Flows |      | Deg. Satn | Average Delay | Level of Service | Aver. Back of Queue | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |      |
|                                 |      | Total veh/h  | HV % | Total veh/h   | HV % | v/c       | sec           |                  | Vehicles veh        | Distance m   |                     |                  | km/h          |      |
| South: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 1                               | L2   | 52           | 0.0  | 52            | 0.0  | 0.511     | 31.6          | LOS C            | 13.3                | 95.2         | 0.73                | 0.68             | 0.86          | 37.1 |
| 2                               | T1   | 911          | 3.4  | 911           | 3.4  | 0.511     | 25.7          | LOS B            | 13.4                | 96.6         | 0.73                | 0.66             | 0.79          | 30.0 |
| Approach                        |      | 962          | 3.2  | 962           | 3.2  | 0.511     | 26.0          | LOS B            | 13.4                | 96.6         | 0.73                | 0.66             | 0.79          | 30.5 |
| North: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 8                               | T1   | 1835         | 0.0  | 1835          | 0.0  | 0.752     | 15.1          | LOS B            | 26.8                | 187.3        | 0.68                | 0.63             | 0.68          | 46.8 |
| 9                               | R2   | 71           | 0.0  | 71            | 0.0  | 0.171     | 18.2          | LOS B            | 1.1                 | 7.6          | 0.60                | 0.70             | 0.60          | 42.5 |
| Approach                        |      | 1905         | 0.0  | 1905          | 0.0  | 0.752     | 15.3          | LOS B            | 26.8                | 187.3        | 0.68                | 0.64             | 0.68          | 46.6 |
| West: LUGARD STREET             |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 10                              | L2   | 27           | 0.0  | 27            | 0.0  | 0.092     | 44.5          | LOS D            | 1.4                 | 10.1         | 0.77                | 0.72             | 0.77          | 19.0 |
| 12                              | R2   | 62           | 0.0  | 62            | 0.0  | 0.092     | 47.7          | LOS D            | 1.4                 | 10.1         | 0.79                | 0.73             | 0.79          | 28.8 |
| Approach                        |      | 89           | 0.0  | 89            | 0.0  | 0.092     | 46.7          | LOS D            | 1.4                 | 10.1         | 0.79                | 0.73             | 0.79          | 26.5 |
| All Vehicles                    |      | 2957         | 1.0  | 2957          | 1.0  | 0.752     | 19.7          | LOS B            | 26.8                | 187.3        | 0.70                | 0.65             | 0.72          | 41.5 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

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

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

| Movement Performance - Pedestrians |                     |             |               |                  |                       |              |                     |      |
|------------------------------------|---------------------|-------------|---------------|------------------|-----------------------|--------------|---------------------|------|
| Mov ID                             | Description         | Demand Flow | Average Delay | Level of Service | Average Back of Queue | Prop. Queued | Effective Stop Rate |      |
|                                    |                     | ped/h       | sec           |                  | Pedestrian ped        | Distance m   |                     |      |
| P3                                 | North Full Crossing | 53          | 64.3          | LOS F            | 0.2                   | 0.2          | 0.96                | 0.96 |
| P4                                 | West Full Crossing  | 53          | 64.3          | LOS F            | 0.2                   | 0.2          | 0.96                | 0.96 |
| All Pedestrians                    |                     | 105         | 64.3          | LOS F            |                       |              | 0.96                | 0.96 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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# MOVEMENT SUMMARY

 Site: 1 [DEV PM LUGARD - CASTLEREAGH OPT 1 2020]

 Network: N101 [OPT 1 PM 2020]

18210 - PENRITH LAKES, PENRITH

Site Category: PENRITH LAKES

Signals - Fixed Time Isolated Cycle Time = 140 seconds (Site User-Given Phase Times)

| Movement Performance - Vehicles |      |              |      |               |      |           |               |                  |                     |            |              |                     |                  |               |
|---------------------------------|------|--------------|------|---------------|------|-----------|---------------|------------------|---------------------|------------|--------------|---------------------|------------------|---------------|
| Mov ID                          | Turn | Demand Flows |      | Arrival Flows |      | Deg. Satn | Average Delay | Level of Service | Aver. Back of Queue |            | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |
|                                 |      | Total veh/h  | HV % | Total veh/h   | HV % | v/c       | sec           |                  | Vehicles veh        | Distance m |              |                     |                  | km/h          |
| South: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |            |              |                     |                  |               |
| 1                               | L2   | 60           | 0.0  | 60            | 0.0  | 0.794     | 36.8          | LOS C            | 26.2                | 186.5      | 0.89         | 0.83                | 1.04             | 34.7          |
| 2                               | T1   | 1489         | 2.0  | 1489          | 2.0  | 0.794     | 30.7          | LOS C            | 26.3                | 187.6      | 0.89         | 0.83                | 0.96             | 27.4          |
| Approach                        |      | 1549         | 2.0  | 1549          | 2.0  | 0.794     | 30.9          | LOS C            | 26.3                | 187.6      | 0.89         | 0.83                | 0.97             | 27.8          |
| North: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |            |              |                     |                  |               |
| 8                               | T1   | 1267         | 0.0  | 1267          | 0.0  | 0.460     | 9.3           | LOS A            | 11.2                | 78.5       | 0.47         | 0.43                | 0.47             | 51.1          |
| 9                               | R2   | 71           | 0.0  | 71            | 0.0  | 0.219     | 24.4          | LOS B            | 1.2                 | 8.7        | 0.75         | 0.74                | 0.75             | 38.9          |
| Approach                        |      | 1338         | 0.0  | 1338          | 0.0  | 0.460     | 10.1          | LOS A            | 11.2                | 78.5       | 0.48         | 0.44                | 0.48             | 50.4          |
| West: LUGARD STREET             |      |              |      |               |      |           |               |                  |                     |            |              |                     |                  |               |
| 10                              | L2   | 75           | 0.0  | 75            | 0.0  | 0.184     | 45.0          | LOS D            | 3.0                 | 21.1       | 0.79         | 0.75                | 0.79             | 18.9          |
| 12                              | R2   | 94           | 0.0  | 94            | 0.0  | 0.184     | 52.3          | LOS D            | 3.0                 | 21.1       | 0.85         | 0.75                | 0.85             | 27.5          |
| Approach                        |      | 168          | 0.0  | 168           | 0.0  | 0.184     | 49.1          | LOS D            | 3.0                 | 21.1       | 0.82         | 0.75                | 0.82             | 24.5          |
| All Vehicles                    |      | 3056         | 1.0  | 3056          | 1.0  | 0.794     | 22.8          | LOS B            | 26.3                | 187.6      | 0.71         | 0.66                | 0.75             | 37.7          |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

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

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

| Movement Performance - Pedestrians |                     |             |               |                  |                       |              |                     |      |
|------------------------------------|---------------------|-------------|---------------|------------------|-----------------------|--------------|---------------------|------|
| Mov ID                             | Description         | Demand Flow | Average Delay | Level of Service | Average Back of Queue | Prop. Queued | Effective Stop Rate |      |
|                                    |                     | ped/h       | sec           |                  | Pedestrian ped        | Distance m   |                     |      |
| P3                                 | North Full Crossing | 53          | 64.3          | LOS F            | 0.2                   | 0.2          | 0.96                | 0.96 |
| P4                                 | West Full Crossing  | 53          | 64.3          | LOS F            | 0.2                   | 0.2          | 0.96                | 0.96 |
| All Pedestrians                    |                     | 105         | 64.3          | LOS F            |                       |              | 0.96                | 0.96 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Project: T:\WORK18\18210 - PENRITH LAKES, PENRITH\MODELLING\18210 - PENRITH LAKES, PENRITH 29JAN20.sip8

# MOVEMENT SUMMARY

 Site: 2 [DEV AM OLD CASTLEREAGH - CASTLEREAGH - ANDREWS OPT 1 2020]

 Network: N101 [OPT 1 AM 2020]

CASTLEREAGH - CASTLEREAGH - ANDREWS  
Site Category: PENRITH LAKES  
Roundabout

| Movement Performance - Vehicles |      |             |      |             |      |         |       |           |               |                  |                     |              |                     |                  |               |
|---------------------------------|------|-------------|------|-------------|------|---------|-------|-----------|---------------|------------------|---------------------|--------------|---------------------|------------------|---------------|
| Mov ID                          | Turn | Demand      |      | Flows       |      | Arrival | Flows | Deg. Satn | Average Delay | Level of Service | Aver. Back of Queue | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |
|                                 |      | Total veh/h | HV % | Total veh/h | HV % |         |       | v/c       | sec           |                  | Vehicles veh        | Distance m   |                     |                  | km/h          |
| South: CASTLEREAGH ROAD         |      |             |      |             |      |         |       |           |               |                  |                     |              |                     |                  |               |
| 1                               | L2   | 41          | 74.4 | 41          | 74.4 | 0.368   |       |           | 4.3           | LOS A            | 0.9                 | 6.3          | 0.33                | 0.30             | 52.2          |
| 2                               | T1   | 611         | 0.0  | 611         | 0.0  | 0.368   |       |           | 2.8           | LOS A            | 0.9                 | 6.3          | 0.34                | 0.35             | 58.2          |
| 3                               | R2   | 368         | 0.0  | 368         | 0.0  | 0.368   |       |           | 10.3          | LOS A            | 0.8                 | 5.9          | 0.35                | 0.58             | 56.2          |
| Approach                        |      | 1020        | 3.0  | 1020        | 3.0  | 0.368   |       |           | 5.6           | LOS A            | 0.9                 | 6.3          | 0.34                | 0.43             | 57.3          |
| East: ANDREWS ROAD              |      |             |      |             |      |         |       |           |               |                  |                     |              |                     |                  |               |
| 4                               | L2   | 620         | 0.0  | 620         | 0.0  | 0.701   |       |           | 8.5           | LOS A            | 2.4                 | 16.6         | 0.90                | 1.05             | 47.3          |
| 5                               | T1   | 57          | 0.0  | 57          | 0.0  | 0.238   |       |           | 5.5           | LOS A            | 0.5                 | 3.2          | 0.75                | 0.80             | 45.9          |
| 6                               | R2   | 96          | 0.0  | 96          | 0.0  | 0.238   |       |           | 12.9          | LOS A            | 0.5                 | 3.2          | 0.75                | 0.80             | 55.2          |
| Approach                        |      | 773         | 0.0  | 773         | 0.0  | 0.701   |       |           | 8.8           | LOS A            | 2.4                 | 16.6         | 0.87                | 1.00             | 48.8          |
| North: CASTLEREAGH ROAD         |      |             |      |             |      |         |       |           |               |                  |                     |              |                     |                  |               |
| 7                               | L2   | 117         | 0.0  | 117         | 0.0  | 0.593   |       |           | 5.0           | LOS A            | 2.1                 | 14.7         | 0.68                | 0.48             | 54.6          |
| 8                               | T1   | 1327        | 0.0  | 1327        | 0.0  | 0.593   |       |           | 4.8           | LOS A            | 2.1                 | 14.8         | 0.69                | 0.52             | 49.3          |
| 9                               | R2   | 17          | 0.0  | 17          | 0.0  | 0.593   |       |           | 12.6          | LOS A            | 2.1                 | 14.8         | 0.70                | 0.56             | 49.1          |
| Approach                        |      | 1461        | 0.0  | 1461        | 0.0  | 0.593   |       |           | 4.9           | LOS A            | 2.1                 | 14.8         | 0.69                | 0.52             | 49.9          |
| West: OLD CASTLEREAGH ROAD      |      |             |      |             |      |         |       |           |               |                  |                     |              |                     |                  |               |
| 10                              | L2   | 45          | 67.4 | 45          | 67.4 | 0.059   |       |           | 6.1           | LOS A            | 0.1                 | 1.1          | 0.60                | 0.65             | 54.3          |
| 11                              | T1   | 15          | 0.0  | 15          | 0.0  | 0.026   |       |           | 4.7           | LOS A            | 0.0                 | 0.3          | 0.59                | 0.58             | 55.9          |
| 12                              | R2   | 7           | 0.0  | 7           | 0.0  | 0.026   |       |           | 12.1          | LOS A            | 0.0                 | 0.3          | 0.59                | 0.58             | 48.3          |
| Approach                        |      | 67          | 45.3 | 67          | 45.3 | 0.059   |       |           | 6.4           | LOS A            | 0.1                 | 1.1          | 0.60                | 0.63             | 54.3          |
| All Vehicles                    |      | 3321        | 1.8  | 3321        | 1.8  | 0.701   |       |           | 6.1           | LOS A            | 2.4                 | 16.6         | 0.62                | 0.61             | 52.7          |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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: 2 [DEV PM OLD CASTLEREAGH - CASTLEREAGH - ANDREWS OPT 1 2020]

 Network: N101 [OPT 1 PM 2020]

CASTLEREAGH - CASTLEREAGH - ANDREWS  
Site Category: PENRITH LAKES  
Roundabout

| Movement Performance - Vehicles |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
|---------------------------------|------|-------------|-------|-------------|-------|-----------|---------------|------------------|---------------------|--------------|---------------------|------------------|---------------|------|
| Mov ID                          | Turn | Demand      | Flows | Arrival     | Flows | Deg. Satn | Average Delay | Level of Service | Aver. Back of Queue | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |      |
|                                 |      | Total veh/h | HV %  | Total veh/h | HV %  | v/c       | sec           |                  | Vehicles veh        | Distance m   |                     |                  | km/h          |      |
| South: CASTLEREAGH ROAD         |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 1                               | L2   | 32          | 96.7  | 32          | 96.7  | 0.512     | 4.6           | LOS A            | 1.4                 | 10.4         | 0.31                | 0.29             | 0.31          | 52.5 |
| 2                               | T1   | 940         | 0.0   | 940         | 0.0   | 0.512     | 2.8           | LOS A            | 1.4                 | 10.4         | 0.32                | 0.35             | 0.32          | 58.4 |
| 3                               | R2   | 504         | 0.0   | 504         | 0.0   | 0.512     | 10.3          | LOS A            | 1.4                 | 9.7          | 0.33                | 0.57             | 0.33          | 56.5 |
| Approach                        |      | 1476        | 2.1   | 1476        | 2.1   | 0.512     | 5.4           | LOS A            | 1.4                 | 10.4         | 0.32                | 0.42             | 0.32          | 57.6 |
| East: ANDREWS ROAD              |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 4                               | L2   | 487         | 0.0   | 487         | 0.0   | 0.418     | 4.5           | LOS A            | 1.0                 | 6.7          | 0.65                | 0.57             | 0.66          | 50.2 |
| 5                               | T1   | 31          | 0.0   | 31          | 0.0   | 0.169     | 4.5           | LOS A            | 0.3                 | 2.1          | 0.59                | 0.74             | 0.59          | 46.2 |
| 6                               | R2   | 103         | 0.0   | 103         | 0.0   | 0.169     | 11.8          | LOS A            | 0.3                 | 2.1          | 0.59                | 0.74             | 0.59          | 55.3 |
| Approach                        |      | 621         | 0.0   | 621         | 0.0   | 0.418     | 5.7           | LOS A            | 1.0                 | 6.7          | 0.64                | 0.60             | 0.64          | 51.4 |
| North: CASTLEREAGH ROAD         |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 7                               | L2   | 101         | 0.0   | 101         | 0.0   | 0.361     | 5.8           | LOS A            | 1.2                 | 8.4          | 0.71                | 0.55             | 0.71          | 54.5 |
| 8                               | T1   | 679         | 0.0   | 679         | 0.0   | 0.361     | 5.4           | LOS A            | 1.2                 | 8.4          | 0.71                | 0.57             | 0.71          | 49.2 |
| 9                               | R2   | 9           | 0.0   | 9           | 0.0   | 0.361     | 13.0          | LOS A            | 1.1                 | 7.7          | 0.71                | 0.59             | 0.71          | 49.0 |
| Approach                        |      | 789         | 0.0   | 789         | 0.0   | 0.361     | 5.5           | LOS A            | 1.2                 | 8.4          | 0.71                | 0.57             | 0.71          | 50.2 |
| West: OLD CASTLEREAGH ROAD      |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 10                              | L2   | 75          | 40.8  | 75          | 40.8  | 0.091     | 7.0           | LOS A            | 0.2                 | 2.0          | 0.74                | 0.71             | 0.74          | 54.1 |
| 11                              | T1   | 49          | 0.0   | 49          | 0.0   | 0.088     | 6.5           | LOS A            | 0.2                 | 1.4          | 0.73                | 0.71             | 0.73          | 55.4 |
| 12                              | R2   | 15          | 0.0   | 15          | 0.0   | 0.088     | 13.9          | LOS A            | 0.2                 | 1.4          | 0.73                | 0.71             | 0.73          | 47.5 |
| Approach                        |      | 139         | 22.0  | 139         | 22.0  | 0.091     | 7.5           | LOS A            | 0.2                 | 2.0          | 0.74                | 0.71             | 0.74          | 54.1 |
| All Vehicles                    |      | 3025        | 2.0   | 3025        | 2.0   | 0.512     | 5.6           | LOS A            | 1.4                 | 10.4         | 0.50                | 0.51             | 0.51          | 54.8 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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: 3 [DEV AM OLD CASTLEREAGH ROAD ACCESS OPT 1 2020] Network: N101 [OPT 1 AM 2020]

OLD CASTLEREAGH ROAD ACCESS  
Site Category: PENRITH LAKES  
Giveaway / Yield (Two-Way)

| Movement Performance - Vehicles |      |        |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
|---------------------------------|------|--------|-------|-------------|-------|-----------|---------------|------------------|---------------------|--------------|---------------------|------------------|---------------|------|
| Mov ID                          | Turn | Demand | Flows | Arrival     | Flows | Deg. Satn | Average Delay | Level of Service | Aver. Back of Queue | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |      |
|                                 |      | veh/h  | HV %  | Total veh/h | HV %  | v/c       | sec           |                  | Vehicles veh        | Distance m   |                     |                  | km/h          |      |
| South: ACCESS                   |      |        |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 3                               | R2   | 31     | 100.0 | 31          | 100.0 | 0.043     | 6.2           | LOS A            | 0.1                 | 0.7          | 0.28                | 0.57             | 0.28          | 29.0 |
| Approach                        |      | 31     | 100.0 | 31          | 100.0 | 0.043     | 6.2           | LOS A            | 0.1                 | 0.7          | 0.28                | 0.57             | 0.28          | 29.0 |
| East: OLD CASTLEREAGH ROAD      |      |        |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 4                               | L2   | 31     | 100.0 | 31          | 100.0 | 0.057     | 7.9           | LOS A            | 0.0                 | 0.0          | 0.00                | 0.33             | 0.00          | 60.9 |
| 5                               | T1   | 56     | 0.0   | 56          | 0.0   | 0.057     | 0.0           | LOS A            | 0.0                 | 0.0          | 0.00                | 0.33             | 0.00          | 75.9 |
| Approach                        |      | 86     | 35.4  | 86          | 35.4  | 0.057     | 4.1           | NA               | 0.0                 | 0.0          | 0.00                | 0.33             | 0.00          | 71.5 |
| West: OLD CASTLEREAGH ROAD      |      |        |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 11                              | T1   | 76     | 0.0   | 76          | 0.0   | 0.039     | 0.0           | LOS A            | 0.0                 | 0.0          | 0.00                | 0.00             | 0.00          | 80.0 |
| Approach                        |      | 76     | 0.0   | 76          | 0.0   | 0.039     | 0.0           | NA               | 0.0                 | 0.0          | 0.00                | 0.00             | 0.00          | 80.0 |
| All Vehicles                    |      | 193    | 31.7  | 193         | 31.7  | 0.057     | 2.2           | NA               | 0.1                 | 0.7          | 0.04                | 0.24             | 0.04          | 71.0 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

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

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

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

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

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

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# MOVEMENT SUMMARY

Site: 3 [DEV PM OLD CASTLEREAGH ROAD ACCESS OPT 1 2020] Network: N101 [OPT 1 PM 2020]

OLD CASTLEREAGH ROAD ACCESS  
Site Category: PENRITH LAKES  
Giveaway / Yield (Two-Way)

| Movement Performance - Vehicles |      |        |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
|---------------------------------|------|--------|-------|-------------|-------|-----------|---------------|------------------|---------------------|--------------|---------------------|------------------|---------------|------|
| Mov ID                          | Turn | Demand | Flows | Arrival     | Flows | Deg. Satn | Average Delay | Level of Service | Aver. Back of Queue | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |      |
|                                 |      | veh/h  | HV %  | Total veh/h | HV %  | v/c       | sec           |                  | Vehicles veh        | Distance m   |                     |                  | km/h          |      |
| South: ACCESS                   |      |        |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 3                               | R2   | 31     | 100.0 | 31          | 100.0 | 0.039     | 5.6           | LOS A            | 0.1                 | 0.7          | 0.19                | 0.54             | 0.19          | 30.2 |
| Approach                        |      | 31     | 100.0 | 31          | 100.0 | 0.039     | 5.6           | LOS A            | 0.1                 | 0.7          | 0.19                | 0.54             | 0.19          | 30.2 |
| East: OLD CASTLEREAGH ROAD      |      |        |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 4                               | L2   | 31     | 100.0 | 31          | 100.0 | 0.036     | 7.9           | LOS A            | 0.0                 | 0.0          | 0.00                | 0.50             | 0.00          | 57.6 |
| 5                               | T1   | 16     | 0.0   | 16          | 0.0   | 0.036     | 0.0           | LOS A            | 0.0                 | 0.0          | 0.00                | 0.50             | 0.00          | 72.7 |
| Approach                        |      | 46     | 65.9  | 46          | 65.9  | 0.036     | 6.2           | NA               | 0.0                 | 0.0          | 0.00                | 0.50             | 0.00          | 63.7 |
| West: OLD CASTLEREAGH ROAD      |      |        |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 11                              | T1   | 37     | 0.0   | 37          | 0.0   | 0.019     | 0.0           | LOS A            | 0.0                 | 0.0          | 0.00                | 0.00             | 0.00          | 80.0 |
| Approach                        |      | 37     | 0.0   | 37          | 0.0   | 0.019     | 0.0           | NA               | 0.0                 | 0.0          | 0.00                | 0.00             | 0.00          | 80.0 |
| All Vehicles                    |      | 114    | 53.7  | 114         | 53.7  | 0.039     | 3.6           | NA               | 0.1                 | 0.7          | 0.05                | 0.35             | 0.05          | 63.8 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

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

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

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

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

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

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# MOVEMENT SUMMARY



Site: 1 [DEV AM LUGARD - CASTLEREAGH OPT 2 2020]



Network: N101 [OPT 2 AM 2020]

18210 - PENRITH LAKES, PENRITH

Site Category: PENRITH LAKES

Signals - Fixed Time Isolated Cycle Time = 140 seconds (Site User-Given Phase Times)

| Movement Performance - Vehicles |      |              |      |               |      |           |               |                  |                     |          |              |                     |                  |               |
|---------------------------------|------|--------------|------|---------------|------|-----------|---------------|------------------|---------------------|----------|--------------|---------------------|------------------|---------------|
| Mov ID                          | Turn | Demand Flows |      | Arrival Flows |      | Deg. Satn | Average Delay | Level of Service | Aver. Back of Queue | Distance | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |
|                                 |      | Total veh/h  | HV % | Total veh/h   | HV % | v/c       | sec           |                  | veh                 | m        |              |                     |                  | km/h          |
| South: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |          |              |                     |                  |               |
| 1                               | L2   | 52           | 0.0  | 52            | 0.0  | 0.485     | 31.1          | LOS C            | 12.6                | 88.1     | 0.72         | 0.67                | 0.84             | 37.3          |
| 2                               | T1   | 880          | 0.0  | 880           | 0.0  | 0.485     | 25.3          | LOS B            | 12.8                | 89.4     | 0.72         | 0.65                | 0.78             | 30.3          |
| Approach                        |      | 932          | 0.0  | 932           | 0.0  | 0.485     | 25.6          | LOS B            | 12.8                | 89.4     | 0.72         | 0.65                | 0.78             | 30.8          |
| North: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |          |              |                     |                  |               |
| 8                               | T1   | 1835         | 0.0  | 1835          | 0.0  | 0.786     | 15.4          | LOS B            | 29.3                | 204.9    | 0.69         | 0.64                | 0.69             | 46.6          |
| 9                               | R2   | 101          | 30.2 | 101           | 30.2 | 0.289     | 19.1          | LOS B            | 1.6                 | 14.3     | 0.62         | 0.72                | 0.62             | 41.2          |
| Approach                        |      | 1936         | 1.6  | 1936          | 1.6  | 0.786     | 15.6          | LOS B            | 29.3                | 204.9    | 0.69         | 0.65                | 0.69             | 46.3          |
| West: LUGARD STREET             |      |              |      |               |      |           |               |                  |                     |          |              |                     |                  |               |
| 10                              | L2   | 27           | 0.0  | 27            | 0.0  | 0.150     | 47.0          | LOS D            | 2.1                 | 16.8     | 0.80         | 0.74                | 0.80             | 18.3          |
| 12                              | R2   | 93           | 33.0 | 93            | 33.0 | 0.150     | 49.3          | LOS D            | 2.1                 | 16.8     | 0.81         | 0.74                | 0.81             | 27.9          |
| Approach                        |      | 120          | 25.4 | 120           | 25.4 | 0.150     | 48.8          | LOS D            | 2.1                 | 16.8     | 0.81         | 0.74                | 0.81             | 26.3          |
| All Vehicles                    |      | 2987         | 2.0  | 2987          | 2.0  | 0.786     | 20.0          | LOS B            | 29.3                | 204.9    | 0.70         | 0.65                | 0.72             | 41.3          |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

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

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

| Movement Performance - Pedestrians |                     |             |               |                  |                       |          |              |                     |
|------------------------------------|---------------------|-------------|---------------|------------------|-----------------------|----------|--------------|---------------------|
| Mov ID                             | Description         | Demand Flow | Average Delay | Level of Service | Average Back of Queue | Distance | Prop. Queued | Effective Stop Rate |
|                                    |                     | ped/h       | sec           |                  | ped                   | m        |              |                     |
| P3                                 | North Full Crossing | 53          | 64.3          | LOS F            | 0.2                   | 0.2      | 0.96         | 0.96                |
| P4                                 | West Full Crossing  | 53          | 64.3          | LOS F            | 0.2                   | 0.2      | 0.96         | 0.96                |
| All Pedestrians                    |                     | 105         | 64.3          | LOS F            |                       |          | 0.96         | 0.96                |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Project: T:\WORK18\18210 - PENRITH LAKES, PENRITH\MODELLING\18210 - PENRITH LAKES, PENRITH 29JAN20.sip8

# MOVEMENT SUMMARY



Site: 1 [DEV PM LUGARD - CASTLEREAGH OPT 2 2020]



Network: N101 [OPT 2 PM 2020]

18210 - PENRITH LAKES, PENRITH

Site Category: PENRITH LAKES

Signals - Fixed Time Isolated Cycle Time = 140 seconds (Site User-Given Phase Times)

| Movement Performance - Vehicles |      |              |      |               |      |           |               |                  |                     |          |              |                     |                  |               |
|---------------------------------|------|--------------|------|---------------|------|-----------|---------------|------------------|---------------------|----------|--------------|---------------------|------------------|---------------|
| Mov ID                          | Turn | Demand Flows |      | Arrival Flows |      | Deg. Satn | Average Delay | Level of Service | Aver. Back of Queue | Distance | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |
|                                 |      | Total veh/h  | HV % | Total veh/h   | HV % | v/c       | sec           |                  | veh                 | m        |              |                     |                  | km/h          |
| South: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |          |              |                     |                  |               |
| 1                               | L2   | 60           | 0.0  | 60            | 0.0  | 0.769     | 36.1          | LOS C            | 25.1                | 175.9    | 0.87         | 0.82                | 1.02             | 35.0          |
| 2                               | T1   | 1459         | 0.0  | 1459          | 0.0  | 0.769     | 30.0          | LOS C            | 25.3                | 176.9    | 0.87         | 0.81                | 0.95             | 27.7          |
| Approach                        |      | 1519         | 0.0  | 1519          | 0.0  | 0.769     | 30.3          | LOS C            | 25.3                | 176.9    | 0.87         | 0.81                | 0.95             | 28.1          |
| North: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |          |              |                     |                  |               |
| 8                               | T1   | 1267         | 0.0  | 1267          | 0.0  | 0.460     | 9.3           | LOS A            | 11.2                | 78.5     | 0.47         | 0.43                | 0.47             | 51.1          |
| 9                               | R2   | 71           | 0.0  | 71            | 0.0  | 0.215     | 23.6          | LOS B            | 1.2                 | 8.4      | 0.73         | 0.73                | 0.73             | 39.4          |
| Approach                        |      | 1338         | 0.0  | 1338          | 0.0  | 0.460     | 10.1          | LOS A            | 11.2                | 78.5     | 0.48         | 0.44                | 0.48             | 50.4          |
| West: LUGARD STREET             |      |              |      |               |      |           |               |                  |                     |          |              |                     |                  |               |
| 10                              | L2   | 75           | 0.0  | 75            | 0.0  | 0.184     | 45.0          | LOS D            | 3.0                 | 21.1     | 0.79         | 0.75                | 0.79             | 18.9          |
| 12                              | R2   | 94           | 0.0  | 94            | 0.0  | 0.184     | 52.3          | LOS D            | 3.0                 | 21.1     | 0.85         | 0.75                | 0.85             | 27.5          |
| Approach                        |      | 168          | 0.0  | 168           | 0.0  | 0.184     | 49.1          | LOS D            | 3.0                 | 21.1     | 0.82         | 0.75                | 0.82             | 24.5          |
| All Vehicles                    |      | 3025         | 0.0  | 3025          | 0.0  | 0.769     | 22.4          | LOS B            | 25.3                | 176.9    | 0.70         | 0.64                | 0.74             | 38.0          |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

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

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

| Movement Performance - Pedestrians |                     |             |               |                  |                       |          |              |                     |
|------------------------------------|---------------------|-------------|---------------|------------------|-----------------------|----------|--------------|---------------------|
| Mov ID                             | Description         | Demand Flow | Average Delay | Level of Service | Average Back of Queue | Distance | Prop. Queued | Effective Stop Rate |
|                                    |                     | ped/h       | sec           |                  | ped                   | m        |              |                     |
| P3                                 | North Full Crossing | 53          | 64.3          | LOS F            | 0.2                   | 0.2      | 0.96         | 0.96                |
| P4                                 | West Full Crossing  | 53          | 64.3          | LOS F            | 0.2                   | 0.2      | 0.96         | 0.96                |
| All Pedestrians                    |                     | 105         | 64.3          | LOS F            |                       |          | 0.96         | 0.96                |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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# MOVEMENT SUMMARY

 Site: 2 [DEV AM OLD CASTLEREAGH - CASTLEREAGH - ANDREWS OPT 2 2020]

 Network: N101 [OPT 2 AM 2020]

CASTLEREAGH - CASTLEREAGH - ANDREWS  
Site Category: PENRITH LAKES  
Roundabout

| Movement Performance - Vehicles |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
|---------------------------------|------|-------------|-------|-------------|-------|-----------|---------------|------------------|---------------------|--------------|---------------------|------------------|---------------|------|
| Mov ID                          | Turn | Demand      | Flows | Arrival     | Flows | Deg. Satn | Average Delay | Level of Service | Aver. Back of Queue | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |      |
|                                 |      | Total veh/h | HV %  | Total veh/h | HV %  | v/c       | sec           |                  | Vehicles veh        | Distance m   |                     |                  | km/h          |      |
| South: CASTLEREAGH ROAD         |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 1                               | L2   | 11          | 0.0   | 11          | 0.0   | 0.352     | 3.4           | LOS A            | 0.8                 | 5.7          | 0.33                | 0.29             | 0.33          | 56.5 |
| 2                               | T1   | 611         | 0.0   | 611         | 0.0   | 0.352     | 2.8           | LOS A            | 0.8                 | 5.7          | 0.33                | 0.33             | 0.33          | 58.4 |
| 3                               | R2   | 368         | 0.0   | 368         | 0.0   | 0.352     | 10.3          | LOS A            | 0.8                 | 5.5          | 0.34                | 0.59             | 0.34          | 56.0 |
| Approach                        |      | 989         | 0.0   | 989         | 0.0   | 0.352     | 5.6           | LOS A            | 0.8                 | 5.7          | 0.33                | 0.43             | 0.33          | 57.4 |
| East: ANDREWS ROAD              |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 4                               | L2   | 636         | 2.5   | 636         | 2.5   | 0.741     | 9.4           | LOS A            | 2.6                 | 18.9         | 0.92                | 1.09             | 1.32          | 46.3 |
| 5                               | T1   | 57          | 0.0   | 57          | 0.0   | 0.240     | 5.6           | LOS A            | 0.5                 | 3.3          | 0.76                | 0.80             | 0.76          | 54.0 |
| 6                               | R2   | 96          | 0.0   | 96          | 0.0   | 0.240     | 12.9          | LOS A            | 0.5                 | 3.3          | 0.76                | 0.80             | 0.76          | 55.1 |
| Approach                        |      | 788         | 2.0   | 788         | 2.0   | 0.741     | 9.6           | LOS A            | 2.6                 | 18.9         | 0.89                | 1.03             | 1.21          | 48.8 |
| North: CASTLEREAGH ROAD         |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 7                               | L2   | 117         | 0.0   | 117         | 0.0   | 0.602     | 5.1           | LOS A            | 2.2                 | 15.4         | 0.69                | 0.50             | 0.70          | 54.5 |
| 8                               | T1   | 1342        | 1.1   | 1342        | 1.1   | 0.602     | 4.9           | LOS A            | 2.2                 | 15.5         | 0.70                | 0.54             | 0.73          | 49.2 |
| 9                               | R2   | 17          | 0.0   | 17          | 0.0   | 0.602     | 12.7          | LOS A            | 2.2                 | 15.5         | 0.71                | 0.58             | 0.76          | 57.8 |
| Approach                        |      | 1476        | 1.0   | 1476        | 1.0   | 0.602     | 5.0           | LOS A            | 2.2                 | 15.5         | 0.70                | 0.54             | 0.73          | 50.0 |
| West: OLD CASTLEREAGH ROAD      |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 10                              | L2   | 15          | 0.0   | 15          | 0.0   | 0.017     | 5.2           | LOS A            | 0.0                 | 0.2          | 0.58                | 0.58             | 0.58          | 55.5 |
| 11                              | T1   | 15          | 0.0   | 15          | 0.0   | 0.019     | 3.9           | LOS A            | 0.0                 | 0.3          | 0.57                | 0.51             | 0.57          | 56.2 |
| 12                              | R2   | 7           | 0.0   | 7           | 0.0   | 0.019     | 11.3          | LOS A            | 0.0                 | 0.3          | 0.57                | 0.51             | 0.57          | 48.7 |
| Approach                        |      | 37          | 0.0   | 37          | 0.0   | 0.019     | 5.9           | LOS A            | 0.0                 | 0.3          | 0.57                | 0.54             | 0.57          | 54.9 |
| All Vehicles                    |      | 3291        | 0.9   | 3291        | 0.9   | 0.741     | 6.3           | LOS A            | 2.6                 | 18.9         | 0.63                | 0.62             | 0.72          | 52.7 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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: 2 [DEV PM OLD CASTLEREAGH - CASTLEREAGH - ANDREWS OPT 2 2020]

 Network: N101 [OPT 2 PM 2020]

CASTLEREAGH - CASTLEREAGH - ANDREWS  
Site Category: PENRITH LAKES  
Roundabout

| Movement Performance - Vehicles |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
|---------------------------------|------|--------------|------|---------------|------|-----------|---------------|------------------|---------------------|--------------|---------------------|------------------|---------------|------|
| Mov ID                          | Turn | Demand Flows |      | Arrival Flows |      | Deg. Satn | Average Delay | Level of Service | Aver. Back of Queue | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |      |
|                                 |      | Total veh/h  | HV % | Total veh/h   | HV % | v/c       | sec           |                  | Vehicles veh        | Distance m   |                     |                  |               | km/h |
| South: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 1                               | L2   | 1            | 0.0  | 1             | 0.0  | 0.497     | 3.4           | LOS A            | 1.4                 | 9.6          | 0.31                | 0.29             | 0.31          | 56.6 |
| 2                               | T1   | 940          | 0.0  | 940           | 0.0  | 0.497     | 2.8           | LOS A            | 1.4                 | 9.6          | 0.31                | 0.34             | 0.31          | 58.5 |
| 3                               | R2   | 504          | 0.0  | 504           | 0.0  | 0.497     | 10.3          | LOS A            | 1.3                 | 9.2          | 0.33                | 0.57             | 0.33          | 56.3 |
| Approach                        |      | 1445         | 0.0  | 1445          | 0.0  | 0.497     | 5.4           | LOS A            | 1.4                 | 9.6          | 0.32                | 0.42             | 0.32          | 57.7 |
| East: ANDREWS ROAD              |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 4                               | L2   | 503          | 3.1  | 503           | 3.1  | 0.441     | 4.7           | LOS A            | 1.1                 | 7.6          | 0.66                | 0.59             | 0.69          | 50.1 |
| 5                               | T1   | 31           | 0.0  | 31            | 0.0  | 0.170     | 4.5           | LOS A            | 0.3                 | 2.1          | 0.59                | 0.75             | 0.59          | 54.2 |
| 6                               | R2   | 103          | 0.0  | 103           | 0.0  | 0.170     | 11.9          | LOS A            | 0.3                 | 2.1          | 0.59                | 0.75             | 0.59          | 55.3 |
| Approach                        |      | 637          | 2.5  | 637           | 2.5  | 0.441     | 5.9           | LOS A            | 1.1                 | 7.6          | 0.65                | 0.63             | 0.67          | 51.7 |
| North: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 7                               | L2   | 116          | 12.7 | 116           | 12.7 | 0.371     | 6.0           | LOS A            | 1.2                 | 8.8          | 0.71                | 0.56             | 0.71          | 54.3 |
| 8                               | T1   | 679          | 0.0  | 679           | 0.0  | 0.371     | 5.4           | LOS A            | 1.2                 | 8.8          | 0.71                | 0.58             | 0.71          | 49.1 |
| 9                               | R2   | 9            | 0.0  | 9             | 0.0  | 0.371     | 13.0          | LOS A            | 1.1                 | 7.9          | 0.71                | 0.59             | 0.71          | 57.8 |
| Approach                        |      | 804          | 1.8  | 804           | 1.8  | 0.371     | 5.6           | LOS A            | 1.2                 | 8.8          | 0.71                | 0.57             | 0.71          | 50.4 |
| West: OLD CASTLEREAGH ROAD      |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 10                              | L2   | 44           | 0.0  | 44            | 0.0  | 0.059     | 6.8           | LOS A            | 0.1                 | 0.9          | 0.72                | 0.69             | 0.72          | 54.7 |
| 11                              | T1   | 49           | 0.0  | 49            | 0.0  | 0.061     | 5.3           | LOS A            | 0.2                 | 1.1          | 0.73                | 0.59             | 0.73          | 55.6 |
| 12                              | R2   | 15           | 0.0  | 15            | 0.0  | 0.061     | 12.6          | LOS A            | 0.2                 | 1.1          | 0.73                | 0.59             | 0.73          | 47.8 |
| Approach                        |      | 108          | 0.0  | 108           | 0.0  | 0.061     | 6.9           | LOS A            | 0.2                 | 1.1          | 0.73                | 0.63             | 0.73          | 54.5 |
| All Vehicles                    |      | 2995         | 1.0  | 2995          | 1.0  | 0.497     | 5.6           | LOS A            | 1.4                 | 9.6          | 0.51                | 0.51             | 0.51          | 54.9 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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: 1 [DEV AM LUGARD - CASTLEREAGH OPT 1 2023]



Network: N101 [OPT 1 AM 2023]

18210 - PENRITH LAKES, PENRITH

Site Category: PENRITH LAKES

Signals - Fixed Time Isolated Cycle Time = 140 seconds (Site User-Given Phase Times)

| Movement Performance - Vehicles |      |              |      |               |      |           |               |                  |                     |            |              |                     |                  |               |
|---------------------------------|------|--------------|------|---------------|------|-----------|---------------|------------------|---------------------|------------|--------------|---------------------|------------------|---------------|
| Mov ID                          | Turn | Demand Flows |      | Arrival Flows |      | Deg. Satn | Average Delay | Level of Service | Aver. Back of Queue |            | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |
|                                 |      | Total veh/h  | HV % | Total veh/h   | HV % | v/c       | sec           |                  | Vehicles veh        | Distance m |              |                     |                  | km/h          |
| South: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |            |              |                     |                  |               |
| 1                               | L2   | 54           | 0.0  | 54            | 0.0  | 0.535     | 32.0          | LOS C            | 14.1                | 101.3      | 0.74         | 0.69                | 0.87             | 36.9          |
| 2                               | T1   | 952          | 3.4  | 952           | 3.4  | 0.535     | 26.1          | LOS B            | 14.3                | 102.6      | 0.74         | 0.67                | 0.80             | 29.8          |
| Approach                        |      | 1006         | 3.2  | 1006          | 3.2  | 0.535     | 26.5          | LOS B            | 14.3                | 102.6      | 0.74         | 0.68                | 0.81             | 30.3          |
| North: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |            |              |                     |                  |               |
| 8                               | T1   | 1835         | 0.0  | 1835          | 0.0  | 0.753     | 15.2          | LOS B            | 26.8                | 187.5      | 0.68         | 0.63                | 0.68             | 46.8          |
| 9                               | R2   | 71           | 0.0  | 71            | 0.0  | 0.177     | 18.7          | LOS B            | 1.1                 | 7.6        | 0.61         | 0.70                | 0.61             | 42.2          |
| Approach                        |      | 1905         | 0.0  | 1905          | 0.0  | 0.753     | 15.3          | LOS B            | 26.8                | 187.5      | 0.68         | 0.64                | 0.68             | 46.6          |
| West: LUGARD STREET             |      |              |      |               |      |           |               |                  |                     |            |              |                     |                  |               |
| 10                              | L2   | 27           | 0.0  | 27            | 0.0  | 0.092     | 44.5          | LOS D            | 1.4                 | 10.1       | 0.77         | 0.72                | 0.77             | 19.0          |
| 12                              | R2   | 62           | 0.0  | 62            | 0.0  | 0.092     | 47.7          | LOS D            | 1.4                 | 10.1       | 0.79         | 0.73                | 0.79             | 28.8          |
| Approach                        |      | 89           | 0.0  | 89            | 0.0  | 0.092     | 46.7          | LOS D            | 1.4                 | 10.1       | 0.79         | 0.73                | 0.79             | 26.5          |
| All Vehicles                    |      | 3001         | 1.1  | 3001          | 1.1  | 0.753     | 20.0          | LOS B            | 26.8                | 187.5      | 0.70         | 0.65                | 0.73             | 41.2          |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

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

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

| Movement Performance - Pedestrians |                     |             |               |                  |                       |              |                     |      |
|------------------------------------|---------------------|-------------|---------------|------------------|-----------------------|--------------|---------------------|------|
| Mov ID                             | Description         | Demand Flow | Average Delay | Level of Service | Average Back of Queue | Prop. Queued | Effective Stop Rate |      |
|                                    |                     | ped/h       | sec           |                  | Pedestrian ped        | Distance m   |                     |      |
| P3                                 | North Full Crossing | 53          | 64.3          | LOS F            | 0.2                   | 0.2          | 0.96                | 0.96 |
| P4                                 | West Full Crossing  | 53          | 64.3          | LOS F            | 0.2                   | 0.2          | 0.96                | 0.96 |
| All Pedestrians                    |                     | 105         | 64.3          | LOS F            |                       |              | 0.96                | 0.96 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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# MOVEMENT SUMMARY



Site: 1 [DEV PM LUGARD - CASTLEREAGH OPT 1 2023]



Network: N101 [OPT 1 PM 2023]

18210 - PENRITH LAKES, PENRITH

Site Category: PENRITH LAKES

Signals - Fixed Time Isolated Cycle Time = 140 seconds (Site User-Given Phase Times)

| Movement Performance - Vehicles |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
|---------------------------------|------|--------------|------|---------------|------|-----------|---------------|------------------|---------------------|--------------|---------------------|------------------|---------------|------|
| Mov ID                          | Turn | Demand Flows |      | Arrival Flows |      | Deg. Satn | Average Delay | Level of Service | Aver. Back of Queue | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |      |
|                                 |      | Total veh/h  | HV % | Total veh/h   | HV % | v/c       | sec           |                  | Vehicles veh        | Distance m   |                     |                  | km/h          |      |
| South: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 1                               | L2   | 63           | 0.0  | 63            | 0.0  | 0.831     | 38.0          | LOS C            | 28.4                | 202.2        | 0.92                | 0.86             | 1.07          | 34.2 |
| 2                               | T1   | 1558         | 2.0  | 1558          | 2.0  | 0.831     | 31.9          | LOS C            | 28.5                | 203.3        | 0.92                | 0.86             | 1.00          | 26.9 |
| Approach                        |      | 1621         | 2.0  | 1621          | 2.0  | 0.831     | 32.1          | LOS C            | 28.5                | 203.3        | 0.92                | 0.86             | 1.00          | 27.2 |
| North: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 8                               | T1   | 1267         | 0.0  | 1267          | 0.0  | 0.460     | 9.3           | LOS A            | 11.2                | 78.5         | 0.47                | 0.43             | 0.47          | 51.1 |
| 9                               | R2   | 71           | 0.0  | 71            | 0.0  | 0.226     | 26.3          | LOS B            | 1.3                 | 9.3          | 0.78                | 0.74             | 0.78          | 38.0 |
| Approach                        |      | 1338         | 0.0  | 1338          | 0.0  | 0.460     | 10.2          | LOS A            | 11.2                | 78.5         | 0.49                | 0.44             | 0.49          | 50.3 |
| West: LUGARD STREET             |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 10                              | L2   | 75           | 0.0  | 75            | 0.0  | 0.184     | 45.0          | LOS D            | 3.0                 | 21.1         | 0.79                | 0.75             | 0.79          | 18.9 |
| 12                              | R2   | 94           | 0.0  | 94            | 0.0  | 0.184     | 52.3          | LOS D            | 3.0                 | 21.1         | 0.85                | 0.75             | 0.85          | 27.5 |
| Approach                        |      | 168          | 0.0  | 168           | 0.0  | 0.184     | 49.1          | LOS D            | 3.0                 | 21.1         | 0.82                | 0.75             | 0.82          | 24.5 |
| All Vehicles                    |      | 3127         | 1.0  | 3127          | 1.0  | 0.831     | 23.7          | LOS B            | 28.5                | 203.3        | 0.73                | 0.68             | 0.77          | 37.1 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

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

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

| Movement Performance - Pedestrians |                     |             |               |                  |                       |              |                     |      |
|------------------------------------|---------------------|-------------|---------------|------------------|-----------------------|--------------|---------------------|------|
| Mov ID                             | Description         | Demand Flow | Average Delay | Level of Service | Average Back of Queue | Prop. Queued | Effective Stop Rate |      |
|                                    |                     | ped/h       | sec           |                  | Pedestrian ped        | Distance m   |                     |      |
| P3                                 | North Full Crossing | 53          | 64.3          | LOS F            | 0.2                   | 0.2          | 0.96                | 0.96 |
| P4                                 | West Full Crossing  | 53          | 64.3          | LOS F            | 0.2                   | 0.2          | 0.96                | 0.96 |
| All Pedestrians                    |                     | 105         | 64.3          | LOS F            |                       |              | 0.96                | 0.96 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Project: T:\WORK18\18210 - PENRITH LAKES, PENRITH\MODELLING\18210 - PENRITH LAKES, PENRITH 29JAN20.sip8

# MOVEMENT SUMMARY

 Site: 2 [DEV AM OLD CASTLEREAGH - CASTLEREAGH - ANDREWS OPT 1 2023]

 Network: N101 [OPT 1 AM 2023]

CASTLEREAGH - CASTLEREAGH - ANDREWS  
Site Category: PENRITH LAKES  
Roundabout

| Movement Performance - Vehicles |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
|---------------------------------|------|-------------|-------|-------------|-------|-----------|---------------|------------------|---------------------|--------------|---------------------|------------------|---------------|------|
| Mov ID                          | Turn | Demand      | Flows | Arrival     | Flows | Deg. Satn | Average Delay | Level of Service | Aver. Back of Queue | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |      |
|                                 |      | Total veh/h | HV %  | Total veh/h | HV %  | v/c       | sec           |                  | Vehicles veh        | Distance m   |                     |                  | km/h          |      |
| South: CASTLEREAGH ROAD         |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 1                               | L2   | 43          | 74.4  | 43          | 74.4  | 0.388     | 4.4           | LOS A            | 0.9                 | 6.8          | 0.35                | 0.30             | 0.35          | 52.1 |
| 2                               | T1   | 639         | 0.0   | 639         | 0.0   | 0.388     | 2.9           | LOS A            | 0.9                 | 6.8          | 0.35                | 0.35             | 0.35          | 58.2 |
| 3                               | R2   | 385         | 0.0   | 385         | 0.0   | 0.388     | 10.4          | LOS A            | 0.9                 | 6.3          | 0.36                | 0.58             | 0.36          | 56.1 |
| Approach                        |      | 1067        | 3.0   | 1067        | 3.0   | 0.388     | 5.6           | LOS A            | 0.9                 | 6.8          | 0.35                | 0.43             | 0.35          | 57.2 |
| East: ANDREWS ROAD              |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 4                               | L2   | 649         | 0.0   | 649         | 0.0   | 0.771     | 10.2          | LOS A            | 2.9                 | 20.3         | 0.94                | 1.12             | 1.40          | 45.4 |
| 5                               | T1   | 59          | 0.0   | 59          | 0.0   | 0.258     | 5.7           | LOS A            | 0.5                 | 3.6          | 0.78                | 0.81             | 0.78          | 45.7 |
| 6                               | R2   | 100         | 0.0   | 100         | 0.0   | 0.258     | 13.0          | LOS A            | 0.5                 | 3.6          | 0.78                | 0.81             | 0.78          | 55.1 |
| Approach                        |      | 808         | 0.0   | 808         | 0.0   | 0.771     | 10.2          | LOS A            | 2.9                 | 20.3         | 0.91                | 1.06             | 1.28          | 47.3 |
| North: CASTLEREAGH ROAD         |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 7                               | L2   | 122         | 0.0   | 122         | 0.0   | 0.628     | 5.6           | LOS A            | 2.5                 | 17.6         | 0.72                | 0.56             | 0.76          | 54.3 |
| 8                               | T1   | 1388        | 0.0   | 1388        | 0.0   | 0.628     | 5.4           | LOS A            | 2.5                 | 17.6         | 0.73                | 0.60             | 0.79          | 48.9 |
| 9                               | R2   | 18          | 0.0   | 18          | 0.0   | 0.628     | 13.3          | LOS A            | 2.5                 | 17.5         | 0.74                | 0.65             | 0.82          | 48.7 |
| Approach                        |      | 1528        | 0.0   | 1528        | 0.0   | 0.628     | 5.5           | LOS A            | 2.5                 | 17.6         | 0.73                | 0.60             | 0.79          | 49.6 |
| West: OLD CASTLEREAGH ROAD      |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 10                              | L2   | 47          | 67.4  | 47          | 67.4  | 0.063     | 6.2           | LOS A            | 0.1                 | 1.2          | 0.62                | 0.66             | 0.62          | 54.3 |
| 11                              | T1   | 15          | 0.0   | 15          | 0.0   | 0.028     | 4.8           | LOS A            | 0.1                 | 0.4          | 0.60                | 0.59             | 0.60          | 55.8 |
| 12                              | R2   | 8           | 0.0   | 8           | 0.0   | 0.028     | 12.2          | LOS A            | 0.1                 | 0.4          | 0.60                | 0.59             | 0.60          | 48.2 |
| Approach                        |      | 70          | 45.3  | 70          | 45.3  | 0.063     | 6.6           | LOS A            | 0.1                 | 1.2          | 0.61                | 0.64             | 0.61          | 54.2 |
| All Vehicles                    |      | 3474        | 1.8   | 3474        | 1.8   | 0.771     | 6.7           | LOS A            | 2.9                 | 20.3         | 0.66                | 0.66             | 0.77          | 52.2 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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: 2 [DEV PM OLD CASTLEREAGH - CASTLEREAGH - ANDREWS OPT 1 2023]

 Network: N101 [OPT 1 PM 2023]

CASTLEREAGH - CASTLEREAGH - ANDREWS  
Site Category: PENRITH LAKES  
Roundabout

| Movement Performance - Vehicles |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
|---------------------------------|------|--------------|------|---------------|------|-----------|---------------|------------------|---------------------|--------------|---------------------|------------------|---------------|------|
| Mov ID                          | Turn | Demand Flows |      | Arrival Flows |      | Deg. Satn | Average Delay | Level of Service | Aver. Back of Queue | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |      |
|                                 |      | Total veh/h  | HV % | Total veh/h   | HV % | v/c       | sec           |                  | Vehicles veh        | Distance m   |                     |                  | km/h          |      |
| South: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 1                               | L2   | 33           | 96.7 | 33            | 96.7 | 0.539     | 4.7           | LOS A            | 1.6                 | 11.5         | 0.33                | 0.30             | 0.33          | 52.3 |
| 2                               | T1   | 983          | 0.0  | 983           | 0.0  | 0.539     | 2.9           | LOS A            | 1.6                 | 11.5         | 0.33                | 0.35             | 0.33          | 58.3 |
| 3                               | R2   | 527          | 0.0  | 527           | 0.0  | 0.539     | 10.4          | LOS A            | 1.5                 | 10.6         | 0.35                | 0.57             | 0.35          | 56.4 |
| Approach                        |      | 1544         | 2.1  | 1544          | 2.1  | 0.539     | 5.5           | LOS A            | 1.6                 | 11.5         | 0.33                | 0.43             | 0.33          | 57.5 |
| East: ANDREWS ROAD              |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 4                               | L2   | 510          | 0.0  | 510           | 0.0  | 0.446     | 4.7           | LOS A            | 1.1                 | 7.6          | 0.68                | 0.60             | 0.71          | 50.0 |
| 5                               | T1   | 32           | 0.0  | 32            | 0.0  | 0.180     | 4.5           | LOS A            | 0.3                 | 2.2          | 0.60                | 0.76             | 0.60          | 46.1 |
| 6                               | R2   | 108          | 0.0  | 108           | 0.0  | 0.180     | 11.9          | LOS A            | 0.3                 | 2.2          | 0.60                | 0.76             | 0.60          | 55.3 |
| Approach                        |      | 650          | 0.0  | 650           | 0.0  | 0.446     | 5.9           | LOS A            | 1.1                 | 7.6          | 0.66                | 0.63             | 0.68          | 51.2 |
| North: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 7                               | L2   | 106          | 0.0  | 106           | 0.0  | 0.386     | 6.1           | LOS A            | 1.4                 | 9.5          | 0.74                | 0.58             | 0.74          | 54.3 |
| 8                               | T1   | 710          | 0.0  | 710           | 0.0  | 0.386     | 5.8           | LOS A            | 1.4                 | 9.5          | 0.74                | 0.60             | 0.74          | 48.8 |
| 9                               | R2   | 10           | 0.0  | 10            | 0.0  | 0.386     | 13.4          | LOS A            | 1.2                 | 8.6          | 0.74                | 0.62             | 0.74          | 48.7 |
| Approach                        |      | 826          | 0.0  | 826           | 0.0  | 0.386     | 5.9           | LOS A            | 1.4                 | 9.5          | 0.74                | 0.60             | 0.74          | 49.9 |
| West: OLD CASTLEREAGH ROAD      |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 10                              | L2   | 78           | 40.8 | 78            | 40.8 | 0.098     | 7.4           | LOS A            | 0.2                 | 2.3          | 0.77                | 0.72             | 0.77          | 53.8 |
| 11                              | T1   | 52           | 0.0  | 52            | 0.0  | 0.095     | 6.9           | LOS A            | 0.2                 | 1.6          | 0.76                | 0.74             | 0.76          | 55.2 |
| 12                              | R2   | 15           | 0.0  | 15            | 0.0  | 0.095     | 14.3          | LOS A            | 0.2                 | 1.6          | 0.76                | 0.74             | 0.76          | 47.2 |
| Approach                        |      | 145          | 22.0 | 145           | 22.0 | 0.098     | 7.9           | LOS A            | 0.2                 | 2.3          | 0.77                | 0.73             | 0.77          | 53.9 |
| All Vehicles                    |      | 3164         | 2.0  | 3164          | 2.0  | 0.539     | 5.8           | LOS A            | 1.6                 | 11.5         | 0.53                | 0.53             | 0.53          | 54.7 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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: 3 [DEV AM OLD CASTLEREAGH ROAD ACCESS OPT 1 2023]
  Network: N101 [OPT 1 AM 2023]

OLD CASTLEREAGH ROAD ACCESS  
 Site Category: PENRITH LAKES  
 Giveway / Yield (Two-Way)

| Movement Performance - Vehicles |      |             |       |             |       |           |               |                  |              |               |              |                     |                  |               |
|---------------------------------|------|-------------|-------|-------------|-------|-----------|---------------|------------------|--------------|---------------|--------------|---------------------|------------------|---------------|
| Mov ID                          | Turn | Demand      | Flows | Arrival     | Flows | Deg. Satn | Average Delay | Level of Service | Aver. Queue  | Back of Queue | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |
|                                 |      | Total veh/h | HV %  | Total veh/h | HV %  | v/c       | sec           |                  | Vehicles veh | Distance m    |              |                     |                  | km/h          |
| South: ACCESS                   |      |             |       |             |       |           |               |                  |              |               |              |                     |                  |               |
| 3                               | R2   | 32          | 100.0 | 32          | 100.0 | 0.046     | 6.3           | LOS A            | 0.1          | 0.8           | 0.29         | 0.57                | 0.29             | 28.8          |
| Approach                        |      | 32          | 100.0 | 32          | 100.0 | 0.046     | 6.3           | LOS A            | 0.1          | 0.8           | 0.29         | 0.57                | 0.29             | 28.8          |
| East: OLD CASTLEREAGH ROAD      |      |             |       |             |       |           |               |                  |              |               |              |                     |                  |               |
| 4                               | L2   | 32          | 100.0 | 32          | 100.0 | 0.059     | 7.9           | LOS A            | 0.0          | 0.0           | 0.00         | 0.33                | 0.00             | 60.9          |
| 5                               | T1   | 58          | 0.0   | 58          | 0.0   | 0.059     | 0.0           | LOS A            | 0.0          | 0.0           | 0.00         | 0.33                | 0.00             | 75.9          |
| Approach                        |      | 90          | 35.4  | 90          | 35.4  | 0.059     | 4.1           | NA               | 0.0          | 0.0           | 0.00         | 0.33                | 0.00             | 71.5          |
| West: OLD CASTLEREAGH ROAD      |      |             |       |             |       |           |               |                  |              |               |              |                     |                  |               |
| 11                              | T1   | 79          | 0.0   | 79          | 0.0   | 0.041     | 0.0           | LOS A            | 0.0          | 0.0           | 0.00         | 0.00                | 0.00             | 80.0          |
| Approach                        |      | 79          | 0.0   | 79          | 0.0   | 0.041     | 0.0           | NA               | 0.0          | 0.0           | 0.00         | 0.00                | 0.00             | 80.0          |
| All Vehicles                    |      | 201         | 31.7  | 201         | 31.7  | 0.059     | 2.3           | NA               | 0.1          | 0.8           | 0.05         | 0.24                | 0.05             | 71.0          |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

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

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

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

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

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

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# MOVEMENT SUMMARY

 Site: 3 [DEV PM OLD CASTLEREAGH ROAD ACCESS OPT 1 2023]
  Network: N101 [OPT 1 PM 2023]

OLD CASTLEREAGH ROAD ACCESS  
 Site Category: PENRITH LAKES  
 Giveaway / Yield (Two-Way)

| Movement Performance - Vehicles |      |             |       |             |         |       |           |               |                  |                     |              |                     |                  |               |
|---------------------------------|------|-------------|-------|-------------|---------|-------|-----------|---------------|------------------|---------------------|--------------|---------------------|------------------|---------------|
| Mov ID                          | Turn | Demand      |       | Flows       | Arrival | Flows | Deg. Satn | Average Delay | Level of Service | Aver. Back of Queue | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |
|                                 |      | Total veh/h | HV %  | Total veh/h | HV %    |       | v/c       | sec           |                  | Vehicles veh        | Distance m   |                     |                  | km/h          |
| South: ACCESS                   |      |             |       |             |         |       |           |               |                  |                     |              |                     |                  |               |
| 3                               | R2   | 32          | 100.0 | 32          | 100.0   | 0.041 |           | 5.6           | LOS A            | 0.1                 | 0.7          | 0.19                | 0.54             | 30.1          |
| Approach                        |      | 32          | 100.0 | 32          | 100.0   | 0.041 |           | 5.6           | LOS A            | 0.1                 | 0.7          | 0.19                | 0.54             | 30.1          |
| East: OLD CASTLEREAGH ROAD      |      |             |       |             |         |       |           |               |                  |                     |              |                     |                  |               |
| 4                               | L2   | 32          | 100.0 | 32          | 100.0   | 0.038 |           | 7.9           | LOS A            | 0.0                 | 0.0          | 0.00                | 0.50             | 57.5          |
| 5                               | T1   | 17          | 0.0   | 17          | 0.0     | 0.038 |           | 0.0           | LOS A            | 0.0                 | 0.0          | 0.00                | 0.50             | 72.7          |
| Approach                        |      | 48          | 65.9  | 48          | 65.9    | 0.038 |           | 6.2           | NA               | 0.0                 | 0.0          | 0.00                | 0.50             | 63.7          |
| West: OLD CASTLEREAGH ROAD      |      |             |       |             |         |       |           |               |                  |                     |              |                     |                  |               |
| 11                              | T1   | 39          | 0.0   | 39          | 0.0     | 0.020 |           | 0.0           | LOS A            | 0.0                 | 0.0          | 0.00                | 0.00             | 80.0          |
| Approach                        |      | 39          | 0.0   | 39          | 0.0     | 0.020 |           | 0.0           | NA               | 0.0                 | 0.0          | 0.00                | 0.00             | 80.0          |
| All Vehicles                    |      | 119         | 53.7  | 119         | 53.7    | 0.041 |           | 3.6           | NA               | 0.1                 | 0.7          | 0.05                | 0.35             | 63.8          |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

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

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

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

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

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

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# MOVEMENT SUMMARY



Site: 1 [DEV AM LUGARD - CASTLEREAGH OPT 2 2023]



Network: N101 [OPT 2 AM 2023]

18210 - PENRITH LAKES, PENRITH

Site Category: PENRITH LAKES

Signals - Fixed Time Isolated Cycle Time = 140 seconds (Site User-Given Phase Times)

| Movement Performance - Vehicles |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
|---------------------------------|------|--------------|------|---------------|------|-----------|---------------|------------------|---------------------|--------------|---------------------|------------------|---------------|------|
| Mov ID                          | Turn | Demand Flows |      | Arrival Flows |      | Deg. Satn | Average Delay | Level of Service | Aver. Back of Queue | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |      |
|                                 |      | Total veh/h  | HV % | Total veh/h   | HV % | v/c       | sec           |                  | Vehicles veh        | Distance m   |                     |                  | km/h          |      |
| South: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 1                               | L2   | 54           | 0.0  | 54            | 0.0  | 0.508     | 31.5          | LOS C            | 13.4                | 93.6         | 0.73                | 0.68             | 0.86          | 37.1 |
| 2                               | T1   | 920          | 0.0  | 920           | 0.0  | 0.508     | 25.6          | LOS B            | 13.6                | 94.9         | 0.73                | 0.66             | 0.79          | 30.0 |
| Approach                        |      | 974          | 0.0  | 974           | 0.0  | 0.508     | 26.0          | LOS B            | 13.6                | 94.9         | 0.73                | 0.66             | 0.79          | 30.6 |
| North: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 8                               | T1   | 1835         | 0.0  | 1835          | 0.0  | 0.788     | 15.4          | LOS B            | 29.4                | 206.1        | 0.69                | 0.65             | 0.69          | 46.6 |
| 9                               | R2   | 101          | 30.2 | 101           | 30.2 | 0.299     | 19.4          | LOS B            | 1.6                 | 14.3         | 0.63                | 0.72             | 0.63          | 41.0 |
| Approach                        |      | 1936         | 1.6  | 1936          | 1.6  | 0.788     | 15.6          | LOS B            | 29.4                | 206.1        | 0.69                | 0.65             | 0.69          | 46.3 |
| West: LUGARD STREET             |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 10                              | L2   | 27           | 0.0  | 27            | 0.0  | 0.150     | 47.0          | LOS D            | 2.1                 | 16.8         | 0.80                | 0.74             | 0.80          | 18.3 |
| 12                              | R2   | 93           | 33.0 | 93            | 33.0 | 0.150     | 49.3          | LOS D            | 2.1                 | 16.8         | 0.81                | 0.74             | 0.81          | 27.9 |
| Approach                        |      | 120          | 25.4 | 120           | 25.4 | 0.150     | 48.8          | LOS D            | 2.1                 | 16.8         | 0.81                | 0.74             | 0.81          | 26.3 |
| All Vehicles                    |      | 3030         | 2.0  | 3030          | 2.0  | 0.788     | 20.3          | LOS B            | 29.4                | 206.1        | 0.71                | 0.66             | 0.73          | 41.0 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

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

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

| Movement Performance - Pedestrians |                     |             |               |                  |                       |              |                     |      |
|------------------------------------|---------------------|-------------|---------------|------------------|-----------------------|--------------|---------------------|------|
| Mov ID                             | Description         | Demand Flow | Average Delay | Level of Service | Average Back of Queue | Prop. Queued | Effective Stop Rate |      |
|                                    |                     | ped/h       | sec           |                  | Pedestrian ped        | Distance m   |                     |      |
| P3                                 | North Full Crossing | 53          | 64.3          | LOS F            | 0.2                   | 0.2          | 0.96                | 0.96 |
| P4                                 | West Full Crossing  | 53          | 64.3          | LOS F            | 0.2                   | 0.2          | 0.96                | 0.96 |
| All Pedestrians                    |                     | 105         | 64.3          | LOS F            |                       |              | 0.96                | 0.96 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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# MOVEMENT SUMMARY



Site: 1 [DEV PM LUGARD - CASTLEREAGH OPT 2 2023]



Network: N101 [OPT 2 PM 2023]

18210 - PENRITH LAKES, PENRITH

Site Category: PENRITH LAKES

Signals - Fixed Time Isolated Cycle Time = 140 seconds (Site User-Given Phase Times)

| Movement Performance - Vehicles |      |              |      |               |      |           |               |                  |                     |          |              |                     |                  |               |
|---------------------------------|------|--------------|------|---------------|------|-----------|---------------|------------------|---------------------|----------|--------------|---------------------|------------------|---------------|
| Mov ID                          | Turn | Demand Flows |      | Arrival Flows |      | Deg. Satn | Average Delay | Level of Service | Aver. Back of Queue | Distance | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |
|                                 |      | Total veh/h  | HV % | Total veh/h   | HV % | v/c       | sec           |                  | veh                 | m        |              |                     |                  | km/h          |
| South: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |          |              |                     |                  |               |
| 1                               | L2   | 63           | 0.0  | 63            | 0.0  | 0.804     | 37.0          | LOS C            | 27.1                | 189.6    | 0.90         | 0.84                | 1.05             | 34.6          |
| 2                               | T1   | 1526         | 0.0  | 1526          | 0.0  | 0.804     | 30.9          | LOS C            | 27.2                | 190.7    | 0.90         | 0.83                | 0.97             | 27.3          |
| Approach                        |      | 1589         | 0.0  | 1589          | 0.0  | 0.804     | 31.2          | LOS C            | 27.2                | 190.7    | 0.90         | 0.84                | 0.98             | 27.7          |
| North: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |          |              |                     |                  |               |
| 8                               | T1   | 1267         | 0.0  | 1267          | 0.0  | 0.460     | 9.3           | LOS A            | 11.2                | 78.5     | 0.47         | 0.43                | 0.47             | 51.1          |
| 9                               | R2   | 71           | 0.0  | 71            | 0.0  | 0.221     | 24.9          | LOS B            | 1.3                 | 8.9      | 0.76         | 0.74                | 0.76             | 38.7          |
| Approach                        |      | 1338         | 0.0  | 1338          | 0.0  | 0.460     | 10.1          | LOS A            | 11.2                | 78.5     | 0.49         | 0.44                | 0.49             | 50.3          |
| West: LUGARD STREET             |      |              |      |               |      |           |               |                  |                     |          |              |                     |                  |               |
| 10                              | L2   | 75           | 0.0  | 75            | 0.0  | 0.184     | 45.0          | LOS D            | 3.0                 | 21.1     | 0.79         | 0.75                | 0.79             | 18.9          |
| 12                              | R2   | 94           | 0.0  | 94            | 0.0  | 0.184     | 52.3          | LOS D            | 3.0                 | 21.1     | 0.85         | 0.75                | 0.85             | 27.5          |
| Approach                        |      | 168          | 0.0  | 168           | 0.0  | 0.184     | 49.1          | LOS D            | 3.0                 | 21.1     | 0.82         | 0.75                | 0.82             | 24.5          |
| All Vehicles                    |      | 3095         | 0.0  | 3095          | 0.0  | 0.804     | 23.1          | LOS B            | 27.2                | 190.7    | 0.72         | 0.66                | 0.75             | 37.5          |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

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

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

| Movement Performance - Pedestrians |                     |             |               |                  |                       |          |              |                     |
|------------------------------------|---------------------|-------------|---------------|------------------|-----------------------|----------|--------------|---------------------|
| Mov ID                             | Description         | Demand Flow | Average Delay | Level of Service | Average Back of Queue | Distance | Prop. Queued | Effective Stop Rate |
|                                    |                     | ped/h       | sec           |                  | ped                   | m        |              |                     |
| P3                                 | North Full Crossing | 53          | 64.3          | LOS F            | 0.2                   | 0.2      | 0.96         | 0.96                |
| P4                                 | West Full Crossing  | 53          | 64.3          | LOS F            | 0.2                   | 0.2      | 0.96         | 0.96                |
| All Pedestrians                    |                     | 105         | 64.3          | LOS F            |                       |          | 0.96         | 0.96                |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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# MOVEMENT SUMMARY



Site: 2 [DEV AM OLD CASTLEREAGH - CASTLEREAGH - ANDREWS OPT 2 2023]



Network: N101 [OPT 2 AM 2023]

CASTLEREAGH - CASTLEREAGH - ANDREWS

Site Category: PENRITH LAKES

Roundabout

| Movement Performance - Vehicles |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
|---------------------------------|------|-------------|-------|-------------|-------|-----------|---------------|------------------|---------------------|--------------|---------------------|------------------|---------------|------|
| Mov ID                          | Turn | Demand      | Flows | Arrival     | Flows | Deg. Satn | Average Delay | Level of Service | Aver. Back of Queue | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |      |
|                                 |      | Total veh/h | HV %  | Total veh/h | HV %  | v/c       | sec           |                  | Vehicles veh        | Distance m   |                     |                  | km/h          |      |
| South: CASTLEREAGH ROAD         |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 1                               | L2   | 11          | 0.0   | 11          | 0.0   | 0.371     | 3.4           | LOS A            | 0.9                 | 6.2          | 0.34                | 0.29             | 0.34          | 56.4 |
| 2                               | T1   | 639         | 0.0   | 639         | 0.0   | 0.371     | 2.8           | LOS A            | 0.9                 | 6.2          | 0.34                | 0.34             | 0.34          | 58.3 |
| 3                               | R2   | 385         | 0.0   | 385         | 0.0   | 0.371     | 10.3          | LOS A            | 0.9                 | 6.0          | 0.36                | 0.59             | 0.36          | 55.9 |
| Approach                        |      | 1035        | 0.0   | 1035        | 0.0   | 0.371     | 5.6           | LOS A            | 0.9                 | 6.2          | 0.35                | 0.43             | 0.35          | 57.4 |
| East: ANDREWS ROAD              |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 4                               | L2   | 665         | 2.5   | 665         | 2.5   | 0.816     | 11.8          | LOS A            | 3.3                 | 23.9         | 0.96                | 1.18             | 1.55          | 43.7 |
| 5                               | T1   | 59          | 0.0   | 59          | 0.0   | 0.261     | 5.7           | LOS A            | 0.5                 | 3.7          | 0.78                | 0.81             | 0.78          | 53.9 |
| 6                               | R2   | 100         | 0.0   | 100         | 0.0   | 0.261     | 13.1          | LOS A            | 0.5                 | 3.7          | 0.78                | 0.81             | 0.78          | 55.0 |
| Approach                        |      | 825         | 2.0   | 825         | 2.0   | 0.816     | 11.5          | LOS A            | 3.3                 | 23.9         | 0.93                | 1.11             | 1.40          | 46.8 |
| North: CASTLEREAGH ROAD         |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 7                               | L2   | 122         | 0.0   | 122         | 0.0   | 0.638     | 5.7           | LOS A            | 2.6                 | 18.4         | 0.73                | 0.57             | 0.78          | 54.3 |
| 8                               | T1   | 1404        | 1.1   | 1404        | 1.1   | 0.638     | 5.6           | LOS A            | 2.6                 | 18.4         | 0.74                | 0.62             | 0.81          | 48.8 |
| 9                               | R2   | 18          | 0.0   | 18          | 0.0   | 0.638     | 13.4          | LOS A            | 2.6                 | 18.3         | 0.75                | 0.67             | 0.84          | 57.6 |
| Approach                        |      | 1544        | 1.0   | 1544        | 1.0   | 0.638     | 5.7           | LOS A            | 2.6                 | 18.4         | 0.74                | 0.62             | 0.81          | 49.7 |
| West: OLD CASTLEREAGH ROAD      |      |             |       |             |       |           |               |                  |                     |              |                     |                  |               |      |
| 10                              | L2   | 15          | 0.0   | 15          | 0.0   | 0.018     | 5.3           | LOS A            | 0.0                 | 0.2          | 0.59                | 0.59             | 0.59          | 55.4 |
| 11                              | T1   | 15          | 0.0   | 15          | 0.0   | 0.020     | 4.0           | LOS A            | 0.0                 | 0.3          | 0.59                | 0.52             | 0.59          | 56.1 |
| 12                              | R2   | 8           | 0.0   | 8           | 0.0   | 0.020     | 11.4          | LOS A            | 0.0                 | 0.3          | 0.59                | 0.52             | 0.59          | 48.6 |
| Approach                        |      | 39          | 0.0   | 39          | 0.0   | 0.020     | 6.0           | LOS A            | 0.0                 | 0.3          | 0.59                | 0.55             | 0.59          | 54.8 |
| All Vehicles                    |      | 3442        | 0.9   | 3442        | 0.9   | 0.816     | 7.1           | LOS A            | 3.3                 | 23.9         | 0.67                | 0.68             | 0.81          | 52.0 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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.

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# MOVEMENT SUMMARY

 Site: 2 [DEV PM OLD CASTLEREAGH - CASTLEREAGH - ANDREWS OPT 2 2023]

 Network: N101 [OPT 2 PM 2023]

CASTLEREAGH - CASTLEREAGH - ANDREWS  
Site Category: PENRITH LAKES  
Roundabout

| Movement Performance - Vehicles |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
|---------------------------------|------|--------------|------|---------------|------|-----------|---------------|------------------|---------------------|--------------|---------------------|------------------|---------------|------|
| Mov ID                          | Turn | Demand Flows |      | Arrival Flows |      | Deg. Satn | Average Delay | Level of Service | Aver. Back of Queue | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed |      |
|                                 |      | Total veh/h  | HV % | Total veh/h   | HV % | v/c       | sec           |                  | Vehicles veh        | Distance m   |                     |                  |               | km/h |
| South: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 1                               | L2   | 1            | 0.0  | 1             | 0.0  | 0.522     | 3.4           | LOS A            | 1.5                 | 10.5         | 0.32                | 0.29             | 0.32          | 56.5 |
| 2                               | T1   | 983          | 0.0  | 983           | 0.0  | 0.522     | 2.9           | LOS A            | 1.5                 | 10.5         | 0.32                | 0.34             | 0.32          | 58.4 |
| 3                               | R2   | 527          | 0.0  | 527           | 0.0  | 0.522     | 10.4          | LOS A            | 1.4                 | 10.0         | 0.34                | 0.58             | 0.34          | 56.3 |
| Approach                        |      | 1512         | 0.0  | 1512          | 0.0  | 0.522     | 5.5           | LOS A            | 1.5                 | 10.5         | 0.33                | 0.42             | 0.33          | 57.6 |
| East: ANDREWS ROAD              |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 4                               | L2   | 526          | 3.1  | 526           | 3.1  | 0.471     | 5.0           | LOS A            | 1.2                 | 8.5          | 0.69                | 0.63             | 0.74          | 49.9 |
| 5                               | T1   | 32           | 0.0  | 32            | 0.0  | 0.181     | 4.6           | LOS A            | 0.3                 | 2.3          | 0.61                | 0.76             | 0.61          | 54.1 |
| 6                               | R2   | 108          | 0.0  | 108           | 0.0  | 0.181     | 11.9          | LOS A            | 0.3                 | 2.3          | 0.61                | 0.76             | 0.61          | 55.3 |
| Approach                        |      | 666          | 2.5  | 666           | 2.5  | 0.471     | 6.1           | LOS A            | 1.2                 | 8.5          | 0.67                | 0.66             | 0.71          | 51.6 |
| North: CASTLEREAGH ROAD         |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 7                               | L2   | 121          | 12.7 | 121           | 12.7 | 0.397     | 6.4           | LOS A            | 1.4                 | 9.9          | 0.75                | 0.59             | 0.75          | 54.1 |
| 8                               | T1   | 710          | 0.0  | 710           | 0.0  | 0.397     | 5.8           | LOS A            | 1.4                 | 9.9          | 0.74                | 0.61             | 0.74          | 48.8 |
| 9                               | R2   | 10           | 0.0  | 10            | 0.0  | 0.397     | 13.4          | LOS A            | 1.3                 | 8.8          | 0.74                | 0.62             | 0.74          | 57.6 |
| Approach                        |      | 841          | 1.8  | 841           | 1.8  | 0.397     | 5.9           | LOS A            | 1.4                 | 9.9          | 0.74                | 0.61             | 0.74          | 50.1 |
| West: OLD CASTLEREAGH ROAD      |      |              |      |               |      |           |               |                  |                     |              |                     |                  |               |      |
| 10                              | L2   | 46           | 0.0  | 46            | 0.0  | 0.064     | 7.2           | LOS A            | 0.1                 | 1.0          | 0.74                | 0.71             | 0.74          | 54.4 |
| 11                              | T1   | 52           | 0.0  | 52            | 0.0  | 0.066     | 5.6           | LOS A            | 0.2                 | 1.2          | 0.77                | 0.62             | 0.77          | 55.4 |
| 12                              | R2   | 15           | 0.0  | 15            | 0.0  | 0.066     | 12.9          | LOS A            | 0.2                 | 1.2          | 0.77                | 0.62             | 0.77          | 47.5 |
| Approach                        |      | 113          | 0.0  | 113           | 0.0  | 0.066     | 7.2           | LOS A            | 0.2                 | 1.2          | 0.76                | 0.65             | 0.76          | 54.3 |
| All Vehicles                    |      | 3132         | 1.0  | 3132          | 1.0  | 0.522     | 5.8           | LOS A            | 1.5                 | 10.5         | 0.53                | 0.53             | 0.54          | 54.8 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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: 101 [Andrews Rd / Castlereagh Rd / Old Castlereagh Rd PM Ex]

Roundabout

| Movement Performance - Vehicles |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
|---------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|--------------------------------|------------|--------------|-----------------------------|--------------------|
| Mov ID                          | OD Mov | Demand Total veh/h | Flows HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Castlereagh Rd           |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 1                               | L2     | 1                  | 35.0       | 0.608         | 4.1               | LOS A            | 5.2                            | 47.0       | 0.53         | 0.34                        | 54.8               |
| 2                               | T1     | 940                | 35.0       | 0.608         | 3.5               | LOS A            | 5.2                            | 47.0       | 0.54         | 0.38                        | 56.9               |
| 3                               | R2     | 504                | 35.0       | 0.608         | 11.3              | LOS B            | 5.0                            | 45.4       | 0.56         | 0.59                        | 54.5               |
| Approach                        |        | 1445               | 35.0       | 0.608         | 6.2               | LOS A            | 5.2                            | 47.0       | 0.54         | 0.45                        | 56.0               |
| East: Andrews Rd                |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 4                               | L2     | 487                | 35.0       | 0.557         | 6.6               | LOS A            | 3.7                            | 33.5       | 0.76         | 0.85                        | 54.2               |
| 5                               | T1     | 31                 | 35.0       | 0.228         | 5.8               | LOS A            | 1.0                            | 8.9        | 0.65         | 0.81                        | 53.3               |
| 6                               | R2     | 103                | 35.0       | 0.228         | 13.4              | LOS B            | 1.0                            | 8.9        | 0.65         | 0.81                        | 53.7               |
| Approach                        |        | 621                | 35.0       | 0.557         | 7.7               | LOS A            | 3.7                            | 33.5       | 0.74         | 0.84                        | 54.0               |
| North: Castlereagh Rd           |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 7                               | L2     | 101                | 35.0       | 0.487         | 6.8               | LOS A            | 3.4                            | 31.3       | 0.75         | 0.69                        | 53.7               |
| 8                               | T1     | 679                | 35.0       | 0.487         | 6.7               | LOS A            | 3.4                            | 31.3       | 0.75         | 0.73                        | 56.1               |
| 9                               | R2     | 9                  | 35.0       | 0.487         | 14.8              | LOS B            | 3.2                            | 29.3       | 0.76         | 0.79                        | 56.4               |
| Approach                        |        | 789                | 35.0       | 0.487         | 6.8               | LOS A            | 3.4                            | 31.3       | 0.75         | 0.73                        | 55.8               |
| West: Old Castlereagh Rd        |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 10                              | L2     | 44                 | 35.0       | 0.103         | 7.1               | LOS A            | 0.5                            | 4.6        | 0.77         | 0.77                        | 53.9               |
| 11                              | T1     | 49                 | 35.0       | 0.103         | 7.6               | LOS A            | 0.5                            | 4.6        | 0.76         | 0.81                        | 55.0               |
| 12                              | R2     | 15                 | 35.0       | 0.103         | 16.1              | LOS B            | 0.4                            | 3.9        | 0.76         | 0.85                        | 54.2               |
| Approach                        |        | 108                | 35.0       | 0.103         | 8.5               | LOS A            | 0.5                            | 4.6        | 0.76         | 0.80                        | 54.4               |
| All Vehicles                    |        | 2964               | 35.0       | 0.608         | 6.7               | LOS A            | 5.2                            | 47.0       | 0.65         | 0.62                        | 55.5               |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

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 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.

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# MOVEMENT SUMMARY

 Site: 101 [Andrews Rd / Castlereagh Rd / Old Castlereagh Rd PM Dev Sce 2]

Roundabout

| Movement Performance - Vehicles |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
|---------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|-----------------------|---------------------|--------------|-----------------------------|--------------------|
| Mov ID                          | OD Mov | Demand Total veh/h | Flows HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back Vehicles veh | of Queue Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Castlereagh Rd           |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 1                               | L2     | 1                  | 35.0       | 0.620         | 4.1               | LOS A            | 5.4                   | 49.0                | 0.54         | 0.34                        | 54.8               |
| 2                               | T1     | 940                | 35.0       | 0.620         | 3.5               | LOS A            | 5.4                   | 49.0                | 0.55         | 0.38                        | 56.9               |
| 3                               | R2     | 535                | 35.0       | 0.620         | 11.3              | LOS B            | 5.2                   | 47.3                | 0.57         | 0.60                        | 54.3               |
| Approach                        |        | 1476               | 35.0       | 0.620         | 6.3               | LOS A            | 5.4                   | 49.0                | 0.56         | 0.46                        | 55.9               |
| East: Andrews Rd                |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 4                               | L2     | 518                | 35.0       | 0.595         | 6.9               | LOS A            | 4.1                   | 37.7                | 0.78         | 0.90                        | 54.1               |
| 5                               | T1     | 31                 | 35.0       | 0.232         | 5.9               | LOS A            | 1.0                   | 9.1                 | 0.66         | 0.81                        | 53.3               |
| 6                               | R2     | 103                | 35.0       | 0.232         | 13.4              | LOS B            | 1.0                   | 9.1                 | 0.66         | 0.81                        | 53.7               |
| Approach                        |        | 652                | 35.0       | 0.595         | 7.9               | LOS A            | 4.1                   | 37.7                | 0.76         | 0.88                        | 54.0               |
| North: Castlereagh Rd           |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 7                               | L2     | 101                | 35.0       | 0.503         | 7.2               | LOS A            | 3.7                   | 33.7                | 0.78         | 0.74                        | 53.5               |
| 8                               | T1     | 679                | 35.0       | 0.503         | 7.2               | LOS A            | 3.7                   | 33.7                | 0.78         | 0.79                        | 56.0               |
| 9                               | R2     | 9                  | 35.0       | 0.503         | 15.4              | LOS B            | 3.4                   | 31.3                | 0.78         | 0.85                        | 56.3               |
| Approach                        |        | 789                | 35.0       | 0.503         | 7.3               | LOS A            | 3.7                   | 33.7                | 0.78         | 0.79                        | 55.7               |
| West: Old Castlereagh Rd        |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 10                              | L2     | 44                 | 35.0       | 0.105         | 7.2               | LOS A            | 0.5                   | 4.7                 | 0.78         | 0.78                        | 53.8               |
| 11                              | T1     | 49                 | 35.0       | 0.105         | 7.7               | LOS A            | 0.5                   | 4.7                 | 0.77         | 0.82                        | 54.8               |
| 12                              | R2     | 15                 | 35.0       | 0.105         | 16.3              | LOS B            | 0.4                   | 4.1                 | 0.76         | 0.86                        | 54.0               |
| Approach                        |        | 108                | 35.0       | 0.105         | 8.7               | LOS A            | 0.5                   | 4.7                 | 0.77         | 0.81                        | 54.3               |
| All Vehicles                    |        | 3025               | 35.0       | 0.620         | 7.0               | LOS A            | 5.4                   | 49.0                | 0.67         | 0.65                        | 55.4               |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

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 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.

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# MOVEMENT SUMMARY

 Site: 101 [Andrews Rd / Castlereagh Rd / Old Castlereagh Rd PM Dev Sce 1]

Roundabout

| Movement Performance - Vehicles |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
|---------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|-----------------------|---------------------|--------------|-----------------------------|--------------------|
| Mov ID                          | OD Mov | Demand Total veh/h | Flows HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back Vehicles veh | of Queue Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Castlereagh Rd           |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 1                               | L2     | 1                  | 35.0       | 0.629         | 4.4               | LOS A            | 5.4                   | 49.3                | 0.59         | 0.36                        | 54.5               |
| 2                               | T1     | 940                | 35.0       | 0.629         | 3.7               | LOS A            | 5.4                   | 49.3                | 0.60         | 0.41                        | 56.6               |
| 3                               | R2     | 504                | 35.0       | 0.629         | 11.7              | LOS B            | 5.3                   | 48.1                | 0.62         | 0.63                        | 54.3               |
| Approach                        |        | 1445               | 35.0       | 0.629         | 6.5               | LOS A            | 5.4                   | 49.3                | 0.61         | 0.49                        | 55.7               |
| East: Andrews Rd                |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 4                               | L2     | 487                | 35.0       | 0.558         | 6.6               | LOS A            | 3.7                   | 33.7                | 0.76         | 0.85                        | 54.1               |
| 5                               | T1     | 61                 | 35.0       | 0.271         | 5.7               | LOS A            | 1.2                   | 10.9                | 0.67         | 0.77                        | 53.9               |
| 6                               | R2     | 103                | 35.0       | 0.271         | 13.3              | LOS B            | 1.2                   | 10.9                | 0.67         | 0.77                        | 54.3               |
| Approach                        |        | 652                | 35.0       | 0.558         | 7.6               | LOS A            | 3.7                   | 33.7                | 0.74         | 0.83                        | 54.2               |
| North: Castlereagh Rd           |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 7                               | L2     | 101                | 35.0       | 0.499         | 6.9               | LOS A            | 3.6                   | 32.5                | 0.77         | 0.71                        | 53.6               |
| 8                               | T1     | 679                | 35.0       | 0.499         | 6.9               | LOS A            | 3.6                   | 32.5                | 0.77         | 0.76                        | 56.1               |
| 9                               | R2     | 9                  | 35.0       | 0.499         | 15.1              | LOS B            | 3.3                   | 30.2                | 0.77         | 0.82                        | 56.3               |
| Approach                        |        | 789                | 35.0       | 0.499         | 7.0               | LOS A            | 3.6                   | 32.5                | 0.77         | 0.76                        | 55.7               |
| West: Old Castlereagh Rd        |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 10                              | L2     | 44                 | 35.0       | 0.137         | 7.1               | LOS A            | 0.7                   | 6.2                 | 0.79         | 0.76                        | 53.7               |
| 11                              | T1     | 80                 | 35.0       | 0.137         | 7.5               | LOS A            | 0.7                   | 6.2                 | 0.78         | 0.81                        | 55.2               |
| 12                              | R2     | 15                 | 35.0       | 0.137         | 16.2              | LOS B            | 0.6                   | 5.4                 | 0.77         | 0.85                        | 54.5               |
| Approach                        |        | 139                | 35.0       | 0.137         | 8.3               | LOS A            | 0.7                   | 6.2                 | 0.78         | 0.80                        | 54.7               |
| All Vehicles                    |        | 3025               | 35.0       | 0.629         | 7.0               | LOS A            | 5.4                   | 49.3                | 0.68         | 0.65                        | 55.3               |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

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 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.

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# MOVEMENT SUMMARY

 Site: 101 [Andrews Rd / Castlereagh Rd / Old Castlereagh Rd AM Dev Sce 2]

Roundabout

| Movement Performance - Vehicles |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
|---------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|-----------------------|---------------------|--------------|-----------------------------|--------------------|
| Mov ID                          | OD Mov | Demand Total veh/h | Flows HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back Vehicles veh | of Queue Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Castlereagh Rd           |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 1                               | L2     | 11                 | 35.0       | 0.721         | 8.6               | LOS A            | 6.2                   | 56.1                | 0.89         | 0.92                        | 52.8               |
| 2                               | T1     | 611                | 35.0       | 0.721         | 8.1               | LOS A            | 6.2                   | 56.1                | 0.89         | 0.93                        | 55.0               |
| 3                               | R2     | 399                | 35.0       | 0.721         | 17.5              | LOS B            | 5.6                   | 50.8                | 0.88         | 1.08                        | 50.5               |
| Approach                        |        | 1020               | 35.0       | 0.721         | 11.8              | LOS B            | 6.2                   | 56.1                | 0.88         | 0.99                        | 53.0               |
| East: Andrews Rd                |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 4                               | L2     | 87                 | 35.0       | 0.946         | 32.4              | LOS C            | 12.6                  | 115.0               | 1.00         | 1.55                        | 40.1               |
| 5                               | T1     | 620                | 35.0       | 0.946         | 34.5              | LOS C            | 12.6                  | 115.0               | 0.99         | 1.52                        | 40.1               |
| 6                               | R2     | 96                 | 35.0       | 0.946         | 47.0              | LOS D            | 10.0                  | 91.2                | 0.98         | 1.49                        | 38.0               |
| Approach                        |        | 803                | 35.0       | 0.946         | 35.7              | LOS D            | 12.6                  | 115.0               | 0.99         | 1.52                        | 39.9               |
| North: Castlereagh Rd           |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 7                               | L2     | 117                | 35.0       | 0.833         | 11.5              | LOS B            | 12.5                  | 113.7               | 0.99         | 1.12                        | 51.4               |
| 8                               | T1     | 1327               | 35.0       | 0.833         | 11.7              | LOS B            | 12.5                  | 113.7               | 0.99         | 1.15                        | 53.1               |
| 9                               | R2     | 17                 | 35.0       | 0.833         | 20.4              | LOS C            | 11.6                  | 105.5               | 0.99         | 1.19                        | 52.7               |
| Approach                        |        | 1461               | 35.0       | 0.833         | 11.8              | LOS B            | 12.5                  | 113.7               | 0.99         | 1.15                        | 53.0               |
| West: Old Castlereagh Rd        |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 10                              | L2     | 15                 | 35.0       | 0.033         | 5.8               | LOS A            | 0.2                   | 1.4                 | 0.73         | 0.64                        | 54.1               |
| 11                              | T1     | 15                 | 35.0       | 0.033         | 5.7               | LOS A            | 0.2                   | 1.4                 | 0.72         | 0.69                        | 55.4               |
| 12                              | R2     | 7                  | 35.0       | 0.033         | 13.8              | LOS B            | 0.1                   | 1.3                 | 0.72         | 0.74                        | 54.6               |
| Approach                        |        | 37                 | 35.0       | 0.033         | 7.4               | LOS A            | 0.2                   | 1.4                 | 0.72         | 0.68                        | 54.7               |
| All Vehicles                    |        | 3321               | 35.0       | 0.946         | 17.5              | LOS B            | 12.6                  | 115.0               | 0.95         | 1.19                        | 49.1               |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

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 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.

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# MOVEMENT SUMMARY

 Site: 101 [Andrews Rd / Castlereagh Rd / Old Castlereagh Rd AM Dev Sce 1]

Roundabout

| Movement Performance - Vehicles |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
|---------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|-----------------------|---------------------|--------------|-----------------------------|--------------------|
| Mov ID                          | OD Mov | Demand Total veh/h | Flows HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back Vehicles veh | of Queue Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Castlereagh Rd           |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 1                               | L2     | 11                 | 35.0       | 0.719         | 8.8               | LOS A            | 6.1                   | 55.8                | 0.89         | 0.95                        | 52.8               |
| 2                               | T1     | 611                | 35.0       | 0.719         | 8.3               | LOS A            | 6.1                   | 55.8                | 0.89         | 0.96                        | 54.8               |
| 3                               | R2     | 368                | 35.0       | 0.719         | 17.8              | LOS B            | 5.5                   | 50.2                | 0.88         | 1.08                        | 50.5               |
| Approach                        |        | 989                | 35.0       | 0.719         | 11.9              | LOS B            | 6.1                   | 55.8                | 0.89         | 1.00                        | 53.0               |
| East: Andrews Rd                |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 4                               | L2     | 57                 | 35.0       | 0.920         | 26.6              | LOS C            | 10.9                  | 99.4                | 1.00         | 1.44                        | 42.8               |
| 5                               | T1     | 651                | 35.0       | 0.920         | 28.3              | LOS C            | 10.9                  | 99.4                | 0.99         | 1.43                        | 42.9               |
| 6                               | R2     | 96                 | 35.0       | 0.920         | 40.4              | LOS D            | 8.8                   | 79.8                | 0.98         | 1.40                        | 40.6               |
| Approach                        |        | 803                | 35.0       | 0.920         | 29.6              | LOS C            | 10.9                  | 99.4                | 0.99         | 1.42                        | 42.6               |
| North: Castlereagh Rd           |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 7                               | L2     | 117                | 35.0       | 0.813         | 10.2              | LOS B            | 11.2                  | 101.7               | 0.95         | 1.05                        | 52.3               |
| 8                               | T1     | 1327               | 35.0       | 0.813         | 10.4              | LOS B            | 11.2                  | 101.7               | 0.95         | 1.09                        | 54.1               |
| 9                               | R2     | 17                 | 35.0       | 0.813         | 18.9              | LOS B            | 10.5                  | 95.1                | 0.95         | 1.13                        | 53.8               |
| Approach                        |        | 1461               | 35.0       | 0.813         | 10.4              | LOS B            | 11.2                  | 101.7               | 0.95         | 1.09                        | 54.0               |
| West: Old Castlereagh Rd        |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 10                              | L2     | 15                 | 35.0       | 0.050         | 5.7               | LOS A            | 0.2                   | 2.2                 | 0.72         | 0.58                        | 54.0               |
| 11                              | T1     | 35                 | 35.0       | 0.050         | 5.6               | LOS A            | 0.2                   | 2.2                 | 0.72         | 0.64                        | 55.8               |
| 12                              | R2     | 7                  | 35.0       | 0.050         | 13.8              | LOS B            | 0.2                   | 1.9                 | 0.72         | 0.70                        | 55.4               |
| Approach                        |        | 57                 | 35.0       | 0.050         | 6.7               | LOS A            | 0.2                   | 2.2                 | 0.72         | 0.63                        | 55.3               |
| All Vehicles                    |        | 3311               | 35.0       | 0.920         | 15.5              | LOS B            | 11.2                  | 101.7               | 0.94         | 1.14                        | 50.5               |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

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 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.

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# MOVEMENT SUMMARY

 **Site: 101 [Castlereagh Rd / Lugard St PM Ex]**

Signals - Fixed Time Isolated    Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
|---------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|-----------------------|---------------------|--------------|-----------------------------|--------------------|
| Mov ID                          | OD Mov | Demand Total veh/h | Flows HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back Vehicles veh | of Queue Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Castlereagh Rd           |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 1                               | L2     | 60                 | 35.0       | 0.738         | 21.0              | LOS C            | 29.5                  | 268.1               | 0.73         | 0.69                        | 45.7               |
| 2                               | T1     | 1459               | 35.0       | 0.738         | 15.0              | LOS B            | 29.6                  | 269.5               | 0.73         | 0.68                        | 48.0               |
| Approach                        |        | 1519               | 35.0       | 0.738         | 15.2              | LOS B            | 29.6                  | 269.5               | 0.73         | 0.68                        | 47.9               |
| North: Castlereagh Rd           |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 8                               | T1     | 1267               | 35.0       | 0.520         | 5.7               | LOS A            | 14.1                  | 128.7               | 0.42         | 0.39                        | 54.8               |
| 9                               | R2     | 71                 | 35.0       | 0.408         | 24.5              | LOS C            | 2.5                   | 23.0                | 0.83         | 0.78                        | 41.3               |
| Approach                        |        | 1338               | 35.0       | 0.520         | 6.7               | LOS A            | 14.1                  | 128.7               | 0.44         | 0.41                        | 53.9               |
| West: Lugard St                 |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 10                              | L2     | 75                 | 35.0       | 0.201         | 44.5              | LOS D            | 3.5                   | 31.7                | 0.83         | 0.75                        | 33.7               |
| 12                              | R2     | 94                 | 35.0       | 0.473         | 59.7              | LOS E            | 5.3                   | 48.0                | 0.97         | 0.79                        | 29.5               |
| Approach                        |        | 168                | 35.0       | 0.473         | 53.0              | LOS D            | 5.3                   | 48.0                | 0.91         | 0.77                        | 31.2               |
| All Vehicles                    |        | 3025               | 35.0       | 0.738         | 13.6              | LOS B            | 29.6                  | 269.5               | 0.61         | 0.56                        | 48.9               |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

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

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

| Movement Performance - Pedestrians |                     |                   |                   |                  |                                      |            |              |                             |  |
|------------------------------------|---------------------|-------------------|-------------------|------------------|--------------------------------------|------------|--------------|-----------------------------|--|
| Mov ID                             | Description         | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |  |
| P3                                 | North Full Crossing | 53                | 54.3              | LOS E            | 0.2                                  | 0.2        | 0.95         | 0.95                        |  |
| P4                                 | West Full Crossing  | 53                | 11.3              | LOS B            | 0.1                                  | 0.1        | 0.43         | 0.43                        |  |
| All Pedestrians                    |                     | 105               | 32.8              | LOS D            |                                      |            | 0.69         | 0.69                        |  |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

 **Site: 101 [Castlereagh Rd / Lugard St PM Dev]**

Signals - Fixed Time Isolated    Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
|---------------------------------|--------|-----------------------|---------------|------------------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| Mov ID                          | OD Mov | Demand Total<br>veh/h | Flows HV<br>% | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| South: Castlereagh Rd           |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
| 1                               | L2     | 60                    | 35.0          | 0.767            | 23.2                 | LOS C            | 31.6                                 | 287.6         | 0.78         | 0.73                           | 44.5                  |
| 2                               | T1     | 1459                  | 35.0          | 0.767            | 17.3                 | LOS B            | 31.8                                 | 289.1         | 0.78         | 0.73                           | 46.6                  |
| Approach                        |        | 1519                  | 35.0          | 0.767            | 17.5                 | LOS B            | 31.8                                 | 289.1         | 0.78         | 0.73                           | 46.6                  |
| North: Castlereagh Rd           |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
| 8                               | T1     | 1267                  | 35.0          | 0.520            | 5.7                  | LOS A            | 14.1                                 | 128.7         | 0.42         | 0.39                           | 54.8                  |
| 9                               | R2     | 101                   | 35.0          | 0.486            | 28.9                 | LOS C            | 4.4                                  | 40.4          | 0.96         | 0.83                           | 39.3                  |
| Approach                        |        | 1368                  | 35.0          | 0.520            | 7.5                  | LOS A            | 14.1                                 | 128.7         | 0.46         | 0.42                           | 53.3                  |
| West: Lugard St                 |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
| 10                              | L2     | 105                   | 35.0          | 0.258            | 42.7                 | LOS D            | 4.8                                  | 44.0          | 0.82         | 0.77                           | 34.2                  |
| 12                              | R2     | 94                    | 35.0          | 0.473            | 59.7                 | LOS E            | 5.3                                  | 48.0          | 0.97         | 0.79                           | 29.5                  |
| Approach                        |        | 199                   | 35.0          | 0.473            | 50.7                 | LOS D            | 5.3                                  | 48.0          | 0.89         | 0.78                           | 31.8                  |
| All Vehicles                    |        | 3086                  | 35.0          | 0.767            | 15.2                 | LOS B            | 31.8                                 | 289.1         | 0.65         | 0.59                           | 47.8                  |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

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

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

| Movement Performance - Pedestrians |                     |                      |                      |                  |                                            |               |              |                                |  |
|------------------------------------|---------------------|----------------------|----------------------|------------------|--------------------------------------------|---------------|--------------|--------------------------------|--|
| Mov ID                             | Description         | Demand Flow<br>ped/h | Average Delay<br>sec | Level of Service | Average Back of Queue<br>Pedestrian<br>ped | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per ped |  |
| P3                                 | North Full Crossing | 53                   | 54.3                 | LOS E            | 0.2                                        | 0.2           | 0.95         | 0.95                           |  |
| P4                                 | West Full Crossing  | 53                   | 12.6                 | LOS B            | 0.1                                        | 0.1           | 0.46         | 0.46                           |  |
| All Pedestrians                    |                     | 105                  | 33.5                 | LOS D            |                                            |               | 0.71         | 0.71                           |  |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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# MOVEMENT SUMMARY

 **Site: 101 [Castlereagh Rd / Lugard St PM Dev - 2022]**

Signals - Fixed Time Isolated Cycle Time = 120 seconds (User-Given Cycle Time)  
Design Life Analysis (Practical Capacity): Results for 3 years

| Movement Performance - Vehicles |        |              |      |           |               |                     |                            |                        |              |                     |               |
|---------------------------------|--------|--------------|------|-----------|---------------|---------------------|----------------------------|------------------------|--------------|---------------------|---------------|
| Mov ID                          | OD Mov | Demand Flows |      | Deg. Satn | Average Delay | Level of Service    | 95% Back of Queue Vehicles | Back of Queue Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |        | Total veh/h  | HV % | v/c       | sec           |                     | veh                        | m                      |              | per veh             | km/h          |
| South: Castlereagh Rd           |        |              |      |           |               |                     |                            |                        |              |                     |               |
| 1                               | L2     | 63           | 35.0 | 0.812     | 25.5          | LOS C               | 35.8                       | 325.6                  | 0.83         | 0.79                | 43.3          |
| 2                               | T1     | 1525         | 35.0 | 0.812     | 19.5          | LOS B               | 35.9                       | 326.9                  | 0.83         | 0.78                | 45.3          |
| Approach                        |        | 1587         | 35.0 | 0.812     | 19.8          | LOS B               | 35.9                       | 326.9                  | 0.83         | 0.78                | 45.2          |
| North: Castlereagh Rd           |        |              |      |           |               |                     |                            |                        |              |                     |               |
| 8                               | T1     | 1324         | 35.0 | 0.550     | 6.4           | LOS A               | 15.8                       | 143.7                  | 0.45         | 0.41                | 54.3          |
| 9                               | R2     | 106          | 35.0 | 0.519     | 33.4          | LOS C               | 4.8                        | 43.3                   | 0.98         | 0.85                | 37.5          |
| Approach                        |        | 1430         | 35.0 | 0.550     | 8.4           | LOS A               | 15.8                       | 143.7                  | 0.49         | 0.45                | 52.6          |
| West: Lugard St                 |        |              |      |           |               |                     |                            |                        |              |                     |               |
| 10                              | L2     | 110          | 35.0 | 0.261     | 42.0          | LOS D               | 5.0                        | 45.6                   | 0.82         | 0.77                | 34.5          |
| 12                              | R2     | 98           | 35.0 | 0.465     | 58.7          | LOS E <sup>11</sup> | 5.5                        | 49.7                   | 0.96         | 0.79                | 29.8          |
| Approach                        |        | 208          | 35.0 | 0.465     | 49.8          | LOS D               | 5.5                        | 49.7                   | 0.89         | 0.78                | 32.1          |
| All Vehicles                    |        | 3225         | 35.0 | 0.812     | 16.6          | LOS B               | 35.9                       | 326.9                  | 0.68         | 0.63                | 46.9          |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

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

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

<sup>11</sup> Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.

| Movement Performance - Pedestrians |                     |             |               |                     |                                  |                        |              |                     |
|------------------------------------|---------------------|-------------|---------------|---------------------|----------------------------------|------------------------|--------------|---------------------|
| Mov ID                             | Description         | Demand Flow | Average Delay | Level of Service    | Average Back of Queue Pedestrian | Back of Queue Distance | Prop. Queued | Effective Stop Rate |
|                                    |                     | ped/h       | sec           |                     | ped                              | m                      |              | per ped             |
| P3                                 | North Full Crossing | 56          | 54.3          | LOS E <sup>12</sup> | 0.2                              | 0.2                    | 0.95         | 0.95                |
| P4                                 | West Full Crossing  | 56          | 13.1          | LOS B               | 0.1                              | 0.1                    | 0.47         | 0.47                |
| All Pedestrians                    |                     | 112         | 33.7          | LOS D               |                                  |                        | 0.71         | 0.71                |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

<sup>12</sup> Level of Service is worse than the Pedestrian Level of Service Target specified in the Parameter Settings dialog.

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# MOVEMENT SUMMARY

 **Site: 101 [Castlereagh Rd / Lugard St AM Dev - 2022]**

Signals - Fixed Time Isolated Cycle Time = 120 seconds (User-Given Cycle Time)  
Design Life Analysis (Practical Capacity): Results for 3 years

| Movement Performance - Vehicles |        |              |      |           |               |                     |                            |                        |              |                     |               |
|---------------------------------|--------|--------------|------|-----------|---------------|---------------------|----------------------------|------------------------|--------------|---------------------|---------------|
| Mov ID                          | OD Mov | Demand Flows |      | Deg. Satn | Average Delay | Level of Service    | 95% Back of Queue Vehicles | Back of Queue Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |        | Total veh/h  | HV % | v/c       | sec           |                     | veh                        | m                      |              | per veh             | km/h          |
| South: Castlereagh Rd           |        |              |      |           |               |                     |                            |                        |              |                     |               |
| 1                               | L2     | 54           | 35.0 | 0.535     | 22.6          | LOS C               | 17.2                       | 156.9                  | 0.66         | 0.62                | 44.7          |
| 2                               | T1     | 920          | 35.0 | 0.535     | 16.7          | LOS B               | 17.4                       | 158.0                  | 0.66         | 0.60                | 47.0          |
| Approach                        |        | 973          | 35.0 | 0.535     | 17.0          | LOS B               | 17.4                       | 158.0                  | 0.66         | 0.60                | 46.8          |
| North: Castlereagh Rd           |        |              |      |           |               |                     |                            |                        |              |                     |               |
| 8                               | T1     | 1917         | 35.0 | 0.831     | 9.8           | LOS A               | 37.7                       | 343.0                  | 0.67         | 0.63                | 51.7          |
| 9                               | R2     | 106          | 35.0 | 0.312     | 15.6          | LOS B               | 2.2                        | 20.1                   | 0.62         | 0.74                | 45.9          |
| Approach                        |        | 2023         | 35.0 | 0.831     | 10.1          | LOS B               | 37.7                       | 343.0                  | 0.67         | 0.64                | 51.3          |
| West: Lugard St                 |        |              |      |           |               |                     |                            |                        |              |                     |               |
| 10                              | L2     | 61           | 35.0 | 0.125     | 36.5          | LOS D               | 2.5                        | 22.6                   | 0.74         | 0.73                | 36.3          |
| 12                              | R2     | 65           | 35.0 | 0.308     | 57.3          | LOS E <sup>11</sup> | 3.5                        | 32.0                   | 0.94         | 0.76                | 30.1          |
| Approach                        |        | 125          | 35.0 | 0.308     | 47.3          | LOS D               | 3.5                        | 32.0                   | 0.84         | 0.75                | 32.8          |
| All Vehicles                    |        | 3122         | 35.0 | 0.831     | 13.8          | LOS B               | 37.7                       | 343.0                  | 0.67         | 0.63                | 48.8          |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

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

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

<sup>11</sup> Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.

| Movement Performance - Pedestrians |                     |             |               |                     |                       |                        |              |                     |  |
|------------------------------------|---------------------|-------------|---------------|---------------------|-----------------------|------------------------|--------------|---------------------|--|
| Mov ID                             | Description         | Demand Flow | Average Delay | Level of Service    | Average Back of Queue | Back of Queue Distance | Prop. Queued | Effective Stop Rate |  |
|                                    |                     | ped/h       | sec           |                     | Pedestrian ped        | m                      |              | per ped             |  |
| P3                                 | North Full Crossing | 56          | 54.3          | LOS E <sup>12</sup> | 0.2                   | 0.2                    | 0.95         | 0.95                |  |
| P4                                 | West Full Crossing  | 56          | 15.5          | LOS B               | 0.1                   | 0.1                    | 0.51         | 0.51                |  |
| All Pedestrians                    |                     | 112         | 34.9          | LOS D               |                       |                        | 0.73         | 0.73                |  |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

<sup>12</sup> Level of Service is worse than the Pedestrian Level of Service Target specified in the Parameter Settings dialog.

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# MOVEMENT SUMMARY

 **Site: 101 [Castlereagh Rd / Lugard St AM Ex]**

Signals - Fixed Time Isolated Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
|---------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|-----------------------|---------------------|--------------|-----------------------------|--------------------|
| Mov ID                          | OD Mov | Demand Total veh/h | Flows HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back Vehicles veh | of Queue Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Castlereagh Rd           |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 1                               | L2     | 52                 | 25.0       | 0.452         | 18.8              | LOS B            | 14.2                  | 120.9               | 0.57         | 0.54                        | 47.1               |
| 2                               | T1     | 880                | 25.0       | 0.452         | 13.0              | LOS B            | 14.3                  | 121.7               | 0.57         | 0.53                        | 49.3               |
| Approach                        |        | 932                | 25.0       | 0.452         | 13.3              | LOS B            | 14.3                  | 121.7               | 0.57         | 0.53                        | 49.2               |
| North: Castlereagh Rd           |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 8                               | T1     | 1835               | 25.0       | 0.735         | 7.6               | LOS A            | 29.1                  | 247.3               | 0.56         | 0.53                        | 53.3               |
| 9                               | R2     | 71                 | 25.0       | 0.200         | 12.7              | LOS B            | 1.1                   | 9.0                 | 0.50         | 0.69                        | 47.8               |
| Approach                        |        | 1905               | 25.0       | 0.735         | 7.8               | LOS A            | 29.1                  | 247.3               | 0.56         | 0.53                        | 53.1               |
| West: Lugard St                 |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 10                              | L2     | 27                 | 25.0       | 0.061         | 39.4              | LOS D            | 1.2                   | 9.9                 | 0.76         | 0.70                        | 35.5               |
| 12                              | R2     | 62                 | 25.0       | 0.296         | 57.9              | LOS E            | 3.4                   | 28.7                | 0.94         | 0.76                        | 30.1               |
| Approach                        |        | 89                 | 25.0       | 0.296         | 52.2              | LOS D            | 3.4                   | 28.7                | 0.89         | 0.74                        | 31.5               |
| All Vehicles                    |        | 2926               | 25.0       | 0.735         | 10.9              | LOS B            | 29.1                  | 247.3               | 0.57         | 0.54                        | 50.7               |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

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

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

| Movement Performance - Pedestrians |                     |                   |                   |                  |                                      |            |              |                             |  |
|------------------------------------|---------------------|-------------------|-------------------|------------------|--------------------------------------|------------|--------------|-----------------------------|--|
| Mov ID                             | Description         | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |  |
| P3                                 | North Full Crossing | 53                | 54.3              | LOS E            | 0.2                                  | 0.2        | 0.95         | 0.95                        |  |
| P4                                 | West Full Crossing  | 53                | 13.1              | LOS B            | 0.1                                  | 0.1        | 0.47         | 0.47                        |  |
| All Pedestrians                    |                     | 105               | 33.7              | LOS D            |                                      |            | 0.71         | 0.71                        |  |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

 **Site: 101 [Castlereagh Rd / Lugard St AM Dev]**

Signals - Fixed Time Isolated    Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
|---------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|-----------------------|---------------------|--------------|-----------------------------|--------------------|
| Mov ID                          | OD Mov | Demand Total veh/h | Flows HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back Vehicles veh | of Queue Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Castlereagh Rd           |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 1                               | L2     | 52                 | 25.0       | 0.478         | 21.2              | LOS C            | 15.5                  | 131.6               | 0.62         | 0.58                        | 45.7               |
| 2                               | T1     | 880                | 25.0       | 0.478         | 15.3              | LOS B            | 15.6                  | 132.5               | 0.62         | 0.57                        | 47.8               |
| Approach                        |        | 932                | 25.0       | 0.478         | 15.7              | LOS B            | 15.6                  | 132.5               | 0.62         | 0.57                        | 47.6               |
| North: Castlereagh Rd           |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 8                               | T1     | 1835               | 25.0       | 0.745         | 7.7               | LOS A            | 29.9                  | 254.6               | 0.56         | 0.53                        | 53.3               |
| 9                               | R2     | 101                | 25.0       | 0.259         | 13.6              | LOS B            | 1.7                   | 14.6                | 0.55         | 0.71                        | 47.3               |
| Approach                        |        | 1936               | 25.0       | 0.745         | 8.0               | LOS A            | 29.9                  | 254.6               | 0.56         | 0.54                        | 52.9               |
| West: Lugard St                 |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 10                              | L2     | 58                 | 25.0       | 0.116         | 37.0              | LOS D            | 2.4                   | 20.3                | 0.74         | 0.73                        | 36.3               |
| 12                              | R2     | 62                 | 25.0       | 0.296         | 57.9              | LOS E            | 3.4                   | 28.7                | 0.94         | 0.76                        | 30.1               |
| Approach                        |        | 120                | 25.0       | 0.296         | 47.8              | LOS D            | 3.4                   | 28.7                | 0.85         | 0.74                        | 32.8               |
| All Vehicles                    |        | 2987               | 25.0       | 0.745         | 12.0              | LOS B            | 29.9                  | 254.6               | 0.59         | 0.56                        | 50.0               |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

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

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

| Movement Performance - Pedestrians |                     |                   |                   |                  |                                      |            |              |                             |  |
|------------------------------------|---------------------|-------------------|-------------------|------------------|--------------------------------------|------------|--------------|-----------------------------|--|
| Mov ID                             | Description         | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |  |
| P3                                 | North Full Crossing | 53                | 54.3              | LOS E            | 0.2                                  | 0.2        | 0.95         | 0.95                        |  |
| P4                                 | West Full Crossing  | 53                | 15.0              | LOS B            | 0.1                                  | 0.1        | 0.50         | 0.50                        |  |
| All Pedestrians                    |                     | 105               | 34.7              | LOS D            |                                      |            | 0.73         | 0.73                        |  |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

▽ Site: 101 [Old Castlereagh Rd / Access PM Dev]

Giveway / Yield (Two-Way)

| Movement Performance - Vehicles |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
|---------------------------------|--------|-----------------------|---------------|------------------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| Mov ID                          | OD Mov | Demand Total<br>veh/h | Flows HV<br>% | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| South: Access                   |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
| 3                               | R2     | 31                    | 100.0         | 0.049            | 8.1                  | LOS A            | 0.2                                  | 2.0           | 0.36         | 0.64                           | 49.5                  |
| Approach                        |        | 31                    | 100.0         | 0.049            | 8.1                  | LOS A            | 0.2                                  | 2.0           | 0.36         | 0.64                           | 49.5                  |
| East: Old Castlereagh Rd        |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
| 4                               | L2     | 31                    | 100.0         | 0.073            | 6.1                  | LOS A            | 0.0                                  | 0.0           | 0.00         | 0.27                           | 54.1                  |
| 5                               | T1     | 72                    | 35.0          | 0.073            | 0.0                  | LOS A            | 0.0                                  | 0.0           | 0.00         | 0.27                           | 57.9                  |
| Approach                        |        | 102                   | 54.4          | 0.073            | 2.8                  | NA               | 0.0                                  | 0.0           | 0.00         | 0.27                           | 56.7                  |
| West: Old Castlereagh Rd        |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
| 11                              | T1     | 113                   | 35.0          | 0.071            | 0.0                  | LOS A            | 0.0                                  | 0.0           | 0.00         | 0.00                           | 60.0                  |
| Approach                        |        | 113                   | 35.0          | 0.071            | 0.0                  | NA               | 0.0                                  | 0.0           | 0.00         | 0.00                           | 60.0                  |
| All Vehicles                    |        | 245                   | 51.2          | 0.073            | 1.8                  | NA               | 0.2                                  | 2.0           | 0.04         | 0.19                           | 57.1                  |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

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

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

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

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

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

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# MOVEMENT SUMMARY

▽ Site: 101 [Old Castlereagh Rd / Access PM Dev - 2022]

Giveway / Yield (Two-Way)

Design Life Analysis (Practical Capacity): Results for 3 years

| Movement Performance - Vehicles |        |              |       |           |               |                  |                            |                   |              |                     |               |
|---------------------------------|--------|--------------|-------|-----------|---------------|------------------|----------------------------|-------------------|--------------|---------------------|---------------|
| Mov ID                          | OD Mov | Demand Flows |       | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | of Queue Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |        | Total veh/h  | HV %  | v/c       | sec           |                  | veh                        | m                 |              | per veh             | km/h          |
| South: Access                   |        |              |       |           |               |                  |                            |                   |              |                     |               |
| 3                               | R2     | 32           | 100.0 | 0.052     | 8.2           | LOS A            | 0.2                        | 2.2               | 0.37         | 0.65                | 49.5          |
| Approach                        |        | 32           | 100.0 | 0.052     | 8.2           | LOS A            | 0.2                        | 2.2               | 0.37         | 0.65                | 49.5          |
| East: Old Castlereagh Rd        |        |              |       |           |               |                  |                            |                   |              |                     |               |
| 4                               | L2     | 32           | 100.0 | 0.077     | 6.1           | LOS A            | 0.0                        | 0.0               | 0.00         | 0.27                | 54.1          |
| 5                               | T1     | 75           | 35.0  | 0.077     | 0.0           | LOS A            | 0.0                        | 0.0               | 0.00         | 0.27                | 57.9          |
| Approach                        |        | 107          | 54.4  | 0.077     | 2.8           | NA               | 0.0                        | 0.0               | 0.00         | 0.27                | 56.7          |
| West: Old Castlereagh Rd        |        |              |       |           |               |                  |                            |                   |              |                     |               |
| 11                              | T1     | 118          | 35.0  | 0.074     | 0.0           | LOS A            | 0.0                        | 0.0               | 0.00         | 0.00                | 60.0          |
| Approach                        |        | 118          | 35.0  | 0.074     | 0.0           | NA               | 0.0                        | 0.0               | 0.00         | 0.00                | 60.0          |
| All Vehicles                    |        | 256          | 51.2  | 0.077     | 1.8           | NA               | 0.2                        | 2.2               | 0.05         | 0.19                | 57.1          |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

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

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

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

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

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

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# MOVEMENT SUMMARY

▽ Site: 101 [Old Castlereagh Rd / Access AM Dev]

Giveway / Yield (Two-Way)

| Movement Performance - Vehicles |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
|---------------------------------|--------|-----------------------|---------------|------------------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| Mov ID                          | OD Mov | Demand Total<br>veh/h | Flows HV<br>% | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| South: Access                   |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
| 3                               | R2     | 31                    | 100.0         | 0.050            | 8.3                  | LOS A            | 0.2                                  | 2.1           | 0.37         | 0.65                           | 49.4                  |
| Approach                        |        | 31                    | 100.0         | 0.050            | 8.3                  | LOS A            | 0.2                                  | 2.1           | 0.37         | 0.65                           | 49.4                  |
| East: Old Castlereagh Rd        |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
| 4                               | L2     | 31                    | 100.0         | 0.095            | 6.1                  | LOS A            | 0.0                                  | 0.0           | 0.00         | 0.21                           | 54.5                  |
| 5                               | T1     | 106                   | 35.0          | 0.095            | 0.0                  | LOS A            | 0.0                                  | 0.0           | 0.00         | 0.21                           | 58.3                  |
| Approach                        |        | 137                   | 49.5          | 0.095            | 2.2                  | NA               | 0.0                                  | 0.0           | 0.00         | 0.21                           | 57.4                  |
| West: Old Castlereagh Rd        |        |                       |               |                  |                      |                  |                                      |               |              |                                |                       |
| 11                              | T1     | 92                    | 35.0          | 0.058            | 0.0                  | LOS A            | 0.0                                  | 0.0           | 0.00         | 0.00                           | 60.0                  |
| Approach                        |        | 92                    | 35.0          | 0.058            | 0.0                  | NA               | 0.0                                  | 0.0           | 0.00         | 0.00                           | 60.0                  |
| All Vehicles                    |        | 259                   | 50.3          | 0.095            | 1.7                  | NA               | 0.2                                  | 2.1           | 0.04         | 0.19                           | 57.2                  |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

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

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

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

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

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

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# MOVEMENT SUMMARY

▽ Site: 101 [Old Castlereagh Rd / Access AM Dev - 2022]

Giveway / Yield (Two-Way)

Design Life Analysis (Practical Capacity): Results for 3 years

| Movement Performance - Vehicles |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
|---------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|-----------------------|---------------------|--------------|-----------------------------|--------------------|
| Mov ID                          | OD Mov | Demand Total veh/h | Flows HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back Vehicles veh | of Queue Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Access                   |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 3                               | R2     | 32                 | 100.0      | 0.053         | 8.4               | LOS A            | 0.2                   | 2.2                 | 0.38         | 0.66                        | 49.3               |
| Approach                        |        | 32                 | 100.0      | 0.053         | 8.4               | LOS A            | 0.2                   | 2.2                 | 0.38         | 0.66                        | 49.3               |
| East: Old Castlereagh Rd        |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 4                               | L2     | 32                 | 100.0      | 0.099         | 6.1               | LOS A            | 0.0                   | 0.0                 | 0.00         | 0.21                        | 54.5               |
| 5                               | T1     | 111                | 35.0       | 0.099         | 0.0               | LOS A            | 0.0                   | 0.0                 | 0.00         | 0.21                        | 58.3               |
| Approach                        |        | 143                | 49.5       | 0.099         | 2.2               | NA               | 0.0                   | 0.0                 | 0.00         | 0.21                        | 57.4               |
| West: Old Castlereagh Rd        |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 11                              | T1     | 96                 | 35.0       | 0.060         | 0.0               | LOS A            | 0.0                   | 0.0                 | 0.00         | 0.00                        | 60.0               |
| Approach                        |        | 96                 | 35.0       | 0.060         | 0.0               | NA               | 0.0                   | 0.0                 | 0.00         | 0.00                        | 60.0               |
| All Vehicles                    |        | 271                | 50.3       | 0.099         | 1.7               | NA               | 0.2                   | 2.2                 | 0.05         | 0.19                        | 57.2               |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

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

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

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

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

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

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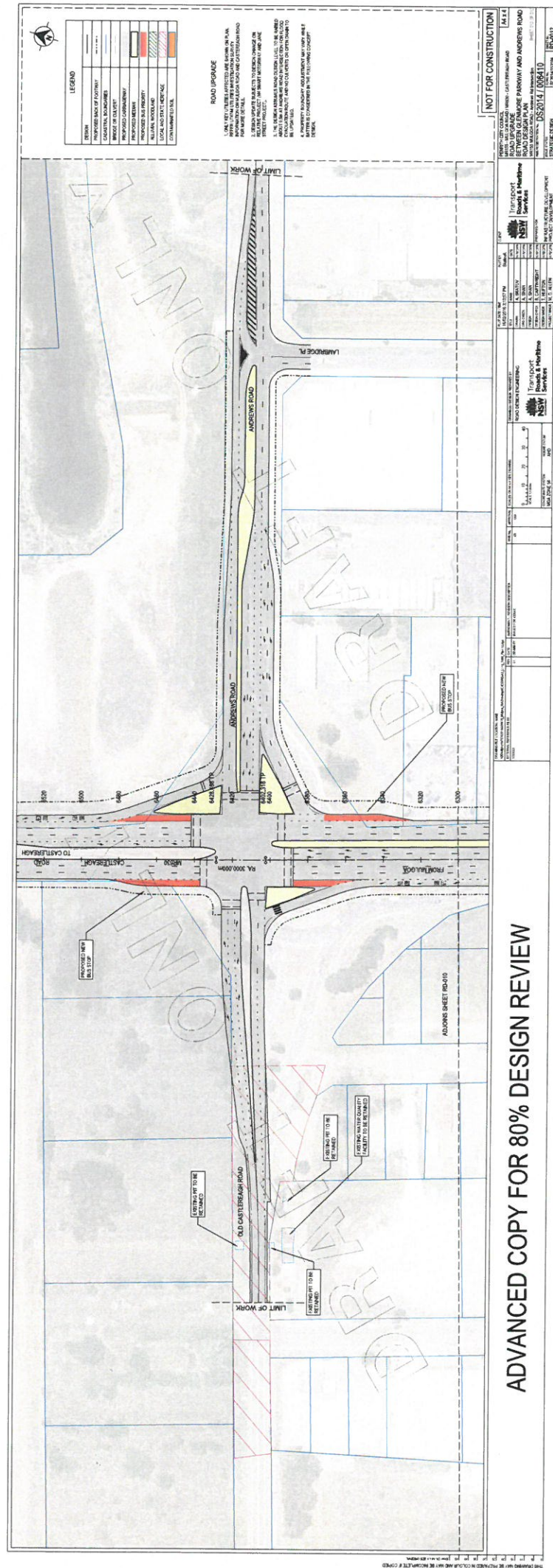
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## **APPENDIX D**

### **CONCEPT DESIGN FOR ROAD UPGRADE**







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