MODUS
Transport and Traffic Engineering

Technical Memorandum

To	Precise Planning	Date	20 February 2025
Prepared by	Afaf El Harda, Modus Traffic and Transport Engineer	Approved by	Tetteh Anang, Modus Senior Traffic Engineer
Location	39 Redground Road, Crookwell		
Subject	Proposed Residential Development - Traffic Engineering Report		
Status	Final	Attachments	**Appendix A**: Development Plans **Appendix B:** Swept Path Assessment **Appendix C:** Traffic Survey **Appendix D:** Network Flow Diagram **Appendix E:** SIDRA Results

1 Introduction

1.1 Overview

Modus has been commissioned by Precise Planning, to provide traffic and transport advice in relation to the proposed residential subdivision located at 39 Redground Road, Crookwell.

This technical memorandum has been produced by Modus to assess the traffic and transport engineering items in support of the proposed Residential Subdivision development.

1.2 Limitations

Modus has completed this traffic report in accordance with the usual care and thoroughness of the consulting profession. The assessment is based on accepted traffic engineering practises and standards applicable at the time of undertaking the assessment. Modus disclaims responsibility for any changes to project planning or road conditions that may occur after completion of the assessment.

2 Existing Situation

2.1 Site Location

The development site is located at 39 Redground Road, Crookwell. The site is bounded by low density residential to the north and south, vegetation to the east, west and south, and Redground Road to the east.

The site is identified within the Council Planning Scheme as a Primary Production (RU1) zone. The site is surrounded by similar zones to the north, south and west, and a low-density residential (R2) zone to the east.

The site location is shown on Figure 2-1.

Figure 2-1 Site Location

Source: Nearmap

2.2 Existing Site Use

The lot is currently occupied by a residential dwelling.

2.3 Existing Road Network

Table 2-1 outlines characteristics of the existing road network in the immediate proximity of the proposed development site.

Table 2-1 Key Road Characteristics

Road	Hierarchy	Speed Limit	Typical Form
Redground Road	Local Road	50km/hr	Two lanes, undivided
North Street	Local Road	50km/hr*	Two lanes, undivided
Gordon Road	Local Road	50km/hr*	Two lanes, undivided,
Soudan Road	Local Road	50km/hr*	Two lanes, undivided
Wolseley Road	Local Road	50km/hr*	Two lanes, undivided

*Note: 50km/hr on unsigned roads

2.4 Public Transport Facilities

The development site is located within a 400m radius (comfortable 5-minute walk) of three (3) Transport for NSW bus stops located along North Street, Soudan Road, and Wolseley Street. These bus stops serve school buses.

The nearest bus stop is located within less than 100m walking distance along North Street. This bus stop serves bus route S746 and operates from Monday to Friday. The morning schedules runs from 08:20AM to 08:50AM and the evening schedule runs from 15:18PM 15:42PM.

Only school bus routes are serviced in the vicinity of the proposed development.

2.5 Active Transport Facilities

There are no off-road active transport facilities within close proximity to the proposed development.

Furthermore, there are no dedicated on-street cycle lanes in the vicinity of the site.

3 Proposed Development

3.1 Overview

The development proposes to reconfigure one lot into 21 residential allotments. The development is expected to provide an on-site parking arrangement for residents.

The proposed site plan is illustrated on Figure 3-1. A copy of the development plans can be found at **Appendix A**.

Figure 3-1 Proposed Development

Source: CIVPlan, Drawing Number 23017-041, Revision P0

3.2 Development Access

Access to the development is proposed via two (2) connections to the local road network. Three (3) local internal roads are proposed as part of the proposed development. The proposed roads are connected to Redground Road to the east.

4 Design Considerations

4.1 Relevant Standards

Review of the layout of the proposed development layout has been conducted in adherence to the relevant standards and guidelines, these include:

- Upper Chalan Shire Council Planning Scheme Development Control Plan
- Western Sydney Street Design Guidelines
- Austroads Guide to Road Design
- Austroads Guide to Traffic Management
- Australian Standards, AS2890.1:2004 Parking Facilities Part 1: Off-Street Car Parking, 2004 (AS2890.1)
- Australian Standards, AS2890.2:2004 Parking Facilities Part 2: Off-Street Commercial Vehicle Facilities, 2002 (AS2890.2)
- Roads and Traffic Authority, Guide to Traffic Generating Developments, 2024, (RTA GTGD)
- Roads and Traffic Authority, Guide to Traffic Generating Developments, 2002, (RTA GTGD)

4.2 Overview

The residential development proposes to provide access to the external road network through a new connection to Redground Road.

4.2.1 Road Hierarchy

The development proposes local roads, in accordance with the surrounding road network. This is based on the number of lots that will be servicing each proposed road.

4.2.2 Internal Road Layout

The proposed new roads are provided with 5.0m-7.5m carriageways, and 11.0m-20.1m road reserves, consisting of two (2) travel lanes. This arrangement complies with the Local Street types 1 and 2 outlined in the Western Sydney Street Design Guidelines.

Table 4-1 Internal Road Design

Road	Road carriageway	Road reserve	Number of lots serviced
Northern road	7.1m	20.1m	9 lots
Western road	7.5m	20.1m	2 lots
Southern road	5.0m	11.0m	9 lots

All proposed new roads except for the southern road adjacent to the boundary are provided with a 20m road reserve, including a 7.1m carriageway generally consisting of two (2) travel lanes. This arrangement complies with the Local Street types 1 & 2, and a local collector road outlined in the Western Sydney Street Design Guidelines. The northern road is provided with a 11m road reserve, including a 5.05m carriageway. It is expected that as part of any future development to the south, the additional 9m road reserve will be provided to increase the total road reserve to 20m. This will ensure that the proposed road to the south complies with the standard drawing requirements.

4.2.3 Intersection Spacing

It is noted that there is no guidance available within the Council DCP or Western Sydney Street Design Guidelines. As such, Modus has referred to the Austroads requirements and existing provisions within the surrounding residential catchment.

The minimum spacing between intersections is generally 60m. The proposed development provides an intersection separation of 83m and is therefore considered suitable.

4.2.4 Street Length / Speed Control

In accordance with the Western Sydney Street Design Guidelines, traffic calming is required for local streets. Spacing of speed control devices (i.e. speed humps, chicanes etc) should not be less than 80m and generally not more than 120m to 150m.

It is recommended that two (2) traffic calming devices on the northern and southern internal roads i.e. speed humps are provided in the detailed design phase.

4.2.5 Sight Distance

The sight distance for each lot will be reviewed in accordance with AS2890.1 during the detailed design phase. The minimum requirement for a 50km/hr design speed is 40m.

4.2.6 Dwelling Access

The dwelling access will be provided and reviewed during the detailed design phase in accordance with AS2890.1. Driveway separation between each lot is required to be 1-3m.

Additionally, access is prohibited within 6m of the tangent point of an intersection.

4.3 Servicing Arrangements

4.3.1 Design Vehicle Requirement

As the proposed development is a residential use for low density residential, the minimum design vehicle required for furniture delivery and refuse servicing are as follows:

- Heavy Rigid Vehicle (HRV)
- Side Loading Refuse Collection Vehicle (RCV)
- Fire Truck (MRV)

4.3.2 Swept Path Assessment

A swept path assessment has been undertaken for the largest design vehicle anticipated on site (HRV). The swept paths indicate that the HRV can enter and exit the proposed development safely and efficiently. The HRV swept paths can be found in **Appendix B.**

5 Traffic Generation

5.1 Adopted Traffic Generation Rates

In order to determine the traffic demand of development, reference has been made to the RTA GTGD (2024) for low density residential land use with similar geographic locations and peak periods. Table 5-1 summarises the adopted trip generation rates for the land use.

Table 5-1 Adopted Generation Rates

Land Use	Yield	Trip Generation Rates			Trip Generation			Source
		AM Peak Hour	AM Peak Hour	Daily	Peak Hour	Peak Hour	Daily	
Residential Subdivision	21 dwellings	0.83 vph/ dwelling	0.84 vph/ dwelling	7.53 vpd/ dwelling	18 vph	18 vph	159 vph	RTA
Proposed Total					**18 vph**	**18 vph**	**159 vpd**	

5.2 Trip Distribution

Table 5-2 and Table 5-3 shows the peak hour traffic directional distribution and the resulting directional trips for the proposed development.

Table 5-2 Directional Distribution

Land Use	AM		PM	
	IN	OUT	IN	OUT
Residential Subdivision	30%	70%	60%	40%

Table 5-3 Directional Trips

Land Use	AM		PM	
	IN	OUT	IN	OUT
Residential Subdivision	6 vph	13 vph	11 vph	8 vph
TOTAL PEAK TRAFFIC	18 vph		18 vph	

As indicated in Table 5-3, the proposed development is anticipated to generate in the order of 18 vph in the AM and PM peak.

5.3 External Directional Trip Distribution

The external directional trip distribution has been adopted based on the surrounding area and trip attractors. Therefore, the external directional trip distributions for inbound and outbound movements in both the AM and PM peak periods are as follows:

- Southbound: 90%

- Northbound: 10%

5.4 Environmental Capacity

To understand whether the external road network is suitable for the development, an environmental capacity assessment has been undertaken for Redground Road. Reference has been made to the traffic generation outlined in the RTA GTGD (2024) for low density residential land use.

5.4.3 Redground Road

In order to determine the anticipated traffic generation on Redground Road, the existing and proposed traffic generation has been estimated in Table 5-4. For the purposes of this assessment, a conservative estimate of 50% has been applied to the proposed development traffic generation to travel west/north of the site.

Table 5-4 Gwynn Hughes Street Traffic Generation

Land Use	Yield	Daily Trip Generation Rate	Daily Trip Generation
Existing Residential Catchment	31 dwellings	7.53 vpd per dwelling	234 vpd
Proposed Residential Catchment	21 dwellings		159 vpd
Total	52 dwellings	-	393 vpd

The results in Table 5-4 outline the daily generation is anticipated to be 393vpd, which is expected to be accommodated within the network capacity of a local road.

Additionally, to assess any potential future road upgrades, Modus has referred to Table 4.5 of the Austroads Guide to Road Design (Part 3 – Geometric Design), which outlines the carriageway widths for rural roads. For a threshold of 150-500vpd, the carriageway is required to have a minimum traffic lane width of 6.2m.

An aerial review of the existing Redground Road carriageway has been undertaken and indicates that the minimum traffic lane for the carriageway is approximately 5.3m, however, the typical carriageway width is 6.2m, and only a small section of the street that's below the width of 6.2m.

Additionally, Modus has referred to section 7.2.1 of Roads and Traffic Authority, Guide to Traffic Generating Developments, 2002, (RTA GTGD), which outlines that a 3 to 3.5m wide carriageway is best suited to an average of less than 100 houses. There are only 52 dwellings including the proposed development along Redground Road.

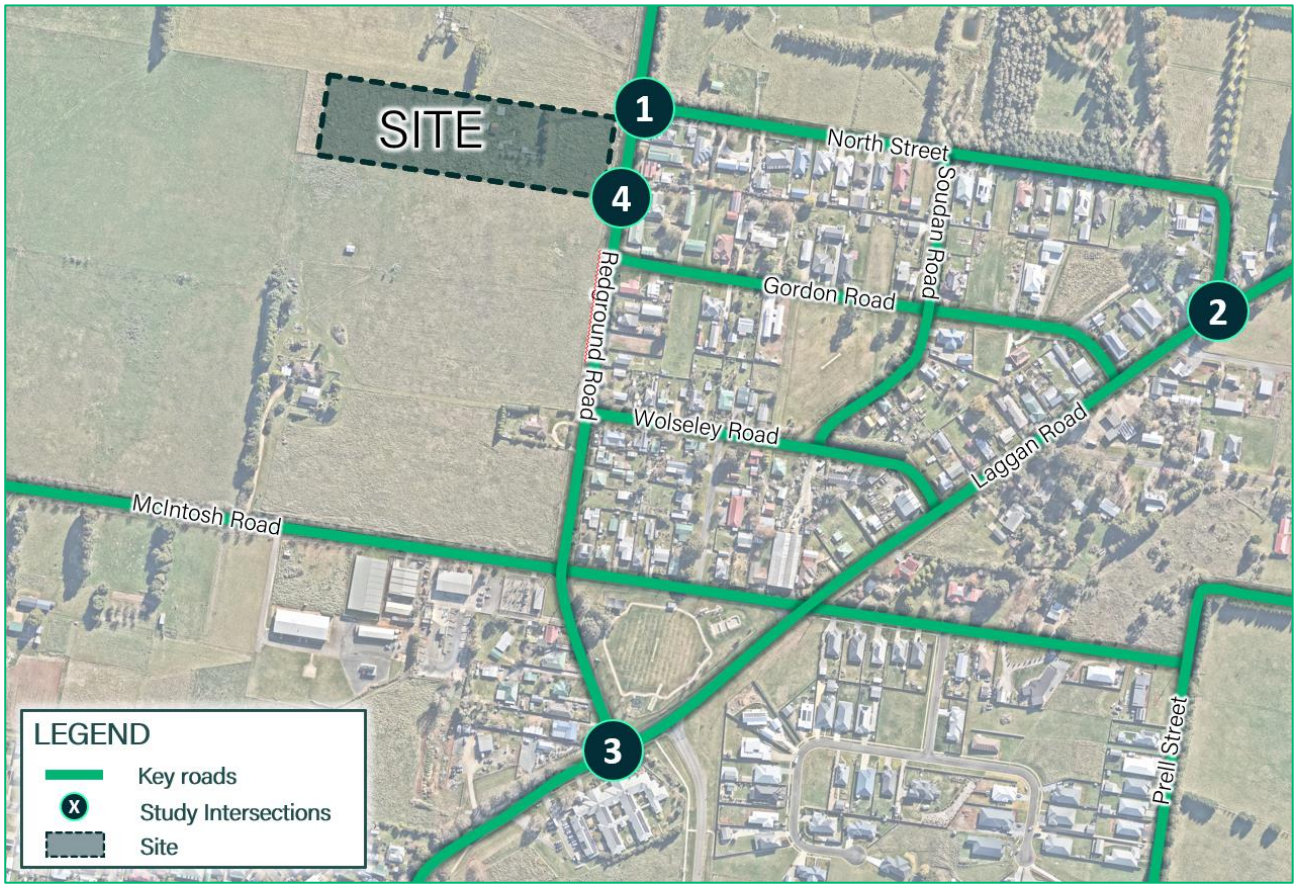
Therefore, the existing road network is suitable to accommodate the anticipated developed traffic and no additional road widening / upgrades are required.

6 Traffic Assumptions and Characteristics

6.1 Study Intersections

The study intersections are illustrated in Figure 6-1 and further detail is provided below in Table 6-1.

Figure 6-1 Study Intersections



Source: Nearmap

Table 6-1 Existing Arrangements of Study Intersections

Study Intersection ID	Study Intersection	Control
1	Redground Road / North Street	Priority Controlled
2	Laggan Road / Clifton Street	Priority Controlled
3	Laggan Road / Broderick Street	Priority Controlled
4	Redground Road / Southern Access	Priority Controlled

6.2 Background Traffic Volumes

To understand the existing traffic conditions along the surrounding road network, traffic counts were undertaken on Tuesday 11th of February 2025 at the following intersections:

- Redground Road / North Street
- Laggan Road / Broderick Street
- Laggan Road / Clifton Street

The network peak period has been summarised in Table 6-2. A copy of the traffic survey data is enclosed in **Appendix B**.

Table 6-2 Peak Periods

Study Intersection ID	Peak Periods	
	AM	PM
1-3	8:00 AM – 9:00 AM	3:15 PM – 4:15 PM

7 Traffic Assessment Criteria

7.1 Assessment Scenarios

In accordance with the RTA GTGD, for smaller scale developments, the impact assessment year for the site assessed should be the current year and the year of opening.

On this basis, Modus has assumed that the development year of opening is 2026. Table 7-1 summarises the impact assessment scenarios.

Table 7-1 Assessment Scenarios

Impact Assessment Scenario	Study Intersections
2025 BG (Current Year)	All
2026 BG (Year of opening)	All
2026 BG + Dev (Year of opening)	All

Note: BG = Background, Dev = Development Traffic

7.2 Assessment Criteria

7.2.4 Level of Service

The RTA GTGD recognises the intersection level of service as a greater indicator of intersection performance in comparison to the previous RTA *Guide to Traffic Generating Developments*, significance on the degree of saturation (DOS). For priority-controlled intersections, the level of service thresholds are outlined in Table 7-2. It is noted that typically levels of service that are D or E indicate that the intersection has either reached or exceed practical capacity.

Table 7-2 Adopted Intersection Performance Threshold – Degree of Saturation

Level of Service	Average delay per vehicles (secs/veh)
A	<14
B	15 to 28
C	29 to 42
D	43 to 56
E	57 to 70

7.2.5 Intersection Degree of Saturation

The performance of each study intersection has been analysed using SIDRA Intersection 9.1 (SIDRA). SIDRA is the primary industry modelling software that estimates the capacity and performance of

intersections SIDRA analyses an intersection's Degree of Saturation (DOS), queues and delays. DOS is a measure of the proportion of traffic entering an intersection relative to the intersection's capacity.

Table 7-3 Adopted Intersection Performance Threshold – Degree of Saturation

Intersection Treatment	DOS Threshold
Priority Controlled	Less than or equal to 0.80

If DOS exceeds the values in Table 7-3 this indicates the intersection is nearing its practical capacity and upgrade works may be required. Above these threshold values, users of the intersection are likely to experience increasing delays and queueing.

7.2.6 Intersection Queue Lengths

The 95th percentile queue relates to the queue length which 95% of all observed queue lengths during the assessment hour fall under, or in other terms, the length which 5% of all observed queues exceed. This provides an indication of the maximum queue length which should be designed for such that upstream lanes are not adversely impacted.

8 SIDRA Assessment

8.1 Intersection 1A: Existing Redground Road / North Street

The existing intersection of Redground Road / North Street is a priority controlled intersection as shown in Figure 8-1. Results from the SIDRA analysis is summarised in Table 8-1 and **Appendix B**.

Figure 8-1 Redground Road / North Street Intersection - SIDRA Layout

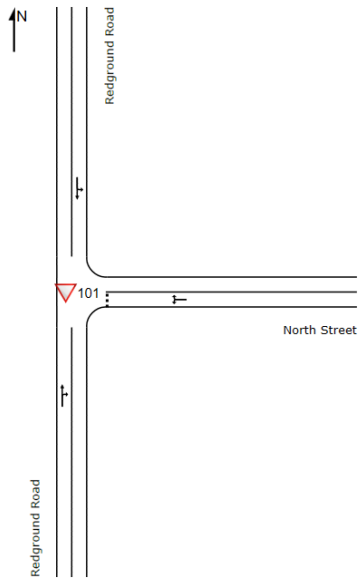
Existing form	Existing form SIDRA
	

Table 8-1 Redground Road / North Street Intersection - SIDRA Analysis Summary

Scenario	DOS	Critical Delay	95th %ile Queue	LOS
AM Peak				
2025 BG	0.0115	6.7 sec	0.2m	A
2026 BG	0.016	6.7 sec	0.2m	A
PM Peak				
2025 BG	0.015	6.2 sec	0.2m	A
2026 BG	0.016	6.2 sec	0.2m	A

The results presented in Table 8-1 above suggest that the intersection is within acceptable performance thresholds for a priority controlled intersection (LOS≥D) in all assessment scenarios. Additionally, the proposed development does not significantly impact delays or queuing.

8.2 Intersection 1B: Proposed Redground Road / North Street

The existing intersection of Redground Road / North Street is a priority controlled intersection as shown in Figure 8-1. Results from the SIDRA analysis is summarised in Table 8-2 and **Appendix B**.

Figure 8-2 Redground Road / North Street Intersection - SIDRA Layout

Proposed form

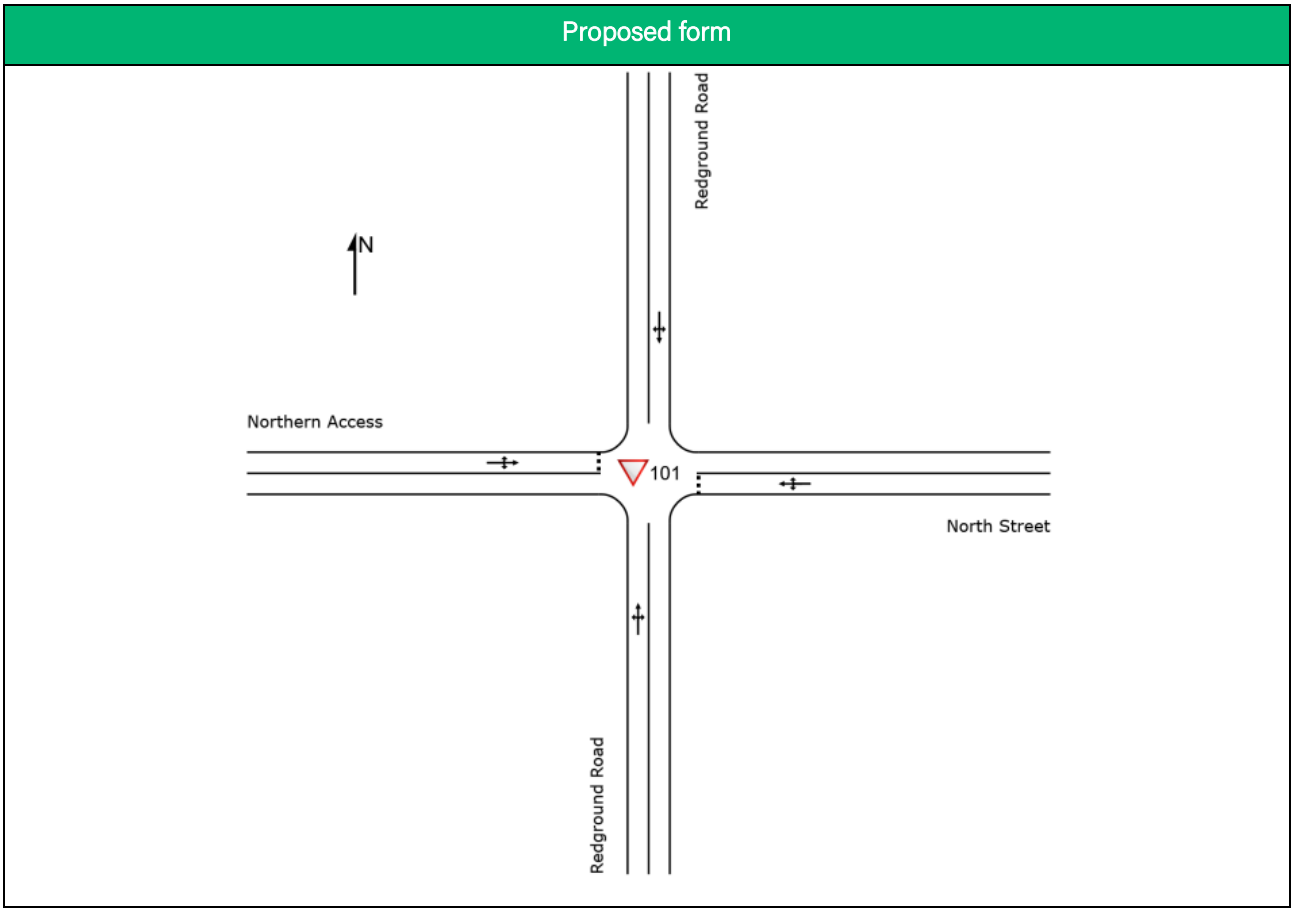


Table 8-2 Redground Road / North Street Intersection - SIDRA Analysis Summary

Scenario	DOS	Critical Delay	95th %ile Queue	LOS
AM Peak				
2026 BG + Dev	0.016	5.8 sec	0.3m	A
PM Peak				
2026 BG + Dev	0.019	6.4 sec	0.3m	A

The results presented in Table 8-2 above suggest that the intersection is within acceptable performance thresholds for a priority controlled intersection (LOS≥D) in all assessment scenarios. Additionally, the observed queuing and delay are minimal.

8.3 Intersection 2: Laggan Road / Clifton Street

The existing intersection of Laggan Road / Clifton Street is a priority controlled intersection as shown in Figure 8-3. Results from the SIDRA analysis is summarised in Table 8-3 and **Appendix B**.

Figure 8-3 Laggan Road / Clifton Street Intersection - SIDRA Layout

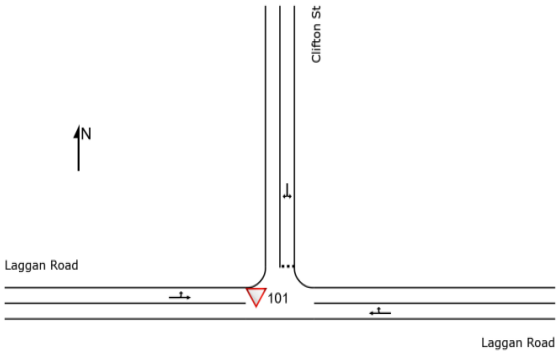
Existing form	Existing form SIDRA
	

Table 8-3 Laggan Road / Clifton Street Intersection - SIDRA Analysis Summary

Scenario	DOS	Critical Delay	95th %ile Queue	LOS
AM Peak				
2025 BG	0.0137	5.9 sec	1.1m	A
2026 BG	0.040	6.0 sec	1.1m	A
2026 BG + DEV	0.047	6.0 sec	1.3m	A
PM Peak				
2025 BG	0.045	6.1 sec	1.2m	A
2026 BG	0.045	6.2 sec	1.3m	A
2026 BG + DEV	0.047	6.2 sec	1.3m	A

The results presented in Table 8-3 above suggest that the intersection is within acceptable performance thresholds for a priority controlled intersection (LOS≥D) in all assessment scenarios. Additionally, the proposed development does not significantly impact delays or queuing.

8.4 Intersection 3: Laggan Road / Broderick Street

The existing intersection of Laggan Road / Broderick Street is a priority controlled intersection as shown in Figure 8-4. Results from the SIDRA analysis is summarised in Table 8-4 and **Appendix B**.

Figure 8-4 Laggan Road / Broderick Street Intersection - SIDRA Layout

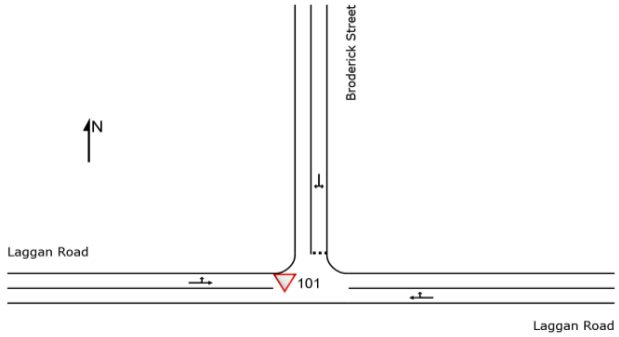
Existing form	Existing form SIDRA
	

Table 8-4 Laggan Road / Broderick Street Intersection - SIDRA Analysis Summary

Scenario	DOS	Critical Delay	95th %ile Queue	LOS
AM Peak				
2025 BG	0.032	5.7 sec	0.1m	A
2026 BG	0.035	5.8 sec	0.1m	A
2026 BG + DEV	0.035	5.8 sec	0.2m	A
PM Peak				
2025 BG	0.035	5.8 sec	0.1m	A
2026 BG	0.037	5.8 sec	0.1M	A
2026 BG + DEV	0.037	5.8 sec	0.2m	A

The results presented in Table 8-4 above suggest that the intersection is within acceptable performance thresholds for a priority controlled intersection (LOS≥D) in all assessment scenarios. Additionally, the proposed development does not significantly impact delays or queuing.

8.5 Intersection 4: Redground Road / Southern Access

The existing intersection of Redground Road / Southern Access is a priority controlled intersection as shown in Figure 8-5. Results from the SIDRA analysis is summarised in Table 8-5 and **Appendix B**.

Figure 8-5 Redground Road / Southern Access Intersection - SIDRA Layout

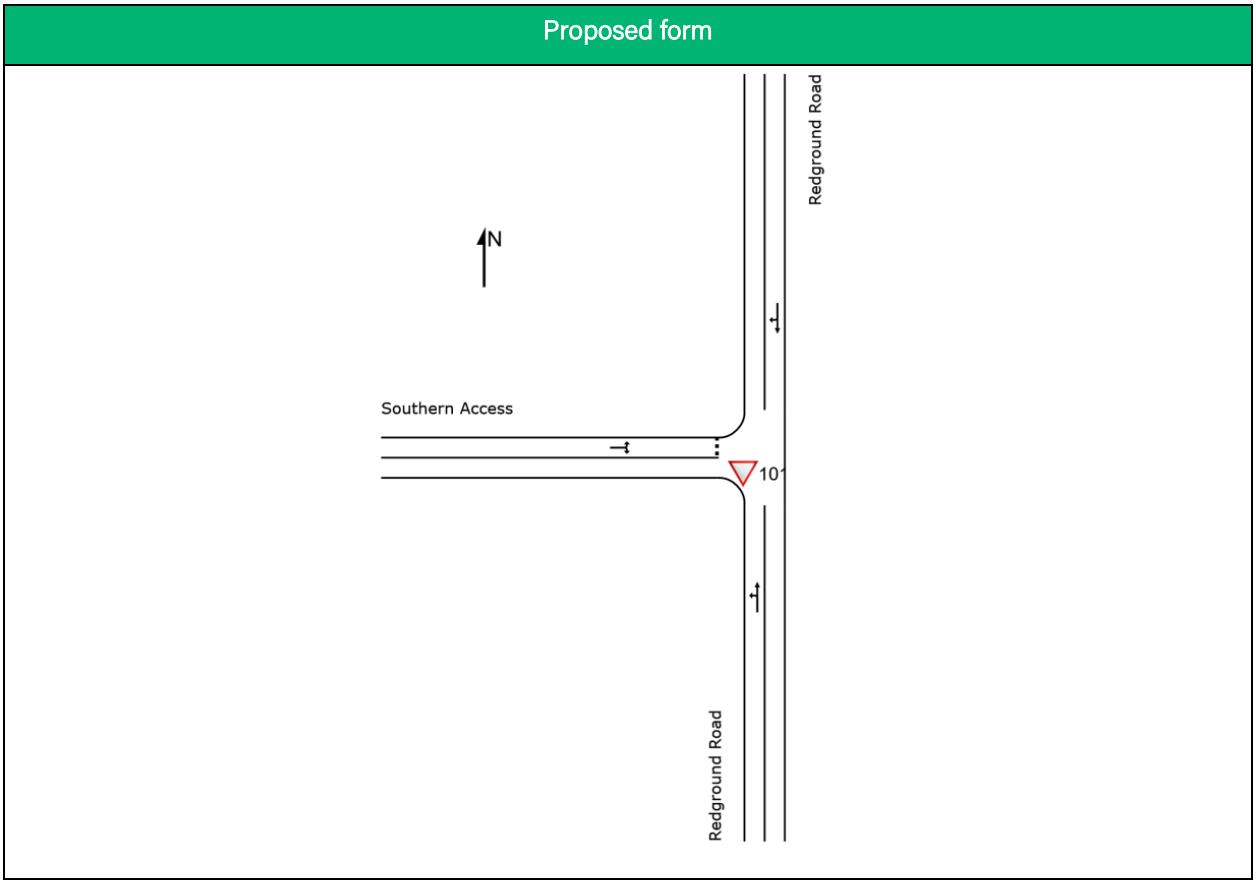


Table 8-5 Redground Road / Southern Access Intersection - SIDRA Analysis Summary

Scenario	DOS	Critical Delay	95th %ile Queue	LOS
AM Peak				
2026 BG + Dev	0.023	5.7 sec	0.1m	A
PM Peak				
2026 BG + Dev	0.042	5.8 sec	1.1m	A

The results presented in Table 8-5 above suggest that the intersection is within acceptable performance thresholds for a priority controlled intersection (LOS≥D) in all assessment scenarios. Additionally, the proposed development does not significantly impact delays or queuing.

9 Turn Warrant Assessment

Modus has conducted a turn warrant assessment to confirm the required turn treatment provisions most suitable for the site access intersections. The turn warrant assessment has been conducted in accordance with the Austroads 'Guide to Road Design' Part 4A for the following conditions:

- Year 2025 Background Traffic + Proposed Development Traffic (Year of Opening)
- Posted speed limit of 50km/hr along Redground Road (design speed of 60km/hr)
- Without splitter island

The turn warrant assessment has been conducted utilising the extended design domain which can be used where the costs of the intersection upgrade are considered impractical given the low traffic in the area. The assessment was conducted during all surveyed peak periods of the intersection outlined within Table 5-2 of this report. Therefore, the resultant turn treatment requirements for the site access intersections are outlined below on Figure 9-1 and Figure 9-2.

Figure 9-1 Turn Warrant Assessment – Redground Road / North Street Intersection

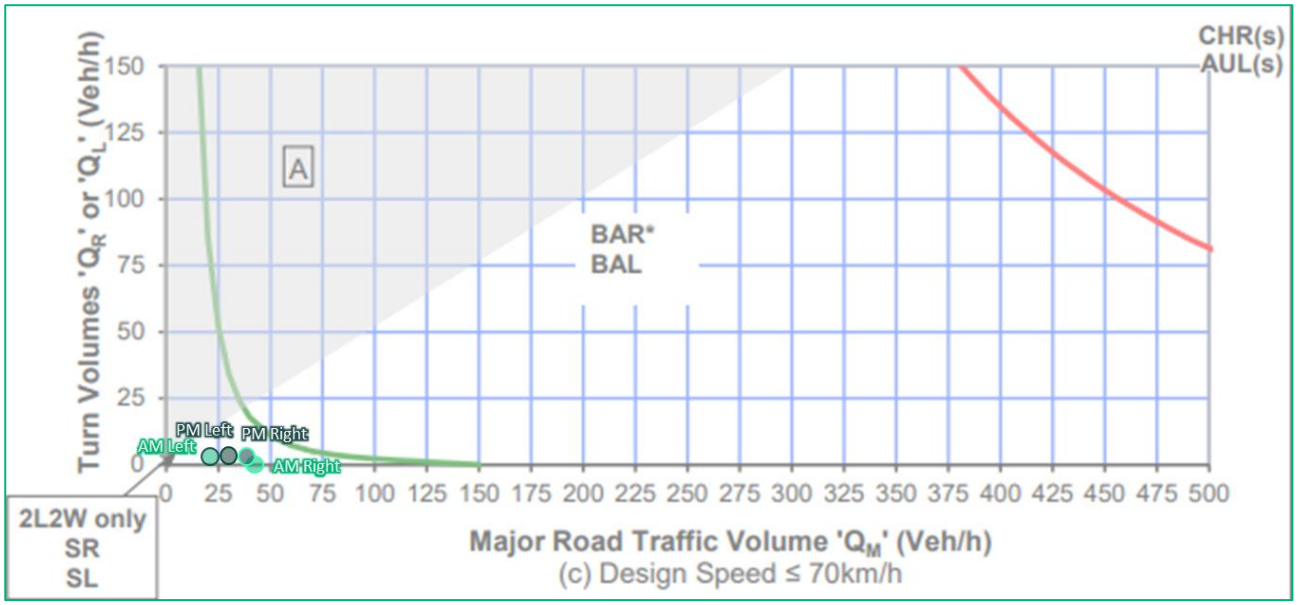
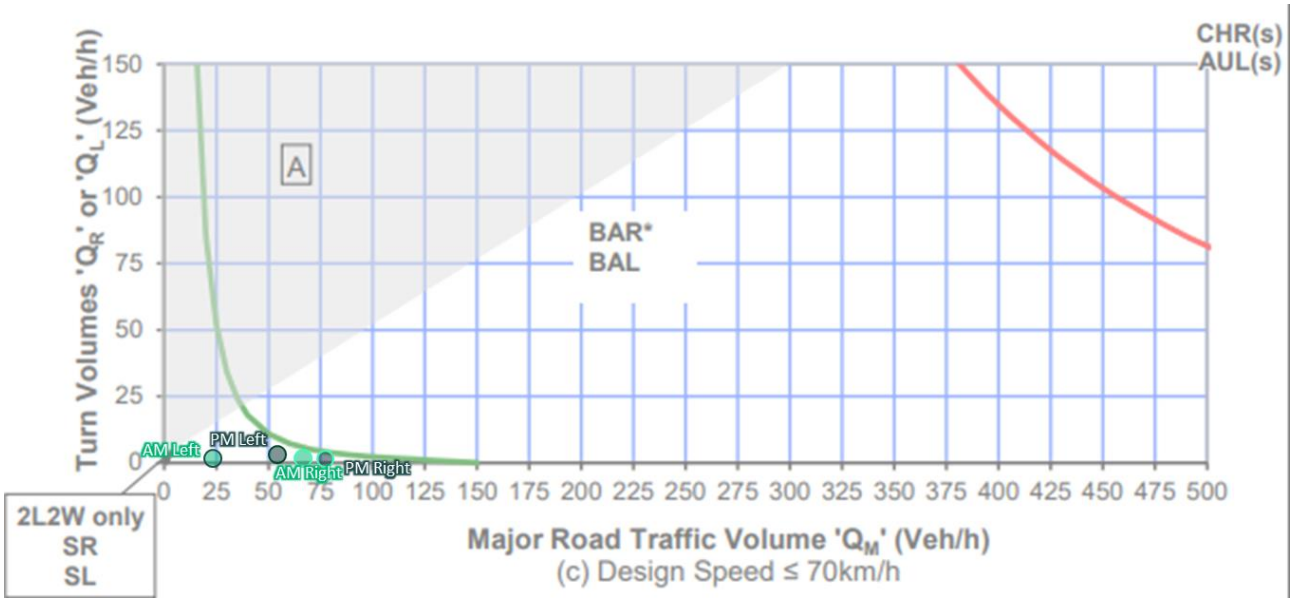


Figure 9-2 Turn Warrant Assessment – Redground Road / Southern Site Access Intersection



Therefore, the turn warrant assessment results indicate that a simple left and simple right turn treatment is required for the proposed site accesses. This is consistent with the existing formation of Redground Road and no upgrades will be required as part of the proposed development.

10 Pedestrian and Public Transport Access Strategy

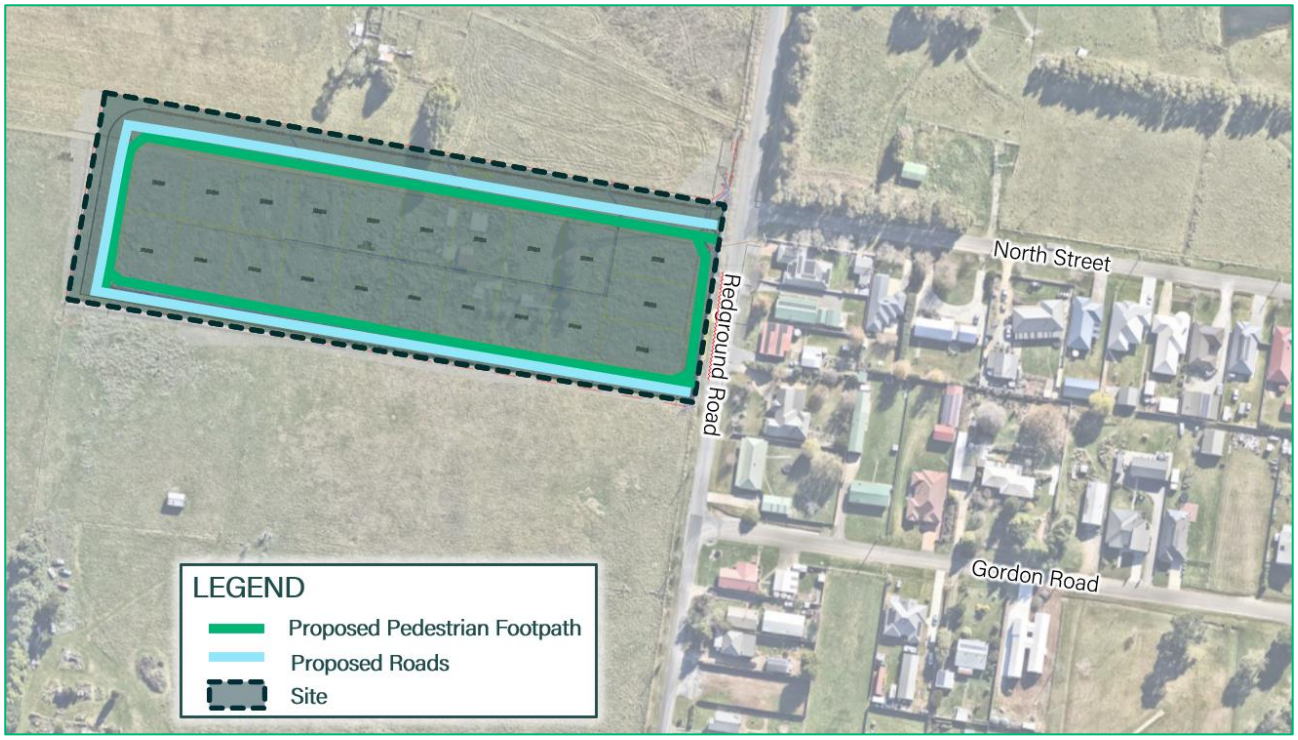
10.1 Pedestrians

It is noted that in accordance with the Western Sydney Street Design Guidelines, the proposed roads could be classified as local road type 1 or 2. However, they have been designed as local road type 1.

The proposed development will provide 1.2m wide pedestrian paths on one side of each road as shown in Figure 10-1. It is expected that the footpaths will connect through from the footpath along Redground Road.

This arrangement is considered to be suitable given that the proposed local roads can be classified as local road type 1, which does not require a pedestrian footpath, and only requires a shared zone.

Figure 10-1 Proposed Footpath Connection



10.2 Public Transport Access

There is currently no public transport available within a 400-meter radius of the proposed development. To support future developments in the area, it is recommended that a bus route be established. Figure 10-2 illustrates a potential location for a bus stop to serve the proposed development.

Figure 10-2 Indicative bus stop location

11 Summary

Modus has been commissioned by Precise Planning, to provide traffic and transport advice in relation to the proposed subdivision located at 39 Redground Road, Crookwell. Based on our assessment, Modus has the following findings:

Existing Conditions

- The development site has a single frontage to Redground Road. The site is bounded by low density residential to the north and south, vegetation to the west and south, and Redground Road to the east
- The site is identified within the Council Planning Scheme as a Primary Production (RU1) zone. The site is surrounded by similar zones to the north, south and west, and a low-density residential (R2) zone to the east.

Proposed Development

- The development proposes to reconfigure one lot into 21 residential allotments. The development is expected to provide an on-site parking arrangement for residents.

Access

- Access to the development is proposed via two (2) connections to the local road network.
- Three (3) local roads are proposed. The proposed roads are connected to Redground Road to the east.

Traffic Compliance Assessment

- The development proposes local roads, in accordance with the surrounding road network. This is based on the number of lots that will be servicing each proposed road.
- The proposed new road provides road carriageways of 5.0m-7.5m and road reserve of 11.0m-20.1m and generally comply with the Local Street types 1 and 2 outlined in the Western Sydney Street Design Guidelines. It is expected that development to the south will provide the remainder of the southern internal access road.
- The minimum intersection separation of 60m is exceeded and is therefore suitable.
- Due to the length of the proposed roads, it is recommended that the development provides traffic calming devices in the detailed design phase.
- Sight distance for each lot to be provided in the detailed design phase in accordance with AS2890.1.

- Dwelling driveway separation to be provided during the detailed design phase in accordance with a minimum 1-3m driveway separation between each lot. and a minimum 6m from the tangent point of the internal intersection.
- The refuse collection arrangements are proposed to occur via kerb-side collection by a side loading RCV.
- The proposed roads can accommodate a 12.5m HRV, which will navigate the site in a forward in / forward out direction.

Traffic Impact

- The proposed development is anticipated to generate 18 vph and 159 vpd, which is anticipated to be further distributed into the local road network. The anticipated development traffic is expected to be accommodated within the local road hierarchy.
- Based on the above, the proposed development is anticipated to have a negligible impact on the operation and safety of the external road network.
- A SIDRA assessment was undertaken of study intersection which indicated that all intersections operated within acceptable thresholds and were able to accommodate the proposed development.

Turn Warrant Assessment

- The proposed development is required to provide a simple left and simple right turn treatment at the site access intersections. This is consistent with the existing formation of Redground Road and no upgrades are required as part of the proposed development.

Pedestrian and Public Transport Access Strategy

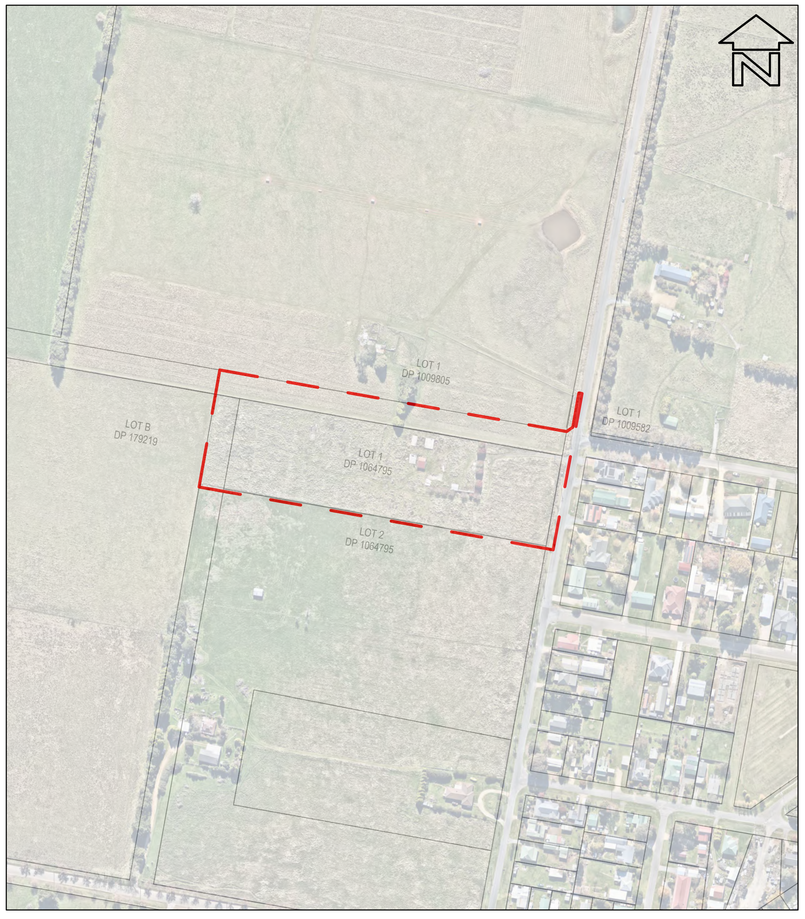
- The proposed development will provide pedestrian paths on one side of each road.
- It is expected that footpaths will connect through the proposed development and allow for any future footpaths along Redground Road.
- The proposed roads been designed in accordance with the Western Sydney Street Design Guidelines for local road type 1.
- It is recommended that the provision of bus facilities is reviewed to allow for public transport within a 400m radius.

APPENDIX A

DEVELOPMENT PLANS

39 REDGROUND RD, CROOKWELL, NSW - LOT 1 D.P 1064795
21 LOT RESIDENTIAL SUBDIVISION
CIVIL ENGINEERING CONCEPT DESIGN & FLOOD IMPACT ASSESSMENT

UPPER LACHLAN SHIRE COUNCIL PLANNING PROPOSAL APPLICATION

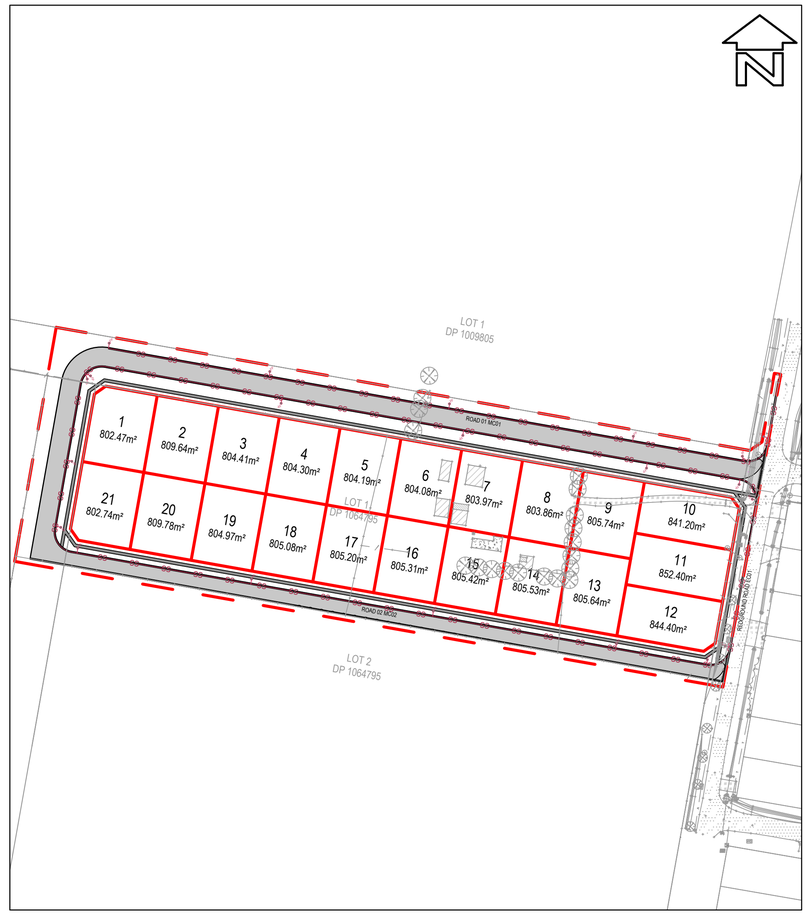


SITE LOCALITY PLAN

1:2500 @ A1

DRAWING SCHEDULE INDEX

	SHEET	TITLE	REV
CIVIL ENGINEERING CONCEPT DESIGN	23017-401	COVER AND INDEX	P0
	23017-402	GENERAL ARRANGEMENT PLAN	P0
	23017-403	EXISTING AND SITE PREPARATION PLAN	P0
	23017-404	SOIL AND WATER MANAGEMENT PLAN	P0
	23017-405	SOIL AND WATER MANAGEMENT DETAILS	P0
	23017-406	BULK EARTHWORKS PLAN	P0
	23017-407	ROAD 01 MC01 LONGITUDINAL AND TYPICAL SECTIONS	P0
	23017-408	ROAD 01 MC02 LONGITIDINAL AND TYPICAL SECTION	P0
	23017-409	DRAINAGE LAYOUT PLAN	P0
	23017-410	STORMWATER QUANTITY MODELLING PLAN	P0
FLOOD IMPACT ASSESSMENT	23017-411	CATCHMENT ANALYSIS PLAN	P0
	23017-412	DRAINS MODELLING AND RESULTS 1 OF 2	P0
	23017-413	DRAINS MODELLING AND RESULTS 2 OF 2	P0
	23017-414	PRE DEVELOPMENT & POST DEVELOPMENT 10% & 1% AEP RESULTS - DEPTHS	P0
	23017-415	PRE DEVELOPMENT & POST DEVELOPMENT 0.5% & 0.2% AEP RESULTS - DEPTHS	P0
	23017-416	PRE DEVELOPMENT & POST DEVELOPMENT 0.05% & PMF RESULTS - DEPTHS	P0
	23017-417	PRE DEVELOPMENT & POST DEVELOPMENT 10% & 1% AEP RESULTS - WSE	P0
	23017-418	PRE DEVELOPMENT & POST DEVELOPMENT 0.5% & 0.2% AEP RESULTS - WSE	P0
	23017-419	PRE DEVELOPMENT & POST DEVELOPMENT 0.05% AEP & PMF RESULTS - WSE	P0
	23017-420	PRE DEVELOPMENT & POST DEVELOPMENT 10% & 1% AEP RESULTS - DxV	P0
	23017-421	PRE DEVELOPMENT & POST DEVELOPMENT 0.5% & 0.2% AEP RESULTS - DxV	P0
	23017-422	PRE DEVELOPMENT & POST DEVELOPMENT 0.05% AEP & PMF - DxV	P0
	23017-423	PRE & POST DEVELOPMENT 10%, 1%, 0.5% & 0.2% AEP - WAY DRY NOW WET	P0
	23017-424	PRE & POST DEVELOPMENT 0.05% AEP & PMF - WAY DRY NOW WET	P0



GENERAL OVERVIEW

1:1250 @ A1

0 25 50 75 100 150 SCALE:- 1:2500

0 10 20 30 40 50 SCALE:- 1:1250

SCALE: AS NOTED
SIZE: A1
DATE OF SURVEY: 21 MAR 2023
DATUM: MGA2020, AHD

SURVEY	AS	
DESIGN	JE	
DRAWN	JE	
CHECKED	RB	
APPROVED	JW	

REV	DESCRIPTION	DATE
P0	PRELIMINARY PLANNING PROPOSAL DESIGN	18 MAR 24

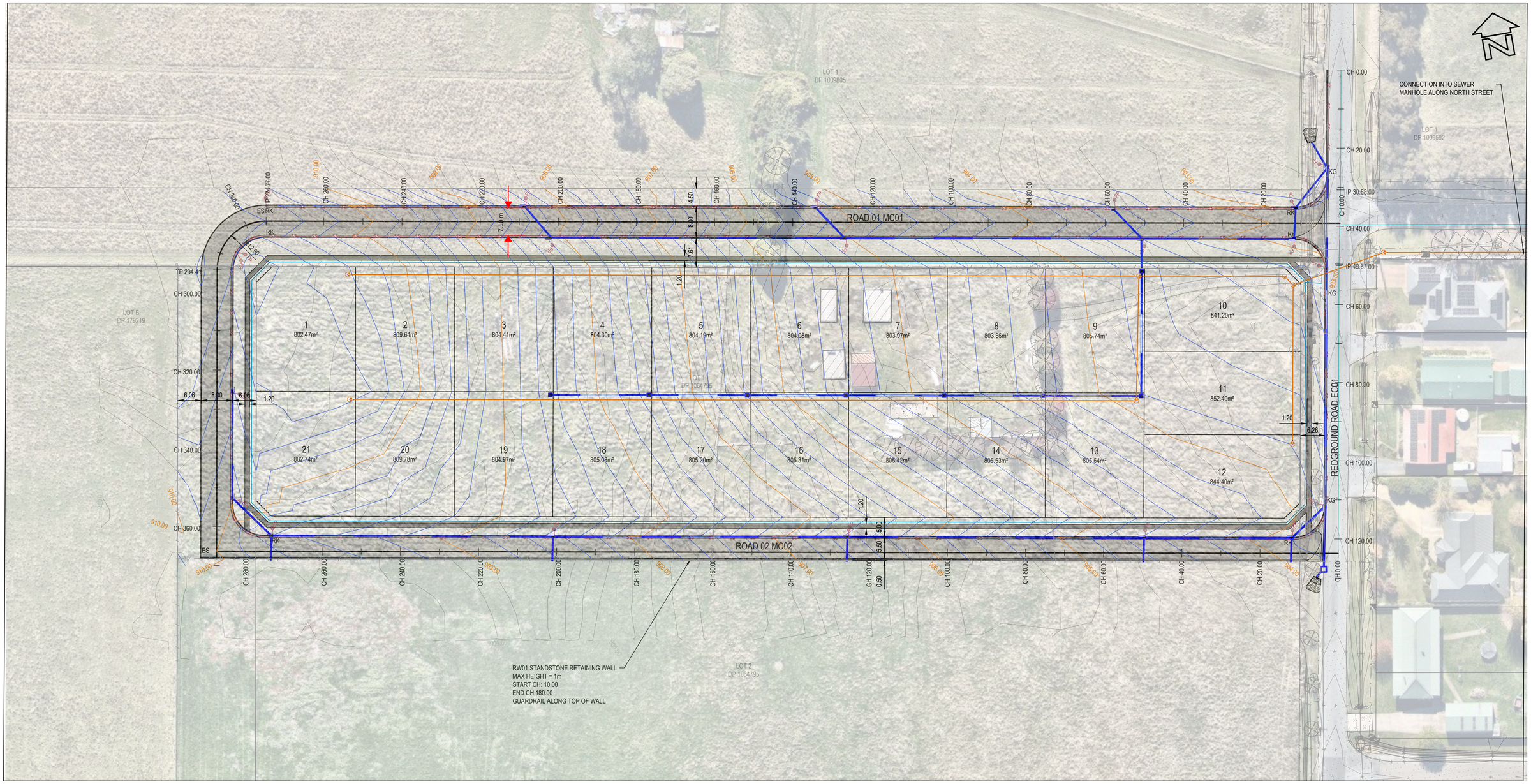
CIVPLAN
DEVELOPMENT & INFRASTRUCTURE CONSULTING
CIVPLAN PTY LTD ABN: 49 620 926 114 | CIVPLAN CONSULTING PTY LTD ABN: 79 157 731 912
SOUTH COAST OFFICE: 390 PRINCES HIGHWAY, BOMADERRY NSW 2541
SYDNEY OFFICE: 152 SAILORS BAY ROAD, NORTHBRIDGE NSW 2063
T: 1800 318 052 E: info@civplan.com.au W: www.civplan.com.au

JOB NAME: 21 LOT RESIDENTIAL SUBDIVISION
LOCATION: 39 REDGROUND, CROOKWELL, NSW - LOT 1 D.P. 1064795
LGA: UPPER LACHLAN SHIRE COUNCIL
CLIENT: BLUE WATER LAND PTY LTD
DESCRIPTION: PLANNING PROPOSAL
DRAWING: COVER AND INDEX

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

RELEASE DATE: 18 MARCH 2024

JOB-DRAWING NUMBER	REV
23017-401	P0



GENERAL ARRANGEMENT

1:500 @ A1

SHEET LEGEND

DESCRIPTION	DETAIL	DESCRIPTION	DETAIL	DESCRIPTION	DETAIL	DESCRIPTION	DETAIL
BARRIER KERB 'KG'	KG	KERB / PEDESTRIAN RAMP		SUB-SOIL AND FLUSH POINTS	SS SS	STORMWATER LOCATION (EXISTING)	SW
ROLL KERB 'RK'	RK	NOMINAL CONTROL LINE		KERB ADAPTOR / OUTLET		SEWER LOCATION (EXISTING)	S
EDGE STRIP 'ES'	ES	ROAD PAVEMENT		LIMIT OF WORKS		WATER LOCATION (EXISTING)	W
KERB ONLY 'KO'	KO	PATH PAVING (CONCRETE)		BOUNDARIES		TELSTRA LOCATION (EXISTING)	T
MOUNTABLE SF TYPE KERB 'SF'	SK	CONTOURS (MAJOR)	25	TREE AND LANDSCAPING		FIBRE OPTICS LOCATION (EXISTING)	FO
DISH DRAIN 'DD'	DD	CONTOURS (MINOR)		DRAINAGE PIT - 1.8m PIT WITH LINTEL		ELECTRICAL LOCATION (EXISTING)	E
VEHICULAR CROSSING		RETAINING WALL STRUCTURES		DRAINAGE PIT - 2.4m SAG WITH LINTEL		GAS LOCATION (EXISTING)	G

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

BEFORE YOU DIG www.byda.com.au

Liability limited by a scheme approved under Professional Standards Legislation. COVER OF EXCELLENCE

GDA 2020

0 5 10 15 20 25
SCALE:- 1:500

SCALE: AS NOTED
SIZE: A1
DATE OF SURVEY: 21 MAR 2023
DATUM: MGA2020, AHD

SURVEY	AS	REV	DESCRIPTION	DATE
DESIGN	JE	P0	PRELIMINARY PLANNING PROPOSAL DESIGN	18 MAR 24
DRAWN	JE			
CHECKED	RB			
APPROVED	JW			

CIVPLAN
DEVELOPMENT & INFRASTRUCTURE CONSULTING
CIVPLAN PTY LTD ABN: 49 620 926 114 | CIVPLAN CONSULTING PTY LTD ABN: 79 157 731 912
SOUTH COAST OFFICE: 390 PRINCES HIGHWAY, BOMADERRY NSW 2541
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T: 1800 318 052 E: info@civplan.com.au W: www.civplan.com.au

JOB NAME: 21 LOT RESIDENTIAL SUBDIVISION
LOCATION: 39 REDGROUND, CROOKWELL, NSW - LOT 1 D.P. 1064795
LGA: UPPER LACHLAN SHIRE COUNCIL
CLIENT: BLUE WATER LAND PTY LTD
DESCRIPTION: PLANNING PROPOSAL
DRAWING: GENERAL ARRANGMENT

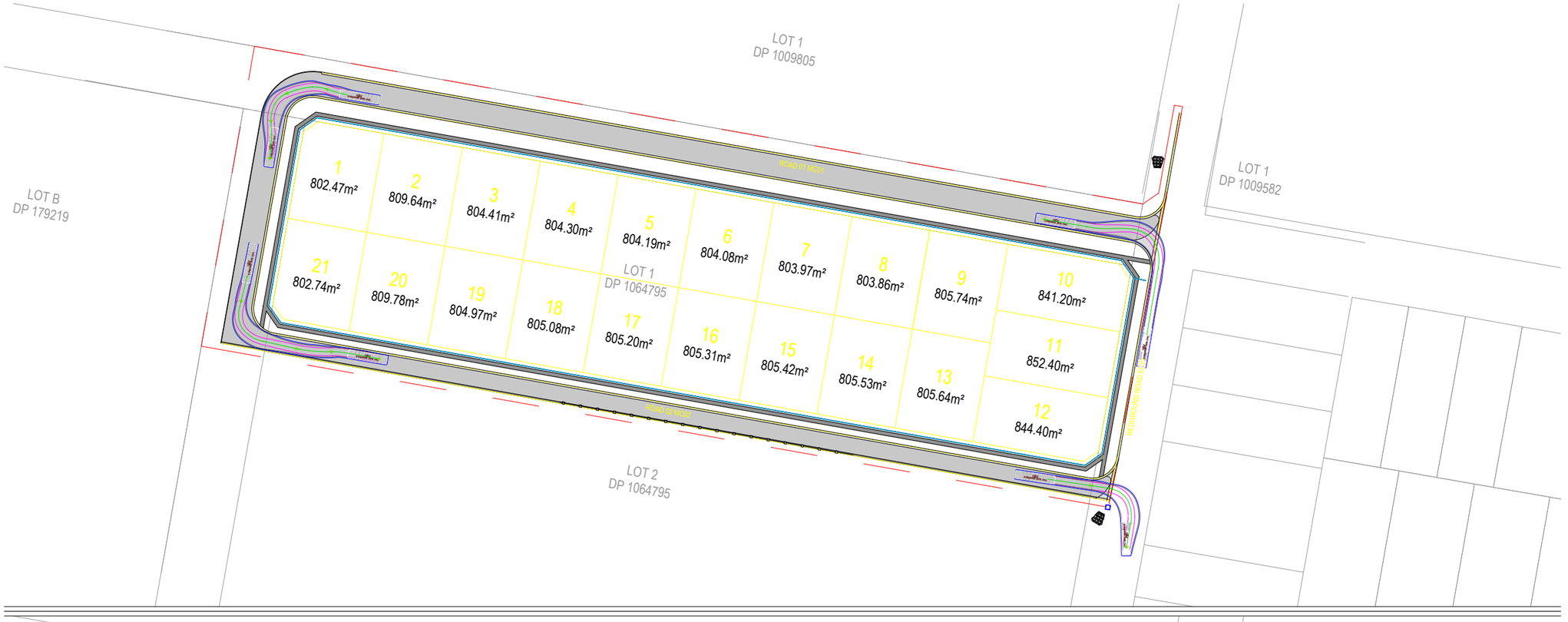
PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

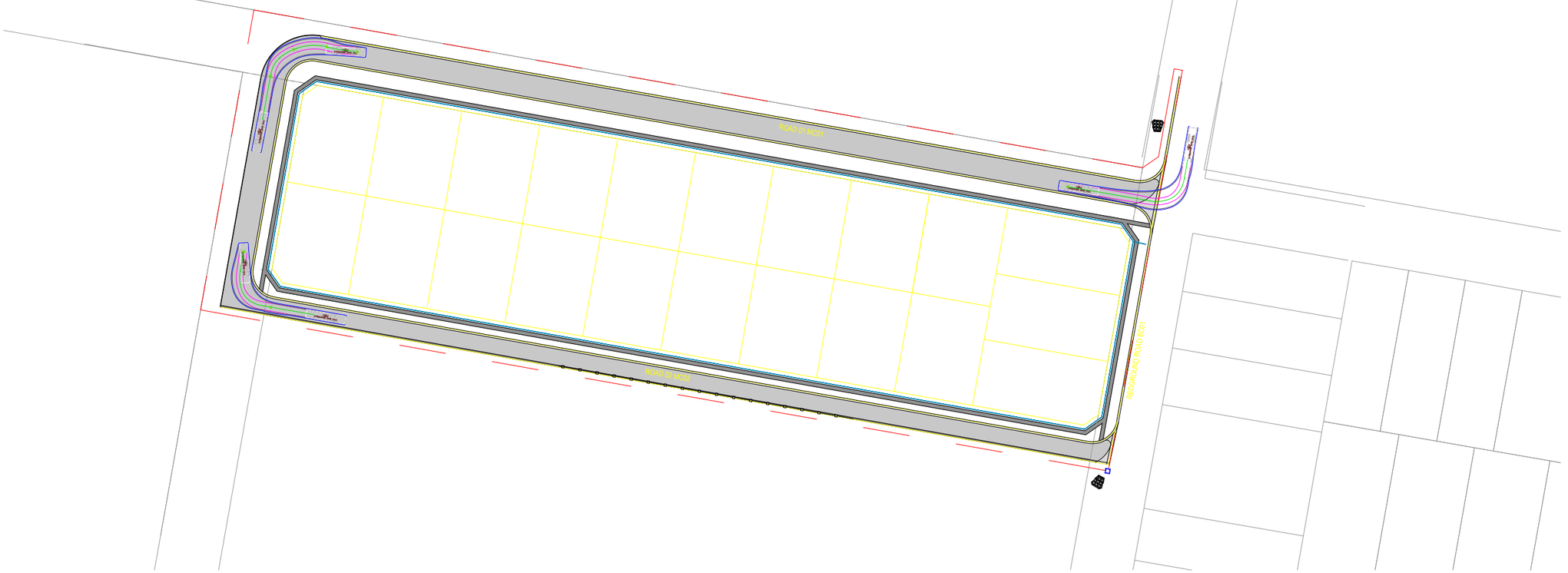
RELEASE DATE: 18 MARCH 2024

JOB-DRAWING NUMBER	REV
23017-402	P0

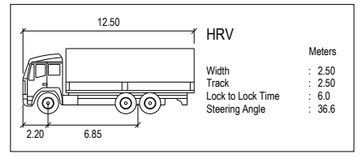
APPENDIX B

SWEPT PATH ASSESSMENT





VEHICLE USED IN SIMULATION



SWEPT PATH LEGEND
- VEHICLE BODY
- FRONT TIRES
- VEHICLE PATH
- VEHICLE CLEARANCE (300mm)
- VEHICLE

N

0 10 20 30 40 50 60m
10 8 6 4 2
SCALE 1:1500

PROJECT

39 REDGROUND ROAD, CROOKWELL

CLIENT

PRECISE PLANNING

DRAWING TITLE

HRV SWEPT PATH ASSESSMENT

DRAWING NUMBER

MOD23142QLD - SK01

DATE	REVISION
18 FEB 2025	A

REV	DRAWN BY	APPROVED	DATE	AMENDMENT DETAILS

MODUS
Transport and Traffic Engineering

ABN 84 102 758 061
310 Edward Street, BRISBANE CITY QLD 4000

T: 1300 606 408 E: marketing@moduseng.com.au
W: www.modusengineering.com.au

PRELIMINARY ADVICE ONLY

NOT TO BE USED FOR CONSTRUCTION

GENERAL NOTES:

1. PRELIMINARY DESIGN ISSUED FOR COMMENT ONLY.
2. ALL DIMENSIONS ARE PROVIDED IN METERS UNLESS NOTED OTHERWISE.

APPENDIX C

TRAFFIC SURVEY

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Laggan Rd and Clifton St, Crookwell

GPS	-34.44960, 149.47107
Date:	Wed 12/02/25
Weather:	Fine
Suburban:	Crookwell
Customer:	N/A

North:	Clifton St
East:	Laggan Rd
South:	N/A
West:	Laggan Rd

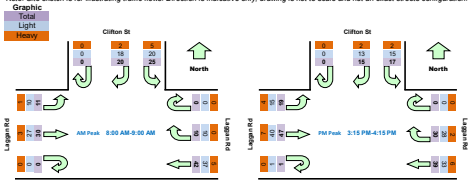
Survey Period	AM:	6:00 AM-9:00 AM
	PM:	3:00 PM-6:00 PM
Traffic Peak	AM:	8:00 AM-9:00 AM
	PM:	3:15 PM-4:15 PM

All Vehicles

Time		North Approach Clifton St			East Approach Laggan Rd			West Approach Laggan Rd			Hourly Total	
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	Hour	Peak
6:00	6:15	0	1	1	0	0	5	0	4	0	65	
6:15	6:30	0	0	4	0	1	3	0	1	1	89	
6:30	6:45	0	1	3	0	1	11	0	6	2	107	
6:45	7:00	0	2	3	0	1	4	0	8	2	123	
7:00	7:15	0	6	4	0	2	10	0	7	6	127	
7:15	7:30	0	8	7	0	4	3	0	4	2	123	
7:30	7:45	0	7	2	0	1	15	0	11	4	119	
7:45	8:00	0	4	3	0	2	5	0	9	1	121	
8:00	8:15	0	4	7	0	2	10	0	6	2	138	Peak
8:15	8:30	0	4	3	0	3	7	0	6	1		
8:30	8:45	0	6	9	0	2	17	0	5	3		
8:45	9:00	0	6	6	0	3	8	0	13	5		
15:00	15:15	0	2	4	0	0	5	0	12	1	148	
15:15	15:30	0	2	3	0	7	11	1	15	8	168	Peak
15:30	15:45	0	3	7	0	9	10	0	12	8	161	
15:45	16:00	0	4	2	0	8	9	0	5	0	146	
16:00	16:15	0	6	5	0	6	9	0	15	3	155	
16:15	16:30	0	3	7	0	7	12	0	6	5	149	
16:30	16:45	0	2	7	0	8	5	0	7	5	144	
16:45	17:00	0	2	3	0	9	10	0	10	3	154	
17:00	17:15	0	2	7	0	5	9	0	11	4	157	
17:15	17:30	0	1	5	0	7	8	0	13	1		
17:30	17:45	0	5	5	0	6	12	0	14	2		
17:45	18:00	0	2	9	0	3	9	0	13	4		

Peak Time		North Approach Clifton St			East Approach Laggan Rd			West Approach Laggan Rd			Peak
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	total
8:00	9:00	0	20	25	0	10	42	0	30	11	138
15:15	16:15	0	15	17	0	30	39	1	47	19	168

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.



Light Vehicles

Time		North Approach Clifton St			East Approach Laggan Rd			West Approach Laggan Rd		
Period Start	Period End	U	R	L	U	R	WB	U	EB	L
6:00	6:15	0	1	1	0	0	4	0	4	0
6:15	6:30	0	0	4	0	1	2	0	1	1
6:30	6:45	0	1	2	0	1	10	0	6	1
6:45	7:00	0	2	2	0	1	4	0	8	2
7:00	7:15	0	4	4	0	1	9	0	7	4
7:15	7:30	0	7	6	0	4	3	0	4	2
7:30	7:45	0	7	2	0	0	13	0	8	4
7:45	8:00	0	3	3	0	2	5	0	8	1
8:00	8:15	0	3	5	0	2	9	0	6	2
8:15	8:30	0	4	3	0	3	7	0	5	1
8:30	8:45	0	5	6	0	2	15	0	5	3
8:45	9:00	0	6	6	0	3	6	0	11	4
15:00	15:15	0	2	4	0	0	5	0	12	1
15:15	15:30	0	2	3	0	6	9	1	10	6
15:30	15:45	0	2	6	0	9	10	0	12	6
15:45	16:00	0	3	1	0	8	7	0	4	0
16:00	16:15	0	6	5	0	5	7	0	14	3
16:15	16:30	0	2	7	0	7	12	0	6	4
16:30	16:45	0	2	7	0	8	5	0	7	4
16:45	17:00	0	2	3	0	8	10	0	9	2
17:00	17:15	0	1	7	0	5	9	0	10	3
17:15	17:30	0	1	5	0	7	8	0	12	1
17:30	17:45	0	5	5	0	6	11	0	14	1
17:45	18:00	0	2	9	0	3	9	0	12	3

Peak Time		North Approach Clifton St			East Approach Laggan Rd			West Approach Laggan Rd			Peak
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	total
8:00	9:00	0	18	20	0	10	37	0	27	10	122
15:15	16:15	0	13	15	0	28	33	1	40	15	145

Heavy Vehicles

Time		North Approach Clifton St			East Approach Laggan Rd			West Approach Laggan Rd		
Period Start	Period End	U	R	L	U	R	WB	U	EB	L
6:00	6:15	0	0	0	0	0	1	0	0	0
6:15	6:30	0	0	0	0	0	1	0	0	0
6:30	6:45	0	0	1	0	0	1	0	0	1
6:45	7:00	0	0	1	0	0	0	0	0	0
7:00	7:15	0	2	0	0	1	1	0	0	2
7:15	7:30	0	1	1	0	0	0	0	0	0
7:30	7:45	0	0	0	0	1	2	0	3	0
7:45	8:00	0	1	0	0	0	0	0	1	0
8:00	8:15	0	1	2	0	0	1	0	0	0
8:15	8:30	0	0	0	0	0	0	0	1	0
8:30	8:45	0	1	3	0	0	2	0	0	0
8:45	9:00	0	0	0	0	0	2	0	2	1
15:00	15:15	0	0	0	0	0	0	0	0	0
15:15	15:30	0	0	0	0	1	2	0	5	2
15:30	15:45	0	1	1	0	0	0	0	0	2
15:45	16:00	0	1	1	0	0	2	0	1	0
16:00	16:15	0	0	0	0	1	2	0	1	0
16:15	16:30	0	1	0	0	0	0	0	0	1
16:30	16:45	0	0	0	0	0	0	0	0	1
16:45	17:00	0	0	0	0	1	0	0	1	1
17:00	17:15	0	1	0	0	0	0	0	1	1
17:15	17:30	0	0	0	0	0	0	0	1	0
17:30	17:45	0	0	0	0	0	1	0	0	1
17:45	18:00	0	0	0	0	0	0	0	1	1

Peak Time		North Approach Clifton St			East Approach Laggan Rd			West Approach Laggan Rd			Peak
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	total
8:00	9:00	0	2	5	0	0	5	0	3	1	16
15:15	16:15	0	2	2	0	2	6	0	7	4	23

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Redground Rd and North St, Crookwell

GPS	-34.444769, 149.472279
Date:	Wed 12/02/25
Weather:	Fine
Suburban:	Crookwell
Customer:	N/A

North:	Redground Rd
East:	North St
South:	Redground Rd
West:	N/A

Survey Period	AM:	6:00 AM-9:00 AM
	PM:	3:00 PM-6:00 PM
Traffic Peak	AM:	8:00 AM-9:00 AM
	PM:	3:15 PM-4:15 PM

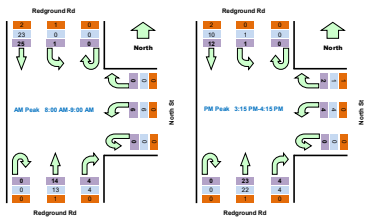
All Vehicles

Time		North Approach Redground			East Approach North St			South Approach Redground			Hourly Total	
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	Hour	Peak
6:00	6:15	0	0	0	0	0	0	0	0	0	12	
6:15	6:30	0	3	0	0	0	1	0	0	1	23	
6:30	6:45	0	1	0	0	0	0	0	1	1	28	
6:45	7:00	0	2	0	0	0	1	0	0	1	35	
7:00	7:15	0	6	0	0	1	0	0	0	4	36	
7:15	7:30	0	6	0	0	0	1	0	0	3	36	
7:30	7:45	0	7	0	0	0	1	0	0	2	34	
7:45	8:00	0	2	0	0	0	0	0	0	3	39	
8:00	8:15	0	5	0	0	0	1	0	1	4	50	Peak
8:15	8:30	0	4	0	0	0	1	0	1	2		
8:30	8:45	0	7	1	0	0	2	0	2	3		
8:45	9:00	0	9	0	0	0	2	0	0	5		
15:00	15:15	0	4	0	0	0	1	0	0	0	40	
15:15	15:30	0	1	0	0	0	2	0	0	8	46	Peak
15:30	15:45	0	5	0	0	1	1	0	1	5	46	Peak
15:45	16:00	0	4	0	0	1	0	0	1	5	41	
16:00	16:15	0	2	1	0	0	1	0	2	5	39	
16:15	16:30	0	3	0	0	0	0	0	2	6	35	
16:30	16:45	0	2	0	0	0	1	0	1	4	34	
16:45	17:00	0	1	0	0	0	1	0	2	5	39	
17:00	17:15	0	3	0	0	0	0	0	1	3	37	
17:15	17:30	0	4	0	0	0	1	0	0	5		
17:30	17:45	0	6	0	0	0	1	0	0	6		
17:45	18:00	0	2	0	1	0	1	0	1	2		

Peak Time		North Approach Redground			East Approach North St			South Approach Redground			Peak
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	total
8:00	9:00	0	25	1	0	0	6	0	4	14	50
15:15	16:15	0	12	1	0	2	4	0	4	23	46

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic
Total
Light
Heavy



Light Vehicles

Time		North Approach Redground			East Approach North St			South Approach Redground			
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	
6:00	6:15	0	0	0	0	0	0	0	0	0	
6:15	6:30	0	3	0	0	0	1	0	0	1	
6:30	6:45	0	1	0	0	0	0	0	1	1	
6:45	7:00	0	2	0	0	0	0	0	0	1	
7:00	7:15	0	4	0	0	1	0	0	0	2	
7:15	7:30	0	5	0	0	0	1	0	0	3	
7:30	7:45	0	7	0	0	0	1	0	0	2	
7:45	8:00	0	2	0	0	0	0	0	0	3	
8:00	8:15	0	5	0	0	0	1	0	1	3	
8:15	8:30	0	4	0	0	0	1	0	1	2	
8:30	8:45	0	5	0	0	0	2	0	2	3	
8:45	9:00	0	9	0	0	0	2	0	0	5	
15:00	15:15	0	4	0	0	0	1	0	0	0	
15:15	15:30	0	1	0	0	0	2	0	0	7	
15:30	15:45	0	5	0	0	0	1	0	1	5	
15:45	16:00	0	2	0	0	1	0	0	1	5	
16:00	16:15	0	2	1	0	0	1	0	2	5	
16:15	16:30	0	3	0	0	0	0	0	2	5	
16:30	16:45	0	2	0	0	0	1	0	1	4	
16:45	17:00	0	1	0	0	0	1	0	2	5	
17:00	17:15	0	3	0	0	0	0	0	1	3	
17:15	17:30	0	3	0	0	0	1	0	0	5	
17:30	17:45	0	6	0	0	0	1	0	0	5	
17:45	18:00	0	2	0	1	0	1	0	1	1	

Peak Time		North Approach Redground			East Approach North St			South Approach Redground			Peak
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	total
8:00	9:00	0	23	0	0	0	6	0	4	13	46
15:15	16:15	0	10	1	0	1	4	0	4	22	42

Heavy Vehicles

Time		North Approach Redground			East Approach North St			South Approach Redground			
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	
6:00	6:15	0	0	0	0	0	0	0	0	0	
6:15	6:30	0	0	0	0	0	0	0	0	0	
6:30	6:45	0	0	0	0	0	0	0	0	0	
6:45	7:00	0	0	0	0	0	1	0	0	0	
7:00	7:15	0	2	0	0	0	0	0	0	2	
7:15	7:30	0	1	0	0	0	0	0	0	0	
7:30	7:45	0	0	0	0	0	0	0	0	0	
7:45	8:00	0	0	0	0	0	0	0	0	0	
8:00	8:15	0	0	0	0	0	0	0	0	1	
8:15	8:30	0	0	0	0	0	0	0	0	0	
8:30	8:45	0	2	1	0	0	0	0	0	0	
8:45	9:00	0	0	0	0	0	0	0	0	0	
15:00	15:15	0	0	0	0	0	0	0	0	0	
15:15	15:30	0	0	0	0	0	0	0	0	1	
15:30	15:45	0	0	0	0	1	0	0	0	0	
15:45	16:00	0	2	0	0	0	0	0	0	0	
16:00	16:15	0	0	0	0	0	0	0	0	0	
16:15	16:30	0	0	0	0	0	0	0	0	1	
16:30	16:45	0	0	0	0	0	0	0	0	0	
16:45	17:00	0	0	0	0	0	0	0	0	0	
17:00	17:15	0	0	0	0	0	0	0	0	0	
17:15	17:30	0	1	0	0	0	0	0	0	0	
17:30	17:45	0	0	0	0	0	0	0	0	1	
17:45	18:00	0	0	0	0	0	0	0	0	1	

Peak Time		North Approach Redground			East Approach North St			South Approach Redground			Peak
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	total
8:00	9:00	0	2	1	0	0	0	0	0	1	4
15:15	16:15	0	2	0	0	1	0	0	0	1	4

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

trafficsurvey.com.au

Intersection of Laggan Rd and Broderick St, Crookwell

GPS	-34.446439, 149.477991
Date:	Wed 12/02/25
Weather:	Fine
Suburban:	Crookwell
Customer:	N/A

North:	Broderick St
East:	Laggan Rd
South:	N/A
West:	Laggan Rd

Survey Period	AM:	6:00 AM-9:00 AM
	PM:	3:00 PM-6:00 PM
Traffic Peak	AM:	8:00 AM-9:00 AM
	PM:	3:15 PM-4:15 PM

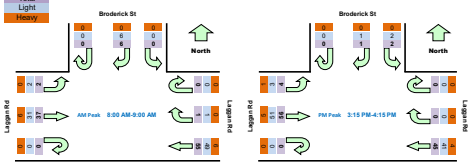
All Vehicles

Time		North Approach Broderick St			East Approach Laggan Rd			West Approach Laggan Rd			Hourly Total	
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	Hour	Peak
6:00	6:15	0	0	0	0	0	6	0	2	1	58	
6:15	6:30	0	0	0	0	1	7	0	3	0	67	
6:30	6:45	0	0	1	0	0	8	0	10	0	77	
6:45	7:00	0	0	0	0	0	10	0	9	0	81	
7:00	7:15	0	0	0	0	1	6	0	10	1	79	
7:15	7:30	0	0	0	0	0	12	0	9	0	76	
7:30	7:45	0	1	0	0	0	9	0	13	0	76	
7:45	8:00	0	3	0	0	0	8	0	6	0	84	
8:00	8:15	0	1	0	0	0	6	0	8	0	101	Peak
8:15	8:30	0	2	0	0	1	10	0	8	0		
8:30	8:45	0	2	0	0	0	18	0	9	2		
8:45	9:00	0	1	0	0	0	21	0	12	0		
15:00	15:15	0	1	0	0	1	12	0	10	0	103	
15:15	15:30	0	0	0	0	0	9	0	17	1	108	Peak
15:30	15:45	0	0	0	0	0	9	0	13	1	96	
15:45	16:00	0	0	0	0	0	17	0	12	0	97	
16:00	16:15	0	1	2	0	0	10	0	14	2	87	
16:15	16:30	0	0	0	0	0	8	0	7	0	79	
16:30	16:45	0	2	0	0	0	5	0	11	6	96	
16:45	17:00	0	1	0	0	0	8	0	10	0	97	
17:00	17:15	0	1	0	0	0	13	0	5	2	103	
17:15	17:30	0	0	0	0	0	18	0	13	1		
17:30	17:45	0	1	0	0	0	13	0	10	1		
17:45	18:00	0	2	0	0	0	9	0	13	1		

Peak Time		North Approach Broderick St			East Approach Laggan Rd			West Approach Laggan Rd			Peak
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	total
8:00	9:00	0	6	0	0	1	55	0	37	2	101
15:15	16:15	0	1	2	0	0	45	0	56	4	108

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic
Total
Light
Heavy



Light Vehicles

Time		North Approach Broderick St			East Approach Laggan Rd			West Approach Laggan Rd		
Period Start	Period End	U	R	L	U	R	WB	U	EB	L
6:00	6:15	0	0	0	0	0	6	0	2	1
6:15	6:30	0	0	0	0	1	6	0	3	0
6:30	6:45	0	0	1	0	0	7	0	10	0
6:45	7:00	0	0	0	0	0	9	0	9	0
7:00	7:15	0	0	0	0	1	5	0	7	1
7:15	7:30	0	0	0	0	0	12	0	8	0
7:30	7:45	0	1	0	0	0	7	0	12	0
7:45	8:00	0	3	0	0	0	7	0	6	0
8:00	8:15	0	1	0	0	0	6	0	8	0
8:15	8:30	0	2	0	0	1	7	0	8	0
8:30	8:45	0	2	0	0	0	17	0	7	2
8:45	9:00	0	1	0	0	0	19	0	8	0
15:00	15:15	0	1	0	0	1	10	0	9	0
15:15	15:30	0	0	0	0	0	9	0	15	1
15:30	15:45	0	0	0	0	0	9	0	12	0
15:45	16:00	0	0	0	0	0	16	0	12	0
16:00	16:15	0	1	2	0	0	7	0	12	2
16:15	16:30	0	0	0	0	0	8	0	7	0
16:30	16:45	0	2	0	0	0	5	0	10	6
16:45	17:00	0	1	0	0	0	8	0	9	0
17:00	17:15	0	1	0	0	0	13	0	5	2
17:15	17:30	0	0	0	0	0	18	0	11	1
17:30	17:45	0	1	0	0	0	10	0	10	1
17:45	18:00	0	2	0	0	0	9	0	12	1

Peak Time		North Approach Broderick St			East Approach Laggan Rd			West Approach Laggan Rd			Peak
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	total
8:00	9:00	0	6	0	0	1	49	0	31	2	89
15:15	16:15	0	1	2	0	0	41	0	51	3	98

Heavy Vehicles

Time		North Approach Broderick St			East Approach Laggan Rd			West Approach Laggan Rd		
Period Start	Period End	U	R	L	U	R	WB	U	EB	L
6:00	6:15	0	0	0	0	0	0	0	0	0
6:15	6:30	0	0	0	0	0	1	0	0	0
6:30	6:45	0	0	0	0	0	1	0	0	0
6:45	7:00	0	0	0	0	0	1	0	0	0
7:00	7:15	0	0	0	0	0	1	0	3	0
7:15	7:30	0	0	0	0	0	0	0	1	0
7:30	7:45	0	0	0	0	0	2	0	1	0
7:45	8:00	0	0	0	0	0	1	0	0	0
8:00	8:15	0	0	0	0	0	0	0	0	0
8:15	8:30	0	0	0	0	0	3	0	0	0
8:30	8:45	0	0	0	0	0	1	0	2	0
8:45	9:00	0	0	0	0	0	2	0	4	0
15:00	15:15	0	0	0	0	0	2	0	1	0
15:15	15:30	0	0	0	0	0	0	0	2	0
15:30	15:45	0	0	0	0	0	0	0	1	1
15:45	16:00	0	0	0	0	0	1	0	0	0
16:00	16:15	0	0	0	0	0	3	0	2	0
16:15	16:30	0	0	0	0	0	0	0	0	0
16:30	16:45	0	0	0	0	0	0	0	1	0
16:45	17:00	0	0	0	0	0	0	0	1	0
17:00	17:15	0	0	0	0	0	0	0	0	0
17:15	17:30	0	0	0	0	0	0	0	2	0
17:30	17:45	0	0	0	0	0	3	0	0	0
17:45	18:00	0	0	0	0	0	0	0	1	0

Peak Time		North Approach Broderick St			East Approach Laggan Rd			West Approach Laggan Rd			Peak
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	total
8:00	9:00	0	0	0	0	0	6	0	6	0	12
15:15	16:15	0	0	0	0	0	4	0	5	1	10

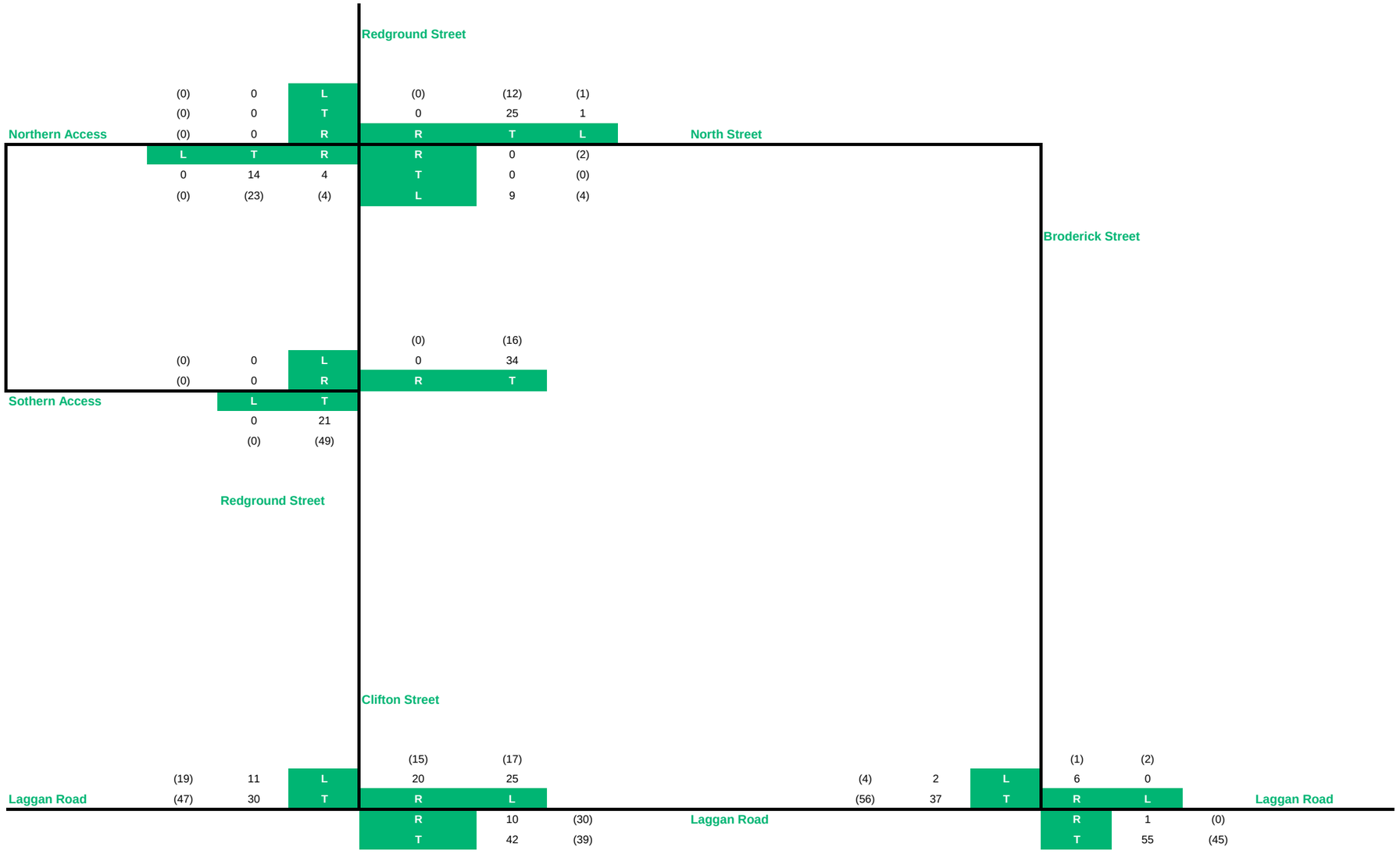
APPENDIX D

NETWORK FLOW DIAGRAM

Legend

L	Left turn
T	Through
R	Right turn
U	U-turn
00	AM Peak Hour Volumes
(00)	PM Peak Hour Volumes
	Development Area

Base year	2025
Assessment year	2026
Linear Growth Rate	6.4%
AM Peak Hour End	9:00 AM
PM Peak Hour End	5:30 PM



MODUS
Transport and Traffic Engineering

Project: 39 Redground Road, (

Client: Precise Planning

Date: 20/02/2025

2025 Background Traffic Volumes

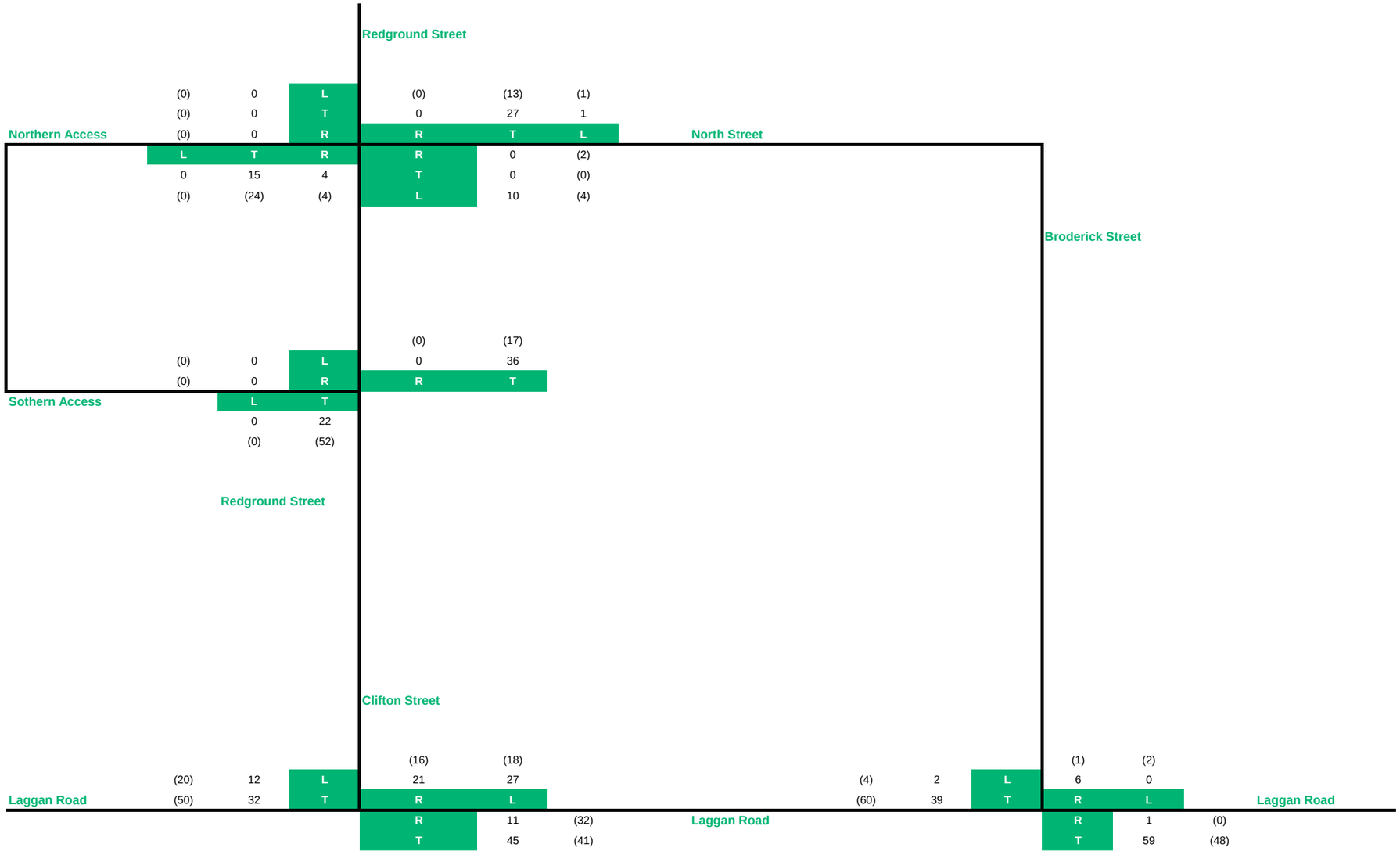
Prepared by: Afaf El Harda

Reviewed by: Tetteh Anang

Legend

L	Left turn
T	Through
R	Right turn
U	U-turn
00	AM Peak Hour Volumes
(00)	PM Peak Hour Volumes
	Development Area

Base year	2025
Assessment year	2026
Linear Growth Rate	6.4%
AM Peak Hour End	9:00 AM
PM Peak Hour End	5:30 PM



MODUS
Transport and Traffic Engineering

Project: 39 Redground Road, (

Client: Precise Planning

Date: 20/02/2025

2026 Background Traffic Volumes

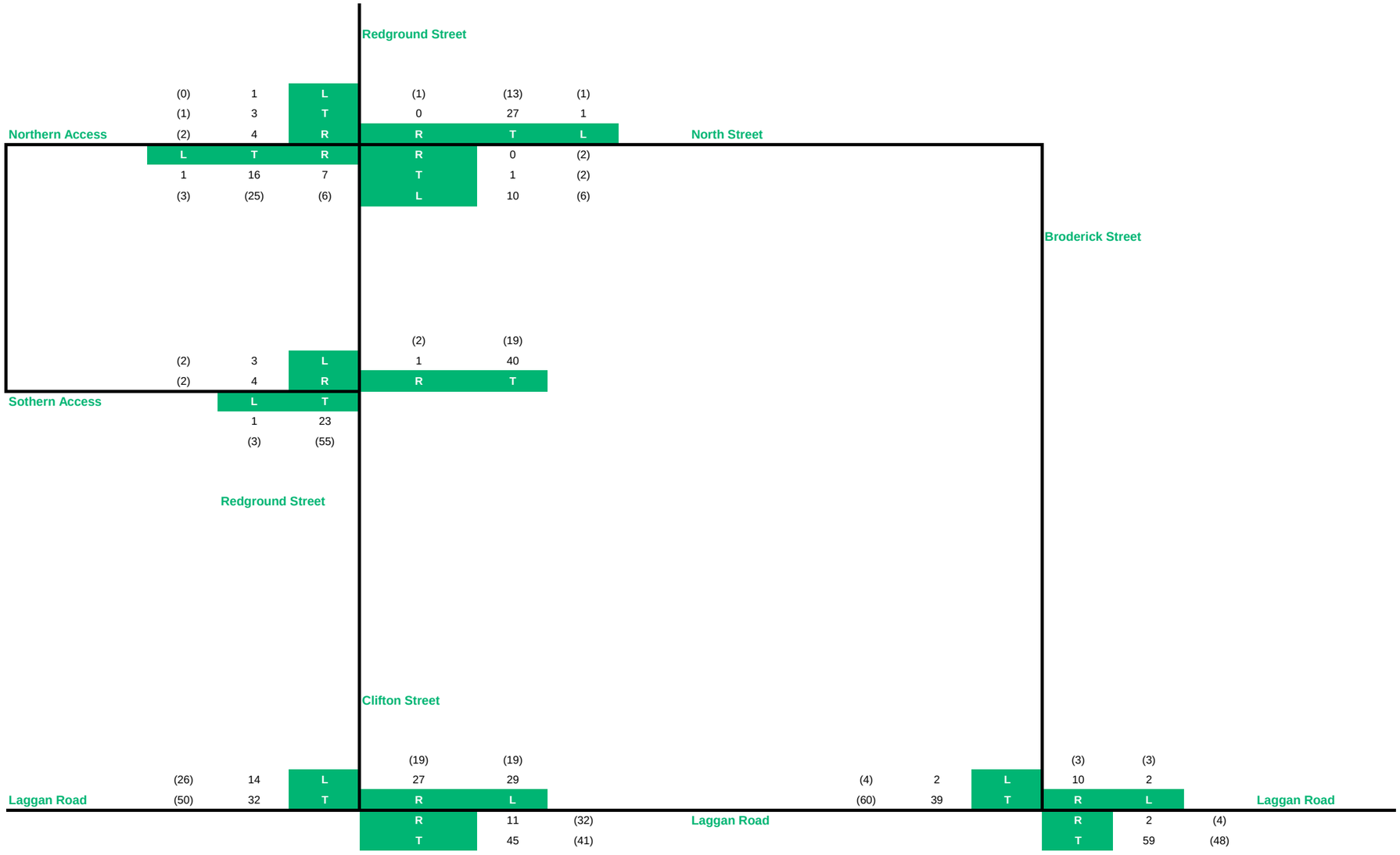
Prepared by: Afaf El Harda

Reviewed by: Tetteh Anang

Legend

L	Left turn
T	Through
R	Right turn
U	U-turn
00	AM Peak Hour Volumes
(00)	PM Peak Hour Volumes
	Development Area

Base year	2025
Assessment year	2026
Linear Growth Rate	6.4%
AM Peak Hour End	9:00 AM
PM Peak Hour End	5:30 PM



MODUS
Transport and Traffic Engineering

Project: 39 Redground Road, (

Client: Precise Planning

Date: 20/02/2025

2025 Background+Devlopment Traffic Volumes

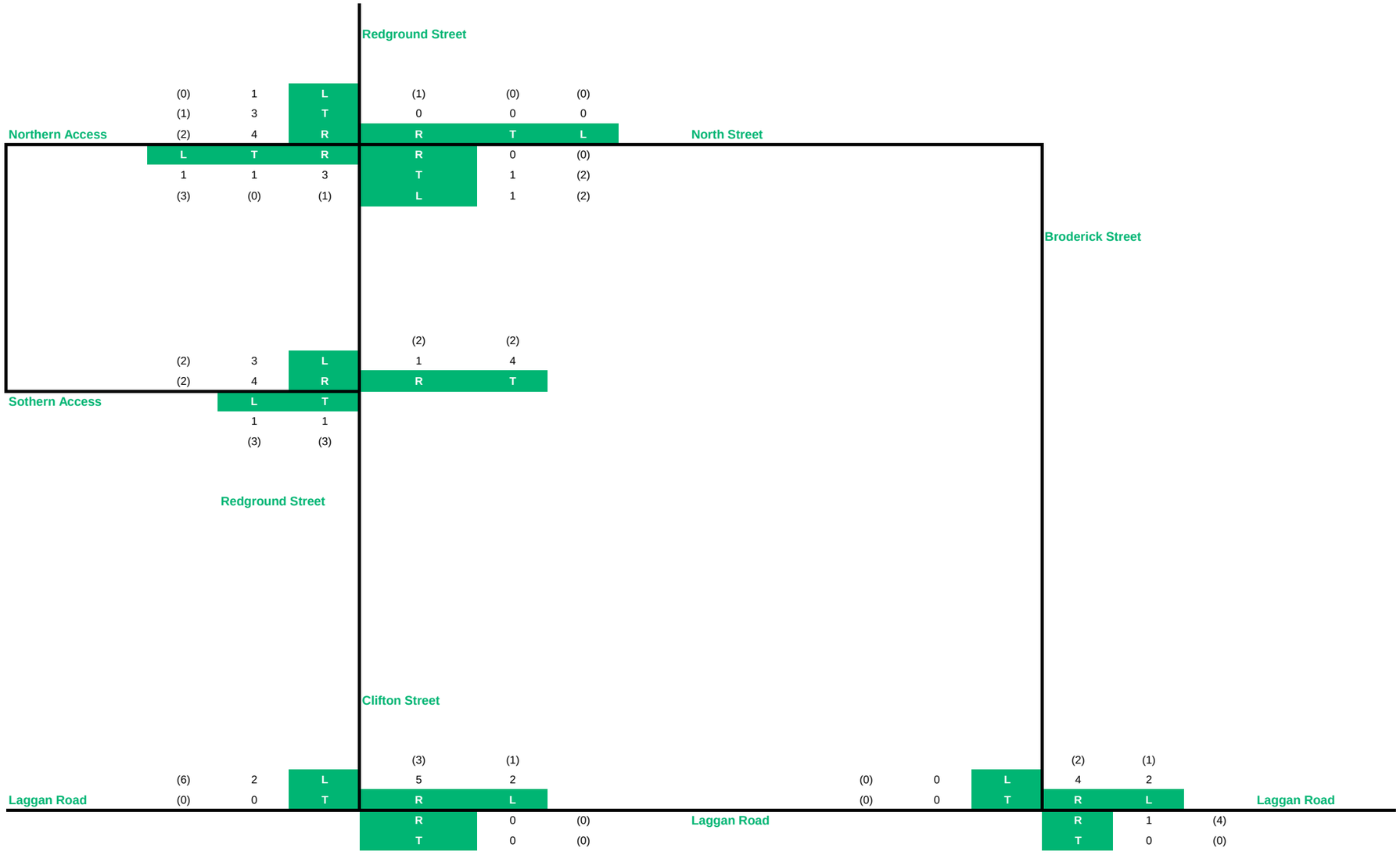
Prepared by: Afaf El Harda

Reviewed by: Tetteh Anang

Legend

L	Left turn
T	Through
R	Right turn
U	U-turn
00	AM Peak Hour Volumes
(00)	PM Peak Hour Volumes
	Development Area

Base year	2025
Assessment year	2026
Linear Growth Rate	6.4%
AM Peak Hour End	9:00 AM
PM Peak Hour End	5:30 PM



MODUS
Transport and Traffic Engineering

Project: 39 Redground Road, (

Client: Precise Planning

Date: 20/02/2025

Development Traffic Volumes

Prepared by: Afaf El Harda

Reviewed by: Tetteh Anang

APPENDIX E

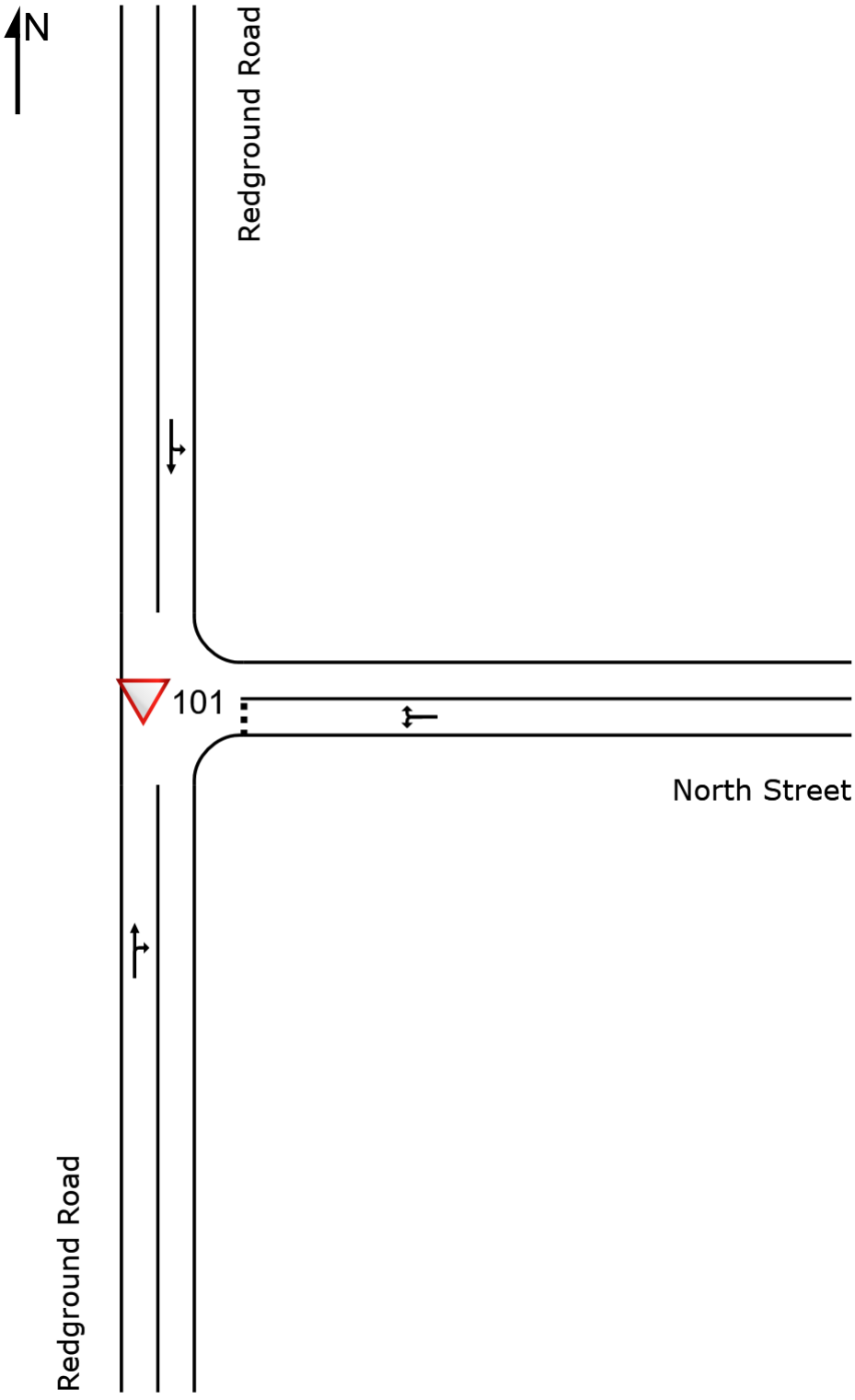
SIDRA RESULTS

SITE LAYOUT

Site: 101 [BG2026 - AM - ACCESS 1 (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Organisation: MODUS TRAFFIC ENGINEERING PTY LTD | Licence: NETWORK / 1PC | Created: Thursday, 20 February 2025 10:08:20 AM
Project: C:\Users\YuriSuzuki\Modus Engineering\Projects 2023 - 2024 - Documents\General\Projects 2023-2024\NSW\MOD23142NSW - 39 Redground Road, Crookwell\3 ANALYSIS\SIDRA\SIDRA.sip9

MOVEMENT SUMMARY

Site: 101 [BG2025 - AM - ACCESS 1 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Redground Road															
2	T1	All MCs	15	7.0	15	7.0	0.010	0.0	LOS A	0.0	0.2	0.04	0.14	0.04	58.6
3	R2	All MCs	4	0.0	4	0.0	0.010	5.5	LOS A	0.0	0.2	0.04	0.14	0.04	55.9
Approach			19	5.4	19	5.4	0.010	1.2	NA	0.0	0.2	0.04	0.14	0.04	58.0
East: North Street															
4	L2	All MCs	9	0.0	9	0.0	0.007	5.6	LOS A	0.0	0.2	0.09	0.55	0.09	52.6
6	R2	All MCs	1	0.0	1	0.0	0.007	5.6	LOS A	0.0	0.2	0.09	0.55	0.09	52.4
Approach			11	0.0	11	0.0	0.007	5.6	LOS A	0.0	0.2	0.09	0.55	0.09	52.6
North: Redground Road															
7	L2	All MCs	1	100.0	1	100.0	0.015	6.7	LOS A	0.0	0.0	0.00	0.02	0.00	52.7
8	T1	All MCs	26	8.0	26	8.0	0.015	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.7
Approach			27	11.5	27	11.5	0.015	0.3	NA	0.0	0.0	0.00	0.02	0.00	59.4
All Vehicles			57	7.4	57	7.4	0.015	1.6	NA	0.0	0.2	0.03	0.16	0.03	57.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [BG2025 - PM - ACCESS 1 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Redground Road															
2	T1	All MCs	24	4.0	24	4.0	0.015	0.0	LOS A	0.0	0.2	0.02	0.09	0.02	59.1
3	R2	All MCs	4	0.0	4	0.0	0.015	5.5	LOS A	0.0	0.2	0.02	0.09	0.02	56.3
Approach			28	3.4	28	3.4	0.015	0.8	NA	0.0	0.2	0.02	0.09	0.02	58.7
East: North Street															
4	L2	All MCs	4	0.0	4	0.0	0.005	5.6	LOS A	0.0	0.1	0.07	0.56	0.07	52.7
6	R2	All MCs	2	50.0	2	50.0	0.005	6.2	LOS A	0.0	0.1	0.07	0.56	0.07	50.3
Approach			6	16.7	6	16.7	0.005	5.8	LOS A	0.0	0.1	0.07	0.56	0.07	51.9
North: Redground Road															
7	L2	All MCs	1	0.0	1	0.0	0.008	5.5	LOS A	0.0	0.0	0.00	0.05	0.00	57.0
8	T1	All MCs	13	17.0	13	17.0	0.008	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	59.5
Approach			14	15.7	14	15.7	0.008	0.4	NA	0.0	0.0	0.00	0.05	0.00	59.3
All Vehicles			48	8.6	48	8.6	0.015	1.4	NA	0.0	0.2	0.02	0.14	0.02	57.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [BG2026 - AM - ACCESS 1 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Redground Road															
2	T1	All MCs	16	7.0	16	7.0	0.011	0.0	LOS A	0.0	0.2	0.04	0.13	0.04	58.6
3	R2	All MCs	4	0.0	4	0.0	0.011	5.5	LOS A	0.0	0.2	0.04	0.13	0.04	55.9
Approach			20	5.5	20	5.5	0.011	1.2	NA	0.0	0.2	0.04	0.13	0.04	58.1
East: North Street															
4	L2	All MCs	11	0.0	11	0.0	0.007	5.6	LOS A	0.0	0.2	0.09	0.54	0.09	52.6
6	R2	All MCs	1	0.0	1	0.0	0.007	5.6	LOS A	0.0	0.2	0.09	0.54	0.09	52.4
Approach			12	0.0	12	0.0	0.007	5.6	LOS A	0.0	0.2	0.09	0.54	0.09	52.6
North: Redground Road															
7	L2	All MCs	1	100.0	1	100.0	0.016	6.7	LOS A	0.0	0.0	0.00	0.02	0.00	52.7
8	T1	All MCs	28	8.0	28	8.0	0.016	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.7
Approach			29	11.3	29	11.3	0.016	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.5
All Vehicles			61	7.3	61	7.3	0.016	1.6	NA	0.0	0.2	0.03	0.16	0.03	57.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [BG2026 - PM - ACCESS 1 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Redground Road															
2	T1	All MCs	25	4.0	25	4.0	0.016	0.0	LOS A	0.0	0.2	0.02	0.09	0.02	59.1
3	R2	All MCs	4	0.0	4	0.0	0.016	5.5	LOS A	0.0	0.2	0.02	0.09	0.02	56.4
Approach			29	3.4	29	3.4	0.016	0.8	NA	0.0	0.2	0.02	0.09	0.02	58.7
East: North Street															
4	L2	All MCs	4	0.0	4	0.0	0.004	5.6	LOS A	0.0	0.1	0.06	0.55	0.06	52.7
6	R2	All MCs	1	50.0	1	50.0	0.004	6.2	LOS A	0.0	0.1	0.06	0.55	0.06	50.3
Approach			5	10.0	5	10.0	0.004	5.7	LOS A	0.0	0.1	0.06	0.55	0.06	52.2
North: Redground Road															
7	L2	All MCs	1	0.0	1	0.0	0.008	5.5	LOS A	0.0	0.0	0.00	0.04	0.00	57.1
8	T1	All MCs	14	17.0	14	17.0	0.008	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	59.5
Approach			15	15.8	15	15.8	0.008	0.4	NA	0.0	0.0	0.00	0.04	0.00	59.4
All Vehicles			49	7.8	49	7.8	0.016	1.2	NA	0.0	0.2	0.02	0.12	0.02	58.1

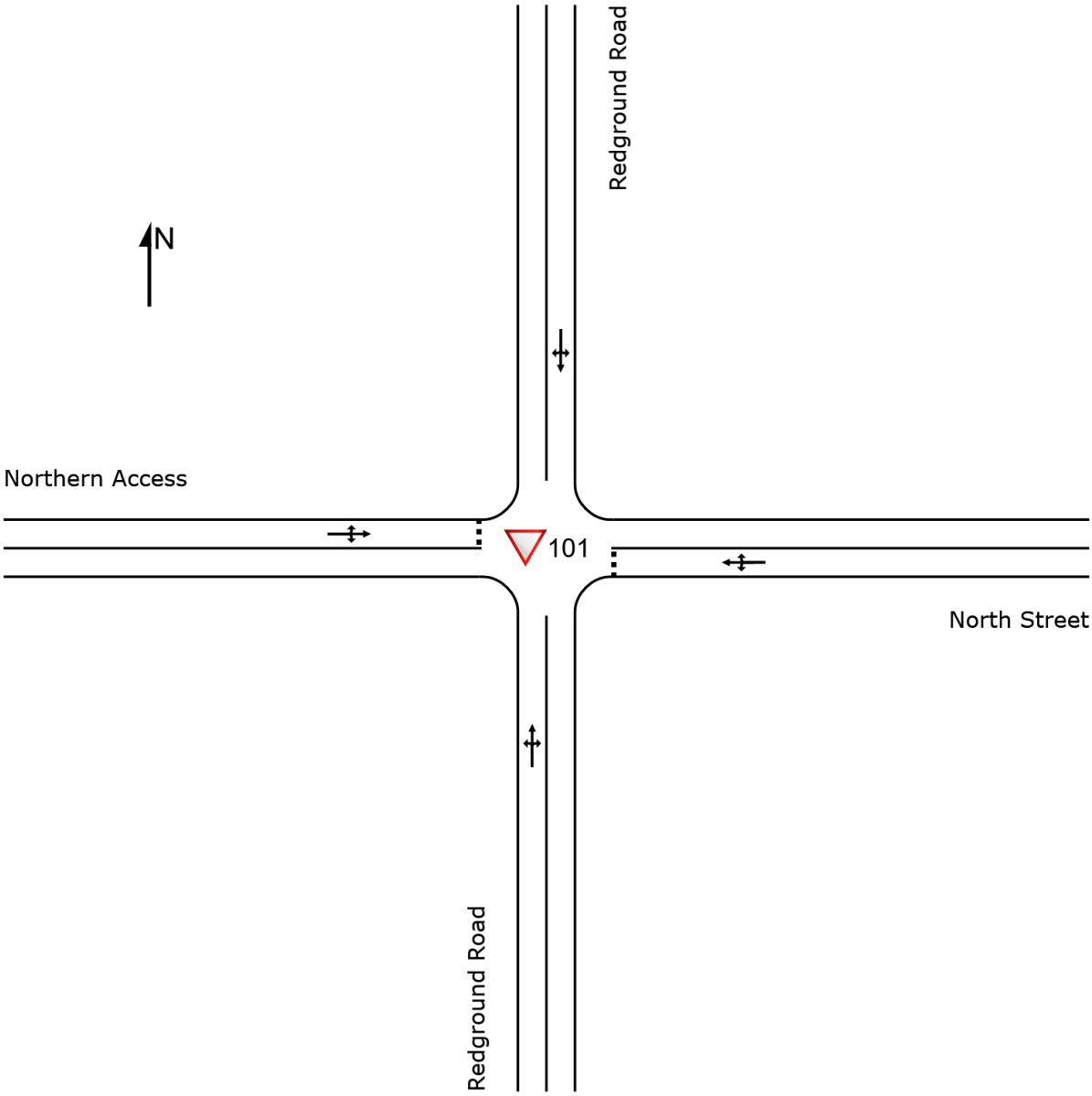
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 101 [BG2026+Dev - AM - ACCESS 1 (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [BG2026+Dev - AM - ACCESS 1 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Redground Road															
1	L2	All MCs	1	5.0	1	5.0	0.014	5.7	LOS A	0.0	0.3	0.06	0.20	0.06	53.6
2	T1	All MCs	17	7.0	17	7.0	0.014	0.0	LOS A	0.0	0.3	0.06	0.20	0.06	57.9
3	R2	All MCs	7	0.0	7	0.0	0.014	5.5	LOS A	0.0	0.3	0.06	0.20	0.06	55.3
Approach			25	4.9	25	4.9	0.014	1.9	NA	0.0	0.3	0.06	0.20	0.06	57.0
East: North Street															
4	L2	All MCs	11	0.0	11	0.0	0.008	5.6	LOS A	0.0	0.2	0.09	0.54	0.09	52.7
5	T1	All MCs	1	5.0	1	5.0	0.008	4.4	LOS A	0.0	0.2	0.09	0.54	0.09	50.6
6	R2	All MCs	1	0.0	1	0.0	0.008	5.7	LOS A	0.0	0.2	0.09	0.54	0.09	52.4
Approach			13	0.4	13	0.4	0.008	5.5	LOS A	0.0	0.2	0.09	0.54	0.09	52.5
North: Redground Road															
7	L2	All MCs	1	0.0	1	0.0	0.016	5.5	LOS A	0.0	0.1	0.01	0.04	0.01	57.1
8	T1	All MCs	28	0.0	28	0.0	0.016	0.0	LOS A	0.0	0.1	0.01	0.04	0.01	59.6
9	R2	All MCs	1	5.0	1	5.0	0.016	5.5	LOS A	0.0	0.1	0.01	0.04	0.01	55.0
Approach			31	0.2	31	0.2	0.016	0.4	NA	0.0	0.1	0.01	0.04	0.01	59.4
West: Northern Access															
10	L2	All MCs	1	5.0	1	5.0	0.007	5.6	LOS A	0.0	0.2	0.12	0.54	0.12	50.9
11	T1	All MCs	3	5.0	3	5.0	0.007	4.4	LOS A	0.0	0.2	0.12	0.54	0.12	51.4
12	R2	All MCs	4	5.0	4	5.0	0.007	5.8	LOS A	0.0	0.2	0.12	0.54	0.12	50.5
Approach			8	5.0	8	5.0	0.007	5.2	LOS A	0.0	0.2	0.12	0.54	0.12	50.9
All Vehicles			77	2.3	77	2.3	0.016	2.2	NA	0.0	0.3	0.05	0.23	0.05	56.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [BG2026+Dev - PM - ACCESS 1 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Redground Road															
1	L2	All MCs	3	5.0	3	5.0	0.019	5.6	LOS A	0.0	0.3	0.03	0.16	0.03	54.1
2	T1	All MCs	26	4.0	26	4.0	0.019	0.0	LOS A	0.0	0.3	0.03	0.16	0.03	58.5
3	R2	All MCs	6	0.0	6	0.0	0.019	5.5	LOS A	0.0	0.3	0.03	0.16	0.03	55.8
Approach			36	3.4	36	3.4	0.019	1.5	NA	0.0	0.3	0.03	0.16	0.03	57.6
East: North Street															
4	L2	All MCs	6	0.0	6	0.0	0.008	5.6	LOS A	0.0	0.2	0.08	0.54	0.08	52.9
5	T1	All MCs	2	5.0	2	5.0	0.008	4.4	LOS A	0.0	0.2	0.08	0.54	0.08	50.9
6	R2	All MCs	2	50.0	2	50.0	0.008	6.4	LOS A	0.0	0.2	0.08	0.54	0.08	50.5
Approach			11	11.0	11	11.0	0.008	5.5	LOS A	0.0	0.2	0.08	0.54	0.08	52.0
North: Redground Road															
7	L2	All MCs	1	0.0	1	0.0	0.009	5.6	LOS A	0.0	0.1	0.02	0.08	0.02	56.7
8	T1	All MCs	14	17.0	14	17.0	0.009	0.0	LOS A	0.0	0.1	0.02	0.08	0.02	59.1
9	R2	All MCs	1	5.0	1	5.0	0.009	5.5	LOS A	0.0	0.1	0.02	0.08	0.02	54.4
Approach			16	15.1	16	15.1	0.009	0.7	NA	0.0	0.1	0.02	0.08	0.02	58.7
West: Northern Access															
10	L2	All MCs	1	5.0	1	5.0	0.004	5.7	LOS A	0.0	0.1	0.12	0.54	0.12	50.8
11	T1	All MCs	1	5.0	1	5.0	0.004	4.4	LOS A	0.0	0.1	0.12	0.54	0.12	51.3
12	R2	All MCs	2	5.0	2	5.0	0.004	5.8	LOS A	0.0	0.1	0.12	0.54	0.12	50.4
Approach			4	5.0	4	5.0	0.004	5.4	LOS A	0.0	0.1	0.12	0.54	0.12	50.7
All Vehicles			66	7.5	66	7.5	0.019	2.2	NA	0.0	0.3	0.04	0.23	0.04	56.5

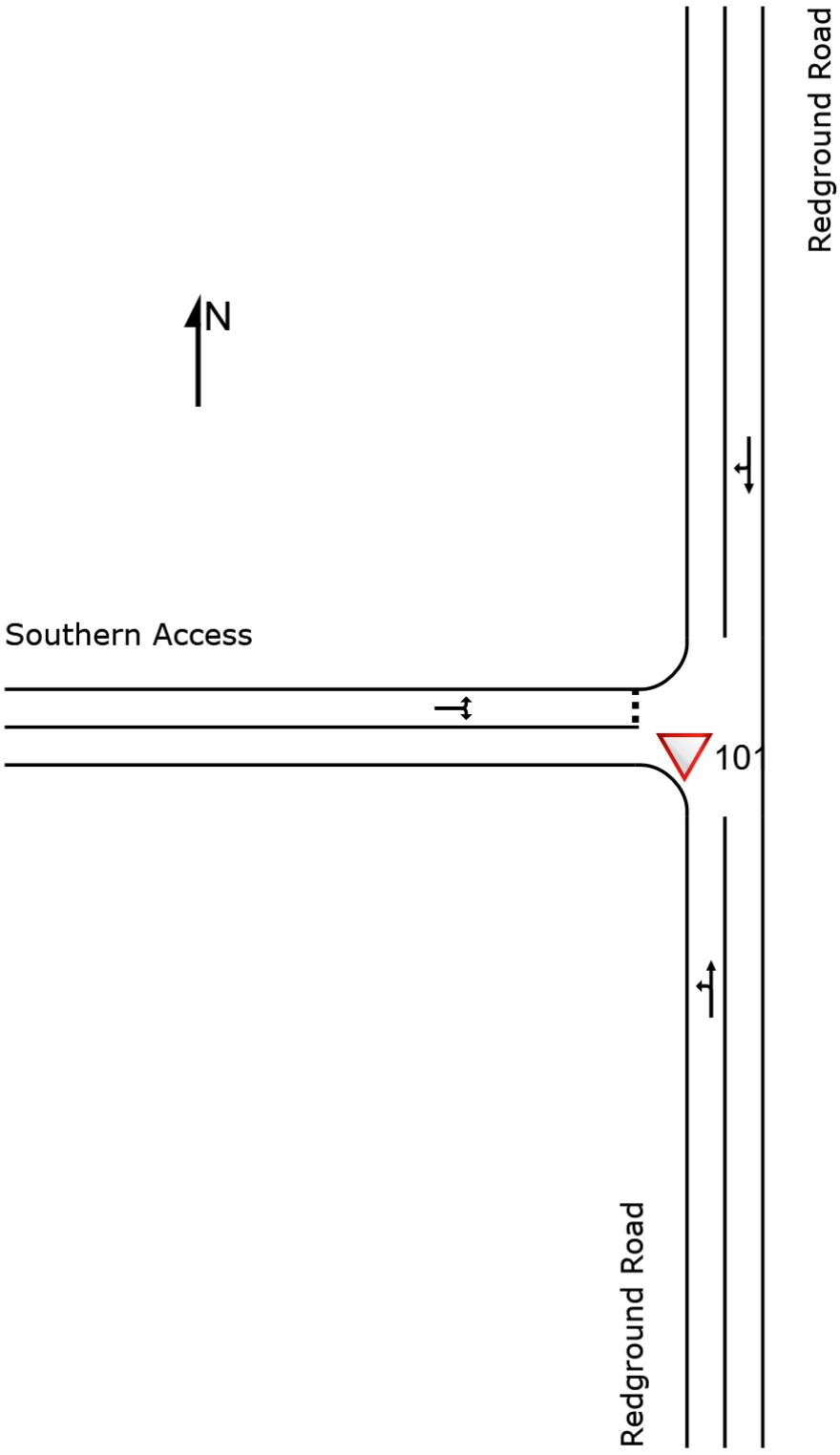
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 101 [BG2026+Dev - AM - ACCESS 2 (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Organisation: MODUS TRAFFIC ENGINEERING PTY LTD | Licence: NETWORK / 1PC | Created: Thursday, 20 February 2025 10:15:58 AM
Project: C:\Users\YuriSuzuki\Modus Engineering\Projects 2023 - 2024 - Documents\General\Projects 2023-2024\NSW\MOD23142NSW - 39 Redground Road, Crookwell\3 ANALYSIS\SIDRA\SIDRA.sip9

MOVEMENT SUMMARY

Site: 101 [BG2026+Dev - AM - ACCESS 2 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Redground Road															
1	L2	All MCs	1	5.0	1	5.0	0.013	5.6	LOS A	0.0	0.0	0.00	0.53	0.00	51.5
2	T1	All MCs	24	5.0	24	5.0	0.013	4.2	LOS A	0.0	0.0	0.00	0.53	0.00	54.2
Approach			25	5.0	25	5.0	0.013	4.2	NA	0.0	0.0	0.00	0.53	0.00	54.1
North: Redground Road															
8	T1	All MCs	42	5.0	42	5.0	0.023	0.0	LOS A	0.0	0.0	0.01	0.02	0.01	59.8
9	R2	All MCs	1	5.0	1	5.0	0.023	5.5	LOS A	0.0	0.0	0.01	0.02	0.01	55.3
Approach			43	5.0	43	5.0	0.023	0.1	NA	0.0	0.0	0.01	0.02	0.01	59.8
West: Southern Access															
10	L2	All MCs	3	5.0	3	5.0	0.006	5.7	LOS A	0.0	0.1	0.10	0.55	0.10	50.5
12	R2	All MCs	4	5.0	4	5.0	0.006	5.7	LOS A	0.0	0.1	0.10	0.55	0.10	50.1
Approach			7	5.0	7	5.0	0.006	5.7	LOS A	0.0	0.1	0.10	0.55	0.10	50.3
All Vehicles			76	5.0	76	5.0	0.023	2.0	NA	0.0	0.1	0.01	0.24	0.01	56.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [BG2026+Dev - PM - ACCESS 2 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Redground Road															
1	L2	All MCs	3	5.0	3	5.0	0.042	5.6	LOS A	0.2	1.1	0.05	0.52	0.05	51.4
2	T1	All MCs	58	5.0	58	5.0	0.042	4.2	LOS A	0.2	1.1	0.05	0.52	0.05	54.0
Approach			61	5.0	61	5.0	0.042	4.3	LOS A	0.2	1.1	0.05	0.52	0.05	53.9
North: Redground Road															
8	T1	All MCs	20	5.0	20	5.0	0.012	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	59.5
9	R2	All MCs	2	5.0	2	5.0	0.012	5.5	LOS A	0.0	0.0	0.00	0.06	0.00	54.9
Approach			22	5.0	22	5.0	0.012	0.5	NA	0.0	0.0	0.00	0.06	0.00	59.1
West: Southern Access															
10	L2	All MCs	2	5.0	2	5.0	0.003	5.8	LOS A	0.0	0.1	0.15	0.54	0.15	50.3
12	R2	All MCs	2	5.0	2	5.0	0.003	5.8	LOS A	0.0	0.1	0.15	0.54	0.15	50.0
Approach			4	5.0	4	5.0	0.003	5.8	LOS A	0.0	0.1	0.15	0.54	0.15	50.2
All Vehicles			87	5.0	87	5.0	0.042	3.4	NA	0.2	1.1	0.04	0.40	0.04	55.0

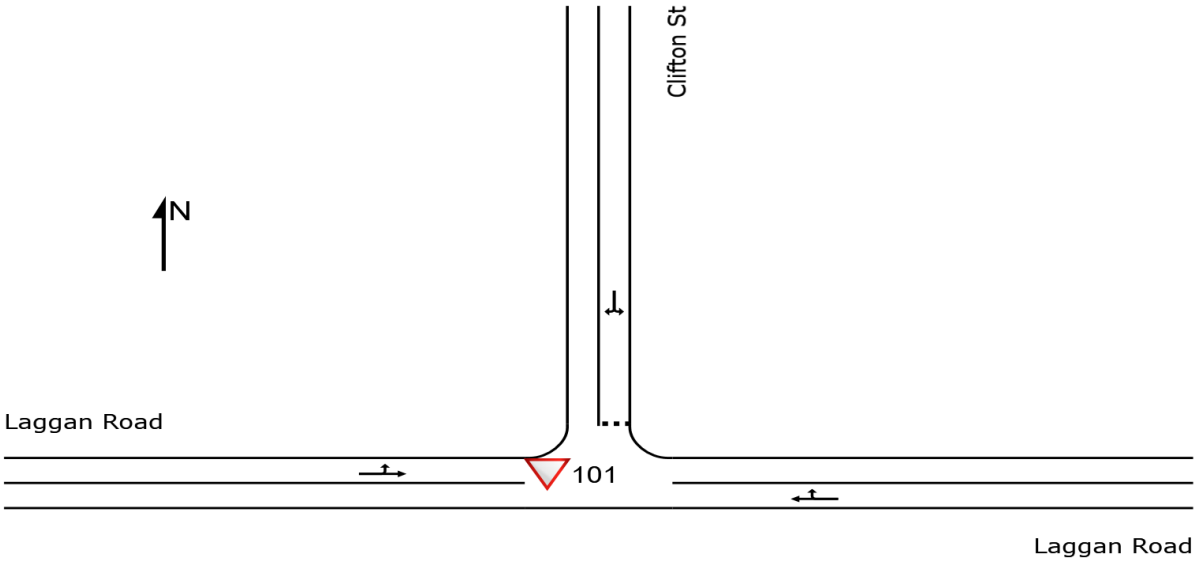
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 101 [BG2025 - AM - Clifton St (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [BG2025 - AM - Clifton St (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Laggan Road															
5	T1	All MCs	44	12.0	44	12.0	0.030	0.0	LOS A	0.1	0.4	0.05	0.12	0.05	58.7
6	R2	All MCs	11	0.0	11	0.0	0.030	5.5	LOS A	0.1	0.4	0.05	0.12	0.05	56.0
Approach			55	9.7	55	9.7	0.030	1.1	NA	0.1	0.4	0.05	0.12	0.05	58.1
North: Clifton St															
7	L2	All MCs	26	20.0	26	20.0	0.037	5.9	LOS A	0.1	1.1	0.12	0.55	0.12	51.7
9	R2	All MCs	21	10.0	21	10.0	0.037	5.9	LOS A	0.1	1.1	0.12	0.55	0.12	51.8
Approach			47	15.6	47	15.6	0.037	5.9	LOS A	0.1	1.1	0.12	0.55	0.12	51.8
West: Laggan Road															
10	L2	All MCs	12	9.0	12	9.0	0.024	5.7	LOS A	0.0	0.0	0.00	0.16	0.00	55.7
11	T1	All MCs	32	10.0	32	10.0	0.024	0.0	LOS A	0.0	0.0	0.00	0.16	0.00	58.5
Approach			43	9.7	43	9.7	0.024	1.5	NA	0.0	0.0	0.00	0.16	0.00	57.8
All Vehicles			145	11.6	145	11.6	0.037	2.8	NA	0.1	1.1	0.06	0.27	0.06	55.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [BG2026 - AM - Clifton St (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Laggan Road															
5	T1	All MCs	47	12.0	47	12.0	0.033	0.0	LOS A	0.1	0.5	0.05	0.13	0.05	58.6
6	R2	All MCs	12	0.0	12	0.0	0.033	5.6	LOS A	0.1	0.5	0.05	0.13	0.05	55.9
Approach			59	9.6	59	9.6	0.033	1.1	NA	0.1	0.5	0.05	0.13	0.05	58.1
North: Clifton St															
7	L2	All MCs	28	20.0	28	20.0	0.040	5.9	LOS A	0.1	1.1	0.13	0.55	0.13	51.7
9	R2	All MCs	22	10.0	22	10.0	0.040	6.0	LOS A	0.1	1.1	0.13	0.55	0.13	51.8
Approach			51	15.6	51	15.6	0.040	5.9	LOS A	0.1	1.1	0.13	0.55	0.13	51.8
West: Laggan Road															
10	L2	All MCs	13	9.0	13	9.0	0.026	5.7	LOS A	0.0	0.0	0.00	0.16	0.00	55.7
11	T1	All MCs	34	10.0	34	10.0	0.026	0.0	LOS A	0.0	0.0	0.00	0.16	0.00	58.5
Approach			46	9.7	46	9.7	0.026	1.5	NA	0.0	0.0	0.00	0.16	0.00	57.7
All Vehicles			156	11.6	156	11.6	0.040	2.8	NA	0.1	1.1	0.06	0.27	0.06	55.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [BG2026+Dev - AM - Clifton St (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Laggan Road															
5	T1	All MCs	47	12.0	47	12.0	0.033	0.0	LOS A	0.1	0.5	0.06	0.13	0.06	58.6
6	R2	All MCs	12	0.0	12	0.0	0.033	5.6	LOS A	0.1	0.5	0.06	0.13	0.06	55.9
Approach			59	9.6	59	9.6	0.033	1.1	NA	0.1	0.5	0.06	0.13	0.06	58.1
North: Clifton St															
7	L2	All MCs	31	20.0	31	20.0	0.047	5.9	LOS A	0.2	1.3	0.13	0.55	0.13	51.7
9	R2	All MCs	28	10.0	28	10.0	0.047	6.0	LOS A	0.2	1.3	0.13	0.55	0.13	51.8
Approach			59	15.2	59	15.2	0.047	5.9	LOS A	0.2	1.3	0.13	0.55	0.13	51.8
West: Laggan Road															
10	L2	All MCs	15	9.0	15	9.0	0.027	5.7	LOS A	0.0	0.0	0.00	0.18	0.00	55.6
11	T1	All MCs	34	10.0	34	10.0	0.027	0.0	LOS A	0.0	0.0	0.00	0.18	0.00	58.4
Approach			48	9.7	48	9.7	0.027	1.7	NA	0.0	0.0	0.00	0.18	0.00	57.5
All Vehicles			166	11.6	166	11.6	0.047	3.0	NA	0.2	1.3	0.07	0.29	0.07	55.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [BG2025 - PM - Clifton St (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Laggan Road															
5	T1	All MCs	41	15.0	41	15.0	0.043	0.1	LOS A	0.2	1.2	0.14	0.27	0.14	57.1
6	R2	All MCs	32	7.0	32	7.0	0.043	5.8	LOS A	0.2	1.2	0.14	0.27	0.14	54.2
Approach			73	11.5	73	11.5	0.043	2.6	NA	0.2	1.2	0.14	0.27	0.14	55.8
North: Clifton St															
7	L2	All MCs	18	12.0	18	12.0	0.027	5.8	LOS A	0.1	0.7	0.16	0.55	0.16	52.0
9	R2	All MCs	16	13.0	16	13.0	0.027	6.1	LOS A	0.1	0.7	0.16	0.55	0.16	51.6
Approach			34	12.5	34	12.5	0.027	6.0	LOS A	0.1	0.7	0.16	0.55	0.16	51.8
West: Laggan Road															
10	L2	All MCs	20	21.0	20	21.0	0.040	5.8	LOS A	0.0	0.0	0.00	0.17	0.00	55.2
11	T1	All MCs	49	15.0	49	15.0	0.040	0.0	LOS A	0.0	0.0	0.00	0.17	0.00	58.5
Approach			69	16.7	69	16.7	0.040	1.7	NA	0.0	0.0	0.00	0.17	0.00	57.5
All Vehicles			176	13.8	176	13.8	0.043	2.9	NA	0.2	1.2	0.09	0.29	0.09	55.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [BG2026 - PM - Clifton St (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Laggan Road															
5	T1	All MCs	43	15.0	43	15.0	0.045	0.2	LOS A	0.2	1.3	0.15	0.28	0.15	57.1
6	R2	All MCs	34	7.0	34	7.0	0.045	5.8	LOS A	0.2	1.3	0.15	0.28	0.15	54.2
Approach			77	11.5	77	11.5	0.045	2.6	NA	0.2	1.3	0.15	0.28	0.15	55.8
North: Clifton St															
7	L2	All MCs	19	12.0	19	12.0	0.029	5.9	LOS A	0.1	0.8	0.17	0.55	0.17	51.9
9	R2	All MCs	17	13.0	17	13.0	0.029	6.2	LOS A	0.1	0.8	0.17	0.55	0.17	51.6
Approach			36	12.5	36	12.5	0.029	6.0	LOS A	0.1	0.8	0.17	0.55	0.17	51.8
West: Laggan Road															
10	L2	All MCs	21	21.0	21	21.0	0.043	5.8	LOS A	0.0	0.0	0.00	0.17	0.00	55.2
11	T1	All MCs	53	15.0	53	15.0	0.043	0.0	LOS A	0.0	0.0	0.00	0.17	0.00	58.5
Approach			74	16.7	74	16.7	0.043	1.7	NA	0.0	0.0	0.00	0.17	0.00	57.5
All Vehicles			186	13.7	186	13.7	0.045	2.9	NA	0.2	1.3	0.09	0.29	0.09	55.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [BG2026+Dev - PM - Clifton St (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Laggan Road															
5	T1	All MCs	43	15.0	43	15.0	0.045	0.2	LOS A	0.2	1.3	0.15	0.28	0.15	57.1
6	R2	All MCs	34	7.0	34	7.0	0.045	5.8	LOS A	0.2	1.3	0.15	0.28	0.15	54.2
Approach			77	11.5	77	11.5	0.045	2.6	NA	0.2	1.3	0.15	0.28	0.15	55.8
North: Clifton St															
7	L2	All MCs	20	12.0	20	12.0	0.033	5.9	LOS A	0.1	0.9	0.17	0.55	0.17	51.9
9	R2	All MCs	20	13.0	20	13.0	0.033	6.2	LOS A	0.1	0.9	0.17	0.55	0.17	51.6
Approach			40	12.5	40	12.5	0.033	6.0	LOS A	0.1	0.9	0.17	0.55	0.17	51.8
West: Laggan Road															
10	L2	All MCs	27	21.0	27	21.0	0.047	5.8	LOS A	0.0	0.0	0.00	0.20	0.00	54.9
11	T1	All MCs	53	15.0	53	15.0	0.047	0.0	LOS A	0.0	0.0	0.00	0.20	0.00	58.2
Approach			80	17.1	80	17.1	0.047	2.0	NA	0.0	0.0	0.00	0.20	0.00	57.1
All Vehicles			197	14.0	197	14.0	0.047	3.1	NA	0.2	1.3	0.09	0.30	0.09	55.4

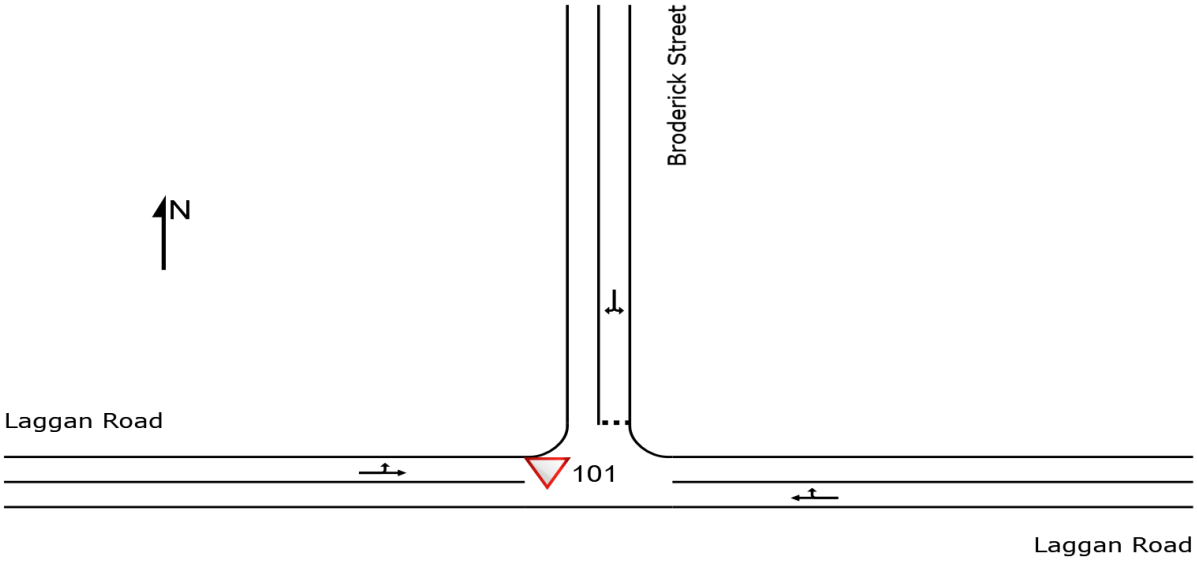
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 101 [BG2026+Dev - AM - Broderick St (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [BG2025 - AM - Broderick St (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Laggan Road															
5	T1	All MCs	58	11.0	58	11.0	0.032	0.0	LOS A	0.0	0.0	0.01	0.01	0.01	59.9
6	R2	All MCs	1	0.0	1	0.0	0.032	5.5	LOS A	0.0	0.0	0.01	0.01	0.01	57.1
Approach			59	10.8	59	10.8	0.032	0.1	NA	0.0	0.0	0.01	0.01	0.01	59.8
North: Broderick Street															
7	L2	All MCs	1	0.0	1	0.0	0.006	5.6	LOS A	0.0	0.1	0.16	0.56	0.16	52.5
9	R2	All MCs	6	0.0	6	0.0	0.006	5.8	LOS A	0.0	0.1	0.16	0.56	0.16	52.2
Approach			7	0.0	7	0.0	0.006	5.7	LOS A	0.0	0.1	0.16	0.56	0.16	52.3
West: Laggan Road															
10	L2	All MCs	2	0.0	2	0.0	0.023	5.5	LOS A	0.0	0.0	0.00	0.03	0.00	57.2
11	T1	All MCs	39	16.0	39	16.0	0.023	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.7
Approach			41	15.2	41	15.2	0.023	0.3	NA	0.0	0.0	0.00	0.03	0.00	59.5
All Vehicles			107	11.7	107	11.7	0.032	0.6	NA	0.0	0.1	0.01	0.06	0.01	59.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [BG2026 - AM - Broderick St (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Laggan Road															
5	T1	All MCs	62	11.0	62	11.0	0.035	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.9
6	R2	All MCs	1	0.0	1	0.0	0.035	5.5	LOS A	0.0	0.0	0.00	0.01	0.00	57.1
Approach			63	10.8	63	10.8	0.035	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
North: Broderick Street															
7	L2	All MCs	1	0.0	1	0.0	0.006	5.7	LOS A	0.0	0.1	0.16	0.56	0.16	52.5
9	R2	All MCs	6	0.0	6	0.0	0.006	5.8	LOS A	0.0	0.1	0.16	0.56	0.16	52.2
Approach			7	0.0	7	0.0	0.006	5.8	LOS A	0.0	0.1	0.16	0.56	0.16	52.2
West: Laggan Road															
10	L2	All MCs	2	0.0	2	0.0	0.024	5.5	LOS A	0.0	0.0	0.00	0.03	0.00	57.2
11	T1	All MCs	41	16.0	41	16.0	0.024	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.7
Approach			43	15.2	43	15.2	0.024	0.3	NA	0.0	0.0	0.00	0.03	0.00	59.5
All Vehicles			114	11.8	114	11.8	0.035	0.5	NA	0.0	0.1	0.01	0.05	0.01	59.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [BG2026+Dev - AM - Broderick St (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Laggan Road															
5	T1	All MCs	62	11.0	62	11.0	0.035	0.0	LOS A	0.0	0.1	0.01	0.02	0.01	59.8
6	R2	All MCs	2	0.0	2	0.0	0.035	5.5	LOS A	0.0	0.1	0.01	0.02	0.01	57.0
Approach			64	10.6	64	10.6	0.035	0.2	NA	0.0	0.1	0.01	0.02	0.01	59.7
North: Broderick Street															
7	L2	All MCs	2	0.0	2	0.0	0.010	5.7	LOS A	0.0	0.2	0.16	0.56	0.16	52.5
9	R2	All MCs	11	0.0	11	0.0	0.010	5.8	LOS A	0.0	0.2	0.16	0.56	0.16	52.2
Approach			13	0.0	13	0.0	0.010	5.8	LOS A	0.0	0.2	0.16	0.56	0.16	52.2
West: Laggan Road															
10	L2	All MCs	2	0.0	2	0.0	0.024	5.5	LOS A	0.0	0.0	0.00	0.03	0.00	57.2
11	T1	All MCs	41	16.0	41	16.0	0.024	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.7
Approach			43	15.2	43	15.2	0.024	0.3	NA	0.0	0.0	0.00	0.03	0.00	59.5
All Vehicles			120	11.2	120	11.2	0.035	0.8	NA	0.0	0.2	0.02	0.08	0.02	58.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [BG2025 - PM - Broderick St (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Laggan Road															
5	T1	All MCs	47	9.0	47	9.0	0.026	0.0	LOS A	0.0	0.0	0.01	0.01	0.01	59.8
6	R2	All MCs	1	0.0	1	0.0	0.026	5.5	LOS A	0.0	0.0	0.01	0.01	0.01	57.0
Approach			48	8.8	48	8.8	0.026	0.1	NA	0.0	0.0	0.01	0.01	0.01	59.8
North: Broderick Street															
7	L2	All MCs	2	0.0	2	0.0	0.002	5.7	LOS A	0.0	0.1	0.15	0.54	0.15	52.5
9	R2	All MCs	1	0.0	1	0.0	0.002	5.8	LOS A	0.0	0.1	0.15	0.54	0.15	52.2
Approach			3	0.0	3	0.0	0.002	5.7	LOS A	0.0	0.1	0.15	0.54	0.15	52.4
West: Laggan Road															
10	L2	All MCs	4	25.0	4	25.0	0.035	5.8	LOS A	0.0	0.0	0.00	0.04	0.00	56.0
11	T1	All MCs	59	9.0	59	9.0	0.035	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	59.7
Approach			63	10.1	63	10.1	0.035	0.4	NA	0.0	0.0	0.00	0.04	0.00	59.4
All Vehicles			115	9.3	115	9.3	0.035	0.4	NA	0.0	0.1	0.01	0.04	0.01	59.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [BG2026 - PM - Broderick St (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Laggan Road															
5	T1	All MCs	51	9.0	51	9.0	0.028	0.0	LOS A	0.0	0.0	0.01	0.01	0.01	59.8
6	R2	All MCs	1	0.0	1	0.0	0.028	5.5	LOS A	0.0	0.0	0.01	0.01	0.01	57.0
Approach			52	8.8	52	8.8	0.028	0.1	NA	0.0	0.0	0.01	0.01	0.01	59.8
North: Broderick Street															
7	L2	All MCs	2	0.0	2	0.0	0.002	5.7	LOS A	0.0	0.1	0.15	0.54	0.15	52.4
9	R2	All MCs	1	0.0	1	0.0	0.002	5.8	LOS A	0.0	0.1	0.15	0.54	0.15	52.2
Approach			3	0.0	3	0.0	0.002	5.7	LOS A	0.0	0.1	0.15	0.54	0.15	52.4
West: Laggan Road															
10	L2	All MCs	4	25.0	4	25.0	0.037	5.8	LOS A	0.0	0.0	0.00	0.04	0.00	56.0
11	T1	All MCs	63	9.0	63	9.0	0.037	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	59.7
Approach			67	10.0	67	10.0	0.037	0.4	NA	0.0	0.0	0.00	0.04	0.00	59.5
All Vehicles			122	9.2	122	9.2	0.037	0.4	NA	0.0	0.1	0.01	0.04	0.01	59.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [BG2026+Dev - PM - Broderick St (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Laggan Road															
5	T1	All MCs	51	9.0	51	9.0	0.030	0.0	LOS A	0.0	0.2	0.03	0.05	0.03	59.4
6	R2	All MCs	4	0.0	4	0.0	0.030	5.5	LOS A	0.0	0.2	0.03	0.05	0.03	56.7
Approach			55	8.3	55	8.3	0.030	0.4	NA	0.0	0.2	0.03	0.05	0.03	59.2
North: Broderick Street															
7	L2	All MCs	3	0.0	3	0.0	0.005	5.7	LOS A	0.0	0.1	0.16	0.54	0.16	52.4
9	R2	All MCs	3	0.0	3	0.0	0.005	5.8	LOS A	0.0	0.1	0.16	0.54	0.16	52.2
Approach			6	0.0	6	0.0	0.005	5.8	LOS A	0.0	0.1	0.16	0.54	0.16	52.3
West: Laggan Road															
10	L2	All MCs	4	25.0	4	25.0	0.037	5.8	LOS A	0.0	0.0	0.00	0.04	0.00	56.0
11	T1	All MCs	63	9.0	63	9.0	0.037	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	59.7
Approach			67	10.0	67	10.0	0.037	0.4	NA	0.0	0.0	0.00	0.04	0.00	59.5
All Vehicles			128	8.8	128	8.8	0.037	0.7	NA	0.0	0.2	0.02	0.07	0.02	59.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.