

Transport Assessment

Proposed Customer Fulfilment Centre

Horsley Drive Business Park Stage 2, Horsley Park

Ref: 1223r03
27/02/2020

Document Control

Project No: 1223r02

Project: State Significant Development Application, Horsley Drive Stage 2, Horsley Park

Client: Charter Hall

File Reference: 1223r03v1 TA_Customer Fulfilment Centre HDBP Stage 2, Issue

Revision History

Revision	Date	Details	Author	Approved by
-	26/02/2020	Issue	V. Cheng	R.B Madden
I	27/02/2020	Issue	V. Cheng / R.B Madden	R.B Madden

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Table of Contents

1	INTRODUCTION	1
1.1	OVERVIEW	1
1.2	TRANSPORT ASSESSMENT TASKS.....	1
1.3	REFERENCE DOCUMENTS	5
2	THE PROPOSAL	7
2.1	THE PROPOSAL	7
3	THE EXISTING SITE.....	8
3.1	SITE LOCATION.....	8
3.2	EXISTING SITE APPROVAL	8
3.3	APPROVED TRAFFIC GENERATION	9
4	THE ROAD NETWORK	10
4.1	ROAD HIERARCHY	10
4.2	HEAVY VEHICLE ACCESS	11
4.3	THE HORSLEY DRIVE UPGRADE.....	12
5	EXISTING & BASELINE ROAD NETWORK PERFORMANCE	14
5.1	BASELINE (WITHOUT DEVELOPMENT) SCENARIOS	14
5.2	LIZARD LOG PRECINCT TRAFFIC GENERATION.....	14
5.3	BACKGROUND TRAFFIC GROWTH	14
5.4	PROPOSED HORSLEY DRIVE UPGRADES	16
5.5	EXISTING TRAFFIC FLOWS.....	18
5.6	EXISTING INTERSECTION PERFORMANCE	21
6	PUBLIC & ACTIVE TRANSPORT.....	25
6.1	BUS SERVICES	25
6.2	PEDESTRIAN AND CYCLE NETWORK.....	25
6.3	EXISTING MODE SHARE	27
7	TRAFFIC ASSESSMENT.....	28
7.1	TRAFFIC GENERATION	28
7.2	CFC TRAFFIC IMPACT ASSESSMENT	31
7.3	MOD STANDARD TRAFFIC IMPACT ASSESSMENT.....	33
7.4	MOD SENSITIVITY TEST TRAFFIC IMPACTS	35
8	PARKING & SERVICING REQUIREMENTS	37
8.1	CAR PARKING REQUIREMENTS	37
8.2	CFC PROPOSED CAR PARKING.....	37
8.3	ACCESSIBLE PARKING.....	37
8.4	OTHER PARKING.....	38
9	DESIGN COMMENTARY	39
9.1	RELEVANT DESIGN STANDARDS	39
9.2	ACCESS DRIVEWAYS AND INTERNAL CIRCULATION	39
9.3	PARKING SPACES	40
9.4	DESIGN SUMMARY	40
10	PRELIMINARY CONSTRUCTION TRAFFIC MANAGEMENT PLAN	41
10.1	OVERVIEW	41
10.2	POTENTIAL HAULAGE ROUTES.....	41
10.3	STAGING AND DURATION OF WORKS.....	45
10.4	PROPOSED WORKING HOURS	45
10.5	VEHICLE SIZE	45
10.6	CONSTRUCTION TRAFFIC GENERATION	46

10.7 PEDESTRIAN MITIGATION MEASURES..... 46

10.8 CONSTRUCTION MITIGATION MEASURES 46

11 CONCLUSIONS..... 48

11.1 CONCLUSIONS..... 48

Appendices

- Appendix A: SIDRA Outputs
- Appendix B: Swept Path Analysis

1 Introduction

1.1 Overview

Ason Group has been commissioned by Charter Hall (the applicant) to prepare this Transport Assessment (TA) in accordance with the technical requirements of the Secretary's Environmental Assessment Requirements (SEARs), in support of the State Significant Development-10404 (SSD-10404) for the development of a 24-hour Customer Fulfilment Centre (CFC) (the Proposal) at Horsley Drive Business Park (HDBP) Stage 2.

It is noteworthy that the HDBP Stage 2 is subject to a Concept Plan and Stage 1 approval (reference SSD-7664). The Concept Plan and Stage 1 SSD is currently subject to a Modification Application (Mod) to facilitate the provision of the proposed CFC. The assessment of the Mod is detailed within the Ason Group report entitled *Transport Assessment Report, Horsley Drive Business Park Stage 2, Horsley Park, State Significant Development Modification, Version 2, 26/02/2020*.

The Proposal seeks approval for development of the southern portion of the HDBP Stage 2 (Lot 1) to provide for:

- A specialist warehouse facility used for the distribution of goods with:
 - 24 hour/day, seven day/week operation
 - 29,631m² of warehouse and office Gross Floor Area (GFA).
 - Construction of hardstand, loading area, 538 parking spaces and 276 van bays.

1.2 Transport Assessment Tasks

This TA provides an assessment of the relevant access, traffic and parking characteristics of the Proposal, and the potential impacts of the Proposal on the local road and parking environment. This has included a detailed assessment of:

1. Existing local road network operations and off-site parking conditions;
2. Public and active transport services and infrastructure, and available sustainable transport strategies to reduce the future (vehicular) trip generation of the Site;
3. The peak period and daily trip generation and distribution of the Site further to the Proposal, and the potential impact of those trips on the local road network;
4. Parking requirements and provision;
5. The design of access driveways; parking aisles and spaces; and servicing areas; and
6. The preparation of a Preliminary Construction Traffic Management Plan.

This scope of work specifically and necessarily references the SEARs prepared by the Department of Planning, Industry and Environment (DPIE), dated 18 December 2019, relating to the Proposal. In this regard, **Table 1** below provides the general SEARs prepared by the Department of Planning and Environment, while **Table 2** and **Table 3** provides the detailed traffic and transport related SEARs request submissions from Council and TfNSW. A summary response is provided to each SEAR, as well as a reference to the section of this TA which provides a detailed assessment of each SEAR.

Table 1: SEARs - General

SEAR	Response / Comment	TA Section
A quantitative Traffic Impact Assessment prepared in accordance with the relevant Council, Austroads and RMS guidelines;	This Transport Assessment has been prepared in accordance with the relevant Council, Austroads and RMS guidelines.	-
Details of all daily and peak traffic and transport movements likely to be generated by the development (vehicle type, public transport) during construction and indicative operation;	Please refer to Section 7.1.	7.1
Details and a justification of the proposed access to, from and within the site (vehicular and pedestrian);	The roundabout would improve the Level of Service (LoS) of the access road to Cowpasture Road and Trivet Street from a LoS C to a LoS A. Further, the design of the access has been provided in compliance with relevant Australian Standards. Survey data indicates that there are only 2 pedestrian movements during the AM and PM peak hours indicating that there are very little pedestrian movements in the area. Therefore, the roundabout access is a suitable upgrade for the existing intersection.	7 & 9
Impacts on the safety and capacity of the surrounding road network (including intersections along Cowpasture Road and Victoria Street) and access points, using SIDRA modelling or similar to assess impacts from current traffic counts and cumulative traffic from existing and proposed developments;	Key intersections along Cowpasture Road, The Horsley Drive and Victoria Street have been modelled using SIDRA Network. Generally, the LoS before and after the Proposal's additional traffic on the existing 2019 road network remain mostly unchanged.	5 & 7
Demonstrate that sufficient loading/unloading, car parking and pedestrian and cyclist facilities have been provided for the development; and	Car parking for the Proposal has been based on known operational requirements.	8
Details of road upgrades, new roads or access points required for the development, if necessary.	No upgrades are required to accommodate the CFC. The access arrangement into the HDBP is currently subject to a separate Modification application. Nevertheless, the CFC will be accessed via an internal HDBP Stage 2 access road, provided in compliance with the relevant Australian Standards.	7

Table 2: Council SEARs

SEAR	Summary Response	TA Section
A Traffic Impact Assessment detailing daily and peak traffic and traffic movements likely to be generated as a result of the proposal (vehicle, public transport, pedestrian and cycle trips), including vehicle access routes and the impacts on nearby intersections, including The Horsley Drive/Cowpasture Road, Newton Road/Cowpasture Road, Cowpasture Road/Victoria Street, Trivet Street/Cowpasture Road and Cowpasture Road/Burilda Close.	All daily and peak traffic movements have been documented in Section 7.1 and the intersections have been assessed in Sections 5 and 7. Vehicle access routes have been discussed in Section 4.	4, 5, 7
An assessment of the existing and future performance of key intersections providing access to the site including any upgrades to the roads or intersections required as a result of the development. The assessment will need to be supported by appropriate modelling and analysis to the satisfaction of Roads and Maritime Services.	Assessment of the existing and future performance of key intersections have been provided in Sections 5 and 7. This assessment has been undertaken in accordance with Roads and Maritime Services guidance.	5, 7,
As Chandos Road and Trivet Street are 5 tonne load road, limited heavy vehicle access shall be restricted via those roads.	See Section 4.2 for heavy vehicle routes.	4.2
An assessment of proposed loading docks, servicing provisions and access arrangements to loading docks shall be addressed.	All loading docks, servicing provisions and access arrangements have been assessed in accordance with the AS2890 series.	9
Details of access and parking arrangements for emergency vehicles shall be submitted as part of the EIS.	Emergency vehicles will have access to the Site. There is ample hardstand area and accesses for emergency vehicles across the Site.	9
The installation of a single roundabout at the intersection of Trivet Street/Cowpasture Road requires approval from Fairfield Traffic Committee, consultation with Council's Traffic and Transport Department is required.	It is expected that this could be undertaken as part of a relevant Condition of Consent at the applicable time.	-
The installation of a roundabout requires changes to the access arrangements to adjacent properties which will require consent from the affected stakeholders.	As above, it is expected that this could be conducted following a relevant Condition of Consent, to be completed prior to the issue of a Construction Certificate.	-
Construction Traffic Management Plan shall be submitted with details of vehicle routes, number of trucks, hours of operation, access arrangement and proposed traffic control measures for all stages of construction.	A preliminary CTMP has been provided at Section 10.	10
Details of the likely dangerous goods to be transported on arterial and local roads to and from the site, if any, and the preparation of an incident management strategy if relevant.	As advised by end-user of the CFC, the Operation of the proposed facility would not require the transportation of dangerous goods on arterial and local roads to/from the Site.	-
The EIS must demonstrate appropriate provisions, design and location of on-site bicycle parking and how bicycle provisions will be integrated with the existing bicycle network.	The CFC provides 20 on-site bicycle parking spaces. There is ample area on Site to accommodate bicycle parking and end of trip facilities for staff and visitors. It is noted that cycle use in the area is generally low, although this is expected to improve as the bicycle network is implemented. The Site can respond to the changing cycling trends as it develops.	8.4

The impact of the development on the Southern Link Road connection to Victoria Street shall be addressed within the EIS.	The Southern Link Road is proposed to terminate to the west of the M7 Westlink (some 3-4kms north west of the Site). Regardless, the traffic impact assessment has shown that the Proposal is acceptable and would not have a material impact on the operation of the road network.	-
All loading and unloading activities shall be carried out within the designated areas inside the building. Swept path diagrams shall be submitted for the largest vehicles proposed to service the site. Vehicular access to the site and all parking spaces shall be designed in accordance with AS 2890.1-2004 and AS 2890.2:2002.	All access, parking and loading docks have been assessed in accordance with the AS2890 series. Please refer to Appendix B for the swept path analysis.	9, Appendix B
Pedestrian access through car parking areas should be clearly marked, and where possible emphasised by the use of raised and textured surfaces. As far as possible, pedestrian access through carparks should be kept separate from vehicle access ways.	Pedestrian access through car parking areas will be clearly marked and the use of textured surfaces will be further explored during the detailed design stage. All carparks have been separated from heavy vehicle accesses.	9

Table 3: TfNSW SEARs

SEAR	Summary Response	TA Section
Daily and peak traffic movements likely to be generated by the proposed development including the impact on nearby intersections and the need/associated funding for upgrading or road improvement works (if required). The key intersections to be examined/modelled is to include but is not limited to: - Cowpasture Road / The Horsley Drive; and - Elizabeth Street / Victoria Street.	A roundabout upgrade is proposed on the existing Cowpasture Road / Trivet Street intersection as part of the Mod, to provide access to the wider HDBP Stage 2. The key intersections have been modelled and analysed in SIDRA in Sections 5 and 7 with the exception of the Elizabeth Street / Victoria Street signalised intersection. The assessment undertaken is consistent with the previous assessment undertaken (in consultation with RMS). Trip distribution assessment indicates that only 15% of all traffic generation would utilise Victoria Street. As such, only 26 vehicles per hour (vph) and 32 vph would enter and exit via Victoria Street during the peak AM and PM hour respectively. This additional traffic generation is of such low volume (approximately 1 additional vehicle every 2 minutes) that there would be minimal traffic impacts on the Elizabeth Street / Victoria Street signalised intersection.	5, 7
Details of the proposed accesses and the parking provisions associated with the proposed development including compliance with the requirements of the relevant Australian Standards (i.e.; turn paths, sight distance requirements, aisle widths, etc.).	All access, parking and loading docks have been assessed in accordance with the AS2890 series. Please refer to Appendix B for the swept path analysis.	9, Appendix B
Proposed number of car parking spaces and compliance with the appropriate parking codes.	Refer to Section 7.	7
Details of service vehicle movements (including vehicle type and likely arrival and departure times).	Servicing vehicle movements during the AM, PM and Site peak hours are detailed in Section 7. Outside of these times, servicing volumes are expected to be between 45-60 vehicles during the period between 5:00am and 5:00pm. Outside of these hours, the servicing volumes will be less than 10 per hour.	7

1.3 Reference Documents

1.3.1 Planning Controls

The Site lies within the Fairfield City Council (Council) Local Government Area (LGA), as such key references in preparing this TA include:

- *Fairfield Local Environmental Plan 2013* (the LEP);
- *Fairfield Development Control Plan 2013* (the DCP);
- *State Environmental Planning Policy (Western Sydney Parklands) 2009* (SEPP WSP).
- *State Environmental Planning Policy (Western Sydney Employment Area) 2009* (SEPP WSEA).
- Greater Sydney Commission (GSC), *Greater Sydney Region Plan*, March 2018;
- GSC, *Western City District Plan*, March 2018;
- Transport for New South Wales (TfNSW), *Future Transport Strategy 2056*, March 2018; and
- TfNSW, *Future Transport – Greater Sydney Services and Infrastructure Plan*, March 2018.

1.3.2 Traffic and Transport Guidelines and Standards

This TA also references general access, traffic and parking guidelines, including:

- Roads and Maritime Services (RMS) *Guide to Traffic Generating Developments* (RMS Guide);
- *RMS Guide to Traffic Generating Developments – Updated Traffic Surveys* (RMS Guide Update);
- Austroads, *Road Design Guide*;
- Austroads, *Guide to Traffic Management – Part 12: Traffic Impacts of Development*;
- Austroads, *Guidelines for Planning and Assessment of Road Freight Access in Industrial Areas*;
- Australian Standard 2890.1: *Parking Facilities – Off-Street Car Parking* (AS 2890.1);
- Australian Standard 2890.2: *Parking Facilities – Off-Street Commercial Vehicle Facilities* (AS 2890.2);
- Australian Standard 2890.6: *Parking Facilities – Off-Street Parking for People with a Disability* (AS 2890.6);
- Austroads *Cycling aspects of Austroads Guides*.

1.3.3 Background Reports

A number of background reports have been referenced to provide more detailed information in regard to future traffic flows through the local road network providing access to the Site; and indeed, in regard to the existing Site approvals. These reports include:

- Ason Group, *Proposed Warehouse / Industrial Facility, Horsley Drive Business Park Stage 2, Horsley Park*, Version 2, 02/12/2016 (Ason 2016 Report);
- TRAFFIX, *Horsley Drive Business Park Traffic Impacts Assessment for a Part 4 Concept Plan Application* May 2012 (TRAFFIX Report);
- Road Delay Solutions, *The Horsley Drive Business Park Revised Structure Plan, Traffic Report December 2014* (Reference: 20140209); and
- Road Delay Solutions *Proposed Lot 2, Proposed Warehouse/Industrial Facilities, The Horsley Drive Business Park, Traffic Impact Report*, April 2016 (Reference: 20160263).
- SMEC *The Horsley Drive Upgrade Traffic Impact Assessment Report* June 2017 (SMEC Report).

2 The Proposal

2.1 The Proposal

A detailed description of the proposed development is included in the Environmental Impact Assessment, prepared separately. In summary, the SSDA proposes:

The Proposal seeks approval for development of the southern portion of the HDBP Stage 2 (Lot 1) to provide for:

- A specialist warehouse facility used for the distribution of goods with:
 - 24 hour/day, seven day/week operation
 - 29,631m² of warehouse and office Gross Floor Area (GFA).
- Access via a new roundabout intersections at Trivet Street / Cowpasture Road. The provision of this roundabout is currently being considered as part of the Mod.

Detailed Site plans are provided in the Environmental Impact Statement which this TA accompanies; a scaled Site Plan is provided below for context.

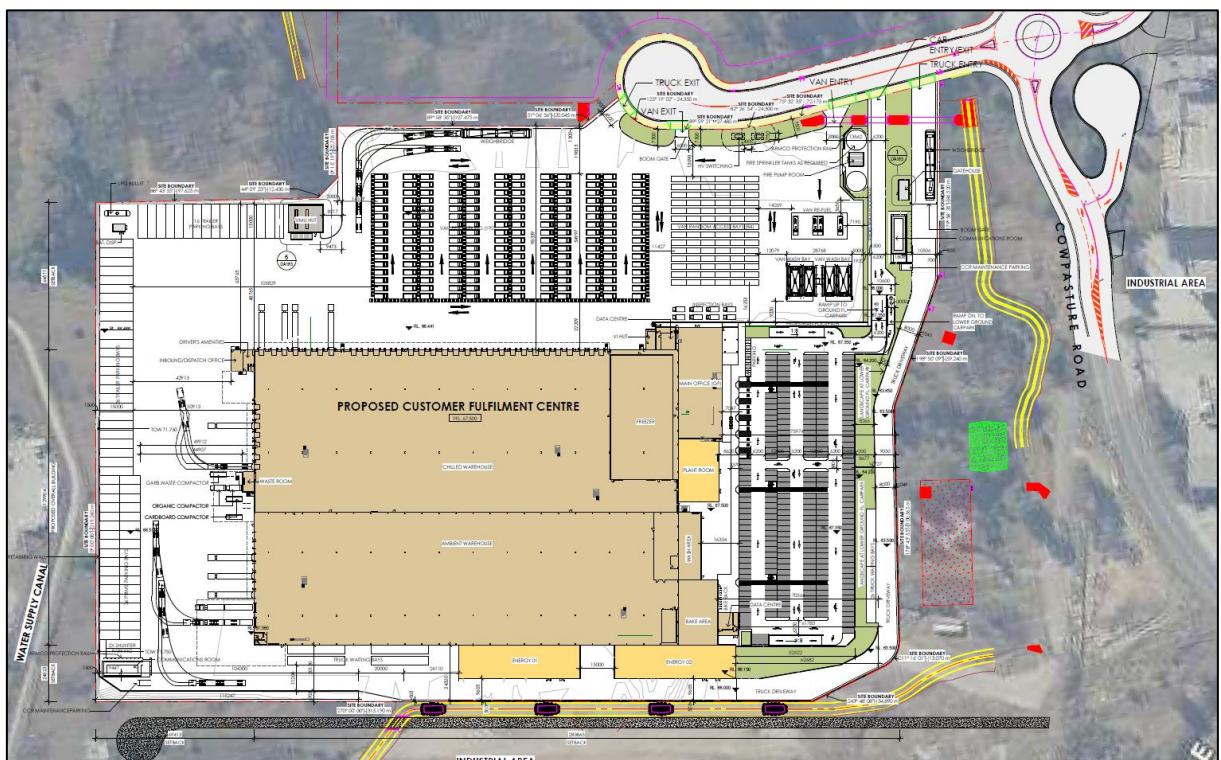


Figure 1: CFC Site Plan

3 The Existing Site

3.1 Site Location

The HDBP comprises a substantial area of industrial/employment land under the Western Sydney Parkland Trust. It is generally located to the northwest of The Horsley Drive signalised intersection with Cowpasture Road. To the north and west of the Site are general farmlands and to the east and south are industrial developments. There is currently an existing access driveway to the Site which provides access to residential dwellings and, previously, access to the HDBP Stage 1 construction site. It is noted that the HDBP Stage 1 is now fully constructed and operational.

Access to HDBP Stage 1 is provided via the recently constructed Cowpasture Road / Burilda Close roundabout. Access to Stage 2 of the HDBP is proposed to be provided via a new intersection onto Cowpasture Road and Trivet Street located at the existing Cowpasture Road and Trivet Street intersection.



Figure 2: HDBP Stage 2 Site Location

3.2 Existing Site Approval

The HDBP Stage 2 Site was previously approved on the 9th November 2017 (SSD 7664), comprising of approximately 88,700m² total building area which includes:

- 86,200m² of warehouse GFA across 4 separate warehouse buildings;
- 2,500m² ancillary office space GFA across 4 separate warehouse lots;
- Hardstand access and manoeuvring areas;
- On-site car parking for 385 cars; and
- A new access road from Cowpasture Road.

3.3 Approved Traffic Generation

With reference to the SSD 7664 approval, and the Ason Group 2016 Report, once fully operational the previously approved HDBP Stage 2 was expected to generate:

- 138 vehicle trips in the AM peak hour
- 139 vehicle trips in the PM peak hour

In total, it was estimated that the Site would generate up to 1,863 vehicles per day.

It is noted that under the proposed Mod, the Site is anticipated to generate the following:

- 176 vehicle trips in the AM peak hour
- 217 vehicle trips in the PM peak hour
- 3,225 daily vehicles (over a 24-hr period).

4 The Road Network

4.1 Road Hierarchy

The key roads and intersections in the vicinity of the Site are shown in **Figure 3**, and described further below.

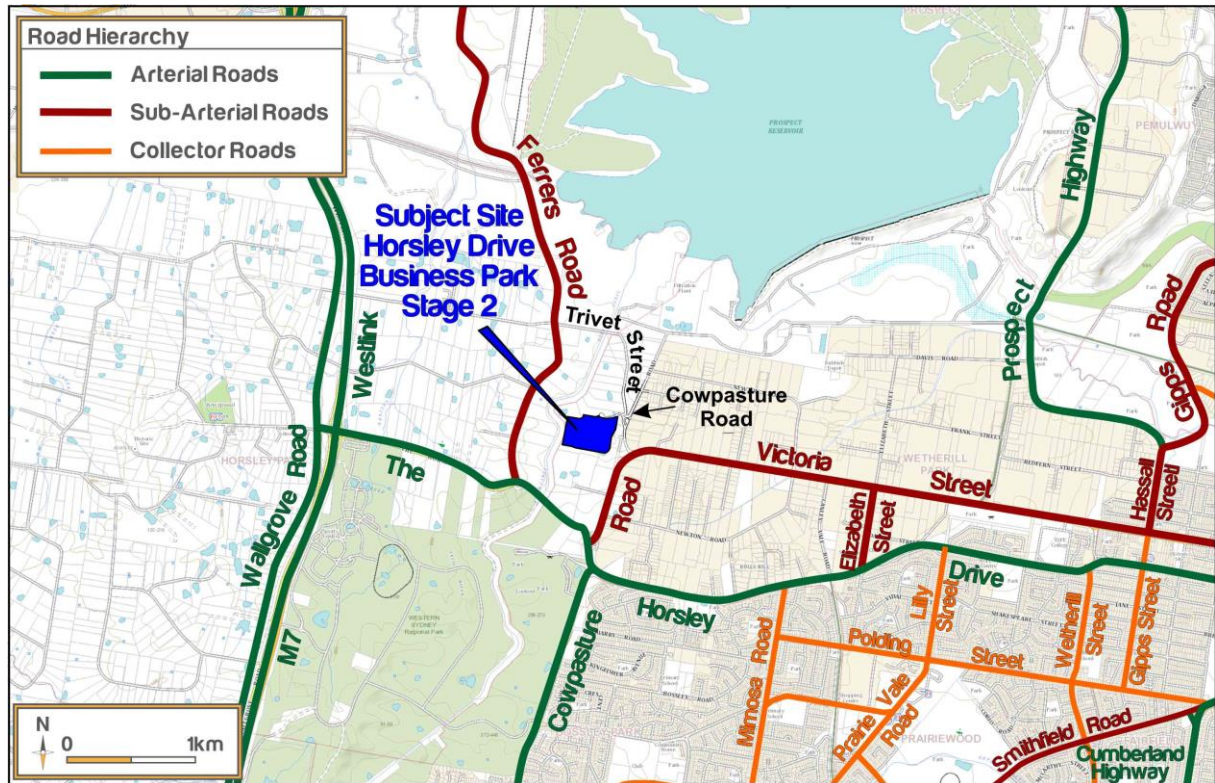


Figure 3: Road Hierarchy

4.1.1 M7 Motorway

A major arterial road that provides Sydney with key links to the M2, M4 and M5 motorways. It runs in a north-south direction to the west of the site, and runs between M2 to the north and M5 to the south, with the M4 intersecting in between. It carries 2 lanes of traffic in each direction.

4.1.2 The Horsley Drive

A TfNSW (formerly RMS) State Road (MR 609) that runs in an east-west direction between the Hume Highway to the east, and Wallgrove Road to the west. It generally consists of 2 lanes of traffic on each direction and historically carried on average 38,136 vehicles per weekday in 2014 near the vicinity of the HDBP Stage 1.

It is understood that TfNSW has plans to upgrade The Horsley Drive between the M7 Motorway in Cowpasture Road, and that the upgraded configuration would comprise a four-lane divided road, with a wide median to allow for widening to six lanes when required. The works would include upgrades to the Ferrers Road and Cowpasture Road (north) signalised intersections, and the upgrade of the Cowpasture Road (south) intersection from a roundabout to traffic signals.

This is discussed further in the following sections, which deal with capacity analysis of the intersections within the study area.

4.1.3 Wallgrove Road

A classified road (MR 515) that generally runs in a north-south direction that is adjacent to the M7 Motorway. It generally carries 1 to 2 lanes of traffic in each direction.

4.1.4 Cowpasture Road

To the south of the Cowpasture Road and The Horsley Drive roundabout, Cowpasture Road is a State Road is a TfNSW State Road (MR 648). To the north of the signalised intersection with The Horsley Drive, Cowpasture Road is a collector road. Cowpasture Road generally carries 2 lanes of traffic in each direction within the vicinity of the HDBP.

4.1.5 Newton Road

A local road that runs in an east-west direction links Victoria Street to the east and Cowpasture Road to the west. It generally comprises of a single lane of undivided traffic in each direction.

4.1.6 Ferrers Road

A Regional Road (RR 7153) that runs in a north-south direction between Brabham Drive in the north to The Horsley Drive in the south. It carries a single lane of traffic in each direction.

4.1.7 Victoria Street

A Regional Road that runs in an east-west direction between Cowpasture Road in the east and Warren Road in the west. It carries 2 lanes of traffic in each direction within a divided carriageway.

4.2 Heavy Vehicle Access

The TfNSW Restricted Access Vehicle (RAV) details approved routes for 25/26m B-doubles which can be found in **Figure 4**. All heavy vehicles would enter and exit the Site via the approved TfNSW routes.

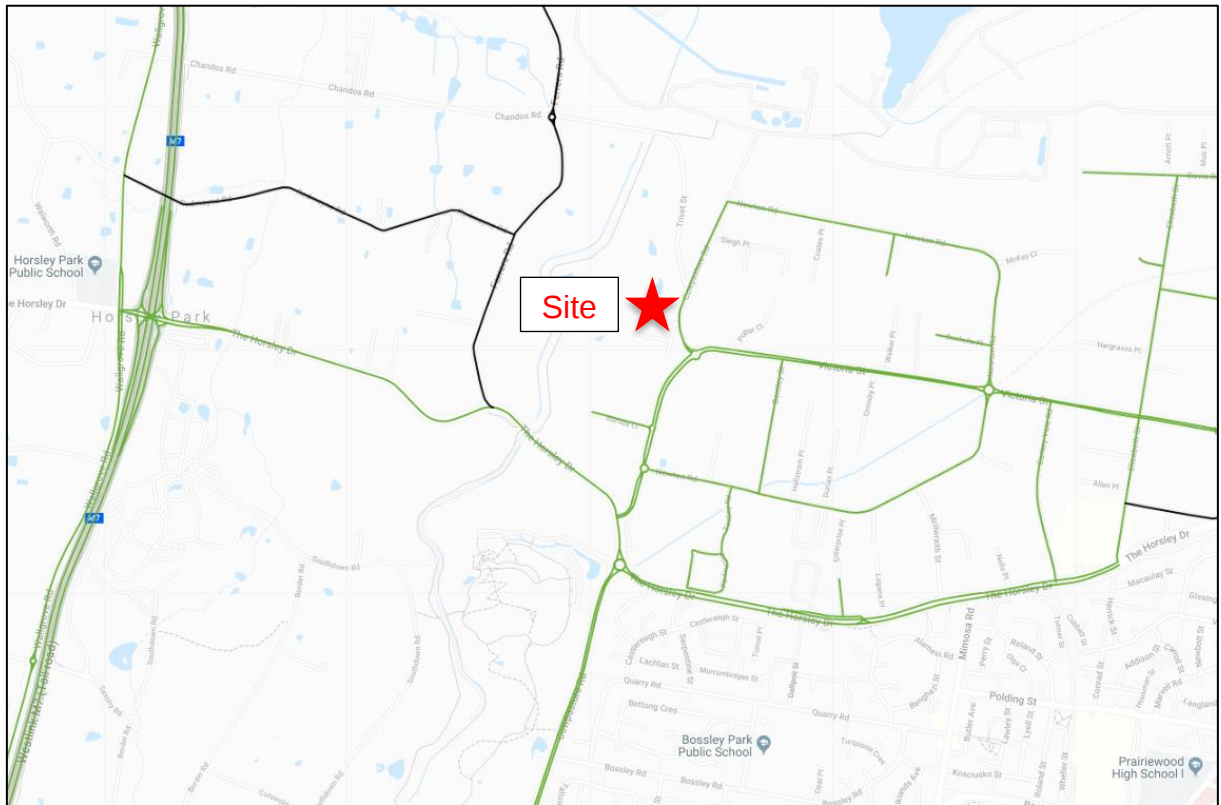


Figure 4: TfNSW RAV Approved 25/26m B-double Vehicle Routes

4.3 The Horsley Drive Upgrade

The NSW Government is well advanced in planning for an upgrade of The Horsley Drive between Cowpasture Road and the M7 Motorway (the HD Upgrade). The proposed upgrades would provide an improved east-west connection from the Western Sydney Employment Area (WSEA) and the M7 Motorway to the Smithfield Wetherill Park Industrial Area, within which lies the Site and the HDBP.

In summary, the proposed upgrade would include:

- Widening The Horsley Drive to 4 lanes four lanes (2 lanes per direction) with a central median capable of accommodated 2 additional lanes (1 lane per direction) in the future;
- An extra eastbound lane from west of Ferrers Road to Cowpasture Road;
- A pedestrian and cyclist shared path along The Horsley Drive, connecting to the Western Sydney Parklands cycleway;
- Upgrade of the Ferrers Road intersection and Cowpasture Road north intersection;
- Upgrade of the roundabout at The Horsley Drive and Cowpasture Road (southern section) to an intersection with traffic lights to improve traffic flow;

The following **Figure 5** showcases the proposed alignment and upgrades of The Horsley Drive.

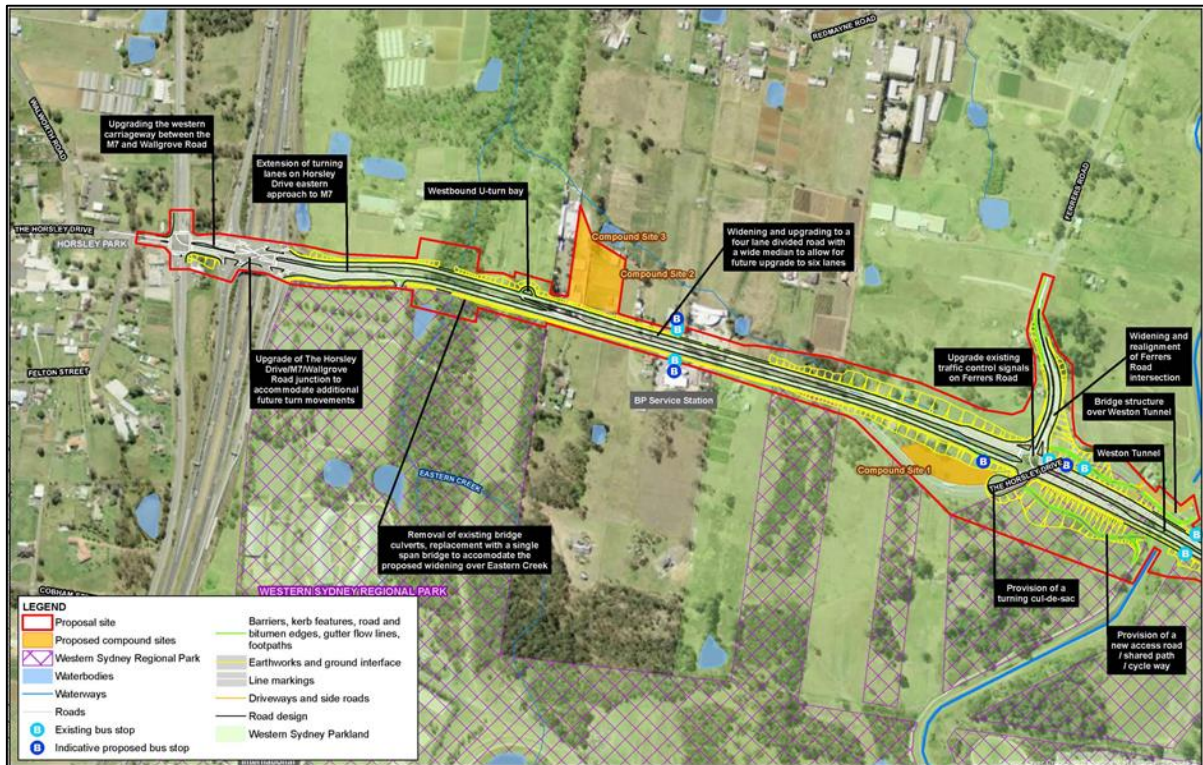


Figure 5: The Horsley Drive Upgrade – Concept Design

Notwithstanding the above, it is noted that land acquisition within the Western Sydney Parklands is currently required to proceed with the detailed design and construction. As such, it is not known when The Horsley Drive upgrades will proceed as it subject to the land acquisition, project approval and funding.

5 Existing & Baseline Road Network Performance

5.1 Baseline (Without Development) Scenarios

It is noted that the Mod application has resulted in a review of the assessment document in the Ason 2016 Report. For ease of reference, the baseline modelling assessment has been reproduced in the below to provide an understand of the existing road network.

To determine the impact of the development, which is the subject of this application, analysis of the performance of the existing road network have been undertaken. Specifically, the following 'without-development' design scenarios have been assessed:

1. 2019 'Existing', which is based upon surveyed 2019 traffic volumes.
2. 2026 'Baseline', which includes the 'Existing' and 'Upgraded' design scenario with background traffic growth applied.

The assumptions applied to forecast design traffic volumes under design scenarios (1) and (2) above are outlined in the following sections.

5.2 Lizard Log Precinct Traffic Generation

It is noted that the Lizard Log Precinct is currently being developed, with the 'Novella' function centre nearing completion. It is expected that this area would be the most active during the weekend as the built form would include restaurants, function centres and leisure centres to complement the existing outdoor leisure facilities. As such, during the weekday peaks, this area would generate only a small number of vehicles. The SMEC Report, produced in support of the HD Upgrades, assumes that only 50 vehicles per hour (two-way) would be generated in the AM and PM peak. An additional left in/left out access is proposed along The Horsley Drive between Ferrers Road and Cowpasture Road.

Therefore, as part of this assessment, it is assumed that 15 vehicles per hour would use the left in/left out access on The Horsley Drive and 35 vehicles per hour would utilise The Horsley Drive / Cowpasture Road / Lizard Log Access Road intersection. This has been adopted as part of the applied as part of the 2026 assessment.

5.3 Background Traffic Growth

It is considered unlikely that any notable regional traffic growth would occur on the study road network to the north of the signalised intersection of The Horsley Drive with Cowpasture Road (i.e. Cowpasture Road (north), Victoria Street, Newton Road, etc). This assumption is based on the following:

- This northern network does not include any TfNSW classified regional roads that are intended to carry regional traffic.
- The catchment area surrounding the northern network is essentially 'built-out', except for the parcels of land of HDBP Stage 2, which are being analysed directly as part of this assessment and therefore should be excluded from background traffic growth.

Regional traffic growth would be more likely to occur on The Horsley Drive as it is a TfNSW road corridor designed to service regional traffic and provides a more direct and convenient connection between the M7 and the Cumberland Highway.

For the 2026 analysis, background traffic growth has been applied to the following intersections:

- The Horsley Drive x Cowpasture Road Roundabout
- Cowpasture Road x The Horsley Drive Signals
- The Horsley Drive x Ferrers Road Signals

These intersections have been assessed assuming the levels of background traffic growth that were adopted as part of SMEC Report as outlined in **Table 4**. It is noted that these rates were provided by TfNSW from the Sydney GMA Strategic Traffic Forecasting Model (STFM) showing peak period traffic volume forecast by direction of travel on The Horsley Drive in 2014, 2026 and 2036.

Table 4: Assumed AM Peak 2026 Background Traffic Growth

Road	Location / Road Section	AM		PM	
		Northbound/ Westbound	Southbound /Eastbound	Northbound/ Westbound	Southbound/ Eastbound
The Horsley Drive	Between M7 Westlink Motorway and Cowpasture Road (north)	2.5% pa compound	3.0% pa compound	1.9% pa compound	2.9% pa compound
	East of Cowpasture Road (south)	3.1% pa compound	2.1% pa compound	1.3% pa compound	2.4% pa compound
Ferrers Road	North of The Horsley Drive	4.5% pa compound	2.7% pa compound	4.6% pa compound	2.1% pa compound
Cowpasture Road	South of The Horsley Drive	1.3% pa compound	2.9% pa compound	2.1% pa compound	1.0% pa compound
	North of The Horsley Drive	1.6% pa compound	1.8% pa compound	2.5% pa compound	0.7% pa compound

5.4 Proposed Horsley Drive Upgrades

It is noted that baseline assessment of the existing layout of key intersections has illustrated that the HD Upgrades are required to facilitate the expected growth in the area. This was also found by the base case assessment provided within the SMEC Report. Therefore, the upgraded layouts have been adopted for the 2026 modelling of The Horsley Drive.

These SIDRA layouts have been adopted from SMEC Report.

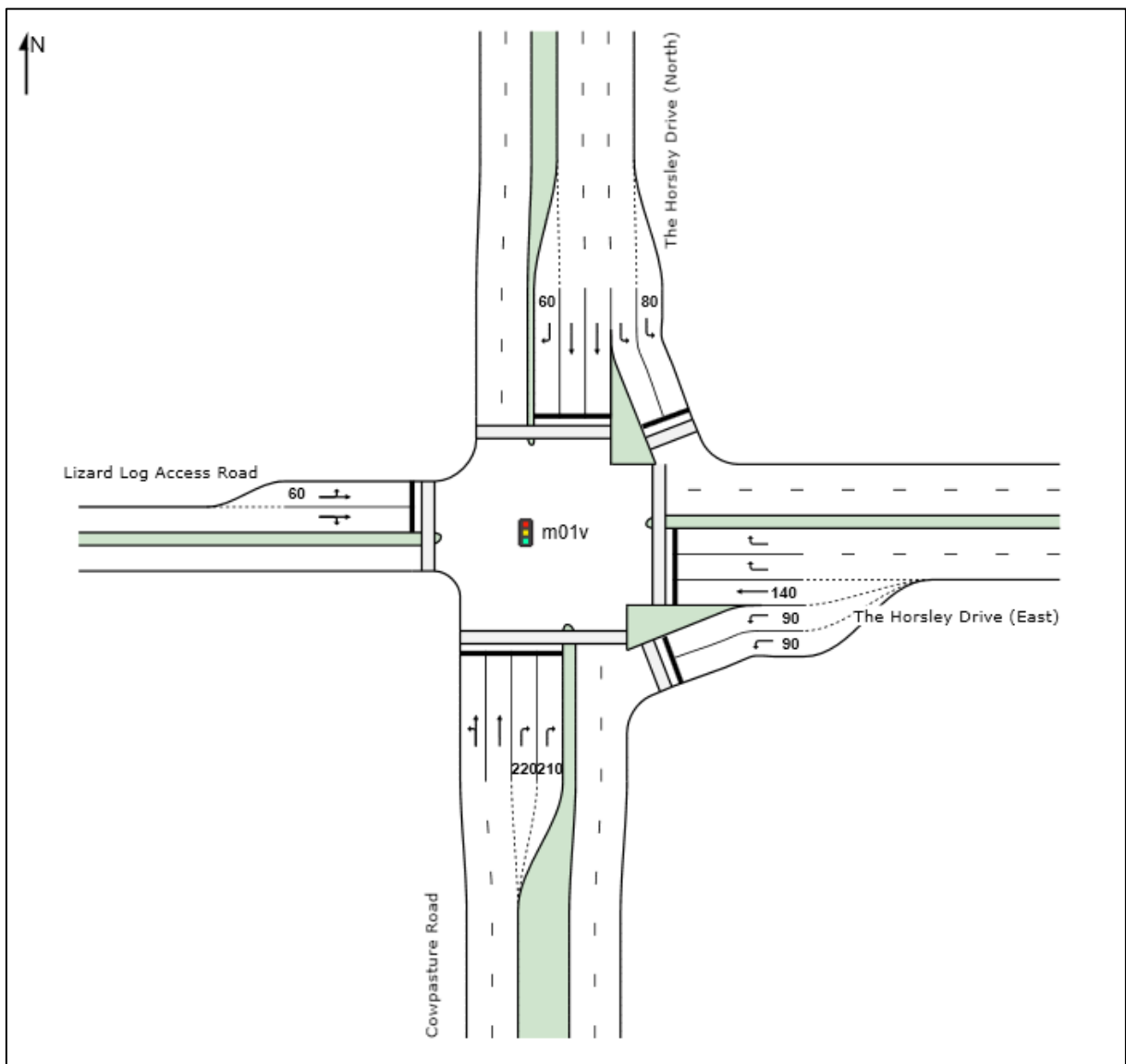


Figure 6: The Horsley Drive / Cowpasture Road / Lizard Log Access Road Upgraded Intersection

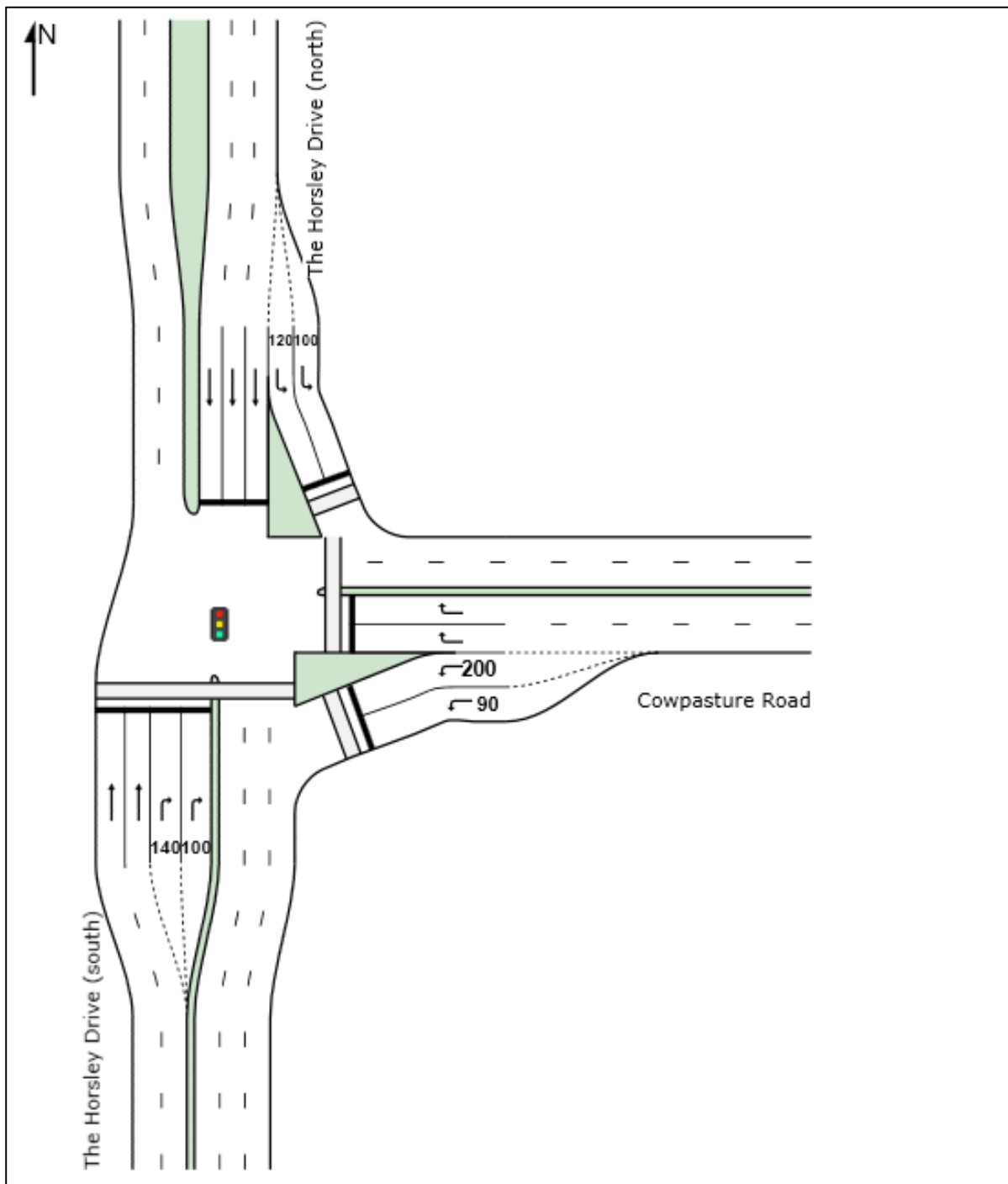


Figure 7: The Horsley Drive / Cowpasture Road Upgraded Intersection

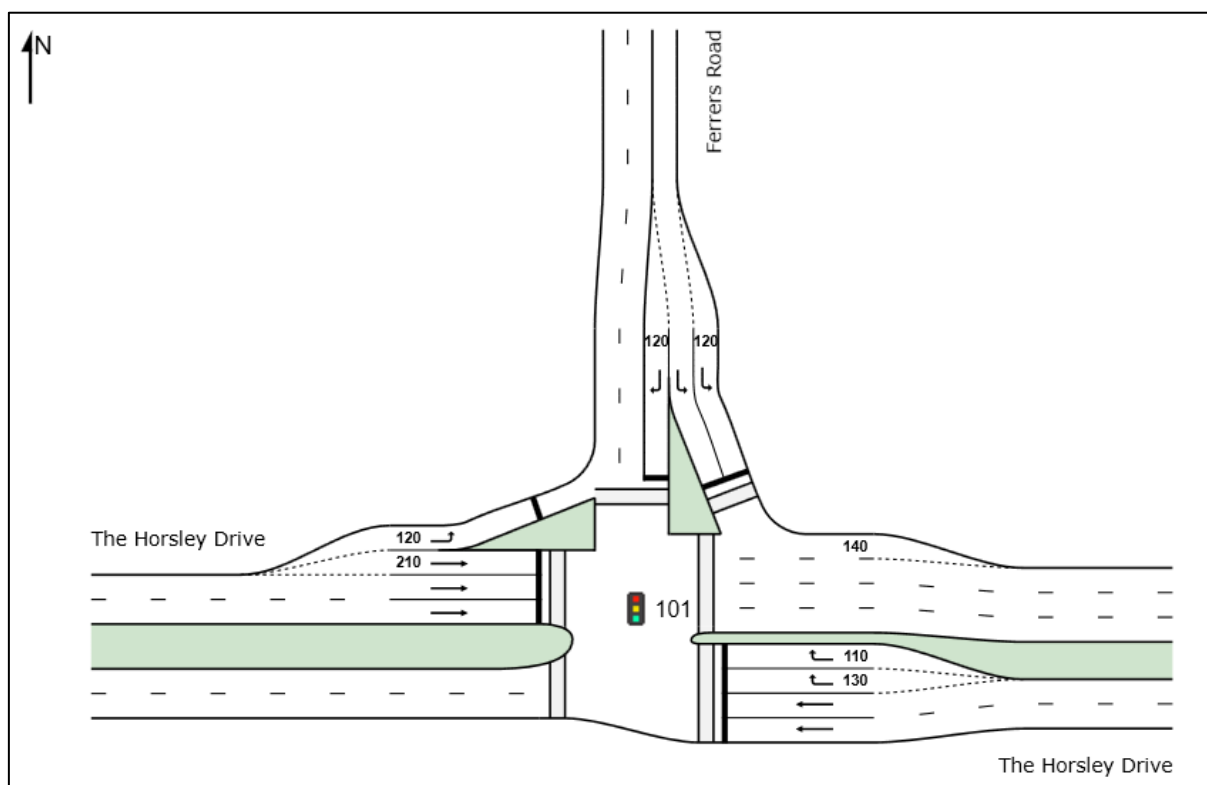


Figure 8: The Horsley Drive / Ferrers Road Upgraded Intersection

5.5 Existing Traffic Flows

5.5.1 Traffic Surveys and Peak Hour Traffic Volumes

Traffic surveys were undertaken by Austraffic in December 2019, including extended AM and PM peak period intersection surveys. While local traffic volumes are expected to grow in future years, the surveys provide significant context in regard to the traffic generation of the broader area, and for a comparison between previously forecast traffic volumes and actual traffic volumes.

AM peak hour and PM peak hour traffic volumes through the key intersections are shown in **Figure 9** and **Figure 10** respectively.

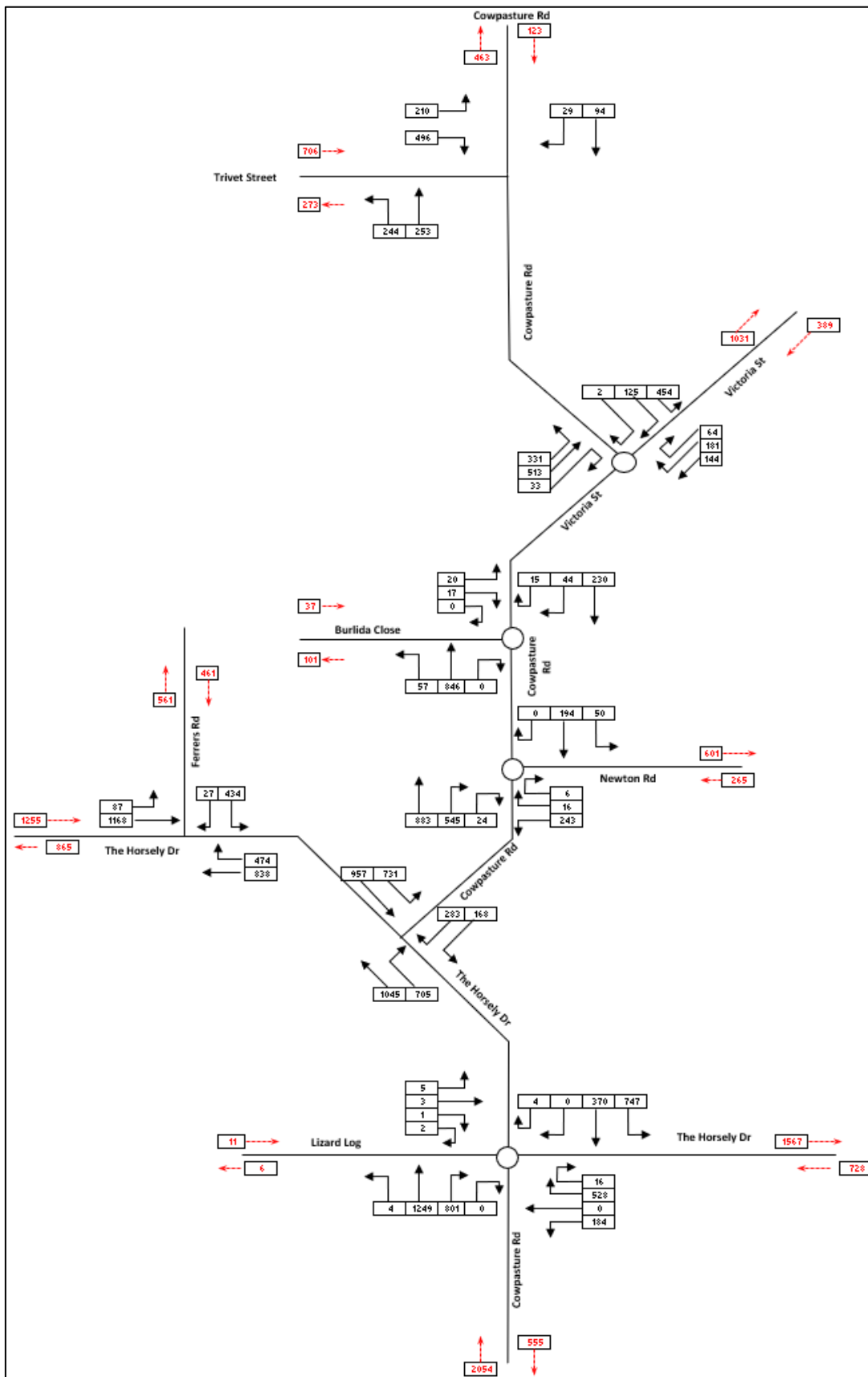


Figure 9: Existing AM Peak Hour Traffic Volumes

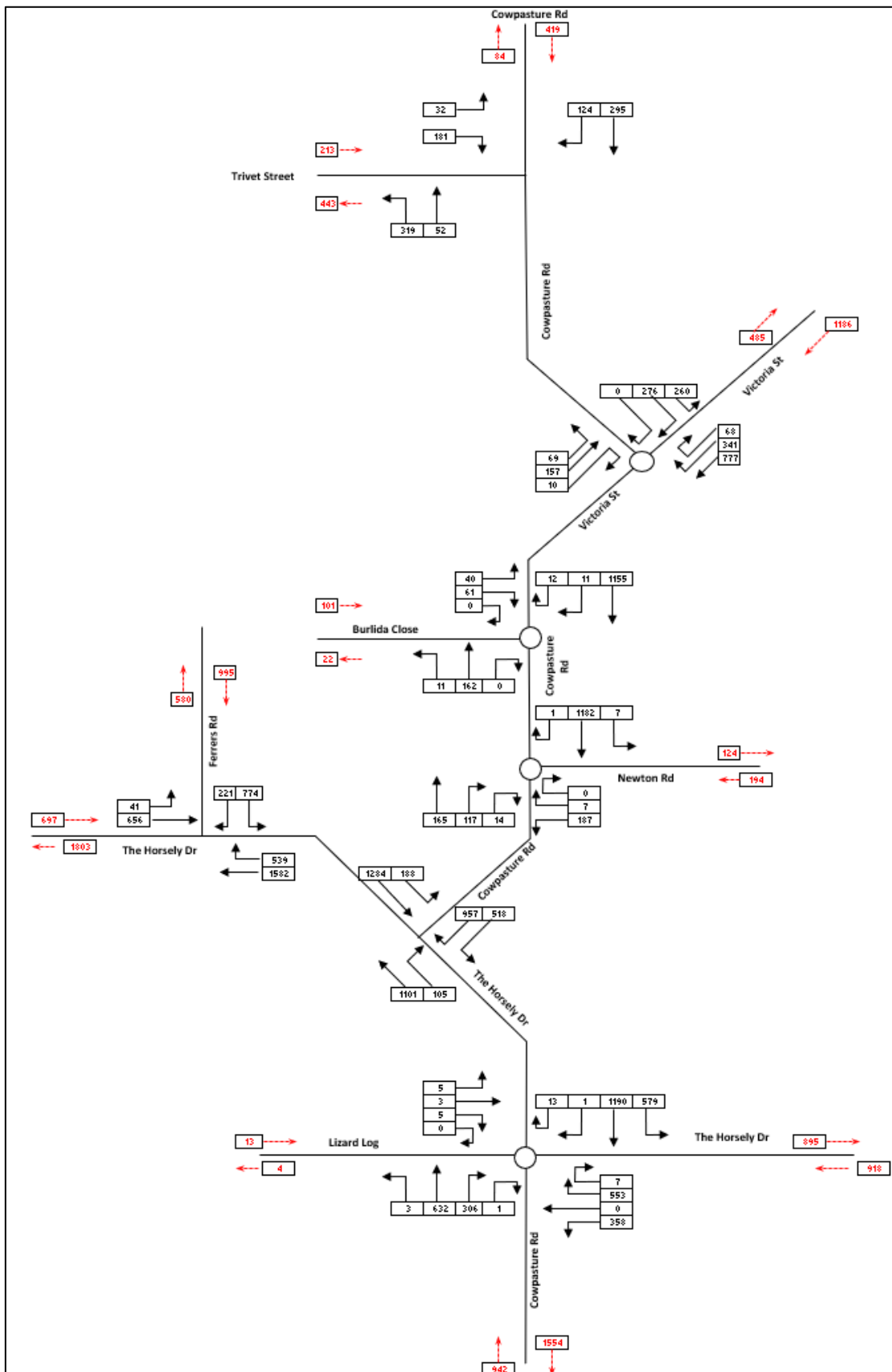


Figure 10: Existing PM Peak Hour Traffic Volumes

5.6 Existing Intersection Performance

5.6.1 2019 Baseline SIDRA Performance Testing

The key intersections identified for assessment as part of this study include:

- The Horsley Drive / Cowpasture Road Roundabout
- Cowpasture Road / The Horsley Drive Signals
- Cowpasture Road / Newton Road Roundabout
- Cowpasture Road / Burilda Close Roundabout
- Cowpasture Road / Victoria Street Roundabout
- Cowpasture Road / Trivet Street Intersection
- The Horsley Drive / Ferrers Road Signals

The performance of the key intersections has been analysed using the TfNSW approved SIDRA intersection modelling software. SIDRA provides a range of performance measures, in particular:

- **Degree of Saturation (DOS):** DOS is defined as the ratio of demand (arrival) flow to capacity.
- **Average Vehicle Delay (AVD):** AVD (or average delay per vehicle in seconds) provides a measure of the operational performance of an intersection and is used to determine an intersection's Level of Service (see below).
- **Level of Service (LOS):** LOS is a comparative measure that provides an indication of the operating performance of an intersection based on AVD. For signalised and roundabout intersections, the SIDRA reported LOS is based on the average delay to all vehicles, while at priority-controlled intersections the SIDRA reported LOS is based on the worst approach delay.

Table 5 provides a recommended baseline for assessment as per the RMS Guide.

The local network performance is provided in **Table 6** which presents the SIDRA intersection network modelling results of the key intersections under the existing "baseline" scenario.

Table 5: RMS Level of Service Summary

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

Table 6: Local Network Performance, 2019 Baseline Scenario

Intersection	Control Type	Period	DOS	AVD	LOS
The Horsley Dr x Cowpasture Rd	Roundabout	AM	1.006	59.6	E
		PM	1.278	373.9	F
Cowpasture Rd x The Horsley Dr	Signals	AM	1.030	43.9	D
		PM	1.066	58.7	E
Cowpasture Rd x Newton Rd	Roundabout	AM	0.185	16.3	B
		PM	0.988	34.2	C
Cowpasture Rd x Burilda Close	Roundabout	AM	0.065	12.7	A
		PM	0.410	11.5	A
Cowpasture Rd x Victoria Street	Roundabout	AM	0.846	24.5	B
		PM	0.151	15.2	B
Cowpasture Rd x Trivet Street	Priority	AM	0.926	30.2	C
		PM	0.365	14.9	B
The Horsley Dr x Ferrers Road	Signals	AM	1.235	62.3	E
		PM	1.432	48.3	D

With regard to Table 6:

- The analysis indicates that the key intersections along The Horsley Drive under the “baseline” scenario are operating at Level of Service (LoS) D or worse.

- The Horsley Drive / Cowpasture Road Roundabout operates unsatisfactorily during the PM peak due to heavy through traffic volumes to and from the northern and southern legs impacting movement on the eastern leg.
- All other key intersections within the Wetherill Park industrial area are operating satisfactorily with a LoS C or higher. Relevant SIDRA Outputs are attached at **Appendix A**.

5.6.2 2026 Baseline SIDRA Performance Testing

The results of the intersection modelling undertaken for the 2026 'Baseline' design scenario are outlined in **Table 7**. As noted, the concept designs provided by the SMEC Report have been adopted.

Table 7: Local Network Performance, 2026 Baseline Scenario

Intersection	Scenario	Control Type	Period	DOS	AVD	LOS
The Horsley Dr x Cowpasture Rd (South)	Do Nothing	Roundabout	AM	1.141	88.3	F
			PM	2.515	371.9	F
	Interim Upgrades	Signals	AM	1.014	62.0	E
			PM	1.099	67.8	E
Cowpasture Rd x The Horsley Dr (North)	Do Nothing	Signals	AM	1.483	144.4	F
			PM	1.246	156.5	F
	Interim Upgrades	Signals	AM	0.795	27.1	B
			PM	1.036	83.5	F
The Horsley Dr x Ferrers Road	Do Nothing	Signals	AM	1.467	108.4	F
			PM	1.901	93.2	F
	Interim Upgrades	Signals	AM	0.729	23.0	B
			PM	0.818	24.8	B

With regard to Table 7:

- Under the "Do Nothing" baseline scenario, all intersections would be operating satisfactorily and it is clear that upgrades are required to accommodate the expected background traffic growth forecast for the area.
- The Horsley Drive / Ferrers Road intersection would operate well following the interim proposed upgrades
- The northern and southern Horsley Drive / Cowpasture Road intersections have been assessed as a network. It is noted that when considered in isolation, both intersections operate satisfactorily with spare capacity. However, as is shown, when considered as a network, the intersections operate unsatisfactorily and over capacity, except for the morning peak at the northern intersection (which operates at LOS B).

This is a result of downstream flows impacting the arrival and departure rate of traffic. This has a notable impact to northbound traffic at the northern intersection. Providing the additional capacity, as identified by the SMEC Report, for the 2036 upgrades, at the northern intersection improves the operation of both intersections in 2026, when assessed as a network.

Finally, the SMEC Report reported that under the interim upgrades (2026), both these intersection would operate satisfactorily, with some spare capacity and acceptable queues. These results were derived utilising Paramics modelling software, rather than through SIDRA analysis.

The modelling analysis undertaken therefore has illustrated that the required upgrades can be delivered as part of the HD Upgrade to accommodate the future background traffic demand.

6 Public & Active Transport

The section details the available public and active transport opportunities near the vicinity of the Site. **Figure 11** showcases the surrounding transport modes near the Site.

6.1 Bus Services

The existing bus services within the vicinity of the Site include Route 835 which provides a direct service between UWS to Prairiewood (connecting to St Mary's Train Station) which is within 800m walking distance to the Site. This service runs at a 30-minute headway during the AM and PM peak periods. Route 814 is a Fairfield to Smithfield Loop Service which connects the Site directly to Fairfield Train Station with 2 bus stops located within a 400m radius of the Site. This service operates at 30-minute frequencies during the peak hour and at an hourly interval during the interpeak periods.

6.2 Pedestrian and Cycle Network

The existing cycle network in the vicinity of the Site is also shown in Figure 11. Off road bike paths are provided to the west of the Site providing a north-south connection, with The Horsley drive providing the main east-west connection.

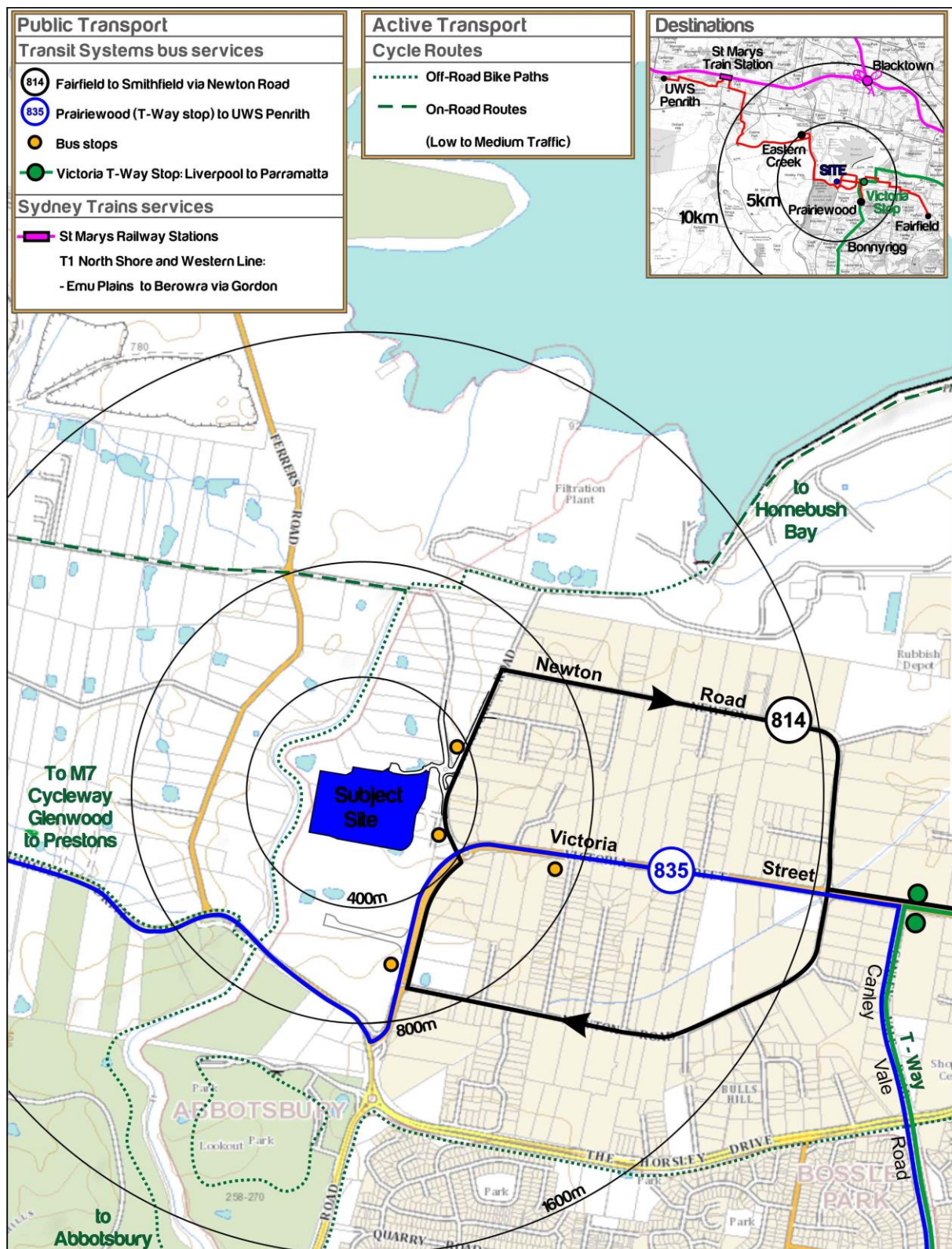


Figure 11: Public & Active Transport Network

6.3 Existing Mode Share

The Journey to Work (JTW) data published by Australian Bureau of Statistics (ABS) of employee mode share in the area (Destination Zone (DZ) 115184209) is shown in **Figure 12**. The data indicates that approximately 96.5% of employees travel to work via private vehicle (driver or passenger) and 3.5% travelling to work via heavy vehicles, with minimal usage of public transport or non-vehicle alternatives.

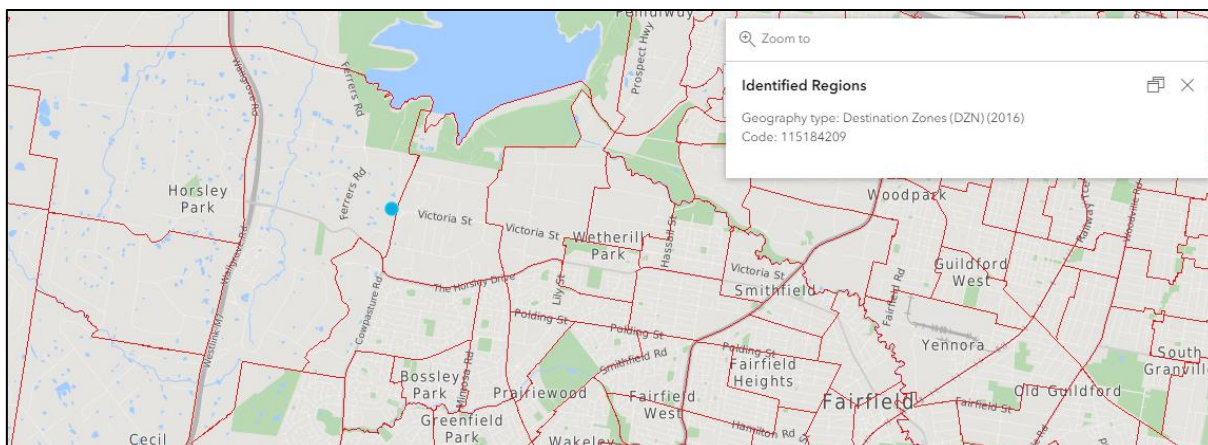


Figure 12: ABS Destination Zone

7 Traffic Assessment

7.1 Traffic Generation

7.1.1 Approved Vehicle Trip Rates

The vehicle trip generation rates and assumptions approved under the Concept Plan are as follows:

- RMS Guide Update derived traffic generation rates from the Erskine Park Industrial Estate and the Wonderland Business Park, Eastern Creek:
 - AM Peak Hour: 0.156 Trips / 100m² GFA
 - PM Peak Hour: 0.157 Trips / 100m² GFA
 - Site Peak Hour: 0.166 Trips / 100m² GFA
 - Daily: 2.100 Trips / 100m² GFA
- An arrival / departure profile of 75% / 25% in the AM Peak, and the reverse in the PM peak, was assumed, as was a heavy vehicle percentage of 20%.

However, the Proposal provides for a specially designed CFC, and therefore specific regard for the operational requirements of the facility has been given to the traffic generation assessment. On this basis, the applicant has provided Ason Group with known operational data of a similar facility, which is documented in the following sections.

7.1.2 CFC Staff Vehicle Trips

To understand the traffic generated by staff, the applicant has provided the expected staff numbers, shift times and truck/van movements throughout the 24-hour period that the CFC will be operational.

The main worker shifts are at the following times:

- | | |
|---------------------|------------------|
| ▪ Day Shift: | 4:00am – 2:00pm |
| ▪ Night Shift: | 2:00pm – 12:00am |
| ▪ Maintenance Shift | 12:00am – 4:00am |
| ▪ Office Shift: | 8:30am – 5:00pm |

The following table details the estimated staff per shift as per the applicant's data:

Table 8: CFC Staff per Shift

Location	Function	Employees	Shift Split	Day	Night	Maintenance	Office
Warehouse	Operations	277		139	139	40	-
	OSP Engineering	27	50% Day 50% Night	14	14	-	-
	Subtotal	304	-	152	152	40	-
Office	Main Office	36	90% Day 10% Night	-	4	-	32
	SD Office and Support	12	50% Day 50% Night	-	6	-	6
	Subtotal	48	-	-	10	-	38
Transport	Office	12	90% Day 10% Night	-	1	-	11
	Drivers	248	50% Day 50% Night	124	124	-	-
	Subtotal	260	-	124	125	-	11
Total	-	612	-	276	287	40	49

It is assumed that some of the Day, Night and Maintenance shift workers would travel as passengers to Site. The RMS Guide Update provides details in relation to the principal mode of travel used by staff at the Erskine Park and Eastern Creek warehouses surveyed by TfNSW. These surveys indicate that 90% of all shift workers would be travelling via private vehicles with 8.2% travelling as passengers.

However, for a conservative measure, it is assumed that all typical office workers would arrive via their own personal vehicles without carpooling with 75% arriving and 25% exiting during the AM peak and vice versa for the PM peak. As such, the staff vehicle trips would be as follows:

Table 9: CFC Light Vehicle Trips

Time	Inbound Vehicle Trips	Outbound Vehicle Trips	Total
4:00am	248	36	284
8:30am	37	12	49
1:30-2:00pm	258	-	258
2:00-2:30pm	-	248	248
5:00pm	12	37	49
12:00am	36	258	294
TOTAL	591	591	1,182

Therefore, the peak road network vehicle staff trips for the AM and PM peak are:

- AM Peak Hour: 37 vehicles in / 12 vehicles out
- PM Peak Hour: 12 vehicles in / 37 vehicles out
- Daily: 1,182 vehicles per day

7.1.3 CFC Delivery Vehicle Trips

The applicant has also provided Ason Group with their delivery vehicle data from a similar facility located in Australia. This data showcases heavy vehicle and van movements all throughout the 24-hour period operation. The following details the peak delivery vehicle movements in the AM, PM and Site peak:

Table 10: CFC Delivery Vehicle Trips

Period	Inbound Vans	Outbound Vans	Inbound Heavy Vehicles	Outbound Heavy Vehicles	Total
AM Peak	36	36	3	3	78
PM Peak	57	57	2	2	118
Site Peak (Prior to 2:00pm Shift Change)	57	57	4	4	122
Daily	589	589	101	101	1,380

7.1.4 Total CFC Traffic Generation

Considering the above information, the total traffic generation of the Site during the critical hours would be:

Table 11: Total CFC Traffic Generation

Land Use	AM Peak	PM Peak	Site Peak	Daily
CFC Staff	49	49	258	1,182
CFC Deliveries	78	118	122	1,380
Total	127	167	380	2,562

7.1.5 Modal Splits

Table 12 presents the relevant mode share details and the results of the application of the person-based RMS Guide surveyed warehouse percentages to the Proposal. The total trips were determined by assuming that the traffic generation to and from the development was 90% of the total mode share.

Table 12: Peak Hourly and Daily Person Trips by Transport Mode

Transport Mode	JTW Mode Share %	Peak Hour		Daily
		AM	PM	
Vehicle	90%	127	167	2,562
Car (as passenger)	8.2%	12	15	233
Bus	1.5%	2	3	42
Cycle	0.2%	0	0	5
Motorbike	0.1%	0	0	3
On Foot	0.2%	0	0	5
Other	0%	0	0	0
TOTAL	100%	141	185	2,850

In summary, the table indicates that 98.2% of persons accessing the future site would arrive via car and 90% as car drivers. The analysis indicates that only 2-3 persons would use alternative means of transport (in this instance, bus public transport) to access the Site during peak hours. It is clear that this level of bus use would have no material impact on the capacity of bus services in the area and pedestrian and cycling facilities would be unaffected by the Proposal.

It is noted that given the provisions of motorcycle and bicycle parking facilities, that the travel by this mode would increase over time.

7.2 CFC Traffic Impact Assessment

7.2.1 Road Network Peak hour

As discussed, the HDBP Stage 2 has an approved traffic generation threshold. Further, it is noted that SSD-7664 is currently subject to a Mod, of which has been subject to an updated traffic assessment. Table 13 provides a comparison of the approved traffic generation, the forecast traffic generation under the Mod and the forecast traffic generation of the CFC.

Table 13: CFC Traffic Generation Comparison

Land Use	AM Peak	PM Peak	Daily
CFC	127	167	2,562
Approved HDBP Stage 2	138	139	1,863
Mod	176	217	3,225

The table above demonstrate that:

Based on the approved HDBP Stage traffic generation, the Proposal is anticipated to generate:

- 11 fewer trips than the approved traffic threshold during the weekday morning peak hour.
- 28 additional trips than the approved traffic threshold during the afternoon peak hour.

Therefore, it can be concluded that the traffic generation associated with the CFC is generally consistent with the acceptable traffic generation for the HDBP Stage 2. The additional 28 trips in the afternoon peak hour, which represents 1 additional vehicle every 2 minutes, would not have a material impact on the operation of the road network, over the already approved development.

The daily trips would increase by 699 trips. However, the CFC trips are forecast over a 24-hour period and therefore would represent a decrease per hour when considered against the typical warehouse operational hours of 12 hours per day.

With regard to the Mod forecast traffic generation, the CFC would be within the traffic generation threshold identified for the updated Concept Plan for the HDBP Stage 2 by:

- 49 trips in the morning peak hour.
- 50 trips in the afternoon peak hour.

7.2.2 Site Peak Hour

During the Site peak hour, the Proposal is expected to generate up to 380 trips per hour, between 1:00pm to 2:00pm. This would occur outside of the typical road network peak hours of 7:00am – 9:00pm and 4:00pm – 6:00pm and also outside of the school peak hours which typically occur between 3:00pm – 4:00pm. As such, this Site Peak traffic generation would be able to be accommodated during the inter-peak hours where traffic volumes in the surrounding road network is much lower.

7.2.3 Summary

On the basis of the above, it can be concluded that the traffic generation associated with the CFC is acceptable. Regardless, the detailed modelling analysis undertaken for the Mod has been summarised in the below sections.

7.3 Mod Standard Traffic Impact Assessment

For the purpose of the Mod assessment, a Standard Assessment of the proposed HDBP Stage 2 has been undertaken, which is defined as the combination of:

- 2019 Baseline traffic – which consists of 2019 existing (surveyed) traffic
- HDBP Stage 2 traffic – forecast development traffic associated with the Proposal.

The operation of the key intersections further to the introduction of the forecast HDBP Stage 2 traffic flows under the Mod has been assessed using SIDRA intersection analysis. The results of the assessment are summarised in **Table 14**, with the relevant SIDRA Outputs provided as Appendix A.

With reference to Table 14, it can be seen that:

- The addition of development traffic generally does not have a material impact on the operation of the intersections across the network, with minimal increase in delay and LOS staying consistent.
- The exception is the Cowpasture Road / Victoria Street roundabout, which deteriorates from a LOS B to LOS C during the AM peak. Nevertheless, this intersection would still operate satisfactorily, and it is noted that this change in LOS is a result of an additional delay of 9.6 seconds.
- The SIDRA analysis indicates that the roundabout of The Horsley Drive / Cowpasture Road / Lizard Log Access Road would operate at a Level of Service of F regardless of the development traffic. However, the AVD increases from 373.9 seconds to of 456.7 seconds. It is note that intersections become very sensitive when already operating so poorly, and it is clear that this intersection requires upgrades, regardless of the development.

Further, the Ason 2016 Report assessment of this roundabout indicated that with the previous HDBP Stage 2 scheme, the AVD would be greater than 456.7 seconds. As such, the roundabout would require an interim upgrade. However, The Department of Planning, Industry and Environment and TfNSW did not support the Ason 2016 Report recommended roundabout upgrade based on road safety grounds and instead preferred for the existing roundabout layout to remain until the full upgrade of The Horsley Drive, which would have a more significant and long-term benefit for the road network.

- Finally, with the introduction of the Cowpasture Road / Trivet Street / Stage 2 Access Roundabout, the upgrade from the current priority controlled intersection, results in the intersection operating with an improved performance. The assessed intersection layout is shown by **Figure 13**.

As such, it is concluded that the additional traffic generated by the proposed Mod beyond that already approved, is acceptable from a traffic planning perspective, and no additional upgrades would be required to accommodate the additional traffic generated.

Table 14: 2019 Local Network Performance, With Development

Intersection	Control Type	Scenario	Period	DOS	AVD	LOS
The Horsley Dr x Cowpasture Rd (South)	Roundabout	Existing	AM	1.006	59.6	E
			PM	1.278	373.9	F
		Future	AM	1.018	66.3	E
			PM	1.385	456.7	F
Cowpasture Rd x The Horsley Dr (North)	Signals	Existing	AM	1.030	43.9	D
			PM	0.969	51.7	D
		Future	AM	1.057	48.3	D
			PM	0.988	56.5	D
Cowpasture Rd x Newton Rd	Roundabout	Existing	AM	0.185	16.3	B
			PM	0.792	16.6	B
		Future	AM	0.213	16.4	B
			PM	0.972	27.8	B
Cowpasture Rd x Burilda Close	Roundabout	Existing	AM	0.065	12.7	A
			PM	0.410	11.5	A
		Future	AM	0.068	12.9	A
			PM	0.442	11.5	A
Cowpasture Rd x Victoria Street	Roundabout	Existing	AM	0.846	24.5	B
			PM	0.151	15.2	B
		Future	AM	0.937	34.1	C
			PM	0.186	15.5	B
Cowpasture Rd x Trivet Street (plus Stage access as roundabout)	Priority	Existing	AM	0.926	30.2	C
	PM		0.365	14.9	B	
	Roundabout	Future	AM	0.146	14.5	A
			PM	0.344	13.2	A
The Horsley Dr x Ferrers Road	Signals	Existing	AM	1.235	62.3	E
			PM	1.432	48.3	D
		Future	AM	1.270	67.7	E
			PM	1.433	49.1	D

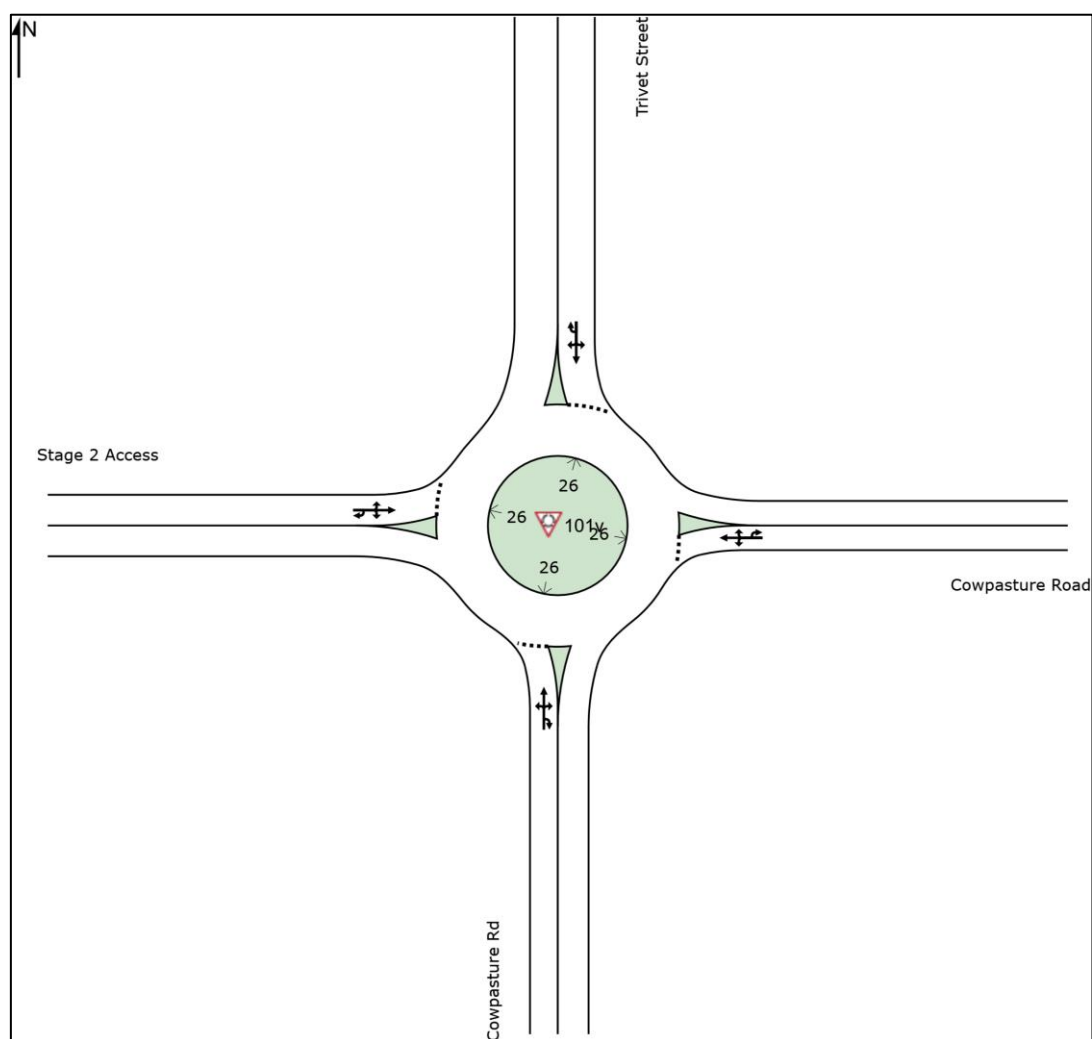


Figure 13: Cowpasture Road / Trivet Street / HDBP Stage 2 Access

7.4 Mod Sensitivity Test Traffic Impacts

Further to the Standard Traffic Impact Assessment, a sensitivity assessment of 2026 scenario of the proposed HDBP Stage 2 has been undertaken for the Mod. The 2026 sensitivity test is defined as the combination of:

- 2026 Baseline traffic – which consists of 2019 existing (surveyed) traffic plus 7 years' traffic growth plus future Lizard Log Traffic,
- HDBP Stage 2 traffic – forecast development traffic associated with the Proposal.

The operation of the key intersections has been assessed under these Sensitivity Test Assessment traffic forecast and the results are summarised in **Table 15**.

Table 15: Local Network Performance, 2026 Future Scenario

Intersection	Scenario	Control Type	Period	DOS	AVD	LOS
The Horsley Dr x Cowpasture Rd (South)	Baseline (HD Upgrade)	Signals	AM	1.014	62.0	E
			PM	1.099	67.8	E
	With Dev		AM	1.043	70.8	F
			PM	1.105	71.4	F
Cowpasture Rd x The Horsley Dr (North)	Baseline (HD Upgrade)	Signals	AM	0.795	27.1	B
			PM	1.036	83.5	F
	With Dev (HD Upgrade)		AM	0.783	29.0	C
			PM	1.054	90.2	F
The Horsley Dr x Ferrers Road	Baseline	Signals	AM	0.729	23.0	B
			PM	0.818	24.8	B
	With Dev (HD Upgrade)		AM	0.743	23.1	B
			PM	0.840	25.1	B

With regard to Table 15:

- The Horsley Drive / Ferrers Road intersection would operate in a consistent manner following the addition of development traffic, with minor increases in delay and LOS remaining unchanged.
- The northern Cowpasture Road / Horsley Drive intersection would also operate in a consistent manner. It is noted that the LOS would change from LOS B to LOS C. However, this is a result of an increase in delay of less than 2 seconds, which would not have a material impact to the operation of this intersection.
- Again, the southern Horsley Drive / Cowpasture Road intersection LOS changes, from a LOS E to LOS F. However, under the baseline (with HD Upgrade interim upgrade) this intersection is approaching a LOS, and as discussed in Section 5, the SIDRA network analysis would indicate that further upgrades are required from that identified by the SMEC Report. It is noteworthy that the increase in LOS is a result of an increase in 9 seconds and 3.6 seconds in the morning and afternoon peaks respectively.

As such, it is concluded that the additional traffic generated by the proposed Mod beyond that already approved, is acceptable from a traffic planning perspective, and no additional upgrades would be required to accommodate the additional traffic generated.

8 Parking & Servicing Requirements

8.1 Car Parking Requirements

Council's DCP, Section 12.1 1 *Car Parking* Table 1 provides the following parking controls:

- Warehouse or Distribution Centres – 1 space per 80m² Gross Leasable Area (GLA)
- Commercial / office space - 1 space per 40m² GLA.

However, the approved parking rates under the Concept Plan are:

- 1 space for every 300m² of warehouse GFA.
- 1 space for every 40m² for all office and ancillary GFA.

8.2 CFC Proposed Car Parking

The proposed CFC has been specially designed and therefore the development of the Proposal has considered the operational characteristics of the development (which has been informed by the applicant and are detailed in Section 7).

Therefore, the proposed parking provision has been based on the number of staff to be located on the Site, and consideration for staff changeover of shift to ensure no impact to the operation of the external network during these periods.

The peak period for parking at the CFC will be during shift change over at 2:00pm, where night shift workers are arriving, prior to shift, and the morning shift workers are still on-site, as well as office staff. Based on the staff expected to drive to Site, as discussed in Section 7.1.2, it is anticipated that there would be some 248 staff parked on-site for the morning shift, with an arrival of 258 staff vehicles expected for the night shift. This would result in a peak of 506 shift worker light vehicles being on-site at any one time.

A total of 538 spaces are proposed for the CFC. The remaining 32 spaces would therefore be available to accommodate office staff vehicles and any visitors.

8.3 Accessible Parking

Accessible parking is to be provided in accordance with the Disability (Access to Premises – Buildings) Standards 2010 from the Building Code of Australia. Accessible parking for commercial (warehouse) developments are to be provided at a rate of:

- 1 space for every 100 car parking spaces or part thereof.

This approach is consistent with that required by the DCP and the approved SSD. Application of this control results in the requirement for 6 accessible spaces.

In response, the Proposal provides for 10 accessible spaces.

8.4 Other Parking

The CFC provides 20 bicycle parking spaces which is located near the carpark, along the perimeter of the building as per the DCP's guidelines. These bicycle spaces would encourage staff members to travel via the extensive bicycle network located along Eastern Creek and the M7 Westlink.

Further to the above, a total of 20 motorcycle parking spaces will be provided for the CFC.

9 Design Commentary

9.1 Relevant Design Standards

The Site's access, car park and service areas have been designed to comply with the following relevant Australian Standards:

- AS2890.1 for car parking areas;
- AS2890.2 for commercial vehicle loading areas;
- AS2890.6 for accessible (disabled) parking.

9.2 Access Driveways and Internal Circulation

The CFC provides the following 5 access driveways into the Site:

- Heavy Vehicle Entry Driveway: 11.7m width
- Heavy Vehicle Exit Driveway: 8m width
- Delivery Van Entry Driveway: 12.6m width
- Delivery Van Exit Driveway: 8.0m width
- Staff Entry Driveway: 4m width
- Staff Exit Driveway: 6.0m width

Swept paths into and out of the heavy vehicle accesses have been tested with the largest vehicle expected to access the Site, a 26m B-double vehicle. Each driveway will be built according to Austroads and Australian Standards.

Internal circulation roads, ramps and parking have been assessed in accordance with AS2890.1 and AS2890.2. Heavy vehicle loading docks have been assessed with 19m AVs. The configuration of these driveways and internal circulation routes would be refined at detailed design stage (prior to the release of a Construction Certificate) in response to a suitable condition of consent.

All key swept path analysis of the proposed development can be found in **Appendix B**.

9.3 Parking Spaces

A detailed review of the car parking areas has been undertaken and the following characteristics are noteworthy:

- All staff and employee parking are to be provided in accordance with AS2890.1 for a Class 1A user, which requires a minimum space length of 5.4m, a minimum width of 2.4m and a minimum aisle width of 5.8m.
- All disabled and adaptable parking spaces are to be provided in accordance with AS2890.6, which requires a space with a clear width of 2.4m and located adjacent to a minimum shared area of 2.4m.
- All spaces located adjacent to obstructions greater than 150mm in height are to be provided with an additional width of 300mm. This includes any landscaping that exceeds 150mm.
- All carparking areas have been separated away from heavy vehicle access.

It is expected that any detailed construction drawings in relation to any modified areas of the car park or Site access would comply with these Standards. Furthermore, compliance with the above Standards would be expected to form a standard condition of consent to any development approval.

9.4 Design Summary

The internal configuration of the Site – including light and heavy vehicular access, car parking and servicing areas – has been designed generally in accordance with the requirements of the relevant Australian Standards (AS2890.1, AS2890.2 and AS2890.6).

As discussed, swept path analysis has been undertaken to confirm the acceptability of the internal road network. The internal road network is able to accommodate the circulation requirements of the largest anticipated heavy vehicle, the 26m B-Double Vehicle.

It is however envisaged that a condition of consent would be imposed requiring compliance with these standards and as such any minor amendments considered necessary (if any) can be dealt with prior to the release of a Construction Certificate.

10 Preliminary Construction Traffic Management Plan

10.1 Overview

A Construction Traffic Management Plan (CTMP) will be submitted as part of detailed construction planning and is expected to be lodged as part of a separate subsequent application following this SSDA.

For the purposes of this TA report, the following general principles for managing construction traffic have been assumed and provide an understanding of the likely traffic impacts during the construction period. It should be noted that the construction programme for the development has not yet been finalised.

- The construction activities are expected to result in traffic movements less than those prescribed in Section 7 and as such, the key intersections in the vicinity of the Site are generally expected to operate adequately.
- The construction activities are expected to generate a peak traffic volume of approximately 310 daily traffic movements during the building construction phase. A peak of 170 heavy vehicle movements per day would occur during the excavation phase.
- Most construction vehicles are expected to access the Site via either the M7 Motorway - The Horsley Drive and Cowpasture Road route or via Smithfield Road (the Cumberland Highway) to the M4.
- Given the area of the Site, it is anticipated that contractor parking would be more than adequately catered for on-site with no reliance on off-street parking.
- Road closures are expected as a consequence of the roundabout construction activities with the potential part closures of Cowpasture Road and Trivet Street to construct the new access road roundabout intersection. The Traffic Management Plan (TMP) for the roundabout construction will be updated progressively as staging plans for the roundabout becomes available. The TMP will seek to minimise traffic impacts at this intersection. This was previously done for the HDBP Stage 1 roundabout construction on a section of road with a high volume of traffic.

The construction of the proposed development is therefore expected to have no major impact on the operation of the road network or on the availability of off-street parking.

10.2 Potential Haulage Routes

The primary potential haulage route to and from the Site would be via the M7 Motorway - The Horsley Drive and Cowpasture Road or via Smithfield Road (the Cumberland Highway) to the M4. TfNSW currently identifies both routes as heavy vehicle routes. Construction of the Proposal would generate additional truck movements along these routes. However, given these roads currently carry high

volumes of heavy vehicles, construction of the development would not have any notable impact upon heavy vehicle volumes on these routes.

All proposed routes will follow the TfNSW Restricted Access Vehicle (RAV) approved routes for 25/26m B-doubles which can be found in **Figure 14**. All construction vehicles would enter and exit the Site via the routes shown in **Figure 15** and **Figure 16**.

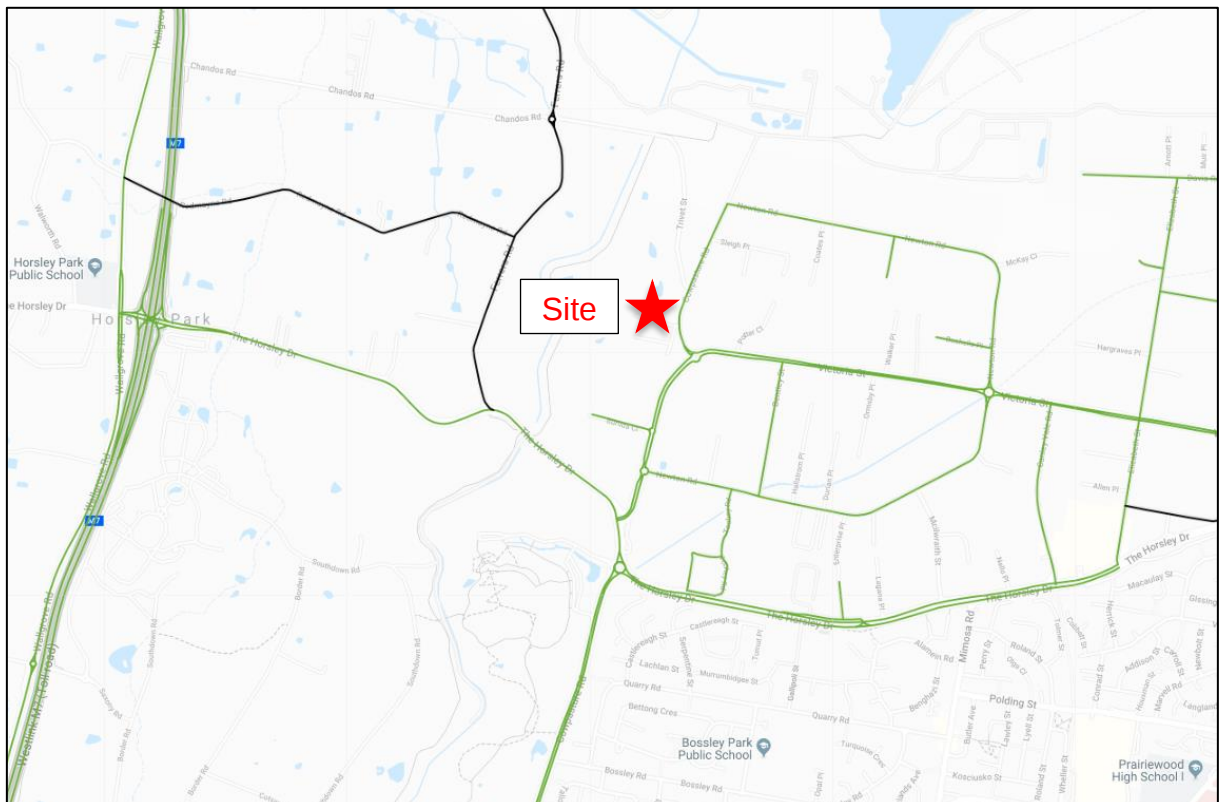


Figure 14: TfNSW RAV Approved 25/26m B-double Vehicle Routes

The routes shown are to be utilised by all construction vehicles travelling to and from the site and represents the shortest route available - hence minimising the impacts of the construction process. A copy of the approved routes will be distributed by the Contractor to all drivers before their arrival to Site.

All heavy vehicles of are to access the Site via the following entry routes during excavation and demolition:

- Route 1: From M7 Westlink, turn onto The Horsley Drive, left onto Cowpasture Road, continue straight on Cowpasture Road before turning left into the Site.
- Route 2: From Smithfield Road, turn onto Victoria Road, turn right at the roundabout onto Cowpasture Road before turning left into the Site.

For exiting the Site, all right turns out of the Cowpasture Road access is limited to only in off-peak hours. During peak hours, heavy vehicles must turn left out of the site access.

All construction heavy vehicles are to use either of the following three routes during excavation and demolition:

- Route 1 (Restricted to Off-Peak Hours): From the Site access, right onto Cowpasture Road, continue straight along Cowpasture road before turning right onto The Horsley Drive and then turn onto the Westlink M7.
- Route 2 (Restricted to Off-Peak Hours): From the Site access, right onto Cowpasture Road, turn right at the roundabout onto Victoria Street to head eastbound onto Smithfield Road.
- Route 3: From the Site access, left onto Cowpasture Road, right onto Newtown Road before heading west at the Victoria Street / Newton Road roundabout to continue onto Victoria Street, straight onto Cowpasture Road before turning right onto The Horsley Drive and then turn onto the Westlink M7.
- Route 4: From the Site access, left onto Cowpasture Road, right onto Newtown Road before heading east at the Victoria Street / Newton Road roundabout to continue onto Victoria Street, to head eastbound onto Smithfield Road.

Any oversized or over-mass vehicles travelling to and / or from the Site will be required to obtain a permit from the TfNSW and / or the National Heavy Vehicle Register (NHVR). Notwithstanding, this CTMP relates to general construction which does not seek the use of oversize vehicles. A separate application would be submitted to Council if required.

All construction vehicles associated with the construction project will enter and exit the Site in a forward direction.

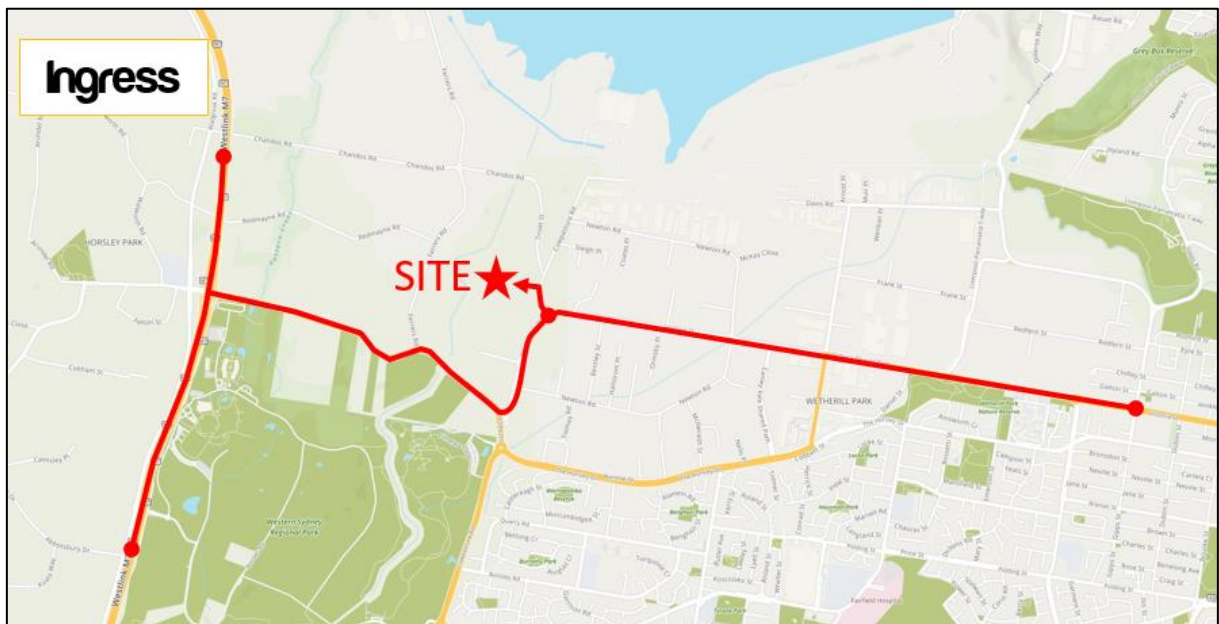


Figure 15: Construction Vehicle Entry Routes

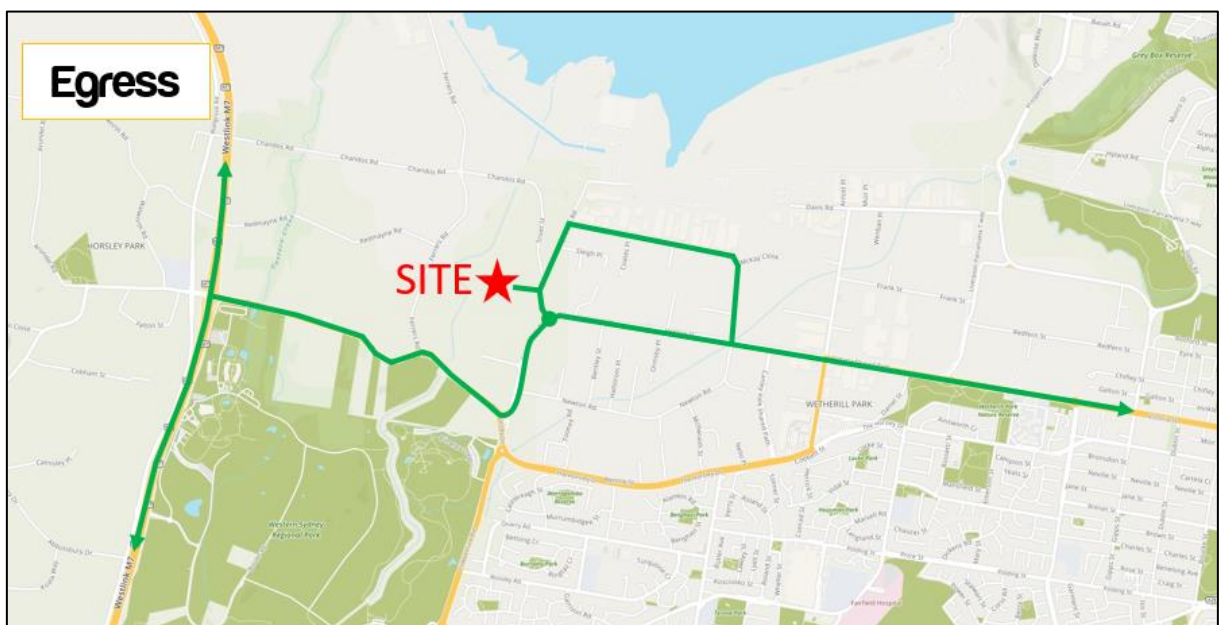


Figure 16: Construction Vehicle Exit Routes

The movement of materials would be managed through the scheduling of deliveries and would aim to minimise the number of heavy vehicles accessing the Site during peak network periods.

10.3 Staging and Duration of Works

Recognising the purpose of this CTMP, it is estimated that the total duration of the demolition and excavation would be approximately 1 year from the commencement date. The start date for construction would likely be February 2020. The following summarises key aspects of the construction stages:

- Demolition works are set to have a duration for 2-3 months.
- Excavation works is estimated to have a duration of 9 months.
- Building construction is estimated to have a duration of 27 months.
- Roadworks associated with the roundabout construction is estimated to have a construction period of 12 months.

10.4 Proposed Working Hours

The type of work being undertaken will vary depending on the phase of construction and associated activities. This includes both construction and design personnel. Notwithstanding, all works will be undertaken in accordance with the Development Consent, which are as follows:

- Monday to Friday (other than Public Holidays): 7:00am – 6:00pm.
- Saturday: 8:00am – 1:00pm
- Sunday & Public Holidays: No works to be undertaken.

It is not uncommon for work outside the hours above to be undertaken in the following circumstances:

- Works that are inaudible at the nearest sensitive receivers;
- Works agreed to in writing by the Planning Secretary;
- For the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons; or
- Where it is required in an emergency to avoid the loss of lives, property or to prevent environmental harm.

10.5 Vehicle Size

The largest vehicles anticipated to access the site during construction would generally be represented by a 19m Truck and Dog Vehicle and the occasional 19m Articulate Vehicle (AV).

10.6 Construction Traffic Generation

Light vehicle traffic generation would be generally associated with staff movements to and from the Site. Staff would be comprised of project managers, various trades and general construction staff. Over the full construction period, the peak workforce represents the worst-case scenario for vehicle movements during the morning or evening road network peak hour. The workforce arrival and departure periods (6.00AM - 8.00AM and 3.00PM - 5.00PM) represent the typical peak construction traffic periods.

Light vehicle construction trips are expected to arrive in the morning and depart in the evening and the number of trips will be based on the workforce numbers. Parking for these construction related-vehicles will be provided on-site.

Heavy vehicle traffic would mainly be generated by activities associated with the removal of excavated material, delivery of construction equipment and delivery of material for construction works. The highest number of heavy vehicle movements would occur during the excavation phase with 170 daily truck movements and 17 truck movements during the peak hour.

It is expected that daily peak of 310 vehicle movements (1 in movement + 1 out movement = 2 movements) would occur during the building construction phase with a peak of 250 light vehicle movements and 60 truck movements per day.

Importantly, the construction traffic volumes are expected to be lower than the volumes anticipated for the proposed development once it becomes operational. Therefore, recognising that the key intersections are expected to generally perform satisfactorily with the Stage 2 development traffic, it can be assumed that the intersections would satisfactorily accommodate the lower volumes of construction traffic.

10.7 Pedestrian Mitigation Measures

It is noted that construction can influence the serviceability of public transport, and other pedestrian amenities, however the construction of HDBP Stage two would likely not affect public transport. Any further public transport impact mitigation strategies would require further consultation with TfNSW and the bus operator. The Bus service 814 is located north of Trivet Street and is the closest route to the site.

10.8 Construction Mitigation Measures

While the traffic impacts of construction of the development are likely to be negligible, the following measures should be undertaken to minimise the impacts of the construction activities of the development:

- Traffic control would be required to manage and regulate traffic movements into and out of the site during construction.
- Disruption to road users would be kept to a minimum by scheduling intensive delivery activities outside of peak hours.
- Construction and delivery vehicles would be limited to use of the M7 Motorway, The Horsley Drive, Cowpasture Road, Smithfield Road (the Cumberland Highway) and the M4, and deliveries during peak periods restricted or minimised.

11 Conclusions

11.1 Conclusions

The key findings of this Transport Assessment are:

- The Proposal generally seeks approval to provide for a 24-hour Customer Fulfilment Centre (CFC) (the Proposal) on the southern Lot of the Horsley Drive Business Park (HDBP) Stage 2. The CFC would provide for 29,631m² of warehouse and office Gross Floor Area (GFA) with associated hardstand and loading areas, 538 parking spaces and 276 van bays.

Access will be provided to the Site via a new access road, which will connect to the wider road network via a new roundabout intersection at the existing Trivet Street / Cowpasture Road intersection. This intersection is to be provided as part of a Modification Application (Mod) relating to the Concept Plan development approval for the HDBP Stage 2 (SSD-7664).

- The Proposal is expected to generate a total of 127 and 167 vehicle trips in the morning and afternoon peak hours respectively. When compared to the approved traffic generation of the HDBP Stage 2, this represents 11 fewer trips in the morning peak hour and 28 additional trips in the afternoon peak hour.

With regard to the forecast traffic generation of the Mod, the CFC forecast traffic generation represents 72% and 77% in the morning and peak hours respectively.

- The Standard Traffic Impact Assessment analysis undertaken of the Mod Proposal indicates that the additional Mod forecast traffic does not have a material impact on the operation of the intersections across the network, with minimal increase in delay and Level of Service remaining consistent.

The exception is the Cowpasture Road / Victoria Street roundabout, which deteriorates from a LOS B to LOS C during the AM peak. Nevertheless, this intersection would still operate satisfactorily, and it is noted that this change in LOS is a result of an additional delay of 9.6 seconds.

- The Mod Sensitivity Test Traffic Impact Assessment undertaken for 2026, concluded that:
 - The Horsley Drive / Ferrers Road intersection would operate in a consistent manner following the addition of development traffic, with minor increases in delay and LOS remaining unchanged.
 - The northern Cowpasture Road / Horsley Drive intersection would also operate in a consistent manner. It is noted that the LOS would change from LOS B to LOS C. However, this is a result of an increase in delay of less than 2 seconds, which would not have a material impact to the operation of this intersection.

- The southern Horsley Drive / Cowpasture Road intersection LOS changes, from a LOS E to LOS F. However, under the baseline (with HD Upgrade interim upgrade) this intersection is approaching a LOS and, the SIDRA network analysis would indicate that further upgrades are required from that identified by the SMEC Report. It is noteworthy that the increase in LOS is a result of an increase in 9 seconds and 3.6 seconds in the morning and afternoon peaks respectively.
- The 538 proposed car parking spaces have been based on known staff and shift patterns for the CFC.

Further, accessible parking would also be provided in accordance with the BCA. Accordingly, the Proposal is supportable on parking grounds.
- The Site access, internal circulation and car parking arrangements have been developed with consideration of the requirements of the DCP and relevant Australian Standards (i.e. AS2890.1, AS2890.2 and AS2890.6). The access arrangements have been developed to permit entry and exit movements in a forward direction, separate commercial (heavy) vehicle and passenger vehicle traffic, and minimise pedestrian crossing distances. Any minor amendments necessary would be undertaken at detailed design stage (prior to the release of a Construction Certificate) in response to a suitable condition of consent.
- A Preliminary CTMP report has been prepared. The CTMP provides an overview of the anticipated vehicle routes, number of trucks, hours of operation, access management and traffic control measures for all stages of construction; It also an assessment of traffic and transport impacts during construction and how these impacts will be mitigated for any associated traffic, pedestrians, cyclists and public transport operations. This Preliminary CTMP is provided for information purposes and would be further detailed in consultation with the relevant authorities at CC stage in response to the expected condition of consent,

This Transport Assessment (TA) has been prepared in accordance with the technical requirements of the Secretary's Environmental Assessment Requirements (SEARs). It is therefore concluded that the development is supportable on transport planning grounds.

Appendix A

SIDRA Outputs

MOVEMENT SUMMARY

 Site: m01 [2019 AM Existing - The Horsley Drive x Cowpasture Road]

 Network: N101 [2019 AM Existing]

The Horsley Drive x Cowpasture Road
Site Category: (None)
Roundabout

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	% veh/h		%	v/c	sec		veh	m				km/h
South: Cowpasture Road														
1	L2	4	25.0	4	25.0	0.003	3.5	LOS A	0.0	0.0	0.03	0.39	0.03	53.5
2	T1	1315	5.9	1315	5.9	0.887	9.5	LOS A	5.6	41.1	0.89	1.06	1.35	46.4
3	R2	843	3.9	843	3.9	0.887	18.3	LOS B	5.3	38.4	0.96	1.23	1.57	50.4
3u	U	1	0.0	1	0.0	0.887	20.8	LOS B	5.3	38.4	0.96	1.23	1.57	50.8
Approach		2163	5.2	2163	5.2	0.887	13.0	LOS A	5.6	41.1	0.91	1.13	1.44	48.5
East: The Horsley Drive (East)														
4	L2	194	12.0	194	12.0	0.339	4.9	LOS A	1.1	8.7	0.68	0.66	0.68	54.5
5	T1	1	0.0	1	0.0	0.339	5.2	LOS A	1.1	8.7	0.68	0.66	0.68	45.5
6	R2	556	10.6	556	10.6	0.339	11.6	LOS A	1.1	8.7	0.69	0.70	0.69	45.0
6u	U	17	6.2	17	6.2	0.339	14.3	LOS A	1.0	7.8	0.70	0.74	0.70	53.9
Approach		767	10.8	767	10.8	0.339	10.0	LOS A	1.1	8.7	0.69	0.69	0.69	48.4
North: The Horsley Drive (North)														
7	L2	786	9.4	763	9.5	1.006	59.6	LOS E	15.0	113.3	1.00	2.05	3.46	25.3
8	T1	389	14.9	378	15.0	0.735	17.4	LOS B	3.0	23.9	0.89	1.08	1.29	47.2
9	R2	1	0.0	1	0.0	0.735	23.8	LOS B	3.0	23.9	0.89	1.08	1.29	26.9
9u	U	4	25.0	4	25.2	0.735	27.7	LOS B	3.0	23.9	0.89	1.08	1.29	25.6
Approach		1181	11.2	1147 ^{N1}	11.4	1.006	45.6	LOS D	15.0	113.3	0.96	1.72	2.73	30.0
West: Lizard Log Access Road														
10	L2	5	20.0	5	20.0	0.046	26.7	LOS B	0.1	0.7	0.94	0.95	0.94	11.7
11	T1	3	0.0	3	0.0	0.025	15.8	LOS B	0.1	0.4	0.98	0.86	0.98	41.7
12	R2	1	0.0	1	0.0	0.025	20.6	LOS B	0.1	0.4	0.98	0.86	0.98	42.3
12u	U	2	4.0	2	4.0	0.025	27.8	LOS B	0.1	0.4	0.98	0.86	0.98	17.0
Approach		12	9.8	12	9.8	0.046	23.4	LOS B	0.1	0.7	0.96	0.90	0.96	25.9
All Vehicles		4123	8.0	4089 ^{N1}	8.0	1.006	21.6	LOS B	15.0	113.3	0.89	1.21	1.66	41.7

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

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

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

^{N1} Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

MOVEMENT SUMMARY

 **Site: m01 [2019 PM Existing - The Horsley Drive x Cowpasture Road]**

 **Network: N101 [2019 PM Existing]**

The Horsley Drive x Cowpasture Road
Site Category: (None)
Roundabout

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	% veh/h	%	v/c				sec	veh				
South: Cowpasture Road														
1	L2	3	0.0	3	0.0	0.002	3.3	LOS A	0.0	0.0	0.03	0.39	0.03	53.6
2	T1	665	9.5	665	9.5	0.413	4.5	LOS A	1.1	8.1	0.61	0.47	0.61	48.5
3	R2	322	8.2	322	8.2	0.413	11.1	LOS A	1.0	7.3	0.63	0.72	0.63	54.2
3u	U	1	0.0	1	0.0	0.413	13.5	LOS A	1.0	7.3	0.63	0.72	0.63	55.7
Approach		992	9.0	992	9.0	0.413	6.6	LOS A	1.1	8.1	0.62	0.55	0.62	51.1
East: The Horsley Drive (East)														
4	L2	377	3.1	377	3.1	1.278	365.2	LOS F	49.2	354.3	1.00	3.65	6.68	8.7
5	T1	1	0.0	1	0.0	1.278	365.6	LOS F	49.2	354.3	1.00	3.65	6.68	5.6
6	R2	582	4.2	582	4.2	1.278	371.6	LOS F	49.2	354.3	1.00	3.34	6.27	5.1
6u	U	7	0.0	7	0.0	1.278	373.9	LOS F	33.5	243.0	1.00	3.18	6.05	9.0
Approach		967	3.7	967	3.7	1.278	369.1	LOS F	49.2	354.3	1.00	3.46	6.43	6.6
North: The Horsley Drive (North)														
7	L2	609	4.3	609	4.3	0.561	5.7	LOS A	1.7	12.6	0.50	0.60	0.52	57.1
8	T1	1253	4.0	1252	4.0	0.884	8.3	LOS A	6.9	49.9	0.76	0.76	0.98	57.0
9	R2	1	100.0	1	100.0	0.884	18.6	LOS B	6.9	49.9	0.76	0.76	0.98	33.6
9u	U	14	7.7	14	7.7	0.884	18.0	LOS B	6.9	49.9	0.76	0.76	0.98	36.5
Approach		1877	4.2	1877	4.2	0.884	7.5	LOS A	6.9	49.9	0.67	0.71	0.83	57.0
West: Lizard Log Access Road														
10	L2	5	20.0	5	20.0	0.010	5.1	LOS A	0.0	0.1	0.68	0.60	0.68	27.3
11	T1	3	0.0	3	0.0	0.011	2.6	LOS A	0.0	0.1	0.68	0.59	0.68	51.9
12	R2	5	0.0	5	0.0	0.011	7.4	LOS A	0.0	0.1	0.68	0.59	0.68	52.8
12u	U	1	0.0	1	0.0	0.011	14.5	LOS B	0.0	0.1	0.68	0.59	0.68	21.0
Approach		15	7.1	15	7.1	0.011	6.1	LOS A	0.0	0.1	0.68	0.59	0.68	45.4
All Vehicles		3851	5.3	3850 ^{N1}	5.3	1.278	98.1	LOS F	49.2	354.3	0.74	1.36	2.18	18.6

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

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

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

^{N1} Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

MOVEMENT SUMMARY



Site: [2019 AM Existing - Cowpasture Road x The Horsley Drive]



Network: N101 [2019 AM Existing]

Horsley Drive x Cowpasture Rd

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 122 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV %	Total	HV %				Vehicles	Distance				
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: The Horsley Drive (south)														
2	T1	1100	7.6	1100	7.6	0.404	7.8	LOS A	8.2	61.0	0.45	0.40	0.45	52.6
3	R2	742	7.4	742	7.4	0.750	30.5	LOS C	7.8	58.2	0.97	0.86	1.01	15.7
Approach		1842	7.5	1842	7.5	0.750	16.9	LOS B	8.2	61.0	0.66	0.59	0.67	41.3
East: Cowpasture Road														
4	L2	177	33.9	177	33.9	0.285	17.4	LOS B	3.2	28.6	0.56	0.68	0.56	24.4
6	R2	301	64.7	301	64.7	0.588	54.4	LOS D	5.2	56.1	0.96	0.81	0.96	28.8
Approach		478	53.3	478	53.3	0.588	40.7	LOS C	5.2	56.1	0.81	0.76	0.81	28.2
North: The Horsley Drive (north)														
7	L2	769	27.5	769	27.5	0.445	15.6	LOS B	5.4	46.3	0.63	0.75	0.63	45.2
8	T1	1007	6.9	1007	6.9	1.030	116.4	LOS F	34.7	257.2	1.00	1.44	1.72	16.8
Approach		1777	15.8	1777	15.8	1.030	72.8	LOS F	34.7	257.2	0.84	1.14	1.25	23.1
All Vehicles		4097	16.4	4097	16.4	1.030	43.9	LOS D	34.7	257.2	0.75	0.85	0.94	28.9

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

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

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

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

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

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue	Prop. Queued	Effective Stop Rate
		ped/h	sec		Pedestrian	Distance	
					ped	m	
P1	South Full Crossing	26	55.2	LOS E	0.1	0.1	0.95
P2	East Full Crossing	26	33.2	LOS D	0.1	0.1	0.74
P3S	North Slip/Bypass Lane Crossing	26	19.9	LOS B	0.0	0.0	0.80
All Pedestrians		79	36.1	LOS D			0.83

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

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

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

MOVEMENT SUMMARY

 Site: [2019 PM Existing - Cowpasture Road x The Horsley Drive]

 Network: N101 [2019 PM Existing]

Horsley Drive x Cowpasture Rd

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 145 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total	HV %	v/c	sec		Distance m				km/h
South: The Horsley Drive (south)													
2	T1	1159	5.8	1042	6.1	0.451	17.2	LOS B	12.4	91.4	0.60	0.54	45.8
3	R2	111	21.0	100	21.8	0.311	73.6	LOS F	2.1	17.3	0.97	0.75	7.7
Approach		1269	7.1	1142 ^{N1}	7.5	0.451	22.2	LOS B	12.4	91.4	0.63	0.56	41.9
East: Cowpasture Road													
4	L2	545	4.6	545	4.6	0.648	35.6	LOS C	15.6	113.7	0.84	0.95	15.8
6	R2	1007	11.6	1007	11.6	0.885	65.6	LOS E	23.4	179.8	1.00	0.97	27.1
Approach		1553	9.2	1552 ^{N1}	9.2	0.885	55.1	LOS D	23.4	179.8	0.94	0.96	25.1
North: The Horsley Drive (north)													
7	L2	198	59.0	198	59.0	0.092	9.6	LOS A	0.8	8.5	0.21	0.59	50.8
8	T1	1352	3.8	1352	3.8	0.969	79.1	LOS F	39.8	287.4	1.00	1.17	22.0
Approach		1549	10.9	1549	10.9	0.969	70.2	LOS E	39.8	287.4	0.90	1.10	23.7
All Vehicles		4372	9.2	4244 ^{N1}	9.5	0.969	51.7	LOS D	39.8	287.4	0.84	0.90	27.9

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

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

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

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

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

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

^{N1} Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue	Prop. Queued	Effective Stop Rate
		ped/h	sec		Pedestrian ped	Distance m	
P1	South Full Crossing	26	46.5	LOS E	0.1	0.1	0.80
P2	East Full Crossing	26	28.6	LOS C	0.1	0.1	0.63
P3S	North Slip/Bypass Lane Crossing	26	62.9	LOS F	0.1	0.1	0.93
All Pedestrians		79	46.0	LOS E			0.79

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

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

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

MOVEMENT SUMMARY



Site: [2019 AM Existing - Cowpasture Road x Newton Road]



Network: N101 [2019 AM Existing]

Cowpasture Road x Newton Road

Site Category: (None)

Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV %	Total	HV %				Vehicles	Distance				
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Cowpasture Road														
2	T1	929	16.5	929	16.5	0.507	4.5	LOS A	2.0	15.7	0.17	0.41	0.17	43.5
3	R2	574	17.6	574	17.6	0.507	9.3	LOS A	1.9	15.5	0.18	0.58	0.18	50.2
3u	U	25	37.5	25	37.5	0.507	11.7	LOS A	1.9	15.5	0.18	0.58	0.18	37.9
Approach		1528	17.3	1528	17.3	0.507	6.4	LOS A	2.0	15.7	0.17	0.47	0.17	47.5
East: Newton Road														
4	L2	256	54.3	256	54.3	0.357	6.2	LOS A	0.7	6.8	0.48	0.66	0.48	49.5
6	R2	17	31.3	17	31.3	0.357	10.6	LOS A	0.7	6.8	0.48	0.66	0.48	49.5
6u	U	6	33.3	6	33.3	0.357	12.8	LOS A	0.7	6.8	0.48	0.66	0.48	54.6
Approach		279	52.5	279	52.5	0.357	6.6	LOS A	0.7	6.8	0.48	0.66	0.48	49.7
North: Cowpasture Road														
7	L2	53	22.0	53	22.0	0.185	9.7	LOS A	0.6	5.6	0.75	0.66	0.75	46.4
8	T1	204	46.9	204	46.9	0.185	10.8	LOS A	0.6	5.6	0.75	0.67	0.75	29.1
9u	U	1	0.0	1	0.0	0.185	16.3	LOS B	0.6	5.5	0.75	0.68	0.75	28.9
Approach		258	41.6	258	41.6	0.185	10.6	LOS A	0.6	5.6	0.75	0.67	0.75	35.9
All Vehicles		2065	25.1	2065	25.1	0.507	7.0	LOS A	2.0	15.7	0.29	0.52	0.29	46.7

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

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

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

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MOVEMENT SUMMARY

 Site: [2019 PM Existing - Cowpasture Road x Newton Road]

 Network: N101 [2019 PM Existing]

Cowpasture Road x Newton Road
Site Category: (None)
Roundabout

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	% veh/h		%	v/c	sec		veh	m				km/h
South: Cowpasture Road														
2	T1	174	53.9	169	55.0	0.115	4.7	LOS A	0.3	2.9	0.08	0.39	0.08	45.0
3	R2	123	35.0	118	36.1	0.115	9.3	LOS A	0.3	2.3	0.08	0.60	0.08	49.1
3u	U	15	14.3	14	14.8	0.115	11.2	LOS A	0.3	2.3	0.08	0.60	0.08	37.8
Approach		312	44.6	301 ^{N1}	45.7	0.115	6.8	LOS A	0.3	2.9	0.08	0.48	0.08	47.4
East: Newton Road														
4	L2	197	24.6	197	24.6	0.571	10.6	LOS A	0.7	5.9	0.70	0.93	0.94	44.7
6	R2	7	0.0	7	0.0	0.571	14.5	LOS A	0.7	5.9	0.70	0.93	0.94	44.7
6u	U	1	0.0	1	0.0	0.571	16.6	LOS B	0.7	5.9	0.70	0.93	0.94	52.8
Approach		205	23.6	205	23.6	0.571	10.8	LOS A	0.7	5.9	0.70	0.93	0.94	44.8
North: Cowpasture Road														
7	L2	7	57.1	7	57.1	0.792	6.2	LOS A	1.6	11.7	0.44	0.50	0.44	48.1
8	T1	1244	6.9	1244	6.9	0.792	5.4	LOS A	1.6	11.7	0.45	0.50	0.45	35.6
9u	U	1	100.0	1	100.0	0.792	13.9	LOS A	1.5	11.4	0.45	0.51	0.45	35.5
Approach		1253	7.2	1252 ^{N1}	7.2	0.792	5.4	LOS A	1.6	11.7	0.45	0.50	0.45	35.8
All Vehicles		1769	15.7	1759 ^{N1}	15.8	0.792	6.3	LOS A	1.6	11.7	0.41	0.55	0.44	40.7

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

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

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

^{N1} Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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MOVEMENT SUMMARY

 Site: [2019 AM Existing - Cowpasture Road x Burilda Close]

 Network: N101 [2019 AM Existing]

Cowpasture Road x Burilda Close
Site Category: (None)
Roundabout

Movement Performance - Vehicles															
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Back of Queue Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed	
		Total	HV	Total	HV										veh/h
South: Cowpasture Road															
1	L2	60	21.1	60	21.1	0.334	4.7	LOS A	0.9	6.9	0.25	0.42	0.25	43.6	
2	T1	891	16.7	891	16.7	0.334	4.7	LOS A	0.9	6.9	0.26	0.42	0.26	38.2	
Approach		951	16.9	950	16.9	0.334	4.7	LOS A	0.9	6.9	0.26	0.42	0.26	38.9	
North: Cowpasture Road															
8	T1	242	41.7	242	41.7	0.114	4.6	LOS A	0.3	2.6	0.13	0.42	0.13	47.7	
9	R2	46	27.3	46	27.3	0.114	9.2	LOS A	0.3	2.5	0.14	0.50	0.14	47.1	
9u	U	16	46.7	16	46.7	0.114	11.6	LOS A	0.3	2.5	0.14	0.50	0.14	45.5	
Approach		304	39.8	304	39.8	0.114	5.7	LOS A	0.3	2.6	0.13	0.44	0.13	47.5	
West: Stage 1 Access															
10	L2	21	50.0	21	50.0	0.065	6.0	LOS A	0.1	0.8	0.49	0.74	0.49	36.8	
12	R2	18	64.7	18	64.7	0.065	10.9	LOS A	0.1	0.8	0.49	0.74	0.49	36.8	
12u	U	1	0.0	1	0.0	0.065	12.7	LOS A	0.1	0.8	0.49	0.74	0.49	47.4	
Approach		40	55.3	40	55.3	0.065	8.4	LOS A	0.1	0.8	0.49	0.74	0.49	37.2	
All Vehicles		1295	23.5	1295	23.5	0.334	5.1	LOS A	0.9	6.9	0.23	0.43	0.23	41.9	

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

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

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

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MOVEMENT SUMMARY

 **Site: [2019 AM Existing - Cowpasture Road x Burilda Close]**

 **Network: N101 [2019 AM Existing]**

Cowpasture Road x Burilda Close
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Back of Queue Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV									
		veh/h	%	veh/h	%									
South: Cowpasture Road														
1	L2	60	21.1	60	21.1	0.334	4.7	LOS A	0.9	6.9	0.25	0.42	0.25	43.6
2	T1	891	16.7	891	16.7	0.334	4.7	LOS A	0.9	6.9	0.26	0.42	0.26	38.2
Approach		951	16.9	950	16.9	0.334	4.7	LOS A	0.9	6.9	0.26	0.42	0.26	38.9
North: Cowpasture Road														
8	T1	242	41.7	242	41.7	0.114	4.6	LOS A	0.3	2.6	0.13	0.42	0.13	47.7
9	R2	46	27.3	46	27.3	0.114	9.2	LOS A	0.3	2.5	0.14	0.50	0.14	47.1
9u	U	16	46.7	16	46.7	0.114	11.6	LOS A	0.3	2.5	0.14	0.50	0.14	45.5
Approach		304	39.8	304	39.8	0.114	5.7	LOS A	0.3	2.6	0.13	0.44	0.13	47.5
West: Stage 1 Access														
10	L2	21	50.0	21	50.0	0.065	6.0	LOS A	0.1	0.8	0.49	0.74	0.49	36.8
12	R2	18	64.7	18	64.7	0.065	10.9	LOS A	0.1	0.8	0.49	0.74	0.49	36.8
12u	U	1	0.0	1	0.0	0.065	12.7	LOS A	0.1	0.8	0.49	0.74	0.49	47.4
Approach		40	55.3	40	55.3	0.065	8.4	LOS A	0.1	0.8	0.49	0.74	0.49	37.2
All Vehicles		1295	23.5	1295	23.5	0.334	5.1	LOS A	0.9	6.9	0.23	0.43	0.23	41.9

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

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

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

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MOVEMENT SUMMARY

 **Site: [2019 AM Existing - Cowpasture Road x Burilda Close]**

 **Network: N101 [2019 AM Existing]**

Cowpasture Road x Burilda Close
Site Category: (None)
Roundabout

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Cowpasture Road														
1	L2	60	21.1	60	21.1	0.334	4.7	LOS A	0.9	6.9	0.25	0.42	0.25	43.6
2	T1	891	16.7	891	16.7	0.334	4.7	LOS A	0.9	6.9	0.26	0.42	0.26	38.2
Approach		951	16.9	950	16.9	0.334	4.7	LOS A	0.9	6.9	0.26	0.42	0.26	38.9
North: Cowpasture Road														
8	T1	242	41.7	242	41.7	0.114	4.6	LOS A	0.3	2.6	0.13	0.42	0.13	47.7
9	R2	46	27.3	46	27.3	0.114	9.2	LOS A	0.3	2.5	0.14	0.50	0.14	47.1
9u	U	16	46.7	16	46.7	0.114	11.6	LOS A	0.3	2.5	0.14	0.50	0.14	45.5
Approach		304	39.8	304	39.8	0.114	5.7	LOS A	0.3	2.6	0.13	0.44	0.13	47.5
West: Stage 1 Access														
10	L2	21	50.0	21	50.0	0.065	6.0	LOS A	0.1	0.8	0.49	0.74	0.49	36.8
12	R2	18	64.7	18	64.7	0.065	10.9	LOS A	0.1	0.8	0.49	0.74	0.49	36.8
12u	U	1	0.0	1	0.0	0.065	12.7	LOS A	0.1	0.8	0.49	0.74	0.49	47.4
Approach		40	55.3	40	55.3	0.065	8.4	LOS A	0.1	0.8	0.49	0.74	0.49	37.2
All Vehicles		1295	23.5	1295	23.5	0.334	5.1	LOS A	0.9	6.9	0.23	0.43	0.23	41.9

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

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

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

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MOVEMENT SUMMARY

 **Site: 101 [2019 PM Existing - Cowpasture Road x Victoria Street]**

 **Network: N101 [2019 PM Existing]**

Cowpasture Road x Victoria Street
Site Category: (None)
Roundabout

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	% veh/h		%	v/c	sec		veh	m				km/h
NorthEast: Victoria Street														
25	T1	818	8.6	818	8.6	0.556	6.6	LOS A	2.0	15.2	0.72	0.65	0.73	47.0
26	R2	359	2.3	359	2.3	0.556	11.6	LOS A	2.0	14.6	0.74	0.75	0.76	44.9
26u	U	72	19.1	72	19.1	0.556	14.3	LOS A	2.0	14.6	0.74	0.75	0.76	51.7
Approach		1248	7.4	1248	7.4	0.556	8.4	LOS A	2.0	15.2	0.73	0.69	0.74	46.8
NorthWest: Cowpasture Road														
27	L2	274	4.2	274	4.2	0.561	5.9	LOS A	1.5	10.7	0.56	0.73	0.59	50.1
29	R2	291	6.2	291	6.2	0.561	10.8	LOS A	1.5	10.7	0.56	0.73	0.59	41.2
29u	U	1	0.0	1	0.0	0.561	12.7	LOS A	1.5	10.7	0.56	0.73	0.59	41.2
Approach		565	5.2	565	5.2	0.561	8.4	LOS A	1.5	10.7	0.56	0.73	0.59	47.1
SouthWest: Victoria Street														
30	L2	73	21.7	71	22.0	0.151	6.7	LOS A	0.4	3.6	0.65	0.64	0.65	44.6
31	T1	165	41.4	162	41.8	0.151	7.7	LOS A	0.4	3.6	0.66	0.67	0.66	51.5
32u	U	11	50.0	10	50.4	0.151	15.2	LOS B	0.4	3.5	0.67	0.69	0.67	43.1
Approach		248	36.0	243 ^{N1}	36.4	0.151	7.7	LOS A	0.4	3.6	0.66	0.66	0.66	50.1
All Vehicles		2062	10.3	2057 ^{N1}	10.3	0.561	8.3	LOS A	2.0	15.2	0.68	0.70	0.69	47.4

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

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

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

^{N1} Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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MOVEMENT SUMMARY

 **Site: 101 [2019 AM Existing - Cowpasture Road x Trivet Street]**

 **Network: N101 [2019 AM Existing]**

Int 6_Cowpasture Rd_Trivet St
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Queue Vehicles	Back of Queue Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %									
South: Cowpasture Rd														
1	L2	257	4.1	257	4.1	0.276	5.6	LOS A	0.0	0.0	0.00	0.29	0.00	54.4
2	T1	266	16.2	266	16.2	0.276	0.0	LOS A	0.0	0.0	0.00	0.29	0.00	54.6
Approach		523	10.3	523	10.3	0.276	2.8	NA	0.0	0.0	0.00	0.29	0.00	54.5
North: Cowpasture Rd														
8	T1	99	42.6	99	42.6	0.092	1.2	LOS A	0.1	1.2	0.31	0.18	0.31	47.8
9	R2	31	13.8	31	13.8	0.092	8.6	LOS A	0.1	1.2	0.31	0.18	0.31	53.6
Approach		129	35.8	129	35.8	0.092	2.9	NA	0.1	1.2	0.31	0.18	0.31	50.6
West: Trivet St														
10	L2	221	2.9	221	2.9	0.209	9.6	LOS A	0.4	2.6	0.42	0.90	0.42	48.1
12	R2	522	1.6	522	1.6	0.926	30.2	LOS C	5.6	40.1	0.86	1.84	3.47	31.5
Approach		743	2.0	743	2.0	0.926	24.1	LOS B	5.6	40.1	0.73	1.56	2.56	36.1
All Vehicles		1396	8.2	1396	8.2	0.926	14.1	NA	5.6	40.1	0.42	0.96	1.39	42.7

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

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

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

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

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

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

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

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Organisation: ASON GROUP PTY LTD | Processed: Tuesday, 21 January 2020 11:24:04 AM

Project: C:\Users\RebeccaBMadden\AG\Ason Group\Ason Group Team Site - 1223\Projects\Modelling\2020 Modelling\Network\AG1223m08_Network 2019 Scenarios.sip8

MOVEMENT SUMMARY

 **Site: 101 [2019 PM Existing - Cowpasture Road x Trivet Street]**

 **Network: N101 [2019 PM Existing]**

Int 6_Cowpasture Rd_Trivet St
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		veh	Distance m			km/h
South: Cowpasture Rd													
1	L2	336	1.3	335	1.3	0.201	5.6	LOS A	0.0	0.0	0.00	0.50	52.6
2	T1	55	23.1	54	23.0	0.201	0.0	LOS A	0.0	0.0	0.00	0.50	51.5
Approach		391	4.3	389 ^{N1}	4.3	0.201	4.8	NA	0.0	0.0	0.00	0.50	52.5
North: Cowpasture Rd													
8	T1	311	6.8	311	6.8	0.262	1.0	LOS A	0.5	3.6	0.35	0.20	47.9
9	R2	131	1.6	131	1.6	0.262	7.5	LOS A	0.5	3.6	0.35	0.20	54.4
Approach		441	5.3	441	5.3	0.262	2.9	NA	0.5	3.6	0.35	0.20	51.5
West: Trivet St													
10	L2	34	0.0	34	0.0	0.025	8.2	LOS A	0.0	0.3	0.15	0.90	48.9
12	R2	191	2.8	191	2.8	0.365	14.9	LOS B	0.6	4.5	0.65	1.06	42.0
Approach		224	2.3	224	2.3	0.365	13.9	LOS A	0.6	4.5	0.58	1.03	43.2
All Vehicles		1056	4.3	1054 ^{N1}	4.3	0.365	5.9	NA	0.6	4.5	0.27	0.49	49.9

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

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

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

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

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

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

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

^{N1} Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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Organisation: ASON GROUP PTY LTD | Processed: Thursday, 20 February 2020 5:29:51 PM

Project: C:\Users\RebeccaBMadden\AG\Ason Group\Ason Group Team Site - 1223\Projects\Modelling\2020 Modelling\Network\AG1223m08_Network 2019 Scenarios.sip8

MOVEMENT SUMMARY



Site: m01 [2026 AM Baseline - The Horsley Drive x Cowpasture Road]



Network: N101 [2026 AM Existing Do Nothing]

The Horsley Drive x Cowpasture Road

Site Category: (None)

Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m			km/h
South: Cowpasture Road													
1	L2	14	0.0	14	0.0	0.007	3.3	LOS A	0.0	0.1	0.07	0.07	53.3
2	T1	1445	5.9	1445	5.9	1.100	101.8	LOS F	40.5	297.6	1.00	4.36	14.8
3	R2	1029	3.9	1029	3.9	1.100	112.1	LOS F	30.8	223.1	1.00	3.85	22.8
3u	U	1	0.0	1	0.0	1.100	114.5	LOS F	30.8	223.1	1.00	3.85	22.9
Approach		2489	5.0	2489	5.0	1.100	105.5	LOS F	40.5	297.6	0.99	4.13	18.6
East: The Horsley Drive (East)													
4	L2	224	11.7	224	11.7	0.418	4.9	LOS A	1.4	11.1	0.71	0.71	54.3
5	T1	9	0.0	9	0.0	0.418	5.3	LOS A	1.4	11.1	0.71	0.71	45.3
6	R2	695	10.5	695	10.5	0.418	11.7	LOS A	1.4	11.1	0.72	0.72	44.8
6u	U	20	5.3	20	5.3	0.418	14.4	LOS A	1.3	10.0	0.73	0.73	53.8
Approach		948	10.5	948	10.5	0.418	10.1	LOS A	1.4	11.1	0.72	0.72	48.1
North: The Horsley Drive (North)													
7	L2	967	9.4	715	10.7	1.141	161.2	LOS F	20.9	159.9	1.00	3.41	12.3
8	T1	479	14.9	357	16.9	0.867	34.5	LOS C	4.6	36.5	0.96	1.31	35.9
9	R2	9	0.0	7	0.0	0.867	40.7	LOS C	4.6	36.5	0.96	1.31	19.2
9u	U	5	20.0	4	22.4	0.867	44.6	LOS D	4.6	36.5	0.96	1.31	16.4
Approach		1461	11.2	1083 ^{N1}	12.7	1.141	118.2	LOS F	20.9	159.9	0.98	2.70	15.9
West: Lizard Log Access Road													
10	L2	5	20.0	5	20.0	0.064	31.2	LOS C	0.1	0.7	0.97	0.97	10.5
11	T1	7	0.0	7	0.0	0.135	26.8	LOS B	0.2	1.6	0.97	0.97	35.1
12	R2	5	0.0	5	0.0	0.135	31.6	LOS C	0.2	1.6	0.97	0.97	35.6
12u	U	2	0.0	2	0.0	0.135	38.8	LOS C	0.2	1.6	0.97	0.97	14.2
Approach		20	5.3	20	5.3	0.135	30.5	LOS C	0.2	1.6	0.97	0.97	28.4
All Vehicles		4919	7.9	4541 ^{N1}	8.6	1.141	88.3	LOS F	40.5	297.6	0.94	3.06	20.3

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

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

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

^{N1} Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

MOVEMENT SUMMARY



Site: m01 [2026 PM Baseline - The Horsley Drive x Cowpasture Road]



Network: N101 [2026 PM Existing Do Nothing]

The Horsley Drive x Cowpasture Road
Site Category: (None)
Roundabout

Movement Performance - Vehicles													
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		veh	Distance m			km/h
South: Cowpasture Road													
1	L2	13	0.0	13	0.0	0.007	3.3	LOS A	0.0	0.1	0.07	0.07	53.3
2	T1	776	9.4	776	9.4	0.417	4.1	LOS A	1.1	8.3	0.50	0.50	49.3
3	R2	345	8.2	345	8.2	0.417	10.6	LOS A	1.0	7.7	0.53	0.53	54.9
3u	U	1	0.0	1	0.0	0.417	13.0	LOS A	1.0	7.7	0.53	0.53	56.4
Approach		1135	8.9	1135	8.9	0.417	6.0	LOS A	1.1	8.3	0.51	0.51	51.7
East: The Horsley Drive (East)													
4	L2	445	3.1	445	3.1	2.515	1416.9	LOS F	115.5	831.7	1.00	5.39	2.5
5	T1	9	0.0	9	0.0	2.515	1417.3	LOS F	115.5	831.7	1.00	5.39	1.6
6	R2	643	4.1	643	4.1	2.515	1424.6	LOS F	115.5	831.7	1.00	4.67	1.4
6u	U	8	0.0	8	0.0	2.515	1427.7	LOS F	75.3	544.9	1.00	4.29	2.6
Approach		1106	3.6	1106	3.6	2.515	1421.5	LOS F	115.5	831.7	1.00	4.96	1.9
North: The Horsley Drive (North)													
7	L2	744	4.4	674	4.4	0.630	6.7	LOS A	2.2	16.2	0.56	0.62	55.8
8	T1	1531	4.1	1387	4.1	0.994	23.3	LOS B	16.2	117.1	0.98	1.37	42.8
9	R2	11	10.0	10	10.1	0.994	30.7	LOS C	16.2	117.1	0.98	1.37	23.5
9u	U	16	6.7	14	6.7	0.994	33.1	LOS C	16.2	117.1	0.98	1.37	21.4
Approach		2301	4.2	2085 ^{N1}	4.3	0.994	18.0	LOS B	16.2	117.1	0.84	1.14	46.0
West: Lizard Log Access Road													
10	L2	5	20.0	5	20.0	0.010	5.1	LOS A	0.0	0.1	0.67	0.67	27.5
11	T1	7	0.0	7	0.0	0.021	2.5	LOS A	0.0	0.3	0.67	0.67	52.4
12	R2	9	0.0	9	0.0	0.021	7.3	LOS A	0.0	0.3	0.67	0.67	53.4
12u	U	1	0.0	1	0.0	0.021	14.5	LOS A	0.0	0.3	0.67	0.67	21.0
Approach		23	4.5	23	4.5	0.021	5.6	LOS A	0.0	0.3	0.67	0.58	48.8
All Vehicles		4565	5.2	4349 ^{N1}	5.5	2.515	371.9	LOS F	115.5	831.7	0.79	1.94	6.2

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

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

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

^{N1} Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

MOVEMENT SUMMARY

 Site: [2026 AM Baseline - Cowpasture Road x The Horsley Drive]  Network: N101 [2026 AM Existing Do Nothing]

Horsley Drive x Cowpasture Rd

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 122 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed	
		Total	HV	Total	HV									
		veh/h	%	veh/h	%	v/c	sec		veh	m			km/h	
South: The Horsley Drive (south)														
2	T1	1320	7.5	1240	7.6	0.456	8.2	LOS A	9.7	72.6	0.47	0.43	0.47	52.2
3	R2	882	7.4	829	7.5	0.838	36.0	LOS C	9.9	74.1	1.00	0.92	1.13	22.7
Approach		2202	7.5	2068 ^{N1}	7.6	0.838	19.4	LOS B	9.9	74.1	0.68	0.62	0.74	40.7
East: Cowpasture Road														
4	L2	200	33.7	200	33.7	0.479	20.1	LOS B	4.4	39.3	0.66	0.73	0.66	22.6
6	R2	333	66.5	333	66.5	0.656	55.9	LOS D	5.8	64.2	0.98	0.84	1.01	28.5
Approach		533	54.2	533	54.2	0.656	42.4	LOS C	5.8	64.2	0.86	0.80	0.88	27.6
North: The Horsley Drive (north)														
7	L2	946	27.5	946	27.5	0.547	16.3	LOS B	7.1	61.7	0.68	0.77	0.68	44.7
8	T1	1248	6.8	1248	6.8	1.483	492.0	LOS F	104.3	773.0	1.00	2.81	3.59	5.0
Approach		2195	15.7	2195	15.7	1.483	286.9	LOS F	104.3	773.0	0.86	1.93	2.34	8.8
All Vehicles		4929	16.2	4796 ^{N1}	16.6	1.483	144.4	LOS F	104.3	773.0	0.78	1.24	1.48	14.2

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

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

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

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

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

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

^{N1} Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue Pedestrian	Distance m	Prop. Queued	Effective Stop Rate
		ped/h	sec		ped			
P1	South Full Crossing	26	55.2	LOS E	0.1	0.1	0.95	0.95
P2	East Full Crossing	26	33.2	LOS D	0.1	0.1	0.74	0.74
P3S	North Slip/Bypass Lane Crossing	26	19.9	LOS B	0.0	0.0	0.80	0.80
All Pedestrians		79	36.1	LOS D			0.83	0.83

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

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

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

MOVEMENT SUMMARY



Site: [2026 PM Baseline - Cowpasture Road x The Horsley Drive]



Network: N101 [2026 PM Existing Do Nothing]

Horsley Drive x Cowpasture Rd

Site Category: (None)

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

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV % veh/h	Total HV	%	v/c	sec		veh	Distance m			km/h
South: The Horsley Drive (south)													
2	T1	1335	5.8	980	6.6	0.376	10.6	LOS A	8.9	65.8	0.47	0.42	50.3
3	R2	126	20.8	95	23.4	0.288	70.7	LOS F	1.9	16.0	0.97	0.75	14.2
Approach		1461	7.1	1076 ^{N1}	8.1	0.376	15.9	LOS B	8.9	65.8	0.52	0.45	45.8
East: Cowpasture Road													
4	L2	573	5.3	573	5.3	0.797	46.8	LOS D	17.9	131.2	0.96	1.06	13.0
6	R2	1198	10.3	1198	10.3	1.246	294.6	LOS F	59.7	454.7	1.00	1.66	9.4
Approach		1771	8.7	1771	8.7	1.246	214.5	LOS F	59.7	454.7	0.99	1.47	9.7
North: The Horsley Drive (north)													
7	L2	242	59.1	242	59.1	0.110	8.9	LOS A	0.9	9.0	0.18	0.59	47.4
8	T1	1660	3.8	1660	3.8	1.153	207.2	LOS F	81.5	589.2	1.00	1.80	10.7
Approach		1902	10.8	1902	10.8	1.153	182.0	LOS F	81.5	589.2	0.90	1.65	12.1
All Vehicles		5134	9.0	4748 ^{N1}	9.8	1.246	156.5	LOS F	81.5	589.2	0.84	1.31	13.5

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

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

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

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

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

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

^{N1} Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue	Prop. Queued	Effective Stop Rate
		ped/h	sec		Pedestrian ped	Distance m	
P1	South Full Crossing	26	51.5	LOS E	0.1	0.1	0.86
P2	East Full Crossing	26	20.7	LOS C	0.1	0.1	0.54
P3S	North Slip/Bypass Lane Crossing	26	60.4	LOS F	0.1	0.1	0.93
All Pedestrians		79	44.2	LOS E			0.78

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

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

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

MOVEMENT SUMMARY



Site: 101 [2026 AM Existing - Ferrers Road x The Horsley Drive]

The Horsley Drive x Ferrers Road

Site Category: (None)

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

Movement Performance - Vehicles

Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: The Horsley Drive												
5	T1	1052	26.0	0.373	2.4	LOS A	7.7	65.8	0.24	0.22	0.24	57.7
6	R2	593	9.9	1.467	489.3	LOS F	124.9	949.0	1.00	1.85	3.23	6.4
Approach		1644	20.2	1.467	177.9	LOS F	124.9	949.0	0.51	0.80	1.31	14.9
North: Ferrers Road												
7	L2	551	9.8	0.798	35.0	LOS C	30.3	230.1	0.91	0.88	0.93	37.7
9	R2	39	29.7	0.297	73.3	LOS F	2.6	22.9	0.98	0.74	0.98	26.6
Approach		589	11.1	0.798	37.6	LOS C	30.3	230.1	0.91	0.87	0.93	36.7
West: The Horsley Drive												
10	L2	113	11.2	0.951	69.2	LOS E	68.0	546.0	1.00	1.10	1.23	28.7
11	T1	1521	18.1	0.951	63.5	LOS E	68.2	551.4	1.00	1.10	1.23	29.3
Approach		1634	17.6	0.951	63.9	LOS E	68.2	551.4	1.00	1.10	1.23	29.3
All Vehicles		3867	17.7	1.467	108.4	LOS F	124.9	949.0	0.78	0.94	1.22	21.2

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

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

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

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

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

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Back of Queue Distance m	Prop. Queued	Effective Stop Rate
P2	East Full Crossing	11	64.2	LOS F	0.0	0.0	0.96	0.96
P3	North Full Crossing	11	21.2	LOS C	0.0	0.0	0.55	0.55
All Pedestrians		21	42.7	LOS E			0.75	0.75

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

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

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

MOVEMENT SUMMARY



Site: 101 [2026 PM Existing - Ferrers Road x The Horsley Drive]

The Horsley Drive x Ferrers Road

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 139 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Deg. HV %	Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: The Horsley Drive												
5	T1	1903	8.1	0.854	13.0	LOS A	54.2	406.0	0.63	0.61	0.65	49.5
6	R2	647	8.9	1.010	87.2	LOS F	45.6	343.3	1.00	1.11	1.50	21.0
Approach		2551	8.3	1.010	31.8	LOS C	54.2	406.0	0.73	0.74	0.87	36.8
North: Ferrers Road												
7	L2	942	4.2	0.834	24.7	LOS B	35.3	256.4	0.84	0.94	1.00	42.3
9	R2	319	8.6	1.901	871.0	LOS F	85.8	644.6	1.00	2.16	4.23	3.8
Approach		1261	5.3	1.901	238.8	LOS F	85.8	644.6	0.88	1.25	1.82	11.9
West: The Horsley Drive												
10	L2	53	32.0	0.889	69.0	LOS E	33.4	273.5	1.00	1.02	1.19	28.6
11	T1	853	18.3	0.889	63.0	LOS E	34.0	274.9	1.00	1.03	1.19	29.5
Approach		905	19.1	0.889	63.3	LOS E	34.0	274.9	1.00	1.03	1.19	29.4
All Vehicles		4717	9.6	1.901	93.2	LOS F	85.8	644.6	0.82	0.93	1.18	22.9

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

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

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

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

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

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P2	East Full Crossing	11	61.8	LOS F	0.0	0.0	0.94	0.94
P3	North Full Crossing	11	38.9	LOS D	0.0	0.0	0.75	0.75
All Pedestrians		21	50.3	LOS E			0.85	0.85

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

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

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

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MOVEMENT SUMMARY

 Site: m01v [2026 AM Base - RMS Upgrade - The Horsley Drive x Cowpasture Road]

 Network: N101 [2026 AM Existing RMS Upgrades]

The Horsley Drive x Cowpasture Road

Site Category: (None)

Signals - Fixed Time Coordinated Cycle Time = 110 seconds (Network Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Cowpasture Road														
1	L2	14	0.0	14	0.0	1.014	98.5	LOS F	40.5	297.6	1.00	1.38	1.60	16.9
2	T1	1445	5.9	1445	5.9	1.014	94.2	LOS F	40.5	297.6	1.00	1.40	1.62	15.1
3	R2	1029	3.9	1029	3.9	0.916	62.7	LOS E	20.2	146.0	1.00	1.03	1.29	30.3
Approach		2488	5.0	2488	5.0	1.014	81.2	LOS F	40.5	297.6	1.00	1.24	1.48	21.3
East: The Horsley Drive (East)														
4	L2	224	11.7	224	11.7	0.136	23.6	LOS B	2.1	16.0	0.60	0.71	0.60	42.9
5	T1	9	0.0	9	0.0	0.043	50.7	LOS D	0.3	2.0	0.92	0.65	0.92	24.8
6	R2	715	10.3	715	10.3	0.928	71.3	LOS F	15.3	116.9	1.00	1.06	1.41	18.5
Approach		948	10.5	948	10.5	0.928	59.8	LOS E	15.3	116.9	0.91	0.98	1.21	23.6
North: The Horsley Drive (North)														
7	L2	967	9.4	967	9.4	0.627	14.3	LOS A	6.0	45.5	0.41	0.68	0.41	44.3
8	T1	484	15.0	484	15.0	0.904	64.0	LOS E	9.3	73.8	1.00	1.07	1.40	24.9
9	R2	9	0.0	9	0.0	0.090	63.5	LOS E	0.3	2.3	1.00	0.67	1.00	12.2
Approach		1461	11.2	1461	11.2	0.904	31.1	LOS C	9.3	73.8	0.61	0.81	0.74	35.0
West: Lizard Log Access Road														
10	L2	5	20.0	5	20.0	0.050	49.5	LOS D	0.3	2.6	0.91	0.65	0.91	7.7
11	T1	7	0.0	7	0.0	0.050	44.2	LOS D	0.3	2.6	0.91	0.65	0.91	27.3
12	R2	7	0.0	7	0.0	0.050	36.1	LOS C	0.2	1.4	0.91	0.64	0.91	30.2
Approach		20	5.3	20	5.3	0.050	42.6	LOS D	0.3	2.6	0.91	0.64	0.91	24.3
All Vehicles		4918	7.9	4918	7.9	1.014	62.0	LOS E	40.5	297.6	0.86	1.06	1.21	24.5

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

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

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

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

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

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue	Distance	Prop. Queued	Effective Stop Rate
		ped/h	sec		Pedestrian	ped		
P1	South Full Crossing	26	49.2	LOS E	0.1	0.1	0.95	0.95
P2	East Full Crossing	26	49.2	LOS E	0.1	0.1	0.95	0.95
P2S	East Slip/Bypass Lane Crossing	26	49.2	LOS E	0.1	0.1	0.95	0.95
P3	North Full Crossing	26	49.2	LOS E	0.1	0.1	0.95	0.95
P3S	North Slip/Bypass Lane Crossing	26	49.2	LOS E	0.1	0.1	0.95	0.95
P4	West Full Crossing	26	49.2	LOS E	0.1	0.1	0.95	0.95
All Pedestrians		158	49.2	LOS E			0.95	0.95

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY



Site: m01v [2026 PM Base - RMS Upgrade - The Horsley Drive x Cowpasture Road]



Network: N101 [2026 PM Existing RMS Upgrades]

The Horsley Drive x Cowpasture Road

Site Category: (None)

Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		veh	m				km/h
South: Cowpasture Road														
1	L2	13	0.0	13	0.0	0.589	38.8	LOS C	12.9	97.3	0.81	0.72	0.81	30.7
2	T1	776	9.4	776	9.4	0.589	33.5	LOS C	13.5	102.0	0.81	0.72	0.81	29.2
3	R2	346	8.2	346	8.2	1.099	185.3	LOS F	13.1	98.4	1.00	1.31	1.99	14.6
Approach		1135	8.9	1135	8.9	1.099	79.9	LOS F	13.5	102.0	0.87	0.90	1.17	20.0
East: The Horsley Drive (East)														
4	L2	445	3.1	445	3.1	0.507	59.4	LOS E	8.7	62.3	0.92	0.82	0.92	30.9
5	T1	9	0.0	9	0.0	0.044	67.7	LOS E	0.4	2.7	0.92	0.66	0.92	20.9
6	R2	653	4.0	653	4.0	1.061	159.2	LOS F	24.3	175.7	1.00	1.25	1.78	9.8
Approach		1107	3.6	1107	3.6	1.061	118.3	LOS F	24.3	175.7	0.97	1.07	1.43	16.0
North: The Horsley Drive (North)														
7	L2	744	4.4	744	4.4	0.290	13.3	LOS A	4.5	33.0	0.30	0.65	0.30	46.3
8	T1	1546	4.1	1546	4.1	0.898	48.9	LOS D	22.1	160.0	0.98	0.96	1.07	29.4
9	R2	11	10.0	11	10.0	0.068	79.6	LOS F	0.5	3.6	1.00	0.69	1.00	10.2
Approach		2301	4.2	2301	4.2	0.898	37.5	LOS C	22.1	160.0	0.76	0.86	0.82	33.2
West: Lizard Log Access Road														
10	L2	5	20.0	5	20.0	0.066	67.4	LOS E	0.5	3.8	0.92	0.66	0.92	5.9
11	T1	7	0.0	7	0.0	0.066	63.8	LOS E	0.5	3.8	0.92	0.66	0.92	22.1
12	R2	9	0.0	9	0.0	0.067	53.5	LOS D	0.3	2.3	0.82	0.63	0.82	24.4
Approach		22	4.8	22	4.8	0.067	60.2	LOS E	0.5	3.8	0.88	0.65	0.88	19.9
All Vehicles		4565	5.2	4565	5.2	1.099	67.8	LOS E	24.3	175.7	0.84	0.92	1.05	23.1

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

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

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

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

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

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue	Distance	Prop. Queued	Effective Stop Rate
		ped/h	sec		ped	m		
P1	South Full Crossing	26	69.2	LOS F	0.1	0.1	0.96	0.96
P2	East Full Crossing	26	69.2	LOS F	0.1	0.1	0.96	0.96
P2S	East Slip/Bypass Lane Crossing	26	69.2	LOS F	0.1	0.1	0.96	0.96
P3	North Full Crossing	26	69.2	LOS F	0.1	0.1	0.96	0.96
P3S	North Slip/Bypass Lane Crossing	26	69.2	LOS F	0.1	0.1	0.96	0.96
P4	West Full Crossing	26	69.2	LOS F	0.1	0.1	0.96	0.96

All Pedestrians	158	69.2 LOS F	0.96	0.96
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Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

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

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

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MOVEMENT SUMMARY



Site: [2026 AM Existing - RMS Upgrade - Cowpasture Road x The Horsley Drive]



Network: N101 [2026 AM Existing RMS Upgrades]

Horsley Drive x Cowpasture Rd

Site Category: (None)

Signals - Fixed Time Coordinated Cycle Time = 110 seconds (Network Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		veh	Distance m			km/h
South: The Horsley Drive (south)													
2	T1	1320	7.5	1320	7.5	0.501	6.4	LOS A	7.1	52.9	0.36	0.33	53.8
3	R2	882	7.4	882	7.4	0.780	45.6	LOS D	14.1	104.7	1.00	0.90	20.0
Approach		2202	7.5	2202	7.5	0.780	22.1	LOS B	14.1	104.7	0.62	0.55	39.2
East: Cowpasture Road													
4	L2	200	33.7	200	33.7	0.106	15.1	LOS B	1.4	12.7	0.46	0.63	26.3
6	R2	333	66.5	333	66.5	0.525	44.7	LOS D	4.9	53.6	0.92	0.80	31.5
Approach		533	54.2	533	54.2	0.525	33.6	LOS C	4.9	53.6	0.75	0.74	30.7
North: The Horsley Drive (north)													
7	L2	946	27.5	946	27.5	0.493	18.5	LOS B	8.5	73.2	0.59	0.75	43.5
8	T1	1248	6.8	1248	6.8	0.795	39.8	LOS C	13.4	99.1	0.97	1.06	32.2
Approach		2195	15.7	2195	15.7	0.795	30.6	LOS C	13.4	99.1	0.81	0.85	36.9
All Vehicles		4929	16.2	4929	16.2	0.795	27.1	LOS B	14.1	104.7	0.71	0.70	37.1

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

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

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

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

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

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue	Prop. Queued	Effective Stop Rate
		ped/h	sec		ped	Distance m	
P1	South Full Crossing	26	49.2	LOS E	0.1	0.1	0.95
P2	East Full Crossing	26	32.9	LOS D	0.1	0.1	0.77
P2S	East Slip/Bypass Lane Crossing	26	28.4	LOS C	0.1	0.1	0.72
P3S	North Slip/Bypass Lane Crossing	26	29.1	LOS C	0.1	0.1	0.73
All Pedestrians		105	34.9	LOS D			0.79

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

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

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

MOVEMENT SUMMARY



Site: [2026 PM Existing - RMS Upgrade - Cowpasture Road x The Horsley Drive]



Network: N101 [2026 PM Existing RMS Upgrades]

Horsley Drive x Cowpasture Rd

Site Category: (None)

Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV % veh/h	Total HV %		v/c	sec		veh	Distance m			km/h
South: The Horsley Drive (south)													
2	T1	1335	5.8	1287	5.8	0.532	16.3	LOS B	15.2	112.0	0.57	0.52	46.4
3	R2	126	20.8	122	21.1	0.548	82.7	LOS F	2.8	22.8	1.00	0.76	12.9
Approach		1461	7.1	1409 ^{N1}	7.2	0.548	22.0	LOS B	15.2	112.0	0.61	0.54	42.2
East: Cowpasture Road													
4	L2	573	5.3	573	5.3	0.478	38.2	LOS C	12.2	89.5	0.78	0.79	15.1
6	R2	1198	10.3	1198	10.3	1.035	131.3	LOS F	41.2	313.7	1.00	1.21	17.8
Approach		1771	8.7	1771	8.7	1.035	101.2	LOS F	41.2	313.7	0.93	1.07	17.5
North: The Horsley Drive (north)													
7	L2	242	59.1	242	59.1	0.105	8.2	LOS A	0.7	7.4	0.14	0.58	47.9
8	T1	1660	3.8	1660	3.8	1.036	127.7	LOS F	56.6	409.1	1.00	1.40	15.8
Approach		1902	10.8	1902	10.8	1.036	112.5	LOS F	56.6	409.1	0.89	1.29	17.6
All Vehicles		5134	9.0	5082 ^{N1}	9.1	1.036	83.5	LOS F	56.6	409.1	0.83	1.01	21.4

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

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

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

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

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

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

^{N1} Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue	Prop. Queued	Effective Stop Rate
		ped/h	sec		Pedestrian ped	Distance m	
P1	South Full Crossing	26	49.7	LOS E	0.1	0.1	0.81
P2	East Full Crossing	26	23.0	LOS C	0.1	0.1	0.55
P2S	East Slip/Bypass Lane Crossing	26	19.8	LOS B	0.1	0.1	0.51
P3S	North Slip/Bypass Lane Crossing	26	69.2	LOS F	0.1	0.1	0.96
All Pedestrians		105	40.4	LOS E			0.71

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

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

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

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MOVEMENT SUMMARY



Site: 101 [2026 AM Base - RMS Upgrade - Ferrers Road x The Horsley Drive]

The Horsley Drive x Ferrers Road

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: The Horsley Drive												
5	T1	1052	26.0	0.432	5.6	LOS A	10.0	85.4	0.43	0.38	0.43	54.9
6	R2	593	9.9	0.712	45.0	LOS D	13.8	104.9	0.97	0.86	1.02	34.2
Approach		1644	20.2	0.712	19.8	LOS B	13.8	104.9	0.62	0.56	0.64	45.1
North: Ferrers Road												
7	L2	551	9.8	0.392	25.0	LOS B	9.9	75.3	0.70	0.76	0.70	42.0
9	R2	39	29.7	0.169	47.1	LOS D	1.7	15.0	0.91	0.73	0.91	33.2
Approach		589	11.1	0.392	26.5	LOS B	9.9	75.3	0.71	0.76	0.71	41.3
West: The Horsley Drive												
10	L2	113	11.2	0.152	24.3	LOS B	3.3	25.5	0.64	0.72	0.64	42.4
11	T1	1521	18.1	0.729	24.8	LOS B	22.2	179.6	0.87	0.77	0.87	42.7
Approach		1634	17.6	0.729	24.8	LOS B	22.2	179.6	0.85	0.77	0.85	42.7
All Vehicles		3867	17.7	0.729	23.0	LOS B	22.2	179.6	0.73	0.68	0.74	43.4

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

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

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

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

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

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

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Back of Queue Distance m	Prop. Queued	Effective Stop Rate
P21	East Stage 1	11	44.2	LOS E	0.0	0.0	0.94	0.94
P22	East Stage 2	11	44.2	LOS E	0.0	0.0	0.94	0.94
P3	North Full Crossing	11	20.5	LOS C	0.0	0.0	0.64	0.64
P3S	North Slip/Bypass Lane Crossing	11	18.6	LOS B	0.0	0.0	0.61	0.61
P41	West Stage 1	11	42.3	LOS E	0.0	0.0	0.92	0.92
P42	West Stage 2	11	39.6	LOS D	0.0	0.0	0.89	0.89
All Pedestrians		63	34.9	LOS D			0.82	0.82

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

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

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

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MOVEMENT SUMMARY



Site: 101 [2026 PM Base - RMS Upgrade - Ferrers Road x The Horsley Drive]

The Horsley Drive x Ferrers Road

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 105 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: The Horsley Drive												
5	T1	1903	8.1	0.818	14.1	LOS A	37.4	279.8	0.77	0.72	0.78	48.8
6	R2	647	8.9	0.608	39.5	LOS C	14.3	107.6	0.91	0.83	0.91	36.1
Approach		2551	8.3	0.818	20.6	LOS B	37.4	279.8	0.81	0.75	0.81	44.8
North: Ferrers Road												
7	L2	942	4.2	0.492	18.4	LOS B	15.3	111.0	0.60	0.75	0.60	45.6
9	R2	319	8.6	0.797	51.6	LOS D	16.8	126.0	1.00	0.91	1.13	32.2
Approach		1261	5.3	0.797	26.8	LOS B	16.8	126.0	0.70	0.79	0.73	41.2
West: The Horsley Drive												
10	L2	53	32.0	0.118	35.1	LOS C	2.0	17.6	0.76	0.72	0.76	37.4
11	T1	853	18.3	0.596	33.9	LOS C	13.6	109.9	0.90	0.77	0.90	38.6
Approach		905	19.1	0.596	34.0	LOS C	13.6	109.9	0.89	0.76	0.89	38.5
All Vehicles		4717	9.6	0.818	24.8	LOS B	37.4	279.8	0.79	0.76	0.81	42.5

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

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

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

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

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

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P21	East Stage 1	11	38.6	LOS D	0.0	0.0	0.86	0.86
P22	East Stage 2	11	38.6	LOS D	0.0	0.0	0.86	0.86
P3	North Full Crossing	11	31.3	LOS D	0.0	0.0	0.77	0.77
P3S	North Slip/Bypass Lane Crossing	11	29.0	LOS C	0.0	0.0	0.74	0.74
P41	West Stage 1	11	36.9	LOS D	0.0	0.0	0.84	0.84
P42	West Stage 2	11	34.4	LOS D	0.0	0.0	0.81	0.81
All Pedestrians		63	34.8	LOS D			0.81	0.81

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

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

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

MOVEMENT SUMMARY



Site: m01 [2019 AM Existing + Dev - The Horsley Drive
x Cowpasture Road]



Network: N101 [2019 AM
Existing + Dev]

The Horsley Drive x Cowpasture Road

Site Category: (None)

Roundabout

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV									
		veh/h	% veh/h		%	v/c	sec		veh	m				km/h
South: Cowpasture Road														
1	L2	4	25.0	4	25.0	0.003	3.5	LOS A	0.0	0.0	0.03	0.39	0.03	53.5
2	T1	1333	6.0	1333	6.0	0.905	10.5	LOS A	6.2	45.5	0.91	1.13	1.48	45.3
3	R2	843	3.9	843	3.9	0.905	19.7	LOS B	5.8	42.2	0.98	1.29	1.72	49.5
3u	U	1	0.0	1	0.0	0.905	22.1	LOS B	5.8	42.2	0.98	1.29	1.72	49.9
Approach		2181	5.2	2181	5.2	0.905	14.1	LOS A	6.2	45.5	0.93	1.19	1.57	47.5
East: The Horsley Drive (East)														
4	L2	194	12.0	194	12.0	0.351	4.9	LOS A	1.2	9.0	0.69	0.67	0.69	54.4
5	T1	1	0.0	1	0.0	0.351	5.3	LOS A	1.2	9.0	0.69	0.67	0.69	45.4
6	R2	579	10.7	579	10.7	0.351	11.7	LOS A	1.2	9.0	0.70	0.71	0.70	44.9
6u	U	17	6.3	17	6.3	0.351	14.4	LOS A	1.1	8.1	0.70	0.74	0.70	53.9
Approach		791	10.9	791	10.9	0.351	10.1	LOS A	1.2	9.0	0.70	0.70	0.70	48.3
North: The Horsley Drive (North)														
7	L2	800	9.5	765	9.6	1.018	66.3	LOS E	16.3	123.6	1.00	2.16	3.72	23.6
8	T1	399	14.8	382	15.0	0.748	18.1	LOS B	3.2	24.9	0.90	1.09	1.32	46.6
9	R2	1	0.0	1	0.0	0.748	24.5	LOS B	3.2	24.9	0.90	1.09	1.32	26.5
9u	U	4	25.0	4	25.4	0.748	28.4	LOS B	3.2	24.9	0.90	1.09	1.32	25.0
Approach		1204	11.3	1152 ^{N1}	11.5	1.018	50.1	LOS D	16.3	123.6	0.97	1.80	2.91	28.4
West: Lizard Log Access Road														
10	L2	5	20.0	5	20.0	0.054	29.8	LOS C	0.1	0.7	0.95	0.95	0.95	10.8
11	T1	3	0.0	3	0.0	0.028	16.9	LOS B	0.1	0.5	0.97	0.88	0.97	40.9
12	R2	1	0.0	1	0.0	0.028	21.7	LOS B	0.1	0.5	0.97	0.88	0.97	41.5
12u	U	2	0.0	2	0.0	0.028	28.9	LOS C	0.1	0.5	0.97	0.88	0.97	16.7
Approach		12	9.1	12	9.1	0.054	25.4	LOS B	0.1	0.7	0.96	0.92	0.96	24.9
All Vehicles		4187	8.0	4135 ^{N1}	8.1	1.018	23.4	LOS B	16.3	123.6	0.90	1.27	1.77	40.4

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

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

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

^{N1} Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

MOVEMENT SUMMARY



Site: m01 [2019 PM Existing + Dev - The Horsley Drive x Cowpasture Road]



Network: N101 [2019 PM Existing + Dev]

The Horsley Drive x Cowpasture Road

Site Category: (None)

Roundabout

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Back of Queue Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV									
South: Cowpasture Road														
1	L2	3	0.0	3	0.0	0.002	3.3	LOS A	0.0	0.0	0.03	0.39	0.03	53.6
2	T1	678	9.5	678	9.5	0.413	4.4	LOS A	1.1	8.1	0.60	0.47	0.60	48.6
3	R2	322	8.2	322	8.2	0.413	11.1	LOS A	1.0	7.3	0.62	0.71	0.62	54.3
3u	U	1	0.0	1	0.0	0.413	13.4	LOS A	1.0	7.3	0.62	0.71	0.62	55.8
Approach		1004	9.0	1004	9.0	0.413	6.5	LOS A	1.1	8.1	0.61	0.55	0.61	51.2
East: The Horsley Drive (East)														
4	L2	377	3.1	377	3.1	1.385	448.2	LOS F	57.3	412.9	1.00	4.02	7.54	7.3
5	T1	1	0.0	1	0.0	1.385	448.6	LOS F	57.3	412.9	1.00	4.02	7.54	4.7
6	R2	600	4.2	600	4.2	1.385	454.5	LOS F	57.3	412.9	1.00	3.66	7.05	4.2
6u	U	7	0.0	7	0.0	1.385	456.7	LOS F	38.9	281.8	1.00	3.46	6.78	7.5
Approach		985	3.7	985	3.7	1.385	452.1	LOS F	57.3	412.9	1.00	3.80	7.24	5.4
North: The Horsley Drive (North)														
7	L2	637	4.5	637	4.5	0.585	5.9	LOS A	1.9	13.8	0.51	0.61	0.54	56.8
8	T1	1274	4.1	1273	4.1	0.898	8.8	LOS A	7.4	53.9	0.78	0.79	1.03	56.4
9	R2	1	100.0	1	100.0	0.898	19.2	LOS B	7.4	53.9	0.78	0.79	1.03	33.1
9u	U	14	7.7	14	7.7	0.898	18.6	LOS B	7.4	53.9	0.78	0.79	1.03	35.7
Approach		1925	4.3	1925	4.3	0.898	7.9	LOS A	7.4	53.9	0.69	0.73	0.87	56.4
West: Lizard Log Access Road														
10	L2	5	20.0	5	20.0	0.010	5.1	LOS A	0.0	0.1	0.68	0.60	0.68	27.5
11	T1	3	0.0	3	0.0	0.011	2.5	LOS A	0.0	0.1	0.67	0.58	0.67	51.9
12	R2	5	0.0	5	0.0	0.011	7.3	LOS A	0.0	0.1	0.67	0.58	0.67	52.9
12u	U	1	0.0	1	0.0	0.011	14.5	LOS A	0.0	0.1	0.67	0.58	0.67	21.0
Approach		15	7.1	15	7.1	0.011	6.0	LOS A	0.0	0.1	0.67	0.59	0.67	45.5
All Vehicles		3929	5.4	3929	5.4	1.385	118.9	LOS F	57.3	412.9	0.75	1.45	2.40	16.1

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

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

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

MOVEMENT SUMMARY



Site: [2019 AM Existing + Dev - Cowpasture Road x The Horsley Drive]



Network: N101 [2019 AM Existing + Dev]

Horsley Drive x Cowpasture Rd

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 122 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		veh	m				km/h
South: The Horsley Drive (south)														
2	T1	1100	7.6	1100	7.6	0.404	7.8	LOS A	8.2	61.0	0.45	0.40	0.45	52.6
3	R2	783	7.7	783	7.7	0.793	32.6	LOS C	8.7	65.1	0.99	0.89	1.06	15.0
Approach		1883	7.6	1883	7.6	0.793	18.1	LOS B	8.7	65.1	0.67	0.60	0.70	40.2
East: Cowpasture Road														
4	L2	200	31.6	200	31.6	0.339	18.0	LOS B	3.8	33.5	0.59	0.70	0.59	24.0
6	R2	321	61.0	321	61.0	0.616	54.7	LOS D	5.5	58.9	0.97	0.82	0.97	28.8
Approach		521	49.7	521	49.7	0.616	40.6	LOS C	5.5	58.9	0.82	0.77	0.82	28.1
North: The Horsley Drive (north)														
7	L2	811	26.4	811	26.4	0.465	15.7	LOS B	5.7	49.1	0.64	0.75	0.64	45.1
8	T1	1007	6.9	1007	6.9	1.057	134.8	LOS F	38.2	283.6	1.00	1.54	1.85	15.0
Approach		1818	15.6	1818	15.6	1.057	81.7	LOS F	38.2	283.6	0.84	1.19	1.31	21.4
All Vehicles		4222	16.2	4222	16.2	1.057	48.3	LOS D	38.2	283.6	0.76	0.88	0.98	27.3

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

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

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

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

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

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue	Distance	Prop. Queued	Effective Stop Rate
		ped/h	sec		ped	m		
P1	South Full Crossing	26	55.2	LOS E	0.1	0.1	0.95	0.95
P2	East Full Crossing	26	33.2	LOS D	0.1	0.1	0.74	0.74
P3S	North Slip/Bypass Lane Crossing	26	19.9	LOS B	0.0	0.0	0.80	0.80
All Pedestrians		79	36.1	LOS D			0.83	0.83

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

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

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

MOVEMENT SUMMARY



Site: [2019 PM Existing + Dev - Cowpasture Road x The Horsley Drive]



Network: N101 [2019 PM Existing + Dev]

Horsley Drive x Cowpasture Rd

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 145 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Queue	Back of Queue Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV % veh/h	Total HV %		v/c	sec		veh	m				km/h
South: The Horsley Drive (south)														
2	T1	1159	5.8	1004	6.2	0.440	17.6	LOS B	12.0	88.4	0.60	0.54	0.60	45.5
3	R2	141	17.9	123	18.9	0.376	74.1	LOS F	2.6	21.0	0.98	0.76	0.98	7.7
Approach		1300	7.1	1127 ^{N1}	7.6	0.440	23.8	LOS B	12.0	88.4	0.64	0.56	0.64	40.8
East: Cowpasture Road														
4	L2	594	5.0	593	5.0	0.700	37.2	LOS C	16.9	123.0	0.87	0.98	1.13	15.4
6	R2	1056	11.3	1055	11.3	0.906	69.5	LOS E	25.5	195.7	1.00	0.99	1.19	26.3
Approach		1649	9.0	1649	9.0	0.906	57.8	LOS E	25.5	195.7	0.95	0.99	1.17	24.3
North: The Horsley Drive (north)														
7	L2	228	51.6	228	51.6	0.103	9.4	LOS A	0.9	9.5	0.21	0.60	0.21	50.8
8	T1	1352	3.8	1352	3.8	0.988	90.1	LOS F	42.2	305.4	1.00	1.22	1.39	20.2
Approach		1580	10.7	1580	10.7	0.988	78.4	LOS F	42.2	305.4	0.89	1.13	1.22	22.1
All Vehicles		4529	9.1	4356 ^{N1}	9.4	0.988	56.5	LOS D	42.2	305.4	0.85	0.93	1.05	26.4

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

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

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

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

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

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

^{N1} Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue	Prop. Queued	Effective Stop Rate
		ped/h	sec		Pedestrian ped	Distance m	
P1	South Full Crossing	26	45.7	LOS E	0.1	0.1	0.79
P2	East Full Crossing	26	29.2	LOS C	0.1	0.1	0.64
P3S	North Slip/Bypass Lane Crossing	26	62.9	LOS F	0.1	0.1	0.93
All Pedestrians		79	45.9	LOS E			0.79

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

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

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

MOVEMENT SUMMARY



Site: [2019 AM Existing + Dev - Cowpasture Road x Newton Road]



Network: N101 [2019 AM Existing + Dev]

Cowpasture Road x Newton Road

Site Category: (None)

Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Queue Vehicles	Back of Queue Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV %	Total	HV %									
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Cowpasture Road														
2	T1	1012	15.9	1012	15.9	0.533	4.5	LOS A	2.2	17.5	0.17	0.41	0.17	43.2
3	R2	574	17.6	574	17.6	0.533	9.3	LOS A	2.1	17.2	0.19	0.57	0.19	50.3
3u	U	25	37.5	25	37.5	0.533	11.7	LOS A	2.1	17.2	0.19	0.57	0.19	38.2
Approach		1611	16.9	1610	16.9	0.533	6.3	LOS A	2.2	17.5	0.18	0.47	0.18	47.4
East: Newton Road														
4	L2	256	54.3	256	54.3	0.372	6.5	LOS A	0.7	7.0	0.51	0.70	0.51	49.3
6	R2	17	31.3	17	31.3	0.372	10.8	LOS A	0.7	7.0	0.51	0.70	0.51	49.3
6u	U	6	33.3	6	33.3	0.372	13.0	LOS A	0.7	7.0	0.51	0.70	0.51	54.5
Approach		279	52.5	279	52.5	0.372	6.9	LOS A	0.7	7.0	0.51	0.70	0.51	49.5
North: Cowpasture Road														
7	L2	53	22.0	53	22.0	0.213	9.8	LOS A	0.7	6.5	0.77	0.66	0.77	46.3
8	T1	251	39.9	251	39.9	0.213	10.7	LOS A	0.7	6.5	0.77	0.68	0.77	29.1
9u	U	1	0.0	1	0.0	0.213	16.4	LOS B	0.7	6.3	0.76	0.68	0.76	29.0
Approach		304	36.7	304	36.7	0.213	10.6	LOS A	0.7	6.5	0.77	0.67	0.77	35.1
All Vehicles		2194	24.1	2194	24.1	0.533	7.0	LOS A	2.2	17.5	0.30	0.53	0.30	46.4

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

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

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

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Modelling\Network\AG1223m08_Network 2019 Scenarios.sip8

MOVEMENT SUMMARY



Site: [2019 PM Existing + Dev - Cowpasture Road x Newton Road]



Network: N101 [2019 PM Existing + Dev]

Cowpasture Road x Newton Road

Site Category: (None)

Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	% veh/h	%	v/c				sec	veh				
South: Cowpasture Road														
2	T1	235	41.3	224	42.7	0.132	4.6	LOS A	0.3	3.1	0.08	0.41	0.08	44.4
3	R2	123	35.0	117	36.4	0.132	9.3	LOS A	0.3	2.7	0.08	0.58	0.08	49.6
3u	U	15	14.3	14	15.0	0.132	11.2	LOS A	0.3	2.7	0.08	0.58	0.08	38.6
Approach		373	38.1	355 ^{N1}	39.5	0.132	6.4	LOS A	0.3	3.1	0.08	0.47	0.08	47.2
East: Newton Road														
4	L2	197	24.6	197	24.6	0.687	13.1	LOS A	0.8	6.8	0.72	0.99	1.12	42.2
6	R2	7	0.0	7	0.0	0.687	17.0	LOS B	0.8	6.8	0.72	0.99	1.12	42.2
6u	U	1	0.0	1	0.0	0.687	19.1	LOS B	0.8	6.8	0.72	0.99	1.12	50.9
Approach		205	23.6	205	23.6	0.687	13.3	LOS A	0.8	6.8	0.72	0.99	1.12	42.2
North: Cowpasture Road														
7	L2	7	57.1	7	57.1	0.972	17.3	LOS B	4.7	34.8	0.46	0.71	0.78	40.4
8	T1	1341	6.8	1341	6.8	0.972	17.8	LOS B	4.9	36.5	0.46	0.74	0.83	21.7
9u	U	1	100.0	1	100.0	0.972	27.8	LOS B	4.9	36.5	0.47	0.77	0.87	20.5
Approach		1349	7.2	1349	7.2	0.972	17.8	LOS B	4.9	36.5	0.46	0.74	0.83	21.9
All Vehicles		1927	14.9	1909 ^{N1}	15.1	0.972	15.2	LOS B	4.9	36.5	0.42	0.72	0.72	30.0

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

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

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

^{N1} Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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MOVEMENT SUMMARY



Site: [2019 AM Existing + Dev - Cowpasture Road x Burilda Close]



Network: N101 [2019 AM Existing + Dev]

Cowpasture Road x Burilda Close

Site Category: (None)

Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Back of Queue Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV %	Total	HV %									
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Cowpasture Road														
1	L2	60	21.1	60	21.1	0.361	4.7	LOS A	1.0	7.7	0.25	0.42	0.25	43.5
2	T1	973	16.0	973	16.0	0.361	4.7	LOS A	1.0	7.7	0.26	0.42	0.26	38.1
Approach		1033	16.3	1033	16.3	0.361	4.7	LOS A	1.0	7.7	0.26	0.42	0.26	38.7
North: Cowpasture Road														
8	T1	288	36.5	288	36.5	0.128	4.6	LOS A	0.3	2.9	0.14	0.42	0.14	47.9
9	R2	46	27.3	46	27.3	0.128	9.2	LOS A	0.3	2.8	0.14	0.49	0.14	47.4
9u	U	16	46.7	16	46.7	0.128	11.6	LOS A	0.3	2.8	0.14	0.49	0.14	46.0
Approach		351	35.7	351	35.7	0.128	5.5	LOS A	0.3	2.9	0.14	0.43	0.14	47.7
West: Stage 1 Access														
10	L2	21	50.0	21	50.0	0.068	6.3	LOS A	0.1	0.8	0.52	0.76	0.52	36.5
12	R2	18	64.7	18	64.7	0.068	11.2	LOS A	0.1	0.8	0.52	0.76	0.52	36.5
12u	U	1	0.0	1	0.0	0.068	12.9	LOS A	0.1	0.8	0.52	0.76	0.52	47.1
Approach		40	55.3	40	55.3	0.068	8.6	LOS A	0.1	0.8	0.52	0.76	0.52	36.9
All Vehicles		1423	22.2	1423	22.2	0.361	5.0	LOS A	1.0	7.7	0.24	0.43	0.24	41.9

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

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

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

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MOVEMENT SUMMARY



Site: [2019 PM Existing + Dev - Cowpasture Road x Burilda Close]



Network: N101 [2019 PM Existing + Dev]

Cowpasture Road x Burilda Close

Site Category: (None)

Roundabout

Movement Performance - Vehicles													
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		veh	Distance m			km/h
South: Cowpasture Road													
1	L2	12	63.6	11	64.9	0.088	4.9	LOS A	0.2	1.8	0.12	0.39	37.4
2	T1	232	39.1	221	40.4	0.088	4.6	LOS A	0.2	1.8	0.13	0.39	40.1
Approach		243	40.3	232 ^{N1}	41.6	0.088	4.6	LOS A	0.2	1.8	0.13	0.39	39.8
North: Cowpasture Road													
8	T1	1313	6.5	1312	6.5	0.442	4.7	LOS A	1.4	10.4	0.29	0.42	47.2
9	R2	12	36.4	12	36.3	0.442	9.9	LOS A	1.4	10.4	0.31	0.43	46.6
9u	U	13	8.3	13	8.3	0.442	11.5	LOS A	1.4	10.4	0.31	0.43	46.9
Approach		1337	6.8	1336 ^{N1}	6.8	0.442	4.8	LOS A	1.4	10.4	0.29	0.42	47.2
West: Stage 1 Access													
10	L2	42	2.5	42	2.5	0.098	3.5	LOS A	0.1	0.7	0.22	0.58	38.5
12	R2	64	11.5	64	11.5	0.098	8.0	LOS A	0.1	0.7	0.22	0.58	38.5
12u	U	1	0.0	1	0.0	0.098	11.4	LOS A	0.1	0.7	0.22	0.58	48.8
Approach		107	7.8	107	7.8	0.098	6.3	LOS A	0.1	0.7	0.22	0.58	38.7
All Vehicles		1687	11.7	1676 ^{N1}	11.7	0.442	4.8	LOS A	1.4	10.4	0.26	0.43	46.0

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

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

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

^{N1} Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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MOVEMENT SUMMARY



**Site: 101 [2019 AM Existing + Dev - Cowpasture Road
x Victoria Street]**



**Network: N101 [2019 AM
Existing + Dev]**

Cowpasture Road x Victoria Street

Site Category: (None)

Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV %	Total	HV %				Vehicles	Distance				
		veh/h		veh/h	%	v/c	sec		veh	m				km/h
NorthEast: Victoria Street														
25	T1	152	43.8	152	43.8	0.185	6.6	LOS A	0.5	4.5	0.55	0.57	0.55	48.8
26	R2	208	9.1	208	9.1	0.231	10.0	LOS A	0.7	5.2	0.52	0.65	0.52	44.7
26u	U	67	35.9	67	35.9	0.231	12.7	LOS A	0.7	5.2	0.52	0.65	0.52	50.9
Approach		427	25.6	427	25.6	0.231	9.2	LOS A	0.7	5.2	0.53	0.62	0.53	47.4
NorthWest: Cowpasture Road														
27	L2	487	4.3	487	4.3	0.937	24.4	LOS B	6.6	49.7	1.00	1.50	2.35	38.6
29	R2	178	21.3	178	21.3	0.937	30.2	LOS C	6.6	49.7	1.00	1.50	2.35	24.9
29u	U	2	50.0	2	50.0	0.937	34.1	LOS C	6.6	49.7	1.00	1.50	2.35	24.9
Approach		667	9.0	667	9.0	0.937	25.9	LOS B	6.6	49.7	1.00	1.50	2.35	36.2
SouthWest: Victoria Street														
30	L2	431	10.5	431	10.5	0.472	6.2	LOS A	1.6	12.2	0.66	0.64	0.66	44.8
31	T1	540	21.8	540	21.8	0.472	6.9	LOS A	1.6	12.2	0.68	0.67	0.68	51.9
32u	U	35	39.4	35	39.4	0.472	14.4	LOS A	1.5	12.4	0.69	0.68	0.69	43.2
Approach		1005	17.6	1005	17.6	0.472	6.8	LOS A	1.6	12.4	0.67	0.66	0.67	49.8
All Vehicles		2100	16.5	2100	16.5	0.937	13.4	LOS A	6.6	49.7	0.75	0.92	1.18	43.9

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

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

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

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MOVEMENT SUMMARY



Site: 101 [2019 PM Existing + Dev - Cowpasture Road
x Victoria Street]



Network: N101 [2019 PM
Existing + Dev]

Cowpasture Road x Victoria Street
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	% veh/h	veh/h	%	v/c	sec		veh	m				km/h
NorthEast: Victoria Street														
25	T1	818	8.6	818	8.6	0.626	8.7	LOS A	2.8	20.9	0.85	0.82	0.96	45.9
26	R2	372	2.5	372	2.5	0.626	14.2	LOS A	2.7	20.0	0.86	0.89	1.01	42.6
26u	U	72	19.1	72	19.1	0.626	17.0	LOS B	2.7	20.0	0.86	0.89	1.01	50.1
Approach		1261	7.4	1261	7.4	0.626	10.8	LOS A	2.8	20.9	0.86	0.85	0.98	45.3
NorthWest: Cowpasture Road														
27	L2	295	4.6	295	4.6	0.672	6.8	LOS A	2.3	16.9	0.66	0.78	0.73	49.4
29	R2	387	6.3	387	6.3	0.672	11.7	LOS A	2.3	16.9	0.66	0.78	0.73	40.0
29u	U	1	0.0	1	0.0	0.672	13.6	LOS A	2.3	16.9	0.66	0.78	0.73	40.0
Approach		683	5.5	683	5.5	0.672	9.6	LOS A	2.3	16.9	0.66	0.78	0.73	45.7
SouthWest: Victoria Street														
30	L2	134	14.2	129	14.5	0.186	6.6	LOS A	0.5	4.3	0.68	0.67	0.68	44.6
31	T1	165	41.4	160	42.1	0.186	8.0	LOS A	0.5	4.3	0.70	0.70	0.70	51.3
32u	U	11	50.0	10	50.7	0.186	15.5	LOS B	0.5	4.5	0.70	0.71	0.70	42.9
Approach		309	29.9	299 ^{N1}	30.6	0.186	7.7	LOS A	0.5	4.5	0.69	0.69	0.69	49.3
All Vehicles		2254	9.9	2243 ^{N1}	10.0	0.672	10.0	LOS A	2.8	20.9	0.77	0.81	0.86	46.0

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

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

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

^{N1} Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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MOVEMENT SUMMARY



Site: 101v [2019 AM Upgrade + Dev - Cowpasture Road x Trivet Street x Stage 2 Access]



Network: N101 [2019 AM Existing + Dev]

Int 6_Cowpasture Rd_Trivet St
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Back of Queue Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV %	Total	HV %									
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Cowpasture Rd														
1	L2	100	9.5	100	9.5	0.418	4.0	LOS A	1.2	9.0	0.23	0.50	0.23	48.2
2	T1	257	4.1	257	4.1	0.418	4.1	LOS A	1.2	9.0	0.23	0.50	0.23	54.0
3	R2	266	16.2	266	16.2	0.418	9.5	LOS A	1.2	9.0	0.23	0.50	0.23	49.2
3u	U	1	0.0	1	0.0	0.418	11.6	LOS A	1.2	9.0	0.23	0.50	0.23	44.3
Approach		624	10.1	624	10.1	0.418	6.4	LOS A	1.2	9.0	0.23	0.50	0.23	51.4
East: Cowpasture Road														
4	L2	99	0.0	99	0.0	0.146	6.7	LOS A	0.4	2.6	0.67	0.70	0.67	37.9
5	T1	1	0.0	1	0.0	0.146	6.9	LOS A	0.4	2.6	0.67	0.70	0.67	49.3
6	R2	31	0.0	31	0.0	0.146	12.2	LOS A	0.4	2.6	0.67	0.70	0.67	52.6
6u	U	1	0.0	1	0.0	0.146	14.5	LOS A	0.4	2.6	0.67	0.70	0.67	51.0
Approach		132	0.0	132	0.0	0.146	8.0	LOS A	0.4	2.6	0.67	0.70	0.67	44.1
North: Trivet Street														
7	L2	221	0.0	221	0.0	0.586	5.3	LOS A	1.4	10.2	0.50	0.57	0.52	51.7
8	T1	522	1.6	522	1.6	0.586	5.4	LOS A	1.4	10.2	0.50	0.57	0.52	49.6
9	R2	17	25.0	17	25.0	0.586	11.2	LOS A	1.4	10.2	0.50	0.57	0.52	50.8
9u	U	1	0.0	1	0.0	0.586	12.9	LOS A	1.4	10.2	0.50	0.57	0.52	57.0
Approach		761	1.7	761	1.7	0.586	5.5	LOS A	1.4	10.2	0.50	0.57	0.52	50.4
West: Stage 2 Access														
10	L2	11	0.0	11	0.0	0.069	5.7	LOS A	0.1	1.0	0.53	0.69	0.53	49.2
11	T1	1	0.0	1	0.0	0.069	5.9	LOS A	0.1	1.0	0.53	0.69	0.53	46.7
12	R2	56	9.4	56	9.4	0.069	11.3	LOS A	0.1	1.0	0.53	0.69	0.53	38.8
12u	U	1	0.0	1	0.0	0.069	13.4	LOS A	0.1	1.0	0.53	0.69	0.53	50.0
Approach		68	7.7	68	7.7	0.069	10.4	LOS A	0.1	1.0	0.53	0.69	0.53	41.9
All Vehicles		1585	5.1	1585	5.1	0.586	6.3	LOS A	1.4	10.2	0.41	0.56	0.42	50.2

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

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

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

MOVEMENT SUMMARY



Site: 101v [2019 PM Upgrade + Dev - Cowpasture Road x Trivet Street x Stage 2 Access]



Network: N101 [2019 PM Existing + Dev]

Int 6_Cowpasture Rd_Trivet St
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV % veh/h	Total HV %		v/c	sec		veh	Distance m			km/h
South: Cowpasture Rd													
1	L2	74	5.7	73	5.7	0.343	4.4	LOS A	0.9	6.4	0.37	0.48	49.3
2	T1	336	1.3	331	1.3	0.343	4.5	LOS A	0.9	6.4	0.37	0.48	54.6
3	R2	55	23.1	54	23.1	0.343	10.1	LOS A	0.9	6.4	0.37	0.48	48.8
3u	U	1	0.0	1	0.0	0.343	12.0	LOS A	0.9	6.4	0.37	0.48	45.0
Approach		465	4.5	459 ^{N1}	4.5	0.343	5.1	LOS A	0.9	6.4	0.37	0.48	53.4
East: Cowpasture Road													
4	L2	247	8.5	247	8.5	0.344	5.7	LOS A	0.9	6.4	0.55	0.66	38.5
5	T1	1	0.0	1	0.0	0.344	5.6	LOS A	0.9	6.4	0.55	0.66	49.5
6	R2	131	1.6	131	1.6	0.344	11.0	LOS A	0.9	6.4	0.55	0.66	52.7
6u	U	1	0.0	1	0.0	0.344	13.2	LOS A	0.9	6.4	0.55	0.66	51.3
Approach		380	6.1	380	6.1	0.344	7.5	LOS A	0.9	6.4	0.55	0.66	46.3
North: Trivet Street													
7	L2	34	0.0	34	0.0	0.177	4.1	LOS A	0.3	1.8	0.24	0.44	53.0
8	T1	191	2.8	191	2.8	0.177	4.2	LOS A	0.3	1.8	0.24	0.44	51.3
9	R2	14	0.0	14	0.0	0.177	9.4	LOS A	0.3	1.8	0.24	0.44	55.8
9u	U	1	0.0	1	0.0	0.177	11.7	LOS A	0.3	1.8	0.24	0.44	58.1
Approach		239	2.2	239	2.2	0.177	4.5	LOS A	0.3	1.8	0.24	0.44	51.9
West: Stage 2 Access													
10	L2	21	0.0	21	0.0	0.136	5.6	LOS A	0.3	2.0	0.52	0.70	49.1
11	T1	1	0.0	1	0.0	0.136	5.7	LOS A	0.3	2.0	0.52	0.70	46.7
12	R2	118	7.1	118	7.1	0.136	11.1	LOS A	0.3	2.0	0.52	0.70	38.7
12u	U	1	0.0	1	0.0	0.136	13.3	LOS A	0.3	2.0	0.52	0.70	49.9
Approach		141	6.0	141	6.0	0.136	10.3	LOS A	0.3	2.0	0.52	0.70	41.6
All Vehicles		1225	4.7	1219 ^{N1}	4.8	0.344	6.3	LOS A	0.9	6.4	0.42	0.55	50.2

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

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

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

^{N1} Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

MOVEMENT SUMMARY



Site: m01v [2026 AM Base + Dev - RMS Upgrade -
The Horsley Drive x Cowpasture Road]



Network: N101 [2026 AM
Existing + Dev RMS Upgrades]

The Horsley Drive x Cowpasture Road

Site Category: (None)

Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Network Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		veh	m				km/h
South: Cowpasture Road														
1	L2	14	0.0	14	0.0	1.043	120.3	LOS F	49.1	361.1	1.00	1.46	1.69	14.5
2	T1	1463	6.0	1463	6.0	1.043	116.7	LOS F	49.1	361.1	1.00	1.47	1.71	12.7
3	R2	1029	3.9	1029	3.9	0.916	66.3	LOS E	21.7	156.8	1.00	1.02	1.27	29.4
Approach		2506	5.1	2506	5.1	1.043	96.0	LOS F	49.1	361.1	1.00	1.28	1.53	18.9
East: The Horsley Drive (East)														
4	L2	224	11.7	224	11.7	0.138	25.6	LOS B	2.3	17.6	0.61	0.71	0.61	41.9
5	T1	9	0.0	9	0.0	0.043	54.9	LOS D	0.3	2.2	0.92	0.65	0.92	23.7
6	R2	738	10.4	738	10.4	0.937	78.0	LOS F	18.1	137.9	1.00	1.07	1.40	17.4
Approach		972	10.6	972	10.6	0.937	65.7	LOS E	18.1	137.9	0.91	0.98	1.21	22.2
North: The Horsley Drive (North)														
7	L2	981	9.4	981	9.4	0.616	15.2	LOS B	6.7	50.6	0.41	0.69	0.41	43.6
8	T1	494	14.9	494	14.9	0.896	64.6	LOS E	9.9	78.1	1.00	1.00	1.28	24.8
9	R2	9	0.0	9	0.0	0.098	69.1	LOS E	0.4	2.5	1.00	0.67	1.00	11.4
Approach		1484	11.2	1484	11.2	0.896	32.0	LOS C	9.9	78.1	0.61	0.79	0.70	34.5
West: Lizard Log Access Road														
10	L2	5	20.0	5	20.0	0.048	53.8	LOS D	0.3	2.6	0.91	0.65	0.91	7.1
11	T1	7	0.0	7	0.0	0.048	47.2	LOS D	0.3	2.6	0.92	0.65	0.92	26.3
12	R2	7	0.0	7	0.0	0.048	41.1	LOS C	0.2	1.7	0.96	0.67	0.96	28.4
Approach		20	5.3	20	5.3	0.048	46.7	LOS D	0.3	2.6	0.93	0.66	0.93	23.0
All Vehicles		4982	8.0	4982	8.0	1.043	70.8	LOS F	49.1	361.1	0.87	1.08	1.22	22.5

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

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

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

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

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

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue	Distance	Prop. Queued	Effective Stop Rate
		ped/h	sec		ped	m		
P1	South Full Crossing	26	54.2	LOS E	0.1	0.1	0.95	0.95
P2	East Full Crossing	26	54.2	LOS E	0.1	0.1	0.95	0.95
P2S	East Slip/Bypass Lane Crossing	26	54.2	LOS E	0.1	0.1	0.95	0.95
P3	North Full Crossing	26	54.2	LOS E	0.1	0.1	0.95	0.95
P3S	North Slip/Bypass Lane Crossing	26	54.2	LOS E	0.1	0.1	0.95	0.95
P4	West Full Crossing	26	54.2	LOS E	0.1	0.1	0.95	0.95

All Pedestrians	158	54.2 LOS E	0.95	0.95
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Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

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

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

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MOVEMENT SUMMARY

 Site: m01v [2026 PM Base + Dev - RMS Upgrade - The Horsley Drive x Cowpasture Road]

 Network: N101 [2026 PM Existing + Dev RMS Upgrades]

The Horsley Drive x Cowpasture Road

Site Category: (None)

Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	% veh/h		%	v/c	sec		veh	m				km/h
South: Cowpasture Road														
1	L2	13	0.0	13	0.0	0.579	37.9	LOS C	12.8	96.4	0.80	0.71	0.80	31.1
2	T1	788	9.3	788	9.3	0.579	32.7	LOS C	13.7	103.3	0.80	0.71	0.80	29.6
3	R2	346	8.2	346	8.2	1.099	185.3	LOS F	13.1	98.4	1.00	1.31	1.99	14.6
Approach		1147	8.9	1147	8.9	1.099	78.8	LOS F	13.7	103.3	0.86	0.89	1.16	20.2
East: The Horsley Drive (East)														
4	L2	445	3.1	445	3.1	0.507	59.4	LOS E	8.7	62.3	0.92	0.82	0.92	30.9
5	T1	9	0.0	9	0.0	0.044	67.7	LOS E	0.4	2.7	0.92	0.66	0.92	20.9
6	R2	669	4.1	669	4.1	1.105	190.2	LOS F	27.6	199.8	1.00	1.34	1.94	8.4
Approach		1124	3.7	1124	3.7	1.105	137.4	LOS F	27.6	199.8	0.97	1.12	1.53	14.2
North: The Horsley Drive (North)														
7	L2	772	4.5	767	4.5	0.300	13.7	LOS A	4.9	35.9	0.32	0.66	0.32	45.9
8	T1	1567	4.2	1559	4.2	0.892	46.9	LOS D	22.1	160.0	0.97	0.95	1.05	30.1
9	R2	11	10.0	10	10.0	0.067	79.6	LOS F	0.5	3.6	1.00	0.69	1.00	10.2
Approach		2349	4.3	2337 ^{N1}	4.3	0.892	36.2	LOS C	22.1	160.0	0.76	0.85	0.81	33.8
West: Lizard Log Access Road														
10	L2	5	20.0	5	20.0	0.065	67.3	LOS E	0.5	3.8	0.92	0.66	0.92	5.9
11	T1	7	0.0	7	0.0	0.065	63.8	LOS E	0.5	3.8	0.92	0.66	0.92	22.1
12	R2	9	0.0	9	0.0	0.066	54.3	LOS D	0.3	2.4	0.83	0.63	0.83	24.2
Approach		22	4.8	22	4.8	0.066	60.6	LOS E	0.5	3.8	0.88	0.65	0.88	19.8
All Vehicles		4643	5.3	4630 ^{N1}	5.3	1.105	71.4	LOS F	27.6	199.8	0.83	0.93	1.07	22.3

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

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

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

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

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

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

^{N1} Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue	Prop. Queued	Effective Stop Rate
		ped/h	sec		Pedestrian	Distance	
					ped	m	
P1	South Full Crossing	26	69.2	LOS F	0.1	0.1	0.96
P2	East Full Crossing	26	69.2	LOS F	0.1	0.1	0.96
P2S	East Slip/Bypass Lane Crossing	26	69.2	LOS F	0.1	0.1	0.96
P3	North Full Crossing	26	69.2	LOS F	0.1	0.1	0.96
P3S	North Slip/Bypass Lane Crossing	26	69.2	LOS F	0.1	0.1	0.96
P4	West Full Crossing	26	69.2	LOS F	0.1	0.1	0.96

All Pedestrians	158	69.2 LOS F	0.96	0.96
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Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

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

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

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MOVEMENT SUMMARY

 Site: [2026 AM Existing + Dev - RMS Upgrade - Cowpasture Road x The Horsley Drive]

 Network: N101 [2026 AM Existing + Dev RMS Upgrades]

Horsley Drive x Cowpasture Rd

Site Category: (None)

Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Network Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: The Horsley Drive (south)														
2	T1	1320	7.5	1288	7.5	0.471	6.6	LOS A	7.5	56.2	0.36	0.33	0.36	53.6
3	R2	923	7.6	900	7.7	0.769	46.9	LOS D	15.2	113.3	0.99	0.89	1.01	19.6
Approach		2243	7.6	2188 ^{N1}	7.6	0.769	23.2	LOS B	15.2	113.3	0.62	0.56	0.63	38.4
East: Cowpasture Road														
4	L2	221	31.9	221	31.9	0.116	16.1	LOS B	1.7	15.2	0.46	0.64	0.46	25.5
6	R2	361	61.5	361	61.5	0.607	51.1	LOS D	6.0	63.9	0.95	0.82	0.95	29.9
Approach		582	50.3	582	50.3	0.607	37.8	LOS C	6.0	63.9	0.77	0.75	0.77	29.3
North: The Horsley Drive (north)														
7	L2	987	26.5	987	26.5	0.527	21.1	LOS B	10.2	88.0	0.63	0.77	0.63	42.2
8	T1	1248	6.8	1248	6.8	0.783	41.3	LOS C	14.1	104.8	0.96	0.90	1.02	31.6
Approach		2236	15.5	2236	15.5	0.783	32.4	LOS C	14.1	104.8	0.82	0.84	0.85	36.1
All Vehicles		5061	16.0	5006 ^{N1}	16.2	0.783	29.0	LOS C	15.2	113.3	0.72	0.71	0.74	36.1

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

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

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

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

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

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

^{N1} Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians							
Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue	Prop. Queued	Effective Stop Rate
		ped/h	sec		Pedestrian	Distance	
					ped	m	
P1	South Full Crossing	26	54.2	LOS E	0.1	0.1	0.95
P2	East Full Crossing	26	34.5	LOS D	0.1	0.1	0.76
P2S	East Slip/Bypass Lane Crossing	26	30.1	LOS D	0.1	0.1	0.71
P3S	North Slip/Bypass Lane Crossing	26	29.4	LOS C	0.1	0.1	0.70
All Pedestrians		105	37.1	LOS D			0.78

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

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

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

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MOVEMENT SUMMARY



Site: [2026 PM Existing + Dev - RMS Upgrade -
Cowpasture Road x The Horsley Drive]



Network: N101 [2026 PM
Existing + Dev RMS Upgrades]

Horsley Drive x Cowpasture Rd

Site Category: (None)

Signals - Fixed Time Coordinated Cycle Time = 150 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV % veh/h	Total HV	%	v/c	sec		veh	Distance m			km/h
South: The Horsley Drive (south)													
2	T1	1335	5.8	1267	5.9	0.529	17.4	LOS B	15.2	111.5	0.57	0.52	45.7
3	R2	157	18.1	149	18.5	0.658	83.9	LOS F	3.4	27.9	1.00	0.80	12.8
Approach		1492	7.1	1416 ^{N1}	7.2	0.658	24.5	LOS B	15.2	111.5	0.62	0.55	40.7
East: Cowpasture Road													
4	L2	621	5.6	621	5.6	0.522	38.2	LOS C	13.2	97.0	0.79	0.79	15.1
6	R2	1246	10.1	1246	10.1	1.054	143.4	LOS F	44.8	341.0	1.00	1.25	16.7
Approach		1867	8.6	1867	8.6	1.054	108.4	LOS F	44.8	341.0	0.93	1.10	16.5
North: The Horsley Drive (north)													
7	L2	273	52.9	273	52.9	0.115	8.0	LOS A	0.8	8.1	0.14	0.58	48.4
8	T1	1660	3.8	1660	3.8	1.053	139.4	LOS F	58.7	424.2	1.00	1.45	14.7
Approach		1933	10.7	1933	10.7	1.053	120.9	LOS F	58.7	424.2	0.88	1.32	16.7
All Vehicles		5292	8.9	5216 ^{N1}	9.1	1.054	90.2	LOS F	58.7	424.2	0.83	1.03	20.2

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

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

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

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

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

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

^{N1} Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue	Prop. Queued	Effective Stop Rate
		ped/h	sec		Pedestrian ped	Distance m	
P1	South Full Crossing	26	48.9	LOS E	0.1	0.1	0.81
P2	East Full Crossing	26	23.5	LOS C	0.1	0.1	0.56
P2S	East Slip/Bypass Lane Crossing	26	20.3	LOS C	0.1	0.1	0.52
P3S	North Slip/Bypass Lane Crossing	26	69.2	LOS F	0.1	0.1	0.96
All Pedestrians		105	40.5	LOS E			0.71

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

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

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

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MOVEMENT SUMMARY



Site: 101 [2026 AM Base + Dev - RMS Upgrade - Ferrers Road x The Horsley Drive]

The Horsley Drive x Ferrers Road

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: The Horsley Drive												
5	T1	1068	25.7	0.438	5.7	LOS A	10.2	87.1	0.43	0.39	0.43	54.9
6	R2	599	9.8	0.719	45.3	LOS D	14.0	106.5	0.98	0.87	1.03	34.1
Approach		1667	20.0	0.719	19.9	LOS B	14.0	106.5	0.63	0.56	0.64	45.0
North: Ferrers Road												
7	L2	562	9.6	0.399	25.1	LOS B	10.2	77.1	0.70	0.77	0.70	42.0
9	R2	39	29.7	0.169	47.1	LOS D	1.7	15.0	0.91	0.73	0.91	33.2
Approach		601	10.9	0.399	26.5	LOS B	10.2	77.1	0.71	0.76	0.71	41.3
West: The Horsley Drive												
10	L2	113	11.2	0.152	24.3	LOS B	3.3	25.5	0.64	0.72	0.64	42.4
11	T1	1551	17.9	0.743	25.2	LOS B	23.0	185.5	0.88	0.78	0.88	42.5
Approach		1663	17.4	0.743	25.2	LOS B	23.0	185.5	0.86	0.78	0.86	42.5
All Vehicles		3932	17.5	0.743	23.1	LOS B	23.0	185.5	0.74	0.68	0.75	43.3

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

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

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

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

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

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Back of Queue Distance m	Prop. Queued	Effective Stop Rate
P21	East Stage 1	11	44.2	LOS E	0.0	0.0	0.94	0.94
P22	East Stage 2	11	44.2	LOS E	0.0	0.0	0.94	0.94
P3	North Full Crossing	11	20.5	LOS C	0.0	0.0	0.64	0.64
P3S	North Slip/Bypass Lane Crossing	11	18.6	LOS B	0.0	0.0	0.61	0.61
P41	West Stage 1	11	42.3	LOS E	0.0	0.0	0.92	0.92
P42	West Stage 2	11	39.6	LOS D	0.0	0.0	0.89	0.89
All Pedestrians		63	34.9	LOS D			0.82	0.82

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

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

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

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MOVEMENT SUMMARY



Site: 101 [2026 PM Base + Dev - RMS Upgrade - Ferrers Road x The Horsley Drive]

The Horsley Drive x Ferrers Road

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: The Horsley Drive												
5	T1	1938	8.0	0.840	16.1	LOS B	40.0	299.0	0.78	0.76	0.82	47.5
6	R2	661	8.8	0.610	37.6	LOS C	13.9	104.3	0.91	0.83	0.91	36.8
Approach		2599	8.2	0.840	21.5	LOS B	40.0	299.0	0.81	0.77	0.84	44.2
North: Ferrers Road												
7	L2	951	4.2	0.497	17.9	LOS B	14.8	107.3	0.60	0.75	0.60	45.9
9	R2	319	8.6	0.828	52.5	LOS D	16.6	125.0	1.00	0.94	1.20	31.9
Approach		1269	5.3	0.828	26.6	LOS B	16.6	125.0	0.70	0.80	0.75	41.3
West: The Horsley Drive												
10	L2	53	32.0	0.120	34.2	LOS C	1.9	16.9	0.77	0.72	0.77	37.7
11	T1	875	17.9	0.622	33.1	LOS C	13.5	108.8	0.91	0.78	0.91	39.0
Approach		927	18.7	0.622	33.1	LOS C	13.5	108.8	0.90	0.77	0.90	38.9
All Vehicles		4796	9.5	0.840	25.1	LOS B	40.0	299.0	0.80	0.78	0.83	42.3

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

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

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

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

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

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

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P21	East Stage 1	11	37.9	LOS D	0.0	0.0	0.87	0.87
P22	East Stage 2	11	37.9	LOS D	0.0	0.0	0.87	0.87
P3	North Full Crossing	11	30.4	LOS D	0.0	0.0	0.78	0.78
P3S	North Slip/Bypass Lane Crossing	11	28.1	LOS C	0.0	0.0	0.75	0.75
P41	West Stage 1	11	36.1	LOS D	0.0	0.0	0.85	0.85
P42	West Stage 2	11	33.6	LOS D	0.0	0.0	0.82	0.82
All Pedestrians		63	34.0	LOS D			0.82	0.82

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

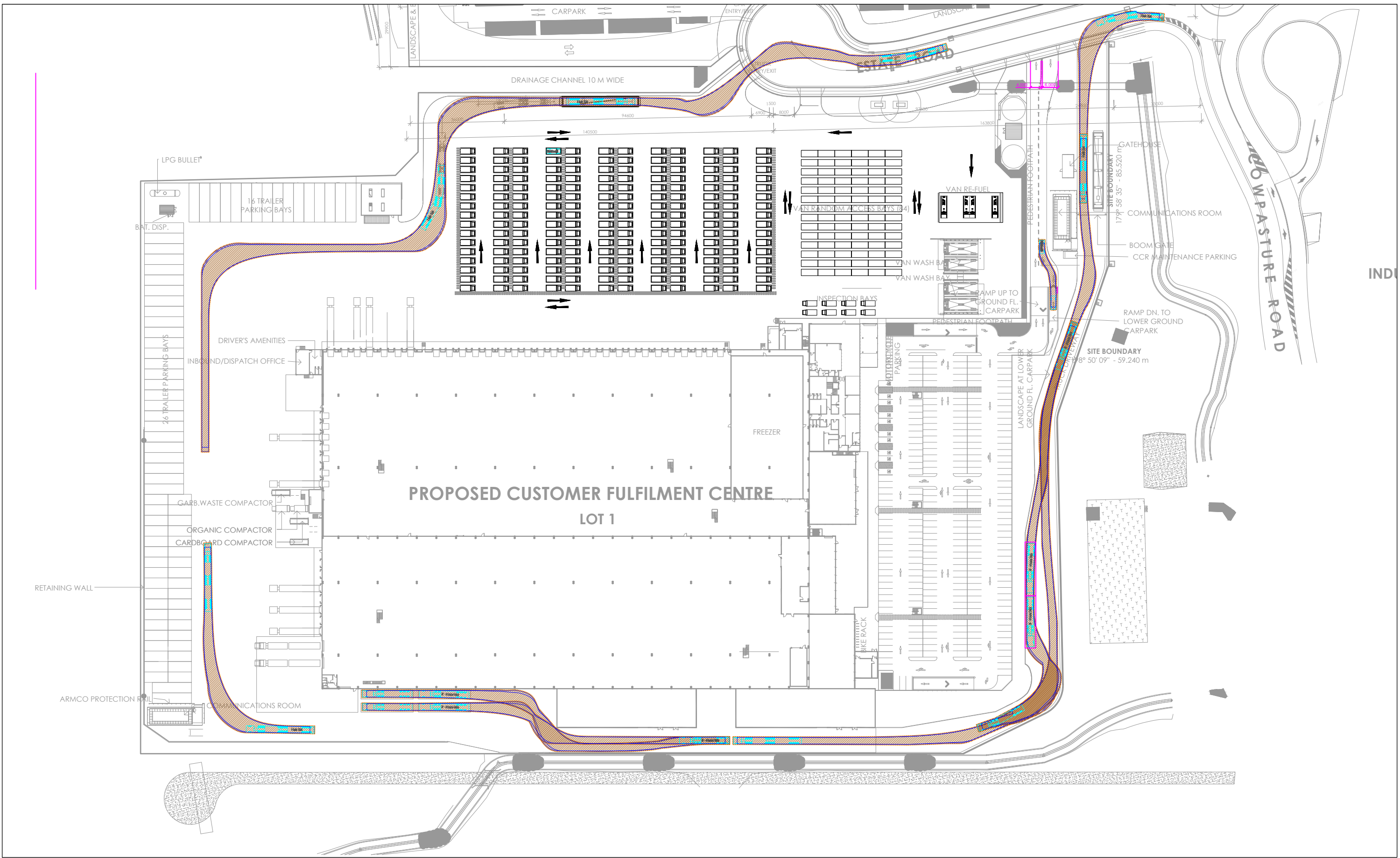
Pedestrian movement LOS values are based on average delay per pedestrian movement.

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

Project: C:\Users\RebeccaBMadden\AG\Ason Group\Ason Group Team Site - 1223\Projects\Modelling\2020
Modelling\Network\AG1223m08_Network 2026 Scenarios.sip8

Appendix B

Swept Path Analysis

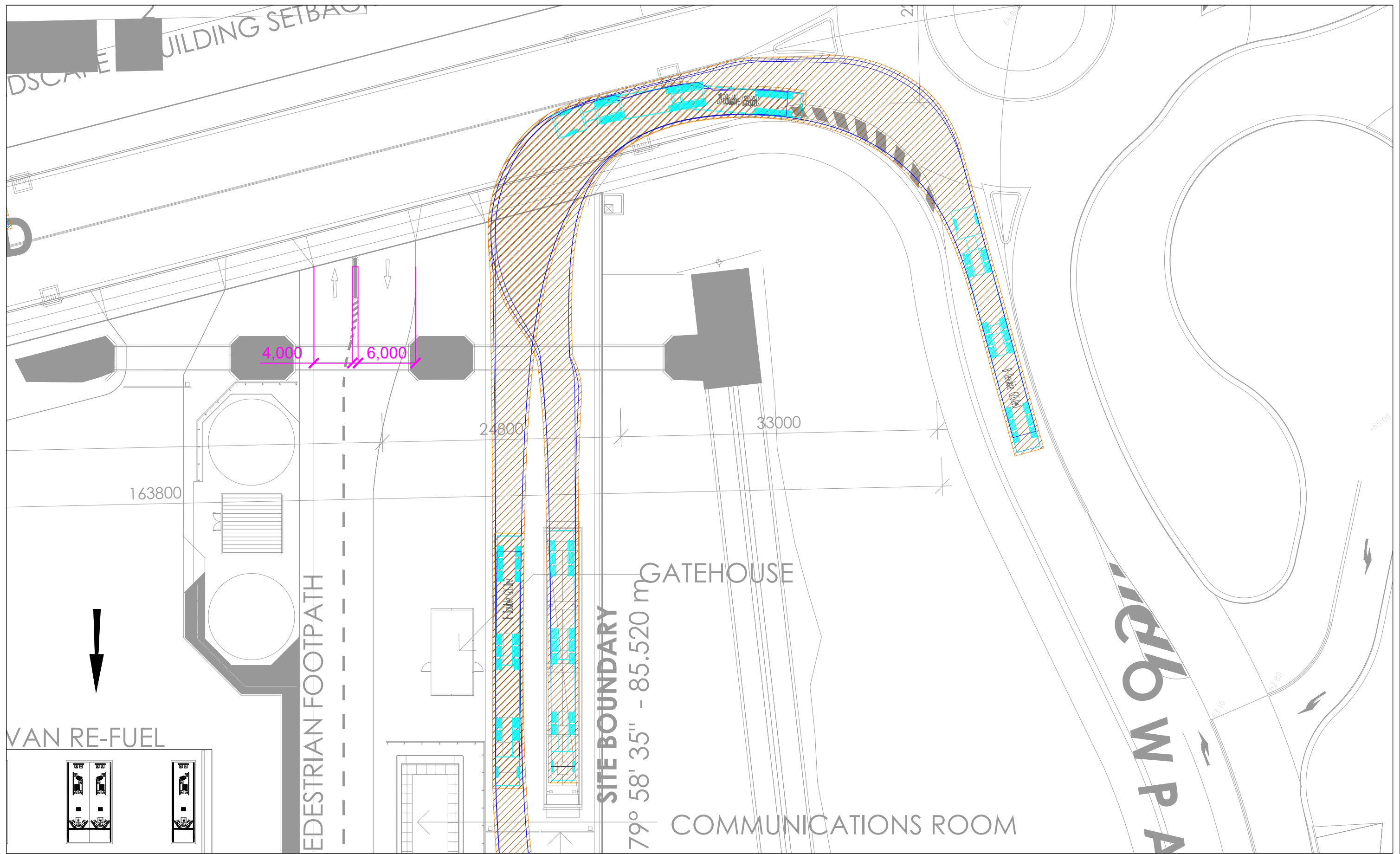


Revision notes:		
Rev:	Date:	Notes:
For information purposes only - not for construction		

Drawn By: VC
Client: Charter Hall

Project: 1223d01 Horsley Drive Business Park Stage 2
Drawing Title: Customer Fulfilment Centre

Date: 03/02/2020
Scale @ A3: n/a
Drawing Number: 01



Revision notes:			Drawn By: VC	Project: 1223d01 Horsley Drive Business Park Stage 2	Date: 03/02/2020	asongroup Suite 5.02, Level 5, 1 Castlereagh Street Sydney NSW 2000 info@asongroup.com.au
Rev:	Date:	Notes:				
			Client: Charter Hall	Drawing Title: Customer Fulfilment Centre Truck and Light Vehicle Access	Scale @ A3: n/a	
For information purposes only - not for construction						
					Drawing Number: 02	