WSU Milperra Neighbourhood Centre DA

Traffic Impact Assessment

Prepared for:

Mirvac

18 December 2024

The Transport Planning Partnership

WSU Milperra Neighbourhood Centre DA

Traffic Impact Assessment

Client: Mirvac

Version: V02

Date: 18 December 2024

TTPP Reference: 19334

Quality Record

Version	Date	Prepared by	Reviewed by	Approved by	Signature
V01	16/12/24	Clinton Cheung	Paul Cai	Wayne Johnson	Draft
V02	18/12/24	Clinton Cheung	Paul Cai	Wayne Johnson	

Table of Contents

Tables

Figures

1   Introduction

A Development Application (DA) will be lodged with City of Canterbury Bankstown Council (Council) for the development of a neighbourhood centre at the existing childcare centre on the former Western Sydney University (WSU) site at 2 Bullecourt Avenue, Milperra. The proposed development involves refurbishment of the existing childcare centre, a café and a sales office adjacent to the childcare centre, associated car parking, and construction of a new access road from Horsley Road.

The Transport Planning Partnership Pty Ltd (TTPP) has prepared this Traffic Impact Assessment (TIA) report on behalf of Mirvac Residential (NSW) Developments Pty Ltd, to accompany the DA submission.

1.1   Project Background

On 1 June 2022, a Gateway determination was issued by the Department of Planning, Housing and Infrastructure (DPHI) to endorse the planning proposal (PP) to rezone the site to provide residential dwellings, a new commercial centre and public open spaces (Ref: PP-2021-5837).

The residential subdivision component and commercial area of the site are shown in Figure 1.1.

This report relates to the DA of the commercial area (neighbourhood centre) development only, which includes a childcare centre, a café, a sales office and a new internal access road off Horsley Road to the neighbourhood centre (as shown in light green in Figure 1.1). The residential development (Stages 1-6) is subject to separate approvals.

Figure 1.1: Subdivision Staging Plan
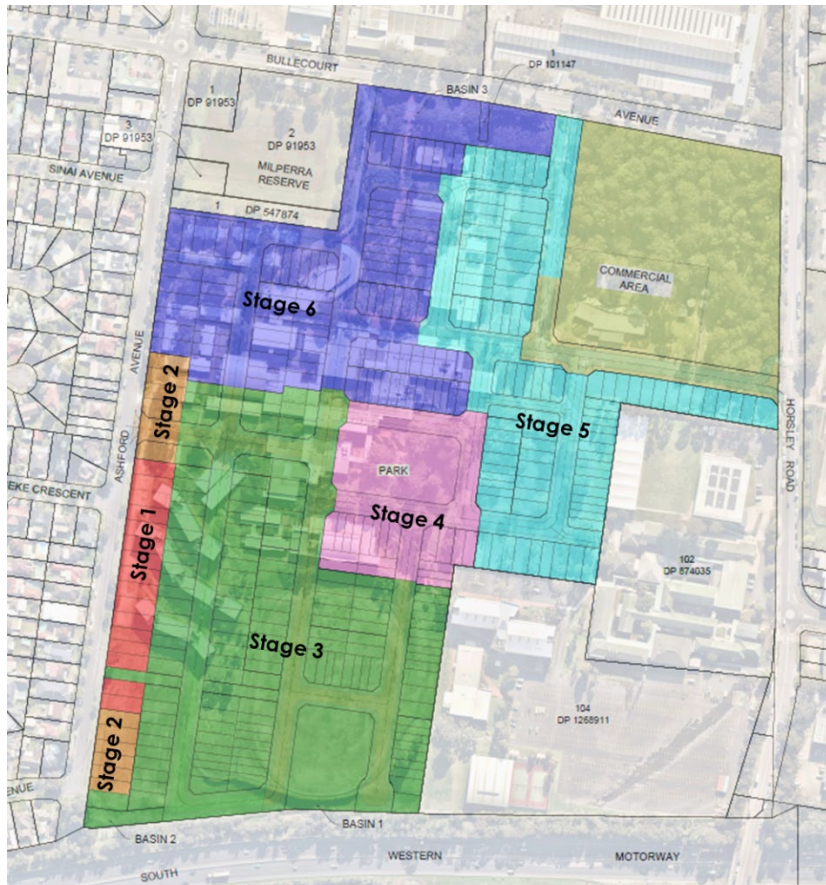
1.2 References

In preparing this report, reference has been made to the following:

- Canterbury-Bankstown Development Control Plan 2023

- Canterbury-Bankstown Development Control Plan 2023 – Chapter 11.13 Former WSU Campus, Milperra site specific DCP (amended August 2024)

- TfNSW Guide to Transport Impact Assessment Version 1.1 2024

- Genesis Traffic, 2024, Traffic Impact Assessment for 270 Horsley Road, Milperra

- Other documents referenced in this report.

1.3 Report Structure

This report assesses the traffic and transport implications of the proposed development and is set out as follows:

- Chapter 2 discusses the existing conditions including a description of the subject site.

- Chapter 3 provides a brief description of the proposed development.

- Chapter 4 assesses the future parking requirement of the site.

- Chapter 5 examines the traffic generation and its impacts.

- Chapter 6 presents the conclusions of the assessment.

2 Existing Conditions

2.1 Site Description

The site is located in Milperra and falls within the Canterbury-Bankstown local government area (LGA). The masterplan site is known as the former Western Sydney University (WSU) Milperra Campus which will be redeveloped for residential, business, recreation and conservation uses.

The proposed development is located at the existing childcare centre, which has been identified as a local centre and childcare in the approved planning proposal.

The location of the neighbourhood centre site is show in Figure 2.1, with the masterplan site outlined in red.

Figure 2.1: Locality Map
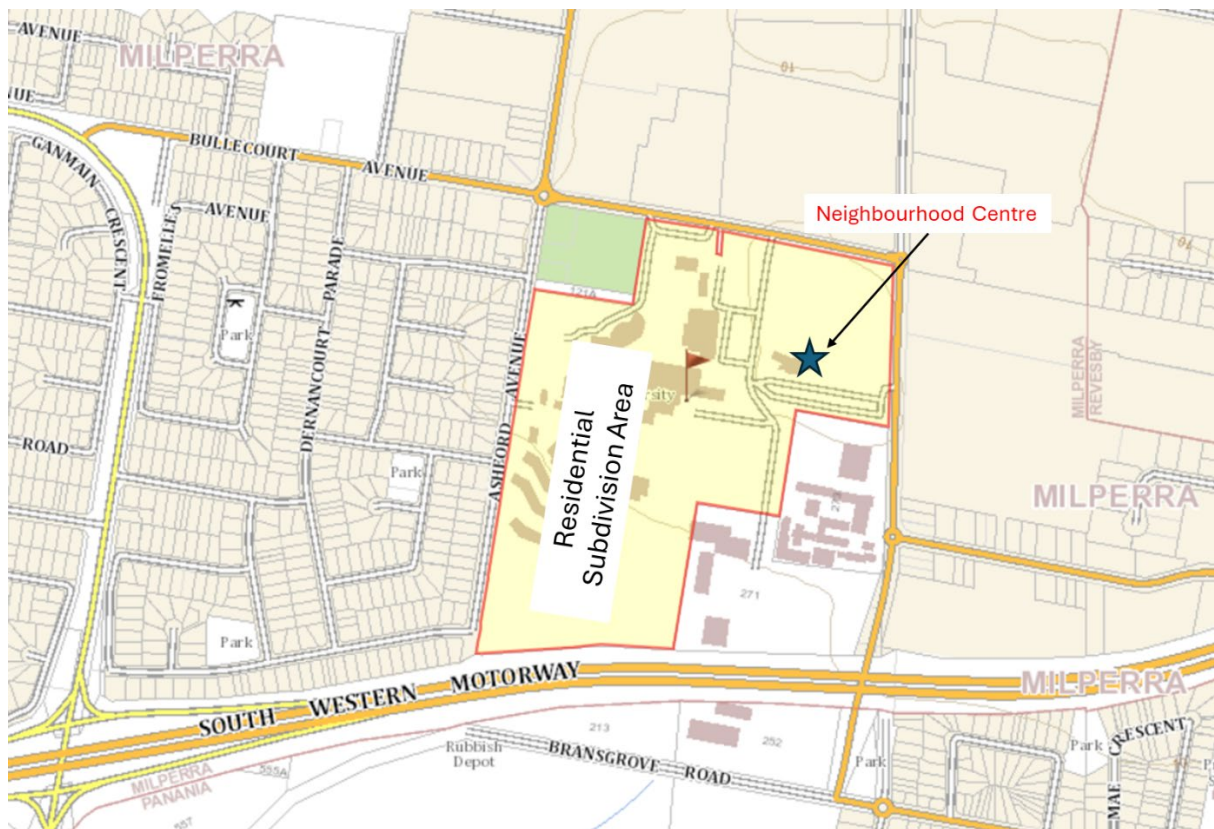
Source: SIX Maps

Surrounding land uses in the area are predominantly light industrial to the north and east, including an industrial development at 270 Horsley Road (a SSDA has been submitted to Department of Planning, Housing and Infrastructure for redevelopment of the site), and low density residential to the west of the site.

2.2 Abutting Road Network

The site is surrounded by a network of local roads, including Bullecourt Avenue to the north, Horsley Road to the east and Ashford Avenue to the west of the site. A brief description of these roads is provided below.

2.2.1 Bullecourt Avenue

Bullecourt Avenue functions as a two-way, two-lane primary collector road, generally aligned in an east-west direction between Horsley Road and Ashford Avenue. The road carriageway is approximately 12.5m wide (kerb to kerb), with unrestricted kerbside parking generally provided on both sides of the road. Bullecourt Avenue has a posted speed limit of 60 km/hr. This road provides good connectivity between Henry Lawson Drive and Horsley Drive to the west and east ends respectively.

2.2.2 Horsley Road

Horsley Road functions as a two-way, two-lane primary collector road and is generally aligned in a north-south direction between Ladbroke Street and Bransgrove Road. The road carriageway is approximately 12.0m wide (kerb to kerb), with unrestricted kerbside parking generally provided on both sides of the road. This road provides good connectivity to/from the wider arterial road network via Bullecourt Avenue, Beaconsfield Street and Bransgrove Road.

The posted speed limit is 60km/hr, with 40 km/hr school zone restrictions in operation during school hours to the south of the Horsley Road-Bullecourt Avenue intersection.

An existing site access is provided on Horsley Road between Bullecourt Avenue and Beaconsfield Street, which forms a roundabout intersection with Horsley Road.

2.2.3 Ashford Avenue

Ashford Avenue functions as a two-way, two-lane local collector road, generally aligned in a north-south direction between Milperra Road and Flanders Avenue to the north and south ends respectively. The road carriageway is approximately 12.0m wide (kerb to kerb), with unrestricted kerbside parking provided on the east side and restricted kerbside parking on the west side of the road.

The posted speed limit is 50 km/hr within the vicinity of the site.

2.3   Pedestrian and Cyclist Infrastructure

Paved pedestrian footpaths are generally provided on both sides of Bullecourt Avenue and Horsley Road, which provides good access to the surrounding areas and public transport facilities.

There is a good provision of cycle infrastructure in the local area. To the west of the site, a shared path is provided along Henry Lawson Drive, providing connectivity in a generally north-south direction between Lansdowne and East Hills. In addition to this, there is a cycleway provided to the south of the site traversing the sports fields which provides good connectivity to/from Panania.

A map showing existing cycling facilities within the site vicinity is shown in Figure 2.2.

Figure 2.2: Cycleway Map
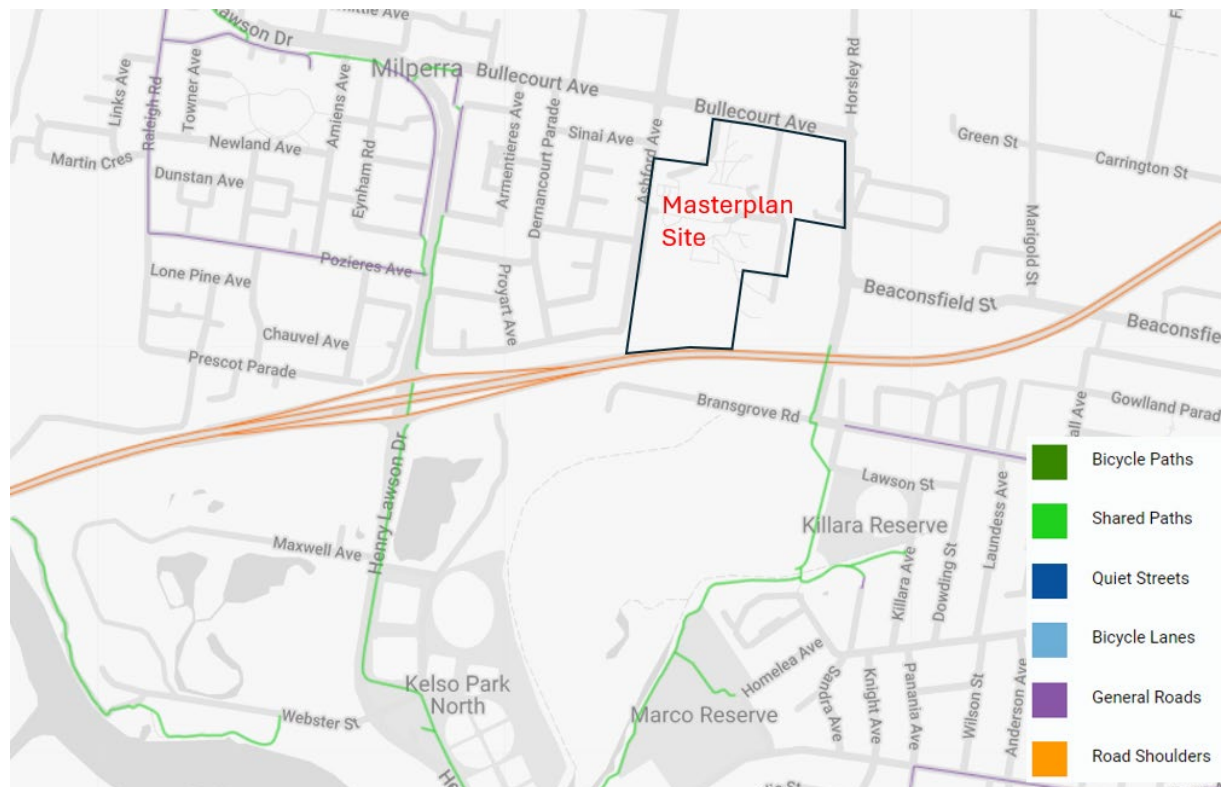
Source: Roads and Maritime Services Cycleway Finder

2.4   Public Transport Facilities

The site is accessible by public transport, with a number of bus services operating within a 400m catchment radius of the centre of the site. It is however noted that there are no nearby railway stations within the immediate local area. The nearest railway station is Panania Station, which is approximately 1.5km from the site.

The site's proximity to nearby public transport facilities is shown in Figure 2.3.

Figure 2.3: Site Proximity to Nearby Public Transport Facilities
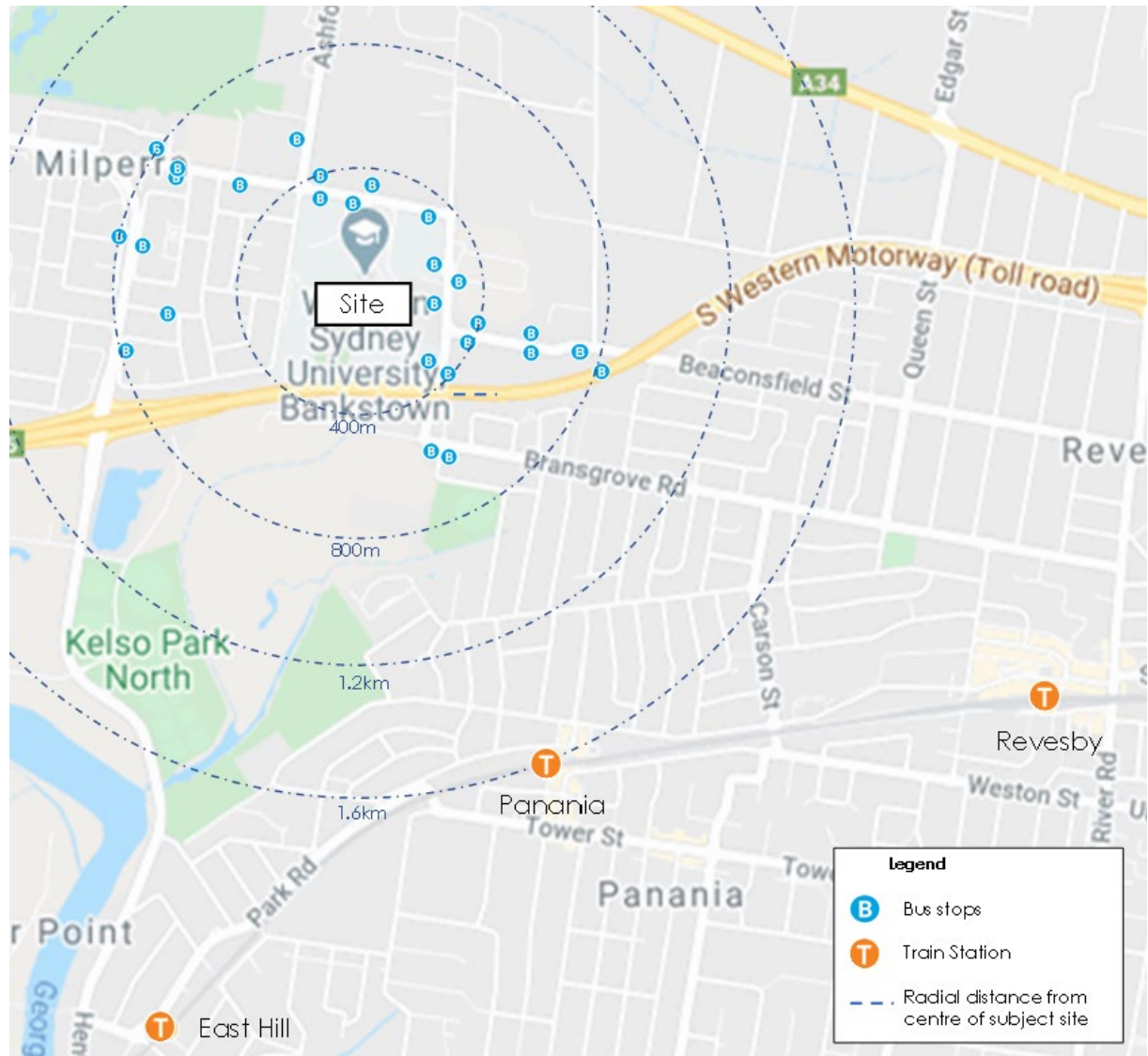
Base Map Source: Google Maps Australia

A summary of the existing bus services within a 400m radius catchment of the centre of the site, as well as their associated frequencies, is provided in Table 2.1.

Table 2.1: Bus Service Summary

Service No.	Route Description	Approximate Frequency (Each Direction)	
		Peak	**Off-Peak**
922	Between East Hills and Bankstown	Every 30 mins	
962	Between East Hills and Miranda	Every 15-20 mins	Every 30 mins
M90	Between Burwood and Liverpool	Every 10 mins	Every 15 mins
S5	Between Milperra and Padstow	Five services per day	

2.5   Existing Vehicle Access

The neighbourhood centre area is currently occupied by a childcare centre. The masterplan site was formerly occupied by the WSU Milperra campus, which has been relocated to a new location in Bankstown. There are several vehicle access points provided along Ashford Avenue, Bullecourt Avenue and Horsley Road frontages as shown in Figure 2.4.

The existing access on Horsley Road (access #4) will be modified to accommodate a new access road from Horsley Road as per the approved concept master plan in the site specific DCP. This is further discussed in Section 3.3 of this report.

Figure 2.4: Existing Vehicle Access Locations
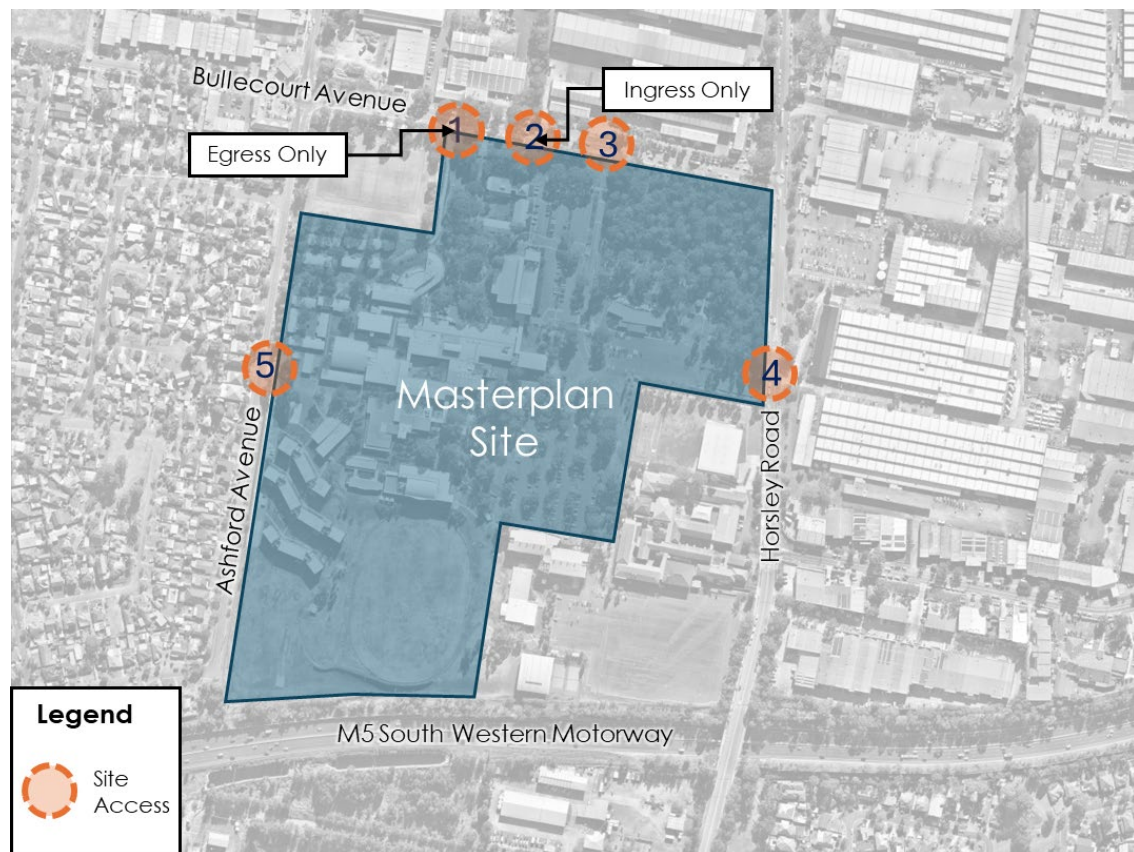
2.6   Existing Traffic Volumes

Traffic surveys were undertaken on Tuesday 19 November 2024 between 6:00am and 10:00am and between 3:00pm and 7:00pm at the following key intersections:

- Horsley Road – Bullecourt Avenue (roundabout)
- Horsley Road – Existing Site Access #4 (roundabout)
- Horsley Road – Beaconsfield Street (roundabout)

Based on the traffic surveys, the road network peak occurred between 7:45am and 8:45am in the AM Peak and between 4pm and 5pm in the PM Peak.

The existing intersection peak hourly traffic volumes are shown in Figure 2.5.

Figure 2.5: Intersection Peak Traffic Volumes

7.45-8.45AM

Total

HV	31	179	⌐	Horsley Rd
	35	536	⌐	0 38 3
	0	5	U	0 79 59

Bullecourt Ave | 1 | U ↵ ↓

↩ ↑ U
449 82 4
37 3 1

0 34 ⌐
0 19 ⌐
0 0 U
0 0 39
3 46 556

Site Access | 2 | U ↵ ↓

↩ ↑ U
16 501 67
0 40 1

0 0 11 25
20 78 301 248

| 3 | U ↵ ↓ ↳
Beaconsfield St

↩ ↑ ↪ U
29 297 94 47
0 16 4 0

U 14 0
⌐ 153 24
← 40 0
⌐ 72 10

Horsley Rd

4-5PM

Total

HV	17	48	⌐	Horsley Rd
	20	497	⌐	0 23 4
	0	3	U	0 218 88

Bullecourt Ave | 1 | U ↵ ↓

↩ ↑ U
526 15 2
23 0 0

0 17 ⌐
0 6 ⌐
0 0 U
0 0 25
0 13 568

Site Access | 2 | U ↵ ↓

↩ ↑ U
11 517 5
0 24 0

0 0 4 20
2 0 387 190

| 3 | U ↵ ↓ ↳
Beaconsfield St

↩ ↑ ↪ U
0 261 38 3
0 10 0 0

U 6 0
⌐ 261 13
← 0 0
⌐ 60 2

Horsley Rd

3   Proposed Development

3.1   Project Background

As part of the previous Planning Proposal traffic assessment[1], the indicative masterplan assessed was as follows:

- 441 residential dwellings (197 free standing and 244 attached and semi-detached dwellings)

- A commercial zone comprising:

  ‣ 136m² GFA of office space

  ‣ 250m² GFA of restaurant/café use

  ‣ 250m² GFA of convenience retail use

  ‣ A childcare centre with a capacity for 40 children (existing childcare centre has a capacity for 67 children)

The planning proposal was approved for a total number of 430 residential dwellings (which is slightly lower than the above 441 residential dwellings assessed as part of the planning proposal traffic report). It is however noted that during the DA stages of the residential component (separate DAs to the proposed neighbourhood centre), the total number of residential dwellings has been revised down to 382 dwellings.

The proposed developments will be provided in accordance with the Concept Masterplan in the adopted Site Specific DCP, as shown in Figure 3.1. The proposed neighbourhood centre (this DA) will be located within the identified B1 zone (shown as blue in the concept plan).

---

[1] *TTPP Transport Assessment Version 05 dated 2 June 2020 (TTPP Ref: 19334-R01V05-200602-TIA)*

Figure 3.1: Concept Master Plan

Source: Figure 2 of adopted WSU Milperra Site Specific Development Control Plan

3.2 Proposed Neighbourhood Centre Development

The proposed development involves the following land uses in the neighbourhood centre:

- alterations and additions to the existing single-storey childcare centre to develop a new childcare centre for 95 children

- a sales office with approximately 48m^2 GFA adjacent to the childcare centre

- a café with approximately 133m^2 GFA adjacent to the childcare centre

The proposed development will comprise an at-grade car park with a total of 30 car parking spaces for the above land uses.

In addition, the proposed development will include a new internal access road from Horsley Road as per the Concept Masterplan for the site under the Site Specific DCP.

3.3 Access Arrangements

It is proposed that the existing site access will be removed and a new two-way access road (Road No. 2) will be constructed from Horsley Road to the neighbourhood centre, as shown in

Figure 3.2. This internal road will provide access to the neighbourhood centre car park in addition to the residential subdivision.

This new access road will form a priority T-intersection with Horsley Road. Consequently, the existing site access roundabout on Horsley Road will be redundant and removed. SIDRA intersection modelling was undertaken to assess the traffic impacts of the new site access arrangements. This is provided in Section 5.4 of the report.

The residential areas to the west and south of the neighbourhood centre will be developed later. As a result, the access road (Road No. 2) will comprise a temporary cul-de-sac at the end of the street to the north and a temporary T-head to the west. The remaining streets will be fully constructed to connect with other local roads as part of future development applications.

The new road is to be designed as a local road in accordance with the minimum requirements of the adopted Site Specific DCP. The cross-section of a local road as per the DCP requirements is shown in Figure 3.3 .

Figure 3.2: Internal Access Road from Horsley Road
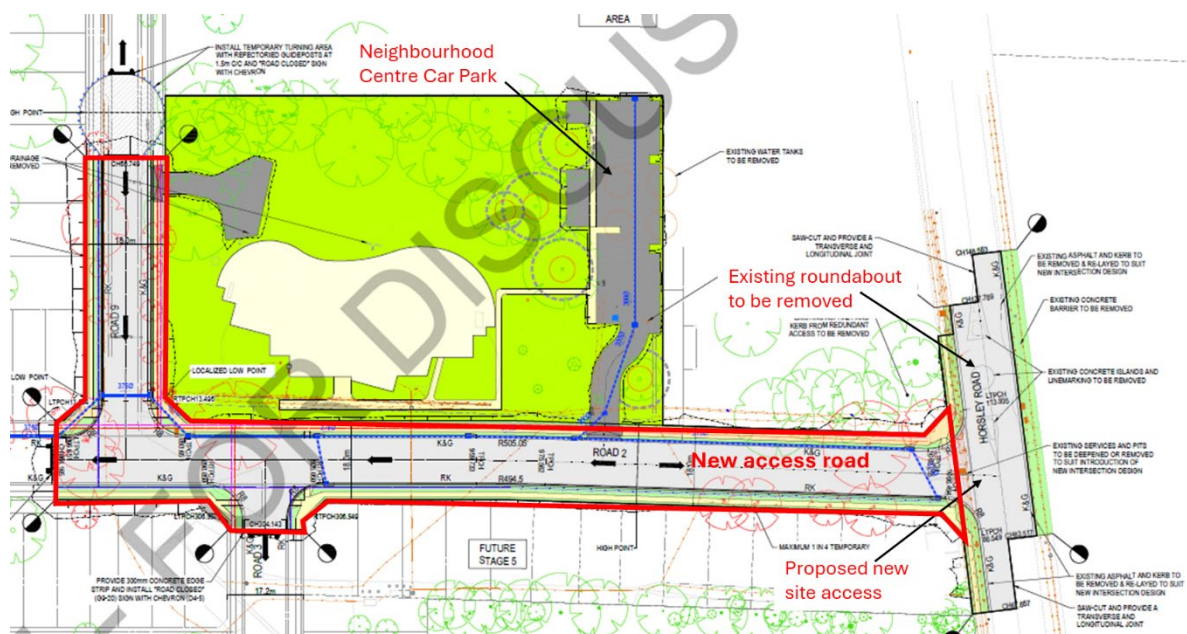
Figure 3.3: Local Road Cross Section
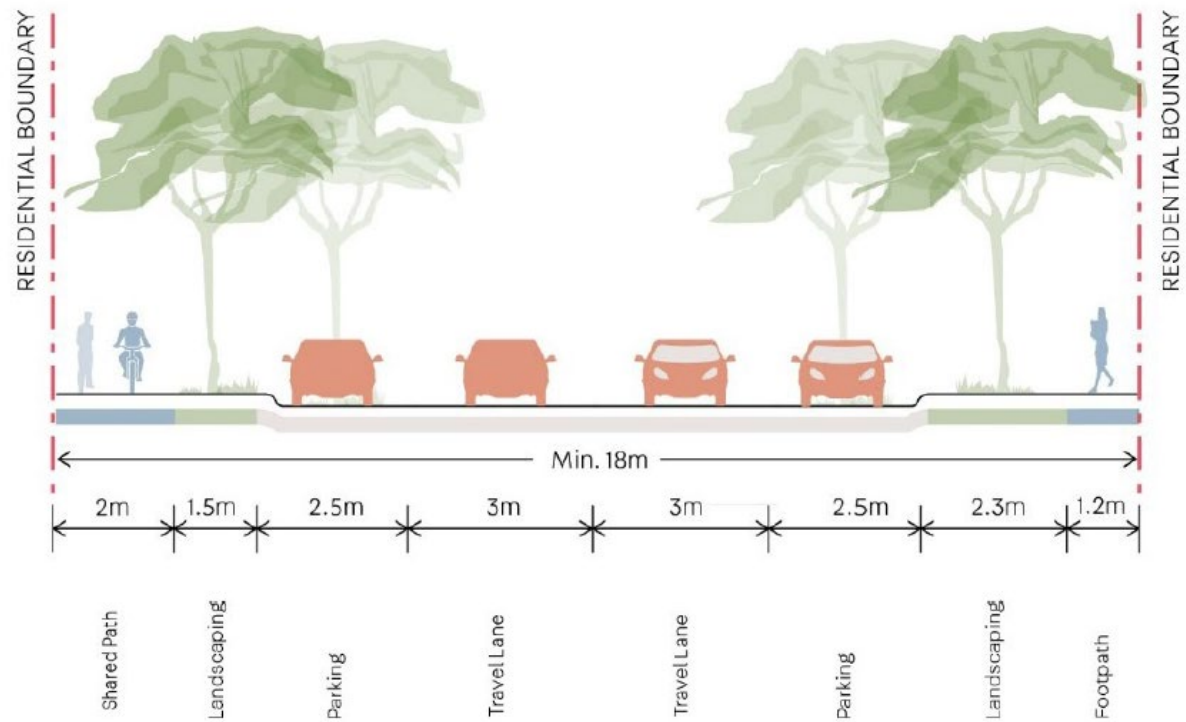
Source: Figure 3 of adopted WSU Milperra Site Specific Development Control Plan

4   Parking Assessment

4.1   Car Parking Assessment

The car parking requirements for the proposed development have been assessed against the Canterbury-Bankstown DCP 2023. A summary of Council's DCP car parking requirements is presented in Table 4.1.

Table 4.1: Council DCP Car Parking Requirements

Land Use	Development Yield	Car Parking Rates	Car Parking Requirements
Childcare	95 children	1 space per 4 children (for staff and visitor parking)	24
Sales Office (office premises)	48m² GFA	1 car space per 40m² GFA	1
Café (restaurants)	133m² GFA	Locations in the former Bankstown LGA Where a restaurant with greater than 100m² of total dining/bar area is provided, 0.15 car space per square metre in excess of 100m².	5
Total			**30**

The proposed development is required to provide a total of 30 car parking spaces according to Council's DCP. The development proposes to provide 30 car spaces within the at-grade car park, thus complies with Council's DCP requirements.

4.2   Accessible Parking Requirement

The DCP Chapter 3.2 Clause 2.7 stipulates the accessible parking requirements. This site is considered a publicly accessible building (BCA Class 9). According to the DCP, in publicly accessible buildings where a development containing more than 10 car spaces, 1 accessible car space is required for every 25 car spaces.

The provision of 30 car spaces would require one accessible space. The proposed development will provide one accessible space within the car park, thus complies with the DCP requirement.

4.3   Bicycle Parking Requirement

The DCP provides bicycle parking rates for the development, as shown in Table 4.2.

Table 4.2: Council DCP Bicycle Parking Requirements

Land Use	Development Yield	Bicycle Parking Rates	Bicycle Parking Requirements
Childcare	16 Staff	1 space per 4 staff	4
Sales Office (office premises)	48m² GFA	Staff: 1 space per 300m² GFA Visitor: 1 space per 500m² GFA over 1,000m²	0
Café (restaurants)	133m² GFA	Staff: 1 space per 100m² GFA over 100m² Visitors: 2 spaces	2 visitor spaces
Total			**6**

According to Table 4.2, the proposed development requires 6 bicycle parking spaces. These bicycle parking spaces will be provided adjacent to the footpath in front of the neighbourhood centre. Therefore, the provision of bicycle parking complies with Council's requirements.

4.4   Waste Collection / Service Vehicle Arrangements

It is proposed that waste collection of the site will occur within the car park and a designated service bay will be provided. It is noted that waste collection will only occur outside the operation hours of the site, to minimise impacts and ensure the safety of other users of the car park. This is to be included in the waste management plan/site operation management plan.

Deliveries to the site will be undertaken by a van (typically a B99 vehicle) or similar vehicle on the service bay or a visitor space. It is anticipated that deliveries will occur between 10am and 2pm on weekdays, which is outside the peak drop-off/pick-up periods. The low frequency of deliveries will not have a noticeable impact on the operation of the site.

4.5   Car Park Layout Review

The proposed car park layout in general complies with Australian Standards AS2890.1 and AS2890.6 for accessible parking spaces. Childcare visitor parking spaces are designed in accordance with the Class 3 parking requirements of AS2890.1:2004.

The private waste vehicle will be required to park within the parking aisle or use some car spaces to turn around within the car park. However, since waste collection will only occur outside the operation hours, this is considered acceptable and will have negligible impact on the operation of the site.

5   Traffic Assessment

5.1   Adjacent Development Traffic Generation

A traffic impact assessment report has been prepared by Genesis Traffic in February 2024 for a proposed industrial development at 270 Horsley Road which is located east of the site. The proposal involves a multi-storey industrial complex comprising 12 warehouse units with a total GFA of 77,130m². Furthermore, the industrial development will remove the existing vehicle access on Horsley Road (adjacent to the roundabout of the subject site's existing access) and construct two new access driveways on Horsley Road, as shown in Figure 5.1.

Based on Genesis's traffic report, the proposed industrial development would generate 185vph and 139vph during the AM and PM peak periods as shown in Figure 5.2. It is acknowledged that the existing site has been demolished when the traffic survey was undertaken on 19 November 2024, thus no existing traffic generation from the industrial site. Based on this, the adjacent development traffic distribution (185vph in AM and 139vph in PM) is illustrated in Figure 5.3.

Figure 5.1: Proposed New Site Access of 270 Horsley Road Development

Figure 5.2: Adjacent Development Traffic Generation

Period	AM peak (0.24 vtph per 100m²)	PM peak (0.18 vtph per 100m²)	Daily (2.64 vehicle trips per 100m²)
Proposal (77,130m² GFA)	+ 185 vtph	+ 139 vtph	+ 2,036 vehicle trips
Less Existing Traffic	-13 vph	- 10 vph	- 563 vehicle trips
Net Addition	+ 172 vtph	+ 129 vtph	+ 1,895 vehicle trips

Figure 5.3: Adjacent Development Traffic Distribution
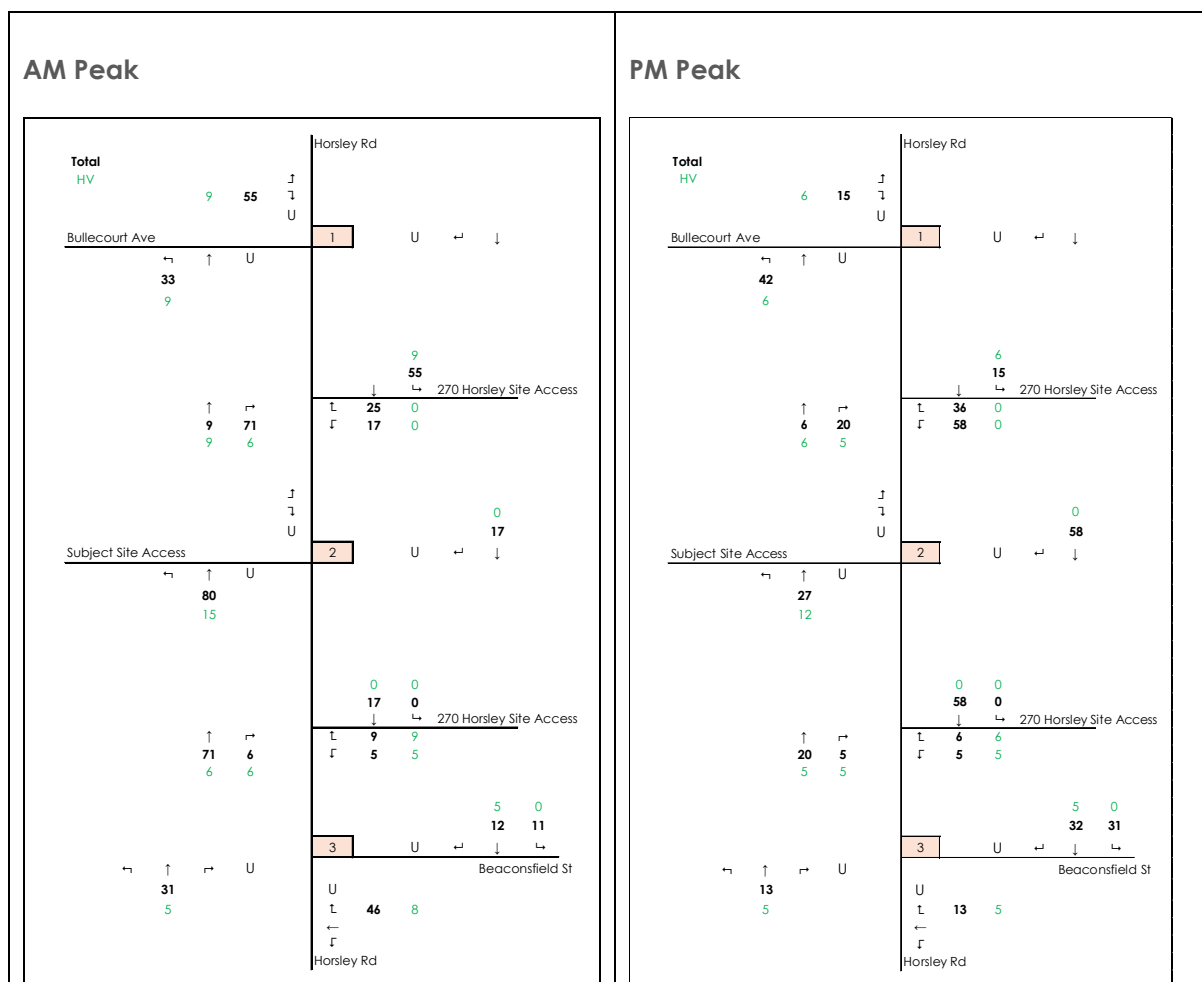
5.2 Proposed Neighbourhood Centre Traffic Generation

Typical generation rates for the proposed development have been sourced from the latest TfNSW Guide to Transport Impact Assessment 2024 (the Guide).

Childcare Centre

The following traffic generation rates have been adopted for the childcare centre.

- 0.81 vehicle trips per child in the AM peak hour

- 0.80 vehicle trips per child in the PM peak hour.

Note: the above trip rates are for the site peak hour period whereas the road network peak hour trip rates for a childcare centre are 0.64 and 0.39 trips per hour for the AM and PM peak respectively. It is further noted that the childcare site peaks do not generally coincide with the road network peaks. However, for a robust assessment the more conservative rates (i.e. site peak) have been used to estimate the potential traffic generation.

Sales Office

The following traffic generation rates have been adopted for the sales office component.

- 1.69 vehicle trips per 100m^2 in the AM peak hour

- 1.20 vehicle trips per 100m^2 in the PM peak hour

Restaurant/Café

The following traffic generation rates have been adopted for the café.

- 2.5 vehicle trips per 100m^2 in the AM peak hour

- 5 vehicle trips per 100m^2 in the PM peak hour

Note: the Guide does not stipulate AM peak trip rate for restaurants. However, as the proposed use is a small local neighbourhood café a trip rate of 50% of the PM rate has been assumed. Furthermore, a local café typically does not operate during the evening road network peak. However, for a robust assessment the PM trip rate has been included.

Future Residential Traffic

To assess the cumulative impacts of the ultimate masterplan, potential traffic generation of the residential component is included for the traffic assessment.

Based on the Guide, the traffic generation rates for low and medium density residential dwellings are as follows:

Low Density Residential
- 0.68 vehicle trips per dwelling in the AM peak hour

- 0.77 vehicle trips per dwelling in the PM peak hour.

Medium Density Residential
- 0.39 vehicle trips per dwelling in the AM peak hour

- 0.37 vehicle trips per dwelling in the PM peak hour.

As noted above, the Planning Proposal was approved for a total number of 430 residential dwellings. However, during the DA stages of the subdivision, the total residential dwelling

provision has been revised down to a total of 382 dwellings which is based on dwelling design and market conditions and also balances density and amenity.

Furthermore, as the individual stages of the residential subdivision are being developed and submitted, refinement of the total 382 dwellings allocation between low density and medium density is still being considered.

Notwithstanding this, for the purposes of traffic generation and traffic modelling a robust approach has been undertaken to conservatively assume the higher trip rates (i.e. low-density rates) for the entire residential subdivision (382 dwellings).

Table 5.1 provides a summary of potential traffic generation of the proposed development (i.e. childcare, sales office and restaurant/café) with consideration of the full residential subdivision. The following inbound and outbound traffic distribution factors have been assumed:

- Neighbourhood centre (i.e. childcare, sales office and restaurant/café): the distribution of inbound and outbound traffic is 50:50 in both AM and PM peaks.

- Residential Traffic: 20 per cent inbound traffic and 80 per cent outbound traffic in the AM peak. The reverse would apply in the PM peak.

Table 5.1: Traffic Generation Summary

Land Use	Yield	TfNSW Traffic Generation Rate		Traffic Generation			
		AM Peak	PM Peak	AM Peak		PM Peak	
				Inbound	Outbound	Inbound	Outbound
Childcare	95 children	0.81 trips per child	0.8 trips per child	39	39	38	38
Office	48m²	1.69 trips per 100m²	1.2 trips per 100m²	1	1	1	1
Restaurant/Café	133m²	2.5 trips per 100m²	5 trips per 100m²	2	2	4	4
Low Density [1]	382 dwellings	0.68 trips per dwelling	0.77 trips per dwelling	52	208	235	59
Total				**342**		**379**	

[1] conservatively assumed low density trip rates for all residential dwellings. In reality there would be some proportion of medium density dwellings which stipulate lower trip generation rates.

Based on the above, the full subdivision including the proposed development would generate 342 vehicle trips (inbound and outbound) in the AM peak hour and 379 vehicle trips (inbound and outbound) in the PM peak hour.

The above traffic generation is less than the planning proposal traffic generation, which was expected to generate 440 vehicle trips in the AM peak hour and 457 vehicle trips in the PM peak hour.

5.3 Traffic Distribution

It is noted that internal road connection to the wider subdivision would not be provided as part of this DA. The internal road connection will be provided as part of the Stages 5 and 6 residential subdivision DAs, which will allow access between the neighbourhood centre, Ashford Avenue and Bullecourt Avenue.

Therefore, prior to completion of the entire residential subdivision development, traffic generated by the neighbourhood centre will only access the site via 'Road 2' off Horsley Road (short-term). Once the internal road connection is completed (long-term), some neighbourhood centre traffic may access the site from the west or north via Ashford Avenue or Bullecourt Avenue. Additionally, some residential traffic will use 'Road 2' to access Horsley Road. The following traffic distributions are assumed in the long-term when the entire masterplan site is developed:

- Neighbourhood Centre Traffic: 50% of the traffic (in/out) will use Horsley Road access, and the rest 50% of the traffic (in/out) will either be internal residential traffic from the west or use Ashford Avenue/Bullecourt Avenue access.

- Residential Traffic: 1/3 of the residential traffic (in/out) will use Horsley Road access.

Figure 5.4 illustrates the AM and PM traffic distribution of the neighbourhood centre only – inbound/outbound trips via Horsley Road access only.

Figure 5.5 illustrates the traffic distribution when the full subdivision is completed, and all development traffic can enter/exit from the east, north and west as needed.

Figure 5.4: Traffic Distribution of Neighbourhood Centre – Horsley Access Only
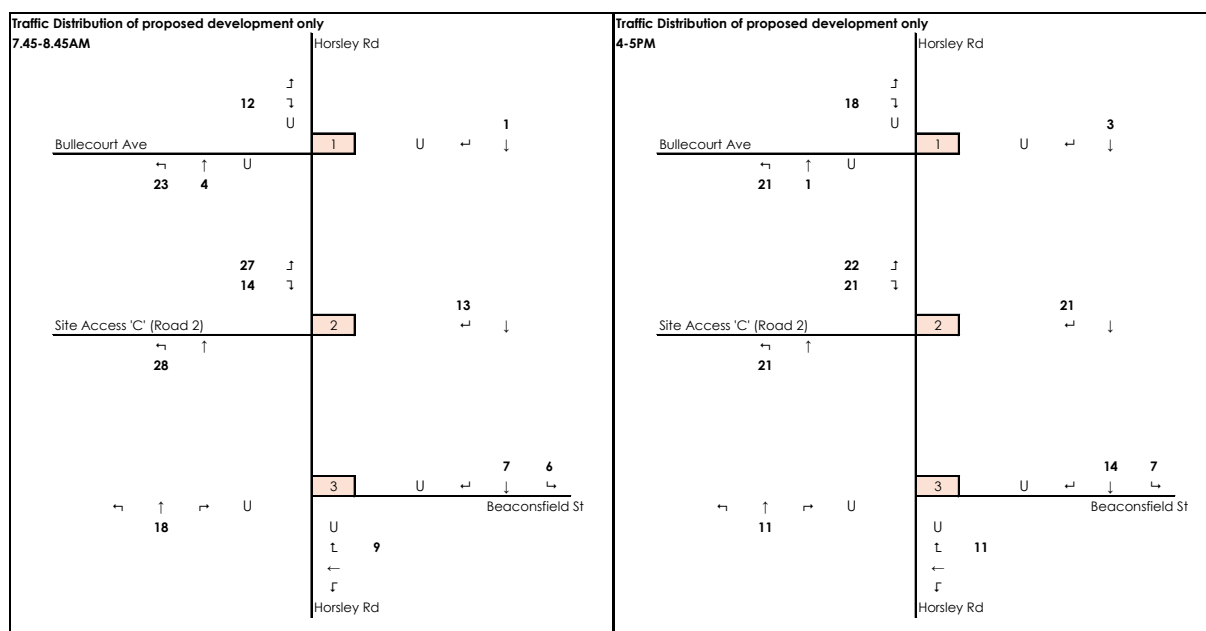
Note – internal road connections to residential connection not yet provided for this DA.

Figure 5.5: Traffic Distribution of Full Subdivision Including Neighbourhood Centre and Residents – Traffic can access site via Horsley Rd, Ashford Ave or Bullecourt Ave
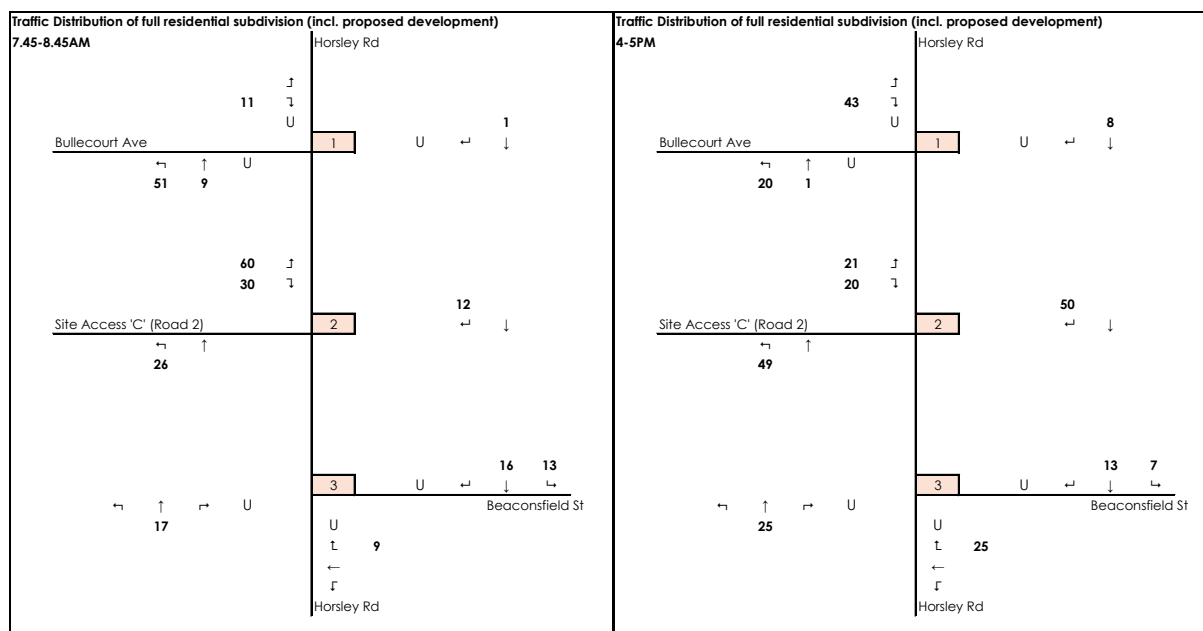
5.4 Traffic Modelling

Performance criteria for intersections are based on the TfNSW Guide to Transport Impact Assessment. A qualitative rating and its corresponding Level of Service (LoS) are applied to the average delay per vehicle as shown in Table 5.2.

Table 5.2: RMS Level of Service Criteria

Level of Service (LoS)	Average Delay per vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Sign
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	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	Greater than 70	Unsatisfactory, requires additional capacity	Unsatisfactory, requires other control mode or major treatment

At signalised intersections, the average delay is the volume weighted average of all movements. For roundabouts and priority (give way and stop sign) controlled intersections, the average delay relates to the worst movement.

5.4.1 Assessed Scenarios

Intersection traffic modelling was undertaken using SIDRA software version 9.1 to assess the performance of the following key intersections:

- Horsley Road – Bullecourt Avenue

- Horsley Road – Site Access (Road no.2)

- Horsley Road – Beaconsfield Street

The following scenarios were assessed:

- **Scenario 1:** Existing conditions - 2024 base case (including existing roundabout site access)

- **Scenario 2:** 2024 Existing + Neighbourhood Centre Development + site access modified to priority T-intersection

- **Scenario 3:** 2024 Existing + Neighbourhood Centre Development + site access modified to priority T-intersection + ultimate residential development traffic (access via internal road connection is available)

- **Scenario 4:** Scenario 3 + adjacent 270 Horsley Road development traffic

- **Scenario 5:** Scenario 4 + 2034 future background traffic growth (10-year traffic growth projections based on TfNSW STFM)

5.4.2 Site Access Road Intersection Layout

The existing site access is currently configured as a three-legged roundabout (Figure 5.6). It is proposed to convert the intersection into a priority T-intersection as shown in Figure 5.7 which applies to Scenarios 2 - 5.

Figure 5.6: Existing Site Access Layout
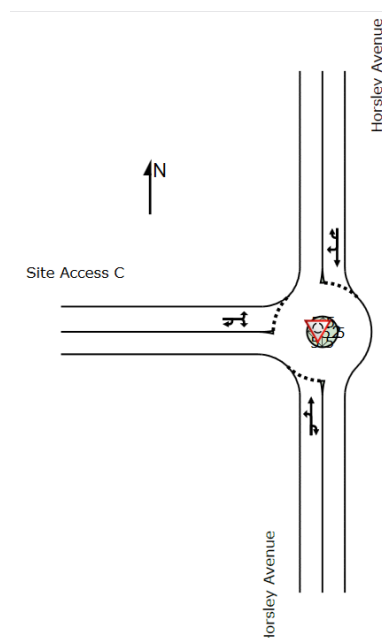
Figure 5.7: Proposed Site Access Layout
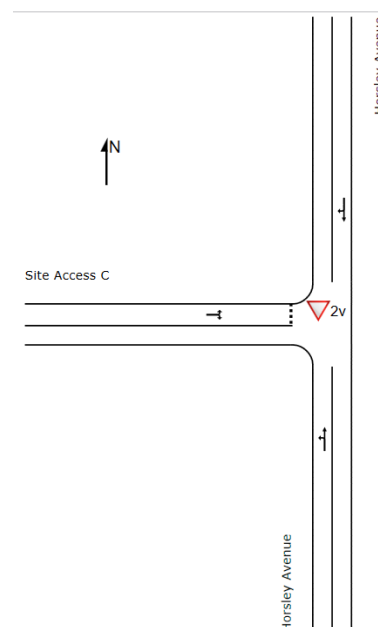
5.4.3 Modelling Results

Table 5.3 (AM) and Table 5.4 (PM) provide a summary of the SIDRA modelling results.

Table 5.3: AM Peak SIDRA Results

Intersection	Control	Scenario 1		Scenario 2		Scenario 3		Scenario 4		Scenario 5	
		Avg Delay	LoS	Avg Delay	LoS	Avg Delay	LoS	Avg Delay	LoS	Avg Delay	LoS
Horsley Road / Bullecourt Avenue	Roundabout	13	A	14	A	14	A	15	B	15	B
Site Access (Road 2)	Roundabout Priority [1]	10	A	16	B	17	B	20	B	27	B
Horsley Road / Beaconsfield Street	Roundabout	12	A	12	A	12	A	14	A	14	A

[1] Scenario 1 layout roundabout. Scenarios 2-5 Priority T-intersection

Table 5.4: PM Peak SIDRA Results

Intersection	Control	Scenario 1		Scenario 2		Scenario 3		Scenario 4		Scenario 5	
		Avg Delay	LoS	Avg Delay	LoS	Avg Delay	LoS	Avg Delay	LoS	Avg Delay	LoS
Horsley Road / Bullecourt Avenue	Roundabout	14	A	14	A	15	B	15	B	18	B
Site Access (Road 2)	Roundabout Priority [1]	10	A	11	A	12	A	14	A	22	B
Horsley Road / Beaconsfield Street	Roundabout	12	A	12	A	12	A	13	A	15	B

[1] Scenario 1 layout roundabout. Scenario 2-5 Priority T-intersection

The intersections under existing conditions operate satisfactorily at LoS A in both peak periods. With the modified site access intersection (priority T-intersection) and addition of the proposed development traffic, full residential subdivision and adjacent development, the surrounding key intersections are anticipated to operate satisfactorily at LoS B or better. Additionally, with the 10-year future background traffic growth the intersections would also continue to operate satisfactorily.

Furthermore, the proposed development is consistent with the overall masterplan for the site, which was assessed in the TTPP's Transport Assessment (Version 05, dated 2 June 2020) as part of the approved planning proposal to rezone the site.

The previous study which assessed the full masterplan of the site concluded that:

▪ *The surrounding key intersections are expected to continue to operate satisfactorily at LoS B or better during both AM and PM peak periods. On this basis, the proposed development is not expected to compromise the existing intersection performance on the surrounding road network, nor result in any safety or operational issues. Therefore, the proposal is considered acceptable from a traffic capacity perspective.*

Overall, the traffic generation of the proposed development is not expected to compromise the intersection performance on the surrounding road network. Moreover, the proposed site access priority intersection on Horsley Road will be able to accommodate the additional development traffic from the neighbourhood centre and residential subdivision, and will have no material impact on the surrounding road network.

6 Conclusion

This report examines the traffic and parking implications of the proposed neighbourhood centre development, which forms part of the wider masterplan of the site.

The key findings of the assessment are presented as follows:

- The neighbourhood centre development application seeks approval to provide a 95-place childcare centre, a sales office and a local café, as well as modification of the site access on Horsley Road to be a priority T-intersection.

- This work forms part of the overall masterplan of the site which obtained approval from the South District Planning Panel in July 2023 to rezone the site to provide residential dwellings, a new commercial centre and public open spaces (Ref: PP-2021-5837).

- This assessment seeks approval for the neighbourhood centre only. All future residential subdivision would be subject to separate DAs for approval.

- Access to the neighbourhood centre will be provided via a new access road ('Road 2') directly off Horsley Road, which will be designed in accordance with the adopted site-specific DCP requirements. 'Road 2' will be temporarily constructed as a cul-de-sac at the western end for this DA however connection to the internal local road network will be provided as part of a separate future residential subdivision DA.

- The proposed development will provide sufficient off-street parking with 30 car parking spaces as per Council DCP requirements. These spaces are proposed to be designed in accordance with AS2890.1 and AS2890.6 design requirements.

- Private waste collection of the site will be accommodated within the car park, and will only occur outside of business operating hours to minimise the impacts on other users of the car park.

- The proposed neighbourhood centre development is expected to generate 84 and 86 vehicle trips (in and out) in the AM and PM peak hour respectively.

- Traffic modelling has been undertaken to assess the traffic impacts of the proposed development (including modification of the existing site access roundabout to a priority T-intersection on Horsley Road), and the cumulative impacts with the ultimate residential subdivision (382 dwellings) and the adjacent industrial development (270 Horsley Road).

- The modelling results indicate all surrounding key intersections are anticipated to operate acceptably at LoS B or better in the short-term and ultimate scenarios. The ultimate scenario results are also consistent with the approved planning proposal of the masterplan site. Therefore, the expected traffic generation of the proposed development and the proposed site access arrangement are not expected to cause significant additional impacts on the road network.

Overall, the traffic and parking aspects of the proposed development are satisfactory.

Appendix A

Site Plans

THE DISCHARGE POINTS OF THE
EXITS REQUIRE THE PATHS OF
TRAVEL TO THE PUBLIC ROAD TO BE
VIA A RAMP NOT EXCEEDING 1:8

EXTENT
OF
PROPOSE
D
RETAININ

RL22.666

RL22.707

RL22.6

RL22.4

RL22.6

RL22.713

RL22.0

RL22.444

RL22.602

17
16
15
14
13
12
81
30
11
29
10
28
09
27
08
26
07

PROPOSED CARPARK

18

19

20

21

22

TURNING
AREA

SERVICE BAY/ TURN
BAY

64   65

63

06
05
04
03
02
1

23

24

25

5400   6600   2400

WASTE
COLLECTION
POINT

PROPOSED NEW
PEDESTRAIN
PATH FROM
CARPARK TO
EXISTING PATH
PROPOSED BIKE
PARKING (5 NOS)

EXISTING PAVED
PEDESTRAIN
PATH TO REMAIN

RL22.

NEW
PEDESTRAIN
PATH
CONNECTING
EXISTING PAVED
PATH TO NEW
FOOTPATH

**PROPOSED ALTS & ADDS TO
CHILDCARE CENTRE**

23785

29408

9227

16580

4763

ELECTRICAL CABINET

10197

7775

25622

16016

6600

6600

**PROPOSED PEDESTRIAN
PATHWAY**

PROPOSED NEW ROAD (ROAD NO. 2)

**PROPOSED
VEHICLE
CROSSING**

180°46'30" 213.29 BDY

PROPOSED SITE PLAN

SCALE 1 : 500 (A3)

PARKING SCHEDULE

ACCESSIBLE	1
ADDITIONAL PARKING	6
STAFF	12
VISITOR	11
TOTAL CARPARKING SPACES	**30**

AMENDMENTS:		
F	PRELIMINARY DA	25.11.2024
G	PRELIMINARY DA	04.12.2024
H	FOOTPATH ADDED	05.12.2024
I	ISSUED FOR DA	11.12.2024

PROJECT NO.:

#194

DA-06

MIRVAC

PROPOSED ALTS & ADDS TO EXISTING CHILDCARE
CENTRE

2 BULLECOURT AVENUE, MILPERRA NSW 2214

0   1   2m

Appendix B

SIDRA Movement Summary

MOVEMENT SUMMARY

▽ Site: 1 [Horsley Road/ Bullecourt Avenue (Site Folder: S1 EX AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

■■ **Network: AM [AM (Network Folder: S1 EX)]**

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h	%	Arrival Flows [Total HV] veh/h	%	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Horsley Road															
1	L2	All MCs	473	8.2	473	8.2	0.417	5.7	LOS A	1.3	10.0	0.40	0.52	0.40	39.7
2	T1	All MCs	86	3.7	86	3.7	0.417	5.4	LOS A	1.3	10.0	0.40	0.52	0.40	47.3
3u	U	All MCs	4	25.0	4	25.0	0.417	10.3	LOS A	1.3	10.0	0.40	0.52	0.40	36.0
Approach			563	7.7	563	7.7	0.417	5.7	LOS A	1.3	10.0	0.40	0.52	0.40	41.2
North: Horsley Road															
8	T1	All MCs	62	5.1	62	5.1	0.213	8.3	LOS A	0.5	4.4	0.71	0.72	0.71	42.0
9	R2	All MCs	83	48.1	83	48.1	0.213	13.2	LOS A	0.5	4.4	0.71	0.72	0.71	39.1
9u	U	All MCs	1	0.0	1	0.0	0.213	12.5	LOS A	0.5	4.4	0.71	0.72	0.71	46.7
Approach			146	29.5	146	29.5	0.213	11.1	LOS A	0.5	4.4	0.71	0.72	0.71	40.1
West: Bullacourt Avenue															
10	L2	All MCs	188	17.3	188	17.3	0.652	6.7	LOS A	2.8	21.0	0.53	0.57	0.53	43.5
12	R2	All MCs	564	6.5	564	6.5	0.652	8.9	LOS A	2.8	21.0	0.53	0.57	0.53	32.9
12u	U	All MCs	5	0.0	5	0.0	0.652	10.2	LOS A	2.8	21.0	0.53	0.57	0.53	37.8
Approach			758	9.2	758	9.2	0.652	8.3	LOS A	2.8	21.0	0.53	0.57	0.53	37.6
All Vehicles			1467	10.6	1467	10.6	0.652	7.6	LOS A	2.8	21.0	0.50	0.57	0.50	39.4

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ Site: 2 [Horsley Road/Site Access C (Site Folder: S1 EX AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

■□ **Network: AM [AM (Network Folder: S1 EX)]**

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance																	
Mov ID	Turn	Mov Class	Demand Flows [Total HV]		Arrival Flows [Total HV]		Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue [Veh.	Dist]	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Horsley Avenue															
1	L2	All MCs	17	0.0	17	0.0	0.460	7.6	LOS A	1.5	10.8	0.27	0.52	0.27	33.9
2	T1	All MCs	527	8.0	527	8.0	0.460	5.4	LOS A	1.5	10.8	0.27	0.52	0.27	38.7
3u	U	All MCs	71	1.5	71	1.5	0.460	9.1	LOS A	1.5	10.8	0.27	0.52	0.27	38.7
Approach			615	7.0	615	7.0	0.460	5.9	LOS A	1.5	10.8	0.27	0.52	0.27	38.5
North: Horsley Avenue															
8	T1	All MCs	585	7.0	585	7.0	0.381	5.3	LOS A	1.1	7.9	0.28	0.53	0.28	36.3
9	R2	All MCs	48	0.0	48	0.0	0.381	10.4	LOS A	1.1	7.9	0.28	0.53	0.28	31.5
9u	U	All MCs	3	0.0	3	0.0	0.381	9.1	LOS A	1.1	7.9	0.28	0.53	0.28	36.3
Approach			637	6.4	637	6.4	0.381	5.7	LOS A	1.1	7.9	0.28	0.53	0.28	35.8
West: Site Access C															
10	L2	All MCs	36	0.0	36	0.0	0.075	3.4	LOS A	0.2	1.1	0.61	0.47	0.61	7.2
12	R2	All MCs	20	0.0	20	0.0	0.075	3.4	LOS A	0.2	1.1	0.61	0.47	0.61	7.2
12u	U	All MCs	1	0.0	1	0.0	0.075	3.4	LOS A	0.2	1.1	0.61	0.47	0.61	7.8
Approach			57	0.0	57	0.0	0.075	3.4	LOS A	0.2	1.1	0.61	0.47	0.61	7.2
All Vehicles			1308	6.4	1308	6.4	0.460	5.7	LOS A	1.5	10.8	0.29	0.52	0.29	36.3

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ Site: 3 [Horsley Road/ Beaconsfield Street/School Access Roundabout (Site Folder: S1 EX AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

■■▯ Network: AM [AM (Network Folder: S1 EX)]

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h		Arrival Flows [Total HV] veh/h		Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
			veh/h	%	veh/h	%									
South: Horsley Road															
1	L2	All MCs	31	0.0	31	0.0	0.500	7.1	LOS A	1.0	7.5	0.50	0.59	0.51	14.2
2	T1	All MCs	313	5.4	313	5.4	0.500	4.0	LOS A	1.0	7.5	0.50	0.59	0.51	34.0
3	R2	All MCs	99	4.3	99	4.3	0.500	6.9	LOS A	1.0	7.5	0.50	0.59	0.51	42.6
3u	U	All MCs	49	0.0	49	0.0	0.500	8.0	LOS A	1.0	7.5	0.50	0.59	0.51	41.0
Approach			492	4.3	492	4.3	0.500	5.2	LOS A	1.0	7.5	0.50	0.59	0.51	32.2
East: Beaconsfield Street															
4	L2	All MCs	76	13.9	76	13.9	0.425	8.0	LOS A	1.1	8.5	0.73	0.74	0.75	38.2
5	T1	All MCs	42	0.0	42	0.0	0.425	11.9	LOS A	1.1	8.5	0.73	0.74	0.75	15.0
6	R2	All MCs	161	15.7	161	15.7	0.425	10.4	LOS A	1.1	8.5	0.73	0.74	0.75	32.3
6u	U	All MCs	15	0.0	15	0.0	0.425	10.8	LOS A	1.1	8.5	0.73	0.74	0.75	40.2
Approach			294	12.2	294	12.2	0.425	10.0	LOS A	1.1	8.5	0.73	0.74	0.75	27.4
North: Horsley Road															
7	L2	All MCs	261	10.1	261	10.1	0.219	5.1	LOS A	0.6	4.7	0.44	0.53	0.44	43.2
8	T1	All MCs	317	3.7	317	3.7	0.269	3.4	LOS A	0.8	5.9	0.42	0.52	0.42	41.7
9	R2	All MCs	82	0.0	82	0.0	0.269	9.9	LOS A	0.8	5.9	0.42	0.52	0.42	12.3
9u	U	All MCs	21	0.0	21	0.0	0.269	7.3	LOS A	0.8	5.9	0.42	0.52	0.42	30.2
Approach			681	5.6	681	5.6	0.269	5.0	LOS A	0.8	5.9	0.43	0.52	0.43	31.3
All Vehicles			1466	6.5	1466	6.5	0.500	6.1	LOS A	1.1	8.5	0.51	0.59	0.52	30.6

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ **Site: 1 [Horsley Road/ Bullecourt Avenue (Site Folder: S1 EX PM)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

◼▭◼ **Network: PM [PM (Network Folder: S1 EX)]**

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance																	
Mov ID	Turn	Mov Class	Demand Flows [Total HV]		Arrival Flows [Total HV]		Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue [Veh.	Dist]	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Horsley Road															
1	L2	All MCs	554	4.4	554	4.4	0.545	7.0	LOS A	1.8	13.4	0.67	0.61	0.67	38.8
2	T1	All MCs	16	0.0	16	0.0	0.545	6.7	LOS A	1.8	13.4	0.67	0.61	0.67	46.3
3u	U	All MCs	2	0.0	2	0.0	0.545	11.1	LOS A	1.8	13.4	0.67	0.61	0.67	33.9
Approach			572	4.2	572	4.2	0.545	7.0	LOS A	1.8	13.4	0.67	0.61	0.67	39.1
North: Horsley Road															
8	T1	All MCs	93	4.5	93	4.5	0.429	9.6	LOS A	1.1	8.4	0.73	0.75	0.76	40.4
9	R2	All MCs	229	10.6	229	10.6	0.429	12.8	LOS A	1.1	8.4	0.73	0.75	0.76	40.9
9u	U	All MCs	1	0.0	1	0.0	0.429	13.7	LOS A	1.1	8.4	0.73	0.75	0.76	45.6
Approach			323	8.8	323	8.8	0.429	11.9	LOS A	1.1	8.4	0.73	0.75	0.76	40.8
West: Bullacourt Avenue															
10	L2	All MCs	51	35.4	51	35.4	0.410	5.7	LOS A	1.4	10.2	0.16	0.61	0.16	43.4
12	R2	All MCs	523	4.0	523	4.0	0.410	7.8	LOS A	1.4	10.2	0.16	0.61	0.16	34.6
12u	U	All MCs	3	0.0	3	0.0	0.410	9.3	LOS A	1.4	10.2	0.16	0.61	0.16	39.0
Approach			577	6.8	577	6.8	0.410	7.6	LOS A	1.4	10.2	0.16	0.61	0.16	36.3
All Vehicles			1472	6.2	1472	6.2	0.545	8.3	LOS A	1.8	13.4	0.48	0.64	0.49	38.9

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ Site: 2 [Horsley Road/Site Access C (Site Folder: S1 EX PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

■■■ **Network: PM [PM (Network Folder: S1 EX)]**

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance																
Mov ID	Turn	Mov Class	Demand Flows [Total HV]		Arrival Flows [Total HV]		Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue [Veh.	Dist]	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Horsley Avenue															
1	L2	All MCs	12	0.0	12	0.0	0.372	7.2	LOS A	1.0	7.3	0.11	0.51	0.11	35.6
2	T1	All MCs	544	4.6	544	4.6	0.372	5.0	LOS A	1.0	7.3	0.11	0.51	0.11	41.0
3u	U	All MCs	5	0.0	5	0.0	0.372	8.8	LOS A	1.0	7.3	0.11	0.51	0.11	41.0
Approach			561	4.5	561	4.5	0.372	5.1	LOS A	1.0	7.3	0.11	0.51	0.11	40.8
North: Horsley Avenue															
8	T1	All MCs	598	4.4	598	4.4	0.399	5.0	LOS A	1.2	8.8	0.11	0.51	0.11	38.6
9	R2	All MCs	14	0.0	14	0.0	0.399	10.1	LOS A	1.2	8.8	0.11	0.51	0.11	33.2
9u	U	All MCs	1	0.0	1	0.0	0.399	8.8	LOS A	1.2	8.8	0.11	0.51	0.11	38.6
Approach			613	4.3	613	4.3	0.399	5.1	LOS A	1.2	8.8	0.11	0.51	0.11	38.5
West: Site Access C															
10	L2	All MCs	18	0.0	18	0.0	0.031	2.8	LOS A	0.1	0.4	0.54	0.39	0.54	7.5
12	R2	All MCs	6	0.0	6	0.0	0.031	2.8	LOS A	0.1	0.4	0.54	0.39	0.54	7.5
12u	U	All MCs	1	0.0	1	0.0	0.031	2.8	LOS A	0.1	0.4	0.54	0.39	0.54	8.1
Approach			25	0.0	25	0.0	0.031	2.8	LOS A	0.1	0.4	0.54	0.39	0.54	7.5
All Vehicles			1199	4.3	1199	4.3	0.399	5.0	LOS A	1.2	8.8	0.12	0.50	0.12	39.2

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ Site: 3 [Horsley Road/ Beaconsfield Street/School Access Roundabout (Site Folder: S1 EX PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

■■■ **Network: PM [PM (Network Folder: S1 EX)]**

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance																
Mov ID	Turn	Mov Class	Demand Flows [Total HV]		Arrival Flows [Total HV]		Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue [Veh.	Dist]	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Horsley Road															
1	L2	All MCs	1	0.0	1	0.0	0.308	8.2	LOS A	0.5	3.9	0.40	0.59	0.40	14.8
2	T1	All MCs	275	3.8	275	3.8	0.308	5.7	LOS A	0.5	3.9	0.40	0.59	0.40	45.5
3	R2	All MCs	40	0.0	40	0.0	0.308	8.6	LOS A	0.5	3.9	0.40	0.59	0.40	49.8
3u	U	All MCs	3	0.0	3	0.0	0.308	10.1	LOS A	0.5	3.9	0.40	0.59	0.40	48.5
Approach			319	3.3	319	3.3	0.308	6.1	LOS A	0.5	3.9	0.40	0.59	0.40	45.9
East: Beaconsfield Street															
4	L2	All MCs	63	3.3	63	3.3	0.379	8.0	LOS A	1.0	7.0	0.64	0.70	0.64	47.2
5	T1	All MCs	1	0.0	1	0.0	0.379	12.2	LOS A	1.0	7.0	0.64	0.70	0.64	16.0
6	R2	All MCs	275	5.0	275	5.0	0.379	10.8	LOS A	1.0	7.0	0.64	0.70	0.64	44.1
6u	U	All MCs	6	0.0	6	0.0	0.379	12.0	LOS A	1.0	7.0	0.64	0.70	0.64	48.4
Approach			345	4.6	345	4.6	0.379	10.3	LOS A	1.0	7.0	0.64	0.70	0.64	44.6
North: Horsley Road															
7	L2	All MCs	200	10.5	200	10.5	0.177	6.3	LOS A	0.5	3.6	0.25	0.56	0.25	47.2
8	T1	All MCs	407	1.0	407	1.0	0.274	5.2	LOS A	0.8	5.9	0.24	0.48	0.24	47.8
9	R2	All MCs	1	0.0	1	0.0	0.274	11.4	LOS A	0.8	5.9	0.24	0.48	0.24	12.7
9u	U	All MCs	2	0.0	2	0.0	0.274	9.4	LOS A	0.8	5.9	0.24	0.48	0.24	39.9
Approach			611	4.1	611	4.1	0.274	5.6	LOS A	0.8	5.9	0.24	0.51	0.24	47.3
All Vehicles			1275	4.0	1275	4.0	0.379	7.0	LOS A	1.0	7.0	0.39	0.58	0.39	46.2

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ Site: 1 [Horsley Road/ Bullecourt Avenue (Site Folder: S2 AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

◼▣◼ Network: AM [AM (Network Folder: S2 EX + Neighbourhood DA)]

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV]		Arrival Flows [Total HV]		Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue [Veh.	Dist]	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Horsley Road															
1	L2	All MCs	497	7.8	497	7.8	0.485	5.7	LOS A	1.7	12.8	0.44	0.53	0.44	39.1
2	T1	All MCs	91	3.5	91	3.5	0.485	5.5	LOS A	1.7	12.8	0.44	0.53	0.44	46.7
3u	U	All MCs	75	1.4	75	1.4	0.485	9.9	LOS A	1.7	12.8	0.44	0.53	0.44	35.0
Approach			662	6.5	662	6.5	0.485	6.2	LOS A	1.7	12.8	0.44	0.53	0.44	40.3
North: Horsley Road															
8	T1	All MCs	63	5.0	63	5.0	0.244	9.1	LOS A	0.6	5.4	0.79	0.75	0.79	41.0
9	R2	All MCs	83	48.1	83	48.1	0.244	14.1	LOS A	0.6	5.4	0.79	0.75	0.79	38.5
9u	U	All MCs	1	0.0	1	0.0	0.244	13.2	LOS A	0.6	5.4	0.79	0.75	0.79	46.0
Approach			147	29.3	147	29.3	0.244	11.9	LOS A	0.6	5.4	0.79	0.75	0.79	39.4
West: Bullacourt Avenue															
10	L2	All MCs	188	17.3	188	17.3	0.752	9.2	LOS A	3.9	29.7	0.79	0.63	0.84	41.9
12	R2	All MCs	577	6.4	577	6.4	0.752	11.2	LOS A	3.9	29.7	0.79	0.63	0.84	30.2
12u	U	All MCs	5	0.0	5	0.0	0.752	12.5	LOS A	3.9	29.7	0.79	0.63	0.84	35.8
Approach			771	9.0	771	9.0	0.752	10.8	LOS A	3.9	29.7	0.79	0.63	0.84	35.1
All Vehicles			1580	9.9	1580	9.9	0.752	8.9	LOS A	3.9	29.7	0.64	0.60	0.67	37.8

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ Site: 2v [Horsley Road/Site Access C - Conversion (Site Folder: S2 AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

◼▯◼ **Network: AM [AM (Network Folder: S2 EX + Neighbourhood DA)]**

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

Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h	%	Arrival Flows [Total HV] veh/h	%	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh] veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
Vehicle Movement Performance															
South: Horsley Avenue															
1	L2	All MCs	46	0.0	46	0.0	0.335	8.9	LOS A	0.0	0.0	0.00	0.08	0.00	30.9
2	T1	All MCs	601	7.0	601	7.0	0.335	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	56.5
Approach			647	6.5	647	6.5	0.335	0.7	NA	0.0	0.0	0.00	0.08	0.00	53.2
North: Horsley Avenue															
8	T1	All MCs	659	6.2	659	6.2	0.412	3.2	LOS A	0.5	3.5	0.16	0.51	0.20	42.5
9	R2	All MCs	62	0.0	62	0.0	0.412	12.3	LOS A	0.5	3.5	0.16	0.51	0.20	35.8
Approach			721	5.7	721	5.7	0.412	4.0	NA	0.5	3.5	0.16	0.51	0.20	41.8
West: Site Access C															
10	L2	All MCs	64	0.0	64	0.0	0.225	3.2	LOS A	0.3	2.2	0.70	0.76	0.76	5.4
12	R2	All MCs	35	0.0	35	0.0	0.225	15.5	LOS B	0.3	2.2	0.70	0.76	0.76	5.4
Approach			99	0.0	99	0.0	0.225	7.5	LOS A	0.3	2.2	0.70	0.76	0.76	5.4
All Vehicles			1467	5.7	1467	5.7	0.412	2.8	NA	0.5	3.5	0.12	0.34	0.15	43.7

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

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

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ Site: 3 [Horsley Road/ Beaconsfield Street/School Access Roundabout (Site Folder: S2 AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

◼◻ Network: AM [AM (Network Folder: S2 EX + Neighbourhood DA)]

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h	%	Arrival Flows [Total HV] veh/h	%	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh.] veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Horsley Road															
1	L2	All MCs	31	0.0	31	0.0	0.523	7.3	LOS A	1.2	8.4	0.53	0.61	0.55	14.2
2	T1	All MCs	332	5.1	332	5.1	0.523	4.2	LOS A	1.2	8.4	0.53	0.61	0.55	33.9
3	R2	All MCs	99	4.3	99	4.3	0.523	7.1	LOS A	1.2	8.4	0.53	0.61	0.55	42.6
3u	U	All MCs	49	0.0	49	0.0	0.523	8.3	LOS A	1.2	8.4	0.53	0.61	0.55	40.9
Approach			511	4.1	511	4.1	0.523	5.3	LOS A	1.2	8.4	0.53	0.61	0.55	32.2
East: Beaconsfield Street															
4	L2	All MCs	76	13.9	76	13.9	0.443	8.4	LOS A	1.2	9.2	0.74	0.76	0.79	38.1
5	T1	All MCs	42	0.0	42	0.0	0.443	12.2	LOS A	1.2	9.2	0.74	0.76	0.79	15.0
6	R2	All MCs	171	14.8	171	14.8	0.443	10.8	LOS A	1.2	9.2	0.74	0.76	0.79	32.1
6u	U	All MCs	15	0.0	15	0.0	0.443	11.1	LOS A	1.2	9.2	0.74	0.76	0.79	40.0
Approach			303	11.8	303	11.8	0.443	10.4	LOS A	1.2	9.2	0.74	0.76	0.79	27.3
North: Horsley Road															
7	L2	All MCs	267	9.8	267	9.8	0.224	5.1	LOS A	0.6	4.8	0.45	0.53	0.45	43.2
8	T1	All MCs	324	3.6	324	3.6	0.275	3.4	LOS A	0.9	6.1	0.43	0.52	0.43	41.7
9	R2	All MCs	82	0.0	82	0.0	0.275	9.9	LOS A	0.9	6.1	0.43	0.52	0.43	12.3
9u	U	All MCs	24	0.0	24	0.0	0.275	7.3	LOS A	0.9	6.1	0.43	0.52	0.43	30.2
Approach			698	5.4	698	5.4	0.275	5.0	LOS A	0.9	6.1	0.44	0.52	0.44	31.5
All Vehicles			1512	6.3	1512	6.3	0.523	6.2	LOS A	1.2	9.2	0.53	0.60	0.54	30.6

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ Site: 1 [Horsley Road/ Bullecourt Avenue (Site Folder: S2 PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

■■■ Network: PM [PM (Network Folder: S2 EX + Neighbourhood DA)]

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Horsley Road															
1	L2	All MCs	576	4.2	576	4.2	0.571	7.1	LOS A	2.0	14.5	0.69	0.61	0.69	38.7
2	T1	All MCs	17	0.0	17	0.0	0.571	6.8	LOS A	2.0	14.5	0.69	0.61	0.69	46.2
3u	U	All MCs	7	0.0	7	0.0	0.571	11.2	LOS A	2.0	14.5	0.69	0.61	0.69	33.7
Approach			600	4.0	600	4.0	0.571	7.1	LOS A	2.0	14.5	0.69	0.61	0.69	39.0
North: Horsley Road															
8	T1	All MCs	96	4.4	96	4.4	0.444	10.1	LOS A	1.2	9.1	0.75	0.77	0.80	39.8
9	R2	All MCs	229	10.6	229	10.6	0.444	13.3	LOS A	1.2	9.1	0.75	0.77	0.80	40.5
9u	U	All MCs	1	0.0	1	0.0	0.444	14.1	LOS A	1.2	9.1	0.75	0.77	0.80	45.3
Approach			326	8.7	326	8.7	0.444	12.4	LOS A	1.2	9.1	0.75	0.77	0.80	40.4
West: Bullacourt Avenue															
10	L2	All MCs	51	35.4	51	35.4	0.433	5.8	LOS A	1.5	11.1	0.20	0.60	0.20	43.3
12	R2	All MCs	542	3.9	542	3.9	0.433	7.9	LOS A	1.5	11.1	0.20	0.60	0.20	34.4
12u	U	All MCs	3	0.0	3	0.0	0.433	9.3	LOS A	1.5	11.1	0.20	0.60	0.20	38.8
Approach			596	6.5	596	6.5	0.433	7.7	LOS A	1.5	11.1	0.20	0.60	0.20	36.1
All Vehicles			1522	6.0	1522	6.0	0.571	8.5	LOS A	2.0	14.5	0.51	0.64	0.52	38.6

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ **Site: 2v [Horsley Road/Site Access C - Conversion (Site Folder: S2 PM)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

■●■ **Network: PM [PM (Network Folder: S2 EX + Neighbourhood DA)]**

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh] veh	[Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Horsley Avenue																
1	L2	All MCs	34	0.0	34	0.0	0.298	8.9	LOS A	0.0	0.0	0.00	0.07	0.00	31.1
2	T1	All MCs	549	4.6	549	4.6	0.298	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	57.2
Approach			583	4.3	583	4.3	0.298	0.5	NA	0.0	0.0	0.00	0.07	0.00	54.4
North: Horsley Avenue																
8	T1	All MCs	603	4.4	603	4.4	0.345	0.3	LOS A	0.2	1.4	0.10	0.14	0.10	54.5
9	R2	All MCs	36	0.0	36	0.0	0.345	11.3	LOS A	0.2	1.4	0.10	0.14	0.10	43.3
Approach			639	4.1	639	4.1	0.345	1.0	NA	0.2	1.4	0.10	0.14	0.10	53.7
West: Site Access C																
10	L2	All MCs	41	0.0	41	0.0	0.138	2.4	LOS A	0.2	1.3	0.63	0.63	0.63	6.0
12	R2	All MCs	28	0.0	28	0.0	0.138	10.7	LOS A	0.2	1.3	0.63	0.63	0.63	6.0
Approach			69	0.0	69	0.0	0.138	5.8	LOS A	0.2	1.3	0.63	0.63	0.63	6.0
All Vehicles			1292	4.0	1292	4.0	0.345	1.0	NA	0.2	1.4	0.08	0.13	0.08	50.9

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

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

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ Site: 3 [Horsley Road/ Beaconsfield Street/School Access Roundabout (Site Folder: S2 PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

◼◼ Network: PM [PM (Network Folder: S2 EX + Neighbourhood DA)]

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total] veh/h	HV] %	Arrival Flows [Total] veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh.] veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Horsley Road															
1	L2	All MCs	1	0.0	1	0.0	0.321	8.2	LOS A	0.6	4.2	0.41	0.59	0.41	14.8
2	T1	All MCs	286	3.7	286	3.7	0.321	5.8	LOS A	0.6	4.2	0.41	0.59	0.41	45.4
3	R2	All MCs	40	0.0	40	0.0	0.321	8.7	LOS A	0.6	4.2	0.41	0.59	0.41	49.8
3u	U	All MCs	3	0.0	3	0.0	0.321	10.2	LOS A	0.6	4.2	0.41	0.59	0.41	48.5
Approach			331	3.2	331	3.2	0.321	6.2	LOS A	0.6	4.2	0.41	0.59	0.41	45.8
East: Beaconsfield Street															
4	L2	All MCs	63	3.3	63	3.3	0.396	8.2	LOS A	1.0	7.4	0.66	0.70	0.66	47.1
5	T1	All MCs	1	0.0	1	0.0	0.396	12.4	LOS A	1.0	7.4	0.66	0.70	0.66	16.0
6	R2	All MCs	286	4.8	286	4.8	0.396	10.9	LOS A	1.0	7.4	0.66	0.70	0.66	43.9
6u	U	All MCs	6	0.0	6	0.0	0.396	12.1	LOS A	1.0	7.4	0.66	0.70	0.66	48.2
Approach			357	4.4	357	4.4	0.396	10.5	LOS A	1.0	7.4	0.66	0.70	0.66	44.4
North: Horsley Road															
7	L2	All MCs	207	10.2	207	10.2	0.183	6.3	LOS A	0.5	3.8	0.25	0.56	0.25	47.2
8	T1	All MCs	422	1.0	422	1.0	0.284	5.2	LOS A	0.9	6.2	0.24	0.48	0.24	47.8
9	R2	All MCs	1	0.0	1	0.0	0.284	11.4	LOS A	0.9	6.2	0.24	0.48	0.24	12.7
9u	U	All MCs	2	0.0	2	0.0	0.284	9.4	LOS A	0.9	6.2	0.24	0.48	0.24	39.8
Approach			633	4.0	633	4.0	0.284	5.6	LOS A	0.9	6.2	0.24	0.51	0.24	47.3
All Vehicles			1320	3.9	1320	3.9	0.396	7.0	LOS A	1.0	7.4	0.40	0.58	0.40	46.1

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ Site: 1 [Horsley Road/ Bullecourt Avenue (Site Folder: S3 AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

◼◻◻ Network: AM [AM (Network Folder: S3 EX + Neighbourhood DA + Subdivision)]

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance																
Mov ID	Turn	Mov Class	Demand Flows [Total HV]		Arrival Flows [Total HV]		Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue [Veh.	Dist]	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Horsley Road																
1	L2	All MCs	526	7.4	526	7.4	0.508	5.8	LOS A	1.9	13.8	0.45	0.53	0.45	39.1
2	T1	All MCs	96	3.3	96	3.3	0.508	5.5	LOS A	1.9	13.8	0.45	0.53	0.45	46.6
3u	U	All MCs	75	1.4	75	1.4	0.508	9.9	LOS A	1.9	13.8	0.45	0.53	0.45	35.0
Approach			697	6.2	697	6.2	0.508	6.2	LOS A	1.9	13.8	0.45	0.53	0.45	40.3
North: Horsley Road																
8	T1	All MCs	63	5.0	63	5.0	0.245	9.1	LOS A	0.6	5.4	0.79	0.75	0.79	41.0
9	R2	All MCs	83	48.1	83	48.1	0.245	14.1	LOS A	0.6	5.4	0.79	0.75	0.79	38.5
9u	U	All MCs	1	0.0	1	0.0	0.245	13.2	LOS A	0.6	5.4	0.79	0.75	0.79	46.0
Approach			147	29.3	147	29.3	0.245	11.9	LOS A	0.6	5.4	0.79	0.75	0.79	39.4
West: Bullacourt Avenue																
10	L2	All MCs	188	17.3	188	17.3	0.758	9.5	LOS A	4.1	30.7	0.81	0.64	0.87	41.6
12	R2	All MCs	576	6.4	576	6.4	0.758	11.6	LOS A	4.1	30.7	0.81	0.64	0.87	29.7
12u	U	All MCs	5	0.0	5	0.0	0.758	12.8	LOS A	4.1	30.7	0.81	0.64	0.87	35.5
Approach			769	9.0	769	9.0	0.758	11.1	LOS A	4.1	30.7	0.81	0.64	0.87	34.7
All Vehicles			1614	9.7	1614	9.7	0.758	9.0	LOS A	4.1	30.7	0.65	0.61	0.68	37.7

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ Site: 2v [Horsley Road/Site Access C - Conversion (Site Folder: S3 AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

■■■ **Network: AM [AM (Network Folder: S3 EX + Neighbourhood DA + Subdivision)]**

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

Vehicle Movement Performance																	
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h		Arrival Flows [Total HV] veh/h		Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
			veh/h	%	veh/h	%									
South: Horsley Avenue															
1	L2	All MCs	44	0.0	44	0.0	0.334	8.9	LOS A	0.0	0.0	0.00	0.08	0.00	31.0
2	T1	All MCs	601	7.0	601	7.0	0.334	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	56.6
Approach			645	6.5	645	6.5	0.334	0.6	NA	0.0	0.0	0.00	0.08	0.00	53.4
North: Horsley Avenue															
8	T1	All MCs	659	6.2	659	6.2	0.410	3.2	LOS A	0.5	3.4	0.15	0.51	0.20	42.7
9	R2	All MCs	61	0.0	61	0.0	0.410	12.3	LOS A	0.5	3.4	0.15	0.51	0.20	35.8
Approach			720	5.7	720	5.7	0.410	4.0	NA	0.5	3.4	0.15	0.51	0.20	41.9
West: Site Access C															
10	L2	All MCs	99	0.0	99	0.0	0.338	4.1	LOS A	0.5	3.8	0.73	0.92	0.92	5.1
12	R2	All MCs	52	0.0	52	0.0	0.338	17.1	LOS B	0.5	3.8	0.73	0.92	0.92	5.1
Approach			151	0.0	151	0.0	0.338	8.5	LOS A	0.5	3.8	0.73	0.92	0.92	5.1
All Vehicles			1516	5.5	1516	5.5	0.410	3.0	NA	0.5	3.8	0.15	0.37	0.18	41.9

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

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

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ Site: 3 [Horsley Road/ Beaconsfield Street/School Access Roundabout (Site Folder: S3 AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

◼▣ Network: AM [AM (Network Folder: S3 EX + Neighbourhood DA + Subdivision)]

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Horsley Road																
1	L2	All MCs	31	0.0	31	0.0	0.522	7.3	LOS A	1.2	8.3	0.53	0.61	0.55	14.2
2	T1	All MCs	331	5.1	331	5.1	0.522	4.2	LOS A	1.2	8.3	0.53	0.61	0.55	33.9
3	R2	All MCs	99	4.3	99	4.3	0.522	7.1	LOS A	1.2	8.3	0.53	0.61	0.55	42.6
3u	U	All MCs	49	0.0	49	0.0	0.522	8.2	LOS A	1.2	8.3	0.53	0.61	0.55	40.9
Approach			509	4.1	509	4.1	0.522	5.3	LOS A	1.2	8.3	0.53	0.61	0.55	32.2
East: Beaconsfield Street																
4	L2	All MCs	76	13.9	76	13.9	0.447	8.6	LOS A	1.2	9.3	0.75	0.76	0.80	38.0
5	T1	All MCs	42	0.0	42	0.0	0.447	12.4	LOS A	1.2	9.3	0.75	0.76	0.80	15.0
6	R2	All MCs	171	14.8	171	14.8	0.447	11.0	LOS A	1.2	9.3	0.75	0.76	0.80	32.0
6u	U	All MCs	15	0.0	15	0.0	0.447	11.3	LOS A	1.2	9.3	0.75	0.76	0.80	39.9
Approach			303	11.8	303	11.8	0.447	10.6	LOS A	1.2	9.3	0.75	0.76	0.80	27.3
North: Horsley Road																
7	L2	All MCs	275	9.6	275	9.6	0.230	5.1	LOS A	0.7	4.9	0.45	0.53	0.45	43.2
8	T1	All MCs	334	3.5	334	3.5	0.281	3.5	LOS A	0.9	6.3	0.43	0.52	0.43	41.7
9	R2	All MCs	82	0.0	82	0.0	0.281	9.9	LOS A	0.9	6.3	0.43	0.52	0.43	12.3
9u	U	All MCs	24	0.0	24	0.0	0.281	7.3	LOS A	0.9	6.3	0.43	0.52	0.43	30.2
Approach			715	5.3	715	5.3	0.281	5.0	LOS A	0.9	6.3	0.44	0.52	0.44	31.7
All Vehicles			1527	6.2	1527	6.2	0.522	6.2	LOS A	1.2	9.3	0.53	0.60	0.55	30.7

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ Site: 1 [Horsley Road/ Bullecourt Avenue (Site Folder: S3 PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

🔲🔲 **Network: PM [PM (Network Folder: S3 EX + Neighbourhood DA + Subdivision)]**

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h	%	Arrival Flows [Total HV] veh/h	%	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Horsley Road															
1	L2	All MCs	575	4.2	575	4.2	0.570	7.1	LOS A	2.0	14.5	0.69	0.61	0.69	38.7
2	T1	All MCs	17	0.0	17	0.0	0.570	6.8	LOS A	2.0	14.5	0.69	0.61	0.69	46.2
3u	U	All MCs	7	0.0	7	0.0	0.570	11.2	LOS A	2.0	14.5	0.69	0.61	0.69	33.7
Approach			599	4.0	599	4.0	0.570	7.1	LOS A	2.0	14.5	0.69	0.61	0.69	39.0
North: Horsley Road															
8	T1	All MCs	101	4.2	101	4.2	0.461	10.6	LOS A	1.3	9.8	0.77	0.79	0.85	39.2
9	R2	All MCs	229	10.6	229	10.6	0.461	13.9	LOS A	1.3	9.8	0.77	0.79	0.85	40.1
9u	U	All MCs	1	0.0	1	0.0	0.461	14.7	LOS B	1.3	9.8	0.77	0.79	0.85	44.9
Approach			332	8.6	332	8.6	0.461	12.9	LOS A	1.3	9.8	0.77	0.79	0.85	39.9
West: Bullacourt Avenue															
10	L2	All MCs	51	35.4	51	35.4	0.450	5.8	LOS A	1.6	11.9	0.20	0.60	0.20	43.3
12	R2	All MCs	568	3.7	568	3.7	0.450	7.9	LOS A	1.6	11.9	0.20	0.60	0.20	34.3
12u	U	All MCs	3	0.0	3	0.0	0.450	9.3	LOS A	1.6	11.9	0.20	0.60	0.20	38.8
Approach			622	6.3	622	6.3	0.450	7.7	LOS A	1.6	11.9	0.20	0.60	0.20	36.0
All Vehicles			1553	5.9	1553	5.9	0.570	8.6	LOS A	2.0	14.5	0.51	0.65	0.53	38.4

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ Site: 2v [Horsley Road/Site Access C - Conversion (Site Folder: S3 PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

▣▶◀ Network: PM [PM (Network Folder: S3 EX + Neighbourhood DA + Subdivision)]

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

Vehicle Movement Performance																
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h	%	Arrival Flows [Total HV] veh/h	%	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Horsley Avenue															
1	L2	All MCs	63	0.0	63	0.0	0.313	8.9	LOS A	0.0	0.0	0.00	0.12	0.00	30.6
2	T1	All MCs	549	4.6	549	4.6	0.313	0.0	LOS A	0.0	0.0	0.00	0.12	0.00	55.3
Approach			613	4.1	613	4.1	0.313	0.9	NA	0.0	0.0	0.00	0.12	0.00	50.8
North: Horsley Avenue															
8	T1	All MCs	603	4.4	603	4.4	0.380	0.8	LOS A	0.4	3.0	0.17	0.25	0.20	50.2
9	R2	All MCs	66	0.0	66	0.0	0.380	11.7	LOS A	0.4	3.0	0.17	0.25	0.20	40.7
Approach			669	3.9	669	3.9	0.380	1.9	NA	0.4	3.0	0.17	0.25	0.20	49.0
West: Site Access C															
10	L2	All MCs	40	0.0	40	0.0	0.140	2.4	LOS A	0.2	1.3	0.64	0.64	0.64	5.9
12	R2	All MCs	27	0.0	27	0.0	0.140	11.7	LOS A	0.2	1.3	0.64	0.64	0.64	5.9
Approach			67	0.0	67	0.0	0.140	6.2	LOS A	0.2	1.3	0.64	0.64	0.64	5.9
All Vehicles			1349	3.8	1349	3.8	0.380	1.7	NA	0.4	3.0	0.12	0.21	0.13	47.4

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

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

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▼ Site: 3 [Horsley Road/ Beaconsfield Street/School Access Roundabout (Site Folder: S3 PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

■■ Network: PM [PM (Network Folder: S3 EX + Neighbourhood DA + Subdivision)]

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance																
Mov ID	Turn	Mov Class	Demand Flows [Total HV]		Arrival Flows [Total HV]		Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue [Veh. Dist]		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m		Rate		km/h
South: Horsley Road															
1	L2	All MCs	1	0.0	1	0.0	0.338	8.3	LOS A	0.6	4.5	0.43	0.60	0.43	14.8
2	T1	All MCs	301	3.5	301	3.5	0.338	5.8	LOS A	0.6	4.5	0.43	0.60	0.43	45.3
3	R2	All MCs	40	0.0	40	0.0	0.338	8.8	LOS A	0.6	4.5	0.43	0.60	0.43	49.7
3u	U	All MCs	3	0.0	3	0.0	0.338	10.2	LOS A	0.6	4.5	0.43	0.60	0.43	48.4
Approach			345	3.0	345	3.0	0.338	6.2	LOS A	0.6	4.5	0.43	0.60	0.43	45.7
East: Beaconsfield Street															
4	L2	All MCs	63	3.3	63	3.3	0.412	8.2	LOS A	1.1	7.8	0.67	0.70	0.67	47.1
5	T1	All MCs	1	0.0	1	0.0	0.412	12.4	LOS A	1.1	7.8	0.67	0.70	0.67	16.0
6	R2	All MCs	301	4.5	301	4.5	0.412	11.0	LOS A	1.1	7.8	0.67	0.70	0.67	43.8
6u	U	All MCs	6	0.0	6	0.0	0.412	12.2	LOS A	1.1	7.8	0.67	0.70	0.67	48.2
Approach			372	4.2	372	4.2	0.412	10.5	LOS A	1.1	7.8	0.67	0.70	0.67	44.3
North: Horsley Road															
7	L2	All MCs	207	10.2	207	10.2	0.183	6.3	LOS A	0.5	3.8	0.25	0.56	0.25	47.2
8	T1	All MCs	421	1.0	421	1.0	0.283	5.2	LOS A	0.9	6.2	0.24	0.48	0.24	47.8
9	R2	All MCs	1	0.0	1	0.0	0.283	11.4	LOS A	0.9	6.2	0.24	0.48	0.24	12.7
9u	U	All MCs	2	0.0	2	0.0	0.283	9.4	LOS A	0.9	6.2	0.24	0.48	0.24	39.8
Approach			632	4.0	632	4.0	0.283	5.6	LOS A	0.9	6.2	0.24	0.51	0.24	47.3
All Vehicles			1348	3.8	1348	3.8	0.412	7.1	LOS A	1.1	7.8	0.41	0.58	0.41	46.1

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ **Site: 1 [Horsley Road/ Bullecourt Avenue (Site Folder: S4 AM)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

■■■ **Network: AM [AM (Network Folder: S4 EX + Neighbourhood DA + Subdivision + Adjacent Dev)]**

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h		Arrival Flows [Total HV] veh/h		Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Horsley Road															
1	L2	All MCs	559	8.5	559	8.5	0.534	5.8	LOS A	2.1	15.3	0.47	0.53	0.47	38.9
2	T1	All MCs	96	3.3	96	3.3	0.534	5.5	LOS A	2.1	15.3	0.47	0.53	0.47	46.6
3u	U	All MCs	75	1.4	75	1.4	0.534	9.9	LOS A	2.1	15.3	0.47	0.53	0.47	34.8
Approach			729	7.1	729	7.1	0.534	6.2	LOS A	2.1	15.3	0.47	0.53	0.47	40.1
North: Horsley Road															
8	T1	All MCs	63	5.0	63	5.0	0.269	9.6	LOS A	0.7	6.2	0.84	0.77	0.84	40.3
9	R2	All MCs	83	48.1	83	48.1	0.269	14.8	LOS B	0.7	6.2	0.84	0.77	0.84	38.1
9u	U	All MCs	1	0.0	1	0.0	0.269	13.7	LOS A	0.7	6.2	0.84	0.77	0.84	45.6
Approach			147	29.3	147	29.3	0.269	12.6	LOS A	0.7	6.2	0.84	0.77	0.84	38.9
West: Bullacourt Avenue															
10	L2	All MCs	188	17.3	188	17.3	0.809	10.8	LOS A	5.2	39.5	0.89	0.66	1.00	40.5
12	R2	All MCs	629	7.2	629	7.2	0.809	12.9	LOS A	5.2	39.5	0.89	0.66	1.00	28.1
12u	U	All MCs	5	0.0	5	0.0	0.809	14.1	LOS A	5.2	39.5	0.89	0.66	1.00	34.2
Approach			823	9.5	823	9.5	0.809	12.4	LOS A	5.2	39.5	0.89	0.66	1.00	32.9
All Vehicles			1700	10.2	1700	10.2	0.809	9.7	LOS A	5.2	39.5	0.71	0.62	0.76	36.7

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ **Site: 2v [Horsley Road/Site Access C - Conversion (Site Folder: S4 AM)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

■□ **Network: AM [AM (Network Folder: S4 EX + Neighbourhood DA + Subdivision + Adjacent Dev)]**

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

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV]		Arrival Flows [Total HV]		Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue [Veh. Dist]		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Horsley Avenue															
1	L2	All MCs	44	0.0	44	0.0	0.370	8.9	LOS A	0.0	0.0	0.00	0.07	0.00	31.0
2	T1	All MCs	671	7.2	671	7.2	0.370	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	56.9
Approach			715	6.8	715	6.8	0.370	0.6	NA	0.0	0.0	0.00	0.07	0.00	54.0
North: Horsley Avenue															
8	T1	All MCs	676	6.1	676	6.1	0.427	3.5	LOS A	0.6	4.1	0.17	0.51	0.23	41.7
9	R2	All MCs	61	0.0	61	0.0	0.427	13.1	LOS A	0.6	4.1	0.17	0.51	0.23	35.2
Approach			737	5.6	737	5.6	0.427	4.3	NA	0.6	4.1	0.17	0.51	0.23	41.0
West: Site Access C															
10	L2	All MCs	99	0.0	99	0.0	0.385	5.3	LOS A	0.6	4.3	0.78	1.03	1.03	4.6
12	R2	All MCs	52	0.0	52	0.0	0.385	20.4	LOS B	0.6	4.3	0.78	1.03	1.03	4.6
Approach			151	0.0	151	0.0	0.385	10.4	LOS A	0.6	4.3	0.78	1.03	1.03	4.6
All Vehicles			1602	5.6	1602	5.6	0.427	3.2	NA	0.6	4.3	0.15	0.37	0.20	41.6

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

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

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ Site: 3 [Horsley Road/ Beaconsfield Street/School Access Roundabout (Site Folder: S4 AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

▣▣ Network: AM [AM (Network Folder: S4 EX + Neighbourhood DA + Subdivision + Adjacent Dev)]

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h	%	Arrival Flows [Total HV] veh/h	%	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Horsley Road															
1	L2	All MCs	31	0.0	31	0.0	0.577	8.0	LOS A	1.5	10.8	0.60	0.67	0.66	14.2
2	T1	All MCs	361	6.1	361	6.1	0.577	4.9	LOS A	1.5	10.8	0.60	0.67	0.66	33.6
3	R2	All MCs	99	4.3	99	4.3	0.577	7.9	LOS A	1.5	10.8	0.60	0.67	0.66	42.3
3u	U	All MCs	49	0.0	49	0.0	0.577	9.0	LOS A	1.5	10.8	0.60	0.67	0.66	40.6
Approach			540	4.9	540	4.9	0.577	6.0	LOS A	1.5	10.8	0.60	0.67	0.66	32.0
East: Beaconsfield Street															
4	L2	All MCs	76	13.9	76	13.9	0.524	10.0	LOS A	1.6	12.6	0.80	0.82	0.93	37.3
5	T1	All MCs	42	0.0	42	0.0	0.524	13.7	LOS A	1.6	12.6	0.80	0.82	0.93	14.9
6	R2	All MCs	216	15.1	216	15.1	0.524	12.4	LOS A	1.6	12.6	0.80	0.82	0.93	31.2
6u	U	All MCs	15	0.0	15	0.0	0.524	12.7	LOS A	1.6	12.6	0.80	0.82	0.93	39.2
Approach			348	12.4	348	12.4	0.524	12.0	LOS A	1.6	12.6	0.80	0.82	0.93	27.2
North: Horsley Road															
7	L2	All MCs	285	9.2	285	9.2	0.239	5.1	LOS A	0.7	5.2	0.46	0.53	0.46	43.2
8	T1	All MCs	345	4.9	345	4.9	0.291	3.5	LOS A	0.9	6.7	0.44	0.52	0.44	41.7
9	R2	All MCs	82	0.0	82	0.0	0.291	9.9	LOS A	0.9	6.7	0.44	0.52	0.44	12.3
9u	U	All MCs	24	0.0	24	0.0	0.291	7.3	LOS A	0.9	6.7	0.44	0.52	0.44	30.2
Approach			737	5.9	737	5.9	0.291	5.0	LOS A	0.9	6.7	0.45	0.52	0.45	31.9
All Vehicles			1625	6.9	1625	6.9	0.577	6.8	LOS A	1.6	12.6	0.57	0.63	0.62	30.7

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ Site: 1 [Horsley Road/ Bullecourt Avenue (Site Folder: S4 PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

■□■ **Network: PM [PM (Network Folder: S4 EX + Neighbourhood DA + Subdivision + Adjacent Dev)]**

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h	%	Arrival Flows [Total HV] veh/h	%	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh.] veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Horsley Road															
1	L2	All MCs	616	5.0	616	5.0	0.610	7.4	LOS A	2.3	16.9	0.72	0.63	0.74	38.5
2	T1	All MCs	17	0.0	17	0.0	0.610	7.1	LOS A	2.3	16.9	0.72	0.63	0.74	46.1
3u	U	All MCs	7	0.0	7	0.0	0.610	11.5	LOS A	2.3	16.9	0.72	0.63	0.74	33.4
Approach			640	4.8	640	4.8	0.610	7.5	LOS A	2.3	16.9	0.72	0.63	0.74	38.7
North: Horsley Road															
8	T1	All MCs	101	4.2	101	4.2	0.469	11.0	LOS A	1.3	10.1	0.78	0.80	0.88	38.9
9	R2	All MCs	229	10.6	229	10.6	0.469	14.3	LOS A	1.3	10.1	0.78	0.80	0.88	39.8
9u	U	All MCs	1	0.0	1	0.0	0.469	15.1	LOS B	1.3	10.1	0.78	0.80	0.88	44.6
Approach			332	8.6	332	8.6	0.469	13.3	LOS A	1.3	10.1	0.78	0.80	0.88	39.6
West: Bullacourt Avenue															
10	L2	All MCs	51	35.4	51	35.4	0.462	5.8	LOS A	1.7	12.6	0.21	0.60	0.21	43.3
12	R2	All MCs	583	4.7	583	4.7	0.462	7.9	LOS A	1.7	12.6	0.21	0.60	0.21	34.3
12u	U	All MCs	3	0.0	3	0.0	0.462	9.3	LOS A	1.7	12.6	0.21	0.60	0.21	38.7
Approach			637	7.1	637	7.1	0.462	7.7	LOS A	1.7	12.6	0.21	0.60	0.21	35.9
All Vehicles			1608	6.5	1608	6.5	0.610	8.8	LOS A	2.3	16.9	0.53	0.65	0.56	38.2

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ **Site: 2v [Horsley Road/Site Access C - Conversion (Site Folder: S4 PM)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

🔳🔳 **Network: PM [PM (Network Folder: S4 EX + Neighbourhood DA + Subdivision + Adjacent Dev)]**

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Horsley Avenue															
1	L2	All MCs	63	0.0	63	0.0	0.324	8.9	LOS A	0.0	0.0	0.00	0.12	0.00	30.6
2	T1	All MCs	569	5.4	569	5.4	0.324	0.0	LOS A	0.0	0.0	0.00	0.12	0.00	55.4
Approach			633	4.8	633	4.8	0.324	0.9	NA	0.0	0.0	0.00	0.12	0.00	51.0
North: Horsley Avenue															
8	T1	All MCs	660	4.0	660	4.0	0.411	0.9	LOS A	0.5	3.5	0.16	0.24	0.21	50.0
9	R2	All MCs	66	0.0	66	0.0	0.411	12.1	LOS A	0.5	3.5	0.16	0.24	0.21	40.6
Approach			726	3.6	726	3.6	0.411	1.9	NA	0.5	3.5	0.16	0.24	0.21	48.9
West: Site Access C															
10	L2	All MCs	40	0.0	40	0.0	0.157	2.5	LOS A	0.2	1.4	0.68	0.68	0.68	5.5
12	R2	All MCs	27	0.0	27	0.0	0.157	13.9	LOS A	0.2	1.4	0.68	0.68	0.68	5.5
Approach			67	0.0	67	0.0	0.157	7.2	LOS A	0.2	1.4	0.68	0.68	0.68	5.5
All Vehicles			1426	4.0	1426	4.0	0.411	1.7	NA	0.5	3.5	0.12	0.21	0.14	47.4

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

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

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ **Site: 3 [Horsley Road/ Beaconsfield Street/School Access Roundabout (Site Folder: S4 PM)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

■■■ **Network: PM [PM (Network Folder: S4 EX + Neighbourhood DA + Subdivision + Adjacent Dev)]**

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance																	
Mov ID	Turn	Mov Class	Demand Flows [Total HV]		Arrival Flows [Total HV]		Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue [Veh.	Dist]	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Horsley Road															
1	L2	All MCs	1	0.0	1	0.0	0.358	8.4	LOS A	0.7	5.0	0.46	0.61	0.46	14.8
2	T1	All MCs	314	5.0	314	5.0	0.358	6.0	LOS A	0.7	5.0	0.46	0.61	0.46	45.2
3	R2	All MCs	40	0.0	40	0.0	0.358	8.8	LOS A	0.7	5.0	0.46	0.61	0.46	49.6
3u	U	All MCs	3	0.0	3	0.0	0.358	10.3	LOS A	0.7	5.0	0.46	0.61	0.46	48.3
Approach			358	4.4	358	4.4	0.358	6.3	LOS A	0.7	5.0	0.46	0.61	0.46	45.5
East: Beaconsfield Street															
4	L2	All MCs	63	3.3	63	3.3	0.442	8.6	LOS A	1.2	8.6	0.70	0.72	0.70	46.7
5	T1	All MCs	1	0.0	1	0.0	0.442	12.8	LOS A	1.2	8.6	0.70	0.72	0.70	16.0
6	R2	All MCs	314	6.0	314	6.0	0.442	11.4	LOS A	1.2	8.6	0.70	0.72	0.70	43.3
6u	U	All MCs	6	0.0	6	0.0	0.442	12.5	LOS A	1.2	8.6	0.70	0.72	0.70	47.9
Approach			384	5.5	384	5.5	0.442	11.0	LOS A	1.2	8.6	0.70	0.72	0.70	43.9
North: Horsley Road															
7	L2	All MCs	238	8.8	238	8.8	0.204	6.3	LOS A	0.6	4.3	0.25	0.56	0.25	47.3
8	T1	All MCs	453	2.1	453	2.1	0.305	5.2	LOS A	1.0	7.0	0.25	0.48	0.25	47.7
9	R2	All MCs	1	0.0	1	0.0	0.305	11.4	LOS A	1.0	7.0	0.25	0.48	0.25	12.7
9u	U	All MCs	2	0.0	2	0.0	0.305	9.4	LOS A	1.0	7.0	0.25	0.48	0.25	39.8
Approach			694	4.4	694	4.4	0.305	5.6	LOS A	1.0	7.0	0.25	0.51	0.25	47.3
All Vehicles			1436	4.7	1436	4.7	0.442	7.2	LOS A	1.2	8.6	0.42	0.59	0.42	45.9

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ Site: 1 [Horsley Road/ Bullecourt Avenue (Site Folder: S5 AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

◼▭ Network: AM [AM (Network Folder: S5 FB + Neighbourhood DA + Subdivision + Adjacent Dev)]

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance																	
Mov ID	Turn	Mov Class	Demand Flows [Total HV]		Arrival Flows [Total HV]		Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue [Veh.	Dist]	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Horsley Road															
1	L2	All MCs	611	7.8	611	7.8	0.582	6.0	LOS A	2.4	17.8	0.54	0.54	0.54	38.7
2	T1	All MCs	96	3.3	96	3.3	0.582	5.7	LOS A	2.4	17.8	0.54	0.54	0.54	46.3
3u	U	All MCs	75	1.4	75	1.4	0.582	10.1	LOS A	2.4	17.8	0.54	0.54	0.54	34.4
Approach			781	6.6	781	6.6	0.582	6.3	LOS A	2.4	17.8	0.54	0.54	0.54	39.8
North: Horsley Road															
8	T1	All MCs	75	4.2	75	4.2	0.341	10.2	LOS A	0.9	8.1	0.90	0.79	0.90	39.6
9	R2	All MCs	98	40.9	98	40.9	0.341	15.2	LOS B	0.9	8.1	0.90	0.79	0.90	38.1
9u	U	All MCs	1	0.0	1	0.0	0.341	14.4	LOS A	0.9	8.1	0.90	0.79	0.90	45.1
Approach			174	24.8	174	24.8	0.341	13.1	LOS A	0.9	8.1	0.90	0.79	0.90	38.6
West: Bullacourt Avenue															
10	L2	All MCs	188	17.3	188	17.3	0.855	12.5	LOS A	6.7	50.2	0.99	0.68	1.16	39.2
12	R2	All MCs	680	6.7	680	6.7	0.855	14.4	LOS A	6.7	50.2	0.99	0.68	1.16	26.2
12u	U	All MCs	5	0.0	5	0.0	0.855	15.6	LOS B	6.7	50.2	0.99	0.68	1.16	32.7
Approach			874	8.9	874	8.9	0.855	14.0	LOS A	6.7	50.2	0.99	0.68	1.16	31.0
All Vehicles			1828	9.4	1828	9.4	0.855	10.7	LOS A	6.7	50.2	0.79	0.63	0.87	35.6

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ **Site: 2v [Horsley Road/Site Access C - Conversion (Site Folder: S5 AM)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

◨◧ **Network: AM [AM (Network Folder: S5 FB + Neighbourhood DA + Subdivision + Adjacent Dev)]**

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

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h		Arrival Flows [Total HV] veh/h		Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh.] veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
			veh/h	%	veh/h	%									
South: Horsley Avenue															
1	L2	All MCs	44	0.0	44	0.0	0.399	8.9	LOS A	0.0	0.0	0.00	0.07	0.00	31.1
2	T1	All MCs	728	6.6	728	6.6	0.399	0.1	LOS A	0.0	0.0	0.00	0.07	0.00	57.1
Approach			773	6.3	773	6.3	0.399	0.6	NA	0.0	0.0	0.00	0.07	0.00	54.3
North: Horsley Avenue															
8	T1	All MCs	735	5.6	735	5.6	0.464	3.8	LOS A	0.7	5.3	0.17	0.51	0.27	40.8
9	R2	All MCs	61	0.0	61	0.0	0.464	14.1	LOS A	0.7	5.3	0.17	0.51	0.27	34.6
Approach			796	5.2	796	5.2	0.464	4.6	NA	0.7	5.3	0.17	0.51	0.27	40.2
West: Site Access C															
10	L2	All MCs	99	0.0	99	0.0	0.463	7.0	LOS A	0.7	5.2	0.84	1.18	1.18	3.9
12	R2	All MCs	52	0.0	52	0.0	0.463	26.8	LOS B	0.7	5.2	0.84	1.18	1.18	3.9
Approach			151	0.0	151	0.0	0.463	13.8	LOS A	0.7	5.2	0.84	1.18	1.18	3.9
All Vehicles			1719	5.2	1719	5.2	0.464	3.6	NA	0.7	5.3	0.15	0.37	0.23	40.8

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

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

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ Site: 3 [Horsley Road/ Beaconsfield Street/School Access Roundabout (Site Folder: S5 AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

◼▣◼ Network: AM [AM (Network Folder: S5 FB + Neighbourhood DA + Subdivision + Adjacent Dev)]

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance																
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Horsley Road																
1	L2	All MCs	31	0.0	31	0.0	0.622	8.4	LOS A	1.8	12.7	0.64	0.69	0.72	14.1
2	T1	All MCs	396	5.6	396	5.6	0.622	5.2	LOS A	1.8	12.7	0.64	0.69	0.72	33.4
3	R2	All MCs	109	3.8	109	3.8	0.622	8.2	LOS A	1.8	12.7	0.64	0.69	0.72	42.2
3u	U	All MCs	49	0.0	49	0.0	0.622	9.3	LOS A	1.8	12.7	0.64	0.69	0.72	40.5
Approach			585	4.5	585	4.5	0.622	6.3	LOS A	1.8	12.7	0.64	0.69	0.72	32.2
East: Beaconsfield Street																
4	L2	All MCs	76	13.9	76	13.9	0.542	10.8	LOS A	1.7	13.5	0.82	0.85	0.99	36.9
5	T1	All MCs	42	0.0	42	0.0	0.542	14.5	LOS A	1.7	13.5	0.82	0.85	0.99	14.9
6	R2	All MCs	216	15.1	216	15.1	0.542	13.2	LOS A	1.7	13.5	0.82	0.85	0.99	30.7
6u	U	All MCs	15	0.0	15	0.0	0.542	13.4	LOS A	1.7	13.5	0.82	0.85	0.99	38.9
Approach			348	12.4	348	12.4	0.542	12.8	LOS A	1.7	13.5	0.82	0.85	0.99	26.9
North: Horsley Road																
7	L2	All MCs	312	8.4	312	8.4	0.262	5.2	LOS A	0.8	5.9	0.48	0.53	0.48	43.2
8	T1	All MCs	377	4.5	377	4.5	0.314	3.5	LOS A	1.0	7.5	0.47	0.52	0.47	41.7
9	R2	All MCs	82	0.0	82	0.0	0.314	10.0	LOS A	1.0	7.5	0.47	0.52	0.47	12.3
9u	U	All MCs	24	0.0	24	0.0	0.314	7.4	LOS A	1.0	7.5	0.47	0.52	0.47	30.2
Approach			795	5.4	795	5.4	0.314	5.0	LOS A	1.0	7.5	0.47	0.52	0.47	32.5
All Vehicles			1728	6.5	1728	6.5	0.622	7.0	LOS A	1.8	13.5	0.60	0.65	0.66	31.0

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ Site: 1 [Horsley Road/ Bullecourt Avenue (Site Folder: S5 PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

◼▣◻ Network: PM [PM (Network Folder: S5 FB + Neighbourhood DA + Subdivision + Adjacent Dev)]

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Horsley Road															
1	L2	All MCs	738	4.1	738	4.1	0.730	9.4	LOS A	3.8	27.8	0.86	0.70	0.97	36.5
2	T1	All MCs	17	0.0	17	0.0	0.730	9.0	LOS A	3.8	27.8	0.86	0.70	0.97	44.3
3u	U	All MCs	7	0.0	7	0.0	0.730	13.4	LOS A	3.8	27.8	0.86	0.70	0.97	30.5
Approach			762	4.0	762	4.0	0.730	9.4	LOS A	3.8	27.8	0.86	0.70	0.97	36.7
North: Horsley Road															
8	T1	All MCs	106	4.0	106	4.0	0.539	13.6	LOS A	1.8	13.3	0.85	0.89	1.07	36.2
9	R2	All MCs	243	10.0	243	10.0	0.539	17.0	LOS B	1.8	13.3	0.85	0.89	1.07	37.8
9u	U	All MCs	1	0.0	1	0.0	0.539	17.7	LOS B	1.8	13.3	0.85	0.89	1.07	42.8
Approach			351	8.1	351	8.1	0.539	16.0	LOS B	1.8	13.3	0.85	0.89	1.07	37.4
West: Bullacourt Avenue															
10	L2	All MCs	51	35.4	51	35.4	0.524	5.9	LOS A	2.2	16.2	0.23	0.59	0.23	43.2
12	R2	All MCs	677	4.0	677	4.0	0.524	7.9	LOS A	2.2	16.2	0.23	0.59	0.23	34.1
12u	U	All MCs	3	0.0	3	0.0	0.524	9.3	LOS A	2.2	16.2	0.23	0.59	0.23	38.6
Approach			731	6.2	731	6.2	0.524	7.8	LOS A	2.2	16.2	0.23	0.59	0.23	35.5
All Vehicles			1843	5.7	1843	5.7	0.730	10.0	LOS A	3.8	27.8	0.61	0.69	0.70	36.6

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ **Site: 2v [Horsley Road/Site Access C - Conversion (Site Folder: S5 PM)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

🔳🔳 **Network: PM [PM (Network Folder: S5 FB + Neighbourhood DA + Subdivision + Adjacent Dev)]**

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Horsley Avenue																
1	L2	All MCs	63	0.0	63	0.0	0.384	8.9	LOS A	0.0	0.0	0.00	0.10	0.00	30.8
2	T1	All MCs	689	4.4	689	4.4	0.384	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	56.0
Approach			753	4.1	753	4.1	0.384	0.8	NA	0.0	0.0	0.00	0.10	0.00	52.2
North: Horsley Avenue																
8	T1	All MCs	749	3.5	749	3.5	0.470	1.5	LOS A	0.8	5.4	0.18	0.25	0.28	47.8
9	R2	All MCs	66	0.0	66	0.0	0.470	13.8	LOS A	0.8	5.4	0.18	0.25	0.28	39.2
Approach			816	3.2	816	3.2	0.470	2.5	NA	0.8	5.4	0.18	0.25	0.28	46.9
West: Site Access C																
10	L2	All MCs	40	0.0	40	0.0	0.219	4.0	LOS A	0.3	2.0	0.78	0.85	0.85	4.4
12	R2	All MCs	27	0.0	27	0.0	0.219	21.7	LOS B	0.3	2.0	0.78	0.85	0.85	4.4
Approach			67	0.0	67	0.0	0.219	11.2	LOS A	0.3	2.0	0.78	0.85	0.85	4.4
All Vehicles			1636	3.5	1636	3.5	0.470	2.1	NA	0.8	5.4	0.12	0.21	0.17	46.7

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

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

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▽ Site: 3 [Horsley Road/ Beaconsfield Street/School Access Roundabout (Site Folder: S5 PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

◼◘◼ Network: PM [PM (Network Folder: S5 FB + Neighbourhood DA + Subdivision + Adjacent Dev)]

NA
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Horsley Road															
1	L2	All MCs	1	0.0	1	0.0	0.437	8.8	LOS A	0.9	6.8	0.55	0.64	0.55	14.8
2	T1	All MCs	363	4.3	363	4.3	0.437	6.4	LOS A	0.9	6.8	0.55	0.64	0.55	44.5
3	R2	All MCs	47	0.0	47	0.0	0.437	9.2	LOS A	0.9	6.8	0.55	0.64	0.55	49.3
3u	U	All MCs	3	0.0	3	0.0	0.437	10.7	LOS A	0.9	6.8	0.55	0.64	0.55	47.9
Approach			415	3.8	415	3.8	0.437	6.7	LOS A	0.9	6.8	0.55	0.64	0.55	45.0
East: Beaconsfield Street															
4	L2	All MCs	63	3.3	63	3.3	0.542	10.6	LOS A	1.8	13.2	0.79	0.79	0.91	45.2
5	T1	All MCs	1	0.0	1	0.0	0.542	14.8	LOS B	1.8	13.2	0.79	0.79	0.91	15.8
6	R2	All MCs	377	5.0	377	5.0	0.542	13.4	LOS A	1.8	13.2	0.79	0.79	0.91	41.2
6u	U	All MCs	6	0.0	6	0.0	0.542	14.5	LOS B	1.8	13.2	0.79	0.79	0.91	46.5
Approach			447	4.7	447	4.7	0.542	13.1	LOS A	1.8	13.2	0.79	0.79	0.91	41.8
North: Horsley Road															
7	L2	All MCs	267	7.9	267	7.9	0.231	6.3	LOS A	0.7	5.1	0.28	0.56	0.28	47.2
8	T1	All MCs	514	1.8	514	1.8	0.349	5.2	LOS A	1.2	8.5	0.29	0.47	0.29	47.5
9	R2	All MCs	1	0.0	1	0.0	0.349	11.5	LOS A	1.2	8.5	0.29	0.47	0.29	12.7
9u	U	All MCs	2	0.0	2	0.0	0.349	9.5	LOS A	1.2	8.5	0.29	0.47	0.29	39.4
Approach			784	3.9	784	3.9	0.349	5.6	LOS A	1.2	8.5	0.29	0.50	0.29	47.2
All Vehicles			1646	4.1	1646	4.1	0.542	7.9	LOS A	1.8	13.2	0.49	0.62	0.52	45.1

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

The Transport Planning Partnership
Suite 402 Level 4, 22 Atchison Street
St Leonards   NSW   2065

P.O. Box 237
St Leonards NSW 1590

02 8437 7800

info@ttpp.net.au

www.ttpp.net.au