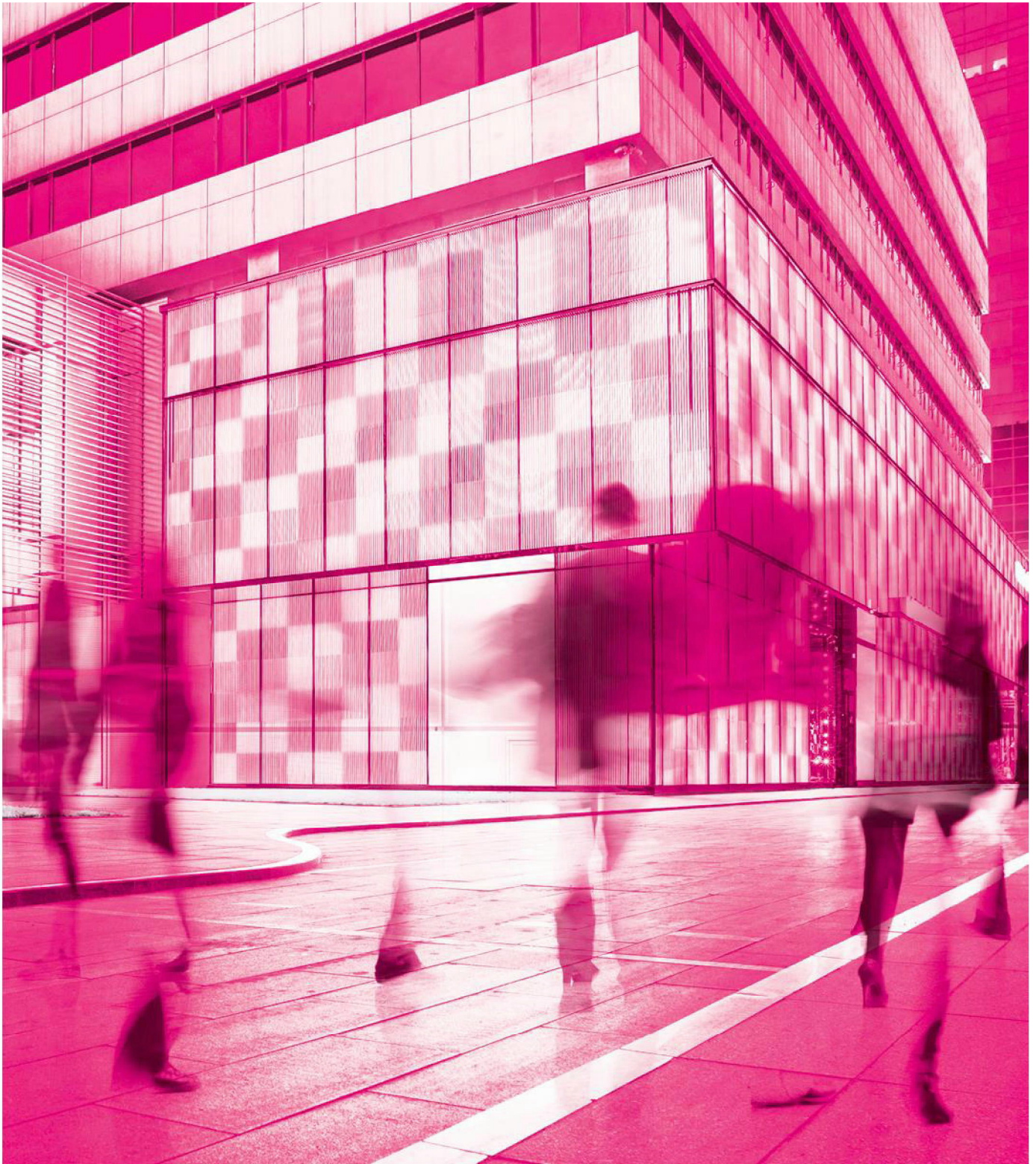




Traffic Impact Assessment;

The Village Green, Penrith

For Greengate
18th December 2018

parking;
traffic;
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wayfinding;
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Document Control

The Village Green, Penrith, Traffic Impact Assessment

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Contents

1. Executive Summary	4
2. Introduction	5
2.1 Project Summary	5
2.2 Scope of the Report	6
3. Background	7
3.1 Site Context	7
3.2 Development Proposal	9
4. Existing Transportation Facilities	11
4.1 Road Hierarchy	11
4.2 Public Transport	14
4.2.1 Bus Services	14
4.2.2 Train Services	17
4.3 Active Transport	17
4.3.1 Walking	17
4.3.2 Cycling	17
5. Traffic Impact Assessment	18
5.1 Existing Traffic Generation	18
5.2 Existing Traffic Volume	18
5.2.1 Existing Peak Hour Traffic Volume	19
5.2.2 Existing Network Operation	22
5.2.3 Derby Street/Woodriff Street	23
5.2.4 Woodriff Street/Reserve Street	23
5.2.5 Station Street/Reserve Street	23
5.3 Post-Development Traffic Generation	24
5.3.1 Post-Development Traffic Distribution	24
5.3.2 Post-Development Network Operation	27
5.3.3 Derby Street/Woodriff Street	27
5.3.4 Woodriff Street/Reserve Street	27
5.3.5 Station Street/Reserve Street	28
5.4 Traffic Impact Summary	28
6. Parking Provision Assessment	29
6.1 Car Parking	29
6.2 Accessible Car Parking	29
6.3 Service Vehicle Parking	30
6.4 Bicycle Parking	30
6.5 Parking Summary	31
7. Access and Design Review	32
7.1 Pedestrian Access	32
7.2 Driveway Location	32
7.3 Car Park Arrangement	32
7.3.1 Access Driveway	32

7.3.2 Typical Requirements	32
7.4 Accessible Car Parking	33
7.5 Bicycle Parking	33
7.6 Indented Pick Up / Drop Off on Reserve & Derby Streets	33
7.7 Loading Dock	34
7.7.1 Servicing & Refuse Collection	34
7.7.2 Ambulance Parking	34
8. Conclusion	35
Attachment 1 - Architectural Drawings	36
Attachment 2 - Car Park & Swept Path Assessment	37
Attachment 3 - Traffic Modelling	38
Figure 1 – Site Location (Source: Google Maps)	5
Figure 2 - Aerial View of Subject Site & Surrounds (Source: Nearmap)	7
Figure 3 - Local Land Use Map (Source: NSW Planning Viewer)	8
Figure 4 - Site Plan	10
Figure 5 - Road Hierarchy (RMS Road Hierarchy Review)	11
Figure 6 - Derby Street (South-easterly towards Woodriff Street)	12
Figure 7 - Woodriff Street (South-westerly towards Reserve Street)	12
Figure 8 - Reserve Street (North-westerly towards Station Street)	13
Figure 9 - Station Street (North-easterly towards Derby Street)	13
Figure 10 - Public Transport Accessibility	14
Figure 11 – Cycleways in the site vicinity (Source: RMS Cycleway Finder)	17
Figure 12 – Location of the Intersection Surveys	18
Figure 13 - Derby Street/Woodriff Street - AM Peak Traffic Volumes	19
Figure 14 - Derby Street/Woodriff Street - PM Peak Traffic Volumes	19
Figure 15 - Woodriff Street/Reserve St - AM Peak Traffic Volumes	20
Figure 16 - Woodriff Street/Reserve St - PM Peak Traffic Volumes	20
Figure 17 - Station Street/Reserve Street - AM Peak Traffic Volumes	21
Figure 18 - Station Street/Reserve Street - PM Peak Traffic Volumes	21
Figure 19 – Post Development AM Peak Traffic Distribution	25
Figure 20 – Post Development PM Peak Traffic Distribution	26
Table 1 - Yield Schedule	9
Table 2 - Derby Street	12
Table 3 - Woodriff Street	12
Table 4 - Reserve Street	13
Table 5 - Station Street	13
Table 6 - Bus Service Summary	14
Table 7 – Intersection Performance – Level of Service	22
Table 8 – SIDRA Results Summary – Existing Situation	23
Table 9 – Post-Development Traffic Generation Summary	24
Table 10 – SIDRA Results Comparison between Existing and Post-Development Scenario	27
Table 11 – Car Parking Requirement Summary	29
Table 12 – Accessible Car Parking Requirement Summary	30
Table 13 – Bicycle Parking Requirement Summary	30

1. Executive Summary

This Traffic Impact Assessment (TIA) will accompany the Development Application (DA) to Penrith City Council for the development of a Residential Aged Care Facility (RACF) and Independent Living Units (ILU), located on Woodriff Street, Penrith.

The development proposal includes the following:

- 3 buildings comprising RACF and ILUs developments;
- 97 basement car parking bays (inclusive of 5 accessible car parking bays);
- A loading dock on ground level with 2 service bays (ambulance, deliveries and waste collection); and
- Indented pick up / drop off bays along Reserve and Derby Street frontages.

The subject site is predominantly surrounded by local roads, whereby on-street parking within the immediate vicinity of the site generally comprises of time restricted and unrestricted parking.

Public transport has been assessed for the locality, whereby a comprehensive network of bus services operated by Blue Mountains Transit service the area, with bus stops located within a 400m radius of the subject site. The closest train station is Penrith Railway Station, located within 800m walking distance from the site, which is within a comfortable walking distance as suggested by the NSW Guidelines to Walking and Cycling (2004), with a service frequency of approximately 5-10 minutes during peak and approximately 15 minutes off-peak period. Thus, it is anticipated that public transport will be an attractive mode of transport for staff members, residents and visitors to/ from the site.

Supporting infrastructure for pedestrians and cyclists has also been assessed for active transport options, where footpaths are found to be generally in good conditions on both sides of the road, alongside with pedestrian crossings/refuge islands and adequate lighting. Thus, active transport may also be an option for staff, visitors and some residents between the site and nearby retail precincts/ Penrith station etc.

In regards to traffic generation of the development, it is anticipated that a net gain of 1.67 vehicles per minutes during the peak hour will not result in any noticeable traffic impacts on the existing road network. This is indicated in the traffic modelling results, whereby the network operation of the existing and post-development displayed LOS A in all adjoining intersections.

In the context of parking provision, the proposal includes 97 car parking spaces inclusive of 5 accessible spaces, which satisfies the requirements in the SEPP Housing for Seniors or People with a Disability (2004) and the Building Code of Australia (BCA) 2006 respectively. Two service bays are provided on the ground level, addressing the SEPP and Penrith City Council DCP 2014 requirements for ambulance, delivery and waste collection vehicle parking. 6 bicycle parking spaces are also to be provided by the development as per the NSW Guidelines to Walking and Cycling (2004).

The vehicular access and car park arrangements have been reviewed at a high level with reference to the Roads and Maritime Services (RMS) Guide to Traffic Generating Developments (2002), the AS2890 series and industry best practice (see **Attachment 2**). It is highlighted that further assessment will need to be undertaken during the detailed design stage. This review has found elements of vehicular access, visibility, manoeuvrability and parking are to be generally compliant and safe for vehicles and other road users; internally and externally.

2. Introduction

2.1 Project Summary

ptc. has been engaged by Greengate to prepare a TIA to accompany a Pre-Development Application (Pre-DA) to be submitted to Penrith City Council for the development of a Residential Aged Care Facility (RACF) and Independent Living Units (ILU), for seniors, located at 3-7 Reserve Street and 222-230 Derby Street, Penrith.

The location of the site is presented in Figure 1.

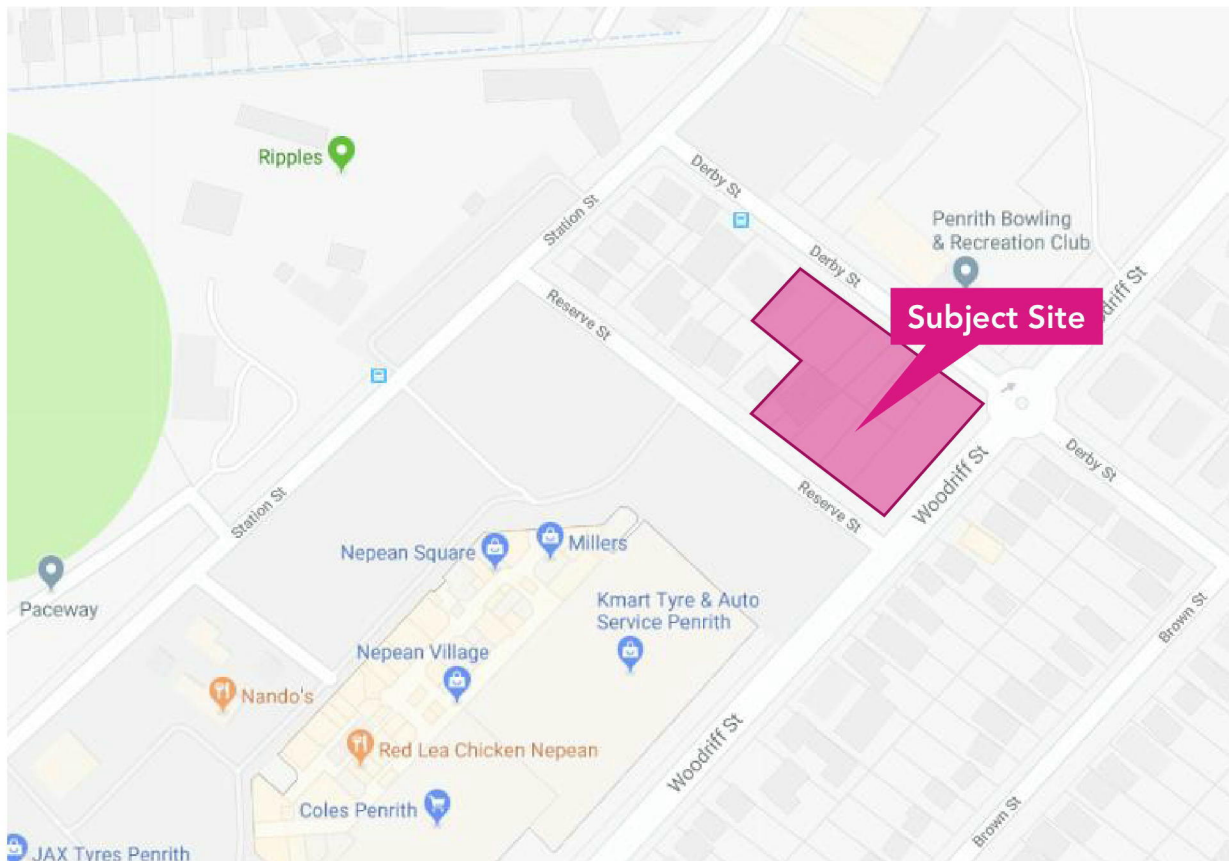


Figure 1 – Site Location (Source: Google Maps)

2.2 Scope of the Report

This report presents the following considerations in relation to the traffic and parking assessment of the proposal:

Section 1	Executive Summary;
Section 2	Introduction;
Section 3	Background information on the proposal;
Section 4	A description of the existing transport characteristics of the locality serving the development property;
Section 5	Determination of the traffic activity associated with the development proposal, and the adequacy of the surrounding road network;
Section 6	Assessment of the proposed parking provision in the context of the relevant planning control requirements;
Section 7	Assessment of the proposed vehicular access, car park and servicing arrangements, in the context of the AS2890 series; and
Section 8	Conclusion.

3. Background

3.1 Site Context

The subject site comprises the following properties:

- Lot C, DP154478;
- Lot D, DP154478;
- Lot 21, DP979866;
- Lot 22, DP979866;
- Lot 23, DP979866;
- Lot 24, DP979866;
- Lot A, DP160027;
- Lot B, DP160027;
- Lot 1, DP198621;
- Lot 2, DP198621; and
- Lot 106, DP1215261.



Figure 2 - Aerial View of Subject Site & Surrounds (Source: Nearmap)

The property has a frontage of approximately 95m to Derby Street, 55m to Woodriff Street and 45m to Reserve Street and has a total site area of 4,954m². The site is currently occupied by an informal on-grade car park without any line marking.

The proposed site lies within a mixed-use zone (B4) and key features surrounding the site include:

- Penrith Railway Station (SP2) and the Local Town Centre (B2) to the north;
- Tourist land use zone (SP3) including iFLY Downunder and Aqua Golf to the west;
- Mixed Use zone (B4) adjacent to the south; and
- Medium density (R3) and high density (R4) residential zones surrounding the site proximity.

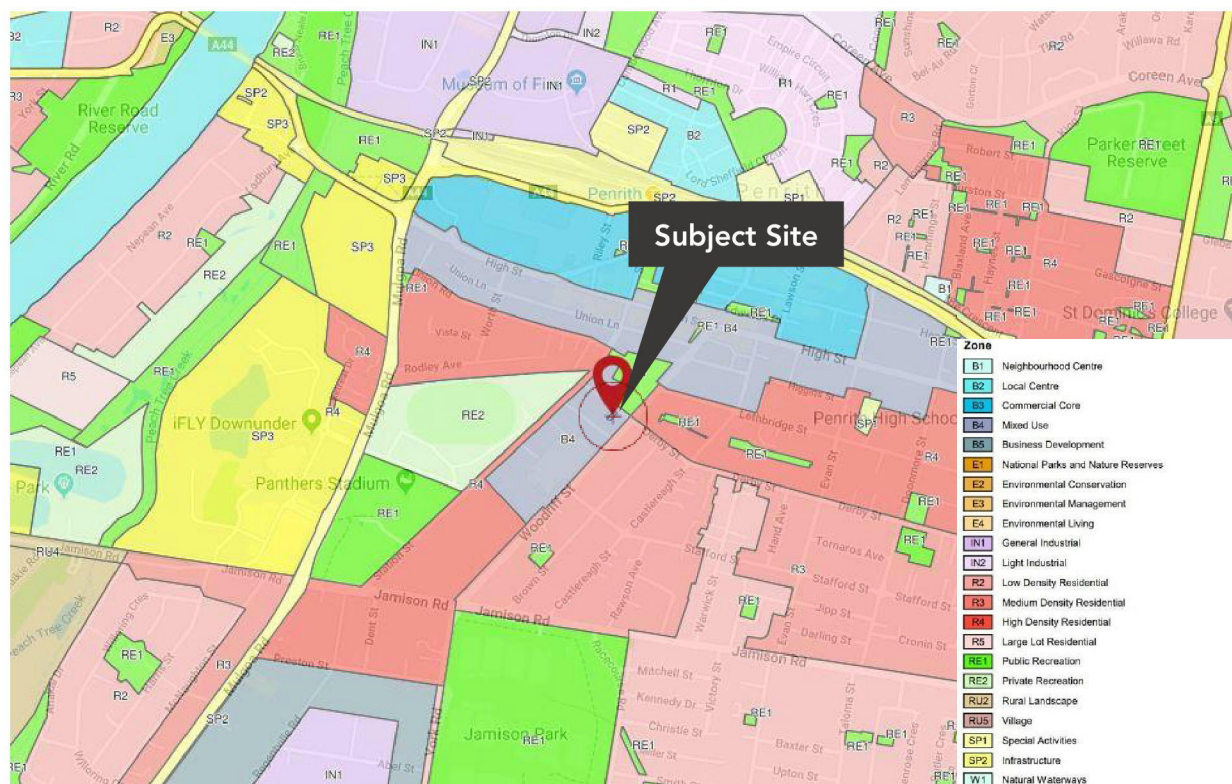


Figure 3 - Local Land Use Map (Source: NSW Planning Viewer)

3.2 Development Proposal

The development proposal involves the construction of a Residential Aged Care Facility (RACF) and Independent Living Units (ILU) for seniors, over three (3) buildings (see Figure 4). The development will have a total gross floor area (GFA) of 12,000m². The yield schedule is summarised in Table 1.

Table 1 - Yield Schedule

Use	Component	Quantity
RACF	Rooms	100
	Beds	120
	Staff*	25
ILU	1-bedroom	16
	1-Bedroom + Study	33
	2-Bedroom + 1 Bath	11
	2-Bedroom + 2 Bath	10
	3-bedroom	6

**Estimated maximum number of staff on site at any one time (peak time)*

Parking will be provided within one (1) basement floor which will be accessible via a new driveway off Reserve Street.

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Version: 1, Version Date: 20/12/2018

4. Existing Transportation Facilities

4.1 Road Hierarchy

The subject site is located in the suburb of Penrith and is primarily serviced by State Roads including Mulgoa Road, Parker Street and Great Western Highway, as well as Regional Roads such as Jamison Road. The site is also serviced by local roads managed by Penrith City Council.

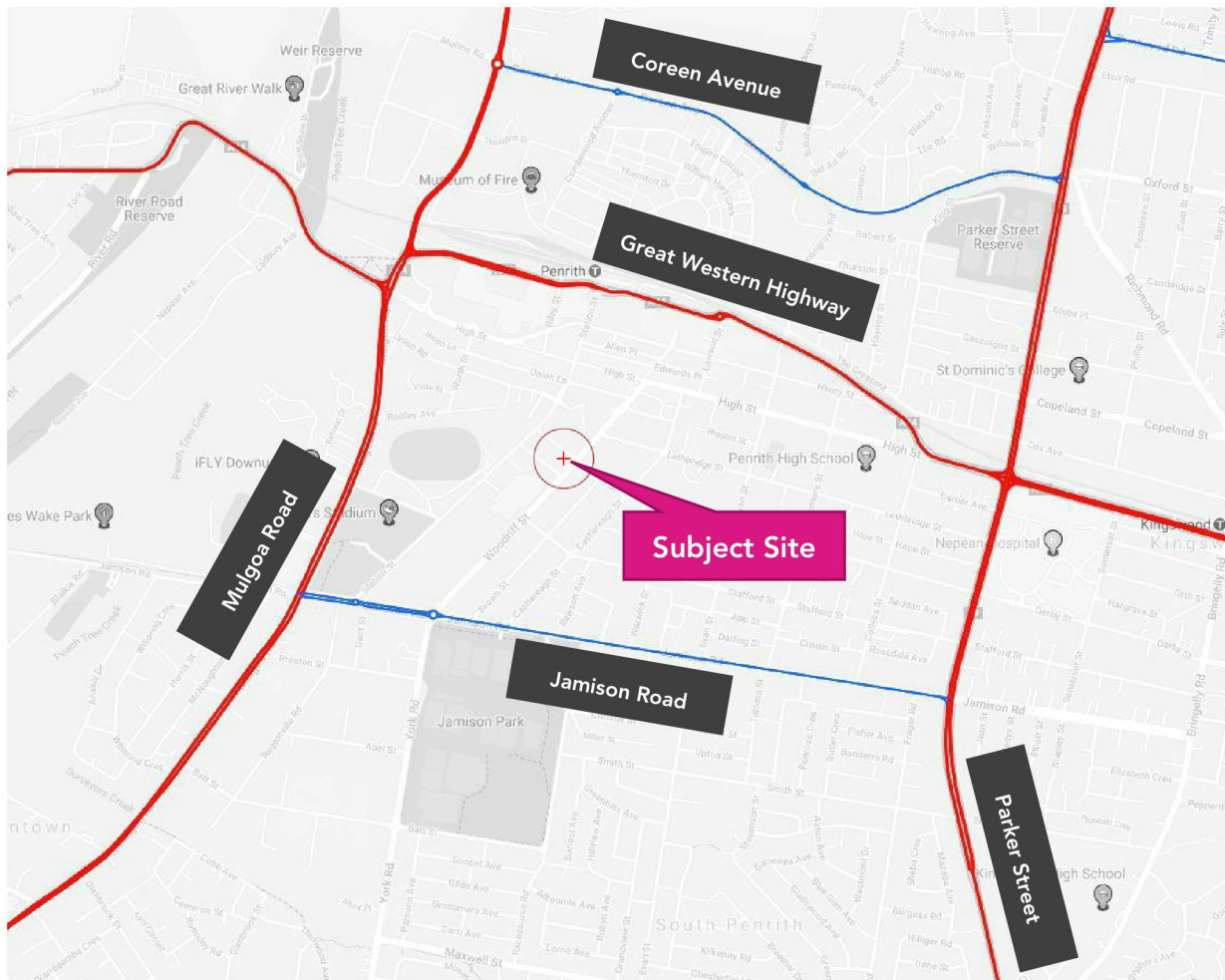


Figure 5 - Road Hierarchy (RMS Road Hierarchy Review)

The NSW administrative road hierarchy comprises the following road classifications, which align with the generic road hierarchy as follows:

- | | |
|----------------|--|
| State Roads | - Freeways and Primary Arterials (RMS Managed) |
| Regional Roads | - Secondary or sub arterials (Council Managed, Part funded by the State) |
| Local Roads: | - Collector and local access roads (Council Managed) |

Table 2 - Derby Street

Derby Street	
Road Classification	Local Road
Alignment	North-West to South-East
Number of Lanes	1 lane in each direction
Carriageway Type	Undivided
Carriageway Width	13m with parking lanes on both sides
Speed Limit	50km/h
School Zone	No
Parking Controls	4P Mon-Fri on northern side and Unrestricted on southern side
Forms Site Frontage	Yes



Figure 6 - Derby Street (South-easterly towards Woodriff Street)

Table 3 - Woodriff Street

Woodriff Street	
Road Classification	Local Road
Alignment	North-East to South-West
Number of Lanes	1 lane in each direction
Carriageway Type	Undivided
Carriageway Width	12.5m with parking lanes on both sides
Speed Limit	50km/h
School Zone	No
Parking Controls	Unrestricted
Forms Site Frontage	Yes



Figure 7 - Woodriff Street (South-westerly towards Reserve Street)

Table 4 - Reserve Street

Reserve Street	
Road Classification	Local Road
Alignment	North-West to South-East
Number of Lanes	1 lane in each direction
Carriageway Type	Undivided
Carriageway Width	12m with parking lanes on both sides
Speed Limit	50km/h
School Zone	No
Parking Controls	Unrestricted
Forms Site Frontage	Yes



Figure 8 - Reserve Street (North-westerly towards Station Street)

Table 5 - Station Street

Station Street	
Road Classification	Local Road
Alignment	North-East to South-West
Number of Lanes	1 lane in each direction
Carriageway Type	Undivided
Carriageway Width	12m with parking lanes on both sides
Speed Limit	50km/h
School Zone	No
Parking Controls	No Parking and unrestricted
Forms Site Frontage	No



Figure 9 - Station Street (North-easterly towards Derby Street)

4.2 Public Transport

The locality has been assessed in the context of available forms of public transport that may be utilised by prospective residents, employees and visitors. When defining accessibility, the NSW Guidelines to Walking & Cycling (2004) suggests that 400m-800m is a comfortable walking distance.

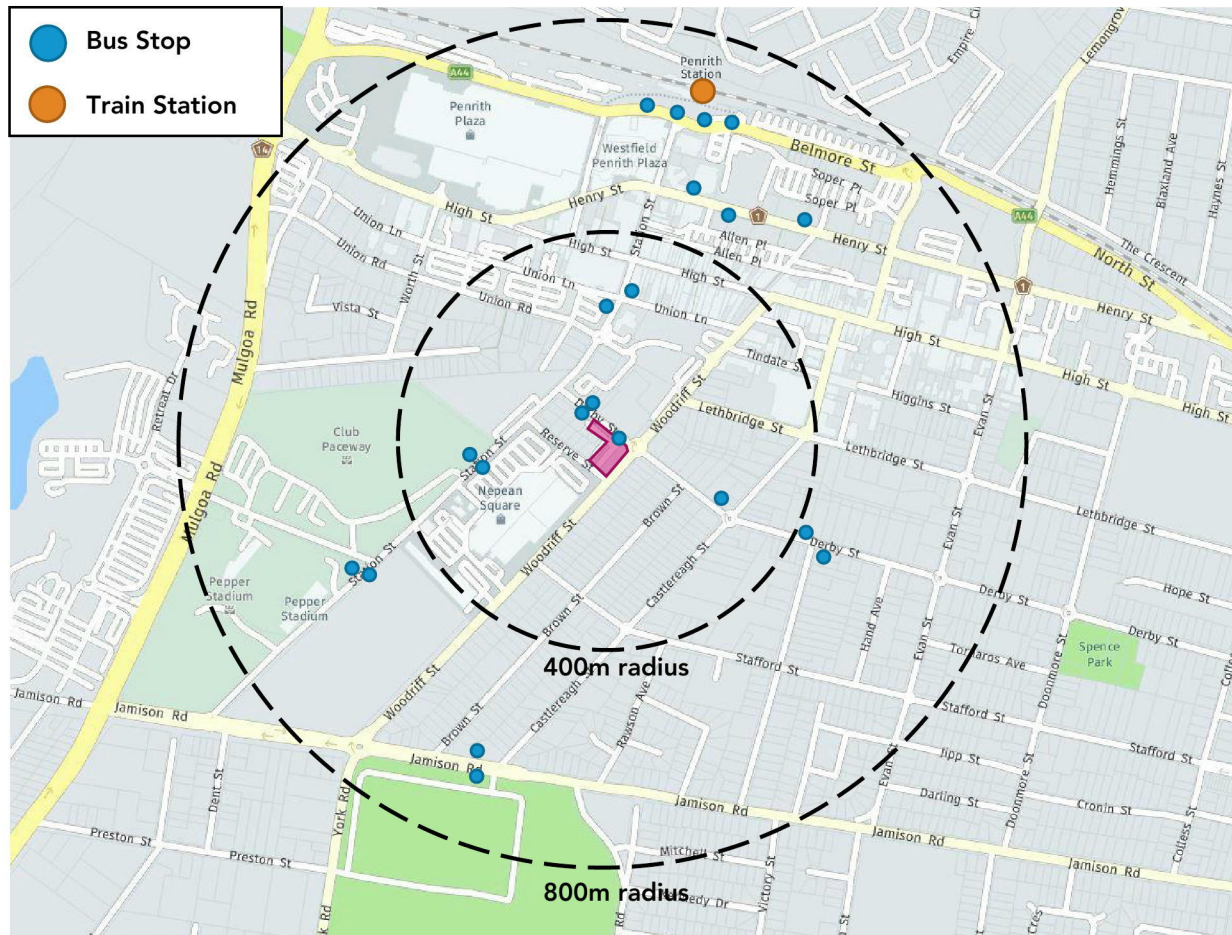


Figure 10 - Public Transport Accessibility

4.2.1 Bus Services

The site is well serviced by a comprehensive network of bus services, operated by Blue Mountains Transit, with multiple bus stops located within a 400m radius of the subject site. Thus, it is anticipated for staff, visitors and some residents of the development to travel to and from the site by bus.

The bus services (available within a 400m radius of the site) are summarised in Table 6.

Table 6 - Bus Service Summary

Route	Coverage	Frequency	Bus Stop Location
688	Penrith to Emu Heights (Loop Service)	Weekday: Approximately every 50mins-1hour Saturday: Approximately every 1 hour Sunday & Public Holidays: Approximately every 2 hours	Station Street south of Reserve Street Stop ID: 2750264

Route	Coverage	Frequency	Bus Stop Location
689	Penrith to Leonay (Loop Service)	Weekday: Approximately every 1 hour Saturday: Approximately every 1 hour Sunday & Public Holidays: Approximately every 2 hours	Derby Street opposite PCYC Penrith Stop ID: 2750233
690P	Springwood to Penrith	Weekday: Limited services Saturday: Limited services Sunday & Public Holidays: Limited services	Nepean Shopping Centre along Station Street Stop ID: 2750126
770	Mount Druitt to Penrith via St Marys	Weekday: Approximately every 30 minutes Saturday: Approximately every 1 hour Sunday & Public Holidays: Approximately every 1 hour	Derby Street opposite PCYC Penrith Stop ID: 2750233
774	Penrith to Mount Druitt via Nepean Hospital	Weekday: Approximately every 30 minutes Saturday: Approximately every 1 hour Sunday & Public Holidays: Approximately every 1 hour	Derby Street opposite PCYC Penrith Stop ID: 2750233
775	Mount Druitt to Penrith via Erskine Park	Weekday: Approximately every 30 minutes Saturday: Approximately every 1 hour Sunday & Public Holidays: Approximately every 1 hour	Derby Street opposite PCYC Penrith Stop ID: 2750233
776	Mount Druitt to Penrith via St Clair	Weekday: Approximately every 30 minutes Saturday: Approximately every 1 hour Sunday & Public Holidays: Approximately every 1 hour	Derby Street opposite PCYC Penrith Stop ID: 2750233
781	St Marys to Penrith via Glenmore Park	Weekday: Limited services Saturday: No services Sunday & Public Holidays: No services	Station Street after Reserve Street Stop ID: 2750264
789	Luddenham to Penrith	Weekday: Limited services Saturday: No services Sunday & Public Holidays: No services	Derby Street before Castlereagh Street Stop ID: 2750240
791	Penrith to Jamisontown via South Penrith (Loop Service)	Weekday: Approximately every 30 minutes Saturday: Approximately every 30 minutes	Derby Street opposite PCYC Penrith Stop ID: 2750233

Route	Coverage	Frequency	Bus Stop Location
		Sunday & Public Holidays: Approximately every 1 hour	
793	Penrith to Jamisontown (Loop Service)	Weekday: Approximately every 30mins-1hour Saturday: Approximately every 1 hour Sunday & Public Holidays: No services	Station Street after Reserve Street Stop ID: 2750264
794	Glenmore Park to Penrith via The Northern Road	Weekday: Approximately every 30mins-1hour Saturday: Approximately every 1 hour Sunday & Public Holidays: Approximately every 1 hour	Derby Street opposite PCYC Penrith Stop ID: 2750233
795	Warragamba to Penrith	Weekday: Limited services Saturday: Limited services Sunday & Public Holidays: Limited services	Station Street after Reserve Street Stop ID: 2750264
797	Penrith to Glenmore Park (Loop Service)	Weekday: Approximately every 30mins Saturday: Approximately every 1 hour Sunday & Public Holidays: Approximately every 1 hour	Station Street after Reserve Street Stop ID: 2750264
799	Glenmore Park to Penrith via Regentville	Weekday: Approximately every 1 hour Saturday: Approximately every 1 hour Sunday & Public Holidays: Approximately every 1 hour	Station Street after Reserve Street Stop ID: 2750264
S13	Penrith to Mountainview Village (Loop Service)	Weekday: Limited services Saturday: No service Sunday & Public Holidays: No service	Derby Street opposite PCYC Penrith Stop ID: 2750233

4.2.2 Train Services

Penrith Train Station is served by the T1 Western Line (formerly the Blue Mountains Line (BMT)), with service frequency of approximately 5-10 minutes during peak and approximately 15 minutes off-peak periods.

It is acknowledged that the subject development will provide residential dwellings for seniors, and as such, the recommended walking distance of up to 800m may not be suitable for prospective users. Nevertheless, there are multiple bus services which provide connection to Penrith Train Station, which makes it a viable alternative mode of transport for prospective residents, staff and visitors.

4.3 Active Transport

The vicinity of the site has been assessed for walking and cycling infrastructure and the level of amenity, with reference to the NSW Guidelines to Walking and Cycling (2004).

4.3.1 Walking

The site is located within comfortable walking distance (400 – 800m) to the local centre and Penrith Railway Station, whereby footpaths are generally provided on both sides of the surrounding road network. Other infrastructure available in the vicinity include refuge islands, signalised crossings and adequate lighting coverage. This in turn provides high level amenity for pedestrian connectivity between the site and bus stops/train stations, nearby retail precincts etc.

4.3.2 Cycling

In regard to cycling infrastructure, Figure 11 shows the existing cycleway network in the surrounding road network of the site, whereby the immediate vicinity of the site comprises a low difficulty on-road cycling environment along Derby and Woodriff Street. Considering the development will comprise of seniors, it is not anticipated for residents to travel via cycling. However, cycling may be a viable active transport option for some staff and visitors travelling to and from the site.

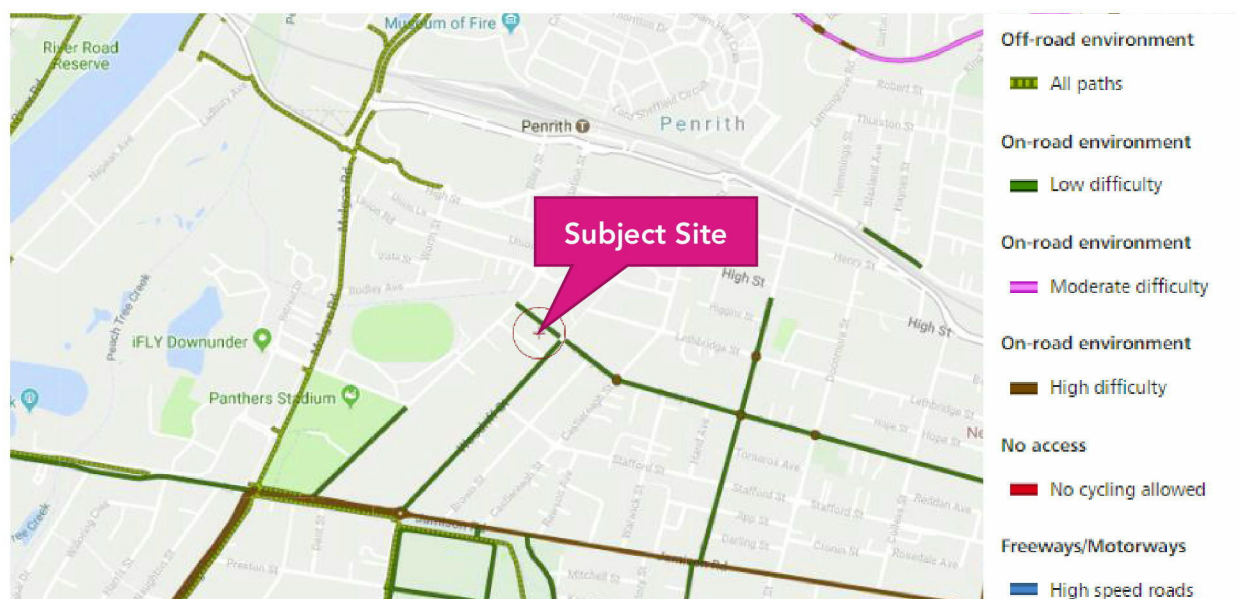


Figure 11 – Cycleways in the site vicinity (Source: RMS Cycleway Finder)

5. Traffic Impact Assessment

The traffic impact assessment has been undertaken with reference to the RMS Guide to Traffic Generating Developments (2002), RMS Technical Direction (TDT 2013/04) and intersection traffic survey data collected on Wednesday 17th May 2017. It is noted that the survey data is less than two years old, whereby the land uses of the site vicinity has not undergone any significant changes since the day of the survey undertaken. Thus, the validity of the data is anticipated to remain.

5.1 Existing Traffic Generation

The existing site is occupied by an existing informal at-grade car park without line marking, with approximately 100-150 car parking spaces. The car parking is well utilised on weekdays which generates AM & PM traffic which is likely to be equal or more than forecast traffic generation associated with the proposal. However, to provide a robust traffic assessment, no deduction has been made from the post development traffic model.

5.2 Existing Traffic Volume

To determine the existing traffic volumes within the vicinity of the site, an intersection survey was conducted on Wednesday 17th May 2017, between 7am – 9am and 4pm – 6pm at the following intersections:

1. Derby Street and Woodriff Street;
2. Woodriff Street and Reserve Street; and
3. Station Street and Reserve Street.

The abovementioned intersection survey locations are shown in Figure 12.



Figure 12 – Location of the Intersection Surveys

5.2.1 Existing Peak Hour Traffic Volume

The peak hour traffic volumes for the corresponding intersections has been determined by the survey data and presented in the following figures.

- Derby Street / Woodriff Street

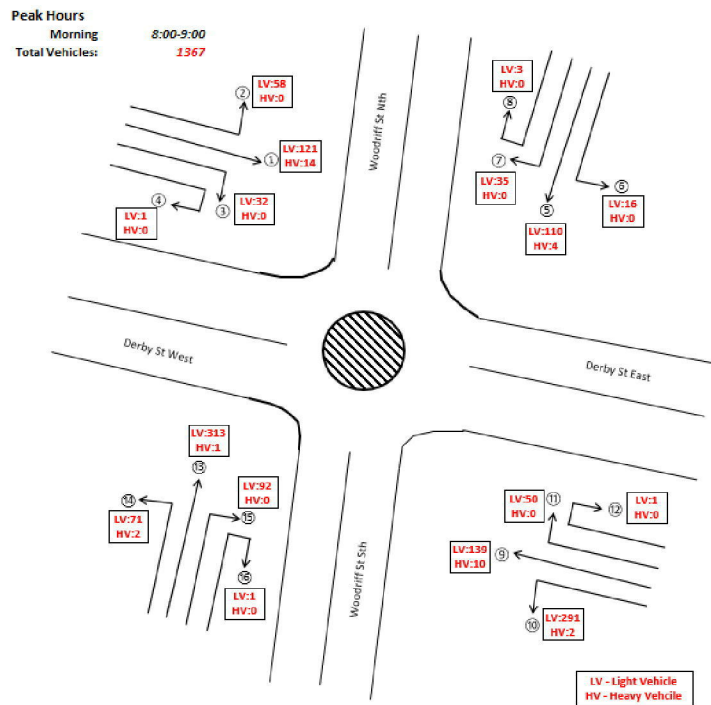


Figure 13 - Derby Street/Woodriff Street - AM Peak Traffic Volumes

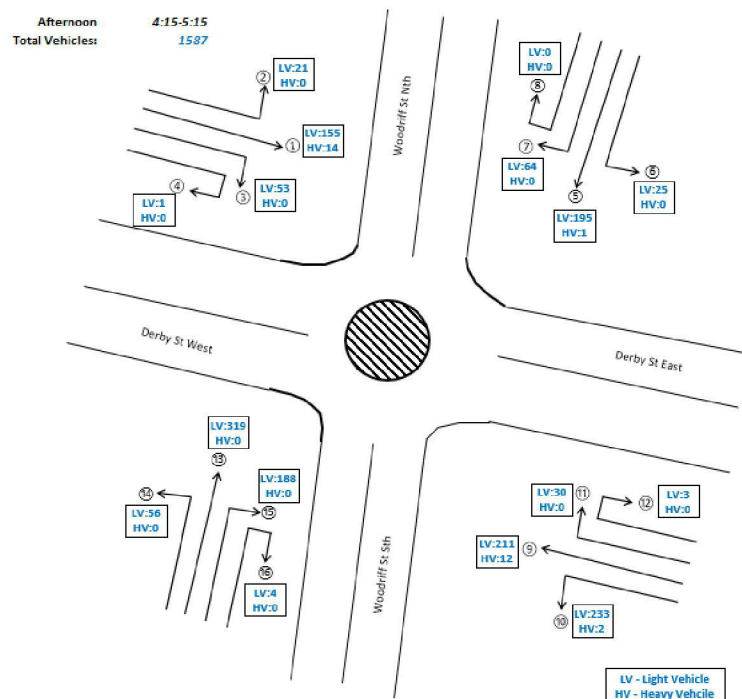


Figure 14 - Derby Street/Woodriff Street - PM Peak Traffic Volumes

- Woodriff Street / Reserve Street

Peak Hours

Morning 8:00-9:00
Total Vehicles: 1069

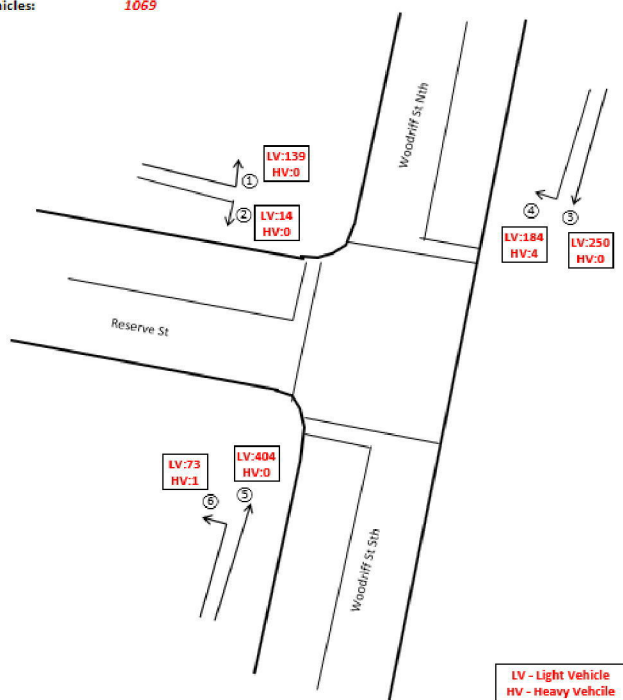


Figure 15 - Woodriff Street/Reserve St - AM Peak Traffic Volumes

Afternoon 4:15-5:15
Total Vehicles: 1247

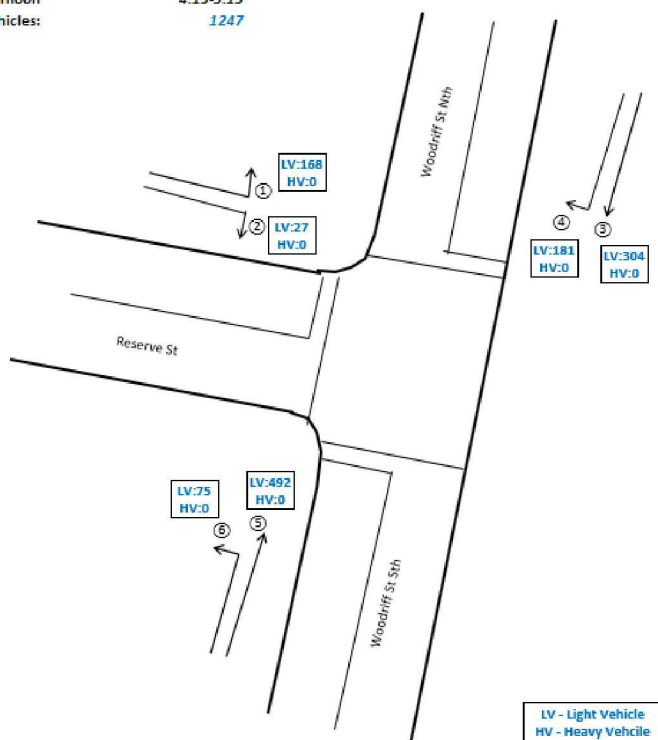


Figure 16 - Woodriff Street/Reserve St - PM Peak Traffic Volumes

- Station Street / Reserve Street

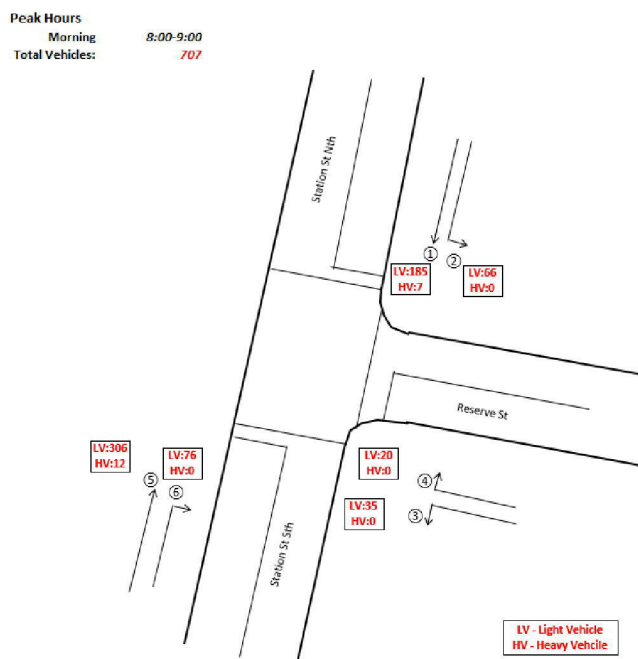


Figure 17 - Station Street/Reserve Street - AM Peak Traffic Volumes

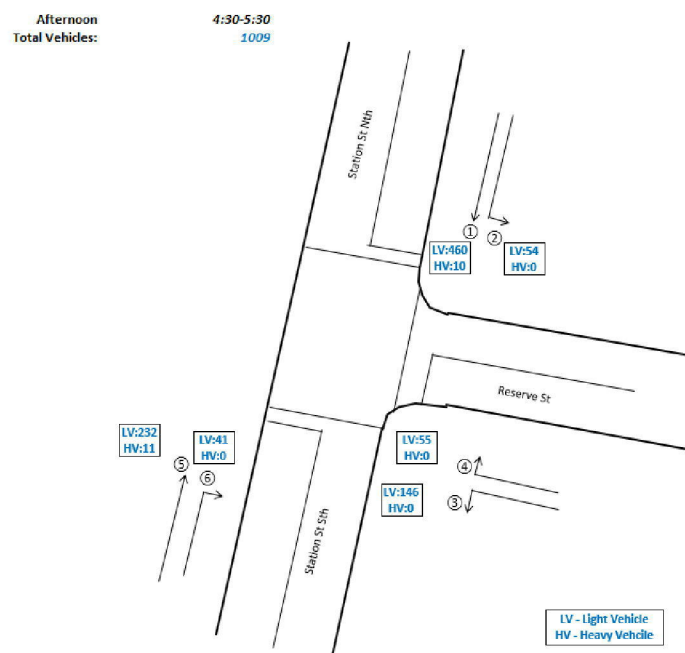


Figure 18 - Station Street/Reserve Street - PM Peak Traffic Volumes

5.2.2 Existing Network Operation

From the survey data, a volume analysis was performed using SIDRA Intersection 8.0 software, a micro-analytical tool for individual intersections and whole-network modelling. The models are based on the collected traffic survey data. SIDRA provides a number of performance indicators, outlined below:

- Degree of Saturation – The total usage of the intersection expressed as a factor of 1 with 1 representing 100% use/saturation. (e.g. 0.8 = 80% saturation)
- Average Delay – The average delay encountered by all vehicles passing through the intersection. It is often important to review the average delay of each approach as a side road could have a long delay time, while the large free flowing major traffic will provide an overall low average delay.
- Level of Service (LoS) – This is a categorization of average delay, intended for simple reference. The RMS adopts the following bands:
- 95% Queue Lengths (Q95) – is defined to be the queue length in metres that has only a 5-percent probability of being exceeded during the analysis time period. It transforms the average delay into measurable distance units.

Level of Service (LoS) is a good indicator of overall performance for individual intersections, with each level summarised in Table 7.

Table 7 – Intersection Performance – Level of Service

Level of Service	Average Delay (secs/vehicle)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	<14	Good operation	
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity. At signals, incidents would cause excessive delays. Roundabouts require other control mode	At capacity, requires other control mode
F	>70	Extra capacity required	Extreme delay, major treatment required

The existing network operation extracted from SIDRA for each intersection of the network are summarised in Table 8.

Table 8 – SIDRA Results Summary – Existing Situation

Intersection	Period	Level of Service	Average Delay (sec)	Degree of Saturation	95% Queue Length (m)
Derby Street / Woodriff Street	AM Peak	LOS A	6.9	0.480	10.1
	PM Peak	LOS A	8.9	0.622	17.3
Woodriff Street / Reserve Street	AM Peak	LOS A	3.4	0.326	5.9
	PM Peak	LOS A	3.7	0.367	7.3
Station Street / Reserve Street	AM Peak	LOS A	1.9	0.234	1.9
	PM Peak	LOS A	2.5	0.288	3.0

5.2.3 Derby Street/Woodriff Street

The SIDRA analysis indicates that the intersection operates at a LOS A during both the AM and PM peaks with minimal average delays. The intersection operates with a spare capacity of approximately 52% in the AM peak and 38% in the PM peak respectively.

5.2.4 Woodriff Street/Reserve Street

The intersection of Woodriff Street and Reserve Street is currently operating at a LOS A in both the AM and PM peak periods. Furthermore, the intersection operates with a degree of saturation of approximately 33% and 37% in the AM and PM peaks respectively.

5.2.5 Station Street/Reserve Street

The Station Street/Reserve Street intersection is currently performing at a LOS A in the AM and PM peaks with negligible 95th percentile queues. The SIDRA analysis indicates that there is ample of spare capacity during both the peak periods which are 77% in the AM peak and 71% in the PM peak respectively.

5.3 Post-Development Traffic Generation

The post-development traffic generation has been calculated with reference to Section 3.3.4 of the RMS Guide to Traffic Generating Developments (2002), which presents the traffic generation rates for housing for aged and disabled persons.

It is noted that the traffic generation rates outlined within the RMS guide are based on the number of dwellings; however, the RACF development yield schedule (see Section 3.2) presents a breakdown of the number of rooms rather than dwellings, which is reflective of the nature of residential aged care facilities. In this regard, the number of rooms is assumed to represent the number of dwellings when calculating the potential traffic generation.

As such, the following rates are adopted to calculate the anticipated post-development traffic generation*:

- Daily vehicle trips: 1 – 2 per dwelling; and
- Evening peak hour vehicle trips: 0.1 – 0.2 per dwelling.

**These figures at the lower end of the above rates are based on research conducted by RMS. This research concentrates on subsidised developments (often run by religious organisations). Generation rates of resident funded developments are often greater, as indicated at the higher end of the range.*

This development falls into the category of the latter development type of the above mentioned rates, and thus the rates at the higher end are implemented, as shown in the calculations presented in Table 9.

Table 9 – Post-Development Traffic Generation Summary

Component	Period	Average Vehicle Trip Rate	No. of Dwellings	Generated Trips
RACF	Peak Hourly (AM)	0.2 trips / dwelling	100	20
	Peak Hourly (PM)	0.2 trips / dwelling	100	20
ILU	Peak Hourly (AM)	0.2 trips / dwelling	76	16 (15.2)
	Peak Hourly (PM)	0.2 trips / dwelling	76	16 (15.2)
Total (RACF + ILU)	Peak Hourly (AM)	0.2 trips / dwelling	176	36 (35.2)
	Peak Hourly (PM)	0.2 trips / dwelling	176	36 (35.2)

5.3.1 Post-Development Traffic Distribution

The calculated trips generated from the proposed development has been applied to the existing traffic network based on the following assumptions:

- AM Peak: 80% of trips will be inbound, 20% of trips will be outbound; and
- PM Peak: 20% of trips will be inbound, 80% trips will be outbound.

It is noted that the proposed development with car parking provision of 97 spaces will replace the existing unformalised car park with a capacity of approximately 100 - 150 spaces. As such, the base level of traffic generation of the development is anticipated to be less than the existing traffic distribution displayed in the

survey data. However, no deductions have been made for the purpose of the traffic modelling for a conservative measure. In light of this, the traffic distribution for the AM and PM peak volumes are presented in the following figures:

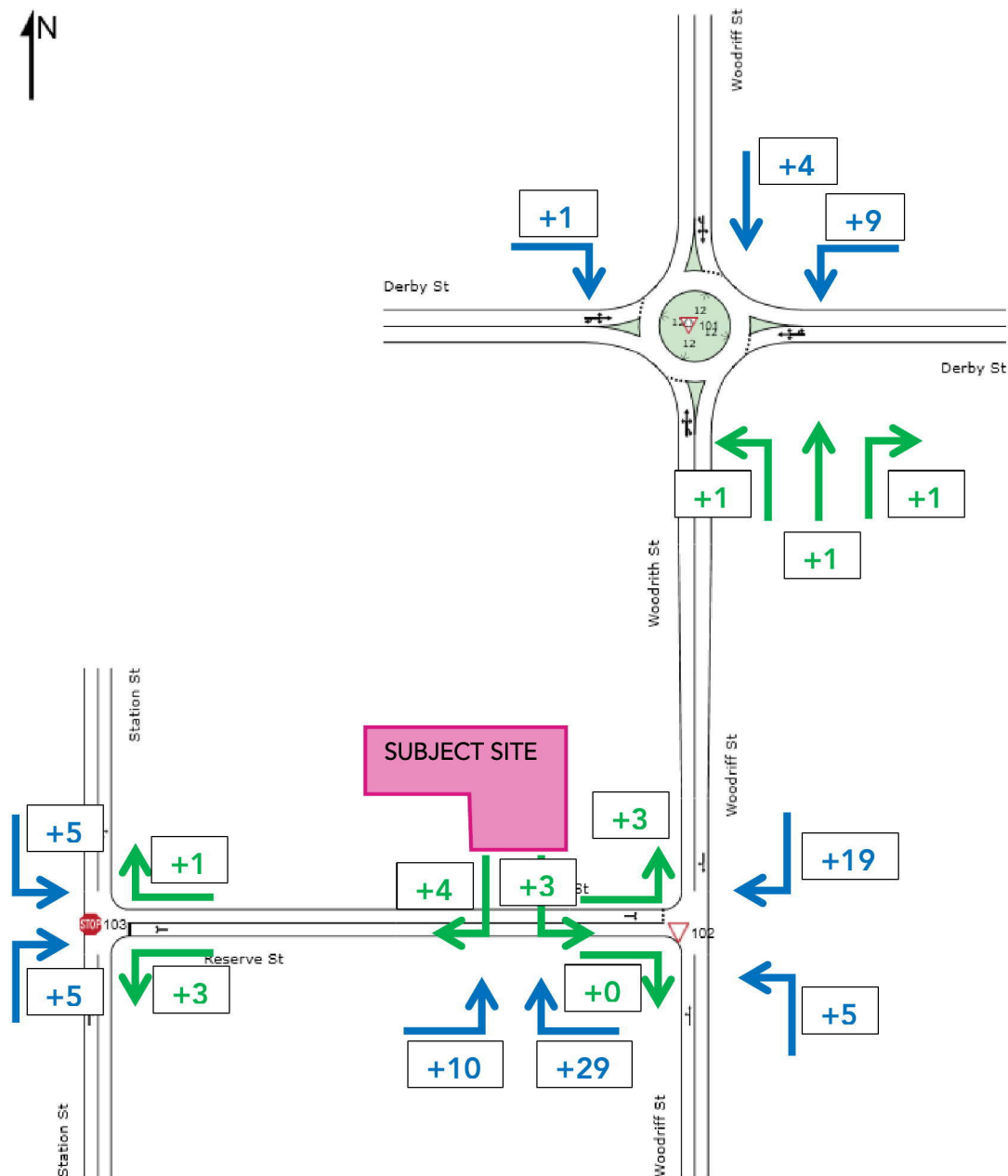


Figure 19 – Post Development AM Peak Traffic Distribution



5.3.2 Post-Development Network Operation

The following table presents a comparison of the SIDRA results for the existing and post-development scenarios.

Table 10 – SIDRA Results Comparison between Existing and Post-Development Scenario

Intersection	Period	Level of Service	Average Delay (sec)	Degree of Saturation	95% Queue Length (m)
Derby Street / Woodriff Street	Existing AM Peak	LOS A	6.9	0.480	10.1
	Post-Development AM Peak	LOS A	7.0	0.488	10.4
	Existing PM Peak	LOS A	8.9	0.622	17.3
	Post-Development PM Peak	LOS A	8.9	0.630	17.9
Woodriff Street / Reserve Street	Existing AM Peak	LOS A	3.4	0.326	5.9
	Post-Development AM Peak	LOS A	3.6	0.341	6.5
	Existing PM Peak	LOS A	3.7	0.367	7.3
	Post-Development PM Peak	LOS A	3.8	0.372	7.5
Station Street / Reserve Street	Existing AM Peak	LOS A	1.9	0.234	1.9
	Post-Development AM Peak	LOS A	2.0	0.238	2.1
	Existing PM Peak	LOS A	2.5	0.288	3.0
	Post-Development PM Peak	LOS A	2.7	0.290	3.5

5.3.3 Derby Street/Woodriff Street

The SIDRA analysis indicates that the intersection will continue to operate at a LOS A during both the AM and PM peaks with acceptable delays. There is a minor increase in the average delay experienced by vehicles navigating the intersection and there is minimal change to the degree of saturation and 95th percentile queue lengths.

5.3.4 Woodriff Street/Reserve Street

The intersection of Woodriff Street and Reserve Street is expected to continue performing at a LOS A in both the AM and PM peak in the post-development scenario. There are no noticeable changes to the key performance indicators for the intersection, indicating that the anticipated traffic generated by the proposed development will have a minimal impact on this intersection.

5.3.5 Station Street/Reserve Street

In the post-development scenario, the Station Street/Reserve Street intersection is anticipated to continue operating with acceptable delays at a LOS A during both the AM and PM peak periods. There are no significant changes in the average delay, degree of saturation or 95th percentile queue lengths when compared to the existing scenario. As such, the proposed development is not anticipated to have any noticeable impact on the operation of the intersection.

5.4 Traffic Impact Summary

The post development traffic generation based on the rates extracted from the RMS Guide to Traffic Generating Developments (2002) resulted in a trip generation 36 peak hourly trips (20 from the RACF and 16 from the ILU development).

The calculated net increase in trips generated by the development has been applied to the SIDRA modelling whereby the output shows no noticeable impact on the operation of the existing local road network. This is exhibited in the level of service output presented in Table 10 of Section 5.3.2, whereby all intersections displayed a level of service A.

Furthermore, the rates adopted from the RMS guide of 2 trips per dwelling may not accurately represent the traffic generated by the RACF development, even though it may represent the ILU development traffic generation appropriately (i.e. an occupant of an individual unit may make up to 2 trips during a single day). This is due to the typical nature of aged care facilities, whereby the majority of trips generated are anticipated to comprise staff and visitors. In this regard, the traffic generation is considered to be based on a conservative measure as the actual trips generated by staff are estimated to reflect a lower number of trips than calculated. This is due to the proposal only comprising 25 staff on site at any one time (refer to Section 3.2). Furthermore, staff are typically expected to arrive earlier than the typical peak of the road network.

As such, the total traffic generation calculated by applying the rate suggested by the RMS guide is considered to be based on a conservative assumption that all units (RACF and ILU) generate traffic volumes at the same rate. Additionally, as discussed in Section 5.3.1, the proposed car parking provision is expected to generate a comparable base level of traffic to the existing road network as it displaces the existing unformalised car park. In light of this, the post-development traffic volume of 36 peak hourly trips is not anticipated to impose any noticeable impacts on the existing operation of the local road network.

6. Parking Provision Assessment

The parking provision has been assessed with reference to State Environmental Planning Policy (SEPP) Housing for Seniors or People with a Disability (2004), Penrith City Council Development Control Plan (DCP) 2014, Building Code of Australia (BCA) 2006 and the NSW Guidelines to Walking and Cycling (2004).

6.1 Car Parking

The car parking provision has been assessed in accordance with the SEPP Housing for Seniors or People with a Disability (2004) and based on the yield schedule presented in Table 1 of Section 3.2. As such, the following rates are adopted:

RACF:

- 1 parking space for each 10 beds in the residential care facility; and
- 1 parking space for each 2 persons to be employed in the connection with the development and on duty at any one time.

ILU:

- 0.5 car spaces for each bedroom where the development application is made by a person other than a social housing provider.

Table 11 – Car Parking Requirement Summary

Use Type	Beds/Staff/Units	Type of Provision	Rate	Parking Required	Parking Provided
RACF	120	Residents/Visitors	0.10 space/bed	12	12
	25	Staff	0.50 space/bed	13	13
RACF Subtotal				25	25
ILU – 1 bedroom	17	Residents/Visitors	0.5 space/bedroom	9	Tbc
ILU – 1 bedroom + study*	32	Residents/Visitors	0.5 space/bedroom	16	Tbc
ILU – 2 bedrooms	21	Residents/Visitors	0.5 space/bedroom	21	Tbc
ILU – 3 bedrooms	6	Residents/Visitors	0.5 space/bedroom	9	Tbc
ILU Subtotal				55	72
Total Car Parking Required				80	97

**study room is not classified as a bedroom, given that these rooms are to be approved for the purpose of a study room only*

6.2 Accessible Car Parking

The accessible parking provision has been assessed in accordance with the Building Code of Australia (BCA) 2006, whereby an aged care building is classified as Class 9c. As such, the required number of accessible car parking spaces required for the RACF is:

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

For the ILU component of the proposal, the SEPP Housing for Seniors or People with a Disability (2004) stipulates the following:

- 5% of the total number of car parking spaces (or at least one space if there are fewer than 20 spaces)

Table 12 – Accessible Car Parking Requirement Summary

Use Type	Car Parking Provided	Rate	Parking Required	Parking Provided
RACF	25	0.01 spaces/proposed car parking spaces	1 (0.25)	1
ILU	72	0.05 spaces/proposed car parking spaces	3 (2.75)	4
Total Accessible Parking Bays Required			4	5

6.3 Service Vehicle Parking

Service vehicle requirements have been assessed with reference to the SEPP Housing for Seniors or People with a Disability (2004) and Penrith City Council DCP (2014), whereby the following service vehicle parking is required as per the documents respectively:

- 1 parking space suitable for an ambulance (RACF); and
- Where relevant, development shall provide on-site loading facilities to accommodate the anticipated heavy vehicle demand for the site.

It is proposed for two service vehicle parking bays with dimensions 3.5m x 10m to be provided within the loading dock. The northern service bay will be dedicated for ambulance parking (bariatric ambulance) and one for waste collection (Veolia refuse vehicle of 9.8 metres in length) and deliveries.

6.4 Bicycle Parking

Penrith City Council DCP (2014) refers to the NSW Guidelines to Walking and Cycling (2004) in relation to bicycle parking requirements, as such the following rates are adopted for the land-use type category of 'aged or disabled self-contained housing':

- Residents: 3-5% of the number of units provided; and
- Visitors: 3-5% of the number of units provided.

In this regard, the ILU development falls under the abovementioned land-use and the respective bicycle parking provision rates. It is noted that the lower rate is adopted due to the nature of the prospective residents of the development to comprise predominantly of seniors. However, this is not anticipated to apply to RACF due to the nature of the development being facilitated by staff rather than independently contained. As such, a summary of the bicycle parking provision is outlined in Table 13.

Table 13 – Bicycle Parking Requirement Summary

Use Type	No. of Units	Type of Provision	Rate	Parking Required	Parking Provided
ILU	76	Residents	0.03 – 0.05 spaces/dwelling	3	3
		Visitors	0.03 – 0.05 spaces/dwelling	3	3
Total Bicycle Parking Required				6	6

6.5 Parking Summary

The total car parking provision of 97 car parking spaces (inclusive of 5 accessible parking spaces) satisfies the minimum parking requirements stipulated by the SEPP Housing for Seniors or People with a Disability (2004) of 80 parking bays (inclusive of 4 parking bays).

Two service bays are provided in the loading dock on the ground floor level; one service bay will be for ambulance parking and one service bay will be for waste collection and deliveries. In this regard, the requirements of the SEPP and the DCP has been addressed.

The bicycle parking provision satisfies the parking requirements suggested in the NSW Guidelines to Walking and Cycling (2004) totalling 6 bicycle parking spaces.

7. Access and Design Review

The following section presents an assessment of the proposed development with reference to the requirements of *AS2890.1:2004 (Off-street Car Parking)*, *AS2890.2:2002 (Off-street Commercial Vehicle Facilities)*, *AS2890.3:2015 (Bicycle Parking)* and *AS2890.6:2009 (Off-street Parking for People with Disabilities)*. This section is to be read in conjunction with the architectural plans dated 18/12/2018 prepared by Jackson Teece (see **Attachment 1**) and the car park assessment undertaken by ptc. (see **Attachment 2**).

7.1 Pedestrian Access

Pedestrian access into the site is available along Reserve and Derby Streets where existing footpaths are present. Separate arrangements for pedestrian and vehicular access are proposed, thus there are no safety issues in the context of pedestrian movements.

7.2 Driveway Location

The development involves the construction of an 8m wide driveway within the Reserve Street frontage. The proposed driveway is situated approximately 60m from the intersection of Woodriff Street and Reserve Street, exceeding the minimum distance of 6m from the roadway tangent point as per Figure 3.1 in AS2890.1. Sight distance on both sides of the driveway is adequate, hence there is no safety issues.

7.3 Car Park Arrangement

7.3.1 Access Driveway

The access driveway to the development has been assessed with reference to Table 3.1 and Table 3.2 of AS2890.1:2004, whereby the access facility category falls in category 1, based on the parking facility of class 1A and frontage road type as a local road (Reserve Street).

As the proposed driveway will facilitate access by light and heavy vehicles, the driveway has been designed to accommodate vehicles up to a 9.8m refuse vehicle (Veolia rear-lift truck). As per Table 3.1 in AS2890.2, The minimum roadway width (between kerbs) for two-way circulation applicable to an HRV is 6.5m for a straight section of road. As the proposed driveway has a width of 8m, this satisfies the minimum requirement stipulated within AS2890.2 for HRV access. Details of the swept path assessment are provided in Attachment 2.

7.3.2 Typical Requirements

The car park access and parking arrangements have been assessed in accordance with the requirements of AS2890.1:2004, with reference to Class 1A (residential, domestic and employee parking) users. In addition to the typical requirements of AS2890.1, Class 1A facilities are to provide the following dimensions (90° angle parking):

- Car Spaces: 2.4m x 5.4m.
- Aisle Width: 5.8m (minimum) OR 6.1m if parking is located opposite a wall or any other vertical obstruction higher than 150mm.
- Height Clearance 2.2m (minimum).

7.4 Accessible Car Parking

The car park access and parking arrangements have been assessed in accordance with the requirements of AS2890.6:2009, with reference to off-street parking for people with disabilities. In addition to the typical requirements of AS2890.6, accessible parking facilities are to provide the following dimensions (90° angle parking):

- Car Spaces: 2.4m x 5.4m.
- Shared Bay with bollard: 2.4m x 5.4m.
- Aisle Width: 5.8m (minimum) OR 6.1m if there is a wall (higher than 150mm).
- Height Clearance 2.5m (minimum).

7.5 Bicycle Parking

With reference to AS2890.3:2015, bicycle parking shall be designed in accordance with the following minimum requirements:

- Horizontal spaces: 1.8m x 0.5m
- Vertical spaces: 1.2m x 0.5m
- Accessible aisle: 1.5m OR 2.0m for lockers.
- Height Clearance: 2.2m.

2 vertical bicycle parking spaces with dimensions 1,200mm x 500mm and 4 horizontal bicycle parking spaces with dimensions 1,800mm x 500mm and are provided by the development. The minimum aisle width of 1,500mm is provided for the bicycle parking spaces.

Residential bicycle parking are to be provided in an enclosed room in the detailed design stage, where further assessment will be undertaken.

7.6 Indented Pick Up / Drop Off on Reserve & Derby Streets

Site observation shows that there is currently a lack of kiss and ride facility in the area, thus a layby for pick up / drop off is proposed on Reserve Street and Derby Street. The net loss of parking due to the proposal is anticipated to be minor. This will improve the safety for residents and the general public and motorists, as indented bays are noted to be safer and less interruptive compared to traditional kerbside bays.

Traditional bays typically require vehicles to park by a reverse manoeuvre, which may create congestion and queuing behind the parking vehicle. Whereby, the proposed indented bays are anticipated to reduce such impacts along both frontages of the development. Swept path assessments has shown vehicles to be able to enter and exit the indented pick up / drop off bays in a forward direction, reducing interruption to through traffic travelling along Reserve and Derby Streets (see **Attachment 2**).

The indented pick up / drop off bays on Reserve and Derby Streets comprises lengths of approximately 14m and 22m respectively. These laybys will accommodate for vehicles up to a 7.7m minibus on Reserve and up to an 8.8m Medium Rigid Vehicle (MRV) for Derby Street.

7.7 Loading Dock

7.7.1 Servicing & Refuse Collection

Refuse collection and deliveries are proposed to occur within the ground floor loading dock (see Attachment 1). It is understood that refuse collection is proposed to be undertaken by a private contractor; as such, the southern loading bay has been designed to accommodate a 9.8m Veolia rear-lift truck with the following minimum requirements:

- Dimensions: 10m x 3.5m.
- Height Clearance 3.7m (minimum, based on a truck body height of 3.4m).

It is highlighted that the minimum headroom of 3.7m must be kept clear of all overhead obstructions (including services, conduits, lighting fixtures etc.). The height clearance shall be maintained within the loading dock and along the entire length of the vehicle access route.

Removalist trucks (up to 9.8m in length) will also be required to utilise the loading dock for any removalist activities.

A swept path assessment has been undertaken, illustrating the access and egress of a 9.8m long refuse vehicle (see Attachment 2). It is noted that some structural amendments are required to facilitate access; however, these can be addressed within the detailed design stage.

7.7.2 Ambulance Parking

In accordance with the parking provision requirements outlined in Section 6.3, an ambulance bay is required. In order to satisfy this requirement, an ambulance bay has been proposed within the loading dock adjacent to the refuse vehicle bay. The ambulance bay is proposed to have the following dimensions:

- Dimensions: 10m x 3.5m.
- Height Clearance 3.5m (minimum, based on a truck body height of 3.2m).

The ambulance bay has dimensions 10m x 3.5m, which is considered fit-for-purpose. The height clearance shall be maintained within the loading dock and along the entire length of the vehicle access route.

A swept path assessment has been undertaken demonstrating access and egress for a standard 6.96m long bariatric ambulance (refer to Attachment 2).

8. Conclusion

In summary, the development proposal involves the construction of a Residential Aged Care Facility (RACF) and Independent Living Units (ILU) for seniors, accommodating a total site area of 4954m².

Traffic modelling has been undertaken to assess the existing road network, based on survey data collected at three key intersections in the vicinity of the site. With reference to the RMS Guide to Traffic Generating Developments (2002), the post-development traffic generation has been calculated to result in 36 peak hourly trips (20 for RACF and 16 for ILUs). This has been incorporated into the post-development traffic modelling which resulted in no significant changes in the existing road network (level of service for the road network remains at LOS A).

In the context of parking, the development provides a total of 97 car parking bays (inclusive of 5 accessible parking bays), satisfying the minimum requirements stipulated in the SEPP Housing for Seniors or People with a Disability (2004) of 80 spaces and the Building Code of Australia (BCA) 2006 of 4 accessible parking bays. The development also provides 2 service vehicle bays, one dedicated for ambulance parking and one for waste collection and deliveries, addressing the requirements of the SEPP and Penrith City Council DCP 2014 respectively. Bicycle parking requirements suggested in the NSW Guidelines to Walking and Cycling (2004) of 6 spaces are provided by the development.

Pick up and drop off areas are proposed as a layby along Reserve and Derby Streets, accommodating for vehicles up to a 7.7m minibus and 8.8m MRV vehicle respectively (see **Attachment 2**).

A review of the subject development access and car park arrangements has been undertaken at a high-level with reference to AS2890.1:2004, AS2890.6:2009 and AS2890.3:2015. It is highlighted that further assessment will need to be undertaken during the detailed design stage. The driveway access is 8 metres in width and located approximately 60 metres from the intersection of Woodriff and Reserve Streets, which satisfies the minimum distance requirements of 6 metres from the roadway tangent point as per Figure 3.1 in AS2890.1. This review has found elements of vehicular access, visibility, manoeuvrability and parking are to be generally compliant and safe for vehicles and other road users; internally and externally.

Attachment 1- Architectural Drawings



CAR PARKING

STAGE 1
BUILDING 1 - RACF - 24 CARS (INCL 1 DISABLED)
BUILDING 2 - ILU - 34 CARS (INCL 2 DISABLED)

STAGE 2
BUILDING 3 - ILU - 39 CARS (INCL 2 DISABLED)

DISABLED PARKING - 5 CARS
SMALL CARS - 3
TANDEM CARS - 2

TOTAL - 97 CAR SPACES

AMENDMENTS

ISSUE DESCRIPTION

A DA ISSUE

ISSUED BY DATE

PH 17/12/2018



THIS DRAWING ISSUE HAS BEEN REVIEWED FOR

DEVELOPMENT APPLICATION

CHECKED BY
PH

APPROVED BY
DP

KEY PLAN

GENERAL NOTES

CLIENT
GREENGATE

DRAWING
BASEMENT FLOOR PLAN



PROJECT
VILLAGE GREEN PENRITH

DATE
NOVEMBER 2018

SCALE @ A1
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PROJECT No.
2018085

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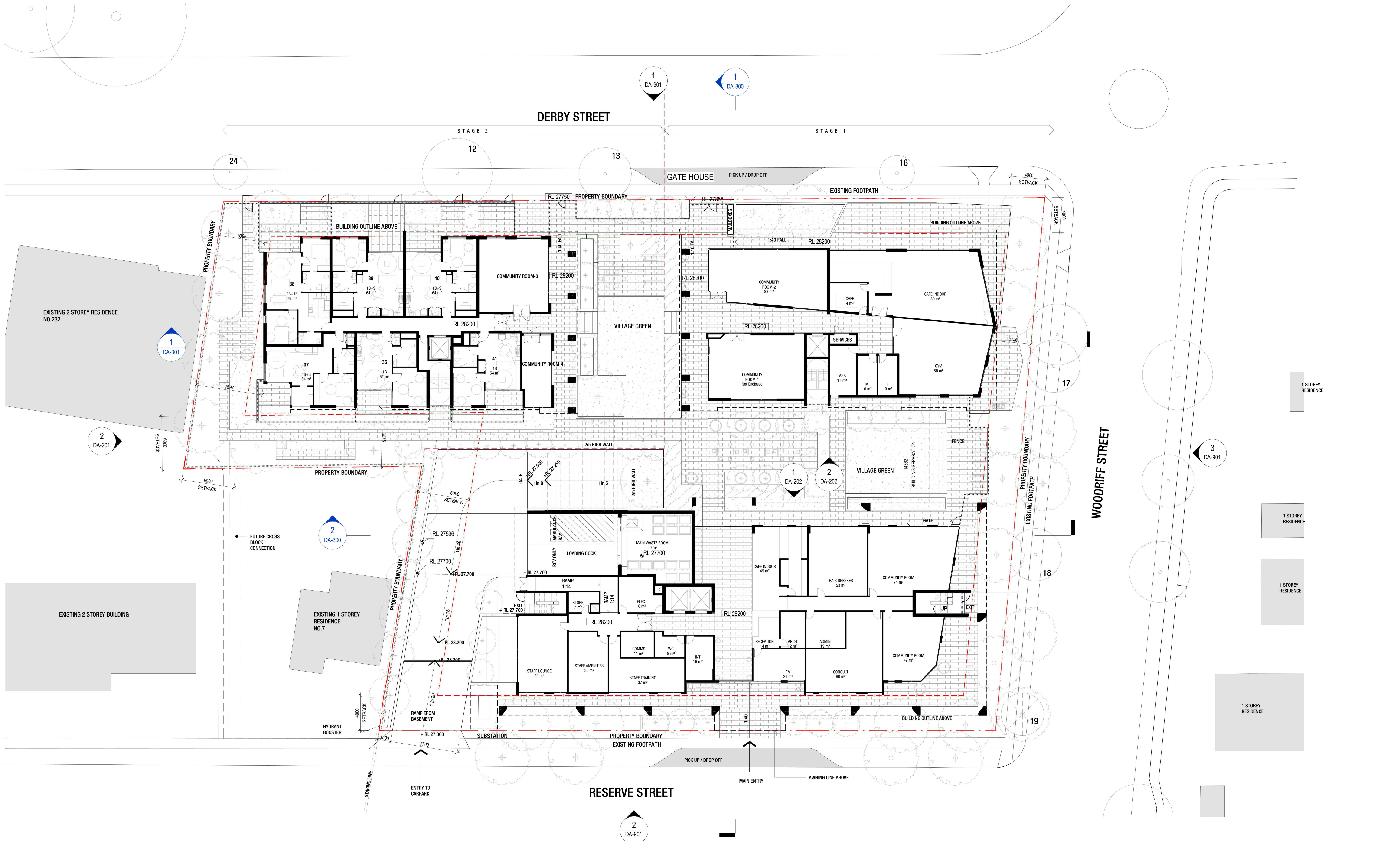
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AMENDMENTS
ISSUE DESCRIPTION
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ISSUED BY PH
DATE 17/12/2018



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DRAWING
GROUND FLOOR PLAN

Greengate
Your life. Your community.

PROJECT
VILLAGE GREEN PENRITH

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SCALE @ A1
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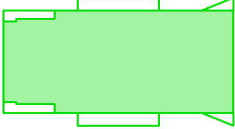
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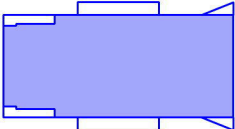
JACKSON TEECE

Attachment 2 - Car Park & Swept Path Assessment

- TYPICAL
- Please note the following compliance requirements:
- Height Clearance: 2.2m (min) throughout all areas of the car park accessible to vehicles and bicycles.
2.5m above accessible and shared bays
3.7m wherever access is required for a Veolia rear lifter refuse vehicle (and safety clearance envelope)
- Sight Splays: Visibility splays in the form of a 2.5m x 2m right-angled triangle to be provided (AS2890.1). Ensure design avoids visual obstructions in sight splay (i.e. dense landscaping, tall fencing/walls etc.)
- Parking Spaces: The parking envelopes shown, must be kept clear of all physical obstructions, including height clearance reductions. Ensure that grades within the parking module do not exceed 1:20 (1:40 for accessible bays).
- Accessible Spaces: To be designed in accordance with AS2890.6. i.e. standard parking space with adjacent shared bay (2.4m x 5.4m), to be installed as per AS2890.6 requirements (bollard and markings).
- Motorcycle Parking: Motorcycle bays to be designed as a 2.5m x 1.2m envelope (AS2890.1).
- Bicycle Parking: Bicycle spaces are to allow for a envelope of 500mm by 1800mm, with an aisle width of 2000mm for locker storage, or 1500mm for racks.
- Control Measures: Please note recommended control measures, including line markings, signage, bollards, convex mirrors, lights etc.



CLASS 1A SPACE ENVELOPE
(AS2890.1:2004)
2.4m x 5.4m



ACCESSIBLE SPACE ENVELOPE
(AS2890.6:2009)
2.4m x 5.4m



ACCESSIBLE SHARED SPACE ENVELOPE
(AS2890.6:2009)
2.4m x 5.4m



SMALL CAR SPACE ENVELOPE
(AS2890.1:2004)
2.3m x 5.0m

CLIENT:	Greengate	REV: 3
DRG. #:	PTC-101	
PROJECT #:	2067	
SCALE:	1 : 400	



CAR
PARKING
STAGE
BUILDING 1 – RACF (IN DIS)
BUILDING 2 – ILU (IN DIS)
34 CARS
STAGE
BUILDING 3 – ILU (IN DIS)
CARS
DISABLED PARKING –
SMALL CARS
TANDEM CARS
– 2
TOTAL – 97 CAR
SPACES

REV	DATE	COMMENT	DRAWN	REVIEWED	REV	DATE	COMMENT	DRAWN	REVIEWED
3	18/12/18	FOR INFORMATION	SC	AU					
2	11/12/18	FOR INFORMATION	DS/SC	AU/SW					
1	30/11/18	FOR INFORMATION	DS/SC	AM					



TYPICAL

Please note the following compliance requirements:

Height Clearance: **2.2m** (min) throughout all areas of the car park accessible to vehicles and bicycles.
2.5m above accessible and shared bays
3.7m wherever access is required for a Veolia rear lifter refuse vehicle (and safety clearance envelope)

Sight Splays: Visibility splays in the form of a **2.5m x 2m** right-angled triangle to be provided (AS2890.1). Ensure design avoids visual obstructions in sight splay (i.e. dense landscaping, tall fencing/walls etc.)

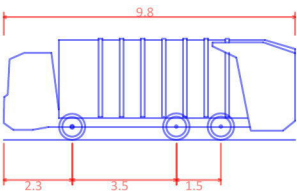
Parking Spaces: The parking envelopes shown, must be kept clear of all physical obstructions, including height clearance reductions. Ensure that grades within the parking module do not exceed 1:20 (1:40 for accessible bays).

Accessible Spaces: To be designed in accordance with AS2890.6. i.e. standard parking space with adjacent shared bay (2.4m x 5.4m), to be installed as per AS2890.6 requirements (bollard and markings).

Motorcycle Parking: Motorcycle bays to be designed as a 2.5m x 1.2m envelope (AS2890.1).

Bicycle Parking: Bicycle spaces are to allow for a envelope of 500mm by 1800mm, with an aisle width of 2000mm for locker storage, or 1500mm for racks.

Control Measures: Please note recommended control measures, including line markings, signage, bollards, convex mirrors, lights etc.



VEOLIA HEAVY REFUSE VEHICLE (9.8M)	
Overall Length	9.800m
Overall Width	2.600m
Overall Body Height	3.406m
Min Body Ground Clearance	0.309m
Max Track Width	2.550m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	9.000m



REV	DATE	COMMENT	DRAWN	REVIEWED	REV	DATE	COMMENT	DRAWN	REVIEWED
3	18/12/18	FOR INFORMATION	SC	AU					
2	11/12/18	FOR INFORMATION	DS/SC	AU/SW					
1	26/11/18	FOR INFORMATION	SC	AU					



TYPICAL

Please note the following compliance requirements:

Height Clearance: **2.2m** (min) throughout all areas of the car park accessible to vehicles and bicycles.
2.5m above accessible and shared bays
3.7m wherever access is required for a Veolia rear lifter refuse vehicle (and safety clearance envelope)

Sight Splays: Visibility splays in the form of a **2.5m x 2m** right-angled triangle to be provided (AS2890.1). Ensure design avoids visual obstructions in sight splay (i.e. dense landscaping, tall fencing/walls etc.)

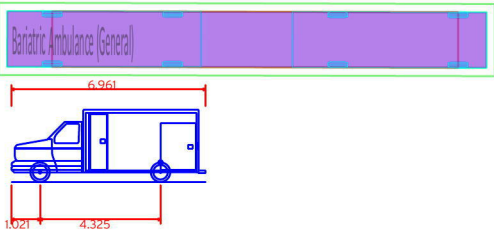
Parking Spaces: The parking envelopes shown, must be kept clear of all physical obstructions, including height clearance reductions. Ensure that grades within the parking module do not exceed 1:20 (1:40 for accessible bays).

Accessible Spaces: To be designed in accordance with AS2890.6. i.e. standard parking space with adjacent shared bay (2.4m x 5.4m), to be installed as per AS2890.6 requirements (bollard and markings).

Motorcycle Parking: Motorcycle bays to be designed as a 2.5m x 1.2m envelope (AS2890.1).

Bicycle Parking: Bicycle spaces are to allow for a envelope of 500mm by 1800mm, with an aisle width of 2000mm for locker storage, or 1500mm for racks.

Control Measures: Please note recommended control measures, including line markings, signage, bollards, convex mirrors, lights etc.



Bariatric Ambulance (General)
Overall Length 6.961m
Overall Width 1.993m
Overall Body Height 2.600m
Min Body Ground Clearance 0.307m
Track Width 1.993m
Lock-to-lock time 4.00s
Wall to Wall Turning Radius 7.650m



REV	DATE	COMMENT	DRAWN	REVIEWED	REV	DATE	COMMENT	DRAWN	REVIEWED
3	18/12/18	FOR INFORMATION	SC	AU					
2	11/12/18	FOR INFORMATION	DS/SC	AU/SW					
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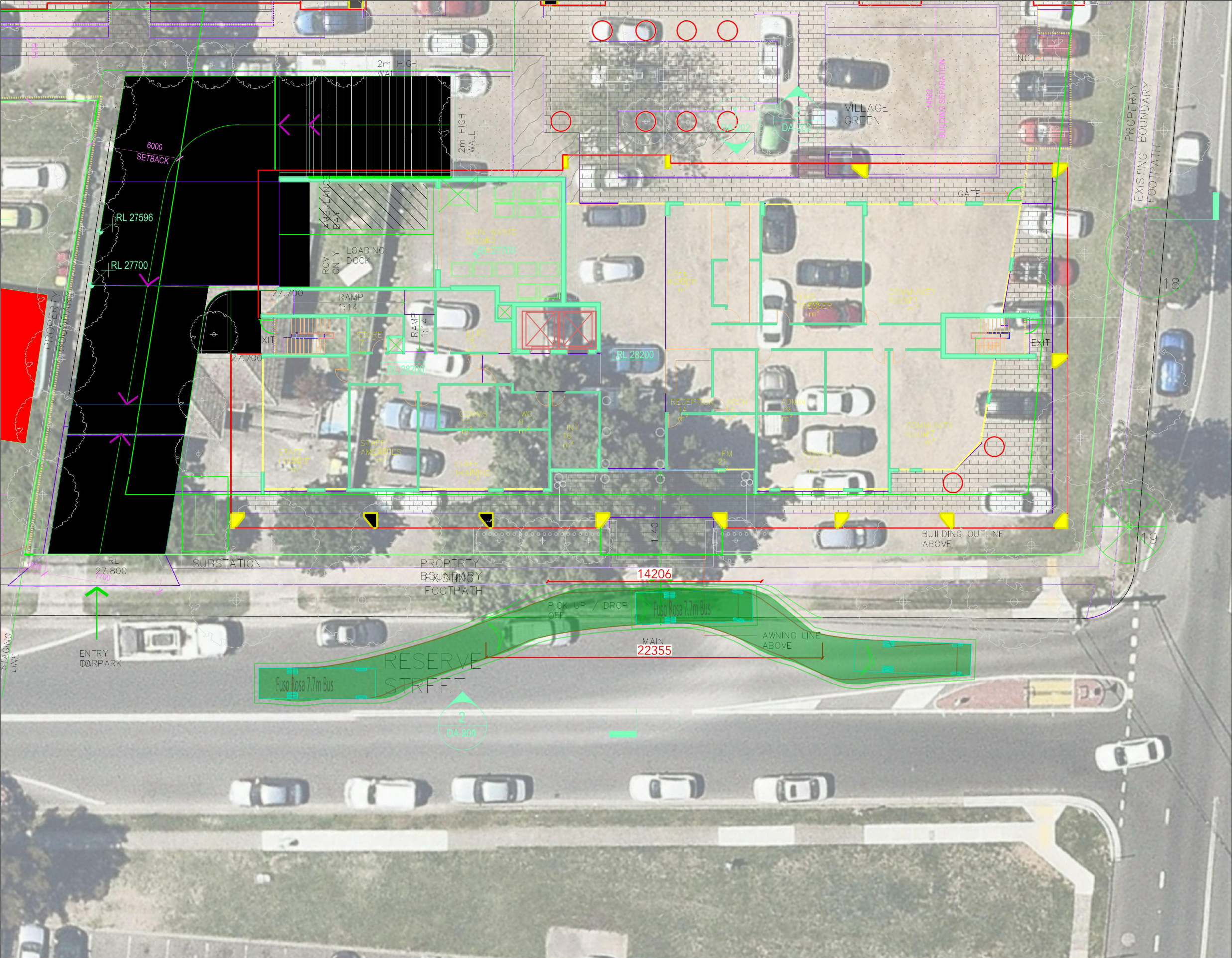


PROJECT:
The Village Green, Penrith

DRAWING TITLE:
Loading Dock Assessment -
Bariatric Ambulance Parking

CLIENT: Greengate
DRG. #: PTC-004
PROJECT #: 2067
SCALE: 1 : 400

REV: 3



- TYPICAL
- Please note the following compliance requirements:
- Height Clearance:

2.2m (min) throughout all areas of the car park accessible to vehicles and bicycles.
2.5m above accessible and shared bays
3.7m wherever access is required for a Veolia rear lifter refuse vehicle (and safety clearance envelope)
- Sight Splays:

Visibility splays in the form of a 2.5m x 2m right-angled triangle to be provided (AS2890.1). Ensure design avoids visual obstructions in sight splay (i.e. dense landscaping, tall fencing/walls etc.)
- Parking Spaces:

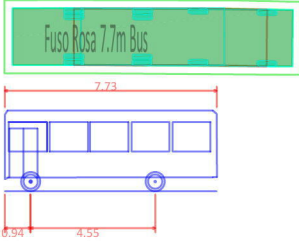
The parking envelopes shown, must be kept clear of all physical obstructions, including height clearance reductions. Ensure that grades within the parking module do not exceed 1:20 (1:40 for accessible bays).
- Accessible Spaces:

To be designed in accordance with AS2890.6. i.e. standard parking space with adjacent shared bay (2.4m x 5.4m), to be installed as per AS2890.6 requirements (bollard and markings).
- Motorcycle Parking:

Motorcycle bays to be designed as a 2.5m x 1.2m envelope (AS2890.1).
- Bicycle Parking:

Bicycle spaces are to allow for a envelope of 500mm by 1800mm, with an aisle width of 2000mm for locker storage, or 1500mm for racks.
- Control Measures:

Please note recommended control measures, including line markings, signage, bollards, convex mirrors, lights etc.



Fuso Rosa 7.7m Bus	
Overall Length	7.730m
Overall Width	2.400m
Overall Body Height	2.945m
Min Body Ground Clearance	0.437m
Track Width	2.070m
Lock-to-lock time	5.00s
Curb to Curb Turning Radius	7.200m

REV	DATE	COMMENT	DRAWN	REVIEWED	REV	DATE	COMMENT	DRAWN	REVIEWED
3	18/12/18	FOR INFORMATION	SC	AU					
2	11/12/18	FOR INFORMATION	DS/SC	AU/SW					
1	-	NOT ISSUED	-	-					





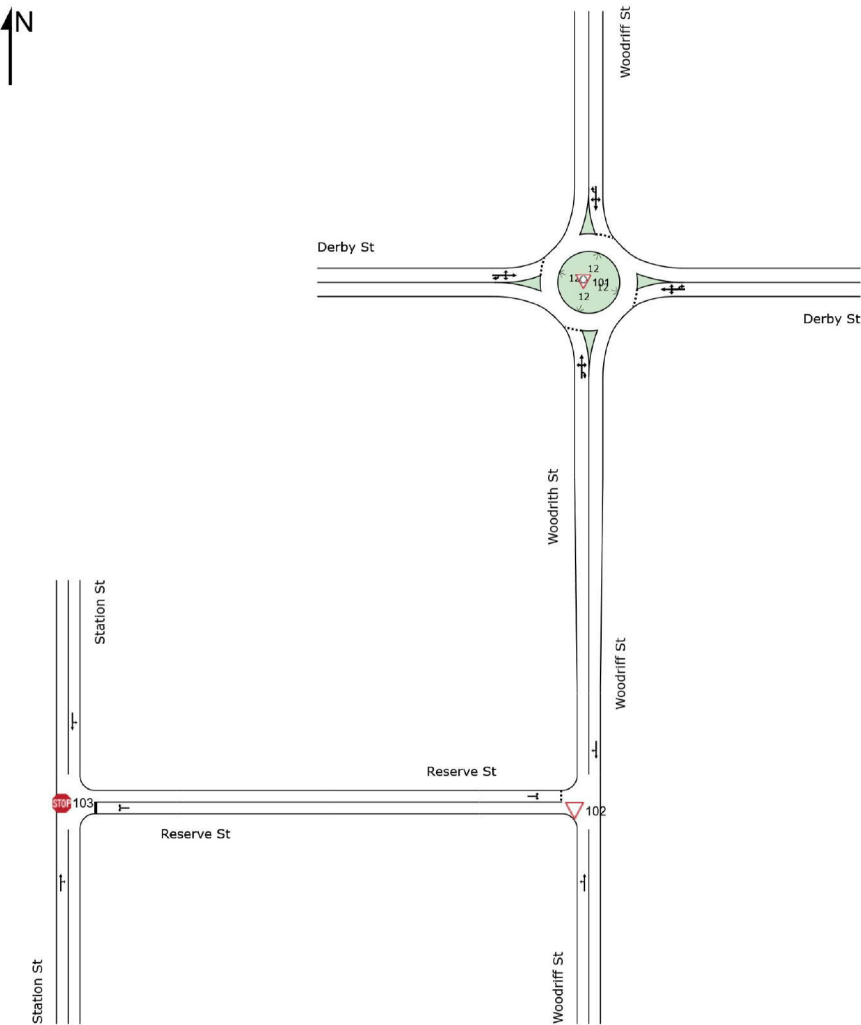
CLIENT:	Greengate	
DRG. #:	PTC-006	REV: 3
PROJECT #:	2067	
SCALE:	1 : 250	

Attachment 3 - Traffic Modelling

NETWORK LAYOUT

Network: N101 [Existing AM Peak Network]

Wednesday 05/17/2017
Existing AM Peak
Network Category: Existing AM Peak Network



SITES IN NETWORK		
Site ID	CCG ID	Site Name
101	NA	Site 1 - Derby St / Woodriff St - Existing AM Peak
102	NA	Site 2 - Woodriff St / Reserve St - Existing AM Peak
103	NA	Site 3 - Station St / Reserve St - Existing AM Peak

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MOVEMENT SUMMARY

 Site: 101 [Site 1 - Derby St / Woodriff St - Existing AM Peak]  Network: N101 [Existing AM Peak Network]

Wednesday 05/17/2017
Existing AM Peak 8:00 - 9:00
Site Category: Existing AM Peak
Roundabout

Movement Performance - Vehicles														
Mov ID	Turn	Demand	Flows	Arrival	Flows	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed	
		veh/h	HV %	Total veh/h	HV %	v/c	sec		veh	Distance m			km/h	
South: Woodriff St														
1	L2	77	2.7	77	2.7	0.480	6.0	LOS A	1.4	10.1	0.61	0.66	0.61	38.7
2	T1	331	0.3	331	0.3	0.480	6.1	LOS A	1.4	10.1	0.61	0.66	0.61	37.9
3	R2	97	0.0	97	0.0	0.480	9.7	LOS A	1.4	10.1	0.61	0.66	0.61	32.3
3u	U	1	0.0	1	0.0	0.480	11.4	LOS A	1.4	10.1	0.61	0.66	0.61	27.3
Approach		505	0.6	505	0.6	0.480	6.8	LOS A	1.4	10.1	0.61	0.66	0.61	36.9
East: Derby St														
4	L2	308	0.7	308	0.7	0.463	5.9	LOS A	1.4	9.9	0.53	0.61	0.53	29.3
5	T1	157	6.7	157	6.7	0.463	6.1	LOS A	1.4	9.9	0.53	0.61	0.53	41.1
6	R2	53	0.0	53	0.0	0.463	9.6	LOS A	1.4	9.9	0.53	0.61	0.53	35.4
6u	U	1	0.0	1	0.0	0.463	11.3	LOS A	1.4	9.9	0.53	0.61	0.53	33.5
Approach		519	2.4	519	2.4	0.463	6.3	LOS A	1.4	9.9	0.53	0.61	0.53	35.1
North: Woodriff St														
7	L2	17	0.0	17	0.0	0.180	6.0	LOS A	0.4	2.9	0.49	0.62	0.49	35.5
8	T1	120	3.5	120	3.5	0.180	6.3	LOS A	0.4	2.9	0.49	0.62	0.49	31.8
9	R2	37	0.0	37	0.0	0.180	9.7	LOS A	0.4	2.9	0.49	0.62	0.49	41.8
9u	U	3	0.0	3	0.0	0.180	11.5	LOS A	0.4	2.9	0.49	0.62	0.49	36.3
Approach		177	2.4	177	2.4	0.180	7.1	LOS A	0.4	2.9	0.49	0.62	0.49	35.3
West: Derby St														
10	L2	61	0.0	61	0.0	0.299	7.6	LOS A	0.8	5.6	0.68	0.75	0.68	39.2
11	T1	142	10.4	142	10.4	0.299	8.2	LOS A	0.8	5.6	0.68	0.75	0.68	37.7
12	R2	34	0.0	34	0.0	0.299	11.3	LOS A	0.8	5.6	0.68	0.75	0.68	35.1
12u	U	1	0.0	1	0.0	0.299	13.0	LOS A	0.8	5.6	0.68	0.75	0.68	43.7
Approach		238	6.2	238	6.2	0.299	8.5	LOS A	0.8	5.6	0.68	0.75	0.68	37.9
All Vehicles		1439	2.4	1439	2.4	0.480	6.9	LOS A	1.4	10.1	0.58	0.65	0.58	36.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 102 [Site 2 - Woodriff St / Reserve St - Existing AM Peak]

Network: N101 [Existing AM Peak Network]

Wednesday 05/17/2017
Existing AM Peak 8:00-9:00
Site Category: Existing AM Peak
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Back of Queue Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		veh	m				km/h
South: Woodriff St														
1	L2	78	1.4	78	1.4	0.260	5.6	LOS A	0.0	0.0	0.00	0.09	0.00	56.2
2	T1	425	0.0	425	0.0	0.260	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	56.2
Approach		503	0.2	503	0.2	0.260	0.9	NA	0.0	0.0	0.00	0.09	0.00	56.2
North: Woodriff St														
8	T1	263	0.0	263	0.0	0.326	2.2	LOS A	0.8	5.9	0.52	0.34	0.58	47.3
9	R2	198	2.1	198	2.1	0.326	8.0	LOS A	0.8	5.9	0.52	0.34	0.58	32.2
Approach		461	0.9	461	0.9	0.326	4.7	NA	0.8	5.9	0.52	0.34	0.58	43.5
West: Reserve St														
10	L2	146	0.0	146	0.0	0.165	7.3	LOS A	0.3	1.8	0.48	0.70	0.48	36.3
12	R2	15	0.0	15	0.0	0.165	11.6	LOS A	0.3	1.8	0.48	0.70	0.48	42.2
Approach		161	0.0	161	0.0	0.165	7.7	LOS A	0.3	1.8	0.48	0.70	0.48	37.2
All Vehicles		1125	0.5	1125	0.5	0.326	3.4	NA	0.8	5.9	0.28	0.28	0.31	47.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

 **Site: 103 [Site 3 - Station St / Reserve St - Existing AM Peak]**

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

Wednesday 05/17/2017
Existing AM Peak 8:00-9:00
Site Category: Existing AM Peak
Stop (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Back of Queue Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		veh	m				km/h
South: Station St														
2	T1	335	3.8	335	3.8	0.234	0.3	LOS A	0.3	1.9	0.19	0.12	0.19	53.8
3	R2	80	0.0	80	0.0	0.234	6.6	LOS A	0.3	1.9	0.19	0.12	0.19	51.5
Approach		415	3.0	415	3.0	0.234	1.6	NA	0.3	1.9	0.19	0.12	0.19	53.4
East: Reserve St														
4	L2	37	0.0	37	0.0	0.069	8.8	LOS A	0.1	0.7	0.35	0.90	0.35	40.4
6	R2	21	0.0	21	0.0	0.069	11.8	LOS A	0.1	0.7	0.35	0.90	0.35	29.7
Approach		58	0.0	58	0.0	0.069	9.9	LOS A	0.1	0.7	0.35	0.90	0.35	36.5
North: Station St														
7	L2	69	0.0	69	0.0	0.144	5.2	LOS A	0.0	0.0	0.00	0.15	0.00	48.1
8	T1	202	3.6	202	3.6	0.144	0.0	LOS A	0.0	0.0	0.00	0.15	0.00	55.4
Approach		272	2.7	272	2.7	0.144	1.3	NA	0.0	0.0	0.00	0.15	0.00	54.5
All Vehicles		744	2.7	744	2.7	0.234	2.1	NA	0.3	1.9	0.13	0.19	0.13	51.3

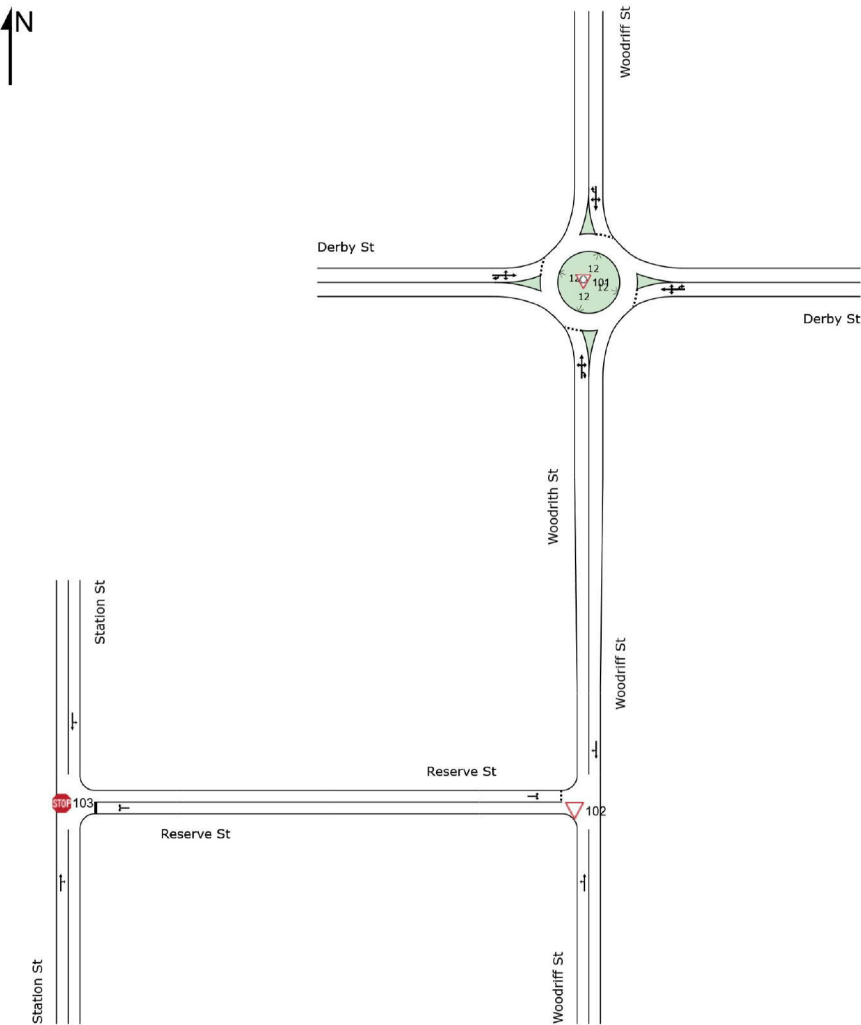
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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NETWORK LAYOUT

Network: N102 [Existing PM Peak Network]

Wednesday 05/17/2017
Existing PM Peak
Network Category: Existing PM Peak Network



SITES IN NETWORK		
Site ID	CCG ID	Site Name
101	NA	Site 1 - Derby St / Woodriff St - Existing PM Peak
102	NA	Site 2 - Woodriff St / Reserve St - Existing PM Peak
103	NA	Site 3 - Station St / Reserve St - Existing PM Peak

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MOVEMENT SUMMARY

 Site: 101 [Site 1 - Derby St / Woodriff St - Existing PM Peak]  Network: N102 [Existing PM Peak Network]

Wednesday 05/17/2017
Existing PM Peak 16:15 - 17:15
Site Category: Existing PM Peak
Roundabout

Movement Performance - Vehicles														
Mov ID	Turn	Demand	Flows	Arrival	Flows	Deg. Satn	Average Delay	Level of Service	Aver. Queue	Back of Queue	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m				km/h
South: Woodrith St														
1	L2	59	0.0	59	0.0	0.622	8.1	LOS A	2.5	17.3	0.79	0.82	0.88	36.2
2	T1	336	0.0	336	0.0	0.622	8.3	LOS A	2.5	17.3	0.79	0.82	0.88	34.5
3	R2	198	0.0	198	0.0	0.622	11.9	LOS A	2.5	17.3	0.79	0.82	0.88	29.6
3u	U	4	0.0	4	0.0	0.622	13.6	LOS A	2.5	17.3	0.79	0.82	0.88	23.9
Approach		597	0.0	597	0.0	0.622	9.5	LOS A	2.5	17.3	0.79	0.82	0.88	33.0
East: Derby St														
4	L2	247	0.9	247	0.9	0.546	7.6	LOS A	1.8	13.1	0.72	0.75	0.76	27.1
5	T1	235	5.4	235	5.4	0.546	7.8	LOS A	1.8	13.1	0.72	0.75	0.76	39.5
6	R2	32	0.0	32	0.0	0.546	11.3	LOS A	1.8	13.1	0.72	0.75	0.76	33.7
6u	U	3	0.0	3	0.0	0.546	13.0	LOS A	1.8	13.1	0.72	0.75	0.76	31.9
Approach		517	2.9	517	2.9	0.546	8.0	LOS A	1.8	13.1	0.72	0.75	0.76	34.8
North: Woodriff St														
7	L2	26	0.0	26	0.0	0.347	7.5	LOS A	0.9	6.3	0.67	0.74	0.67	34.0
8	T1	206	0.5	206	0.5	0.347	7.7	LOS A	0.9	6.3	0.67	0.74	0.67	29.9
9	R2	67	0.0	67	0.0	0.347	11.2	LOS A	0.9	6.3	0.67	0.74	0.67	40.3
9u	U	1	0.0	1	0.0	0.347	12.9	LOS A	0.9	6.3	0.67	0.74	0.67	34.9
Approach		301	0.3	301	0.3	0.347	8.5	LOS A	0.9	6.3	0.67	0.74	0.67	33.6
West: Derby St														
10	L2	22	0.0	22	0.0	0.362	8.4	LOS A	1.0	7.3	0.78	0.83	0.78	37.9
11	T1	178	8.3	178	8.3	0.362	9.0	LOS A	1.0	7.3	0.78	0.83	0.78	36.5
12	R2	56	0.0	56	0.0	0.362	12.2	LOS A	1.0	7.3	0.78	0.83	0.78	33.6
12u	U	1	0.0	1	0.0	0.362	13.9	LOS A	1.0	7.3	0.78	0.83	0.78	42.3
Approach		257	5.7	257	5.7	0.362	9.6	LOS A	1.0	7.3	0.78	0.83	0.78	36.2
All Vehicles		1672	1.8	1672	1.8	0.622	8.9	LOS A	2.5	17.3	0.74	0.79	0.79	34.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 102 [Site 2 - Woodriff St / Reserve St - Existing PM Peak]

Network: N102 [Existing PM Peak Network]

Wednesday 05/17/2017
Existing AM Peak 16:15-17:15
Site Category: Existing PM Peak
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows	Arrival Flows	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed			
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec	Vehicles veh	Distance m					km/h
South: Woodriff St														
1	L2	79	0.0	79	0.0	0.308	5.6	LOS A	0.0	0.0	0.00	0.08	0.00	56.7
2	T1	518	0.0	518	0.0	0.308	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	56.7
Approach		597	0.0	597	0.0	0.308	0.7	NA	0.0	0.0	0.00	0.08	0.00	56.7
North: Woodriff St														
8	T1	320	0.0	320	0.0	0.367	2.8	LOS A	1.0	7.3	0.54	0.32	0.68	46.4
9	R2	191	0.0	191	0.0	0.367	9.1	LOS A	1.0	7.3	0.54	0.32	0.68	30.8
Approach		511	0.0	511	0.0	0.367	5.1	NA	1.0	7.3	0.54	0.32	0.68	43.0
West: Reserve St														
10	L2	177	0.0	177	0.0	0.253	8.0	LOS A	0.4	2.8	0.56	0.78	0.58	34.2
12	R2	28	0.0	28	0.0	0.253	14.1	LOS A	0.4	2.8	0.56	0.78	0.58	40.7
Approach		205	0.0	205	0.0	0.253	8.8	LOS A	0.4	2.8	0.56	0.78	0.58	35.6
All Vehicles		1313	0.0	1313	0.0	0.367	3.7	NA	1.0	7.3	0.30	0.28	0.35	46.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 103 [Site 3 - Station St / Reserve St - Existing PM Peak]**

 **Network: N102 [Existing PM Peak Network]**

Wednesday 05/17/2017
Existing PM Peak 16:30-17:30
Site Category: Existing PM Peak
Stop (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Back of Queue Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		veh	m				km/h
South: Station St														
2	T1	256	4.5	256	4.5	0.178	0.7	LOS A	0.2	1.5	0.22	0.10	0.22	53.9
3	R2	43	0.0	43	0.0	0.178	8.2	LOS A	0.2	1.5	0.22	0.10	0.22	51.7
Approach		299	3.9	299	3.9	0.178	1.8	NA	0.2	1.5	0.22	0.10	0.22	53.7
East: Reserve St														
4	L2	154	0.0	154	0.0	0.321	11.6	LOS A	0.6	4.0	0.59	1.03	0.71	37.8
6	R2	58	0.0	58	0.0	0.321	15.6	LOS B	0.6	4.0	0.59	1.03	0.71	27.8
Approach		212	0.0	212	0.0	0.321	12.7	LOS A	0.6	4.0	0.59	1.03	0.71	35.1
North: Station St														
7	L2	57	0.0	57	0.0	0.288	5.2	LOS A	0.0	0.0	0.00	0.06	0.00	54.5
8	T1	495	2.1	495	2.1	0.288	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	58.0
Approach		552	1.9	552	1.9	0.288	0.5	NA	0.0	0.0	0.00	0.06	0.00	57.9
All Vehicles		1062	2.1	1062	2.1	0.321	3.3	NA	0.6	4.0	0.18	0.26	0.20	48.8

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

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

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

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

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

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

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

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NETWORK LAYOUT

Network: N103 [Post Development AM Peak Network]

Typical Weekday
Post Development AM Peak
Network Category: Post Development AM Peak Network



SITES IN NETWORK		
Site ID	CCG ID	Site Name
101	NA	Site 1 - Derby St / Woodriff St - Post Development AM Peak
102	NA	Site 2 - Woodriff St / Reserve St - Post Development AM Peak
103	NA	Site 3 - Station St / Reserve St - Post Development AM Peak

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MOVEMENT SUMMARY

 **Site: 101 [Site 1 - Derby St / Woodriff St - Post Development AM Peak]**

 **Network: N103 [Post Development AM Peak Network]**

Typical Weekday
Site Category: Post Development AM Peak
Roundabout

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Back of Queue Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		veh	m				km/h
South: Woodriff St														
1	L2	78	2.7	78	2.7	0.488	6.1	LOS A	1.5	10.4	0.62	0.67	0.62	38.6
2	T1	332	0.3	332	0.3	0.488	6.2	LOS A	1.5	10.4	0.62	0.67	0.62	37.7
3	R2	98	0.0	98	0.0	0.488	9.8	LOS A	1.5	10.4	0.62	0.67	0.62	32.2
3u	U	1	0.0	1	0.0	0.488	11.5	LOS A	1.5	10.4	0.62	0.67	0.62	27.2
Approach		508	0.6	508	0.6	0.488	6.9	LOS A	1.5	10.4	0.62	0.67	0.62	36.8
East: Derby St														
4	L2	308	0.7	308	0.7	0.474	5.9	LOS A	1.4	10.2	0.55	0.62	0.55	29.2
5	T1	157	6.7	157	6.7	0.474	6.2	LOS A	1.4	10.2	0.55	0.62	0.55	40.9
6	R2	62	0.0	62	0.0	0.474	9.6	LOS A	1.4	10.2	0.55	0.62	0.55	35.3
6u	U	1	0.0	1	0.0	0.474	11.4	LOS A	1.4	10.2	0.55	0.62	0.55	33.4
Approach		528	2.4	528	2.4	0.474	6.5	LOS A	1.4	10.2	0.55	0.62	0.55	34.9
North: Woodriff St														
7	L2	17	0.0	17	0.0	0.184	6.0	LOS A	0.4	3.0	0.50	0.62	0.50	35.4
8	T1	124	3.4	124	3.4	0.184	6.3	LOS A	0.4	3.0	0.50	0.62	0.50	31.8
9	R2	37	0.0	37	0.0	0.184	9.8	LOS A	0.4	3.0	0.50	0.62	0.50	41.8
9u	U	3	0.0	3	0.0	0.184	11.5	LOS A	0.4	3.0	0.50	0.62	0.50	36.3
Approach		181	2.3	181	2.3	0.184	7.1	LOS A	0.4	3.0	0.50	0.62	0.50	35.2
West: Derby St														
10	L2	61	0.0	61	0.0	0.304	7.7	LOS A	0.8	5.7	0.69	0.76	0.69	39.1
11	T1	142	10.4	142	10.4	0.304	8.3	LOS A	0.8	5.7	0.69	0.76	0.69	37.6
12	R2	35	0.0	35	0.0	0.304	11.4	LOS A	0.8	5.7	0.69	0.76	0.69	35.0
12u	U	1	0.0	1	0.0	0.304	13.1	LOS A	0.8	5.7	0.69	0.76	0.69	43.5
Approach		239	6.2	239	6.2	0.304	8.6	LOS A	0.8	5.7	0.69	0.76	0.69	37.7
All Vehicles		1457	2.4	1457	2.4	0.488	7.0	LOS A	1.5	10.4	0.59	0.66	0.59	36.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Site 2 - Woodriff St / Reserve St - Post Development AM Peak]

Network: N103 [Post Development AM Peak Network]

Typical Weekday
Site Category: Post Development AM Peak
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand	Flows	Arrival	Flows	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed	
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m			km/h	
South: Woodriff St														
1	L2	83	1.3	83	1.3	0.263	5.6	LOS A	0.0	0.0	0.00	0.10	0.00	56.0
2	T1	425	0.0	425	0.0	0.263	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	56.0
Approach		508	0.2	508	0.2	0.263	0.9	NA	0.0	0.0	0.00	0.10	0.00	56.0
North: Woodriff St														
8	T1	263	0.0	263	0.0	0.341	2.3	LOS A	0.9	6.5	0.54	0.36	0.62	46.8
9	R2	213	2.0	213	2.0	0.341	8.2	LOS A	0.9	6.5	0.54	0.36	0.62	31.4
Approach		476	0.9	476	0.9	0.341	4.9	NA	0.9	6.5	0.54	0.36	0.62	42.6
West: Reserve St														
10	L2	149	0.0	149	0.0	0.168	7.3	LOS A	0.3	1.9	0.48	0.70	0.48	36.3
12	R2	15	0.0	15	0.0	0.168	11.9	LOS A	0.3	1.9	0.48	0.70	0.48	42.1
Approach		164	0.0	164	0.0	0.168	7.7	LOS A	0.3	1.9	0.48	0.70	0.48	37.1
All Vehicles		1148	0.5	1148	0.5	0.341	3.6	NA	0.9	6.5	0.29	0.29	0.32	46.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

 **Site: 103 [Site 3 - Station St / Reserve St - Post Development AM Peak]**

 **Network: N103 [Post Development AM Peak Network]**

Typical Weekday
Site Category: Post Development AM Peak
Stop (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Back of Queue Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		veh	m				km/h
South: Station St														
2	T1	335	3.8	335	3.8	0.238	0.4	LOS A	0.3	2.1	0.20	0.13	0.20	53.4
3	R2	85	0.0	85	0.0	0.238	6.6	LOS A	0.3	2.1	0.20	0.13	0.20	51.1
Approach		420	3.0	420	3.0	0.238	1.6	NA	0.3	2.1	0.20	0.13	0.20	53.1
East: Reserve St														
4	L2	40	0.0	40	0.0	0.074	8.8	LOS A	0.1	0.7	0.35	0.90	0.35	40.4
6	R2	22	0.0	22	0.0	0.074	11.9	LOS A	0.1	0.7	0.35	0.90	0.35	29.7
Approach		62	0.0	62	0.0	0.074	9.9	LOS A	0.1	0.7	0.35	0.90	0.35	36.6
North: Station St														
7	L2	75	0.0	75	0.0	0.146	5.2	LOS A	0.0	0.0	0.00	0.16	0.00	47.6
8	T1	202	3.6	202	3.6	0.146	0.0	LOS A	0.0	0.0	0.00	0.16	0.00	55.1
Approach		277	2.7	277	2.7	0.146	1.4	NA	0.0	0.0	0.00	0.16	0.00	54.2
All Vehicles		759	2.6	759	2.6	0.238	2.2	NA	0.3	2.1	0.14	0.20	0.14	50.9

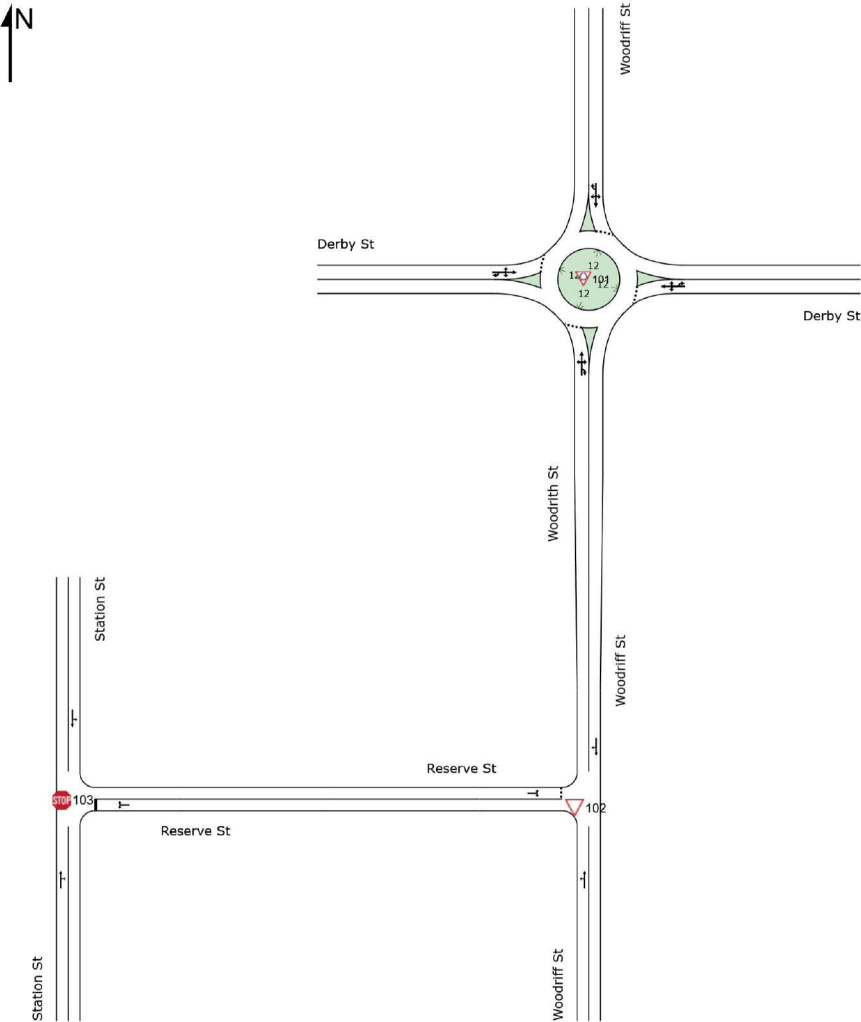
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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NETWORK LAYOUT

Network: N104 [Post Development PM Peak Network]

Typical Weekday
Post Development PM Peak
Network Category: Post Development PM Peak Network



SITES IN NETWORK		
Site ID	CCG ID	Site Name
101	NA	Site 1 - Derby St / Woodriff St - Post Development PM Peak
102	NA	Site 2 - Woodriff St / Reserve St - Post Development PM Peak
103	NA	Site 3 - Station St / Reserve St - Post Development PM Peak

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MOVEMENT SUMMARY

 **Site: 101 [Site 1 - Derby St / Woodriff St - Post Development PM Peak]**

 **Network: N104 [Post Development PM Peak Network]**

Typical Weekday
Site Category: Post Development PM Peak
Roundabout

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Back of Queue Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		veh	m				km/h
South: Woodriff St														
1	L2	60	0.0	60	0.0	0.630	8.3	LOS A	2.6	17.9	0.79	0.82	0.89	36.1
2	T1	340	0.0	340	0.0	0.630	8.4	LOS A	2.6	17.9	0.79	0.82	0.89	34.4
3	R2	200	0.0	200	0.0	0.630	12.0	LOS A	2.6	17.9	0.79	0.82	0.89	29.5
3u	U	4	0.0	4	0.0	0.630	13.8	LOS A	2.6	17.9	0.79	0.82	0.89	23.7
Approach		604	0.0	604	0.0	0.630	9.6	LOS A	2.6	17.9	0.79	0.82	0.89	32.9
East: Derby St														
4	L2	249	0.8	249	0.8	0.551	7.6	LOS A	1.9	13.3	0.73	0.76	0.77	27.0
5	T1	235	5.4	235	5.4	0.551	7.9	LOS A	1.9	13.3	0.73	0.76	0.77	39.4
6	R2	32	0.0	32	0.0	0.551	11.3	LOS A	1.9	13.3	0.73	0.76	0.77	33.7
6u	U	3	0.0	3	0.0	0.551	13.1	LOS A	1.9	13.3	0.73	0.76	0.77	31.8
Approach		519	2.8	519	2.8	0.551	8.0	LOS A	1.9	13.3	0.73	0.76	0.77	34.7
North: Woodriff St														
7	L2	26	0.0	26	0.0	0.351	7.5	LOS A	0.9	6.3	0.67	0.75	0.67	34.0
8	T1	208	0.5	208	0.5	0.351	7.7	LOS A	0.9	6.3	0.67	0.75	0.67	29.9
9	R2	67	0.0	67	0.0	0.351	11.2	LOS A	0.9	6.3	0.67	0.75	0.67	40.3
9u	U	1	0.0	1	0.0	0.351	12.9	LOS A	0.9	6.3	0.67	0.75	0.67	34.9
Approach		303	0.3	303	0.3	0.351	8.5	LOS A	0.9	6.3	0.67	0.75	0.67	33.6
West: Derby St														
10	L2	22	0.0	22	0.0	0.367	8.5	LOS A	1.0	7.4	0.79	0.83	0.79	37.9
11	T1	178	8.3	178	8.3	0.367	9.0	LOS A	1.0	7.4	0.79	0.83	0.79	36.4
12	R2	56	0.0	56	0.0	0.367	12.2	LOS A	1.0	7.4	0.79	0.83	0.79	33.5
12u	U	1	0.0	1	0.0	0.367	13.9	LOS A	1.0	7.4	0.79	0.83	0.79	42.2
Approach		257	5.7	257	5.7	0.367	9.7	LOS A	1.0	7.4	0.79	0.83	0.79	36.1
All Vehicles		1683	1.8	1683	1.8	0.630	8.9	LOS A	2.6	17.9	0.75	0.79	0.80	34.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Site 2 - Woodriff St / Reserve St - Post Development PM Peak]

Network: N104 [Post Development PM Peak Network]

Typical Weekday
Site Category: Post Development PM Peak
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand	Flows	Arrival	Flows	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed	
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m			km/h	
South: Woodriff St														
1	L2	80	0.0	80	0.0	0.309	5.6	LOS A	0.0	0.0	0.00	0.08	0.00	56.6
2	T1	518	0.0	518	0.0	0.309	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	56.6
Approach		598	0.0	598	0.0	0.309	0.8	NA	0.0	0.0	0.00	0.08	0.00	56.6
North: Woodriff St														
8	T1	320	0.0	320	0.0	0.372	2.8	LOS A	1.1	7.5	0.55	0.33	0.69	46.2
9	R2	195	0.0	195	0.0	0.372	9.1	LOS A	1.1	7.5	0.55	0.33	0.69	30.6
Approach		515	0.0	515	0.0	0.372	5.2	NA	1.1	7.5	0.55	0.33	0.69	42.7
West: Reserve St														
10	L2	184	0.0	184	0.0	0.264	8.0	LOS A	0.4	3.0	0.56	0.79	0.59	34.1
12	R2	29	0.0	29	0.0	0.264	14.3	LOS A	0.4	3.0	0.56	0.79	0.59	40.6
Approach		214	0.0	214	0.0	0.264	8.9	LOS A	0.4	3.0	0.56	0.79	0.59	35.5
All Vehicles		1326	0.0	1326	0.0	0.372	3.8	NA	1.1	7.5	0.30	0.29	0.36	46.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

 **Site: 103 [Site 3 - Station St / Reserve St - Post Development PM Peak]**

 **Network: N104 [Post Development PM Peak Network]**

Typical Weekday
Site Category: Post Development PM Peak
Stop (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Back of Queue Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		veh	m				km/h
South: Station St														
2	T1	256	4.5	256	4.5	0.179	0.7	LOS A	0.2	1.5	0.22	0.10	0.22	53.8
3	R2	44	0.0	44	0.0	0.179	8.2	LOS A	0.2	1.5	0.22	0.10	0.22	51.6
Approach		300	3.9	300	3.9	0.179	1.8	NA	0.2	1.5	0.22	0.10	0.22	53.6
East: Reserve St														
4	L2	169	0.0	169	0.0	0.356	11.8	LOS A	0.7	4.7	0.61	1.05	0.76	37.5
6	R2	64	0.0	64	0.0	0.356	16.0	LOS B	0.7	4.7	0.61	1.05	0.76	27.6
Approach		234	0.0	234	0.0	0.356	13.0	LOS A	0.7	4.7	0.61	1.05	0.76	34.8
North: Station St														
7	L2	58	0.0	58	0.0	0.288	5.2	LOS A	0.0	0.0	0.00	0.06	0.00	54.4
8	T1	495	2.1	495	2.1	0.288	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	58.0
Approach		553	1.9	553	1.9	0.288	0.5	NA	0.0	0.0	0.00	0.06	0.00	57.8
All Vehicles		1086	2.0	1086	2.0	0.356	3.6	NA	0.7	4.7	0.19	0.28	0.22	48.2

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

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

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

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

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

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

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

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