BARKER RYAN STEWART

Deicorp Projects (Tallawong Station) Pty Ltd

Traffic and Parking Impact Assessment Report

Proposed Mixed Use Development

Tallawong Station Precinct South

June 2020

ENGINEERING
PLANNING
SURVEYING
CERTIFICATION

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Planning Secretary's Environmental Assessment Requirements

Section 4.12(8) of the *Environmental Planning and Assessment Act 1979*
Schedule 2 of the Environmental Planning and Assessment Regulation 2000

Application Number	SSD-10425
Project Name	Stage 2 – Detailed Development Application - Tallawong Station Precinct South
Location	1-15 and 2-12 Conferta Avenue, Rouse Hill within Blacktown City Council
Applicant	DEICORP PROJECTS (TALLAWONG STATION) PTY LTD
Date of Issue	13/02/2020

Requirement	Relevant Report Section
Item 6 - Traffic, Parking and Access (operation) The EIS must include a traffic, parking and access assessment providing:	
Details of a car parking strategy which includes provision of car and bicycle parking for residential and non-residential uses, and consideration of sharing use of the car spaces between land uses.	Section 3.6 (bicycle parking) and Section 4 (car parking).
Details on the likely estimated future mode share for the various users (residents, visitors, etc) accessing the proposed development measures to encourage users of the development to make sustainable travel choices, including a green travel plan, walking, cycling, public transport and car sharing, adequate provision of bicycle parking and end of trip facilities and the minimisation of private car trips.	Green Travel Plan prepared by Barker Ryan Stewart.
Measures to include street tree planting.	Section 3.4
Impacts of the proposed development on the operation of existing and future transport networks, in particular bus corridors, including the public transport capacity and its ability to accommodate the forecast number of trips to and from the development.	Section 3.5 and the Green Travel Plan.
Modelling and analysis of pedestrian and cyclist access to the proposed development in consultation with TfNSW, together with an assessment of pedestrian and cyclist safety and consideration of the relationship with design and operation of the station.	Section 3.6 and the Green Travel Plan.
Detailed assessment of the existing and future performance of key intersections providing access to the site, supported by appropriate modelling and analysis to the satisfaction of TfNSW.	Section 5
Measures to mitigate impacts of the proposed development on the capacity and operation of existing and future traffic, public transport, pedestrian and bicycle networks, including any required upgrades.	Sections 3.4, 3.5, 3.6 and 5.

Details of existing and proposed vehicle access arrangements, including parking, pedestrian safety management, loading dock and servicing management with consideration of precinct wide shared loading docks and/or remote or off-site loading zone hub facilities, ensuring all servicing and loading occurs on-site and does not rely on kerbside controls.	Sections 3.2, 3.3, 4.7 and Appendix D.
An assessment of pedestrian and cyclist safety with consideration of the relationship with design, access and operation of the station.	Section 3.6

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List of Abbreviations

Abbreviations

DCP .....Blacktown Development Control Plan 2015
LEP ..... Blacktown Local Environmental Plan 2015
GFA ..... Gross Floor Area
AS/NZS2890.1 .....Australian Standards, *'AS/NZS 2890.1:2004 Off-Street Car Parking'*
AS2890.2..... Australian Standards, *'AS 2890.2:2018 Off-Street Commercial Vehicle Facilities'*
AS/NZS2890.6..... Australian Standards, 'AS/NZS 2890.6:2002 Off-Street Parking for People with Disabilities'
RMS..... Roads and Maritime Services
RMS Guide.....RMS Guide to Traffic Generating Developments, Version 2.2, October 2002
RMS Guide Update ..... RMS Guide to Traffic Generating Developments, Updated Traffic Surveys

1 Introduction

Barker Ryan Stewart have been engaged by Deicorp Projects (Tallawong Station) Pty Ltd to prepare a Traffic and Parking Impact Assessment in accordance with the Planning Secretary's Environmental Assessment Requirements (SEARS), Blacktown Council's DCP and LEP and the Roads and Maritime Services (RMS) *'Guide to Traffic Generating Developments'* to accompany a proposal for a mixed-use development comprised of residential units and retail and commercial uses.

The purpose of this report is to assess and address traffic, access, car parking and pedestrian and cycling impacts generated by the proposed development and recommend any mitigation measures where required. This can be briefly outlined as follows:

- The expected traffic generation to/from the proposed development.
- The impact of the proposed development on the road network.
- Intersection analysis based on traffic counts.
- Car parking strategy
- Vehicle parking provisions.
- Access design requirements.
- Vehicular requirements for delivery and waste collection.
- Safety of pedestrians and cyclists and the impact on existing pedestrian and cycling networks.
- Availability of public transport.

The assessment included a review of all known available traffic and transport documentation associated with the Tallawong South Precinct including but not limited to the following:

- Traffic and Transport Study prepared by SCT Consulting,
- The Sydney Metro Tallawong Station Precinct South Submissions Report, and
- The Technical Memorandum – Tallawong Station SSDA – Post Exhibition Responses to Traffic and Parking Comments prepared by SCT Consulting.

This Traffic and Parking Impact Assessment concludes that the subject site is suitable for the proposed development in relation to traffic impact, car parking provision, safety of and provision for pedestrians and cyclists.

2 Existing Conditions

2.1 Site Location

The site is located at 1-15 and 2-12 Conferta Avenue, Rouse Hill (Lots 293 and 294 DP 1213279). The two sites are currently unoccupied and have been cleared of vegetation. The sites are bisected by Conferta Avenue and bounded by Themeda Avenue and Tallawong Metro Station to the north, Cudgegong Road to the east, Schofields Road to the south, and the Tallawong Station commuter car park to the west.

Figure 1: Site Location *(source: NearMap October 2019)*

2.2 Existing Road Conditions

Intersections

The following four signalised intersections with turn bays are located at the corners of the Tallawong Station Precinct South.

- Cudgegong Road/ Schofields Road
- Tallawong Road / Schofields Road
- Themeda Avenue/ Cudgegong Road
- Themeda Avenue/ Tallawong Road

There are also two restricted left in left out intersections at Confeta Avenue and Tallawong Road and Confeta Avenue and Cudgegong Road.

Aristida Avenue has stop sign posted intersections with Confeta Avenue (T intersection) and Themeda Avenue.

Schofields Road

Schofields Road is an urban arterial road that provides a major connection between Rouse Hill town centre to the east and Schofields suburb to the west. It generally consists of two lanes in each direction (3.1m wide) separated by a central concrete median with additional turning lanes at intersections to increase turning capacity. Shared pedestrian / cyclist paths are provided on each side of the road. The posted speed limit is 70km/hr. Intermittent bus lanes are included within intersections.

Cudgegong Road

Cudgegong Road is a local road that provides access from Schofields Road at the southern end to Guntawong Road at the northern end of the road. It generally has two northbound lanes (3.1m wide each) from the intersection with Schofields Road and the rail overpass and one southbound lane (3.1m wide) from Themeda Avenue to Conferta Avenue and two southbound lanes from Conferta Avenue to Schofields Road at a major three-way signalised intersection. A shared pedestrian / cyclist path is provided along the western side of the road. The posted speed limit on Cudgegong Road is 60km/hr.

Tallawong Road

Tallawong Road is a local road that provides a connection between Schofields Road at the south and Guntawong Road to the north. Generally between Themda Avenue and Schofields Road, it has three 3.1m wide lane northbound lanes and two 3.1m wide Southbound lanes. Shared pedestrian / cyclist paths are provided on each side of the road. The posted speed limit is 60km/hr.

Conferta Avenue

Conferta Avenue is a local road running parallel with Schofields Road along the northern edge of Lot 293 and the southern edge of Lot 294. It connects Cudgegong Road to the east and Tallawong Road to the west and also provides access to the southern section of the commuter carpark. It has a single 3.8m wide lane of traffic in each direction. Each carriageway has a parking lane delineated by an edge line. The on-street parking has a 2-Hour time limit outside of morning and afternoon peak periods. The posted speed limit is 50km/hr.

Themeda Avenue

Themeda Avenue is a two-way local road consisting of 3.8m wide single lanes with 2.3m on-street parking on both sides of the road. The on-street parking has a 2-Hour time limit outside of morning and afternoon peak periods. It is adjacent to Tallawong metro Station and connects at signalised intersections at Cudgegong Road to the east and Tallawong Road to the west. The posted speed limit is 50km/hr.

Aristida Street

Aristida Street is a two-way local road consisting of 3.8m wide lanes. It connects Implexa Parade to the north and Conferta Avenue to the south. It is subject to a speed limit of 50km/hr.

2.3 Traffic Flows and Volumes

Traffic counts were undertaken during the morning and afternoon peak periods to gauge the performance of the current road system. The traffic counts were undertaken between the hours of 7am – 9am and 4pm – 6pm on Thursday 12th December 2019 at the following intersections:

- Cudgegong Road/ Schofields Road
- Tallawong Road / Schofields Road

Traffic counts were also undertaken between the hours of 7am – 9am and 4pm – 6pm on Thursday 12th March 2020 at the following intersections:

- Themeda Avenue/ Cudgegong Road
- Themeda Avenue/ Tallawong Road

The location of the intersections where the traffic counts were undertaken are highlighted in Figure 20 in Section 5 of this report.

The peak hour periods, traffic volumes and layouts for each of these intersections are summarised below in **Figures 2 to 5**, the full results of the traffic counts are available in **Appendix E**.

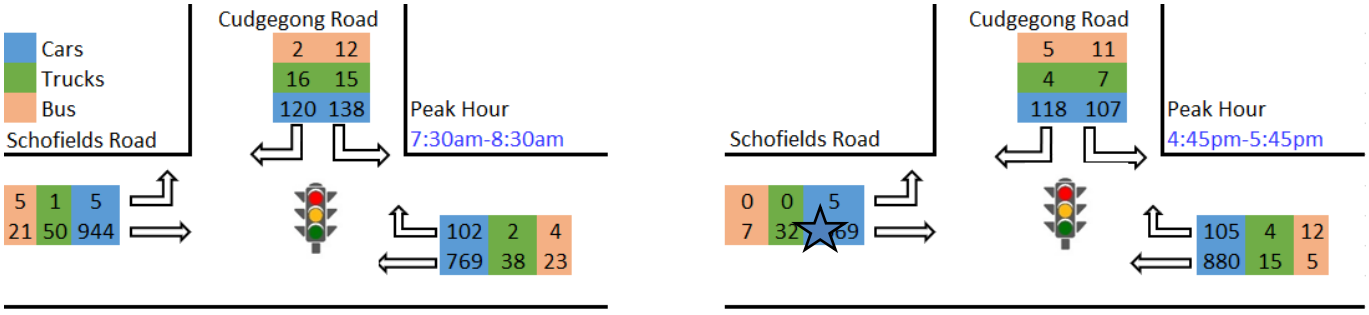

Figure 2: Cudgegong Road / Schofields Road Intersection Count

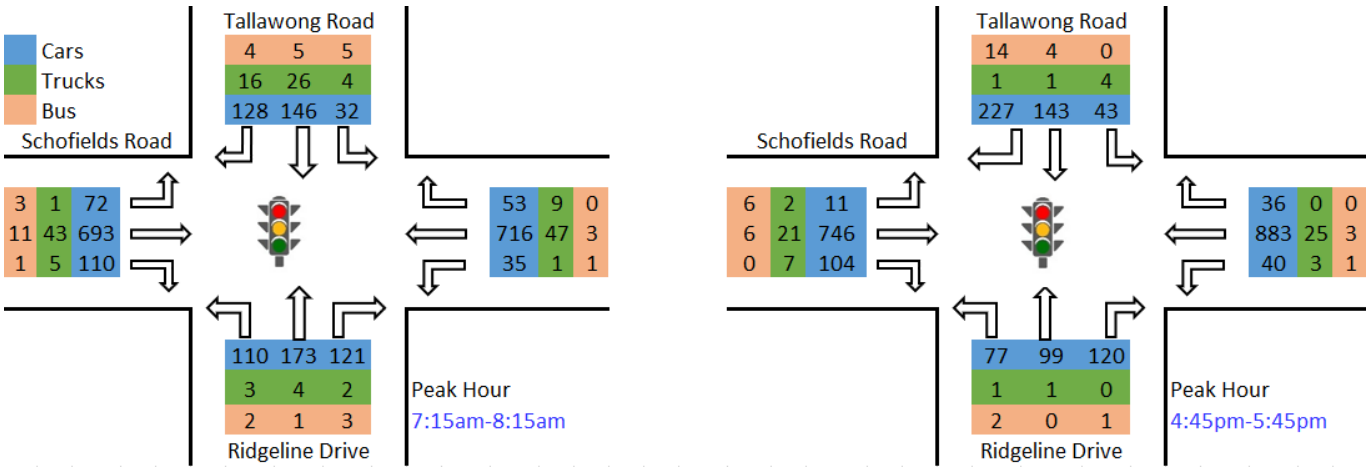

Figure 3: Tallawong Road / Schofields Road Intersection Count

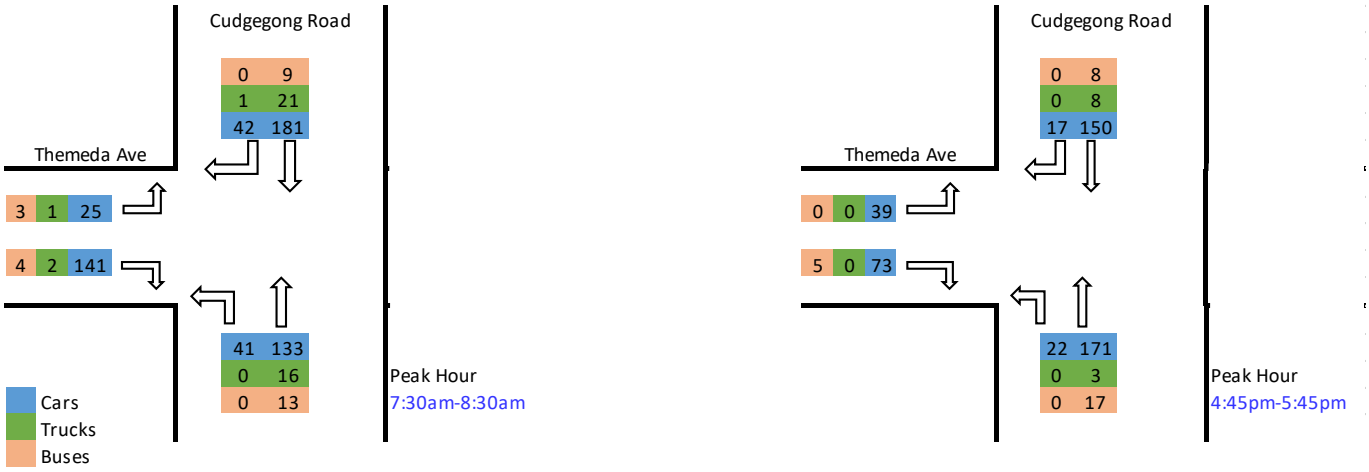

Figure 4: Themeda Avenue / Cudgegong Road Intersection Count

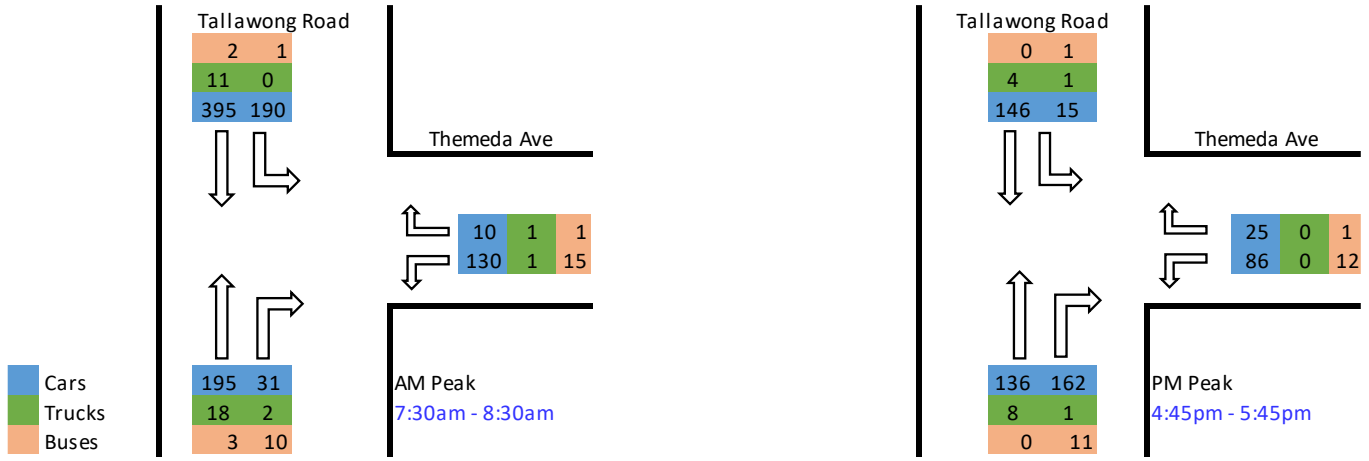

Figure 5: Themeda Avenue / Tallawong Road Intersection Count

2.4 Public Transport Facilities

The area is well serviced by public transport with four bus stops located within 400 metres of the site. These bus stops provide the following services:

- Route 607N Tallawong Station to City QVB via North West T-way and M2 Motorway
- Route 732 Rouse Hill to Blacktown via The Ponds
- Route 742 Marsden Park to Rouse Hill
- Route 747 Marsden Park to Rouse Hill via Riverstone
- Route 751 Rouse Hill Town Centre to Blacktown

The full bus network map is attached at **Appendix B**.

The Sydney Metro Northwest commenced services in June 2019. This rail link connects Sydney's north west region to the Sydney CBD with trains arriving every four minutes during peak hours. Accordingly, the Tallawong train station is located directly adjacent to the site (to the north) and provides connection to centres such as Castle Hill, Epping, Macquarie Park, and the Sydney CBD. **Appendix C** provides a context of the Sydney Metro Northwest with the greater Sydney Train Network.

As part of the Tallawong station facilities there are 1,000 commuter car parking spaces, 4 spaces for buses, 15 kiss-and-ride spaces, 9 taxi spaces and parking and storage for 35 bicycles.

Figure 6 is an extract from the Blacktown Growth Centres DCP and shows the public transport network map highlighting the proposed strategic bus corridors, bus routes, indicative bus stops and pedestrian catchments for bus stops (400m) and train stations (800m).

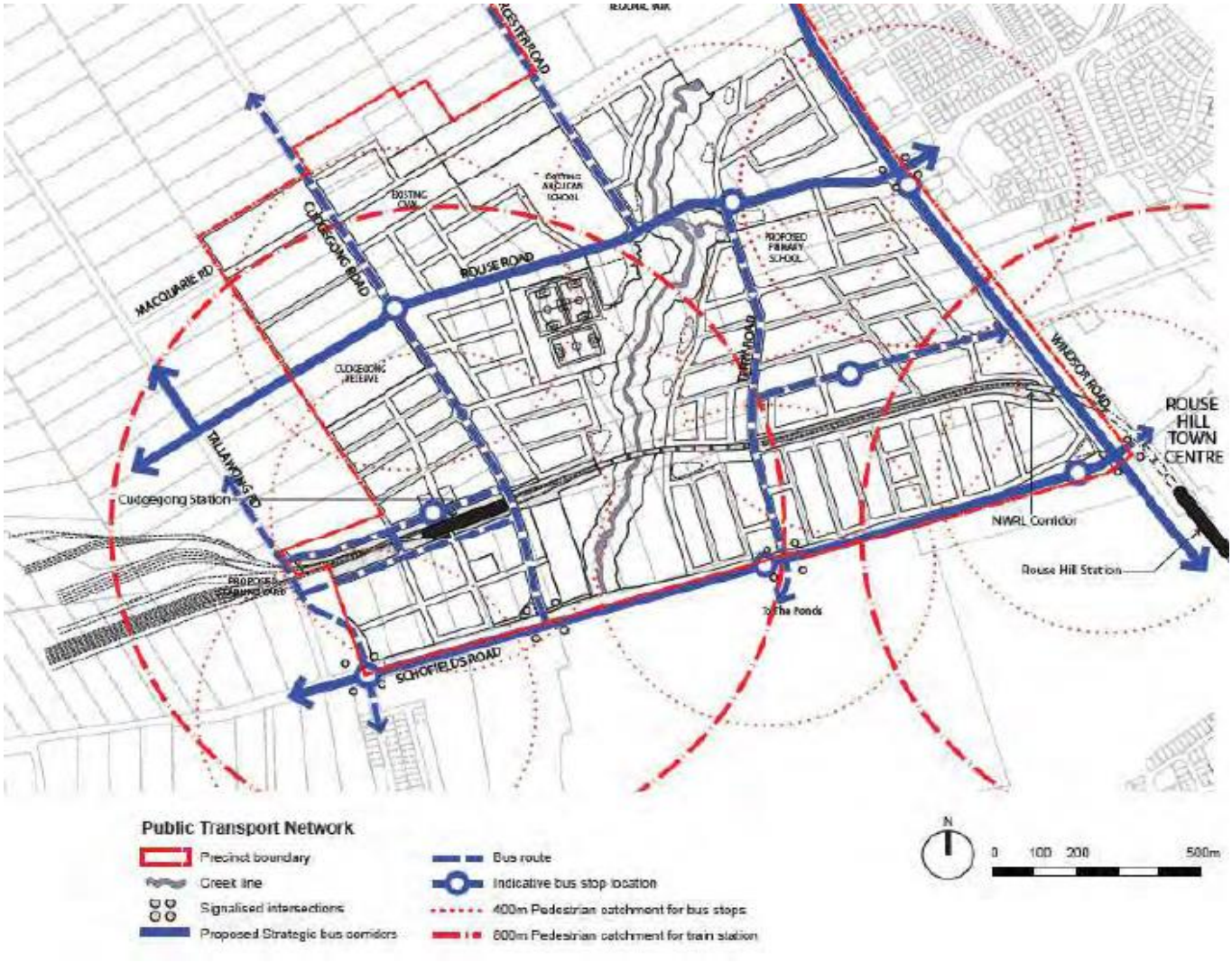

Figure 6: Blacktown Growth Centres DCP Schedule 4 Area 20 Precinct Public Transport Network Map 2011

Figure 7, below identifies existing public bus and transport options in close proximity to the site.

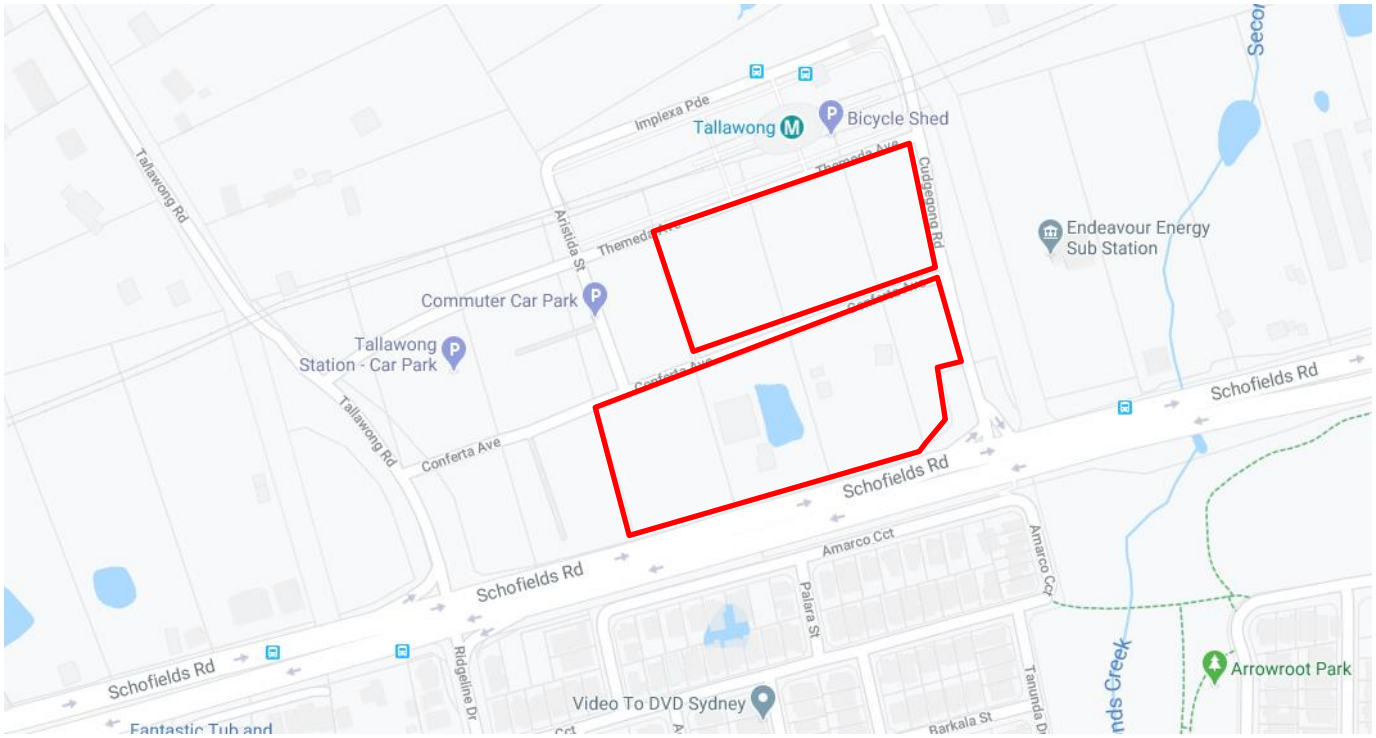

Figure 7: Location of bus stops and Sydney Metro Station to the site

2.5 Pedestrian and Bicycle Facilities

The pedestrian and cycling network extend within the road corridors of Schofields Road, Cudgegong Road and Tallawong Road.

In the immediate vicinity of the site, Themeda Avenue provides 3m wide pedestrian paths on both sides of the road. Conferta Avenue has 2.5m wide footpaths on the northern side of the road and a 1.9m footpaths on the southern side of the road. Aristida Street and Implexa Parade have footpaths on both sides of the road with a zebra crossing located on Themeda Avenue and Implexa Parade, directly in front of the Tallawong Metro Station.

Signalised pedestrian crossings are also available at the following signalised intersections:

- Cudgegong Road/ Schofields Road
- Tallawong Road / Schofields Road
- Themda Avenue/ Cudgegong Road
- Themeda Avenue/ Tallawong Road

As mentioned above, at Tallawong Station there are bike racks available and a bicycle shed with parking for 35 bicycles.

An extract from the DCP Pedestrian and Cycle Network Map shows the site pedestrian and bicycle links that link the Tallawong Station Precinct South to the surrounding area.

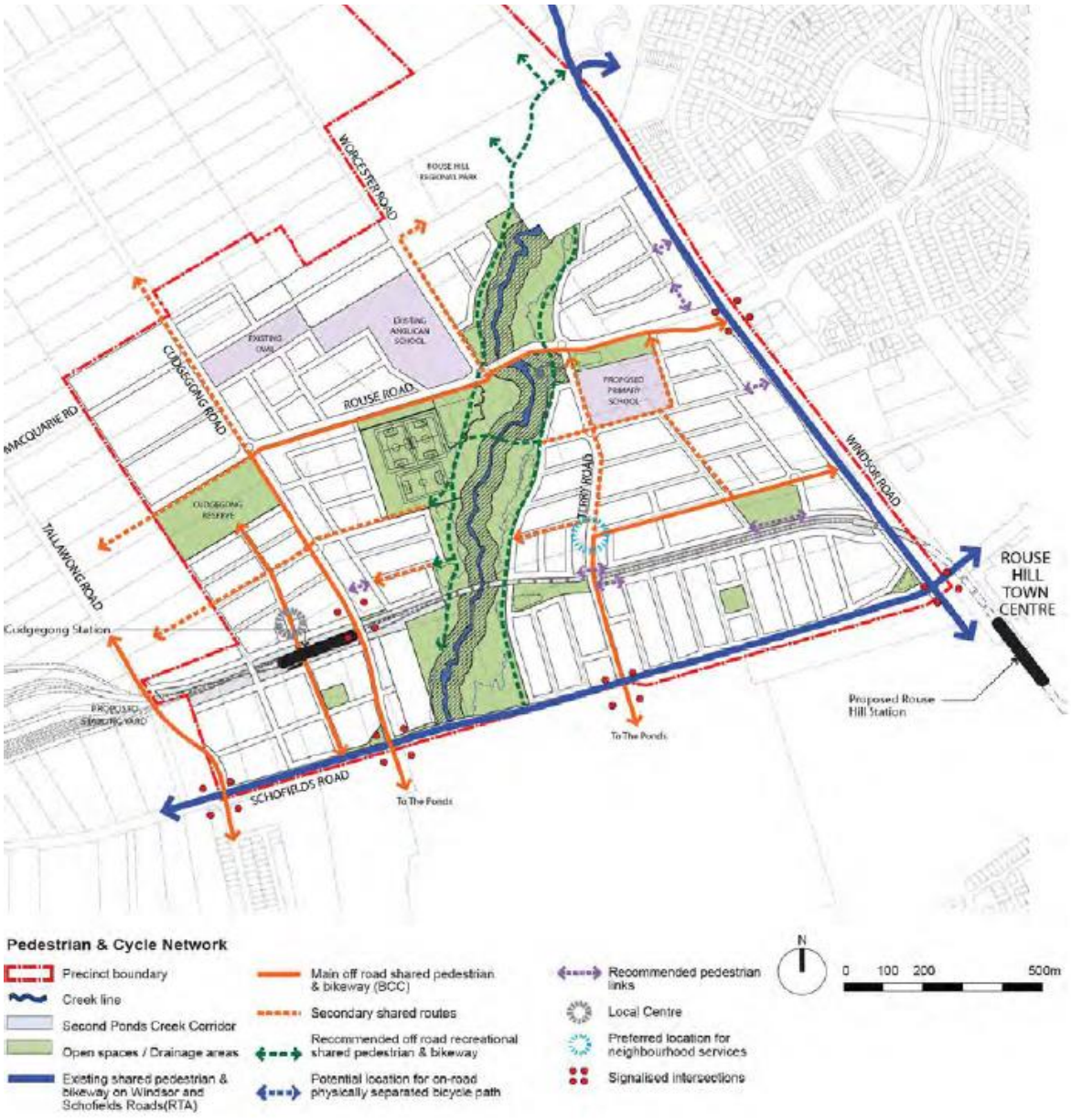

Figure 8: Blacktown Growth Centres DCP Schedule 4 Area 20 DCP Pedestrian and Cycle Network Map

In summary, the roads surrounding the site provide a high standard of pedestrian / cyclist facilities including shared paths and pedestrian and cyclist crossing facilities at each of the signalised intersections. The existing and future pedestrian and bicycle network surrounding the site is attached at **Appendix A**.

3 Proposed Development

3.1 Development Yield

The proposed development is comprised of residential and non-residential components as stipulated in the following table.

Table 1: Proposed Development Yield

Land Use		Yield
Residential	1 Bedroom	252 units
	2 Bedroom	682 units
	3 Bedroom	53 units
	Total	**987 units**
Retail		6,000m^2
Commercial		3,000m^2

The basement level parking is spread over three levels and comprises of 1,368 spaces, comprising of 1,068 residential (including 28 visitor spaces), 100 commercial spaces and 200 retail spaces.

3.2 Access

As shown in Figure 9 below, access to the site will be provided via the vehicle crossings arrangement as follows:

- Site 1A Combined car and loading dock vehicle access on the Northern side of Conferta Avenue
- Site 1B Separated car and loading dock vehicle access on the Northern side of Conferta Avenue
- Site 2A Separated car and loading dock vehicle access on the Northern side of the new proposed road
- Site 2B, 2C & 2E Separated car and loading dock vehicle access on the Southern side of Conferta Avenue
- Site 2D Separated car and loading dock vehicle access on the Southern side new proposed road

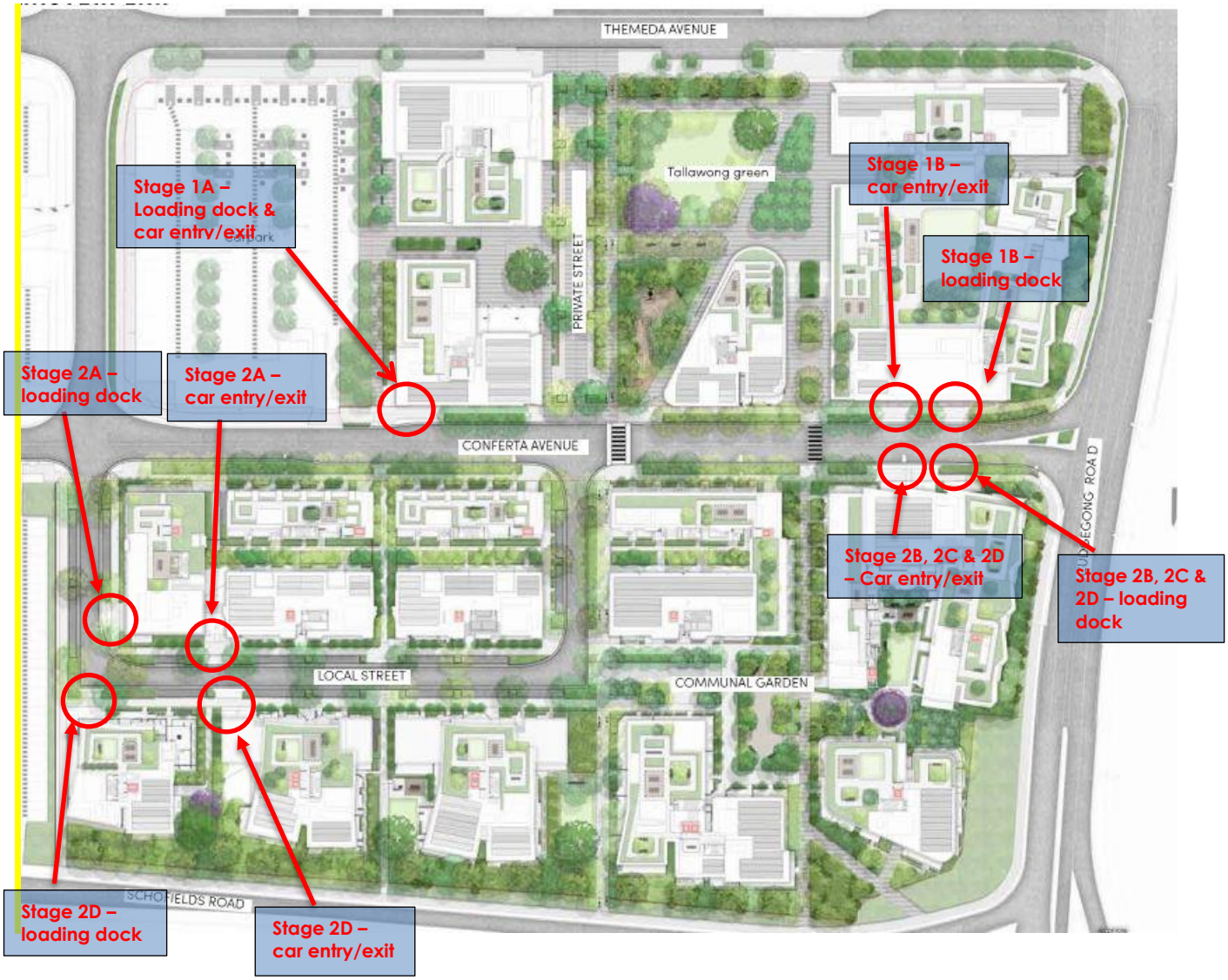

Figure 9: Extract from Landscape Plans showing the location of vehicle crossings within the development.

The entry/exit driveways comply with *AS/NZS 2890.1-2004 Parking Facilities – Off-Street Car Parking, AS 2890.2-2002 Parking Facilities – Off Street Commercial Vehicle Facilities*. More details are available in Section 4.7 of this report (Parking Compliance Check).

Car swept turning path plans of vehicles have been provided in **Appendix D** in accordance *AS/NZS 2890.1-2004 Parking Facilities – Off-Street Car Parking.*

3.3 Service Vehicles and Loading Requirements

Swept turning path plans of Blacktown Council's Waste vehicle have been provided in **Appendix D** in accordance with *AS 2890.2-2002 Parking Facilities – Off Street Commercial Vehicle Facilities* and the Waste Vehicle dimensions outlined in Blacktown City Council's DCP Part G Site Waste Management and Minimisation.

The plans demonstrate forward ingress and egress of an 11 metre Medium Rigid Vehicle (MRV) between the site and Conferta Avenue / proposed new road. Internally, the MRV is able to enter the site in a forward direction, satisfactorily reverse into the waste collection area and loading bay and exit in a forward direction.

The swept turning paths demonstrate that the proposed loading and waste vehicle access provisions comply with Blacktown Council's DCP (minimum 25m) and the requirements of AS 2890.2-2018.

3.4 Public Domain Improvements

Public domain improvements are proposed to the extent outlined in the extracts from the Civil Plans in Figure 10 below not only to accommodate vehicle, pedestrian and bicycle movements from the development to the surrounding road, pedestrian and cycle networks but to also improve the landscaping and overall amenity of the precinct for pedestrians.

Apart from upgrading Conferta Avenue to accommodate a safe movement of vehicles, pedestrians and cyclists, a new public road is also proposed to allow vehicle access to the basement parking and loading bay area and to provide for safe pedestrian movements.

To facilitate pedestrian movement from the precinct to Tallawong Station and the bus stops adjacent to the station, pedestrian and cycling links are provided through the site as shown in Figure 12 and two pedestrian crossings are proposed in Conferta Avenue as indicated in Figure 10 below.

To address concerns about pedestrian and cyclist safety while crossing Conferta Avenue it would be possible to provide a limited amount of on-street parking along both sides of the road as shown in Figure 10 below.

The presence of on-street parking has been shown to reduce traffic speeds as drivers are more aware of vehicle parking movements and adjust their speed accordingly. This on-street parking could most effectively be provided by line marking a parking lane on each side of Conferta Avenue and providing a combination of time-limited parking signs, No Stopping and No Parking signs as shown in Figure 10. The installation of the line marking and signposting can only be implemented with the approval of Blacktown City Council and, if approved, would be installed as part of the development proposal.

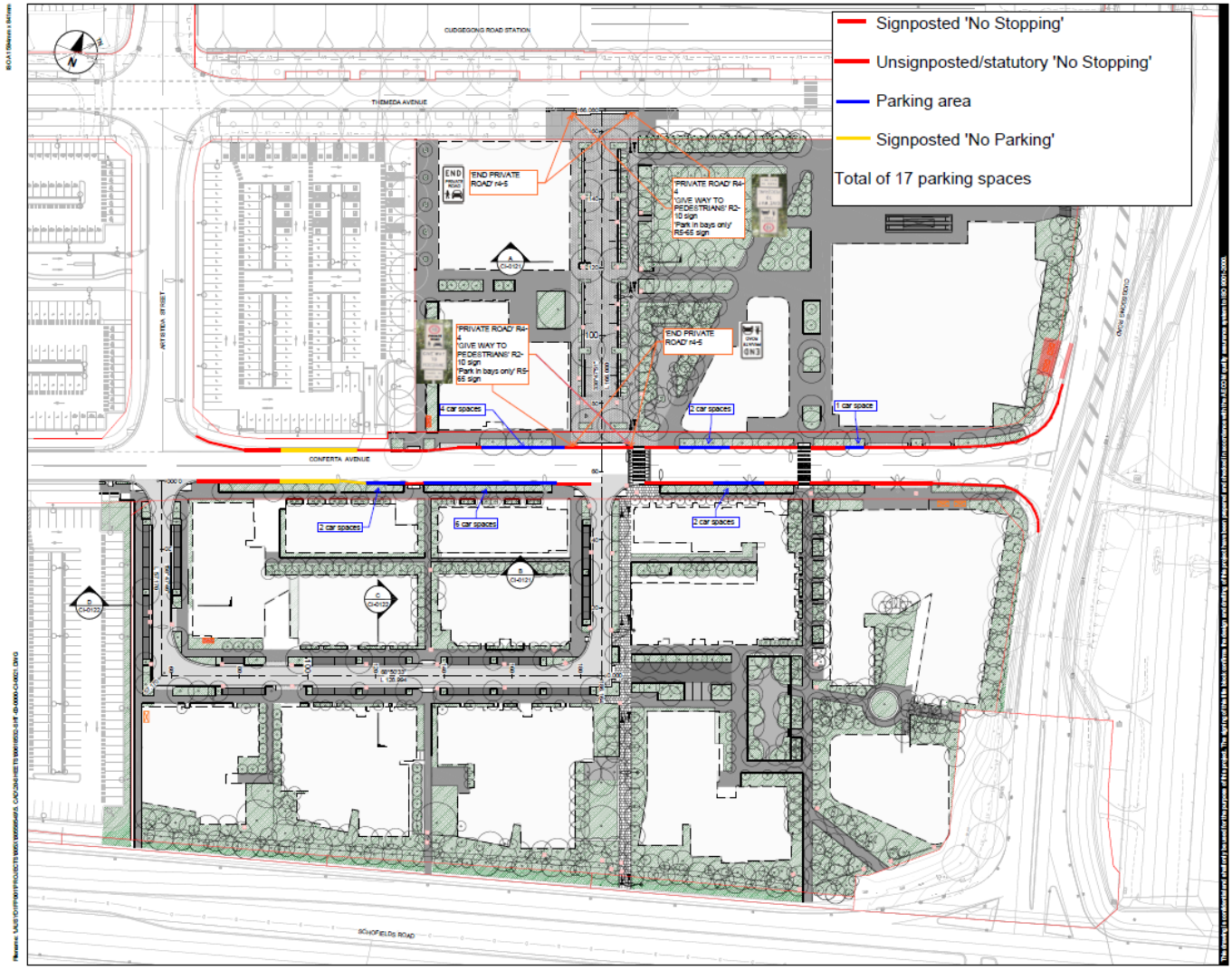

Figure 10: Extract from Civil Plans showing the proposed on-street parking in Conferta Avenue

According to the Landscape Plans, "*The proposed development will deliver a new standard in public domain along the North West Priority Growth Area. Delivering high end public realm comprising of green open space with high end playground*". And, "*The streetscape is designed to be to create a vibrant, diverse and cool character*".

With regards to accessibility the Landscape Plans state, "*All residents and local, community may access and enjoy the public domain universal access to AS1428 has been incorporated into where possible connected walkways, the public spaces and building entries without compromising design quality.*"

Figure 11 below is an extract from Landscape Plans showing an overview of the proposed tree planting through the site, including street tree planting within the existing Conferta Avenue, Themeda Avenue and the proposed new public road.

Figure 11: Extract from Landscape Plans showing the proposed landscape works.

3.5 Public Transport network

Note that the proposed 987 residential units is less than the original 1,100 residential units approved in the concept proposal. Therefore, the Sydney Metro Northwest line and bus network would have been designed to accommodate a higher density on the site than what is currently approved.

From the Green Travel Plan prepared by Barker Ryan Stewart it was estimated that the precinct once fully completed and occupied would generate approximately 100 people per hour traveling by train in the morning peak between 7am and 9am and the evening peak between 4pm and 6pm. It is also estimated that approximately 50 people per hour would leave the precinct to travel by bus in the morning 7am to 9am peak and the evening peak between 4pm and 6pm.

The Sydney Metro Northwest can have trains departing in each direction every four minutes (15 trains per hour) and has the capacity of moving approximately 20,000 people in each direction every hour. Therefore, the additional commuters estimated to be generated by the development would be easily catered for by Sydney Metro Northwest in fact this is the reason the metro line was built in order to accommodate residents in the Northwest Growth area.

The number of people from the precinct likely to commute by bus would be able to be catered for by the buses leaving from Tallawong Station. Figure 6 shows the bus public transport map in the vicinity of the site.

3.6 Pedestrian and Bicycle Facilities

According to the 2016 Census, the average persons per household in the Rouse Hill / Schofields area is 3.07. As the proposed development consists of 987 apartments, it is assumed that the development will accommodate around 3,000 residents.

The census also indicated that 50% of the population in Rouse Hill / Schofields area is employed which equates to 1,500 people employed. In addition, 19.1% of the population travelled to work by public transport (train and bus) or cycled / walked (1.1%), which provides an estimated 300 people that will regularly walk between the site and Tallawong Metro Station and adjacent bus stops during the 2 hour peak periods.

Pedestrian and cyclist access modelling to the proposed development was not considered necessary as the off road pedestrian and cycle paths in Schofields Road and Cudgewong Road and the wider network would have been modelled on a regional scale and the network would be able to cater for the number of pedestrians and cyclists that would be generated by the development, particularly that the development yield proposed is a smaller residential unit yield than what was previously approved by the concept SSDA.

Site Pedestrian Access

Extensive public pedestrian paths exist in the precinct area to support the recently constructed Tallawong Station. The site is located immediately adjacent to the train station with a number of key public facilities within walking distance to the site.

The site is well connected with pedestrian footpaths which allow easy access from Tallawong station to and from the main pedestrian entries to the precinct.

In addition to the public domain works outlined in Section 3.4 above and the proposed through site cycle and pedestrian links shown in Figure 12 below, the existing pedestrian network of footpaths on surrounding public roads would encourage residents, staff and users of the precinct to walk from destination to destination or use a combination of public transport and walking. This would represent a significant mode shift toward active transport based on promotion of site permeability and north- south shared pedestrian links through the site.

The pedestrian site links proposed within the precinct together with the proposed upgrades to the public domain within Conferta Avenue including the two pedestrian crossings will provide safe pedestrian access to Tallawong Station and the surrounding pedestrian network.

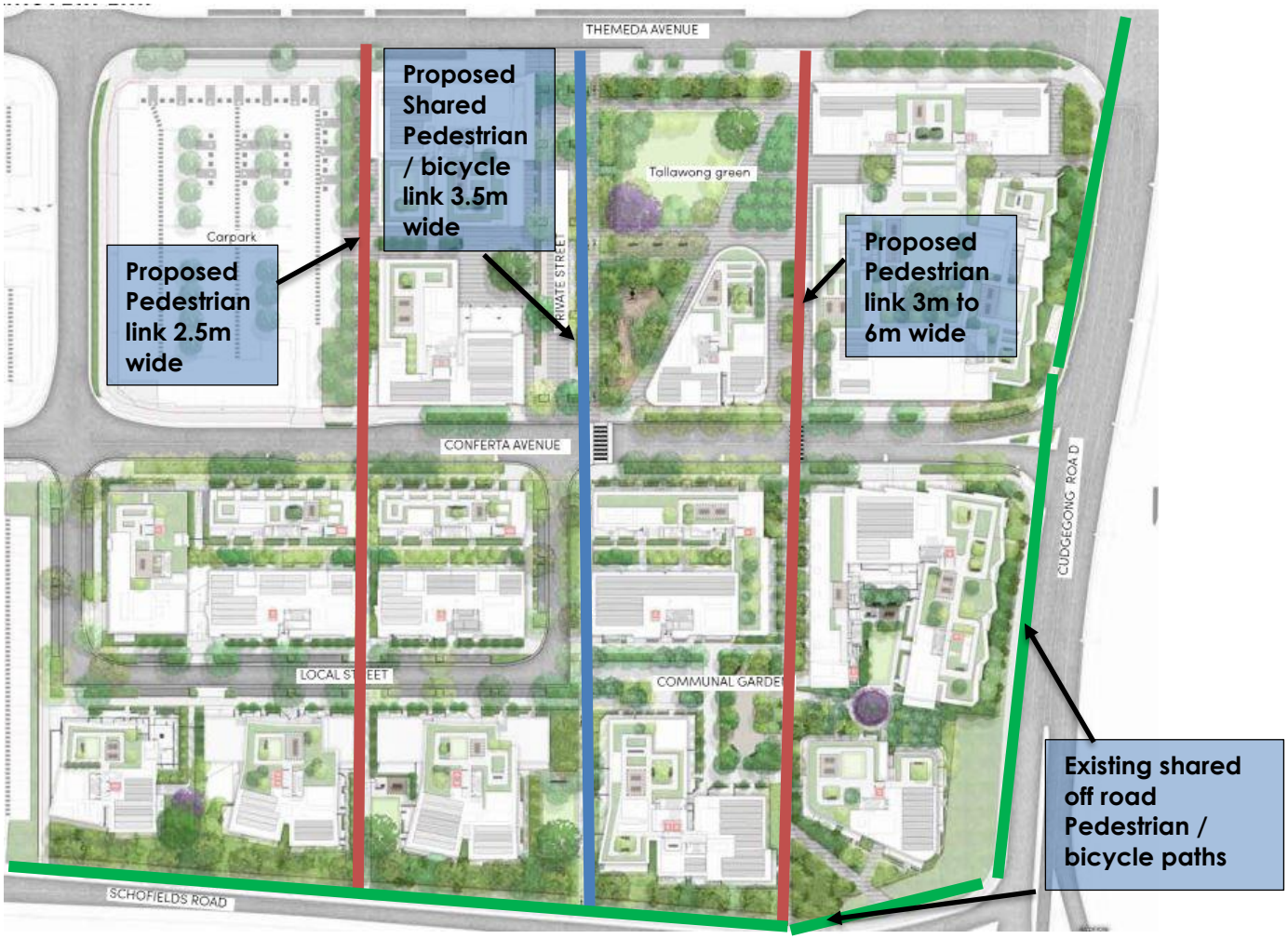

Figure 12: Extract from Landscape Plans with pedestrian and bicycle links added

Bicycle Facilities

In regard to cycling, the 2016 census showed that only 0.2% of the population cycled to and from work. However, assuming a more conservative estimate of 1% of the total residents cycling each day will give a total of 150 cyclists per day.

It is proposed to provide 1,086 bicycle spaces to the precinct which is considered more than sufficient to cater for the storage and facility needs of the residents and their visitors. Note that there is no requirement in the Concept Plan SSD 9063 to provide the non-residential uses with bicycle storage.

The bicycle storage spaces are proposed to be provided at a rate of one space for each residential unit for residents and one space for each 10 units for residential visitors in accordance with the Concept Plan SSD 9063 requirements. This equates to 987 x 1 + 987/10 = 1,086 bicycle parking spaces.

Bicycle parking is proposed to be provided in the following locations adjacent to lifts:

- Site 1A Basement 1 – 55.2m² storage area for 24 bicycles and 76.2m² for 31 bicycles.
- Site 1A Basement 2 – 144.5m² storage area for 69 bicycles.
- Site 1B Basement 3 – 179.8m² storage area for 111 bicycles, 148.2m² for 38 bicycles, 114.7m² for 50 bicycles, 43.6m² for 24 bicycles and 43.1m² for 19 bicycles.
- Site 2A Mezzanine – 359m² storage area and 182 bicycles.
- Site 2B, 2C & 2E Mezzanine – 167.6m² and 74 bicycles.

- Site 2B, 2C & 2E Basement 1 – storage area 51m² for 20 bicycles, 186.3m² for 80 bicycles, 164.7m² for 80 bicycles and 187.1m² for 95 bicycles.
- Site 2D Mezzanine – 127m² storage area for 60 bicycles and 258m² storage area for 129 bicycles.

The precinct will also incorporate dedicated cycle and pedestrian links as shown in Figure 12 above. This includes off road bicycle links in Schofields Road and Cudgegong Road and on road link in Themda Avenue and Conferta Avenue.

Access will be enhanced from Schofields Road through the precinct to Tallawong Station and proposed Cudgegong Town Centre in accordance with Blacktown Growth Centre Precincts DCP mapping. As the North West Growth Centre begins to support greater number of residents, it is anticipated that the provision of additional safe and connected bicycle infrastructure will encourage alternative modes of transport to be utilised by residents and visitors to the site.

The development will connect to Rouse Hill Town Centre via the existing shared path along Schofields Rd. **Appendix A** shows the cycleways along Cudgegong and Tallawong Roads that have been partially constructed by Sydney Metro.

Overall, the precinct will have safe and excellent access for cyclists to public transport and bicycle network and facilities which can accommodate the bicycle movements generated by the proposal.

4 Car Parking Assessment and Strategy

4.1 Parking Requirements

The basement level parking includes 1,368 spaces, comprising of 1,068 residential spaces (including 28 visitor spaces), 100 commercial spaces and 200 retail spaces.

The applicable parking rates for the development are provided below:

Concept SSD 9063 Approval Rates

- 0.6 space per 1-bedroom unit
- 0.9 spaces per 2-bedroom unit
- 1.4 spaces per 3-bedroom unit
- 1 visitor space per 10 units
- 1 space per 60m^2 retail space
- 1 space per 70m^2 commercial space

Blacktown Council DCP Rates

- 1 spaces per 1-bedroom unit
- 1 spaces per 2-bedroom unit
- 2 spaces per 3-bedroom unit
- 1 visitor space per 5 units
- 1 space per 22m^2 retail space (over 200m^2)
- 1 space per 40m^2 office space

RMS Guide Rates (Metropolitan Sub-Regional)

- 0.6 space per 1-bedroom unit
- 0.9 spaces per 2-bedroom unit
- 1.4 spaces per 3-bedroom unit
- 1 visitor space per 5 units
- 4.5 spaces per 100m^2 retail space
- 1 space per 40m^2 commercial space

Proposed Rates

- 1 space per 1-bedroom unit
- 1 space per 2-bedroom unit
- 2 spaces per 3-bedroom unit
- 1 visitor space per 35 units
- 1 space per 30m^2 retail space
- 1 space per 30m^2 commercial space

A summary of these requirements in relation to the development yield is included in Table 2 below.

Table 2: Minimum car parking requirements

Land Use		Concept SSD 9063 Units	Concept SSD 9063 Approval	Proposed Units	SSD 9063 rates	RMS Guide	Council DCP	Proposed Parking
Residential	1-Bedroom	220 units	132	252 units	152	151	252	252
	2-Bedroom	660 units	594	682 units	594	614	682	682
	3-Bedroom	220 units	308	53 units	74	74	106	106
	Visitors	Total units: 1,100	110	Total units: 987	99	198	198	28
Residential sub total			**1,144**		**919**	**1,037**	**1,238**	**1,068**

Land Use	Concept SSD 9063 GFA	Concept SSD 9063 Approval Requirement	Proposed GFA	SSD 9063 rates	RMS Guide	Council DCP	Proposed Parking
Commercial	3,000m^2	43	3,000m^2	43	75	75	100
Retail	6,000m^2	100	6,000m^2	100	270	273	200
Non-Residential total	Total = 9,000m^2	**143**	Total = 9,000m^2	**143**	**345**	**348**	**300**

Land Use	Concept SSD 9063 Approval requirment	SSD 9063 rates	RMS Guide Requirement (based on proposal)	Council DCP Requirement (based on proposal)	Proposed Parking
Residential sub total	1,144	919	1,037	1,238	1,068
Non-Residential total	143	143	345	348	300
Total	**1,287**	**1,062**	**1,382**	**1,586**	**1,368**

4.2 Transit orientated development parking guiding principal

'As a guiding principal, Sydney Metro and Landcom consider that a reduced car parking provision for Tallawong Station Precinct South is fundamental to achieving:

- *An exemplar transit orientated development (maximising the benefits of fast frequent metro connections with services every 4 minutes in the peak and 10 minutes in off peak.*
- *A town centre where cars do not dominate*
- *Activation and life on the street*
- *Less congestion of precinct roads.*

Providing high levels of car parking does not align with the key principles of transit orientated development'

The parking provision included in the concept approval for the development was determined by applying the car parking requirements of State Environmental Planning Policy No 65 - Design Quality of Residential Apartment Development (SEPP 65) and the Apartment Design Guide which states that:

*"Car parking is provided based on proximity to public transport in metropolitan Sydney and centres in regional areas. For development on sites that are within 800m of a railway station or light rail stop in the Sydney Metropolitan Area the **minimum** car parking requirement for residents and visitors is set out in the Guide to Traffic Generating Developments, or the car parking requirement prescribed by the relevant council, whichever is less".*

Given the location of the development close to Tallawong Station, the parking requirements in the RMS Guidelines for Metro Sub-Regional CBD Centres were adopted in the concept approval when determining the required number of parking spaces for the residential components of the site.

The parking rates applicable to the non-residential (commercial / retail) component of the proposed development adopted for the concept approval were based on the rates in the Parramatta DCP for Epping Town Centre.

4.3 Tallawong Station existing commuter car parks

As part of the Tallawong station facilities there are 1,000 car parking spaces (820 regular spaces, 30 accessible spaces and 150 compact car spaces) in the three commuter carparking areas. There are also 4 spaces for buses, 15 kiss-and-ride spaces and 9 taxi spaces provided in Themeda Avenue and Implexa Parade.

The results of the of the AM peak period on Thursday 12 March 2020 are indicated in Figure 13 and the PM peak period on the same day are indicated in Figure 14.

Tallawong Station commuter car parks AM 200312

Time	Car Park 1 (147 spaces)				Car Park 2 (454 spaces)				Car Park 3 (397 spaces)			
	In	Out	Total parked	Available spaces	In	Out	Total parked	Available spaces	In	Out	Total parked	Available spaces
6:45			147	0			239	215			5	392
7:00			147	0	69		308	146			134	263
7:15			147	0	98		406	48			196	201
7:30			147	0	39		445	9			243	154
7:45			147	0	9		454	0			317	80
8:00			147	0			454	0			354	43
8:15			147	0			454	0			377	20
8:30			147	0			454	0			396	1
8:45			147	0			454	0			397	0

4 motor bikes also entered Car Park 2 between 7am-7:30am
Car Park 1 was full at 6:15am except for the dissabled spaces which were all free
Car Park 3 had electronic signage indicating the number of spaces that were free, this sign was checked every 15 minutes

Figure 13: The results of the commuter car park survey AM

Tallawong Station commuter car parks 200312

Time	Car Park 1 (147 spaces)				Car Park 2 (454 spaces)				Car Park 3 (397 spaces)			
	In	Out	Total parked	Available spaces	In	Out	Total parked	Available spaces	In	Out	Total parked	Available spaces
4:00												
4:15											354	43
4:30	3	6	119	28	3	17	380	74			350	47
4:45	2	16	105	42		13	367	87			342	55
5:00	4	8	101	46	1	40	328	126			326	71
5:15	1	10	92	55	4	39	293	161			302	95
5:30	3	10	85	62		38	255	199			269	128
5:45	4	7	82	65	1	31	225	229			239	158
6:00	3	4	81	66	1	45	181	273			200	197

Informal car parking on opposite side of Cudgegong Road to development site - 108 cars parked at 4:15pm
On street parking in Cudgegong Road stretching from bridge over Sydney Metro west to Rouse Road (400m) - 64 cars parked at 4:15pm
On Street parking in Grassland Court - 58 cars parked at 4:15pm
Car Park 3 had electronic signage indicating the number of spaces that were free, this sign was checked every 15 minutes

Figure 14: The results of the commuter car park survey PM

In summary we undertook a car park survey on Thursday 12 March 2020 with the following results:

- P1 (147 spaces) – Full by 6:15am
- P2 (454 spaces) – Full by 7:45am
- P3 (397 spaces) – Full by 8:30am
- P1 had 28 spaces available by 4:30pm and 66 available at 6pm
- P2 had 74 spaces available by 4:30pm and 273 available by 6pm
- P3 had 43 spaces available at 4:15pm and 197 available by 6pm.
- Note that the 30 accessible spaces in P1 remained available throughout the survey.
- Informal car parking on the opposite side of Cudgegong Road to the development site – 108 vehicles parked at 4:15pm
- On street parking in Cudgegong Road stretching from Sydney Metro to Rouse Road (400m) – 64 cars parked at 4:15pm.
- On Street parking in Grassland Court – 58 cars parked at 4:15pm.

The car parking survey reveals that the 1,000 existing car parking spaces located at the Tallawong Station are already at capacity (with the exception of the accessible spaces in P1 which remained vacant) with a substantial overflow of all-day parking currently occurring onto the surrounding street network and adjoining properties during the working week.

Note that this car park survey was also undertaken at a time when the coronavirus was already impacting the use of public transport.

Furthermore, NearMap satellite images taken once per month show that on consecutive months on the dates indicated below the car parks were full.

- Tuesday 29th Oct 2019
- Thursday 12th of Sep 2019
- Friday 16th Aug 2019
- Friday 19th of July 2019

Figure 15: NearMap image 29 October 2019 showing the car parks full.

This indicates that the moment that the Tallawong Station car parks were completed and opened they were at capacity.

4.4 Basis of Proposed Parking Provision

As outlined in Section 4.1 the proposed parking provision is summarised in the following table.

Table 3: Proposed parking

Land Use	Concept SSD 9063 Approval requirment	SSD 9063 rates	RMS Guide Requirement (based on proposal)	Council DCP Requirement (based on proposal)	Proposed Parking
Residential sub total	1,144	919	1,037	1,238	1,068
Non-Residential total	143	143	345	348	300
Total	**1,287**	**1,062**	**1,382**	**1,586**	**1,368**

It should be noted that the primary purpose of the Sydney Metro Northwest is to connect the North-West area with major employment and education centres such Epping, Macquarie University, Macquarie Park, North Ryde, Chatswood and the Sydney CBD primarily for those commuting to work and university.

It is acknowledged that planning for new developments in this area needs to consider the principles of transit-oriented development and the implementation of targeted travel demand management measures and initiatives to reduce the need and reliance on private vehicle travel.

However, the guiding principles do not take into consideration the unique location of Tallawong Precinct South being located at the end of the Sydney Metro Norwest Line and the extensive catchment area it serves. The 1,000 existing commuter car parking spaces located at the Tallawong Station are already at capacity with a substantial overflow of all-day parking currently occurring onto the surrounding street network during every workday. By 8:30am the existing car parks are full by commuters travelling on the Sydney Metro Norwest line, once full drivers of vehicles then proceed to park in the surrounding street network.

The catchment area beyond the North West Growth centre is predominantly rural in nature with poor or no public transport options available to the residents.

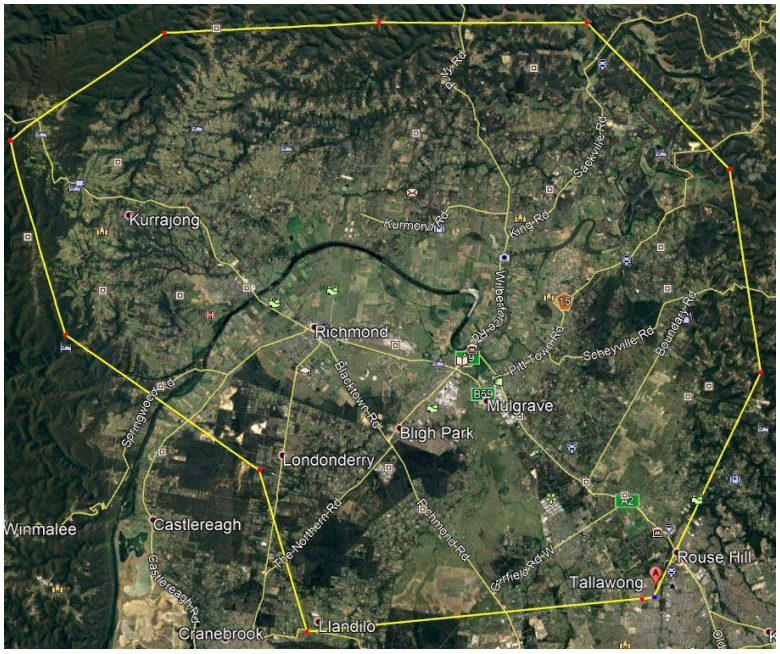

Figure 16: Estimated Catchment area of car users that currently park at Tallawong Station

Even once the Sydney Metro Norwest extends to the Western Sydney airport and connects with Schofields Train Station, this will only partially reduce this catchment area. Also, the surrounding North West Growth sector in the immediate vicinity of Tallawong Station and to the west and east of the station is only partially developed. Once this is fully developed this would put even more pressure on the at capacity Tallawong Station car parks.

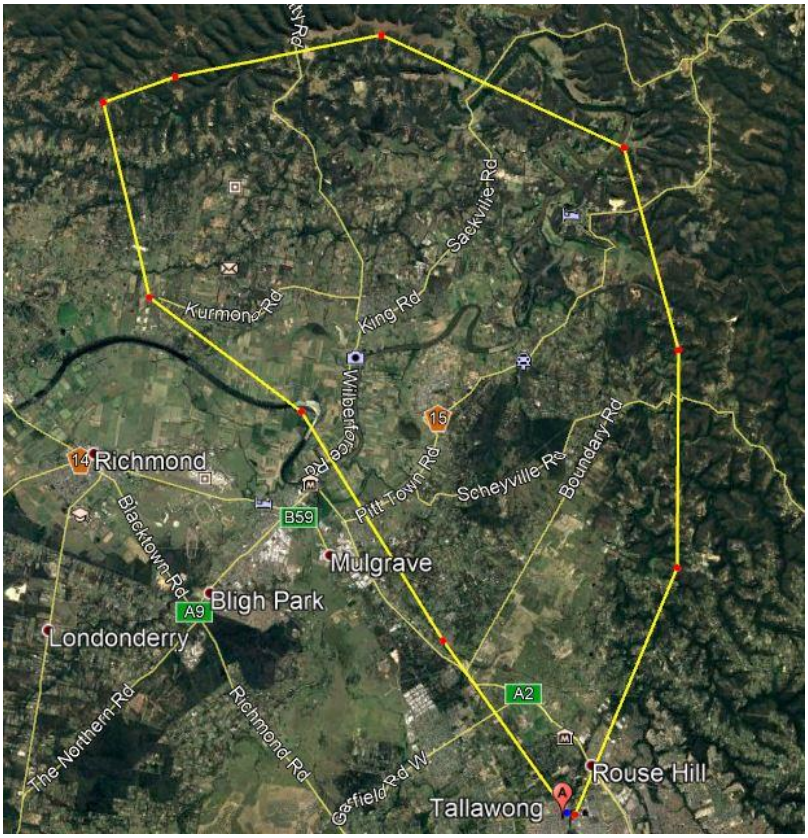

Figure 17: Estimated Catchment area of car users once Sydney Metro Northwest connects with Schofields Station

Furthermore, in the developing area around Tallawong Station there will also be a high demand for a range of local trips by residents on week days such as school / childcare centre pick up and drop off and on weekends for accessing family sporting activities, shopping and visiting family and friends at destinations that are not readily served by public transport. Consequently, there will continue to be a high demand for parking spaces associated with new developments in this area.

Evidence of this high demand for parking can be seen in a review of six residential developments recently approved by Blacktown City Council in the vicinity of Tallwong Station. This review has revealed that, in almost all cases, the parking rates adopted were 1 space per 1 and 2-bedroom units and 2 spaces per 3 bedroom units, with visitor parking at a rate of 1 space per 5 units. The parking rates proposed for the residential component of this development are consistent with the rates that have been adopted in these recently approved developments.

CBRE provided advise to the saleability of residential units in the area and they stated that units without a car parking space are difficult to sell compared to those that do. (See letter at **Appendix G**)

Strictly complying with the car parking rates outlined by the Concept Approval would result in a development that would have insufficient car parking to cater for residential component of the development and would put pressure on the at capacity Tallawong Station car parks and on-street parking in the surrounding road network.

The proposed parking rates are considered better able to meet the travel demands associated with the characteristics of the Tallawong area; are consistent with the parking provision of other approved developments in the vicinity of the Tallawong station and will prevent a detrimental impact on the already at capacity Tallwong Station commuter car parking areas and the surrounding road network.

Although not required to support the proposed parking rates, there is potential for four GoGet shared parking spaces to be provided in the new private road in the vicinity of the Tallawong Station.

In summary, it is proposed that the proposed parking rates of one space per one and two bedroom units, two spaces for each three bedroom unit, one space per 35 units for residential visitor parking and one space per 30m² of GFA for the retail and commercial component should be adopted These rates are considered to be better able to meet the travel demands associated with the characteristics of the Tallawong area and consistent with the parking provision of other approved developments in the Blacktown City Council and The Hills Council LGA within vicinity of the Tallawong Metro station and to reduce the detrimental impact at the already at capacity Tallawong Station car parks and the surrounding road network.

The proposed parking provision of 1,368 spaces is only 81 spaces (or 5.9%) more than what was approved in the concept plan and provides a balance between the minimum requirements of the RMS Guide, Blacktown DCP and the maximum rates of transit orientated development guiding principles.

4.5 Residential Parking Provision

The proposed provision of 1,068 residential spaces for the 987 units proposed equates to approximately one space (1.08 spaces) per unit and is considered satisfactory to cater for the car parking requirements generated by the development.

The residential parking provision is based on the rates of one space per one and two-bedroom units, two spaces for each three bedroom unit, one space per 35 units for residential visitor parking.

The proposed 1,068 residential spaces are considered to be warranted and acceptable for the following reasons:

- The proposed 1,068 residential spaces comply as it is more than the SEPP65 **minimum** parking requirement of 1,037 spaces based on the car parking rates required by the RMS Guide.

- The residential component of 1,068 spaces proposed is 170 spaces less than the 1,238 spaces based on the **minimum** car parking rates required by the Blacktown DCP.

- The original concept approval for the site was for 1,100 residential units and the provision of 1,144 car parking spaces for those units. The current proposal is for 987 residential units and the provision of 1,068 car parking spaces. This is a net reduction of 76 total residential car parking spaces compared to that which was approved in the concept proposal.

- Adequate secure on-site parking is a necessity for all residents to enable them to have a car parking space available 24/7 so they can drive to destinations such as work, schools, sports grounds, recreational areas, visiting friends and relatives etc where there is inadequate public transport modes available from the site.

- The provision of the 28 visitor car parking spaces is considered adequate for the following reasons:
    - Minimum visitor parking would address, to some extent, the transit orientated development guiding principles to minimise the parking provision.
    - Minimising visitor parking would encourage visitors to use the public transport during peak periods.
    - There would be an opportunity for visitors to utilise the 23 car parking spaces to be provided in the new private road and 34 on street parking in the new road (see Figure10).
    - Residential visitors tend to visit outside of peak working week hours and based on the car park survey and satellite images there would be plenty of parking available in the 1,000 space commuter car parks that would be underutilised after 4pm during weekdays and through the weekends which is the peak time for visitors.

- Strictly complying with the car parking rates outlined by the Concept Approval would result in a development that would have insufficient car parking to cater for the residential component of the development and would put pressure on the at capacity Sydney Metro commuter car park and on-street parking in the surrounding road network.

4.6 Non - Residential Parking Provision

The non-residential parking rates adopted for the concept approval were from the Parramatta DCP for Epping Town Centre. However, the travel demand, socio-economic and environmental characteristics of Tallawong and surrounding areas are vastly different to those at Epping being a well-established location close to employment and educational facilities with highly-developed road and public transport networks. The non-residential parking rates for the Epping Town Centre are therefore not considered to be appropriate for use at Tallawong.

In addition, the types of commercial / retail developments proposed have now been identified in more detail since the planning for the concept approval was conducted. Consequently, the parking rates required by RMS and Blacktown City Council are considered to be more appropriate as they relate to specific land use types rather than the generic commercial / retail land uses referred to in the concept approval.

The RMS rates in their Guide to Traffic Generating Development for retail and commercial uses are derived from undertaking numerous car parking surveys of similar retail and commercial developments and are considered appropriate in determining the demand for parking for these types of uses.

However, with a view to follow the guiding principles of transit oriented development with respect to the minimising the provision of parking adjacent Tallawong Station Precinct South, Deicorp has sought advice from an expert that negotiates leases/sale of properties to all the supermarket chains and other retail and commercial operators. They sought to determine the minimum amount of parking that could be provided for retail and commercial uses on site that would still make that component of the development viable and usable.

The expert Shiprock Advisory have stated that one space per 30m² would be the minimum rate at which parking should be provided for the retail and commercial uses. (letter is attached at **Appendix G**).

Strictly complying with the car parking rates outlined by the Concept approval would result in a development that would have insufficient car parking to cater for non-residential component of the development and would put pressure on the existing at capacity Sydney Metro commuter car park and on-street parking in the surrounding road network.

On this basis the proposed provision of 300 non-residential spaces based on the rate of one space per 30m² is considered satisfactory to cater for the car parking requirements generated by the retail and commercial component of the development.

The proposed provision of 300 spaces is 48 spaces less than the 348 spaces required by the Blacktown DCP car parking rates and 45 spaces less than the 345 spaces required by the RMS Guide to Traffic Generating Developments car parking rates.

4.7 Parking Compliance Check

Barker Ryan Stewart has reviewed the Architectural plans prepared by Turner. This review included the layout of car parking and internal roadways / ramps and overall, we are satisfied that the design is consistent with the requirements of Standards AS/NZS 2890.1, AS 2890.2-2002, AS 2890.3-2015 and AS/NZS 2890.6 and Blacktown Council DCP. It is anticipated that the car park will function in a satisfactory manner and in accordance with the original design intent. A summary of critical parameters assessed regarding the Australian Standards is included below.

Table 4: Compliance Table

Control	Proposed	Compliance
AS2890.1-2004 (Off-street Car Parking), AS2890.2-2002 (Off-street commercial vehicle facilities) and Council DCP		
2.4.1 Car Space Dimensions: Class 1A (residential) Class 3 (commercial and retail)	 2.4m x 5.4m with 5.8m aisle width 2.6m x 5.4m with 5.8m aisle width	Yes
2.4.2 Blind aisle Extension & Clearance	1 aisle extension provided for end of aisle parking spaces	Yes
2.5.2 Layout Roadways/Ramps	Passenger vehicle: Minimum 5.5m wide for two-way flow Heavy vehicle: minimum 6.5m wide for two-way flow	Yes
2.5.3 Roadway/Ramp Grades	Passenger vehicle: Max 1:4 (25%) with 2m 1:8 (12.5%) transition ramp Heavy vehicle: Max 1:6.5 (15.4%) with 1:16 (6.25%) in 7m of travel	Yes
3.2.2 Driveway Width	**Site 1A** Category 3 (6m entry, 4-6m exit and a 1-3m median) **Site 1B** Category 3 (6m entry, 4-6m exit and a 1-3m median) **Site 2A** Category 2 (6-9m combined entry / exit) **Site 2B, 2C and 2E** Category 3 (6m entry, 4-6m exit and a 1-3m median) **Site 2D** Category 2 (6-9m combined entry / exit) **Loading dock for all sites** Confirmed via swept path analysis	Yes
3.3 Gradients of Driveways	Maximum 1:20 for the first 6m within the property boundary.	Yes
5.2 Column Location/Spacing	Columns and other obstructions kept clear of parking envelope (as depicted in Figure 5.2 of AS2890.1)	Yes

5.3 Headroom	Passenger vehicles: Minimum 2.2m Heavy vehicles: 4.5m	Yes
Control	**Proposed**	**Compliance**
AS2890.6-2009 (Accessible Parking)		
2.2.1 Car Spaces Dimension	2.4m x 5.4m adjacent to 2.4m wide shared area.	Yes
2.4 Headroom	Minimum 2.5m	Yes

As shown in the table above, the development car park and access design comply with the relevant Australian Standards.

5 Traffic Assessment

The impact of the proposed development on the surrounding road network was assessed using SIDRA Intersection modelling software. The traffic counts outlined in Section 2.3 and traffic generation estimated below in Section 5.1 were used to determine an overall traffic level for the area post-development. Section 5.2 describes how these additional trips were distributed amongst the critical intersections chosen for study.

Ultimately Section 5.3 outlines the SIDRA analysis undertaken which found that the increased traffic resulting from the proposed development will not have a significant impact on the efficiency of the surrounding road network.

5.1 Trip Generation

Currently the site is vacant and as such has no traffic generation associated with it. Trip generation rates for the proposal were determined using the *Guide to Traffic Generating Developments, Updated Traffic Surveys (TDT 2013/04a)* and the rates previously used by SCT Consulting in their Traffic and Transport Study for the Concept Approval for the site.

The *Updated Traffic Surveys* document states that the recommended trip generation rates were based on ten surveys conducted in 2012, eight within Sydney, and one each in the Hunter and Illawarra. All developments were close to public transport, greater than six storeys and almost exclusively residential in nature. Appendix B1 of the document also provides details of the locations where the surveys were conducted and, although located within Sydney, locations such as Strathfield and Pyrmont were classed as "Regional Areas" for the purposes of the trip rate assessment. Consequently, Tallawong would also be regarded as a regional area and the appropriate trip generation rates have been adopted for this assessment.

Due to the proximity of the site to rail and bus services, the primarily residential nature and scale of the development and the high standard and connectivity of pedestrian and cyclist facilities, it was determined that the average Regional residential trip rates were appropriate for this assessment.

The proposed estimated traffic volumes generated by the proposed development are outlined in the Table 6 using the following trip rate shown in Table 5:

Table 5: Trip generation rates

Use	AM trip rates	PM trip rates
Residential (Regional Average)	0.53 trips per unit	0.32 trips per unit
Retail	1.94 per 100m^2	2.7 trips per 100m^2
Commercial	1.6 trips per 100m^2	1.2 trips per 100m^2

Table 6: Proposed development – traffic generation

Land Use	Yield	AM Peak Hour Trips	In	Out	PM Peak Hour Trips	In	Out
Residential	987 units	523	37	150	316	118	30
Retail	6,000 m^2	117	58	59	162	81	81
Commercial	3,000 m^2	48	29	19	36	14	22
Total	**-**	**688**	124	228	**514**	213	133

The retail trip rates used in Table 5 are considered satisfactory given the proximity of the site to Tallawong Station and the reduction in parking to be provided in the retail component of the site compared to the RMS 'Guide to Traffic Generating Development' rates. They were previously accepted/endorsed by the Department of Planning, Blacktown City Council, TfNSW and RMS as outlined in the Sydney Metro Northwest Places Program Tallawong Station Precinct South Submissions Report dated October 2018.

Note that when applying the retail area of 4,500 m² used by SCT Consulting in their analysis and the subject retail and commercial component of the proposal together with the reduction in the proposed number of residential units the overall trips generated by the development is less than that assessed as part of the Concept Approval.

The table above shows the proposed development generates approximately 688 trips during the AM peak hour and 514 trips during the PM peak hour.

5.2 Trip Distribution

This section outlines the methodology used to distribute the trips generated by the proposed development. The in / out distribution for the proposal was as follows:

- Residential 20% in, 80% out (AM), 80% in, 20% out (PM)
- Retail 50% in, 50% out (AM and PM)
- Commercial 60% in, 40 %out (AM), 40%in, 60% out (PM)

Trips were assigned based on a distribution of 10% each to the north and west, and 40% each to the east and south, based on the employment location of resident workers from the 2016 census which indicated that employment locations were largely located in the greater Sydney area.

Access to and from all basement carparks will be via Conferta Avenue, however, as traffic movements at the Conferta Avenue / Cudgegong Road and the Conferta Avenue / Tallawong Road intersections are restricted to left in / left out only several trips will need to be made via Themeda Avenue.

The following diagrams provide summaries of the routes that vehicles will use to enter and exit between the site and the surrounding road network.

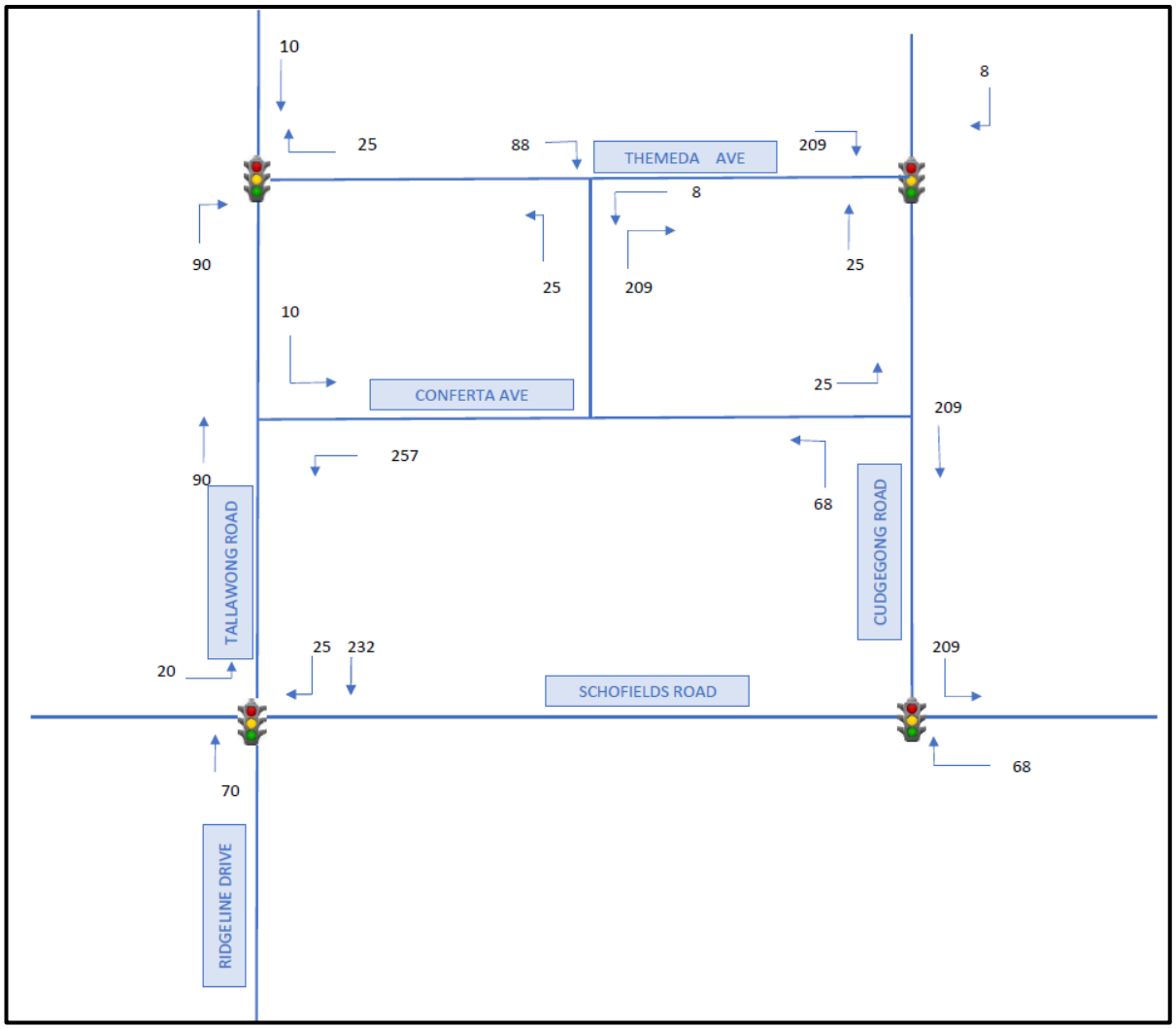

Figure 18: AM Trip Assignment

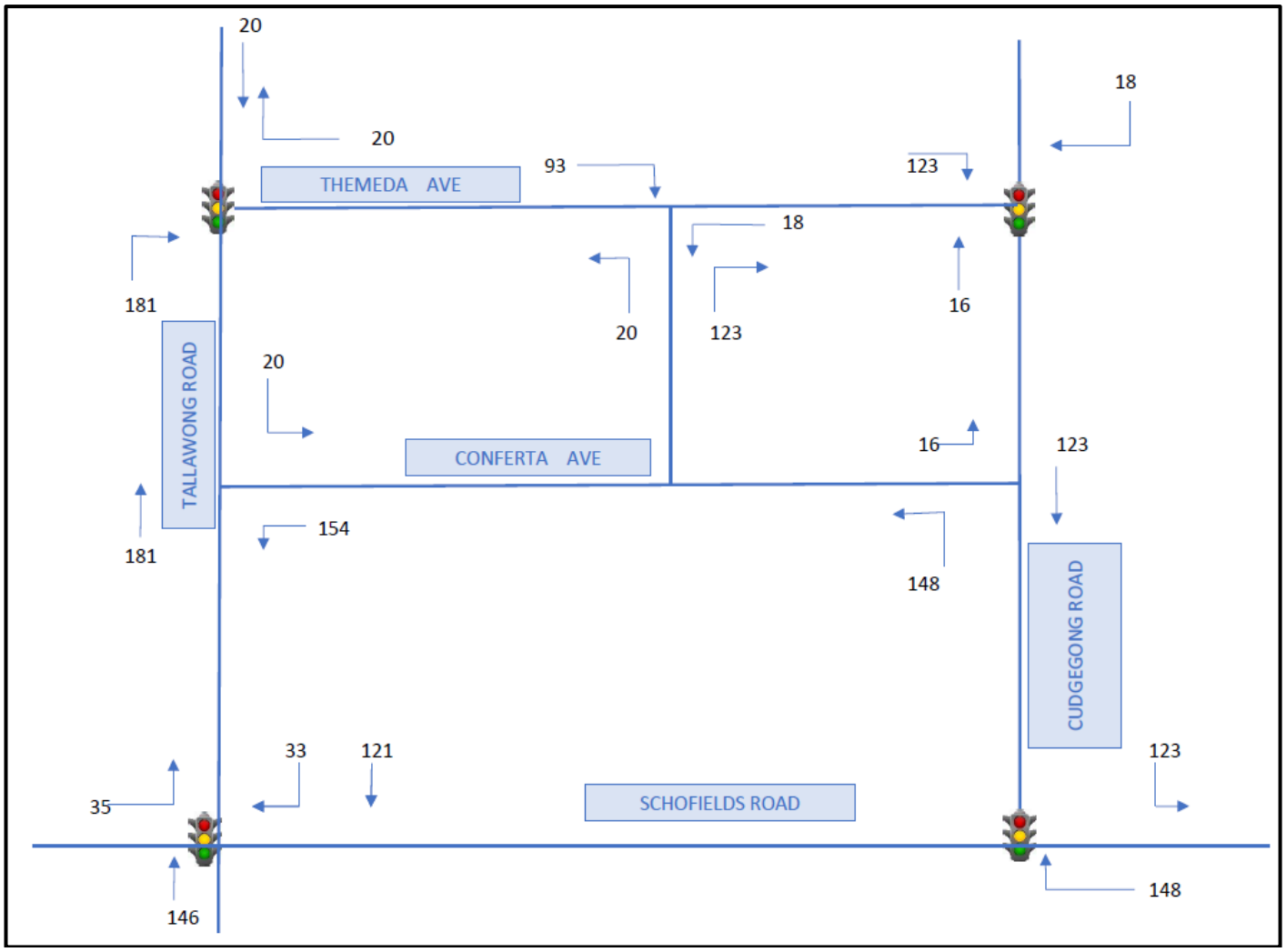

Figure 19: PM Trip Assignment

5.3 SIDRA Analysis and Impact of Generated Traffic

Intersection performance has been assessed using the SIDRA modelling software which uses the level of service (delay) model adopted by Transport for NSW to assess intersection performance.

Average delay is used to determine the level of service (LOS), which ranges from 'A' (excellent level of service) to 'F', with a LOS of 'D' being the minimum acceptable performance. The intersections outlined at the start of Section 2.3 have been assessed as a network for the existing and 10-year growth traffic volumes for AM and PM peak periods.

To assess the expected growth rate over the next 10 years, reference was made to the Transport for NSW vehicle counting station (ID No. 71024) located on Windsor Road between Merriville Road and Sanctuary Drive, Rouse Hill. The traffic volumes recorded at this station increased from an average daily volume of 47,589 vehicles per day to 53,958 vehicles per day, an increase of 6,369 or 13.4% over 8 years (1.67% per annum).

In order to ensure a robust and conservative assessment of the impact of the development on the road network, a growth rate of 2% per annum was applied to the traffic volumes at the surveyed intersections for the projected 10-year growth scenarios.

Figure 20: Intersections analysed using SIDRA

The differences in performance between these two scenarios are summarised in the tables below, with the full movement summary attached at **Appendix F.**

Table 7: Cudgegong Road / Schofields Road SIDRA Modelling Summary

Cudgegong Road/ Schofields Road		Existing Scenario		10-year growth scenario	
		Existing Conditions	Post Development Condition	Existing Conditions	Post Development Condition
AM	Delay (s)	17.3	17.7	26.3	23.1 *(25.6)
	LOS	B	B	B	B *(B)
PM	Delay (s)	16.0	19.6	16.8	23.5 *(26.0)
	LOS	B	B	B	B *(B)

Table 8: Tallawong Road / Schofields Road / Ridgeline Drive SIDRA Modelling Summary

Tallawong Road/ Schofields Road / Ridgeline Dr		Existing Scenario		10-year growth scenario	
		Existing Conditions	Post Development Condition	Existing Conditions	Post Development Condition
AM	Delay (s)	27.7	36.8	31.7	47.0*(53.4)
	LOS	B	C	C	D *(D)
PM	Delay (s)	28.2	32.2	36.4	36.7 *(46.5)
	LOS	C	C	C	C *(D)

Table 9: Themeda Avenue/ Cudgegong Road SIDRA Modelling Summary

Themeda Ave/ Cudgegong Road		Existing Scenario		10-year growth scenario	
		Existing Conditions	Post Development Condition	Existing Conditions	Post Development Condition
AM	Delay (s)	14.1	20.9	15.4	21.2 *(34.1)
	LOS	A	B	B	B *(C)
PM	Delay (s)	12.8	17.5	13.4	17.5 *(29.5)
	LOS	A	B	A	B *(C)

Table 10: Themeda Avenue / Tallawong Road SIDRA Modelling Summary

Themeda Ave/ Tallawong Road		Existing Scenario		10-year growth scenario	
		Existing Conditions	Post Development Condition	Existing Conditions	Post Development Condition
AM	Delay (s)	17.5	23.0	18.7	24.5 *(37.6)
	LOS	B	B	B	B *(C)
PM	Delay (s)	21.5	25.9	24.5	26.6 *(39.0)
	LOS	B	B	B	B *(C)

* The Sidra model for this assessment adopted a network cycle time of 80 seconds based on this being the optimum cycle time to minimise delays at each intersection. However, feedback from Transport for NSW indicated that a cycle time of 140 seconds should be adopted in the modelling. Consequently, additional modelling was conducted for the critical "Post-development / 10-year Growth Scenario" based on a user-given cycle time of 140 seconds. The results are shown in brackets in the tables above indicating that the network will operate within acceptable parameters on a cycle time of 140 seconds, however, average delays will increase at some of the intersections, thereby reducing levels from B to C and C to D which is still well within accepted levels.

These results therefore indicate that the optimum cycle time for this network is 80 seconds as adopted by the original modelling.

In summary, the intersections surrounding the site currently operate at a high level of service with acceptable delays and will continue to operate satisfactorily with spare capacity based on the expected background growth in traffic volumes over the next 10 years and the additional traffic that will be generated by the proposed development. The development traffic will not have any significant impacts on level of service and delays currently experienced within the road network. Consequently, the development can be supported based on traffic grounds without the warrant to upgrade the existing local road network.

The SIDRA analysis and our conclusions are in line with the analysis undertaken in the Traffic and Transport Study prepared for the concept proposal for this development by SCT Consulting, dated 18 May 2018.

5.4 Impact of Construction Traffic

The construction phase of the development will require the delivery of machinery, equipment and materials to the site by a range of heavy vehicles up to a 19 metre articulated vehicle. Access to and from the site will be restricted primarily to the major roads in the area, Schofields Road which has links to the wider state road network at Windsor Road in the east and Richmond Road in the west. The only local roads that will be used for access to and from the site will be Cudegong Road and Tallawong Road which have direct connections with the Schofields Road via signalized intersections.

The management of construction traffic on the surrounding road network is detailed in a Construction Pedestrian and Traffic Management Plan prepared for this development by Barker Ryan Stewart.

5.5 Impact on Road Safety

The additional traffic volumes that will be generated by the proposed development is not expected to have any impact on road safety on the surrounding road network.

The main intersections providing access to and from the site are all controlled by traffic signals with pedestrian crossing facilities on all approaches. The streets directly surrounding and through the site have been designed for low speed environments with raised crossings for pedestrians and cyclists.

A review of all existing pedestrian and cyclist infrastructure has identified a high level of safety and connectivity in all streets surrounding the site and the proposed internal pedestrian / cyclist infrastructure has been designed to connect seamlessly with this existing infrastructure. All shared paths will be identified with the required signage and line marking to minimise any potential pedestrian / cyclist conflicts.

Driveway widths have been designed to minimise crossing distances for pedestrians, while adequately providing for vehicle swept paths. Driveways will also be designed to provide appropriate sight lines for pedestrian safety and to provide the required sight distances to approaching traffic in accordance with AS/NZS 2890.1.

A Road Safety Audit for the Construction phase has been prepared by Barker Ryan Stewart.

6 Conclusion

This Traffic and Parking Impact Assessment has been prepared in accordance with the Planning Secretary's Environmental Assessment Requirements (SEARS), Blacktown Council's DCP and LEP, the Road and Maritime Services (RMS) *'Guide to Traffic Generating Developments'* to accompany a Development Application to the Blacktown City Council for the development of a mixed-use development.

Parking requirements have been assessed in accordance with the approved concept parking rates, Blacktown City Council DCP, the RMS Guide, and proposed rates.

The proposed parking provision provides a balance between the minimum requirements of the RMS Guide, Blacktown DCP, the transit orientated development maximum rates and to alleviate the potential detrimental impact on the existing Sydney Metro commuter car park and existing road network which are already at capacity.

The proposed provision of 1,068 residential spaces for the 987 units is considered satisfactory to cater for the car parking requirements generated by the development.

The proposed provision of 300 spaces is considered satisfactory to cater for the retail and commercial car parking requirements generated by the development.

It is proposed to provide 1,086 bicycle spaces to the precinct which is considered more than sufficient to cater for the storage and facility needs of the residents, visitors, employees and customers.

Traffic surveys and modelling were undertaken on the relevant intersections as follows:

- Cudgegong Road/ Schofields Road
- Tallawong Road / Schofields Road
- Themeda Avenue/ Cudgegong Road
- Themeda Avenue/ Tallawong Road

The SIDRA analysis and our conclusions are in line with the analysis undertaken in the Traffic and Transport Study prepared by SCT Consulting, dated 18 May 2018. The development traffic would have only a minor impact on existing, delays and Level of Service along this traffic network. Accordingly, any network upgrades will be required due solely to the existing conditions and the general growth in traffic that will be expected to occur over future years and not as a result of the additional traffic that will be generated by the proposed development.

The proposed parking and loading facilities have been designed in accordance with the requirements of *AS/NZS 2890.1 – Off StreetCar Parking, AS 2890.2 – Off-Street Commercial Vehicle Facilities* and *AS/NZS 2890.6 - Off-street Parking for People with Disabilities*. These facilities are also considered practical and safe ensuring that all traffic generated by the development can enter and exit the site in a forward direction.

The Traffic and Parking Impact Assessment concludes that the subject site is suitable for the proposed mixed-use development in relation to traffic impact, car parking provision and the provision for pedestrian and bicycle facilities. The development is considered to have negligible effect on the safety and operating outcome of the surrounding transport network.

7 References

Australian Standards, *'AS/NZS 2890.1:2004 Off-Street Car Parking'*.

Australian Standards, *'AS 2890.2:2018 Off-Street Commercial Vehicle Facilities'*.

Australian Standards, 'AS/NZS 2890.6:2002 Off-Street Parking for People with Disabilities'.

Blacktown city Council DCP.

NSW Department of Planning, *'SEPP (Infrastructure) 2007'*.

Roads and Maritime Services, *'Guide to Traffic Generating Developments'* Version 2.2 dated October 2002.

Roads and Maritime Services, *'Guide to Traffic Modelling'* Version 1.0 dated February 2013.

Traffic and Transport Study prepared by SCT Consulting, dated 18 May 2018.

Sydney Metro - Tallawong Station Precinct South Submissions Report, dated October 2018.

Technical Memorandum – Tallawong Station SSDA – Post Exhibition Responses to Traffic and Parking Comments prepared by SCT Consulting.

Appendix A

Pedestrian and bicycle network

BLACKTOWN CITY COUNCIL

2016 BIKE PLAN

EXISTING & FUTURE PROPOSED ROUTES

Proposed Off-Road Cycleways

Proposed On-Road Cycleways

Existing Cycleways

Proposed Developer Funded

RMS Proposed State Link

Council Recommended State Link

Hospitals

Railway Station

Appendix B

Bus network

Greater Western Sydney Bus Network Map - Effective 26 May 2019

Busways

Bus routes

- 668 Windsor to Richmond via Wilberforce, Glossodia & North Richmond
- 669 Wilberforce to Sackville
- 671 Windsor to Riverstone via McGraths Hill
- 672 Windsor to Pitt Town & Wisemans Ferry via McGraths Hill
- 673 Windsor to Penrith via Bligh Park, Llandilo & Cranebrook
- 674 Windsor to Mt Druitt via Bligh Park, Shanes Park & Whalan
- 675C Windsor - RAAF -Richmond - UWS Hawkesbury - Bligh Park - Windsor
- 675A Windsor - Bligh Park - UWS Hawkesbury - Richmond - RAAF - Windsor
- 676 Windsor to South Windsor
- 677 Richmond to Penrith via Londonderry & The Northern Rds
- 668 Richmond to Penrith via Agnes Banks, Castlereagh & Cranebrook
- 679 Windsor to Maraylya & Oakville
- 680 Richmond to Bowen Mtn via Nth Richmond, Grose Wold & Grose Vale
- 682 Richmond to Kurrajong & Berambing via Nth Richmond & Kurmond
- 718 Seven Hills to Kings Langley
- 721 Blacktown to Blacktown Hospital
- 722 Blacktown to Prospect via Flushcombe Rd
- 723 Blacktown to Mt Druitt via Huntingwood & Eastern Creek
- 724 Blacktown to Arndell Park & Eastern Creek Industrial
- 726 Blacktown to Doonside via Monash Rd
- 728 Blacktown to Mt Druitt via Bungarribee & Rooty Hill
- 729 Blacktown to Mt Druitt via Kildare Rd & Minchinbury
- 730 Blacktown to Castle Hill via Glenwood & Norwest Business Park
- 731 Blacktown to Rouse Hill via Stanhope Gardens & Kellyville Ridge
- 732 Blacktown to Rouse Hill via Pye Rd & The Ponds
- 734 Blacktown to Riverstone via The Ponds & Schofields
- 735 Blacktown to Rouse Hill via T-way
- 738 Mt Druitt to Eastern Creek Business Park via Rooty Hill
- 739V Mt Druitt to Frank St
- 741 Riverstone to Maraylya & Oakville
- 742 Rouse Hill to Marsden Park (Hollinsworth Rd) via Riverstone
- 743 Blacktown to Kings Langley via Kings Park
- 744 Blacktown to Bessemer St Industrial
- 745 St Marys to Bella Vista via Plumpton & Glenwood
- 746 Rouse Hill to Riverstone via Box Hill
- 747 Rouse Hill to Marsden Park (Elara Bvd) via Riverstone
- 750 Blacktown to Mt Druitt via Richmond Rd & Carlisle Av
- 751 Blacktown to Rouse Hill via Colebee, Marsden Park & Schofields
- 752 Blacktown to Rouse Hill via Quakers Hill & The Ponds
- 753 Blacktown to Doonside via Tallagandra Dr
- 754 Blacktown to Mt Druitt via Dean Park & Hassall Grove
- 755 Mt Druitt to Shalvey & Plumpton
- 756 Mt Druitt to Blacktown via Plumpton & Woodcroft
- 757 Mt Druitt to Riverstone via Rooty Hill Rd North & Marsden Park
- 758 Mt Druitt to St Marys via Shalvey & Tregear
- 759 Mt Druitt to St Marys via Emerton, Willmot & Ropes Crossing
- 761 Mt Druitt to Bidwill via Carlisle Av
- 770 Mt Druitt to Penrith via Colyton, St Marys & Claremont Meadows
- 771 Mt Druitt to St Marys via Colyton
- 774 Penrith to Mt Druitt via Caddens, Claremont Meadows, St Marys & Oxley Park
- 775 Penrith to via UWS, St Marys, St Clair & Erskine Park
- 776 Penrith to Mt Druitt via Nepean Hospital, UWS & St Clair
- 779 St Marys to Erskine Park Industrial Area
- 780 Penrith to Mt Druitt via Cambridge Park, Ropes Crossing & Tregear
- 781 Penrith St Marys via Glenmore Park, Orchard Hills & Claremont Meadows
- 782 Penrith to Werrington & St Marys via Cambridge Gardens
- 783 Penrith to Jordan Springs via Waterside
- 784 Penrith to Cranebrook via Castlereagh Rd
- 785 Penrith to Werrington via Cambridge Park
- 786 Penrith to Cranebrook via Greygums Rd
- 789 Penrith to Luddenham
- 791 Penrith to Jamisontown via South Penrith
- 793 Penrith to South Penrith
- 794 Penrith to Glenmore Park via South Penrith
- 795 Penrith to Warragamba via Nepean Shores & Mulgoa Rd
- 797 Penrith to Glenmore Park via Mulgoa Rd
- 799 Penrith to Glenmore Park & Blue Hills Estate

Legend

- Shopping Centres
- Common route
- Hospitals
- Occasional diversion

Windsor CBD

Windsor Street Legend
1. Kable St
2. Fitzgerald St
3. Suffolk St

668, 671, 672, 675C, 675A, 673, 674, 676

Hawkesbury District Hospital

Penrith CBD

673, 783, 784, 678, 785, 782, 786, 781, 793, 795, 797, 799, 770, 776, 774, 791, 775, 794, 780, 677, 789

Penrith Station, Penrith Plaza

Mount Druitt CBD

674, 755, 758, 780, 750, 759, 761, 723, 728, 738, 754, 756, 757, 774, 770, 775, 771, 776, 729, 739V

Mt Druitt Station, Westfield

Blacktown CBD

730, 734, 731, 735, 732, 744, 750, 751, 752, 753, 754, 726, 729, 728, 756, 723, 724, 721, 722

Blacktown Station, Westpoint

Route 682 continues to Berambing

Route 669 continues to Sackville

Route 672 continues to Wisemans Ferry

Route 795 continues to Warragamba

Route 789 continues to Luddenham

Occasional trips operate to Horsley Park

Appendix C

Sydney Train Map

Sydney rail network

NSW GOVERNMENT | Transport

M Metro T Trains

Sydney metro and train lines

M *Metro North West Line* Chatswood Tallawong	**T1** *North Shore & Western Line* North Shore Western Richmond	**T2** *Inner West & Leppington Line* Inner West Leppington City	**T3** *Bankstown Line* Liverpool Lidcombe City	**T4** *Eastern Suburbs & Illawarra Line* Eastern Suburbs Illawarra Cronulla
T5 *Cumberland Line* Leppington Richmond	**T6** *Carlingford Line* Carlingford Clyde	**T7** *Olympic Park Line* Olympic Park Lidcombe	**T8** *Airport & South Line* Airport South City	**T9** *Northern Line* Northern Gordon

Stop · Interchange · Interchange · End of line

Line under construction

NORTH

Check timetables and trip planners for train services and connections

Visit **transportnsw.info**

1812TMS-P-COR-A3P

Appendix D

Swept Path Analysis

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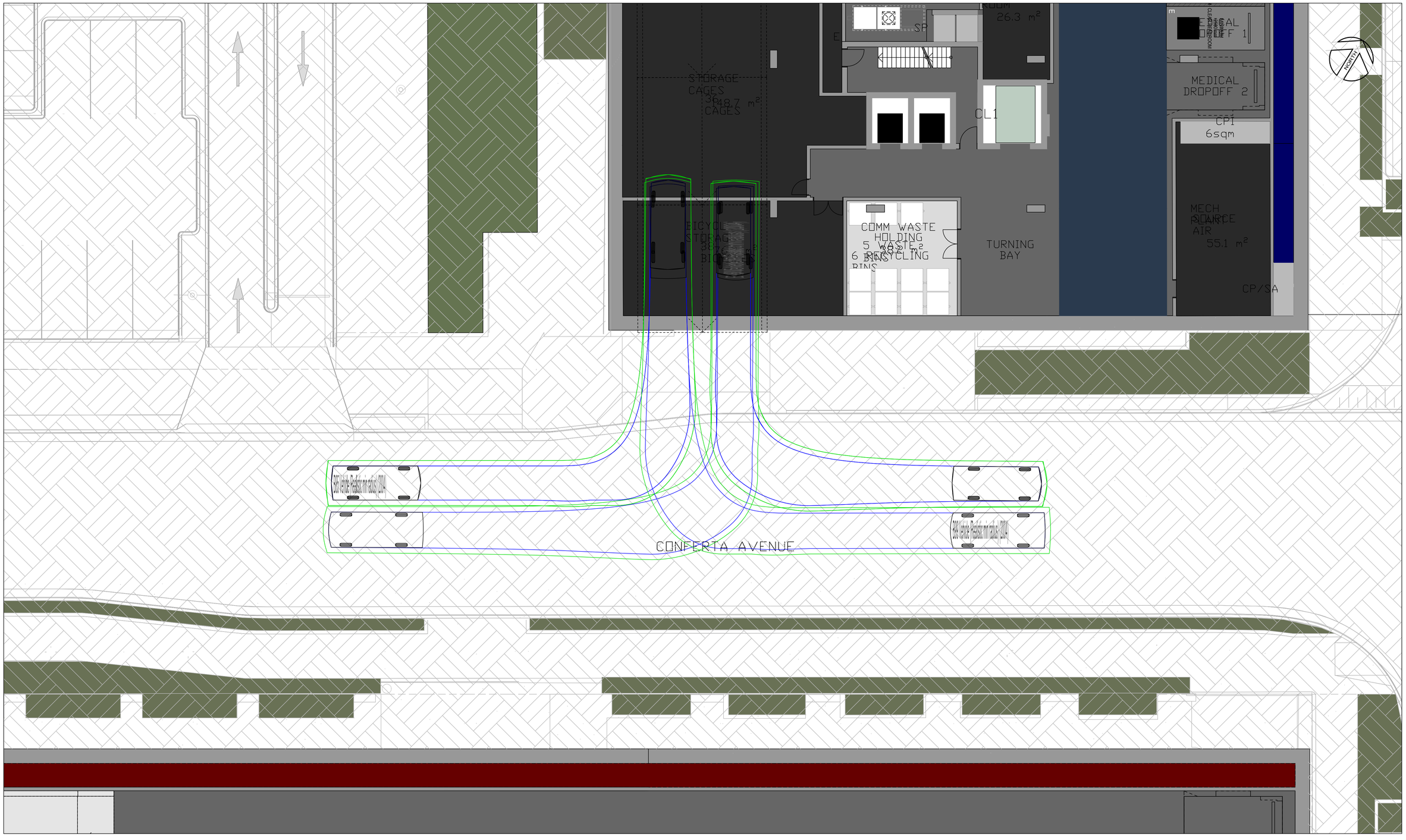

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mail@brs.com.au

Client:

DEICORP

TALLAWONG STATION PRECINCT SOUTH

SITE 1A BASEMENT ACCESS SWEPT PATH ANALYSIS - B99 / B85

Designed: AAJ
Drawn: AAJ
Checked: AAJ

Scales: Plan
Horiz.
Vert.
X-Sect.

Datum: A.H.D.

Plan No.
SY190226TR01

File Ref.
SY190226D01K

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K

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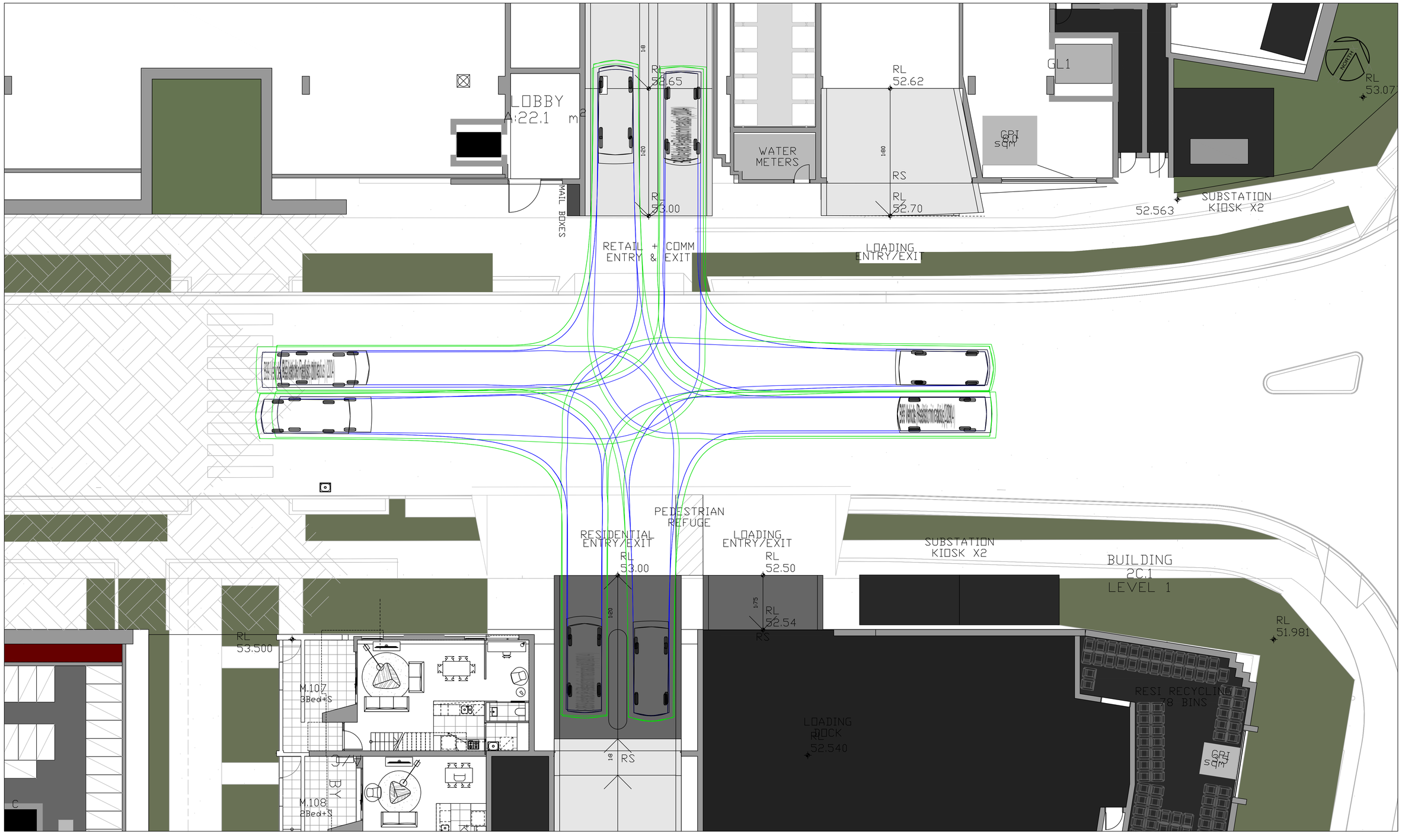

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TALLAWONG STATION PRECINCT SOUTH

SITE 1B BASEMENT ACCESS SWEPT PATH ANALYSIS - B99 / B85

Designed: AAJ
Drawn: AAJ
Checked: AAJ

Scales: Plan
Horiz.
Vert.
X-Sect.

Datum: A.H.D.

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File Ref.
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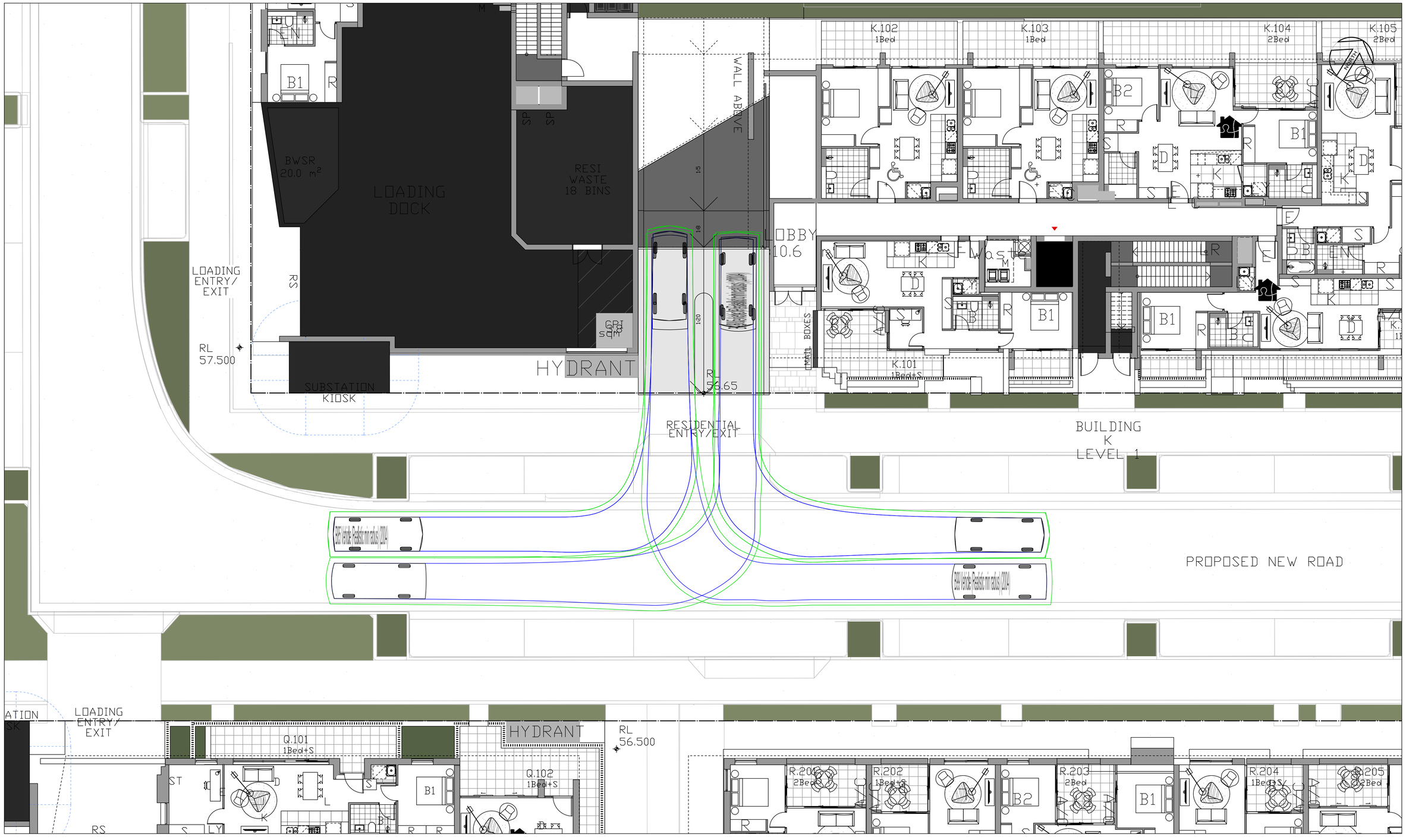

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TALLAWONG STATION PRECINCT SOUTH

SITE 2A BASEMENT ACCESS SWEPT PATH ANALYSIS - B85 / B99

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Drawn: AAJ
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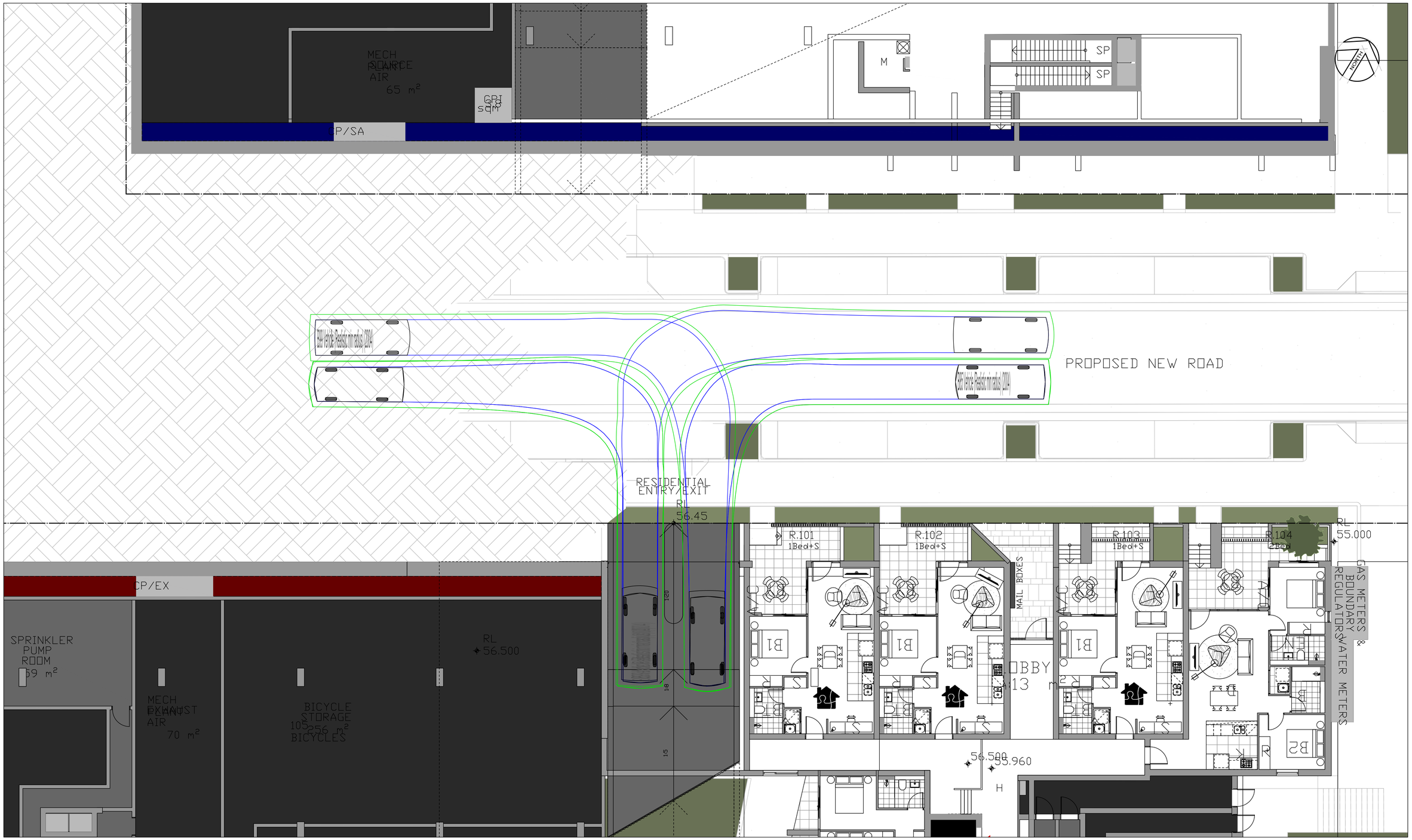

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SITE 2D BASEMENT ACCESS SWEPT PATH ANALYSIS - B99 / B85

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Drawn: AAJ
Checked: AAJ
Scales: Plan / Horiz. / Vert. / X-Sect.
Datum: A.H.D.

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File Ref. SY190226D01K
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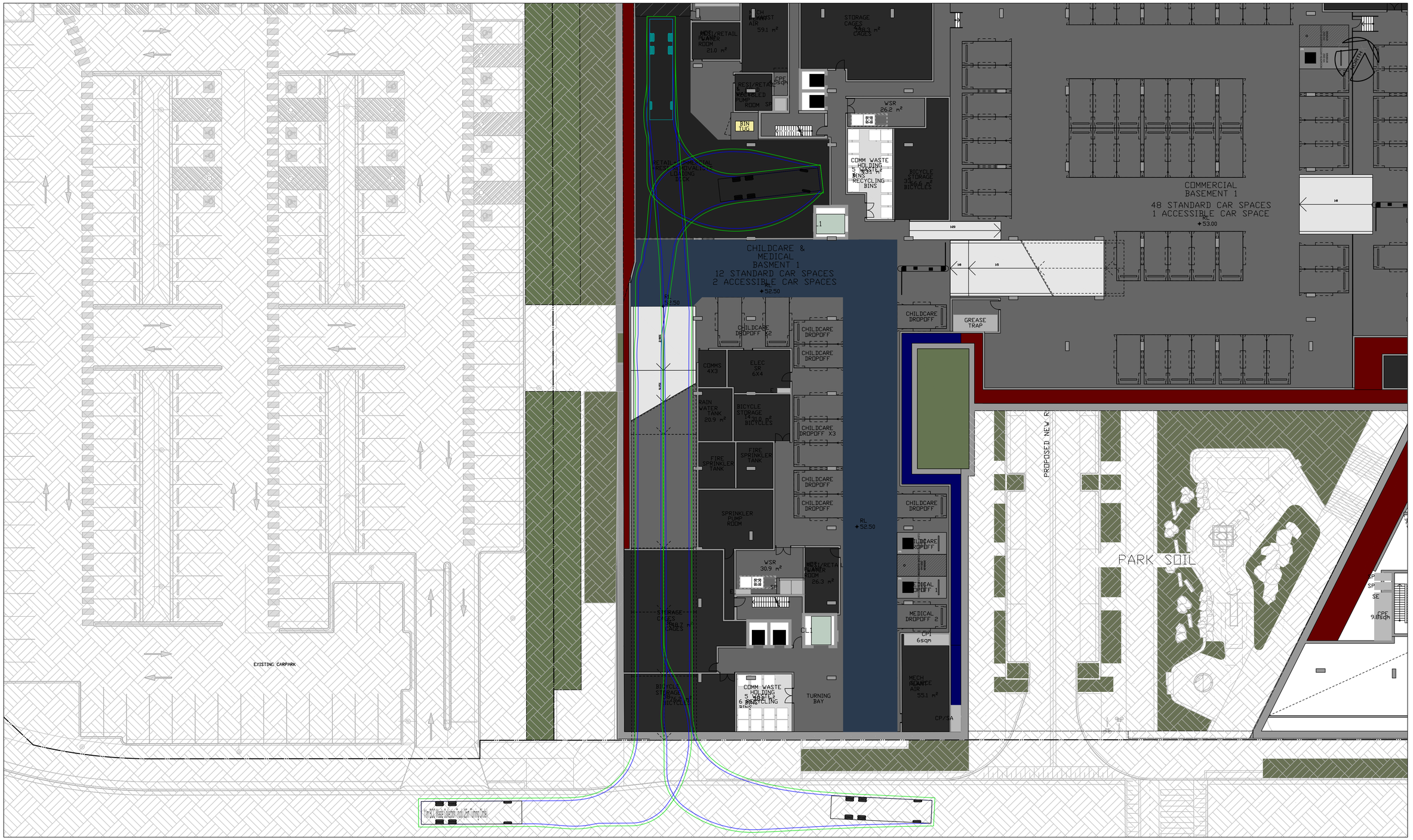

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TALLAWONG STATION PRECINCT SOUTH

SITE 2A BASEMENT ACCESS SWEPT PATH ANALYSIS - 11M BCC WASTE COLLECTION VEHICLE

Designed: AAJ
Drawn: AAJ
Checked: AAJ

Scales: Plan
Horiz.
Vert.
X-Sect.

Datum: A.H.D.

Plan No.
SY190226TR05
File Ref.
SY190226D01K
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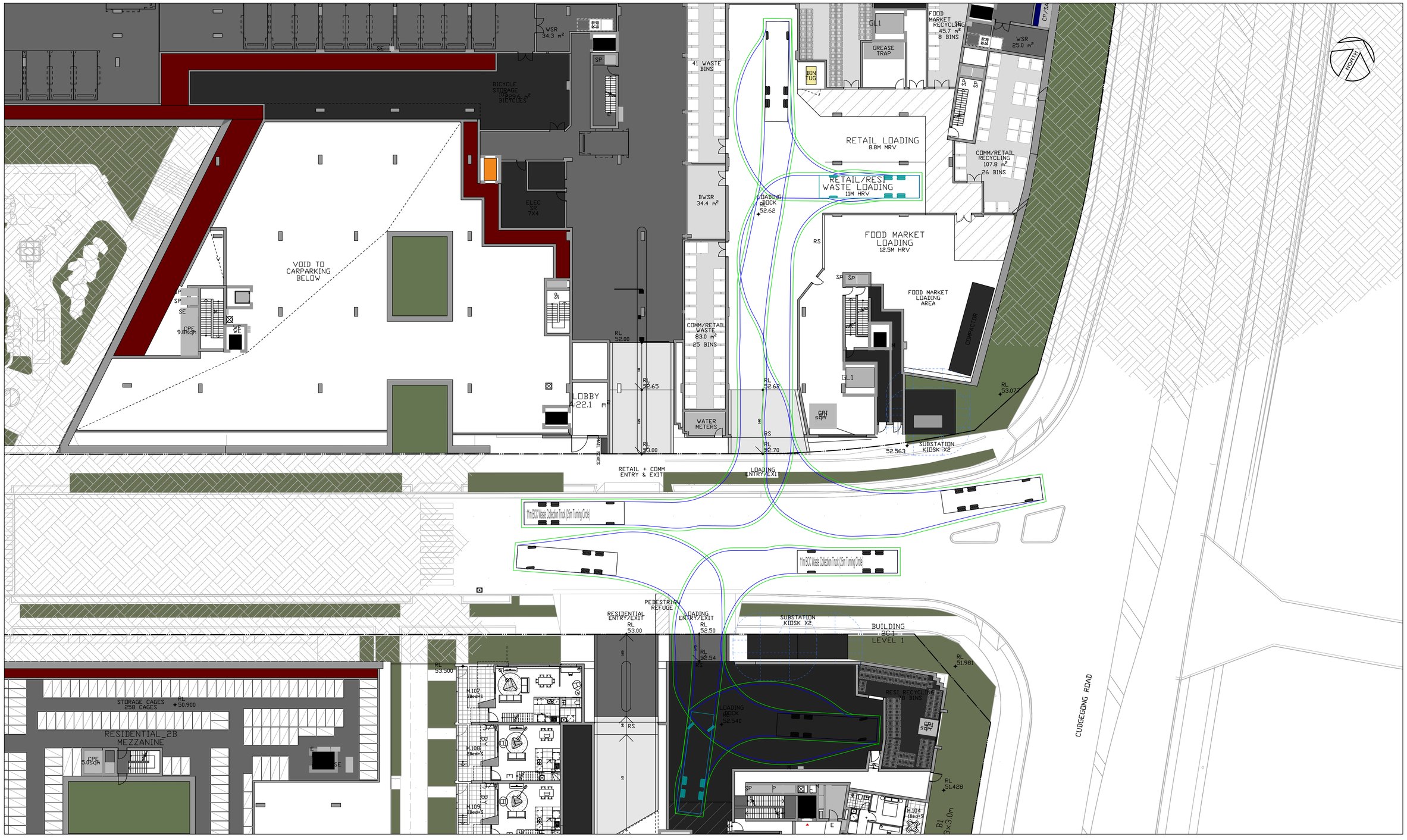

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TALLAWONG STATION PRECINCT SOUTH

SITE 1B, 2B, 2C, AND 2E BASEMENT ACCESS SWEPT PATH ANALYSIS - 11M BCC WASTE COLLECTION

Designed: AAJ
Drawn: AAJ
Checked: AAJ
Scales: Plan / Horiz. / Vert. / X-Sect.
Datum: A.H.D.

Plan No. SY190226TR06
File Ref. SY190226D01K
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TALLAWONG STATION PRECINCT SOUTH

SITE 2A AND 2D BASEMENT ACCESS SWEPT PATH ANALYSIS - 11M BCC WASTE COLLECTION

Designed: AAJ
Drawn: AAJ
Checked: AAJ

Scales: Plan
Horiz.
Vert.
X-Sect.

Datum: A.H.D.

Plan No.
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File Ref.
SY190226D01K

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TALLAWONG STATION PRECINCT SOUTH

SITE 1B BASEMENT ACCESS SWEPT PATH ANALYSIS - 8.8M MRV

Designed: AAJ
Drawn: AAJ
Checked: AAJ

Scales: Plan
Horiz.
Vert.
X-Sect.

Datum: A.H.D.

Plan No. SY190226TR08
File Ref. SY190226D01K
REV. K
SHEET 8 OF 8 SHEETS

Appendix E

Traffic Counts

BARKER RYAN STEWART
TOTAL PROJECT SOLUTIONS

Date	######
Project Site	Cudgegong Road/Themeda Avenue
Project Number	SY190226
Client	Combined Projects (tallawong) Pty. Ltd.

Cars

Time	Western Approach (EB)					Southern Approach (NB)				Northern Approach (SB)				15 min Total	1hr Total
	Left	Straight	Right	U-turn		Left	Straight	Right	U-turn	Left	Straight	Right	U-turn		
7:00	10		5			4	41			13		20		93	
7:15	9		19			11	41			24		24		128	
7:30	6		23			5	29			26		10		99	
7:45	4		39			10	38			51		15		157	477
8:00	6		42			12	25			54		12		151	535
8:15	9		37			14	41			50		5		156	563
8:30	7		45			4	58			44		5		163	627
8:45	14		38				72			72		2		198	668

Trucks

Time	Eastern Approach				Western Approach				Northern Approach				Southern Approach				15 min Total	1hr Total
	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn		
7:00			1							5				1			7	
7:15										10							10	
7:30			1											3			4	
7:45	1									10				5			16	37
8:00										2				7	1		10	40
8:15			1							4				6			11	41
8:30										2				3			5	42
8:45										2				4			6	32

BARKER RYAN STEWART
TOTAL PROJECT SOLUTIONS

Date	12-Mar-20
Project Site	Cudgegong Road/Themeda Avenue
Project Number	SY190226
Client	Combined Projects (tallawong) Pty. Ltd.

Cars

Time	Western Approach (EB)								Southern Approach (NB)				Northern Approach (SB)				15 min Total	1hr Total
	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn		
4:00	6		13							52				90	6		167	
4:15	14		20						7	32				69	2		144	
4:30	6		16						11	31				45	3		112	
4:45	13		13						5	42				30	1		104	527
5:00	12		24						6	49				43	4		138	498
5:15	4		9						5	39				43	3		103	457
5:30	10		27						6	41				34	9		127	472
5:45	18		25						6	34				46	5		134	502
	39		73						22	171				150	17			

Trucks

Time	Eastern Approach				Western Approach				Northern Approach				Southern Approach				15 min Total	1hr Total
	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn		
4:00																	0	
4:15														3			3	
4:30										4				3			7	
4:45										1				3			4	14
5:00														1			1	15
5:15										1				2			3	15
5:30										1				2			3	11
5:45																	0	7

BARKER RYAN STEWART
TOTAL PROJECT SOLUTIONS

Date	5-Dec-19
Project Site	Cudgegong Road/Schofields Road
Project Number	SY190226
Client	Combined Projects (tallawong) Pty. Ltd.

Cars

Time	Eastern Approach (WB)				Western Approach (EB)				Northern Approach (SB)				Southern Approach (NB)				15 min Total	1hr Total
	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn		
7:00	2	232				170	38						13		9		464	
7:15	1	213				156	30						15		28		443	
7:30		227				211	29						37		33		537	
7:45		228				178	29						26		24		485	1929
8:00	2	256				192	23						41		37		551	2016
8:15	3	233				188	21						34		26		505	2078
8:30	4	249				147	11						23		25		459	2000
8:45	1	230				174	16						24		21		466	1981

Trucks

Time	Eastern Approach				Western Approach				Northern Approach				Southern Approach				15 min Total	1hr Total
	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn		
7:00		20				16	5						2		3		46	
7:15		24				11	5						5		1		46	
7:30		14				13	2						5		2		36	
7:45		26				13							6		4		49	177
8:00	1	23				15	1						9		8		57	188
8:15		18				13	1						7		4		43	185
8:30	1	19				10	3						7		4		44	193
8:45	1	16				17	5						5		3		47	191

BARKER RYAN STEWART
TOTAL PROJECT SOLUTIONS

Date	5-Dec-19
Project Site	Cudgegong Road/Rouse Road
Project Number	SY190226
Client	Combined Projects (tallawong) Pty. Ltd.

Cars

Time	Eastern Approach (WB)				Western Approach (EB)				Northern Approach (SB)				Southern Approach (NB)				15 min Total	1hr Total
	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn		
4:00	4	204				172	26						16		18		440	
4:15	3	224				176	18						34		26		481	
4:30	3	256				192	15						41		37		544	
4:45	1	271				236	22						27		25		582	2047
5:00	2	263				167	16						31		41		520	2127
5:15	1	236				212	31						26		28		534	2180
5:30	1	299				265	36						23		24		648	2284
5:45	4	200				162	11						13		17		407	2109

Trucks

Time	Eastern Approach				Western Approach				Northern Approach				Southern Approach				15 min Total	1hr Total
	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn		
4:00	1	8				10	3						2		1		25	
4:15		8				3	1						2		4		18	
4:30	1	23				15	1						9		8		57	
4:45		7				15	3						4		4		33	133
5:00		9				9	1						1		2		22	130
5:15		14				15	7						3				39	151
5:30		11				13	4						4		1		33	127
5:45	1	7				8	1						1				18	112

BARKER RYAN STEWART
TOTAL PROJECT SOLUTIONS

Date	5-Dec-19
Project Site	Schofields Road/Tallawong Road
Project Number	SY190226
Client	Combined Projects (tallawong) Pty. Ltd.

Cars

Time	Eastern Approach (WB)				Western Approach (EB)				Northern Approach (SB)				Southern Approach (NB)				15 min Total	1hr Total
	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn		
7:00	3	152	4		29	163	12		8	24	10		9	53	14		481	
7:15	14	171	2		33	159	9		10	28	24		24	62	18		554	
7:30	13	188	14		26	195	31		9	42	23		22	42	33		638	
7:45	7	206	15		7	195	28		4	52	67		45	41	38		705	2378
8:00	1	151	22		6	144	42		9	24	14		19	28	32		492	2389
8:15	2	143	13		7	184	15		5	12	7		30	22	41		481	2316
8:30	7	114	19		3	127	20		2	17	11		14	9	21		364	2042
8:45	5	117	7		17	148	14		17	25	18		25	35	28		456	1793

Trucks

Time	Eastern Approach				Western Approach				Northern Approach				Southern Approach				15 min Total	1hr Total
	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn		
7:00	1	7	0		2	15			1	0	3		1	3	3		36	
7:15	3	14	3		1	20	5		1	3	6		3	1			60	
7:30		15	1		5	22			1	4	1		2	3	1		55	
7:45		17	4		1	15	4		1	2	6			3	3		56	207
8:00	1	17	3		1	14	3		1	17	3		1	1	1		63	234
8:15		6	2		2	19	6			1	3		2	1	3		45	219
8:30	1	19	3		1	12	2			3	4		3	1	1		50	214
8:45	1	9	3		3	4			2	4	4		1	1	1		33	191

BARKER RYAN STEWART
TOTAL PROJECT SOLUTIONS

Date	5-Dec-19
Project Site	Tallawong Road/Cudgegong Road
Project Number	SY190226
Client	Combined Projects (tallawong) Pty. Ltd.

Cars

Time	Eastern Approach (WB)				Western Approach (EB)				Northern Approach (SB)				Southern Approach (NB)				15 min Total	1hr Total
	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn		
4:00		130	7		5	138	21		2	28	19		13	25	23		411	
4:15	2	209	4			195	20		9	22	41		16	21	33		572	
4:30	2	197	11		4	197	31		10	27	40		21	18	30		588	
4:45	9	215	7		4	175	27		12	33	59		19	36	26		622	2193
5:00	12	233	11		5	201	36		12	29	41		22	19	28		649	2431
5:15	6	211	10		1	178	16		11	38	76		15	17	33		612	2471
5:30	13	224	8		1	192	25		8	43	51		21	27	33		646	2529
5:45	7	184	9			149	33		10	37	73		22	25	39		588	2495
6:00																	0	1846

Trucks

Time	Eastern Approach				Western Approach				Northern Approach				Southern Approach				15 min Total	1hr Total
	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn		
4:00		13	1			8	3		1	3	2		6	1	1		39	
4:15		21	2			10	2			1					1		37	
4:30	1	8			1	13			2	2	9		2		2		40	
4:45	1	13				14	4		2	1	8		1				44	160
5:00	1	6				9	2		1	1	3						23	144
5:15		6			1	5	2			1	4			1			20	127
5:30		7				14				2	4		1		1		29	116
5:45	1	8				6			2	3	2			1			23	95
6:00																	0	72

BARKER RYAN STEWART
TOTAL PROJECT SOLUTIONS

Date	12-Mar-20
Project Site	Tallawong Road/Themeda Av
Project Number	SY190226
Client	Combined Projects (tallawong) Pty. Ltd.

Cars

Time	Eastern Approach (WB)				Western Approach (EB)				Northern Approach (SB)				Southern Approach (NB)				15 min Total	1hr Total
	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn		
7:00						23		2			38	140		19	36		258	
7:15						25		3			42	167		12	47		296	
7:30						43		2			41	124		7	59		276	
7:45						29		5			43	94		14	56		241	1071
8:00						38		1			44	92		4	40		219	1032
8:15						20		2			62	85		6	40		215	951
8:30						10		2			51	43		5	40		151	826
8:45						15		2			27	32		3	36		115	700
						130		10			190	395		31	195			

Trucks

Time	Eastern Approach				Western Approach				Northern Approach				Southern Approach				15 min Total	1hr Total
	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn		
7:00										6				5			11	
7:15										4				6			10	
7:30								1		4				3			8	
7:45						1				2	1			3			7	36
8:00										4				3			7	32
8:15										4	1			2			7	29
8:30										4				5			9	30
8:45										5							5	28

BARKER RYAN STEWART
TOTAL PROJECT SOLUTIONS

Date	5-Dec-19
Project Site	Tallawong Road/Themeda Av
Project Number	SY190226
Client	Combined Projects (tallawong) Pty. Ltd.

Cars

Time	Eastern Approach (WB)				Western Approach (EB)				Northern Approach (SB)				Southern Approach (NB)				15 min Total	1hr Total
	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn		
4:00					19		5			31	25		5	29			114	
4:15					7		2			34	38		4	31			116	
4:30					15		6			32	30		1	39			123	
4:45					17		4			31	35		3	41			131	484
5:00					27		7			31	42		3	44			154	524
5:15					15		4			31	41		6	26			123	531
5:30					27		10			43	44		3	35			162	570
5:45					28		9			33	58		2	30			160	599
6:00																	0	445
					86		25			136	162		15	146				

Trucks

Time	Eastern Approach				Western Approach				Northern Approach				Southern Approach				15 min Total	1hr Total
	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn	Left	Straight	Right	U-turn		
4:00														2			2	
4:15										3	1			3			7	
4:30							1			4			1				6	
4:45														1			1	16
5:00										2	1						3	17
5:15										3				1			4	14
5:30										3				2			5	13
5:45										1							1	13
6:00																	0	10

Appendix F1
SIDRA Movement Summary

Existing

MOVEMENT SUMMARY

Site: 101 [Cudgegong / Themeda Existing AM]

Network: N101 [Tallawong Existing AM]

Cudgegong / Conferta Existing AM
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 60 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Cudgegong Road														
1	L2	43	0.0	43	0.0	0.151	19.1	LOS B	1.4	11.2	0.77	0.67	0.77	28.7
2	T1	171	17.9	171	17.9	0.151	16.7	LOS B	1.8	13.7	0.88	0.73	0.88	31.3
Approach		214	14.3	214	14.3	0.151	17.2	LOS B	1.8	13.7	0.86	0.72	0.86	30.8
North: Cudgegong Road														
8	T1	222	14.2	222	14.2	0.208	13.1	LOS A	1.8	13.9	0.70	0.59	0.70	16.4
9	R2	45	2.3	45	2.3	0.208	18.4	LOS B	1.5	11.1	0.71	0.64	0.71	14.9
Approach		267	12.2	267	12.2	0.208	14.0	LOS A	1.8	13.9	0.70	0.60	0.70	16.1
West: Themeda Ave														
10	L2	31	13.8	31	13.8	0.045	11.3	LOS A	0.2	1.5	0.36	0.60	0.36	37.7
12	R2	155	4.1	155	4.1	0.214	10.3	LOS A	0.9	6.5	0.33	0.62	0.33	38.6
Approach		185	5.7	185	5.7	0.214	10.5	LOS A	0.9	6.5	0.34	0.62	0.34	38.4
All Vehicles		666	11.1	666	11.1	0.214	14.1	LOS A	1.8	13.9	0.65	0.64	0.65	30.4

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	11	24.3	LOS C	0.0	0.0	0.90	0.90
P3	North Full Crossing	13	24.3	LOS C	0.0	0.0	0.90	0.90
P4	West Full Crossing	21	24.3	LOS C	0.0	0.0	0.90	0.90
All Pedestrians		44	24.3	LOS C			0.90	0.90

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

MOVEMENT SUMMARY

Site: CT [Cudgegong / Themeda Existing PM]

Network: N101 [Tallawong Existing PM]

Cudgegong / Conferta Existing PM
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 60 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Cudgegong Road														
1	L2	23	0.0	23	0.0	0.141	17.8	LOS B	1.3	10.9	0.74	0.63	0.74	31.4
2	T1	201	10.5	201	10.5	0.141	15.2	LOS B	1.9	13.5	0.86	0.70	0.86	33.0
Approach		224	9.4	224	9.4	0.141	15.4	LOS B	1.9	13.5	0.85	0.69	0.85	32.9
North: Cudgegong Road														
8	T1	175	9.6	175	9.6	0.129	11.1	LOS A	1.1	8.4	0.63	0.52	0.63	18.7
9	R2	18	0.0	18	0.0	0.129	15.8	LOS B	1.0	7.3	0.63	0.54	0.63	18.0
Approach		193	8.7	193	8.7	0.129	11.5	LOS A	1.1	8.4	0.63	0.52	0.63	18.6
West: Themeda Ave														
10	L2	41	0.0	41	0.0	0.060	9.5	LOS A	0.2	1.3	0.26	0.59	0.26	39.0
12	R2	82	6.4	82	6.4	0.126	10.1	LOS A	0.4	3.1	0.29	0.60	0.29	38.8
Approach		123	4.3	123	4.3	0.126	9.9	LOS A	0.4	3.1	0.28	0.60	0.28	38.9
All Vehicles		540	8.0	540	8.0	0.141	12.8	LOS A	1.9	13.5	0.64	0.61	0.64	32.2

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	14	24.3	LOS C	0.0	0.0	0.90	0.90
P3	North Full Crossing	9	24.3	LOS C	0.0	0.0	0.90	0.90
P4	West Full Crossing	16	24.3	LOS C	0.0	0.0	0.90	0.90
All Pedestrians		39	24.3	LOS C			0.90	0.90

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

MOVEMENT SUMMARY

Site: SC [SCHOFIELDS / CUDGEGONG - AM]

Network: N101 [Tallawong Existing AM]

SCHOFIELDS ROAD / CUDGEGONG ROAD
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 60 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
East: SCHOFIELDS ROAD														
5	T1	874	7.3	874	7.3	0.484	11.9	LOS A	5.3	38.9	0.73	0.63	0.73	43.3
6	R2	114	5.6	114	5.6	0.322	34.9	LOS C	1.0	7.5	0.97	0.74	0.97	28.3
Approach		987	7.1	987	7.1	0.484	14.6	LOS B	5.3	38.9	0.76	0.65	0.76	40.8
North: CUDGEGONG ROAD														
7	L2	174	16.4	174	16.4	0.313	26.8	LOS B	2.9	22.8	0.94	0.81	0.94	37.0
9	R2	145	13.0	145	13.0	0.638	35.0	LOS C	2.7	21.2	1.00	0.84	1.11	18.3
Approach		319	14.9	319	14.9	0.638	30.5	LOS C	2.9	22.8	0.97	0.82	1.02	30.2
West: SCHOFIELDS ROAD														
10	L2	12	54.5	12	54.5	0.018	15.6	LOS B	0.1	1.3	0.61	0.63	0.61	38.0
11	T1	1068	7.0	1068	7.0	0.614	15.9	LOS B	8.5	63.3	0.92	0.81	0.92	46.6
Approach		1080	7.5	1080	7.5	0.614	15.9	LOS B	8.5	63.3	0.91	0.80	0.91	46.5
All Vehicles		2386	8.3	2386	8.3	0.638	17.3	LOS B	8.5	63.3	0.86	0.74	0.86	42.4

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P2	East Full Crossing	8	24.3	LOS C	0.0	0.0	0.90	0.90
P3	North Full Crossing	16	24.3	LOS C	0.0	0.0	0.90	0.90
P4	West Full Crossing	13	24.3	LOS C	0.0	0.0	0.90	0.90
All Pedestrians		37	24.3	LOS C			0.90	0.90

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

MOVEMENT SUMMARY

Site: SC [SCHOFIELDS / CUDGEGONG - PM]

Network: N101 [Tallawong Existing PM]

SCHOFIELDS ROAD / CUDGEGONG ROAD
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 60 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
East: SCHOFIELDS ROAD														
5	T1	947	2.2	947	2.2	0.508	11.5	LOS A	5.9	41.8	0.73	0.64	0.73	43.7
6	R2	127	13.2	127	13.2	0.379	35.3	LOS C	1.2	9.1	0.97	0.75	0.97	28.1
Approach		1075	3.5	1075	3.5	0.508	14.4	LOS A	5.9	41.8	0.76	0.65	0.76	41.0
North: CUDGEGONG ROAD														
7	L2	132	14.4	132	14.4	0.247	26.6	LOS B	2.1	16.8	0.93	0.79	0.93	37.1
9	R2	134	7.1	134	7.1	0.645	35.7	LOS C	2.5	18.5	0.99	0.83	1.09	18.0
Approach		265	10.7	265	10.7	0.645	31.2	LOS C	2.5	18.5	0.96	0.81	1.01	29.2
West: SCHOFIELDS ROAD														
10	L2	5	0.0	5	0.0	0.006	14.3	LOS A	0.1	0.4	0.59	0.61	0.59	38.6
11	T1	1166	3.5	1166	3.5	0.633	14.2	LOS A	8.9	64.4	0.88	0.78	0.88	47.7
Approach		1172	3.5	1172	3.5	0.633	14.2	LOS A	8.9	64.4	0.88	0.78	0.88	47.7
All Vehicles		2512	4.3	2512	4.3	0.645	16.0	LOS B	8.9	64.4	0.84	0.73	0.84	43.4

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P2	East Full Crossing	18	24.3	LOS C	0.0	0.0	0.90	0.90
P3	North Full Crossing	21	24.3	LOS C	0.0	0.0	0.90	0.90
P4	West Full Crossing	13	24.3	LOS C	0.0	0.0	0.90	0.90
All Pedestrians		52	24.3	LOS C			0.90	0.90

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

MOVEMENT SUMMARY

Site: 101 [SCHOFIELDS / TALLAWONG / RIDGELINE - AM]

Network: N101 [Tallawong Existing AM]

SCHOFIELDS / TALLAWONG / RIDGELINE
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 60 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: RIDGELINE DRIVE														
1	L2	126	3.3	126	3.3	0.226	22.9	LOS B	1.7	12.5	0.79	0.75	0.79	42.7
2	T1	143	2.2	143	2.2	0.737	32.3	LOS C	2.8	20.1	1.00	0.88	1.25	29.8
3	R2	158	4.0	158	4.0	0.742	37.4	LOS C	3.1	22.4	1.00	0.90	1.25	27.5
Approach		427	3.2	427	3.2	0.742	31.4	LOS C	3.1	22.4	0.94	0.85	1.12	33.5
East: SCHOFIELDS ROAD														
4	L2	24	0.0	24	0.0	0.025	14.0	LOS A	0.2	1.7	0.59	0.66	0.59	47.3
5	T1	772	6.1	772	6.1	0.722	26.2	LOS B	7.2	52.9	0.99	0.87	1.03	40.8
6	R2	78	13.5	78	13.5	0.462	35.7	LOS C	1.5	11.4	1.00	0.76	1.00	25.1
Approach		874	6.6	874	6.6	0.722	26.7	LOS B	7.2	52.9	0.98	0.85	1.02	39.8
North: TALLAWONG ROAD														
7	L2	35	18.2	35	18.2	0.070	27.1	LOS B	0.6	4.7	0.95	0.74	0.95	18.2
8	T1	146	6.5	146	6.5	0.774	34.8	LOS C	2.9	21.6	1.00	0.85	1.17	33.0
9	R2	128	9.0	128	9.0	0.312	33.8	LOS C	1.1	8.5	0.95	0.75	0.95	33.0
Approach		309	8.8	309	8.8	0.774	33.5	LOS C	2.9	21.6	0.98	0.80	1.06	32.1
West: SCHOFIELDS ROAD														
10	L2	49	2.1	49	2.1	0.051	13.9	LOS A	0.5	3.2	0.54	0.66	0.54	41.7
11	T1	808	6.5	808	6.5	0.752	23.9	LOS B	7.2	52.8	0.97	0.90	1.09	34.1
12	R2	125	2.5	125	2.5	0.697	37.5	LOS C	2.4	17.5	1.00	0.86	1.21	36.8
Approach		983	5.8	983	5.8	0.752	25.2	LOS B	7.2	52.8	0.95	0.88	1.08	34.9
All Vehicles		2594	6.0	2594	6.0	0.774	27.7	LOS B	7.2	52.9	0.96	0.86	1.06	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	11	24.3	LOS C	0.0	0.0	0.90	0.90
P2	East Full Crossing	13	24.3	LOS C	0.0	0.0	0.90	0.90
P3	North Full Crossing	14	24.3	LOS C	0.0	0.0	0.90	0.90
P4	West Full Crossing	16	24.3	LOS C	0.0	0.0	0.90	0.90
All Pedestrians		53	24.3	LOS C			0.90	0.90

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

MOVEMENT SUMMARY

Site: 101 [SCHOFIELDS / TALLAWONG / RIDGELINE - PM]

Network: N101 [Tallawong Existing PM]

SCHOFIELDS / TALLAWONG / RIDGELINE
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 60 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: RIDGELINE DRIVE														
1	L2	84	3.8	84	3.8	0.151	22.5	LOS B	1.1	8.2	0.77	0.73	0.77	42.9
2	T1	105	1.0	105	1.0	0.538	30.0	LOS C	2.0	13.8	0.99	0.78	1.02	30.9
3	R2	127	0.8	127	0.8	0.683	37.2	LOS C	2.5	17.4	1.00	0.85	1.18	27.5
Approach		317	1.7	317	1.7	0.683	30.9	LOS C	2.5	17.4	0.94	0.80	1.02	33.4
East: SCHOFIELDS ROAD														
4	L2	46	9.1	46	9.1	0.038	8.2	LOS A	0.3	1.9	0.44	0.64	0.44	51.1
5	T1	959	3.1	959	3.1	0.836	29.3	LOS C	9.5	67.8	1.00	0.95	1.13	39.2
6	R2	38	0.0	38	0.0	0.205	34.3	LOS C	0.7	4.8	0.97	0.72	0.97	25.6
Approach		1043	3.2	1043	3.2	0.836	28.6	LOS C	9.5	67.8	0.97	0.92	1.10	39.3
North: TALLAWONG ROAD														
7	L2	49	8.5	49	8.5	0.093	26.3	LOS B	0.8	6.0	0.92	0.74	0.92	18.6
8	T1	156	3.4	156	3.4	0.808	35.4	LOS C	3.2	22.8	1.00	0.91	1.31	32.8
9	R2	255	6.2	255	6.2	0.709	37.4	LOS C	2.5	18.6	1.00	0.85	1.17	31.5
Approach		460	5.5	460	5.5	0.808	35.6	LOS C	3.2	22.8	0.99	0.86	1.19	31.3
West: SCHOFIELDS ROAD														
10	L2	20	42.1	20	42.1	0.018	7.3	LOS A	0.1	0.6	0.28	0.59	0.28	49.0
11	T1	814	3.5	814	3.5	0.706	21.7	LOS B	6.9	49.2	0.94	0.85	1.01	35.5
12	R2	117	6.3	117	6.3	0.668	37.2	LOS C	2.3	16.7	1.00	0.85	1.17	36.9
Approach		951	4.7	951	4.7	0.706	23.3	LOS B	6.9	49.2	0.94	0.84	1.01	36.0
All Vehicles		2771	3.9	2771	3.9	0.836	28.2	LOS B	9.5	67.8	0.96	0.87	1.07	36.3

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	13	24.3	LOS C	0.0	0.0	0.90	0.90
P2	East Full Crossing	18	24.3	LOS C	0.0	0.0	0.90	0.90
P3	North Full Crossing	21	24.3	LOS C	0.0	0.0	0.90	0.90
P4	West Full Crossing	15	24.3	LOS C	0.0	0.0	0.90	0.90
All Pedestrians		66	24.3	LOS C			0.90	0.90

MOVEMENT SUMMARY

Site: 101 [Tallawong / Themeda Existing AM]

Network: N101 [Tallawong Existing AM]

Tallawong / Themeda Existing AM
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 60 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Tallawong Road														
2	T1	227	9.7	227	9.7	0.106	8.2	LOS A	1.6	11.9	0.63	0.51	0.63	39.7
3	R2	45	27.9	45	27.9	0.292	37.4	LOS C	0.9	7.5	1.00	0.74	1.00	14.4
Approach		273	12.7	273	12.7	0.292	13.0	LOS A	1.6	11.9	0.69	0.55	0.69	32.4
East: Themeda Ave														
4	L2	154	11.0	154	11.0	0.412	28.4	LOS B	2.5	19.0	0.90	0.79	0.90	30.4
6	R2	13	16.7	13	16.7	0.035	26.1	LOS B	0.2	1.5	0.81	0.67	0.81	32.2
Approach		166	11.4	166	11.4	0.412	28.2	LOS B	2.5	19.0	0.90	0.78	0.90	30.6
North: Tallawong Road														
7	L2	201	0.5	201	0.5	0.435	19.8	LOS B	4.2	29.9	0.79	0.75	0.79	13.3
8	T1	429	3.2	429	3.2	0.435	15.0	LOS B	4.3	31.0	0.79	0.69	0.79	14.8
Approach		631	2.3	631	2.3	0.435	16.5	LOS B	4.3	31.0	0.79	0.71	0.79	14.3
All Vehicles		1069	6.4	1069	6.4	0.435	17.5	LOS B	4.3	31.0	0.78	0.68	0.78	23.9

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	18	24.3	LOS C	0.0	0.0	0.90	0.90
P2	East Full Crossing	13	24.3	LOS C	0.0	0.0	0.90	0.90
P3	North Full Crossing	6	24.3	LOS C	0.0	0.0	0.90	0.90
All Pedestrians		37	24.3	LOS C			0.90	0.90

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

MOVEMENT SUMMARY

Site: TT [Tallawong / Themeda Existing PM]

Network: N101 [Tallawong Existing PM]

Tallawong / Themeda Existing PM
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 60 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Tallawong Road														
2	T1	152	5.6	152	5.6	0.067	7.8	LOS A	1.0	7.1	0.65	0.51	0.65	40.3
3	R2	183	6.9	183	6.9	0.296	23.2	LOS B	2.8	21.0	0.89	0.80	0.89	20.2
Approach		335	6.3	335	6.3	0.296	16.2	LOS B	2.8	21.0	0.78	0.67	0.78	27.5
East: Themeda Ave														
4	L2	103	12.2	103	12.2	0.302	28.7	LOS C	1.6	12.8	0.89	0.76	0.89	30.3
6	R2	27	3.8	27	3.8	0.076	27.2	LOS B	0.4	3.0	0.84	0.70	0.84	31.7
Approach		131	10.5	131	10.5	0.302	28.4	LOS B	1.6	12.8	0.88	0.75	0.88	30.6
North: Tallawong Road														
7	L2	18	11.8	18	11.8	0.309	30.5	LOS C	1.5	10.7	0.93	0.73	0.93	9.7
8	T1	158	2.7	158	2.7	0.309	25.8	LOS B	1.5	10.7	0.93	0.72	0.93	9.9
Approach		176	3.6	176	3.6	0.309	26.3	LOS B	1.5	10.7	0.93	0.72	0.93	9.9
All Vehicles		641	6.4	641	6.4	0.309	21.5	LOS B	2.8	21.0	0.84	0.70	0.84	24.3

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	21	24.3	LOS C	0.0	0.0	0.90	0.90
P2	East Full Crossing	16	24.3	LOS C	0.0	0.0	0.90	0.90
P3	North Full Crossing	18	24.3	LOS C	0.0	0.0	0.90	0.90
All Pedestrians		55	24.3	LOS C			0.90	0.90

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

Appendix F2
SIDRA Movement Summary

Existing + Development

MOVEMENT SUMMARY

Site: CT [Cudgegong / Themeda Existing AM + Devt]

Network: N101 [Tallawong Existing AM + Devt]

Cudgegong / Conferta Existing AM + Devt
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 70 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Cudgegong Road														
1	L2	43	0.0	43	0.0	0.261	33.5	LOS C	2.3	18.6	0.98	0.79	0.98	19.9
2	T1	197	15.5	197	15.5	0.261	29.2	LOS C	2.6	19.6	0.99	0.80	0.99	23.4
Approach		240	12.7	240	12.7	0.261	30.0	LOS C	2.6	19.6	0.99	0.79	0.99	22.8
North: Cudgegong Road														
8	T1	222	14.2	222	14.2	0.347	24.0	LOS B	2.8	21.9	0.87	0.71	0.87	10.4
9	R2	54	2.0	54	2.0	0.347	30.1	LOS C	2.1	16.0	0.88	0.74	0.88	9.4
Approach		276	11.8	276	11.8	0.347	25.2	LOS B	2.8	21.9	0.87	0.72	0.87	10.2
West: Themeda Ave														
10	L2	31	13.8	31	13.8	0.032	11.7	LOS A	0.3	2.3	0.49	0.64	0.49	37.4
12	R2	375	1.7	375	1.7	0.357	12.8	LOS A	4.0	28.6	0.55	0.72	0.55	36.6
Approach		405	2.6	405	2.6	0.357	12.7	LOS A	4.0	28.6	0.54	0.71	0.54	36.7
All Vehicles		921	8.0	921	8.0	0.357	20.9	LOS B	4.0	28.6	0.76	0.73	0.76	27.0

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	13	29.3	LOS C	0.0	0.0	0.91	0.91
P3	North Full Crossing	15	29.3	LOS C	0.0	0.0	0.91	0.91
P4	West Full Crossing	18	29.3	LOS C	0.0	0.0	0.91	0.91
All Pedestrians		45	29.3	LOS C			0.91	0.91

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

MOVEMENT SUMMARY

Site: CT [Cudgegong / Themeda Existing PM + DEVT]

Network: N101 [Tallawong Existing PM + Devt]

Cudgegong / Conferta Existing PM + DEVT
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 70 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Cudgegong Road														
1	L2	23	0.0	23	0.0	0.219	25.6	LOS B	1.7	13.9	0.75	0.63	0.75	24.8
2	T1	218	9.7	218	9.7	0.219	24.7	LOS B	2.6	18.8	0.89	0.73	0.89	26.0
Approach		241	8.7	241	8.7	0.219	24.8	LOS B	2.6	18.8	0.88	0.72	0.88	25.9
North: Cudgegong Road														
8	T1	175	9.6	175	9.6	0.220	20.6	LOS B	1.9	14.6	0.80	0.65	0.80	11.8
9	R2	37	0.0	37	0.0	0.220	26.6	LOS B	1.5	11.1	0.81	0.69	0.81	10.7
Approach		212	8.0	212	8.0	0.220	21.7	LOS B	1.9	14.6	0.80	0.66	0.80	11.6
West: Themeda Ave														
10	L2	41	0.0	41	0.0	0.042	6.7	LOS A	0.1	0.7	0.13	0.56	0.13	41.3
12	R2	212	2.5	212	2.5	0.219	7.1	LOS A	0.7	4.9	0.17	0.58	0.17	41.6
Approach		253	2.1	253	2.1	0.219	7.1	LOS A	0.7	4.9	0.16	0.58	0.16	41.5
All Vehicles		705	6.1	705	6.1	0.220	17.5	LOS B	2.6	18.8	0.60	0.65	0.60	29.1

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	14	29.3	LOS C	0.0	0.0	0.91	0.91
P3	North Full Crossing	24	29.3	LOS C	0.0	0.0	0.92	0.92
P4	West Full Crossing	19	29.3	LOS C	0.0	0.0	0.92	0.92
All Pedestrians		57	29.3	LOS C			0.92	0.92

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

MOVEMENT SUMMARY

Site: SC [SCHOFIELDS / CUDGEGONG - EXISTING AM + DEVT]

Network: N101 [Tallawong Existing AM + Devt]

SCHOFIELDS ROAD / CUDGEGONG ROAD EXISTING AM +DEVT
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 70 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
East: SCHOFIELDS ROAD														
5	T1	874	7.3	874	7.3	0.439	11.4	LOS A	5.6	40.9	0.67	0.58	0.67	43.8
6	R2	185	3.4	185	3.4	0.602	42.1	LOS C	2.1	14.8	1.00	0.80	1.09	25.4
Approach		1059	6.7	1059	6.7	0.602	16.8	LOS B	5.6	40.9	0.72	0.62	0.74	38.9
North: CUDGEGONG ROAD														
7	L2	394	7.2	394	7.2	0.709	29.9	LOS C	7.3	54.5	0.90	0.85	0.94	35.7
9	R2	145	13.0	145	13.0	0.595	32.4	LOS C	2.8	21.6	0.90	0.78	0.91	19.3
Approach		539	8.8	539	8.8	0.709	30.6	LOS C	7.3	54.5	0.90	0.83	0.93	32.6
West: SCHOFIELDS ROAD														
10	L2	12	54.5	12	54.5	0.016	15.0	LOS B	0.1	1.1	0.46	0.60	0.46	38.5
11	T1	1068	7.0	1068	7.0	0.557	12.1	LOS A	7.8	58.2	0.70	0.62	0.70	49.2
Approach		1080	7.5	1080	7.5	0.557	12.2	LOS A	7.8	58.2	0.70	0.62	0.70	49.1
All Vehicles		2678	7.4	2678	7.4	0.709	17.7	LOS B	7.8	58.2	0.75	0.66	0.76	42.1

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P2	East Full Crossing	13	29.3	LOS C	0.0	0.0	0.91	0.91
P3	North Full Crossing	21	29.3	LOS C	0.0	0.0	0.92	0.92
P4	West Full Crossing	19	29.3	LOS C	0.0	0.0	0.92	0.92
All Pedestrians		53	29.3	LOS C			0.91	0.91

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

MOVEMENT SUMMARY

Site: SC [SCHOFIELDS / CUDGEGONG - EXISTING PM + DEVT]

Network: N101 [Tallawong Existing PM + Devt]

SCHOFIELDS ROAD / CUDGEGONG ROAD EXISTING PM +DEVT
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 70 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: SCHOFIELDS ROAD														
5	T1	947	2.2	947	2.2	0.505	13.3	LOS A	6.8	48.2	0.73	0.64	0.73	42.0
6	R2	283	5.9	283	5.9	0.625	39.3	LOS C	3.0	22.3	0.99	0.83	1.07	26.5
Approach		1231	3.1	1231	3.1	0.625	19.2	LOS B	6.8	48.2	0.79	0.68	0.81	37.0
North: CUDGEGONG ROAD														
7	L2	261	7.3	261	7.3	0.431	32.7	LOS C	5.3	39.2	1.00	0.84	1.00	34.4
9	R2	134	7.1	134	7.1	0.585	42.0	LOS C	2.9	21.8	1.00	0.80	1.02	16.0
Approach		395	7.2	395	7.2	0.585	35.8	LOS C	5.3	39.2	1.00	0.83	1.01	29.5
West: SCHOFIELDS ROAD														
10	L2	5	0.0	5	0.0	0.006	15.1	LOS B	0.1	0.4	0.51	0.60	0.51	37.9
11	T1	1166	3.5	1166	3.5	0.630	14.4	LOS A	9.4	67.9	0.81	0.72	0.81	47.6
Approach		1172	3.5	1172	3.5	0.630	14.4	LOS A	9.4	67.9	0.81	0.72	0.81	47.5
All Vehicles		2797	3.8	2797	3.8	0.630	19.6	LOS B	9.4	67.9	0.83	0.72	0.84	40.8

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P2	East Full Crossing	19	29.3	LOS C	0.0	0.0	0.92	0.92
P3	North Full Crossing	24	29.3	LOS C	0.0	0.0	0.92	0.92
P4	West Full Crossing	21	29.3	LOS C	0.0	0.0	0.92	0.92
All Pedestrians		64	29.3	LOS C			0.92	0.92

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

MOVEMENT SUMMARY

Site: STR [SCHOFIELDS / TALLAWONG / RIDGELINE - AM + Devt]

Network: N101 [Tallawong Existing AM + Devt]

SCHOFIELDS / TALLAWONG / RIDGELINE Existing AM + Devt
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 70 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: RIDGELINE DRIVE														
1	L2	126	3.3	126	3.3	0.170	20.2	LOS B	1.7	12.3	0.68	0.73	0.68	44.1
2	T1	217	1.5	217	1.5	0.486	26.0	LOS B	4.1	28.8	0.92	0.75	0.92	33.0
3	R2	158	4.0	158	4.0	0.865	47.9	LOS D	3.9	28.2	1.00	1.01	1.53	23.8
Approach		501	2.7	501	2.7	0.865	31.4	LOS C	4.1	28.8	0.88	0.83	1.05	33.0
East: SCHOFIELDS ROAD														
4	L2	24	0.0	24	0.0	0.030	17.9	LOS B	0.3	2.1	0.63	0.67	0.63	44.8
5	T1	772	6.1	772	6.1	0.842	35.4	LOS C	8.8	64.7	1.00	0.94	1.14	36.6
6	R2	78	13.5	78	13.5	0.539	41.9	LOS C	1.7	13.6	1.00	0.78	1.03	22.7
Approach		874	6.6	874	6.6	0.842	35.5	LOS C	8.8	64.7	0.99	0.92	1.12	35.9
North: TALLAWONG ROAD														
7	L2	35	18.2	35	18.2	0.052	25.3	LOS B	0.6	5.0	0.89	0.73	0.89	19.1
8	T1	408	2.3	408	2.3	0.921	44.9	LOS D	10.2	72.7	1.00	1.03	1.30	29.2
9	R2	155	7.5	155	7.5	0.434	40.0	LOS C	1.6	12.2	0.98	0.76	0.98	30.6
Approach		598	4.6	598	4.6	0.921	42.5	LOS C	10.2	72.7	0.99	0.94	1.20	29.3
West: SCHOFIELDS ROAD														
10	L2	71	1.5	71	1.5	0.085	18.3	LOS B	0.9	6.2	0.62	0.69	0.62	37.9
11	T1	808	6.5	808	6.5	0.878	37.6	LOS C	9.9	72.7	1.00	1.07	1.36	27.4
12	R2	125	2.5	125	2.5	0.814	46.0	LOS D	3.0	21.4	1.00	0.94	1.41	33.9
Approach		1004	5.7	1004	5.7	0.878	37.3	LOS C	9.9	72.7	0.97	1.03	1.32	29.1
All Vehicles		2977	5.2	2977	5.2	0.921	36.8	LOS C	10.2	72.7	0.97	0.94	1.19	32.0

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	16	29.3	LOS C	0.0	0.0	0.91	0.91
P2	East Full Crossing	16	29.3	LOS C	0.0	0.0	0.91	0.91
P3	North Full Crossing	26	29.3	LOS C	0.0	0.0	0.92	0.92
P4	West Full Crossing	26	29.3	LOS C	0.0	0.0	0.92	0.92
All Pedestrians		84	29.3	LOS C			0.92	0.92

MOVEMENT SUMMARY

Site: 101 [SCHOFIELDS / TALLAWONG / RIDGELINE - EXISTING PM + Devt]

Network: N101 [Tallawong Existing PM + Devt]

SCHOFIELDS / TALLAWONG / RIDGELINE EXIST PM + DEVT
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 70 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: RIDGELINE DRIVE														
1	L2	84	3.8	84	3.8	0.132	22.7	LOS B	1.2	8.8	0.72	0.73	0.72	42.7
2	T1	259	0.4	259	0.4	0.769	33.7	LOS C	5.7	40.2	1.00	0.92	1.19	29.1
3	R2	127	0.8	127	0.8	0.683	41.9	LOS C	2.8	20.0	1.00	0.85	1.16	25.8
Approach		471	1.1	471	1.1	0.769	34.0	LOS C	5.7	40.2	0.95	0.87	1.10	31.1
East: SCHOFIELDS ROAD														
4	L2	46	9.1	46	9.1	0.041	9.3	LOS A	0.3	2.2	0.40	0.63	0.40	50.4
5	T1	959	3.1	959	3.1	0.836	33.6	LOS C	10.9	78.0	1.00	0.94	1.11	37.4
6	R2	38	0.0	38	0.0	0.239	42.5	LOS C	0.8	5.9	1.00	0.73	1.00	22.5
Approach		1043	3.2	1043	3.2	0.836	32.8	LOS C	10.9	78.0	0.97	0.92	1.08	37.4
North: TALLAWONG ROAD														
7	L2	49	8.5	49	8.5	0.082	25.1	LOS B	0.9	6.5	0.87	0.74	0.87	19.2
8	T1	283	1.9	283	1.9	0.848	37.1	LOS C	6.7	47.5	1.00	0.97	1.27	32.1
9	R2	289	5.5	289	5.5	0.801	44.0	LOS D	3.4	24.8	1.00	0.90	1.27	29.2
Approach		622	4.1	622	4.1	0.848	39.3	LOS C	6.7	47.5	0.99	0.92	1.24	30.1
West: SCHOFIELDS ROAD														
10	L2	57	14.8	57	14.8	0.047	8.1	LOS A	0.3	2.3	0.34	0.62	0.34	47.7
11	T1	814	3.5	814	3.5	0.706	24.8	LOS B	7.9	56.5	0.94	0.84	0.99	33.5
12	R2	117	6.3	117	6.3	0.779	45.1	LOS D	2.7	20.3	1.00	0.91	1.34	34.2
Approach		987	4.5	987	4.5	0.779	26.3	LOS B	7.9	56.5	0.92	0.84	1.00	34.2
All Vehicles		3123	3.5	3123	3.5	0.848	32.2	LOS C	10.9	78.0	0.95	0.89	1.09	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	24	29.3	LOS C	0.0	0.0	0.92	0.92
P2	East Full Crossing	15	29.3	LOS C	0.0	0.0	0.91	0.91
P3	North Full Crossing	32	29.3	LOS C	0.1	0.1	0.92	0.92
P4	West Full Crossing	18	29.3	LOS C	0.0	0.0	0.91	0.91
All Pedestrians		88	29.3	LOS C			0.92	0.92

MOVEMENT SUMMARY

Site: 101 [Tallawong / Themeda Existing AM + Devt]

Network: N101 [Tallawong Existing AM + Devt]

Tallawong / Themeda Existing AM + Devt
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 70 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Tallawong Road														
2	T1	165	13.4	165	13.4	0.073	8.5	LOS A	1.2	9.7	0.66	0.52	0.66	39.1
3	R2	140	9.0	140	9.0	0.468	39.7	LOS C	3.0	22.6	1.00	0.80	1.00	13.7
Approach		305	11.4	305	11.4	0.468	22.9	LOS B	3.0	22.6	0.81	0.65	0.81	22.9
East: Themeda Ave														
4	L2	154	11.0	154	11.0	0.446	34.5	LOS C	3.2	24.2	0.99	0.81	0.99	27.5
6	R2	39	5.4	39	5.4	0.109	34.2	LOS C	0.8	5.6	0.95	0.74	0.95	28.5
Approach		193	9.8	193	9.8	0.446	34.4	LOS C	3.2	24.2	0.98	0.79	0.98	27.7
North: Tallawong Road														
7	L2	201	0.5	201	0.5	0.456	22.9	LOS B	5.1	36.1	0.80	0.76	0.80	11.7
8	T1	440	3.1	440	3.1	0.456	18.2	LOS B	5.2	37.3	0.81	0.71	0.81	12.9
Approach		641	2.3	641	2.3	0.456	19.6	LOS B	5.2	37.3	0.81	0.72	0.81	12.5
All Vehicles		1139	6.0	1139	6.0	0.468	23.0	LOS B	5.2	37.3	0.84	0.71	0.84	20.2

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	26	29.3	LOS C	0.0	0.0	0.92	0.92
P2	East Full Crossing	31	29.3	LOS C	0.1	0.1	0.92	0.92
P3	North Full Crossing	16	29.3	LOS C	0.0	0.0	0.91	0.91
All Pedestrians		73	29.3	LOS C			0.92	0.92

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

MOVEMENT SUMMARY

Site: TT [Tallawong / Themeda Existing PM + DEVT]

Network: N101 [Tallawong Existing PM + Devt]

Tallawong / Themeda Existing PM + DEVT
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 70 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Tallawong Road														
2	T1	152	5.6	152	5.6	0.059	8.2	LOS A	1.2	8.9	0.74	0.59	0.74	39.7
3	R2	346	3.6	346	3.6	0.406	25.5	LOS B	6.4	46.0	0.93	0.84	0.93	18.9
Approach		498	4.2	498	4.2	0.406	20.2	LOS B	6.4	46.0	0.87	0.77	0.87	23.5
East: Themeda Ave														
4	L2	103	12.2	103	12.2	0.423	36.8	LOS C	2.2	16.7	0.99	0.78	0.99	26.6
6	R2	48	2.2	48	2.2	0.185	35.2	LOS C	1.0	7.0	0.97	0.74	0.97	28.1
Approach		152	9.0	152	9.0	0.423	36.3	LOS C	2.2	16.7	0.98	0.77	0.98	27.1
North: Tallawong Road														
7	L2	18	11.8	18	11.8	0.403	36.6	LOS C	2.0	14.3	0.96	0.75	0.96	8.2
8	T1	179	2.4	179	2.4	0.403	31.9	LOS C	2.0	14.4	0.96	0.75	0.96	8.3
Approach		197	3.2	197	3.2	0.403	32.3	LOS C	2.0	14.4	0.96	0.75	0.96	8.3
All Vehicles		846	4.9	846	4.9	0.423	25.9	LOS B	6.4	46.0	0.91	0.76	0.91	21.3

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	25	29.3	LOS C	0.0	0.0	0.92	0.92
P2	East Full Crossing	29	29.3	LOS C	0.1	0.1	0.92	0.92
P3	North Full Crossing	13	29.3	LOS C	0.0	0.0	0.91	0.91
All Pedestrians		67	29.3	LOS C			0.92	0.92

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

Appendix F3
SIDRA Movement Summary

Existing + Growth

MOVEMENT SUMMARY

Site: CT [Cudgegong / Themeda Existing AM + GROWTH]

Network: N101 [Tallawong Existing AM + GROWTH]

Cudgegong / Conferta Existing AM + GROWTH
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 70 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Cudgegong Road														
1	L2	52	0.0	52	0.0	0.175	20.8	LOS B	1.9	15.3	0.76	0.68	0.76	27.3
2	T1	205	17.9	205	17.9	0.175	18.9	LOS B	2.5	19.1	0.88	0.74	0.88	29.5
Approach		257	14.3	257	14.3	0.175	19.3	LOS B	2.5	19.1	0.86	0.72	0.86	29.1
North: Cudgegong Road														
8	T1	266	14.2	266	14.2	0.245	15.0	LOS B	2.5	19.5	0.70	0.60	0.70	15.0
9	R2	54	2.0	54	2.0	0.245	20.7	LOS B	2.0	15.2	0.72	0.65	0.72	13.4
Approach		320	12.2	320	12.2	0.245	15.9	LOS B	2.5	19.5	0.70	0.61	0.70	14.7
West: Themeda Ave														
10	L2	37	14.3	37	14.3	0.053	11.3	LOS A	0.2	1.8	0.32	0.60	0.32	37.7
12	R2	185	4.0	185	4.0	0.248	10.0	LOS A	1.1	7.6	0.29	0.61	0.29	38.9
Approach		222	5.7	222	5.7	0.248	10.2	LOS A	1.1	7.6	0.29	0.61	0.29	38.7
All Vehicles		799	11.1	799	11.1	0.248	15.4	LOS B	2.5	19.5	0.64	0.64	0.64	29.1

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	16	29.3	LOS C	0.0	0.0	0.91	0.91
P3	North Full Crossing	16	29.3	LOS C	0.0	0.0	0.91	0.91
P4	West Full Crossing	16	29.3	LOS C	0.0	0.0	0.91	0.91
All Pedestrians		47	29.3	LOS C			0.91	0.91

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

MOVEMENT SUMMARY

Site: CT [Cudgegong / Themeda Existing PM + GROWTH]

Network: N101 [Tallawong Existing PM + GROWTH]

Cudgegong / Conferta Existing PM + GROWTH
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 70 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Cudgegong Road														
1	L2	27	0.0	27	0.0	0.161	19.2	LOS B	1.9	15.1	0.74	0.64	0.74	30.0
2	T1	241	10.5	241	10.5	0.161	16.9	LOS B	2.6	18.7	0.86	0.71	0.86	31.4
Approach		268	9.4	268	9.4	0.161	17.2	LOS B	2.6	18.7	0.85	0.70	0.85	31.3
North: Cudgegong Road														
8	T1	211	10.0	211	10.0	0.150	12.2	LOS A	1.5	11.6	0.62	0.52	0.62	17.5
9	R2	22	0.0	22	0.0	0.150	17.3	LOS B	1.3	10.1	0.63	0.55	0.63	16.5
Approach		233	9.0	233	9.0	0.150	12.7	LOS A	1.5	11.6	0.62	0.52	0.62	17.4
West: Themeda Ave														
10	L2	49	0.0	49	0.0	0.072	7.2	LOS A	0.1	0.9	0.12	0.56	0.12	40.8
12	R2	99	6.4	99	6.4	0.150	7.9	LOS A	0.3	2.3	0.16	0.57	0.16	40.9
Approach		148	4.3	148	4.3	0.150	7.6	LOS A	0.3	2.3	0.14	0.56	0.14	40.9
All Vehicles		649	8.1	649	8.1	0.161	13.4	LOS A	2.6	18.7	0.61	0.61	0.61	31.6

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	16	29.3	LOS C	0.0	0.0	0.91	0.91
P3	North Full Crossing	16	29.3	LOS C	0.0	0.0	0.91	0.91
P4	West Full Crossing	16	29.3	LOS C	0.0	0.0	0.91	0.91
All Pedestrians		47	29.3	LOS C			0.91	0.91

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

MOVEMENT SUMMARY

Site: SC [SCHOFIELDS / CUDGEGONG - AM EXIST + GROWTH]

Network: N101 [Tallawong Existing AM + GROWTH]

SCHOFIELDS ROAD / CUDGEGONG ROAD AM EXIST + GROWTH
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 70 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: SCHOFIELDS ROAD														
5	T1	1049	7.4	1049	7.4	0.678	18.7	LOS B	9.0	65.2	0.87	0.77	0.87	37.4
6	R2	136	5.4	136	5.4	0.224	33.6	LOS C	1.3	9.3	0.90	0.75	0.90	28.8
Approach		1185	7.2	1185	7.2	0.678	20.4	LOS B	9.0	65.2	0.88	0.76	0.88	36.2
North: CUDGEGONG ROAD														
7	L2	208	16.2	208	16.2	0.292	22.4	LOS B	3.5	27.6	0.83	0.79	0.83	39.3
9	R2	175	13.3	175	13.3	0.598	28.0	LOS B	3.1	23.9	0.84	0.77	0.84	21.2
Approach		383	14.8	383	14.8	0.598	25.0	LOS B	3.5	27.6	0.83	0.78	0.84	33.1
West: SCHOFIELDS ROAD														
10	L2	14	53.8	14	53.8	0.024	19.9	LOS B	0.2	1.9	0.68	0.65	0.68	34.3
11	T1	1282	7.0	1282	7.0	0.863	32.1	LOS C	15.0	111.4	1.00	1.02	1.18	37.9
Approach		1296	7.5	1296	7.5	0.863	31.9	LOS C	15.0	111.4	1.00	1.01	1.17	37.9
All Vehicles		2864	8.3	2864	8.3	0.863	26.3	LOS B	15.0	111.4	0.93	0.88	1.00	36.8

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P2	East Full Crossing	37	29.3	LOS C	0.1	0.1	0.92	0.92
P3	North Full Crossing	37	29.3	LOS C	0.1	0.1	0.92	0.92
P4	West Full Crossing	37	29.3	LOS C	0.1	0.1	0.92	0.92
All Pedestrians		111	29.3	LOS C			0.92	0.92

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

MOVEMENT SUMMARY

Site: SC [SCHOFIELDS / CUDGEGONG - PM EXIST + GROWTH]

Network: N101 [Tallawong Existing PM + GROWTH]

SCHOFIELDS ROAD / CUDGEGONG ROAD PM EXIST + GROWTH
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 70 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
East: SCHOFIELDS ROAD														
5	T1	1137	2.2	1137	2.2	0.557	11.9	LOS A	8.0	56.6	0.72	0.64	0.72	43.4
6	R2	153	13.1	153	13.1	0.530	41.8	LOS C	1.7	13.0	1.00	0.77	1.03	25.6
Approach		1289	3.5	1289	3.5	0.557	15.4	LOS B	8.0	56.6	0.75	0.65	0.75	40.1
North: CUDGEGONG ROAD														
7	L2	158	14.7	158	14.7	0.313	32.4	LOS C	3.1	24.6	0.98	0.81	0.98	34.4
9	R2	161	7.2	161	7.2	0.705	43.4	LOS D	3.6	26.8	1.00	0.84	1.08	15.6
Approach		319	10.9	319	10.9	0.705	38.0	LOS C	3.6	26.8	0.99	0.82	1.03	26.4
West: SCHOFIELDS ROAD														
10	L2	6	0.0	6	0.0	0.006	13.8	LOS A	0.1	0.4	0.46	0.60	0.46	39.1
11	T1	1399	3.5	1399	3.5	0.695	13.2	LOS A	11.4	82.0	0.81	0.73	0.81	48.4
Approach		1405	3.5	1405	3.5	0.695	13.2	LOS A	11.4	82.0	0.81	0.73	0.81	48.4
All Vehicles		3014	4.3	3014	4.3	0.705	16.8	LOS B	11.4	82.0	0.80	0.71	0.81	42.9

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P2	East Full Crossing	24	29.3	LOS C	0.0	0.0	0.92	0.92
P3	North Full Crossing	15	29.3	LOS C	0.0	0.0	0.91	0.91
P4	West Full Crossing	19	29.3	LOS C	0.0	0.0	0.92	0.92
All Pedestrians		58	29.3	LOS C			0.92	0.92

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

MOVEMENT SUMMARY

Site: STR [SCHOFIELDS / TALLAWONG / RIDGELINE AM EXIST + GROWTH]

Network: N101 [Tallawong Existing AM + GROWTH]

SCHOFIELDS / TALLAWONG / RIDGELINE AM EXIST + GROWTH
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 70 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: RIDGELINE DRIVE														
1	L2	152	2.8	152	2.8	0.270	26.0	LOS B	2.5	17.6	0.80	0.77	0.80	41.2
2	T1	172	1.8	172	1.8	0.771	37.0	LOS C	3.9	27.8	1.00	0.91	1.26	27.7
3	R2	188	3.4	188	3.4	0.800	43.1	LOS D	4.4	31.5	1.00	0.94	1.30	25.4
Approach		512	2.7	512	2.7	0.800	36.0	LOS C	4.4	31.5	0.94	0.88	1.14	31.5
East: SCHOFIELDS ROAD														
4	L2	24	0.0	24	0.0	0.024	13.6	LOS A	0.2	1.4	0.41	0.63	0.41	47.6
5	T1	772	6.1	772	6.1	0.651	27.8	LOS B	8.1	59.6	0.98	0.84	0.98	40.0
6	R2	78	13.5	78	13.5	0.462	43.4	LOS D	1.7	13.6	1.00	0.77	1.00	22.3
Approach		874	6.6	874	6.6	0.651	28.8	LOS C	8.1	59.6	0.96	0.83	0.96	38.8
North: TALLAWONG ROAD														
7	L2	41	17.9	41	17.9	0.082	26.6	LOS B	0.7	5.8	0.87	0.73	0.87	18.5
8	T1	176	6.6	176	6.6	0.814	40.5	LOS C	4.1	30.1	1.00	0.88	1.18	30.8
9	R2	154	8.9	154	8.9	0.339	37.4	LOS C	1.6	11.7	0.95	0.76	0.95	31.5
Approach		371	8.8	371	8.8	0.814	37.7	LOS C	4.1	30.1	0.96	0.81	1.05	30.4
West: SCHOFIELDS ROAD														
10	L2	59	1.8	59	1.8	0.058	14.2	LOS A	0.6	4.2	0.51	0.66	0.51	41.4
11	T1	971	6.5	971	6.5	0.814	28.8	LOS C	10.5	77.2	0.98	0.97	1.15	31.3
12	R2	149	2.1	149	2.1	0.830	45.9	LOS D	3.6	25.5	1.00	0.96	1.43	34.0
Approach		1179	5.7	1179	5.7	0.830	30.3	LOS C	10.5	77.2	0.96	0.95	1.16	32.2
All Vehicles		2935	5.8	2935	5.8	0.830	31.7	LOS C	10.5	77.2	0.96	0.88	1.08	34.0

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	16	29.3	LOS C	0.0	0.0	0.91	0.91
P2	East Full Crossing	16	29.3	LOS C	0.0	0.0	0.91	0.91
P3	North Full Crossing	16	29.3	LOS C	0.0	0.0	0.91	0.91
P4	West Full Crossing	16	29.3	LOS C	0.0	0.0	0.91	0.91
All Pedestrians		63	29.3	LOS C			0.91	0.91

MOVEMENT SUMMARY

Site: 101 [SCHOFIELDS / TALLAWONG / RIDGELINE PM EXIST + GROWTH]

Network: N101 [Tallawong Existing PM + GROWTH]

SCHOFIELDS / TALLAWONG / RIDGELINE PM EXIST + GROWTH
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 70 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: RIDGELINE DRIVE														
1	L2	101	4.2	101	4.2	0.153	22.2	LOS B	1.4	10.5	0.71	0.73	0.71	43.0
2	T1	126	0.8	126	0.8	0.376	28.7	LOS C	2.4	17.2	0.93	0.74	0.93	31.5
3	R2	153	0.7	153	0.7	0.817	45.2	LOS D	3.6	25.4	1.00	0.95	1.38	24.7
Approach		380	1.7	380	1.7	0.817	33.6	LOS C	3.6	25.4	0.90	0.82	1.05	32.2
East: SCHOFIELDS ROAD														
4	L2	35	15.2	35	15.2	0.033	9.8	LOS A	0.3	2.1	0.46	0.63	0.46	49.7
5	T1	905	4.0	905	4.0	0.831	33.7	LOS C	10.3	74.0	1.00	0.94	1.11	37.3
6	R2	81	0.0	81	0.0	0.439	39.8	LOS C	1.7	12.2	1.00	0.77	1.00	23.4
Approach		1021	4.0	1021	4.0	0.831	33.3	LOS C	10.3	74.0	0.98	0.91	1.08	36.8
North: TALLAWONG ROAD														
7	L2	60	8.8	60	8.8	0.095	22.2	LOS B	0.9	6.9	0.76	0.73	0.76	20.8
8	T1	251	27.7	251	27.7	0.875	39.5	LOS C	6.2	53.4	1.00	1.02	1.37	31.1
9	R2	305	6.2	305	6.2	0.849	45.7	LOS D	3.7	27.0	1.00	0.95	1.38	28.6
Approach		616	15.2	616	15.2	0.875	40.9	LOS C	6.2	53.4	0.98	0.96	1.31	29.3
West: SCHOFIELDS ROAD														
10	L2	24	43.5	24	43.5	0.022	7.5	LOS A	0.1	0.9	0.27	0.59	0.27	48.8
11	T1	976	3.5	976	3.5	0.889	37.3	LOS C	12.3	87.8	1.00	1.09	1.36	27.5
12	R2	140	6.0	140	6.0	0.799	44.8	LOS D	3.3	24.3	1.00	0.93	1.36	34.3
Approach		1140	4.6	1140	4.6	0.889	37.6	LOS C	12.3	87.8	0.98	1.06	1.34	28.9
All Vehicles		3157	6.1	3157	6.1	0.889	36.4	LOS C	12.3	87.8	0.97	0.96	1.22	32.2

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	16	29.3	LOS C	0.0	0.0	0.91	0.91
P2	East Full Crossing	16	29.3	LOS C	0.0	0.0	0.91	0.91
P3	North Full Crossing	16	29.3	LOS C	0.0	0.0	0.91	0.91
P4	West Full Crossing	16	29.3	LOS C	0.0	0.0	0.91	0.91
All Pedestrians		63	29.3	LOS C			0.91	0.91

MOVEMENT SUMMARY

Site: TT [Tallawong / Themeda Existing AM + GROWTH]

Network: N101 [Tallawong Existing AM + GROWTH]

Tallawong / Themeda Existing AM + GROWTH
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 70 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Tallawong Road														
2	T1	274	10.0	274	10.0	0.125	9.3	LOS A	2.2	16.6	0.65	0.54	0.65	38.0
3	R2	54	27.5	54	27.5	0.403	43.6	LOS D	1.2	10.4	1.00	0.75	1.00	12.8
Approach		327	12.9	327	12.9	0.403	14.9	LOS B	2.2	16.6	0.71	0.57	0.71	30.4
East: Themeda Ave														
4	L2	184	10.9	184	10.9	0.468	31.7	LOS C	3.5	26.9	0.93	0.80	0.93	28.8
6	R2	15	14.3	15	14.3	0.038	28.6	LOS C	0.3	2.0	0.83	0.68	0.83	31.0
Approach		199	11.1	199	11.1	0.468	31.4	LOS C	3.5	26.9	0.92	0.79	0.92	29.0
North: Tallawong Road														
7	L2	241	0.4	241	0.4	0.466	20.2	LOS B	5.6	39.9	0.76	0.75	0.76	13.0
8	T1	515	3.1	515	3.1	0.466	15.5	LOS B	5.8	41.3	0.76	0.68	0.76	14.5
Approach		756	2.2	756	2.2	0.466	17.0	LOS B	5.8	41.3	0.76	0.70	0.76	14.0
All Vehicles		1282	6.3	1282	6.3	0.468	18.7	LOS B	5.8	41.3	0.77	0.68	0.77	22.9

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	16	29.3	LOS C	0.0	0.0	0.91	0.91
P2	East Full Crossing	16	29.3	LOS C	0.0	0.0	0.91	0.91
P3	North Full Crossing	16	29.3	LOS C	0.0	0.0	0.91	0.91
All Pedestrians		47	29.3	LOS C			0.91	0.91

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

MOVEMENT SUMMARY

Site: TT [Tallawong / Themeda Existing PM + growth]

Network: N101 [Tallawong Existing PM + GROWTH]

Tallawong / Themeda Existing PM + growth
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 70 seconds (Network Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Tallawong Road														
2	T1	182	5.8	182	5.8	0.079	8.5	LOS A	1.4	10.2	0.63	0.50	0.63	39.1
3	R2	219	6.7	219	6.7	0.346	28.7	LOS C	4.1	30.2	0.93	0.82	0.93	17.4
Approach		401	6.3	401	6.3	0.346	19.5	LOS B	4.1	30.2	0.79	0.67	0.79	24.7
East: Themeda Ave														
4	L2	123	12.0	123	12.0	0.336	31.6	LOS C	2.3	17.4	0.89	0.77	0.89	28.8
6	R2	33	3.2	33	3.2	0.084	29.7	LOS C	0.6	4.0	0.83	0.71	0.83	30.5
Approach		156	10.1	156	10.1	0.336	31.2	LOS C	2.3	17.4	0.88	0.76	0.88	29.2
North: Tallawong Road														
7	L2	21	10.0	21	10.0	0.324	33.2	LOS C	2.0	14.4	0.92	0.73	0.92	9.0
8	T1	189	2.8	189	2.8	0.324	28.5	LOS B	2.0	14.5	0.92	0.73	0.92	9.1
Approach		211	3.5	211	3.5	0.324	28.9	LOS C	2.0	14.5	0.92	0.73	0.92	9.1
All Vehicles		767	6.3	767	6.3	0.346	24.5	LOS B	4.1	30.2	0.84	0.71	0.84	22.4

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	21	29.3	LOS C	0.0	0.0	0.92	0.92
P2	East Full Crossing	16	29.3	LOS C	0.0	0.0	0.91	0.91
P3	North Full Crossing	13	29.3	LOS C	0.0	0.0	0.91	0.91
All Pedestrians		49	29.3	LOS C			0.91	0.91

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

Appendix F4
SIDRA Movement Summary

Existing + Growth + Development

MOVEMENT SUMMARY

Site: CT [Cudgegong / Themeda Existing AM + GROWTH + DEVT]

Network: N101 [Tallawong Existing AM + GROWTH + DEVT]

Cudgegong / Conferta Existing AM + GROWTH + DEVT
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 80 seconds (Network Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Cudgegong Road														
1	L2	52	0.0	52	0.0	0.267	34.6	LOS C	2.9	23.0	0.94	0.78	0.94	19.4
2	T1	225	13.6	225	13.6	0.267	31.1	LOS C	3.3	25.0	0.98	0.80	0.98	22.6
Approach		277	11.0	277	11.0	0.267	31.7	LOS C	3.3	25.0	0.97	0.79	0.97	22.0
North: Cudgegong Road														
8	T1	266	14.2	266	14.2	0.376	25.7	LOS B	3.7	29.4	0.85	0.71	0.85	9.9
9	R2	62	1.7	62	1.7	0.376	32.3	LOS C	2.8	20.8	0.87	0.74	0.87	8.8
Approach		328	11.9	328	11.9	0.376	26.9	LOS B	3.7	29.4	0.86	0.72	0.86	9.7
West: Themeda Ave														
10	L2	37	14.3	37	14.3	0.039	9.7	LOS A	0.2	1.6	0.25	0.58	0.25	38.8
12	R2	405	1.8	405	1.8	0.393	10.2	LOS A	2.9	20.3	0.32	0.64	0.32	38.7
Approach		442	2.9	442	2.9	0.393	10.2	LOS A	2.9	20.3	0.31	0.63	0.31	38.7
All Vehicles		1047	7.8	1047	7.8	0.393	21.1	LOS B	3.7	29.4	0.66	0.70	0.66	26.6

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93
P3	North Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93
P4	West Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93
All Pedestrians		158	34.3	LOS D			0.93	0.93

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

MOVEMENT SUMMARY

Site: CT [Cudgegong / Themeda Existing PM + GROWTH + DEVT]

Network: N101 [Tallawong Existing PM + GROWTH + DEVT]

Cudgegong / Conferta Existing PM + GROWTH + DEVT
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 70 seconds (Network Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Cudgegong Road														
1	L2	27	0.0	27	0.0	0.236	24.2	LOS B	1.9	15.4	0.70	0.61	0.70	25.8
2	T1	258	9.8	258	9.8	0.236	23.6	LOS B	3.1	22.2	0.88	0.73	0.88	26.6
Approach		285	8.9	285	8.9	0.236	23.7	LOS B	3.1	22.2	0.86	0.71	0.86	26.6
North: Cudgegong Road														
8	T1	211	10.0	211	10.0	0.242	19.2	LOS B	2.2	17.1	0.78	0.64	0.78	12.4
9	R2	41	0.0	41	0.0	0.242	25.2	LOS B	1.7	12.7	0.79	0.68	0.79	11.3
Approach		252	8.4	252	8.4	0.242	20.2	LOS B	2.2	17.1	0.78	0.65	0.78	12.2
West: Themeda Ave														
10	L2	49	0.0	49	0.0	0.053	8.1	LOS A	0.2	1.4	0.20	0.58	0.20	40.2
12	R2	227	2.3	227	2.3	0.249	8.7	LOS A	1.1	8.1	0.25	0.61	0.25	40.1
Approach		277	1.9	277	1.9	0.249	8.5	LOS A	1.1	8.1	0.24	0.60	0.24	40.1
All Vehicles		814	6.3	814	6.3	0.249	17.5	LOS B	3.1	22.2	0.62	0.66	0.62	29.0

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	29.3	LOS C	0.1	0.1	0.92	0.92
P3	North Full Crossing	53	29.3	LOS C	0.1	0.1	0.92	0.92
P4	West Full Crossing	53	29.3	LOS C	0.1	0.1	0.92	0.92
All Pedestrians		158	29.3	LOS C			0.92	0.92

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

MOVEMENT SUMMARY

Site: SC [SCHOFIELDS / CUDGEGONG - AM EXIST + GROWTH + DEVT]

Network: N101 [Tallawong Existing AM + GROWTH + DEVT]

SCHOFIELDS ROAD / CUDGEGONG ROAD AM EXIST + GROWTH + DEVT
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 80 seconds (Network Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
East: SCHOFIELDS ROAD														
5	T1	1049	7.4	1049	7.4	0.612	17.8	LOS B	9.4	68.4	0.80	0.71	0.80	38.1
6	R2	206	3.1	206	3.1	0.353	38.9	LOS C	2.3	16.4	0.93	0.77	0.93	26.6
Approach		1256	6.7	1256	6.7	0.612	21.3	LOS B	9.4	68.4	0.82	0.72	0.82	35.6
North: CUDGEGONG ROAD														
7	L2	428	7.9	428	7.9	0.609	26.4	LOS B	8.4	62.9	0.87	0.83	0.87	37.4
9	R2	175	13.3	175	13.3	0.630	37.4	LOS C	3.9	30.5	0.94	0.81	0.96	17.5
Approach		603	9.4	603	9.4	0.630	29.6	LOS C	8.4	62.9	0.89	0.82	0.89	32.9
West: SCHOFIELDS ROAD														
10	L2	14	53.8	14	53.8	0.022	19.2	LOS B	0.2	1.8	0.58	0.63	0.58	34.9
11	T1	1282	7.0	1282	7.0	0.767	21.8	LOS B	14.0	103.8	0.92	0.85	0.96	43.0
Approach		1296	7.5	1296	7.5	0.767	21.8	LOS B	14.0	103.8	0.91	0.85	0.95	42.9
All Vehicles		3155	7.5	3155	7.5	0.767	23.1	LOS B	14.0	103.8	0.87	0.79	0.89	38.6

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P2	East Full Crossing	37	34.3	LOS D	0.1	0.1	0.93	0.93
P3	North Full Crossing	37	34.3	LOS D	0.1	0.1	0.93	0.93
P4	West Full Crossing	37	34.3	LOS D	0.1	0.1	0.93	0.93
All Pedestrians		111	34.3	LOS D			0.93	0.93

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

MOVEMENT SUMMARY

Site: SC [SCHOFIELDS / CUDGEGONG - PM EXIST + GROWTH + DEVT]

Network: N101 [Tallawong Existing PM + GROWTH + DEVT]

SCHOFIELDS ROAD / CUDGEGONG ROAD PM EXIST + GROWTH + DEVT
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 70 seconds (Network Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
East: SCHOFIELDS ROAD														
5	T1	1137	2.2	1137	2.2	0.648	15.8	LOS B	9.2	65.4	0.82	0.73	0.82	39.7
6	R2	308	6.5	308	6.5	0.768	43.0	LOS D	3.5	26.2	1.00	0.91	1.27	25.2
Approach		1445	3.1	1445	3.1	0.768	21.6	LOS B	9.2	65.4	0.86	0.77	0.92	35.3
North: CUDGEGONG ROAD														
7	L2	287	8.1	287	8.1	0.441	31.1	LOS C	5.7	42.6	0.99	0.85	0.99	35.1
9	R2	161	7.2	161	7.2	0.529	40.1	LOS C	3.5	25.7	1.00	0.81	1.00	16.6
Approach		448	7.7	448	7.7	0.529	34.3	LOS C	5.7	42.6	0.99	0.83	0.99	29.8
West: SCHOFIELDS ROAD														
10	L2	6	0.0	6	0.0	0.007	17.1	LOS B	0.1	0.6	0.63	0.62	0.63	36.2
11	T1	1399	3.5	1399	3.5	0.804	22.0	LOS B	14.3	103.0	0.97	0.92	1.04	42.9
Approach		1405	3.5	1405	3.5	0.804	22.0	LOS B	14.3	103.0	0.97	0.92	1.04	42.8
All Vehicles		3299	3.9	3299	3.9	0.804	23.5	LOS B	14.3	103.0	0.92	0.84	0.98	38.3

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P2	East Full Crossing	37	29.3	LOS C	0.1	0.1	0.92	0.92
P3	North Full Crossing	21	29.3	LOS C	0.0	0.0	0.92	0.92
P4	West Full Crossing	21	29.3	LOS C	0.0	0.0	0.92	0.92
All Pedestrians		79	29.3	LOS C			0.92	0.92

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

MOVEMENT SUMMARY

Site: STR [SCHOFIELDS / TALLAWONG / RIDGELINE AM EXIST + GROWTH + DEVT]

Network: N101 [Tallawong Existing AM + GROWTH + DEVT]

SCHOFIELDS / TALLAWONG / RIDGELINE AM EXIST + GROWTH + DEVT
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 80 seconds (Network Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: RIDGELINE DRIVE														
1	L2	154	4.1	154	4.1	0.214	23.2	LOS B	2.5	17.8	0.71	0.75	0.71	42.5
2	T1	246	1.7	246	1.7	0.562	30.4	LOS C	5.4	38.1	0.94	0.78	0.94	30.7
3	R2	189	3.9	189	3.9	0.922	59.0	LOS E	5.7	41.1	1.00	1.10	1.65	20.9
Approach		589	3.0	589	3.0	0.922	37.7	LOS C	5.7	41.1	0.90	0.87	1.11	30.4
East: SCHOFIELDS ROAD														
4	L2	29	0.0	29	0.0	0.033	18.0	LOS B	0.3	2.3	0.49	0.65	0.49	44.8
5	T1	926	6.1	926	6.1	0.893	45.1	LOS D	13.1	95.7	1.00	1.04	1.27	33.1
6	R2	94	13.5	94	13.5	0.635	50.2	LOS D	2.4	18.9	1.00	0.80	1.06	20.3
Approach		1049	6.6	1049	6.6	0.893	44.8	LOS D	13.1	95.7	0.99	1.01	1.23	32.4
North: TALLAWONG ROAD														
7	L2	41	17.9	41	17.9	0.064	28.1	LOS B	0.8	6.6	0.87	0.74	0.87	17.8
8	T1	420	2.8	420	2.8	0.969	61.1	LOS E	13.1	94.0	1.00	1.13	1.45	24.7
9	R2	180	7.6	180	7.6	0.449	43.5	LOS D	2.1	15.9	0.98	0.77	0.98	29.3
Approach		641	5.1	641	5.1	0.969	54.1	LOS D	13.1	94.0	0.99	1.00	1.28	25.7
West: SCHOFIELDS ROAD														
10	L2	80	1.3	80	1.3	0.089	18.5	LOS B	1.1	7.5	0.59	0.69	0.59	37.8
11	T1	971	6.5	971	6.5	0.930	49.7	LOS D	15.1	110.2	1.00	1.17	1.47	23.3
12	R2	151	2.8	151	2.8	0.960	67.6	LOS E	4.9	34.9	1.00	1.15	1.89	28.3
Approach		1201	5.7	1201	5.7	0.960	49.8	LOS D	15.1	110.2	0.97	1.14	1.46	24.8
All Vehicles		3481	5.4	3481	5.4	0.969	47.0	LOS D	15.1	110.2	0.97	1.03	1.30	28.3

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	21	34.3	LOS D	0.0	0.0	0.93	0.93
P2	East Full Crossing	21	34.3	LOS D	0.0	0.0	0.93	0.93
P3	North Full Crossing	21	34.3	LOS D	0.0	0.0	0.93	0.93
P4	West Full Crossing	21	34.3	LOS D	0.0	0.0	0.93	0.93

MOVEMENT SUMMARY

Site: STR [SCHOFIELDS / TALLAWONG / RIDGELINE PM EXIST + GROWTH + DEVT]

Network: N101 [Tallawong Existing PM + GROWTH + DEVT]

SCHOFIELDS / TALLAWONG / RIDGELINE PM EXIST + GROWTH + DEVT
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 70 seconds (Network Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: RIDGELINE DRIVE														
1	L2	101	4.2	101	4.2	0.159	22.9	LOS B	1.5	10.7	0.73	0.74	0.73	42.6
2	T1	280	0.4	280	0.4	0.907	44.0	LOS D	7.3	51.1	1.00	1.10	1.55	25.2
3	R2	153	0.7	153	0.7	0.715	41.5	LOS C	3.4	24.0	1.00	0.87	1.18	25.9
Approach		534	1.2	534	1.2	0.907	39.3	LOS C	7.3	51.1	0.95	0.97	1.29	29.1
East: SCHOFIELDS ROAD														
4	L2	35	15.2	35	15.2	0.031	9.6	LOS A	0.3	2.1	0.49	0.64	0.49	49.9
5	T1	905	4.0	905	4.0	0.831	33.7	LOS C	10.3	74.0	1.00	0.94	1.11	37.3
6	R2	81	0.0	81	0.0	0.439	42.9	LOS D	1.8	12.6	1.00	0.77	1.00	22.4
Approach		1021	4.0	1021	4.0	0.831	33.6	LOS C	10.3	74.0	0.98	0.91	1.08	36.7
North: TALLAWONG ROAD														
7	L2	60	8.8	60	8.8	0.099	27.5	LOS B	1.1	8.2	0.90	0.75	0.90	18.0
8	T1	222	2.8	222	2.8	0.731	36.5	LOS C	4.9	35.4	1.00	0.88	1.11	32.3
9	R2	337	4.7	337	4.7	0.812	43.5	LOS D	3.9	28.7	1.00	0.92	1.27	29.4
Approach		619	4.4	619	4.4	0.812	39.4	LOS C	4.9	35.4	0.99	0.89	1.18	29.9
West: SCHOFIELDS ROAD														
10	L2	61	17.2	61	17.2	0.053	8.8	LOS A	0.4	2.8	0.37	0.63	0.37	47.0
11	T1	977	3.6	977	3.6	0.889	37.3	LOS C	12.3	87.8	1.00	1.09	1.36	27.5
12	R2	140	6.0	140	6.0	0.799	44.8	LOS D	3.3	24.3	1.00	0.93	1.36	34.3
Approach		1178	4.6	1178	4.6	0.889	36.7	LOS C	12.3	87.8	0.97	1.05	1.31	29.2
All Vehicles		3352	3.8	3352	3.8	0.907	36.7	LOS C	12.3	87.8	0.97	0.96	1.21	31.9

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	21	29.3	LOS C	0.0	0.0	0.92	0.92
P2	East Full Crossing	21	29.3	LOS C	0.0	0.0	0.92	0.92
P3	North Full Crossing	21	29.3	LOS C	0.0	0.0	0.92	0.92
P4	West Full Crossing	21	29.3	LOS C	0.0	0.0	0.92	0.92
All Pedestrians		84	29.3	LOS C			0.92	0.92

MOVEMENT SUMMARY

Site: TT [Tallawong / Themeda Existing AM + GROWTH + DEVT]

Network: N101 [Tallawong Existing AM + GROWTH + DEVT]

Tallawong / Themeda Existing AM + GROWTH + DEVT
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 80 seconds (Network Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Tallawong Road														
2	T1	274	10.0	274	10.0	0.117	9.8	LOS A	2.4	18.4	0.67	0.55	0.67	37.2
3	R2	148	9.9	148	9.9	0.489	44.4	LOS D	3.6	27.4	1.00	0.81	1.00	12.6
Approach		422	10.0	422	10.0	0.489	22.0	LOS B	3.6	27.4	0.79	0.64	0.79	23.9
East: Themeda Ave														
4	L2	184	10.9	184	10.9	0.503	38.2	LOS C	4.3	32.9	1.00	0.82	1.00	26.0
6	R2	41	5.1	41	5.1	0.108	37.4	LOS C	0.9	6.7	0.95	0.74	0.95	27.3
Approach		225	9.8	225	9.8	0.503	38.1	LOS C	4.3	32.9	0.99	0.81	0.99	26.2
North: Tallawong Road														
7	L2	241	0.4	241	0.4	0.525	25.2	LOS B	7.1	50.0	0.82	0.78	0.82	10.8
8	T1	527	3.4	527	3.4	0.525	20.4	LOS B	7.2	51.8	0.82	0.73	0.82	11.8
Approach		768	2.5	768	2.5	0.525	21.9	LOS B	7.2	51.8	0.82	0.74	0.82	11.5
All Vehicles		1416	5.9	1416	5.9	0.525	24.5	LOS B	7.2	51.8	0.84	0.72	0.84	19.6

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93
P2	East Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93
P3	North Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93
All Pedestrians		158	34.3	LOS D			0.93	0.93

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

MOVEMENT SUMMARY

Site: TT [Tallawong / Themeda Existing PM + growth + DEVT]

Network: N101 [Tallawong Existing PM + GROWTH + DEVT]

Tallawong / Themeda Existing PM + growth + DEVT
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 70 seconds (Network Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Tallawong Road														
2	T1	182	5.8	182	5.8	0.072	8.3	LOS A	1.5	10.7	0.72	0.58	0.72	39.5
3	R2	409	3.6	409	3.6	0.495	27.4	LOS B	7.8	56.1	0.96	0.86	0.96	18.0
Approach		592	4.3	592	4.3	0.495	21.5	LOS B	7.8	56.1	0.89	0.77	0.89	22.7
East: Themeda Ave														
4	L2	124	12.7	124	12.7	0.464	36.1	LOS C	2.6	20.0	0.98	0.79	0.98	26.8
6	R2	54	2.0	54	2.0	0.187	34.2	LOS C	1.1	7.6	0.95	0.75	0.95	28.5
Approach		178	9.5	178	9.5	0.464	35.5	LOS C	2.6	20.0	0.97	0.78	0.97	27.4
North: Tallawong Road														
7	L2	21	10.0	21	10.0	0.474	37.0	LOS C	2.4	17.1	0.97	0.77	0.97	8.1
8	T1	211	2.5	211	2.5	0.474	32.2	LOS C	2.4	17.2	0.97	0.76	0.97	8.2
Approach		232	3.2	232	3.2	0.474	32.7	LOS C	2.4	17.2	0.97	0.76	0.97	8.2
All Vehicles		1001	4.9	1001	4.9	0.495	26.6	LOS B	7.8	56.1	0.92	0.77	0.92	20.9

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	29.3	LOS C	0.1	0.1	0.92	0.92
P2	East Full Crossing	53	29.3	LOS C	0.1	0.1	0.92	0.92
P3	North Full Crossing	53	29.3	LOS C	0.1	0.1	0.92	0.92
All Pedestrians		158	29.3	LOS C			0.92	0.92

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

Appendix G

Car Park Scheme Advice

SHIPROCK ADVISORY

PO Box 1020 Caringbah NSW 1495 · Phone: 0439 646 168
Email: peter@shirprockadvisory.com.au

15 April 2020

Greg Colbran
Development and Planning Executive
Deicorp
Level 3,
161 Redfern Street
Redfern NSW 2016

Dear Greg

Proposed Mixed Use Development incorporating Retail and Commercial
Tallawong Station Precinct South- Parking allocation for Retail/Commercial

We refer to the proposed mixed-use site at the above location.

We commenced a retail/commercial marketing campaign in November 2019 to seek interest to lease out the retail and commercial at the above site.

This has involved presentations and meetings with Coles, Woolworths and other Supermarket operators (Aldi, Metcash, Independents) and associated support specialty shops such as; Fresh Food, Food and Beverage, Restaurants, Services, Gym, Child Care, medical, pharmacy and office tenants.

As these conversations commenced last year, we have found some major concerns being raised from our prospective tenants that the proposed parking allocation of 147 retail/commercial car spaces.

The comments from tenants and from my experience is that the parking allocation as proposed is inadequate to meet the customer needs of the Retail/Commercial precinct which will impact the viability of the Centre.

In my experience and if we are unable to achieve adequate parking this will impact on being able to secure retailers and or the appropriate retailers for the site to be able to have a viable business in this location.

Tallawong is an emerging greenfield location which will be a densely populated location in the future however in the meantime the community currently drives to all the retail centers within the catchment.

Whilst I note we have an adjoining commuter car park for the metro station which has been found to be at capacity by 6am in the morning.

Therefore, the proposed amended retail/commercial of 300 car spaces would be adequate to accommodate the parking requirements for a 9000 sqm Retail/Commercial Centre as proposed at Tallawong.

I would welcome the opportunity to discuss this further as to concerns raised on the parking allocation.

Any questions please contact me.

Yours Sincerely

Peter Mokas

CBRE (RP) Pty Ltd
ABN 92 127 174 207

Level 29, 177 Pacific Hwy
North Sydney NSW 2060

T 61 2 8969 8500
F 61 2 8969 8599

www.cbre.com.au

14th April 2020

Att: John Vamvakaris
Chief Operations Officer-Development
DEICORP
Level 4, 161 Redfern Street
Redfern NSW 2016

Dear John,

Re: Tallawong Car Park Scheme

As one of Australia's largest property services companies, CBRE has a deep understanding of the drivers of demand for residential properties across the country.

Our extensive experience in the sales and marketing of residential properties in new release areas like Sydney's North West enable us to accurately advise on the expectations and preferences of purchasers.

This experience confirms that purchasers of apartments in new development areas across the North West, including purchasers of 1-bedroom apartments, have a strong preference for car parking linked to their apartment. Whilst the major appeal of these areas is affordability and greatly improved transport as a result of the new train line, buyers rely on personal transport i.e. their own car for access to schools sporting amenities visiting friends and family etc. They rely on transport by train mainly for access to and from work, also other city-based events.

Sales of 1-bedroom apartments that do not include parking is significantly slower and results in a disproportionately lower price than comparable apartments with parking provided.

Our strong advice to developers of projects in the North West of Sydney is that a decision to not provide parking for all 1-bedroom apartments will dramatically reduce the saleability and demand for these dwellings.

We believe the correct scheme for Tallawong apartments needs to be as tabled below:

1 bed	1 car space
2 bed	1 car space
3 bed	2 car space

If you have any questions, please do not hesitate to contact me on 0418200236.

Yours sincerely,

14 April 2020

David Milton
CBRE
Managing Director
Residential Projects