



**TRAFFIC AND PARKING IMPACT ASSESSMENT OF
THE PROPOSED MIXED-USE DEVELOPMENT
AT 614 - 632 HIGH STREET, PENRITH**



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Development Type: **Mixed-Use Development**

Site Address: **614 - 632 High Street, Penrith**

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1 INTRODUCTION

McLaren Traffic Engineering was commissioned by *Urban Property Group* to provide a traffic and parking impact assessment of the proposed Mixed-Use Development at 614 - 632 High Street, Penrith as depicted in **Annexure A**.

It is noted that the development application is subject to an appeal in the Land and Environment Court, reference 355201 of 2021. The authors have read and agree to be bound by Part 31 Division 2 of the Uniform Civil Procedure Rules 2005 and the Expert Witness Code of Conduct being Schedule 7 to the Uniform Civil Procedure Rules 2005.

In addition to providing a comprehensive assessment of the traffic and parking impacts of the proposed development, specific responses to the Contentions raised in the Statement of Facts and Contentions filed on 18 February 2022 are provided in **Section 5**.

1.1 Description and Scale of Development

The proposed development has the following characteristics relevant to traffic and parking:

- A 5-storey and one-basement building containing:
 - Retail use of 976m² NLA;
 - Commercial use of 1311m² NLA;
 - 40 serviced apartments consisting of:
 - 33 x 2-bedroom dual key apartments;
 - 7 x 3-bedroom dual key apartments.
 - 254 residential apartments consisting of:
 - 83 x 1-bedroom apartments;
 - 134 x 2-bedroom apartments;
 - 37 x 3-bedroom apartments.
- Five (5) levels of car parking containing 305 car parking spaces comprising of:
 - 184 residential car parking spaces including 28 parking spaces for people with disabilities;
 - 54 serviced apartment car parking spaces including six (6) parking spaces for people with disabilities;
 - 36 residential visitor car parking spaces including one (1) parking space for people with disabilities;
 - 20 retail car parking spaces including one (1) parking space for people with disabilities;
 - Nine (9) commercial car parking spaces including one (1) parking space for people with disabilities;
 - Two (2) car share parking spaces.

- Vehicular access to the ground-level of the car park is provided via a proposed two-way driveway via Union Lane.
- Service vehicle access to the site is provided via a proposed two-way driveway via Union Lane.

1.2 State Environmental Planning Policy (Transport and Infrastructure) 2021

The proposed development does qualify as a traffic generating development with relevant size and/or capacity under *Clause 2.121* of the *SEPP (Transport and Infrastructure) 2021*, as the proposal provides more than 200 car parking spaces. Accordingly, formal referral to Transport for NSW (TfNSW) is necessary and the application will be assessed by Penrith City Council officers in conjunction with TfNSW officers.

1.3 Site Description

The subject site is currently zoned *B4 – Mixed Use* under the *Penrith Local Environmental Plan 2010*. The subject site is also included within the Penrith City Centre in accordance with Penrith Development Control Plan 2014.

The site is currently vacant land and is surrounded by a mix of commercial, residential and retail premises with generally high-density residential premises to the south of the site and Westfield Penrith located to the north of the site. The site has frontages of High Street to the north and Union Lane to the south.

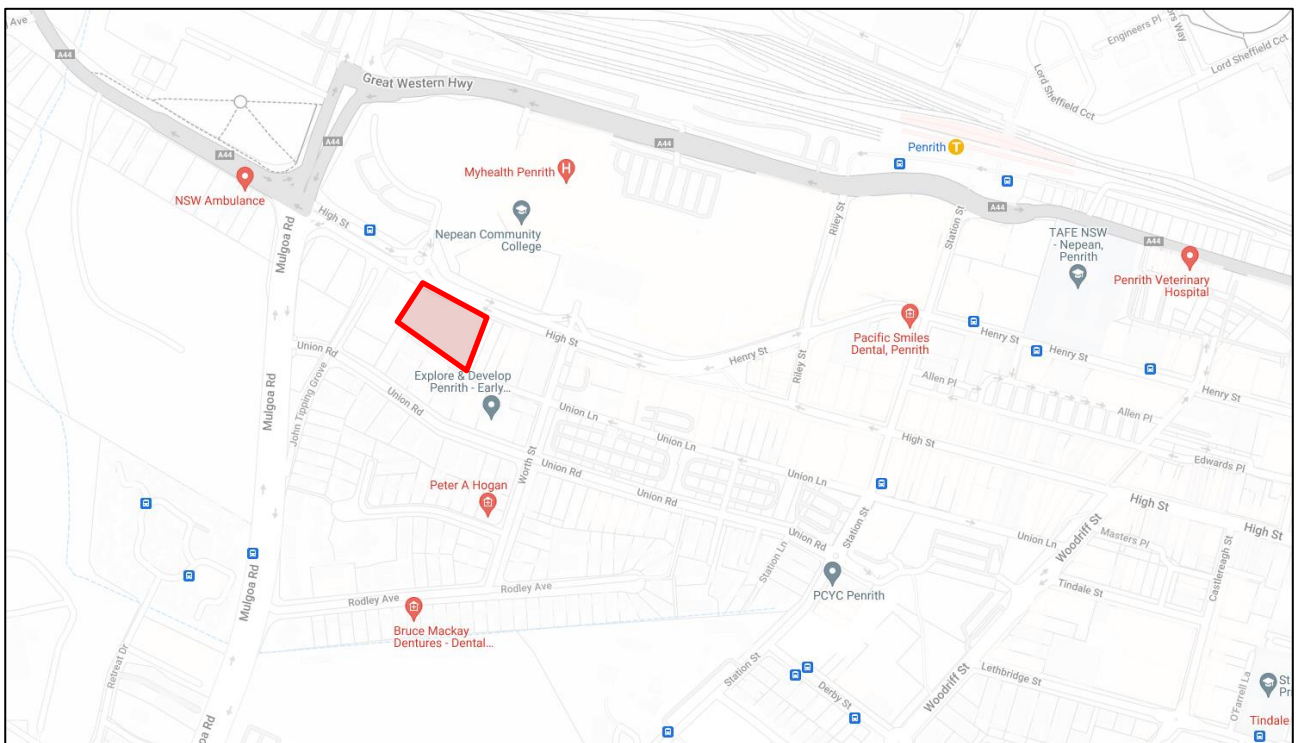
1.4 Site Context

The location of the site is shown on an aerial photo and a street map in **Figure 1** and **Figure 2** respectively.



— Site Location

FIGURE 1: SITE CONTEXT – AERIAL PHOTO



— Site Location

FIGURE 2: SITE CONTEXT – STREET MAP

2 EXISTING TRAFFIC AND PARKING CONDITIONS

2.1 *Road Hierarchy*

The road network servicing the site has characteristics as described in the following sub-sections.

2.1.1 Union Lane

- Unclassified LOCAL road;
- Approximately 6m wide carriageway facilitating one (1) traffic flow lane in each direction;
- Default 50km/h speed limit;
- Signposted '*No Stopping*' restrictions on both sides of the road.

2.1.2 Worth Street

- Unclassified LOCAL road;
- Approximately 12m wide carriageway facilitating two (2) traffic lanes in each direction;
- Default 50km/h speed limit;
- Signposted '*No Stopping*' restrictions on both sides of the road.

2.1.3 High Street

- Unclassified COLLECTOR road;
- Approximately 13m wide carriageway facilitating two (2) traffic flow lanes in each direction, localised carriageway widening occurs at intersections to accommodate turning lanes;
- Signposted 50km/h speed limit;
- Signposted '*No Stopping*' restrictions on both sides of the road, resulting in no kerbside parking;
- Shared bicycle and pedestrian footpath (with directional markings) on the northern side of the road west of Worth Street.

2.1.4 Mulgoa Road

- TfNSW Classified STATE Road (No. 155);
- Approximately 24m wide carriageway (including 10m wide central median) facilitating two (2) traffic flow lanes in each direction, localised carriageway widening occurs at intersections to accommodate turning lanes;
- Signposted 60km/h speed limit;
- Signposted '*No Stopping*' restrictions on both sides of the road.

2.2 Existing Traffic Management

- “Give Way” controlled intersection of Union Lane / Worth Street:
 - Union Lane is one-way westbound east of Worth Street.
- Signal controlled intersection of Union Road / Worth Street;
- Signal controlled intersection of High Street / Worth Street / Westfield car park;
- Pelican crossing located within High Street east of Worth Street;
- Roundabout controlled intersection of High Street / Penrith City Council car park;
- Signal controlled intersection of High Street / Mulgoa Road / Castlereagh Road.

2.3 Existing Traffic Environment

Vehicle turning movement count surveys were conducted at the following intersections from 7:00am to 9:30am and 2:30pm to 6:00pm on Thursday the 5 May 2022 representing a typical operating weekday:

- Worth Street / Union Road;
- Worth Street / Union Lane;
- Worth Street / High Street / Westfield carpark;
- High Street / Penrith City Council car park;
- High Street / Mulgoa Road / Castlereagh Road.

The full survey results are shown in **Annexure B** for reference.

2.3.1 Existing Road Performance

A review of the video footage of the signalised intersections of High Street / Mulgoa Road, High Street / Worth Street and Union Road / Worth Street was undertaken to determine the appropriate input cycle and phase times for the model.

The following considerations have been undertaken to ensure a realistic calibrated model:

- Consideration to the TCS Plan for signalised intersections High Street / Mulgoa Road, High Street / Worth Street and Union Road / Worth Street (**Annexure C**);
- A review of the phase length and cycle times based upon video footage which is reproduced in **Annexure D** for reference;
- Calibration of approach queue lengths (**Annexure E**) with consideration to the following input modifications:
 - Signal Coordination Arrival Type (assumption that the corridor is coordinated to optimise through vehicle movements);
 - Observed maximum queue lengths along Worth Street, High Street and Mulgoa Road.

The performance of the surrounding intersections under the existing traffic conditions has been assessed using SIDRA INTERSECTION 9.0, **Table 1** summarises the resultant intersection performance data, with full SIDRA results reproduced in **Annexure F**.

TABLE 1: EXISTING INTERSECTION PERFORMANCES (SIDRA INTERSECTION 9.0)

Intersection	Peak Hour	Degree of Saturation ⁽¹⁾	Average Delay ⁽²⁾ (sec/vehicle)	Level of Service ⁽³⁾	Control Type	Worst Movement	95th Percentile Queue
EXISTING PERFORMANCE							
High Street / Penrith City Council	AM	0.22	3.7 (Worst: 12.2)	A (Worst: A)	Roundabout	UT from Penrith City Council	0.5 veh (3.5m) High Street (W)
	PM	0.41	3.7 (Worst: 12.4)	A (Worst: A)		UT from Penrith City Council	0.8 veh (5.9m) High Street (E)
Worth Street / High Street	AM	0.25	20.8	B	Signals	RT from Penrith Plaza	4.1 veh (29.4m) High Street (E)
	PM	0.81	31.1	C		T from High Street (E)	9.1 veh (64.5m) High Street (E)
Mulgoa Road / High Street	AM	0.62	44.6	D	Signals	RT from High Street (E)	10 veh (79m) Mulgoa Road (S)
	PM	0.92	52.5	D		RT from Castlereagh Road (N)	15.8 veh (114.6m) Castlereagh Road (N)
Worth Street / Union Lane	AM	0.08	1.1 (Worst: 9)	N/A (Worst: A)	Give Way	RT from Union Lane (E)	0.1 veh (0.5m) Union Lane (E)
	PM	0.69	3 (Worst: 32.4)	N/A (Worst: C)		RT from Union Lane (E)	2.1 veh (14.9m) Worth Street (S)
Worth Street / Union Road	AM	0.38	26.5	B	Signals	T from Worth Street (S)	8 veh (56.7m) Union Road (W)
	PM	0.74	30.4	C		T from Worth Street (S)	11.5 veh (80.6m) Union Road (E)

NOTES:

(1) The Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.

(2) The average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.

(3) The Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets.

(4) No overall Level of Service is provided for Give Way and Stop controlled intersections as the low delays associated with the dominant movements skew the average delay of the intersection. The Level of Service of the worst approach is an indicator of the operation of the intersection, with a worse Level of Service corresponding to long delays and reduced safety outcomes for that approach.

As shown, the relevant intersections are generally performing at a satisfactory to high level of efficiency in both the AM and PM peak hour periods. The signal-controlled intersection of High Street / Mulgoa Road is currently performing at a level of service “D” in both the AM and PM peak, indicative that in the intersection is currently approaching capacity.

2.4 Public Transport

The subject site has access to existing bus stop (ID: 2750398) located approximately 150m walking distance to the northwest of the site on High Street. The bus stop services existing bus route 688 (Penrith to Emu Heights), 689 (Penrith to Leonay), 690P (Springwood to Penrith) and 691 (Mount Riverview to Penrith) provided by Blue Mountains Transit.

Penrith Train Station is located approximately 700m walking distance to the northeast of the subject site, servicing the T1 – North Shore and Western Line and Blue Mountains Line. A train service is provided every 5 – 10 minutes in commuter peak periods and provides direct access between Penrith and Sydney CBD.

The location of the site subject to the surrounding bus network is shown in **Figure 3**.

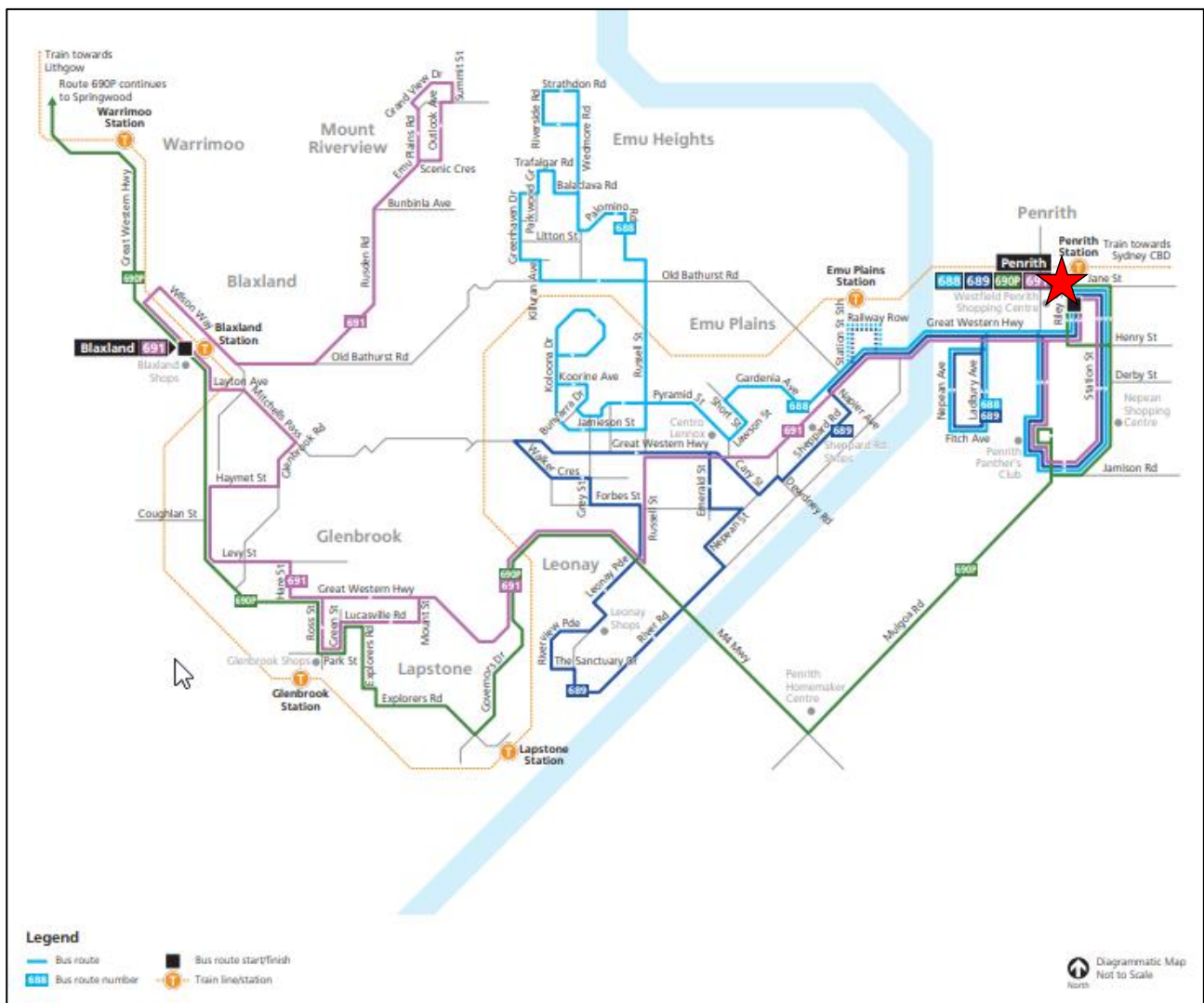


FIGURE 3: BUS NETWORK MAP

3 **PARKING ASSESSMENT**

3.1 **Council Parking Requirement**

Reference is made to *Penrith Development Control Plan (DCP) 2014: Section C10 – Transport, Access and Parking*, which designates the following parking rates applicable to the proposed development:

TABLE C10.2 – Car Parking Rates

Residential Flat Buildings

1 space per 1 or 2 bedrooms

2 spaces per 3 or more bedrooms

1 space per 40 units for service vehicles

In addition, visitor parking is to be provided for developments that have 5 or more dwellings: 1 space per every 5 dwellings, or part thereof.

1 space for car washing for every 50 units, up to a maximum of 4 spaces per building.

Business and office premises

Penrith City Centre – 1 space per 100m² GFA

Hotel or motel accommodation

1 space per unit plus 1 space per manager plus 1 space per 6 employees

Retail Premises

Penrith City Centre and St Marys Town Centre – 1 space per 30m² GFA

Penrith City Centre - A maximum 60% of the total number of commercial parking spaces required by a development, other than for service vehicles, car washing bays and parking spaces allocated to people with a disability, are to be provided on-site. residential developments containing 4 or more dwellings, a car wash bay is to be provided within the visitor parking area. The car wash bay may comprise a visitor car space.

The balance of the total required number of spaces not provided on-site would need to be subject to a contribution under an adopted Contribution Plan or as set by the terms of a Voluntary Planning Agreement.

It should be noted that Council's DCP residential parking rates do provide consideration to the accessibility of the site and are instead a broad rate that covers the whole of the LGA. The subject site is within close proximity to Penrith Train Station and Westfield Penrith such that it would be expected to demand a lower car ownership than other locations within the LGA. With consideration to this, the reference is made to the *TfNSW (formerly RTA) Guide to Traffic Generating Developments* (RTA Guide) which provides car parking rates for high density residential flat buildings in Metropolitan Regional (CBD) Centres:

5.4.3 High density residential flat buildings

Metropolitan Regional (CBD) Centres:

- 0.4 spaces per 1 bedroom unit.
- 0.7 spaces per 2 bedroom unit.
- 1.20 spaces per 3 bedroom unit.
- 1 space per 7 units (visitor parking).

Combining the most relevant car parking requirements for the site between Penrith City Council DCP 2014 and the RTA Guide results in the parking rates set out in **Table 2**.

TABLE 2: RELEVANT PARKING POLICIES AND GUIDES

Land Use	Requirement	Source
Business and Office Premises⁽²⁾	Penrith City Centre – 1 space per 100m ² GFA	Penrith City Council DCP 2014
Retail Premises⁽²⁾	Penrith City Centre – 1 space per 30m ² GFA	Penrith City Council DCP 2014
Hotel or Motel Accommodation⁽¹⁾⁽²⁾	1 space per unit plus 1 space per manager plus 1 space per 6 employees	Penrith City Council DCP 2014
1 Bedroom Unit	0.4 spaces per unit	Guide to Traffic Generating Developments
2 Bedroom Unit	0.7 spaces per unit	Guide to Traffic Generating Developments
3+ Bedroom Unit	1.2 spaces per unit	Guide to Traffic Generating Developments
Residential Visitor	1 space per 7 units	Guide to Traffic Generating Developments

Notes:

- (1) The Penrith DCP 2014 does not provide specific rates for serviced apartments and the application of the hotel/motel rate is appropriate based on the similarity between the land uses.
- (2) The Penrith DCP 2014 states that a maximum of 60% of the parking requirements of commercial uses for sites in the Penrith City Centre shall be provided for on-site and that the remainder shall be subject to contributions.

Application of the above rates to the scale of the development results in the quantum of car parking as summarised in **Table 3**.

TABLE 3: PARKING REQUIREMENTS OF PROPOSAL

Land Use	Requirement	Scale	Parking Required On-Site (spaces)	Maximum Spaces Subject to Contributions	Proposed
Business and Office Premises	Penrith City Centre – 1 space per 100m ² GFA	1,311m ²	8	5	9
Retail Premises	Penrith City Centre – 1 space per 30m ² GFA	976m ²	20	13	20
Serviced Apartments⁽¹⁾	1 space per unit plus 1 space per manager plus 1 space per 6 employees	80 Keys	49 ⁽¹⁾	32	54
1 Bedroom Unit	0.4 spaces per unit	83	33	0	184
2 Bedroom Unit	0.7 spaces per unit	134	94	0	
3+ Bedroom Unit	1.2 spaces per unit	37	45	0	
Residential Visitor	1 space per 7 units	254	36	0	36
Total	-	-	285	50	305

Notes:

(1) A total of 3 staff are assumed, corresponding to one space.

As shown above, application of the relevant parking rates requires the provision of **285** car parking spaces and **50** car parking spaces subject to contributions. The proposed plans detail the provision of **305** car parking spaces, which results in **30** car parking spaces subject to contributions.

3.2 Parking for People with Disabilities

Penrith City Council DCP 2014 refers to the Building Code of Australia and AS2890 in relation to parking for people with disabilities. As such, reference is made to *Table D3.5* of the *Building Code of Australia* (BCA) as part of the *National Construction Code 2019* (NCC) which categorises a the commercial and retail use of the site as a Class 5 and Class 6 building respectively. Therefore, the site requires the provision of car parking for people with disabilities at a rate of:

Class 5 *1 space for every 100 carparking spaces or part thereof.*

Class 6 *1 space for every 50 carparking spaces or part thereof.*

In accordance with the BCA requirements, one (1) accessible car parking space is required for the commercial use of the site and one (1) accessible car parking space is required for the retail use of the site. The proposed development details one (1) accessible space for the commercial, retail and residential visitors (3 spaces total), satisfying the BCA requirement.

In addition to the above, the proposed development includes 31 adaptable units and five (5) adaptable serviced apartments. AS4299:1995 – *Adaptable Housing* requires one (1) adaptable car parking space to be provided per adaptable unit. Therefore, the proposed development requires 36 adaptable/accessible car parking spaces for the residential use of the site. The proposed development details 36 accessible car parking spaces in accordance with the requirements of AS4299:1995.

3.3 **Bicycle Parking Requirements**

Reference is made to Council's DCP which outlines the following requirements for bicycle and motorcycle parking spaces.

Provision of Bicycle Parking Spaces

- a) *For commercial developments providing employment for 20 people or more, bicycle parking is to be in secure and accessible locations, and provided with weather protection, in accordance with AS2890.3:1993 Bicycle Parking Facilities.*

The proposed plans detail the provision **134** bicycle spaces which are expected to adequately accommodate the demand of the site.

3.4 **Motorcycle Parking Requirements**

The Penrith City Council DCP 2014 does not outline a motorcycle parking provision and as such does not require the provision of this facility. Nil (0) motorcycle parking has been provided, satisfying Council requirements.

3.5 **Servicing & Loading**

The Penrith City Council DCP states the following with regard to loading and servicing facilities:

Table C10.3

Site Area	Design Vehicle
<i>Up to 1,500m²</i>	<i>Medium Rigid Vehicle (MRV)</i>
<i>1,500m² to 4,000m²</i>	<i>Heavy Rigid Vehicle (HRV)</i>
<i>Greater than 4,000m²</i>	<i>Articulated Vehicle</i>

While the site in totality is greater than 1,500m² the individual retail and commercial premises are each individually less than 500m² GFA. Therefore, an MRV is expected to be able to adequately accommodate the servicing requirements of the site. An on-site loading bay has been provided able to accommodate one (1) 8.8m MRV and one (1) 10.5m long waste service vehicle (in accordance with the *EPA Better practice guide for resource recovery in residential developments 2019*) concurrently. Swept path testing of an MRV and 10.5m long waste collection vehicle accessing and egressing each loading space is shown in **Annexure G**.

It should be noted that Union Lane is approximately 6m in width and will result in a constraint environment for truck access. However, waste collection vehicles already use the laneway to collect from the sites to the west along the laneway. Therefore, the proposed loading and waste collection will be no change in that operation to the existing conditions along the laneway. In addition, heavy vehicle movements are unlikely to occur during peak times and will be of low in frequency.

3.6 Car Park Design & Compliance

The car parking layout as depicted in **Annexure A**, has been assessed to achieve the relevant clauses and objectives of AS2890.1:2004, AS2890.2:2002 and AS2890.6:2009. Any variances from standards are addressed in the following subsections including required changes, if any. Swept path testing has been undertaken and are reproduced within **Annexure G** for reference.

The proposed car parking and vehicular access design achieves the following:

- 6m wide entry driveway and 4.0m exit driveway via Union Lane;
- 8.1m wide two-way service vehicle driveway facilitating access to Union Lane;
- Minimum 5.8m wide parking aisles;
- Compliant ramp grades not exceeding 25% for private developments and no grade change greater than 12.5%;
- Minimum 5.4m long, 2.4m wide spaces for staff / residents;
- Minimum 5.4m long, 2.5m wide spaces for visitors;
- Minimum 5.4m long, 2.4m wide disabled spaces with adjacent associated 5.4m long, 2.4m wide shared space;
- Minimum 5.4m long, 3.8m width adaptable spaces;
- Minimum headroom of 2.2m for general circulation and 2.5m headroom clearance provided over disabled and adaptable parking areas;
- Minimum 4.5m headroom within the loading/servicing area.

Whilst the plans have been assessed to comply with the relevant standards, it is usual and expected that a design certificate be required at the Construction Certificate stage to account for any changes following the development application.

4 TRAFFIC ASSESSMENT

The impact of the expected traffic generation levels associated with the subject proposal is discussed in the following sub-sections.

4.1 *Traffic Generation*

Traffic generation rates for the relevant land uses are provided in the *RTA Guide to Traffic Generating Developments (2002)* as adopted by Transport for New South Wales (TfNSW) and recent supplements and are presented in **Table 4** below..

The selection of the Sydney Average rates of traffic generation provided in the RMS Technical Direction 2013/04a for the residential units is based on several factors, being:

- The rate of parking provision for the residential units, which averages 0.72 spaces per unit and is similar to the minimum rates of parking required in the RTA Guide to Traffic Generating Developments 2002 for High Density Residential Units in Metropolitan Regional CBD Centres.
- The location of the site is within 800m walking distance of Penrith Train Station and associated Bus Interchange, which provides an attractive option for commuters.
- The site is within the Penrith City Centre as defined in the PDCCP 2014 and residents will be within easy walking distance of employment, shopping and recreational facilities which will suppress private car travel.
- The nearest entrance to the Westfield Penrith Shopping Centre is approximately 200m walking distance from the site and it is likely that residents will walk to and from the centre to complete a significant proportion of daily trips.

TABLE 4: RELEVANT TRAFFIC GENERATION RATES

Land Use	Traffic Generation Rate	Source
Business and Office Premises	AM – 1.6 peak hour vehicle trips per 100m ² GFA PM – 1.2 peak hour vehicle trips per 100m ² GFA	RMS TDT 2013/04a
Retail Premises	Weekday PM – 56 trips per 1000m ²	RTA Guide to Traffic Generating Developments ⁽¹⁾
Serviced Apartments⁽²⁾	Evening Peak Hour – 0.4 trips per unit	RTA Guide to Traffic Generating Developments
High-Density Dwellings	AM – 0.19 trips per unit PM – 0.15 trips per unit	RMS TDT 2013/04a

Notes:

- (1) It is typical practice to utilise the weekday peak hour traffic generation rate of 56 trips per 1000m² for speciality stores in a town centre environment based on the traffic generation rates for shopping centres provided in the Guide to Traffic Generating Developments.
- (2) There is no local reference source that specifically provides a traffic generation rate for service apartments and the motel land use is the most similar land use for which a rate is available.

The resulting traffic generation is summarised in **Table 5**.

TABLE 5: ESTIMATED TRAFFIC GENERATION

Land Use	Peak Hour	Traffic Generation Rate	Scale	Trips		
				IN	OUT	Total
Business and Office Premises⁽¹⁾	AM	1.6 peak hour vehicle trips per 100m ² GFA	1,311m ²	17	4	21
	PM	1.2 peak hour vehicle trips per 100m ² GFA		3	13	16
Retail Premises⁽²⁾	AM	50% of PM Rate	976m ²	14	13	27
	PM	56 trips per 1000m ²		27	28	55
Serviced Apartments⁽³⁾	AM	0.4 trips per unit	80 Keys	6	26	32
	PM			26	6	32
High Density Dwellings⁽³⁾	AM	0.19 trips per unit	254 Units	9	39	48
	PM	0.15 trips per unit		30	8	38
AM Total	-	-	-	46	82	128
PM Total	-	-	-	86	55	141

Notes:

- (1) Directional split of 80% incoming traffic and 20% outgoing traffic applied for the AM peak hour. Vice versa in the PM peak hour.
- (2) Directional split of 50% incoming traffic and 50% outgoing traffic applied for the AM and PM peak hours.
- (3) Directional split of 80% incoming traffic and 20% outgoing traffic applied for the AM peak hour. Vice versa in the PM peak hour.

As shown, the expected traffic generation associated with the proposed development is in the order of **128** vehicle trips in the AM peak period (46 in, 82 out) and **141** vehicle trips in the PM peak period (86 in, 55 out).

4.2 Traffic Distribution

Based on Journey to Work data from the 2016 census, persons living in Penrith worked in the locations listed in **Table 6**.

TABLE 6: 2016 CENSUS JOURNEY TO WORK DATA – PLACE OF RESIDENCE OF PENRITH

Place of Work	% of Persons Living in Penrith
Castlereagh - Cranebrook	9%
Glenmore Park - Regentville	8%
Jamisontown - South Penrith	7%
Penrith	7%
Emu Plains - Leonay	5%
Blaxland - Warrimoo - Lapstone	5%
Cambridge Park	5%
Kingswood - Werrington	5%
Springwood - Winmalee	5%
Mulgoa - Luddenham - Orchard Hills	3%

The surrounding road network, including the upgrades that are currently underway to the intersections along Mulgoa Road, facilitates access to major arterial routes from Mulgoa Road.

On this basis, the following traffic distribution has been assumed:

- Outgoing Traffic
 - 80% of traffic will turn left from Union Lane towards High Street;
 - 10% of traffic will turn right at High Street;
 - 70% of traffic will turn left at High Street:
 - 25% of traffic will turn right at Mulgoa Road;
 - 45% of traffic will travel through on High Street.
 - 20% of traffic will turn right from Union Lane towards Union Road;
 - 3% of traffic will turn right at Union Road;
 - 17% of traffic will turn left at Union Road.
- Incoming Traffic
 - 80% of traffic will turn left into Union Lane from Worth Street;
 - 70% of traffic will turn left from Union Road at Worth Street;
 - 10% of traffic will turn right from Union Road at Worth Street.
 - 20% of traffic will turn right into Union Lane from Worth Street;
 - 10% of traffic will turn left from High Street at Worth Street;
 - 10% of traffic will turn right from High Street at Worth Street:
 - 4% of traffic will turn left on High Street;
 - 6% of traffic will travel through on High Street.

4.3 Traffic Impact

The traffic generation outlined in **Section 4.1 & 4.2** above has been added to the existing traffic volumes recorded. SIDRA INTERSECTION 9.0 was used to assess the intersections performance. The purpose of this assessment is to compare the existing intersection operations to the future scenario under the increased traffic load. The results of this assessment are shown in **Table 7**.

In addition to the assessment of the existing volumes on the road network, modelling of future background growth volumes along all roads of 2% for 14 years (assumed 4 years until completion plus 10 years) was undertaken. The results of this assessment are shown in **Table 8**.

TABLE 7: INTERSECTION PERFORMANCE
SIDRA INTERSECTION 9.0

Intersection	Peak Hour	Degree of Saturation ⁽¹⁾	Average Delay ⁽²⁾ (sec/vehicle)	Level of Service ⁽³⁾	Control Type	Worst Movement	95th Percentile Queue
EXISTING PERFORMANCE							
High Street / Penrith City Council	AM	0.22	3.7 (Worst: 12.2)	A (Worst: A)	Roundabout	UT from Penrith City Council	0.5 veh (3.5m) High Street (W)
	PM	0.41	3.7 (Worst: 12.4)	A (Worst: A)		UT from Penrith City Council	0.8 veh (5.9m) High Street (E)
Worth Street / High Street	AM	0.25	20.8	B	Signals	RT from Penrith Plaza	4.1 veh (29.4m) High Street (E)
	PM	0.81	31.1	C		T from High Street (E)	9.1 veh (64.5m) High Street (E)
Mulgoa Road / High Street	AM	0.62	44.6	D	Signals	RT from High Street (E)	10 veh (79m) Mulgoa Road (S)
	PM	0.92	52.5	D		RT from Castlereagh Road (N)	15.8 veh (114.6m) Castlereagh Road (N)
Worth Street / Union Lane	AM	0.08	1.1 (Worst: 9)	N/A (Worst: A)	Give Way	RT from Union Lane (E)	0.1 veh (0.5m) Union Lane (E)
	PM	0.69	3 (Worst: 32.4)	N/A (Worst: C)		RT from Union Lane (E)	2.1 veh (14.9m) Worth Street (S)
Worth Street / Union Road	AM	0.38	26.5	B	Signals	T from Worth Street (S)	8 veh (56.7m) Union Road (W)
	PM	0.74	30.4	C		T from Worth Street (S)	11.5 veh (80.6m) Union Road (E)
EXISTING + Development							
High Street / Penrith City Council	AM	0.22	3.6 (Worst: 12.2)	A (Worst: A)	Roundabout	UT from Penrith City Council	0.5 veh (3.6m) High Street (W)
	PM	0.46	3.7 (Worst: 12.4)	A (Worst: A)		UT from Penrith City Council	0.9 veh (6.3m) High Street (E)
Worth Street / High Street	AM	0.30	22.8	B	Signals	RT from High Street (W)	4.6 veh (33.1m) High Street (E)
	PM	0.84	29.4	C		RT from Penrith Plaza	9.7 veh (69m) High Street (E)
Mulgoa Road / High Street	AM	0.62	45.1	D	Signals	RT from High Street (E)	10.2 veh (80.8m) Mulgoa Road (S)
	PM	0.94	53.9	D		RT from Castlereagh Road (N)	16.7 veh (121m) Castlereagh Road (N)
Worth Street / Union Lane	AM	0.10	2.1 (Worst: 10.5)	N/A (Worst: A)	Give Way	RT from Union Lane (E)	0.2 veh (1.2m) Union Lane (W)
	PM	0.59	3.6 (Worst: 31.1)	N/A (Worst: C)		RT from Union Lane (E)	1.2 veh (8.7m) Worth Street (N)
Worth Street / Union Road	AM	0.43	26.7	B	Signals	T from Worth Street (S)	8.5 veh (60.6m) Union Road (W)
	PM	0.79	31.4	C		T from Worth Street (S)	13.2 veh (92.6m) Union Road (E)

Notes: Refer to **Table 1**

TABLE 8: INTERSECTION PERFORMANCE – BACKGROUND GROWTH
SIDRA INTERSECTION 9.0

Intersection	Peak Hour	Degree of Saturation ⁽¹⁾	Average Delay ⁽²⁾ (sec/vehicle)	Level of Service ⁽³⁾	Control Type	Worst Movement	95th Percentile Queue
EXISTING + 14 Years Background Growth							
High Street / Penrith City Council	AM	0.29	3.7 (Worst: 12.7)	A (Worst: A)	Roundabout	UT from Penrith City Council	0.7 veh (5m) High Street (W)
	PM	0.76	3.9 (Worst: 13)	A (Worst: A)		UT from Penrith City Council	7.5 veh (52.9m) High Street (E)
Worth Street / High Street	AM	0.35	21.4	B	Signals	RT from Penrith Plaza	5.2 veh (37.7m) High Street (E)
	PM	0.92	34.5	C		RT from High Street (W)	10.7 veh (76m) High Street (E)
Mulgoa Road / High Street	AM	0.79	47.3	D	Signals	RT from High Street (E)	14.7 veh (115.8m) Mulgoa Road (S)
	PM	1.20	80	F		RT from Castlereagh Road (N)	31.7 veh (229.1m) Castlereagh Road (N)
Worth Street / Union Lane	AM	0.10	1.2 (Worst: 11.1)	N/A (Worst: A)	Give Way	RT from Union Lane (E)	0.1 veh (0.8m) Union Lane (E)
	PM	1.38	17.1 (Worst: >70)	N/A (Worst: F)		RT from Union Lane (E)	5.9 veh (41.4m) Worth Street (N)
Worth Street / Union Road	AM	0.62	28.5	C	Signals	T from Worth Street (S)	11 veh (78.3m) Union Road (W)
	PM	1.06	61.9	E		RT from Union Road (E)	33.7 veh (236.1m) Union Road (E)
EXISTING + 14 Years Background Growth + Development							
High Street / Penrith City Council	AM	0.29	3.7 (Worst: 12.7)	A (Worst: A)	Roundabout	UT from Penrith City Council	0.7 veh (5.2m) High Street (W)
	PM	0.78	3.9 (Worst: 13)	A (Worst: A)		UT from Penrith City Council	8.3 veh (58.4m) High Street (E)
Worth Street / High Street	AM	0.40	23.5	B	Signals	RT from Penrith Plaza	7 veh (50.5m) High Street (E)
	PM	0.95	35.4	C		RT from Penrith Plaza	11.2 veh (79.7m) High Street (E)
Mulgoa Road / High Street	AM	0.80	48	D	Signals	RT from High Street (E)	14.3 veh (112.8m) Mulgoa Road (S)
	PM	1.20	80.9	F		RT from Castlereagh Road (N)	31.7 veh (229.1m) Castlereagh Road (N)
Worth Street / Union Lane	AM	0.16	2.1 (Worst: 13.3)	N/A (Worst: A)	Give Way	RT from Union Lane (E)	0.2 veh (1.4m) Union Lane (W)
	PM	1.49	20.9 (Worst: >70)	N/A (Worst: F)		RT from Union Lane (E)	6.9 veh (48.7m) Worth Street (N)
Worth Street / Union Road	AM	0.66	28.5	C	Signals	T from Worth Street (S)	11.3 veh (80.4m) Union Road (W)
	PM	1.13	70.4	E		RT from Union Road (E)	37.8 veh (265m) Union Road (E)

4.3.1 Results Discussion – Existing Base Volumes

As shown in **Table 7**, the relevant intersections retain a satisfactory level of efficiency under post development traffic loading, with the assessed intersections performing at a satisfactory to high level of efficiency in both the AM and PM peak hour periods.

It is noted that the intersection of High Street / Mulgoa Road moves from a Level of Service “C” to “D” during the AM peak hour. However, as discussed in Section 2.3.1 the existing performance of the intersection was operation on the cusp of Level of Service “D”, highlighted by the increase in average delay was only 0.4s which resulted in the change of Level of Service.

4.3.2 Results Discussion – Existing + Growth Base Volumes

As shown in **Table 8**, background growth volumes are expected to cause the intersections of Mulgoa Road / High Street, Worth Street / Union Lane and Worth Street / Union Road to exceed a degree of saturation of 1 in the PM peak hour. This indicates that the traffic volumes approaching these intersections during this peak hour exceed their capacity. Any additional traffic volumes approaching the intersections will disproportionately increase average delays at the intersection.

The addition of the development volumes will not noticeably affect the performance of any of the intersections after the addition of the background growth volumes, with only small changes to the delays at the intersections expected.

5 RESPONSE TO CONTENTIONS

The relevant contentions provided in the Statement of Facts and Contentions filed on 18 February 2022 are reproduced and responded to in the following sub-sections.

5.1 **Contention 9 – Traffic**

The application should be refused because of the unsatisfactory traffic, parking, access and related pedestrian safety impacts.

5.1.1 Particular (a)

The proposed development directs substantial traffic onto Union Lane to the uncontrolled intersection with Worth Street. The increased traffic generated raises concerns with the likelihood of an increase in cross traffic crashes.

The proposed development is estimated to generate approximately 128 vehicles in the AM peak hour and 141 vehicles in the PM peak hour, which equates to 2 – 3 vehicles per minute. The additional traffic generation has been assessed using SIDRA Intersection model for both peak hours, with the results indicating that the performance of the intersection of Union Lane and Worth Street would be unchanged by the additional traffic.

With regards to the suggested impact on road safety at the intersection, sight distances are clear in both directions at the intersection, existing speeds are low, and the context encourages a high level of driver alertness. As detailed in **Section 4.2**, most traffic from the proposed development will make left turns into and out of the laneway, which have a minimal crash risk. The small number of vehicles that will make right turns at the intersection will be provided with adequate sight distances and are unlikely to noticeably increase the risk of crashes.

5.1.2 Particular (b)

Swept path testing of the entrance to Union Lane from Worth Street indicates that it is not possible for light vehicles to pass a heavy vehicle waiting to turn out of the laneway and vice-versa. There is the potential for the issue to be exacerbated by the proposed development. A Plan of Management is not an acceptable solution to manage this impact of the development.

The existing intersection between Union Lane and Worth Street is presently used by an extremely low number of heavy vehicles, such that in the six hours of traffic surveys undertaken, only one heavy vehicle was recorded entering and exiting Union Lane (west).

The proposed development site would result in an increase in vehicle movements at the intersection as follows based on the scale and nature of the proposed uses:

- Up to 141 light vehicles in the worse (PM) peak hour;
- Up to 2 additional heavy vehicle movements, being one vehicle entering and exiting the site.

The probability of conflict between vehicle movements at the intersection can be determined based on the following assumptions:

- A. A conflict would occur if a heavy vehicle was turning either right or left into the laneway whilst another vehicle was waiting to turn out (Scenario 1);
- B. A conflict would occur if a light vehicle was turning left into the laneway whilst a heavy vehicle was waiting to turn out (Scenario 2). It is noted that a light vehicle will be able to make a right turn into the laneway if a heavy vehicle is waiting.

Based on these assumptions there is a 0.07% chance of a conflict in the existing peak hours, based on the PM peak. Based on the post-development traffic volumes, there would be a 0.79% chance of a conflict in the PM peak hour. Whilst the chance of conflict does increase, it remains below a 1% chance in the peak hour and is still a very unlikely event.

In terms of the outcomes for the two scenarios if they do occur:

- A. In the case that a heavy vehicle arrives whilst a vehicle is waiting to turn out of the laneway (Scenario 1), the truck driver would give way to the vehicle exiting the laneway before making the turn.
- B. In the case that a light vehicle arrives from the south whilst a heavy vehicle is waiting to turn out of the laneway, the car driver would give way to the heavy vehicle before making the turn.

There would be a minor increase in delays for the vehicle giving way in each Scenario, but given the extremely low likelihood there would be no noticeable effect on the road network, as any localised queuing would be cleared immediately.

5.1.3 Particular (c)

The proposal does not demonstrate a 'good design' outcome as required under clause 2(g) of the State Environmental Planning Policy (Infrastructure) 2007. The location of the future intersection has been pushed eastward and results in more extensive works to Council's Civic Centre entry point and the removal of a mature and significant tree. Other impacts on trees adjacent to Council's car park entry are not known. Justification of the selected location of the intersection and new road has not been provided.

The amended application does not include any intersection works on High Street and rather dedicates land to facilitate the future construction of a road and intersection to Council's satisfaction in the future by others, consistent with Figure E11.26 of the PDCP 2014.

5.1.4 Particular (d)

The proposal does not comply with clause 104 of the Infrastructure SEPP because it does not address how traffic generated by the development is to be managed within the local road system. In particular, the proposal does not address whether reliance upon Union Lane as the principal means of

vehicular access and egress for more than 270 apartments and a number of commercial uses is appropriate.

The results of the assessment undertaken and detailed in **Section 4** of this report demonstrate that the proposed access to Union Lane will have no unacceptable impacts on the road network in the surrounds of the site.

Union Lane is an access-dominant laneway which is designed to facilitate vehicle access to land and is the more appropriate point of access when compared to the alternative of High Street, which is a traffic-flow dominant road serving a high proportion of the vehicle traffic through the Penrith City Centre.

5.1.5 Particular (e)

The existing the road infrastructure does not cater for the volume of traffic generated by the proposal. The current form and extent of Union Lane is inappropriate as the principle means of vehicular ingress and egress for 272 residential apartments, 41 serviced apartments, 5 commercial tenancies, the drop-off zone for the serviced apartments and the service vehicles associated with these uses.

The results of the assessment undertaken and detailed in **Section 4** of this report demonstrate that the proposed access to Union Lane will have no unacceptable impacts on the road network in the surrounds of the site.

5.1.6 Particular (f)

The Transport for NSW remain unresolved and must be taken into account.

Transport for NSW are not a consent authority for this development application and any specific concerns with the amended application can be raised by Council and addressed without the further involvement of TfNSW.

5.2 Contention 10 – Transport, Access and Parking

5.2.1 Particular (a)

Insufficient detail has been provided in relation to the required road works including all relevant details of the new north-south road to be constructed and its connections with High Street, Union Road and Union Lane.

The amended application does not include any road works along High Street, Union Road or Union Lane.

5.2.2 Particular (b)

The Civil Works Plans appear to indicate a kerb and gutter and road alignment that facilitates only a single lane width on Union Lane adjoining the proposed new link road. A single or one way arrangement for Union Lane is not supported and is not a functional option in the absence of any extension of Union Lane.

The amended application proposes no changes to the width or two-way flow along Union Lane.

5.2.3 Particular (c)

The proposed development will impact the performance of the traffic signals at the intersection of Worth Street and High Street. The existing level of service for the traffic signals at that intersection is 'F'. The contribution of even marginal traffic generation further exacerbates the poor LOS and as such no development traffic, other than potentially servicing vehicles, may utilise Union Lane until alternate relief valves are offered in this quadrant.

The results of the traffic modelling as summarised in **Section 4** indicate that the proposed development will have no unacceptable impact on the intersection of Worth Street and High Street.

5.2.4 Particular (d)

The current plans do not ensure that an appropriate footprint has been set aside for future signalised intersection for the new north-south road required by DCP E11 11.7.1 (c) and only show a hatched area designated as 'Road Widening'. The application should demonstrate that the new north south road including a 3.5m wide pedestrian verge on the eastern side, can be achieved as well as the ultimate final fully signalised intersection.

The proposed dedication of between 6m and 7.8m of width along the western boundary of the site is expected to facilitate the construction of a signalised intersection in the future by others. It is noted that the design includes footpath areas along this frontage which are not included in the dedication and will be retained to supplement pedestrian access in the future.

5.2.5 Particular (e)

The proposal is inconsistent with DCP Part E11 11.3.1 Control 2 which requires existing dead end lanes be extended through to the next street as redevelopment occurs.

The proposal dedicates land to facilitate the future construction of a road and intersection to Council's satisfaction in the future by others, consistent with Figure E11.26 of the PDCP 2014.

5.2.6 Particular (f)

The failure to establish the new north-south road identified in the DCP E11 11.7.1 for vehicle traffic has implications for the road network and the capacity of the site to support development at scale. The new north-south road is required to be established consistent with DCP E11 11.7 Principle 2) to provide north-south connectivity and the active 'eat street' adjoining the Civic and Cultural Precinct and the DCP Precinct Design Principles figure E11.26.

The results of the traffic modelling as summarised in **Section 4** indicate that the proposed development will have no unacceptable impact on the surrounding road network.

The proposal dedicates land to facilitate the future construction of a road and intersection to Council's satisfaction in the future by others, consistent with Figure E11.26 of the PDCP 2014.

5.2.7 Particular (g)

The proposal fails to achieve DCP C10 10.2 Objectives A (a), (d), (e), & (f) to provide safe and efficient travel routes for all vehicles, to cater for current and future growth of vehicle traffic usage, to encourage the orderly and economic provision of road and intersection works, and to ensure that existing roads and intersections are upgraded to provide a satisfactory level of service consistent with the volume and nature of traffic generated by the proposed development.

The results of the traffic modelling as summarised in **Section 4** indicate that the proposed development will have no unacceptable impact on the surrounding road network. An assessment of the surrounding road network has been undertaken under future background growth conditions, which indicate that many of the intersections will require upgrade irrespective of whether the development proceeds.

5.2.8 Particular (h)

The proposal does not demonstrate how it minimises the potential for vehicular/pedestrian conflicts, providing protection for pedestrians where necessary, not restricts traffic flow or creates a hazard to traffic on roads in the vicinity of the development, or identify the need, where apparent, for any additional on-street traffic facilities or road works which may be required to maintain the safe and efficient movement of vehicles and pedestrians as required by DCP C10 10.2 Control 2(a) (ii), (iii) & (v).

The proposed design physically separates vehicle movements from the activated frontages on the north, east and west sides of the site. The site is approximately 90m from the existing traffic signals at the High Street and Worth Street intersection, which includes pedestrian crossings on all approaches. There is no need for any upgrades of the public road network in the surrounds of the site or changes to the proposed design to cater for the safe movements of pedestrians.

With regards to vehicle movements, as addressed above in **Section 5.2.1** the traffic generation of the development will not have any unacceptable impact on road safety at the intersection of Union Lane and Worth Street. Similarly, it is not expected that the traffic associated with the development will have any unacceptable impacts on the safety of the road network more broadly.

5.2.9 Particular (i)

The location of the vehicular access does not consider the traffic impacts on the surrounding road network as required by DCP C10 10.2 Control (2)(c) which in the absence of an extension to Union Lane would require road widening

The results of the traffic modelling as summarised in **Section 4** indicate that the proposed development will have no unacceptable impact on the surrounding road network.

5.2.10 Particular (j)

The design of the vehicle entry points does not comply with table 3.2 of AS 2890.1.

The revised design includes separated driveways as required by Table 3.2 of AS2890.1:2004.

5.2.11 Particular (k)

The design of some of the accessible car parking spaces do not satisfy the requirements of AS 2890.6.

The accessible spaces provided on the revised design meet the requirements of AS2890.6:2009.

5.2.12 Particular (l)

The parking spaces provided for the serviced apartments do not comply with the required minimum 2.5m width as per AS 2890.1 and as required by DCP C10 10.5.1 Control (5)(a), which requires user class 2 dimensions for hotel or motel type use parking.

The usage of parking spaces allocated to Serviced Apartments will be similar to that of those spaces allocated to residents or to commercial / retail staff, in that the parking spaces will be allocated to a single user who will typically use the space for long-term (overnight) parking. On this basis, a space width of 2.4m is acceptable for allocation to serviced apartments.

5.2.13 Particular (m)

Visitor parking is not located outside the secure parking area as required by DCP C10 10.5.1 Control (5)(o).

The revised design locates visitor parking outside of the secure parking area.

5.2.14 Particular (n)

The commercial and residential activities of the building are not provided separate service provision including loading facilities contrary to DCP E11 11.2.6 Objective 3 and 11.4.3 Control 10.

The provision of separate loading and servicing facilities for the residential and commercial uses of the site is unnecessary and would be extremely onerous given the manoeuvring requirements of heavy vehicles. The proposed loading dock will adequately cater to both commercial and residential loading operations.

5.2.15 Particular (o)

The proposal relies on Union Lane as the primary entry and exit point for all traffic generated by the development. The proposed development cannot be adequately serviced without the construction of the new north-south road and its intersections and fails to meet DCP Part B 1.2 Principle 5 requiring the provision of adaptable and inclusive infrastructure which meets the needs of development and is designed to accommodate likely future needs.

The results of the traffic modelling as summarised in **Section 4** indicate that the proposed development will have no unacceptable impact on the intersection of Worth Street and High Street based on the existing road layout.

5.2.16 Particular (p)

The failure to establish the new laneway identified in the DCP for vehicle traffic has implications for the road network and the capacity of the site to support development at scale.

The results of the traffic modelling as summarised in **Section 4** indicate that the proposed development will have no unacceptable impact on the intersection of Worth Street and High Street based on the existing road layout.

The proposal dedicates land to facilitate the future construction of a road and intersection to Council's satisfaction in the future by others, consistent with Figure E11.26 of the PDCP 2014.

5.2.17 Particular (q)

In the absence of a new road, turning arrangements for trucks and service vehicles are inadequate.

The swept path testing results provided in **Annexure G** demonstrate that all service vehicles will be able to adequately enter and exit the site in a forward direction using Union Lane. Heavy vehicles presently use the laneway to service other premises to the west, which indicates that the Laneway arrangement is presently adequate.

5.2.18 Particular (r)

The above ground parking unnecessarily adds to bulk and scale of the building and podium, and the above ground parking is inadequately sleeved on the southern side mezzanine level, and all sides levels 1, 2 as required by DCP C10 10.5.1 Control (2) (a). The application does not demonstrate any unique conditions that preclude basement parking as required by DCP C10 10.5.1 3 (a) and is inconsistent with the sections in DCP E11 11.4.2

*Control 1 and not located in the basement as required by DCP E11 11.4.2
Control 2.*

This matter is to be addressed by others.

5.2.19 Particular (s)

The proposed midblock pedestrian laneway connects a high density residential area to Penrith Shopping Centre and will promote pedestrians crossing at midblock locations. No pedestrian safety infrastructure along High Street is proposed.

The site is approximately 90m from the existing traffic signals at the High Street and Worth Street intersection, which includes pedestrian crossings on all approaches. There is no need for any upgrades of the public road network in the surrounds of the site or changes to the proposed design to cater for the safe movements of pedestrians.

5.2.20 Particular (t)

The interim design does not address pedestrian safety as the development will be a significant generator of pedestrian traffic and an attractor. The desire line for pedestrians is north and northeast toward the Westfield and Railway Station and in this respect a signalised intersection is required.

The site is approximately 90m from the existing traffic signals at the High Street and Worth Street intersection, which includes pedestrian crossings on all approaches. There is no need for any upgrades of the public road network in the surrounds of the site or changes to the proposed design to cater for the safe movements of pedestrians.

5.2.21 Particular (u)

There is no evidence the through site link is required to meet pedestrian desire lines thus the pedestrian link primarily serves as a forecourt for the adjoining uses within the development. Further it removes pedestrian activity from the public street frontages.

This matter is to be addressed by others.

5.2.22 Particular (v)

The development presents confusion in the road hierarchy and intended road users. The provision of a through site link and adjoining commercial tenancy promotes pedestrian movements from High Street terminating at Union Lane which is ill- equipped to serve as a pedestrian thoroughfare. The development then proposes significant vehicle dominated infrastructure to the Union Lane façade further compromising the utility of this road for pedestrians.

The proposal is inconsistent with DCP E11 11.3.1 Control 3 which requires new through site links be connected with existing and proposed through

block lanes, shared zones, arcades and pedestrian ways and opposite other through site links.

This matter is to be addressed by others.

5.3 Contention 11 – Waste Management

5.3.1 Particular (d)

The proposal does not demonstrate Council's garbage truck can adequately service the residential waste removal.

The swept path testing results provided in **Annexure G** demonstrate that the Council waste collection vehicle can acceptably enter and exit the site in a forward direction.

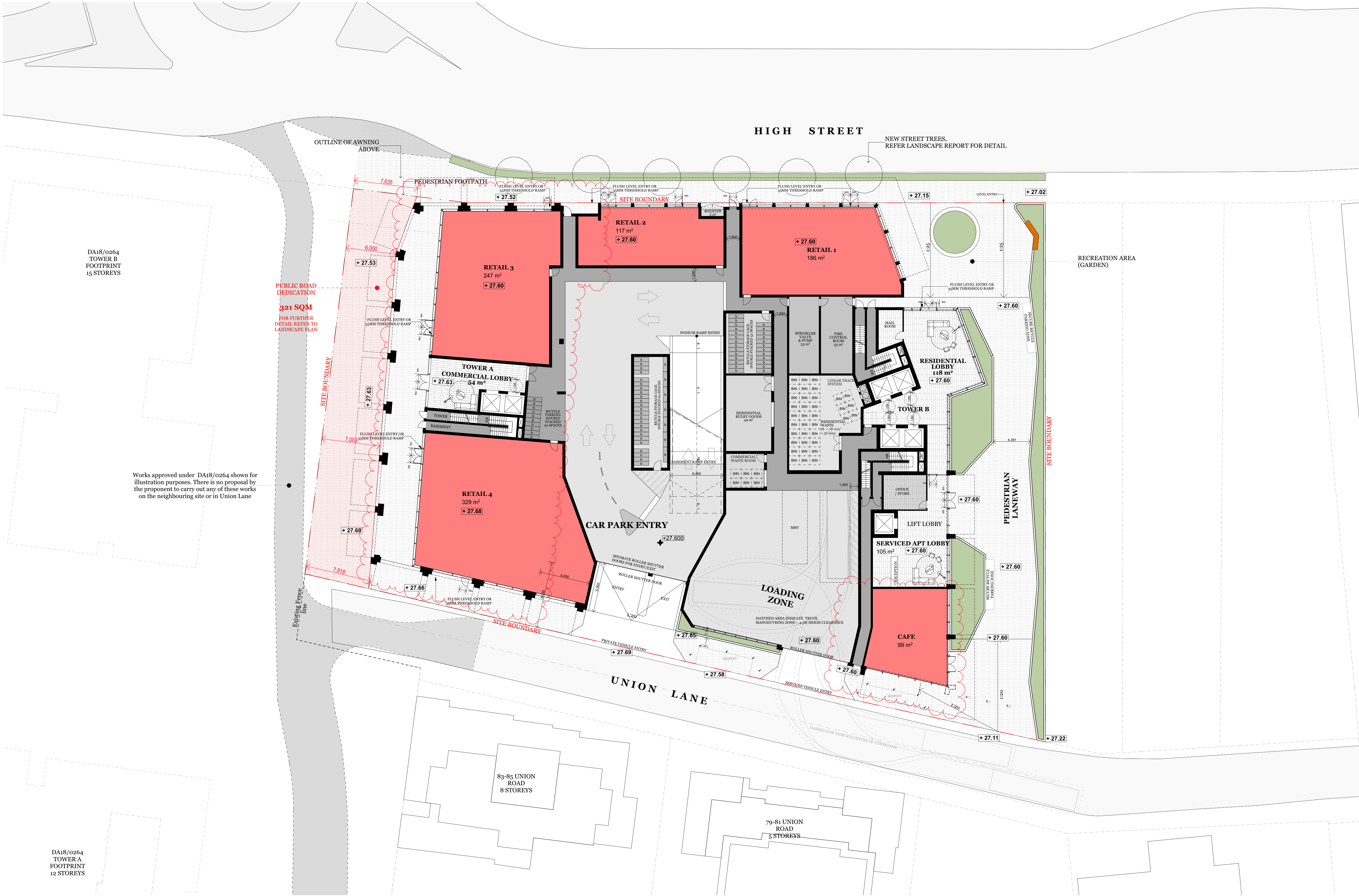
6 **CONCLUSIONS**

In view of the foregoing, the subject Mixed-Use Development proposal at 614 - 632 High Street, Penrith (as depicted in **Annexure A**) is fully supportable in terms of its traffic and parking impacts. The following outcomes of this traffic impact assessment are relevant to note:

- The proposal includes the provision of **305** car parking spaces within a proposed carpark, satisfying the relevant controls applicable to the development, including Council's DCP requirements.
- Council's DCP does not provide a bicycle parking rate, however the plans detail the provision of **134** bicycle parking spaces.
- Council's DCP does not require the provision of motorcycle parking facilities, and none are provided.
- The parking areas of the site have been assessed against the relevant sections of AS2890.1:2004, AS2890.2:2018 and AS2890.6:2009 and have been found to satisfy the objectives of each standard. Swept path testing has been undertaken and is reproduced within **Annexure G**.
- The traffic generation of the proposed development has been estimated to be some **128** vehicle trips in the AM peak period (46 in, 82 out) and **141** vehicle trips in the PM peak period (86 in, 55 out). The impacts of the traffic generation have been modelled using SIDRA INTERSECTION 9.0, indicating that there will be no detrimental impact to the performance of the surrounding intersections as a result of the generated traffic.



**ANNEXURE A: PROPOSED PLANS
(6 SHEETS)**



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Rev.	Date	By	Ckd	Description
D	7/04/2021		DA	
E	13/05/2021	WL	NB	DA
F	6/03/2022	DF	NB	FOR INFORMATION
G	9/03/2022	CR	DF	POST 534 HEARING ISSUE



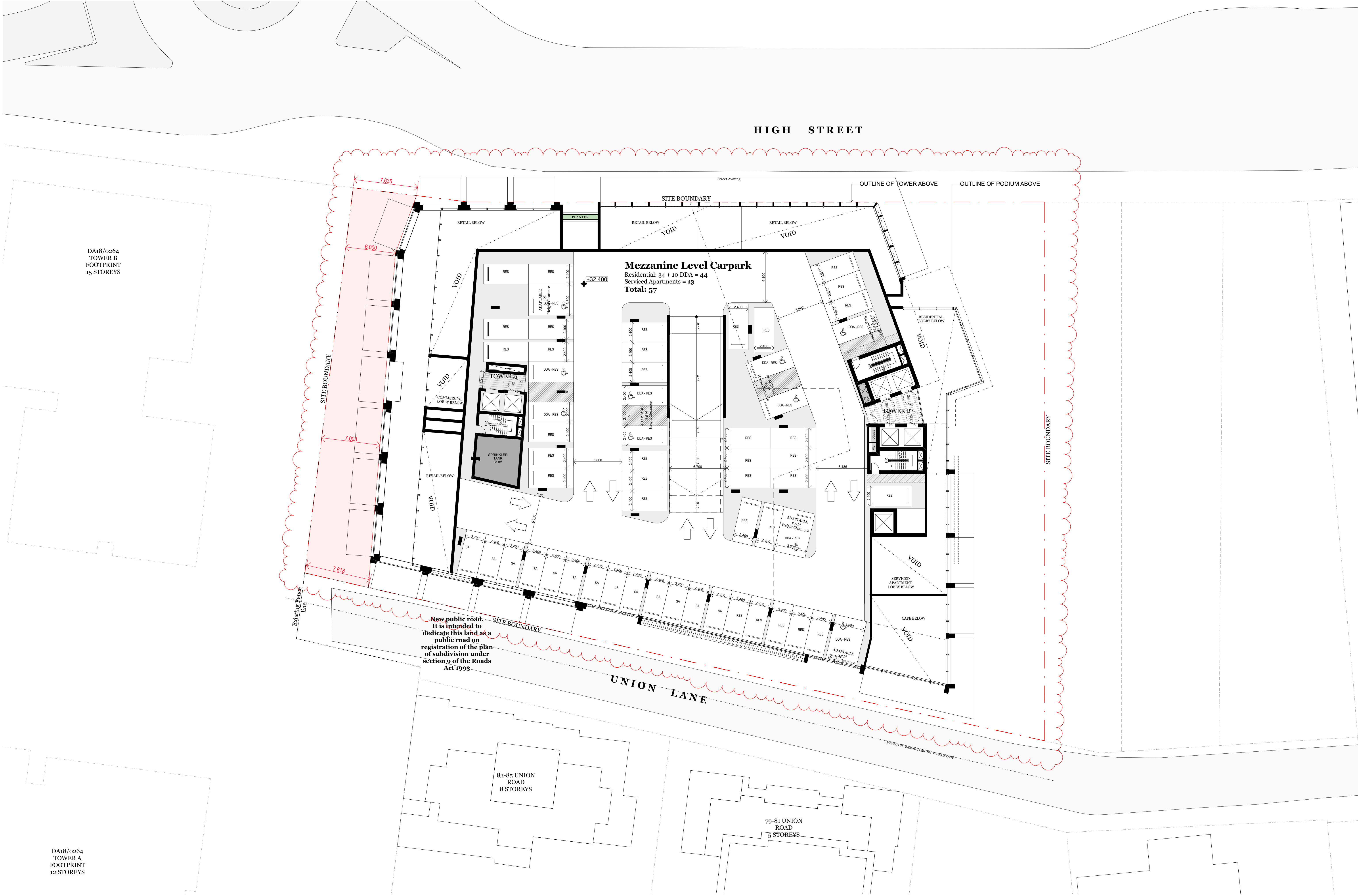
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Project Name	High Street Penrith
Project Address	614-632 High Street, Penrith, NSW 2750
Client	Urban Apartments

Project Number	00012012
Drawing Name	Ground Floor Plan
Scale	1:200@A1
Date	March 2019
Date Commenced	
Drawing Number	DA201
Revision	G

00012012	Ground Floor Plan
1:200@A1	
March 2019	
DA201	
G	



DA18/0264
TOWER B
FOOTPRINT
15 STOREYS

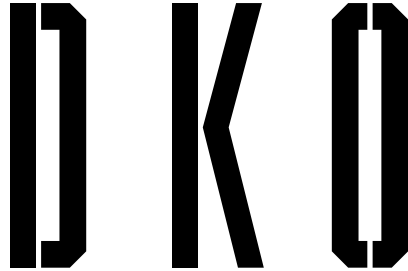
DA18/0264
TOWER A
FOOTPRINT
12 STOREYS

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Rev.	Date	By	Ckd	Description
B	1/04/2020		DA	
C	26/10/2022		DA	
D	7/04/2021		DA	
E	9/05/2022	CR	DF	POST S34 HEARING ISSUE

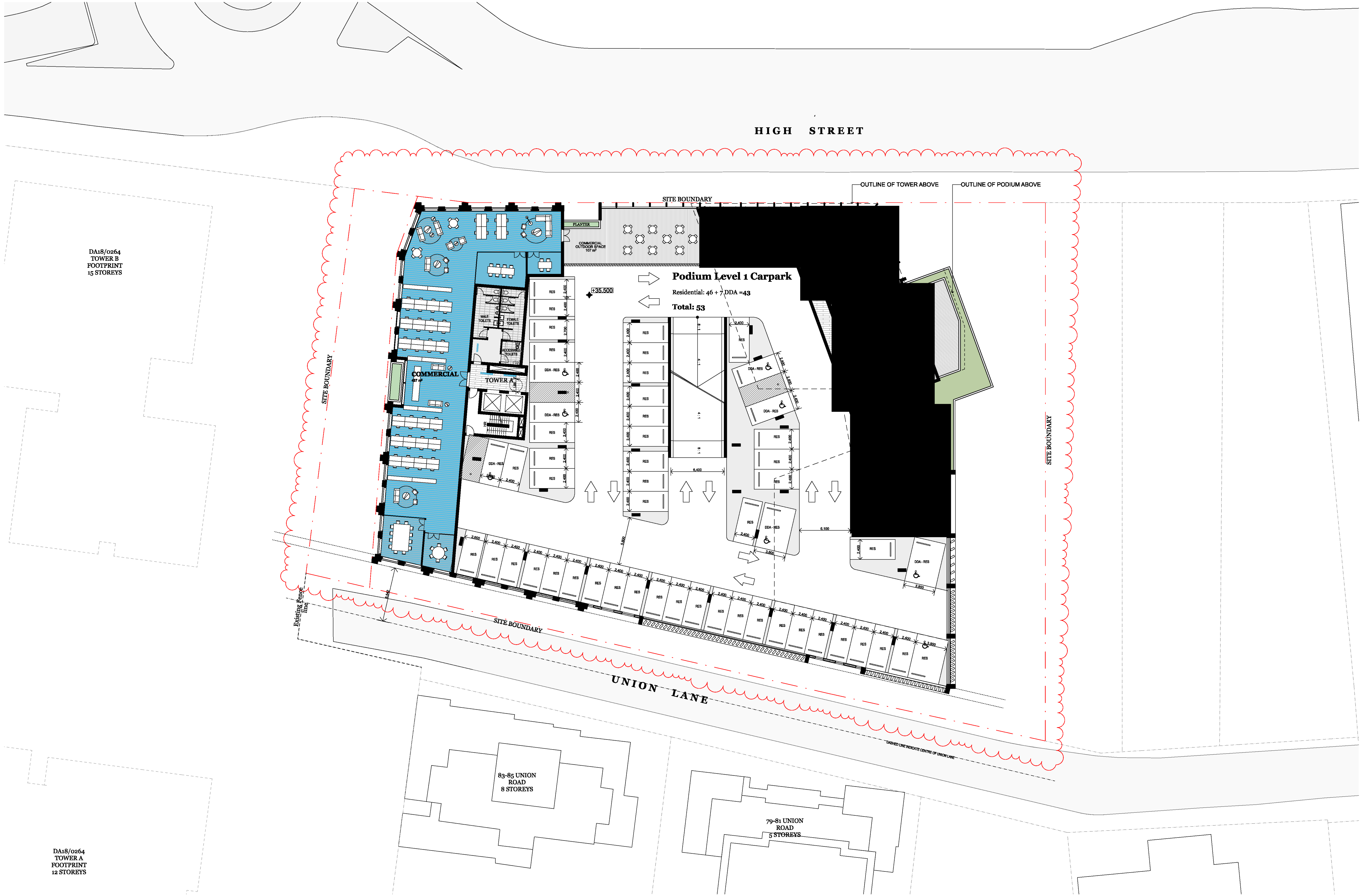


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Project Name	High Street Penrith
Project Address	614-632 High Street, Penrith, NSW 2750
Client	Urban Apartments

Project Number	00012012
Drawing Name	Mezzanine Floor Plan
Scale	1:200@A1
Date	March 2019
Date Commenced	
Revision	DA202 E



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Rev.	Date	By	Ckd	Description
B	1/04/2020		DA	
C	06/10/2022		DA	
D	7/04/2021		DA	
E	9/02/2022	CR	DF	POST 834 HEARING ISSUE



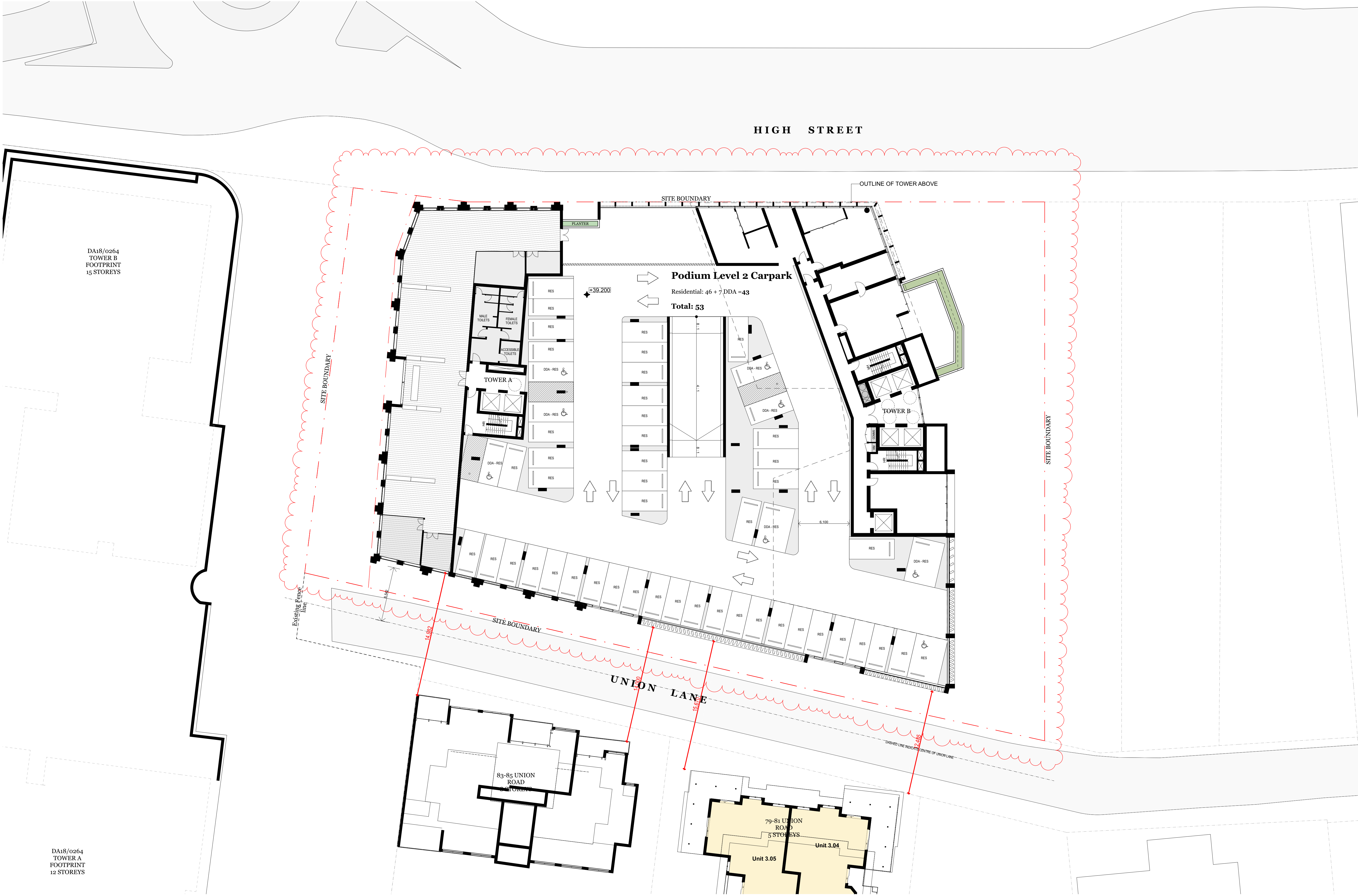
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NSW: Nominated Architects
Kees de Keijzer 5767
David Randerson 8542

DKO

Project Name
Project Address
Client
High Street Penrith
614-632 High Street,
Penrith, NSW 2750
Urban Apartments

Project Number
Drawing Name
Scale
Date
Scale
Date Commenced
Revision
00016012
Level 1
1:200@A1
March 2019
DA203
E



DA18/0264
TOWER B
FOOTPRINT
15 STOREYS

DA18/0264
TOWER A
FOOTPRINT
12 STOREYS

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Rev.	Date	By	Ckd	Description
B	1/04/2020		DA	
C	26/10/2022		DA	
D	7/04/2021		DA	
E	9/05/2022	CR	DF	POST S34 HEARING ISSUE

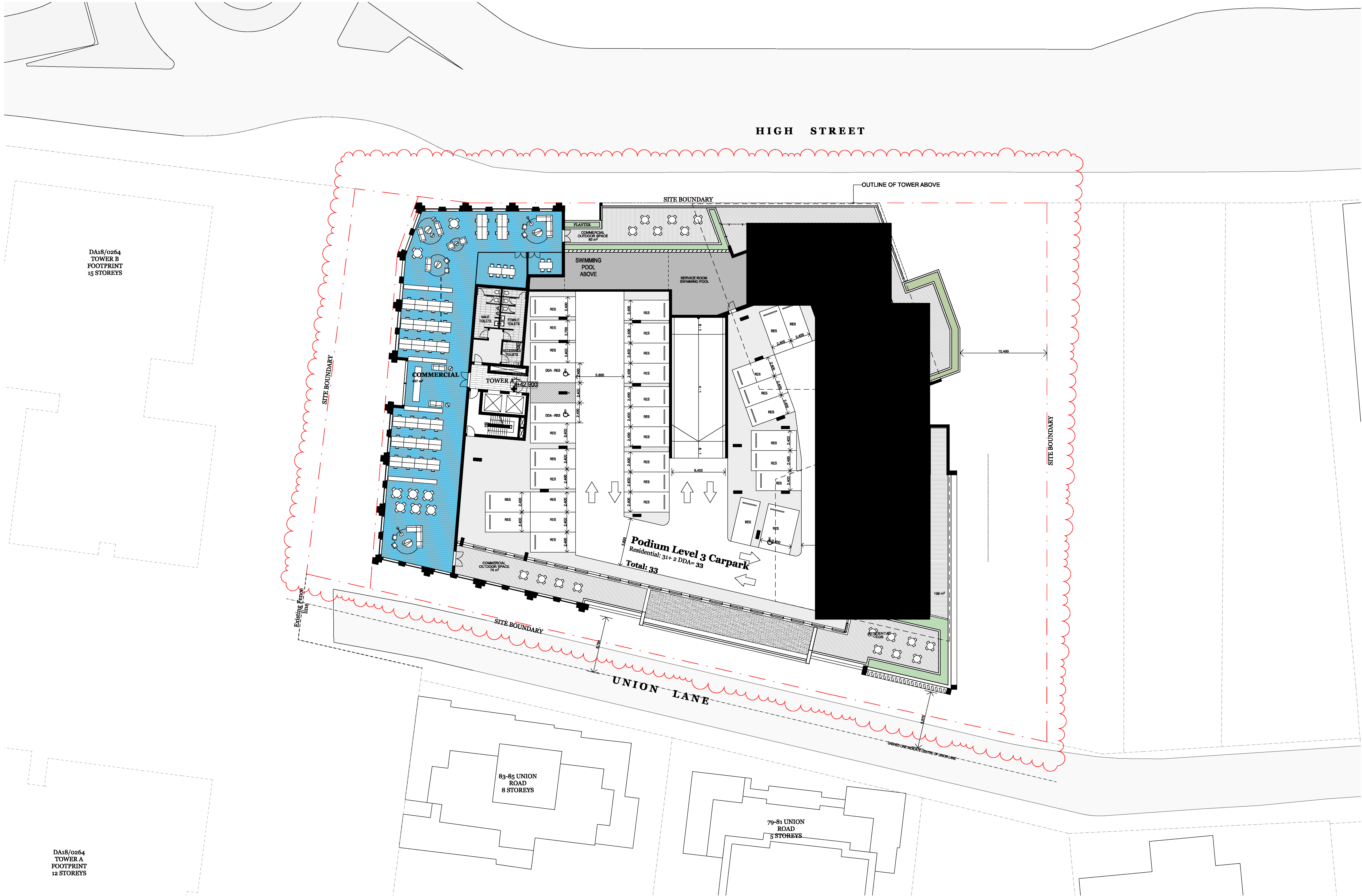


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Project Name	High Street Penrith
Project Address	614-632 High Street, Penrith, NSW 2750
Client	Urban Apartments

Project Number	00018012
Drawing Name	Level 2
Scale	1:200@A1
Date	March 2019
Date Commenced	
Drawing Number	DA204
Revision	E



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Rev.	Date	By	Ckd	Description
B	1/04/2020		DA	
C	06/10/2022		DA	
D	07/04/2023		DA	
E	09/02/2023	CR	DF	POST 834 HEARING ISSUE



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DKO

Project Name
Project Address
Client
Urban Apartments

Project Number
Drawing Name
Scale
Date
Scale
Date Commenced
Drawing Number
Revision
00012012
Level 3 Plan
1:500 @ A1
March 2019
DA205
E



**ANNEXURE B: TRAFFIC SURVEY DATA
(5 SHEETS)**

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

trafficsurvey.com.au



Intersection of High St and Car Park Access, Penrith

GPS -33.751258,150.689157

Date:	Thu 05/05/22
Weather:	Fine
Suburban:	Penrith
Customer:	N/A

North:	Car Park Access
East:	High St
South:	N/A
West:	High St

Survey Period	AM: 7:00 AM-9:30 AM
	PM: 2:30 PM-6:00 PM
Traffic Peak	AM: 8:30 AM-9:30 AM
	PM: 4:45 PM-5:45 PM

All Vehicles

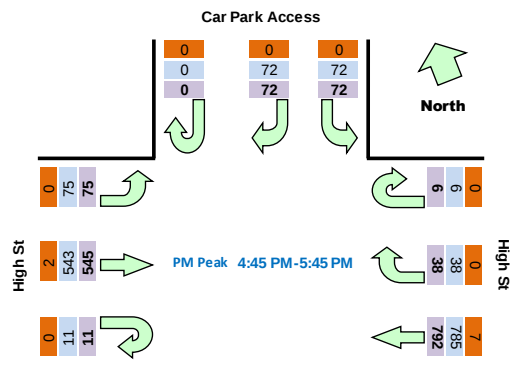
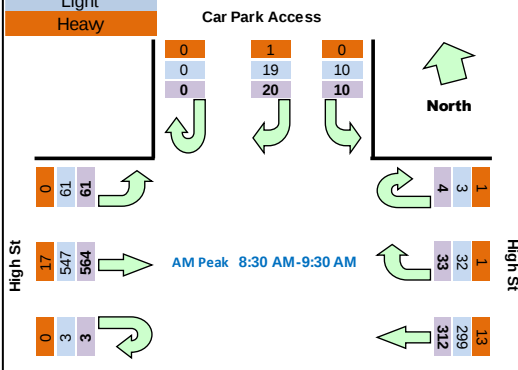
Time		North Approach Car Park Access			East Approach High St			West Approach High St			Hourly Total	
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	Hour	Peak
7:00	7:15	0	0	5	1	2	40	1	40	5	493	
7:15	7:30	0	1	2	0	1	35	2	57	5	562	
7:30	7:45	0	1	2	1	2	51	1	69	8	684	
7:45	8:00	0	0	2	2	2	54	1	93	7	804	
8:00	8:15	0	2	3	1	4	58	0	83	12	909	
8:15	8:30	0	5	2	1	4	79	1	118	15	983	
8:30	8:45	0	6	4	0	8	80	0	141	16	1007	Peak
8:45	9:00	0	2	2	2	12	81	3	151	13		
9:00	9:15	0	4	2	1	7	56	0	149	18		
9:15	9:30	0	8	2	1	6	95	0	123	14		
14:30	14:45	0	14	9	3	8	173	1	106	13	1275	
14:45	15:00	0	14	3	0	7	149	2	104	18	1314	
15:00	15:15	0	19	8	0	5	156	1	113	16	1404	
15:15	15:30	0	20	6	3	8	150	4	130	12	1462	
15:30	15:45	0	16	7	2	12	188	3	114	24	1478	
15:45	16:00	0	19	15	1	13	189	0	124	26	1491	
16:00	16:15	1	22	18	0	8	176	0	139	12	1518	
16:15	16:30	0	16	11	0	7	195	3	101	16	1529	
16:30	16:45	0	21	21	2	8	185	0	124	18	1598	
16:45	17:00	0	17	13	4	16	201	3	139	21	1611	Peak
17:00	17:15	0	31	14	0	9	195	4	117	17	1594	
17:15	17:30	0	15	24	1	6	198	3	152	19		
17:30	17:45	0	9	21	1	7	198	1	137	18		
17:45	18:00	0	17	9	0	10	204	1	137	19		

Peak Time		North Approach Car Park Access			East Approach High St			West Approach High St			Peak total
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	
8:30	9:30	0	20	10	4	33	312	3	564	61	1007
16:45	17:45	0	72	72	6	38	792	11	545	75	1611

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

Graphic

Total
Light
Heavy



TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY



trafficsurvey.com.au



Intersection of High St and Westfield Access, Penrith

GPS -33.752038,150.691002

Date:	Thu 05/05/22
Weather:	Fine
Suburban:	Penrith
Customer:	N/A

North:	Westfield Access
East:	High St
South:	Worth St
West:	High St

Survey	AM: 7:00 AM-9:30 AM
Period	PM: 2:30 PM-6:00 PM
Traffic	AM: 8:30 AM-9:30 AM
Peak	PM: 4:45 PM-5:45 PM

All Vehicles

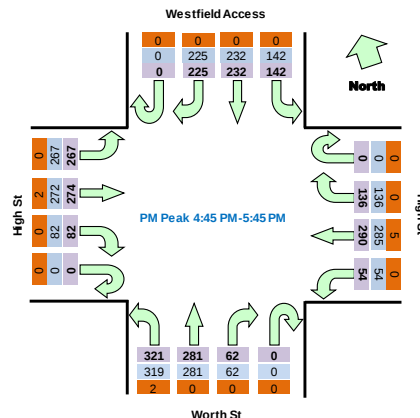
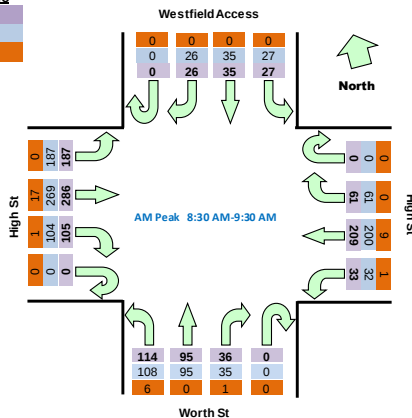
Time		North Approach Westfield Access				East Approach High St				South Approach Worth St				West Approach High St				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
7:00	7:15	0	0	0	0	0	2	23	2	0	6	3	20	0	8	36	2	551	
7:15	7:30	0	1	0	1	0	2	22	3	0	6	3	13	0	14	44	1	631	
7:30	7:45	0	2	1	2	0	4	33	2	0	4	4	19	0	7	62	3	775	
7:45	8:00	0	1	3	2	0	8	26	9	0	10	9	31	0	20	70	7	927	
8:00	8:15	0	3	1	3	0	7	34	12	0	4	5	26	0	23	55	9	1063	
8:15	8:30	0	4	1	3	0	14	39	9	0	6	16	41	0	26	76	19	1194	
8:30	8:45	0	5	3	3	0	16	42	10	0	10	20	41	0	29	92	24	1214	Peak
8:45	9:00	0	2	5	4	0	22	60	8	0	10	33	33	0	31	68	56		
9:00	9:15	0	3	8	6	0	21	41	13	0	10	39	20	0	26	82	44		
9:15	9:30	0	16	19	14	0	2	66	2	0	6	3	20	0	19	44	63		
14:30	14:45	0	60	48	27	0	17	55	7	0	10	29	69	0	11	68	39	1792	
14:45	15:00	0	43	47	22	0	29	69	14	0	11	68	44	0	16	51	40	1841	
15:00	15:15	0	46	42	17	0	31	65	7	0	10	41	50	0	15	53	53	1912	
15:15	15:30	0	48	37	31	0	33	59	10	0	5	52	54	0	25	57	57	2013	
15:30	15:45	0	50	50	22	0	29	87	12	0	5	46	65	0	21	54	48	2076	
15:45	16:00	0	48	41	20	0	32	79	10	0	25	54	76	0	26	50	64	2137	
16:00	16:15	0	46	44	39	0	46	63	5	0	11	45	75	0	14	79	64	2196	
16:15	16:30	0	64	58	31	0	40	63	14	0	8	66	75	0	16	39	57	2245	
16:30	16:45	0	55	50	32	0	36	68	12	0	13	65	72	0	18	65	64	2342	
16:45	17:00	0	69	49	30	0	30	69	17	0	13	68	83	0	10	88	58	2366	Peak
17:00	17:15	0	51	52	43	0	42	63	15	0	19	74	90	0	17	62	52	2357	
17:15	17:30	0	63	73	41	0	27	73	10	0	19	76	69	0	29	69	79		
17:30	17:45	0	42	58	28	0	37	85	12	0	11	63	79	0	26	55	78		
17:45	18:00	0	62	42	29	0	47	86	14	0	12	71	66	0	12	66	68		

Peak Time		North Approach Westfield Access				East Approach High St				South Approach Worth St				West Approach High St				Peak total
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	
8:30	9:30	0	26	35	27	0	61	209	33	0	36	95	114	0	105	286	187	1214
16:45	17:45	0	225	232	142	0	136	290	54	0	62	281	321	0	82	274	267	2366

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

Graphic

Total
Light
Heavy



TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY



trafficsurvey.com.au



Intersection of High St and Great Westernn Hwy, Penrith

GPS -33.750656,150.687705

Date:	Thu 05/05/22
Weather:	Fine
Suburban:	Penrith
Customer:	N/A

North:	Great Westernn Hwy
East:	High St
South:	Mulgoa Rd
West:	High St

Survey	AM: 7:00 AM-9:30 AM
Period	PM: 2:30 PM-6:00 PM
Traffic	AM: 8:00 AM-9:00 AM
Peak	PM: 4:45 PM-5:45 PM

All Vehicles

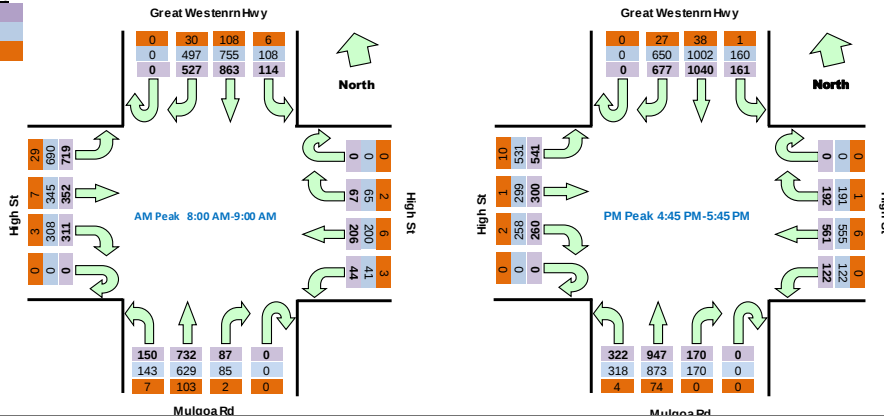
Time		North Approach Great Westernn Hwy				East Approach High St				South Approach Mulgoa Rd				West Approach High St				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
7:00	7:15	0	89	169	10	0	18	20	3	0	7	221	22	0	42	29	142	3399	
7:15	7:30	0	96	172	14	0	7	26	5	0	8	226	21	0	41	42	166	3644	
7:30	7:45	0	121	201	16	0	12	34	7	0	7	192	16	0	53	55	140	3853	
7:45	8:00	0	120	231	21	0	14	35	6	0	6	204	24	0	52	74	162	4035	
8:00	8:15	0	134	222	23	0	17	40	3	0	12	215	30	0	58	60	203	4172	Peak
8:15	8:30	0	130	198	28	0	11	59	15	0	17	180	39	0	83	89	184	4089	
8:30	8:45	0	149	200	27	0	23	47	16	0	25	155	38	0	88	105	163	3997	
8:45	9:00	0	114	243	36	0	16	60	10	0	33	182	43	0	82	98	169		
9:00	9:15	0	114	218	35	0	16	35	9	0	26	167	23	0	64	106	121		
9:15	9:30	0	95	229	30	0	24	55	24	0	32	176	41	0	55	75	105		
14:30	14:45	0	126	233	28	0	34	108	46	0	33	234	60	0	50	59	114	4679	
14:45	15:00	0	184	211	29	0	33	99	33	0	28	180	52	0	81	67	133	4844	
15:00	15:15	0	151	248	24	0	32	100	44	0	25	198	61	0	84	81	141	4985	
15:15	15:30	0	167	242	38	0	34	104	36	0	27	204	59	0	87	81	156	5026	
15:30	15:45	0	173	266	25	0	46	128	33	0	37	213	53	0	62	79	175	5068	
15:45	16:00	0	164	265	30	0	49	130	29	0	30	206	61	0	75	90	142	5003	
16:00	16:15	0	181	233	38	0	33	130	35	0	43	225	49	0	54	70	139	5113	
16:15	16:30	0	167	302	31	0	57	127	30	0	22	208	78	0	63	67	125	5222	
16:30	16:45	0	159	269	32	0	47	123	36	0	40	189	76	0	56	70	128	5286	
16:45	17:00	0	198	302	44	0	43	144	34	0	43	220	70	0	59	76	148	5293	Peak
17:00	17:15	0	163	266	41	0	62	136	32	0	43	238	82	0	76	54	146	5150	
17:15	17:30	0	188	249	41	0	31	150	35	0	46	246	82	0	58	87	128		
17:30	17:45	0	128	223	35	0	56	131	21	0	38	243	88	0	67	83	119		
17:45	18:00	0	206	225	34	0	43	143	36	0	61	200	73	0	58	62	97		

Peak Time		North Approach Great Westernn Hwy				East Approach High St				South Approach Mulgoa Rd				West Approach High St				Peak total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L		
8:00	9:00	0	527	863	114	0	67	206	44	0	87	732	150	0	311	352	719	4172	
16:45	17:45	0	677	1040	161	0	192	561	122	0	170	947	322	0	260	300	541	5293	

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

Graphic

Total	
Light	
Heavy	



TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY



trafficsurvey.com.au



Intersection of Union Ln and Worth St, Penrith

GPS -33.752753,150.690735

Date:	Thu 05/05/22
Weather:	Fine
Suburban:	Penrith
Customer:	N/A

North:	Worth St
East:	Union Ln
South:	Worth St
West:	Union Ln

Survey	AM: 7:00 AM-9:30 AM
Period	PM: 2:30 PM-6:00 PM
Traffic	AM: 8:15 AM-9:15 AM
Peak	PM: 4:45 PM-5:45 PM

All Vehicles

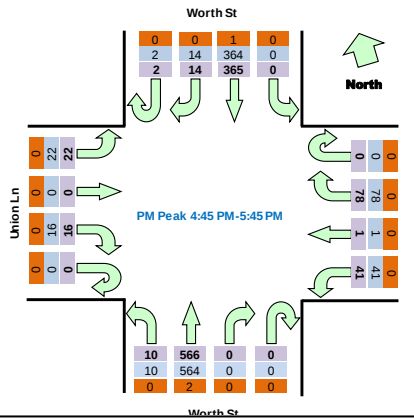
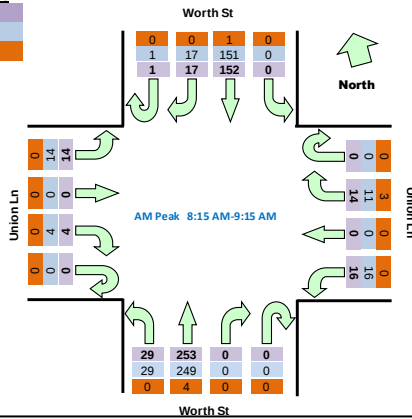
Time		North Approach Worth St				East Approach Union Ln				South Approach Worth St				West Approach Union Ln				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
7:00	7:15	0	0	8	0	0	3	0	2	0	0	25	1	0	1	0	3	230	
7:15	7:30	0	2	20	0	0	2	0	0	0	0	16	5	0	0	0	3	277	
7:30	7:45	0	2	10	0	0	3	1	1	0	0	25	9	0	3	0	0	346	
7:45	8:00	0	4	22	0	0	4	0	1	0	0	42	8	0	2	0	2	413	
8:00	8:15	1	8	31	0	0	0	0	3	0	0	30	12	0	1	0	4	459	
8:15	8:30	0	7	29	0	0	2	0	4	0	0	60	9	0	3	0	3	500	Peak
8:30	8:45	0	5	38	0	0	3	0	1	0	0	62	7	0	0	0	5	474	
8:45	9:00	1	4	38	0	0	5	0	7	0	0	66	7	0	0	0	3		
9:00	9:15	0	1	47	0	0	4	0	4	0	0	65	6	0	1	0	3		
9:15	9:30	0	2	45	0	0	8	0	4	0	0	23	4	0	2	1	2		
14:30	14:45	0	2	62	0	0	13	0	9	0	1	90	4	0	2	0	2	771	
14:45	15:00	0	1	71	0	0	13	0	13	0	0	106	2	0	2	0	0	794	
15:00	15:15	0	3	62	0	0	15	0	11	0	0	83	1	0	3	0	6	824	
15:15	15:30	0	4	68	0	0	8	0	9	1	0	96	5	0	0	0	3	858	
15:30	15:45	1	1	81	0	0	12	1	5	0	0	101	0	0	0	0	6	912	
15:45	16:00	1	1	72	0	0	7	1	7	0	0	133	5	0	2	0	9	957	
16:00	16:15	0	5	60	1	0	13	0	7	0	0	119	4	0	5	0	4	988	
16:15	16:30	0	2	84	0	0	17	0	11	0	0	124	2	0	3	0	5	1052	
16:30	16:45	0	2	80	0	0	17	0	20	0	0	118	0	0	6	0	10	1108	
16:45	17:00	0	4	82	0	0	17	0	11	0	0	143	0	0	6	0	6	1115	Peak
17:00	17:15	1	4	80	0	0	25	0	15	0	0	146	3	0	3	0	5	1091	
17:15	17:30	0	3	115	0	0	22	1	11	0	0	140	3	0	1	0	8		
17:30	17:45	1	3	88	0	0	14	0	4	0	0	137	4	0	6	0	3		
17:45	18:00	0	1	71	0	0	17	0	15	0	0	133	6	0	1	0	1		

Peak Time		North Approach Worth St				East Approach Union Ln				South Approach Worth St				West Approach Union Ln				Peak total
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	
8:15	9:15	1	17	152	0	0	14	0	16	0	0	253	29	0	4	0	14	500
16:45	17:45	2	14	365	0	0	78	1	41	0	0	566	10	0	16	0	22	1115

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

Graphic

Total
Light
Heavy



TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY



trafficsurvey.com.au



Intersection of Union Rd and Worth St, Penrith

GPS -33.753309,150.690526

Date:	Thu 05/05/22
Weather:	Fine
Suburban:	Penrith
Customer:	N/A

North:	Worth St
East:	Union Rd
South:	Worth St
West:	Union Rd

Survey	AM: 7:00 AM-9:30 AM
Period	PM: 2:30 PM-6:00 PM
Traffic	AM: 8:15 AM-9:15 AM
Peak	PM: 4:45 PM-5:45 PM

All Vehicles

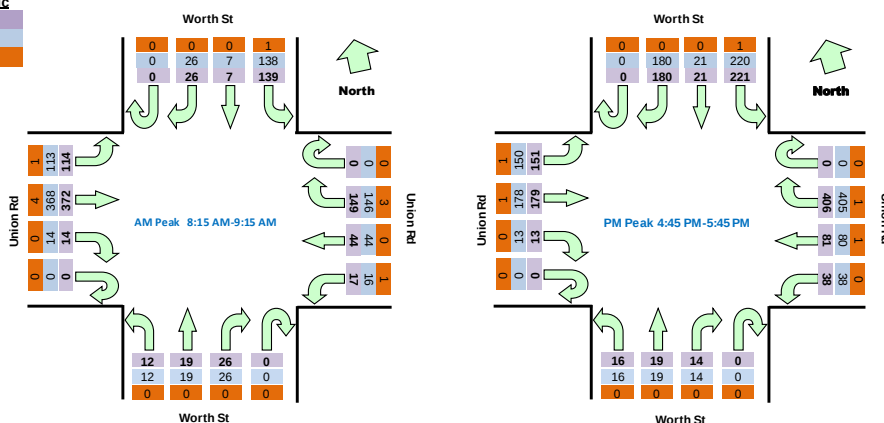
Time		North Approach Worth St				East Approach Union Rd				South Approach Worth St				West Approach Union Rd				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
7:00	7:15	0	3	0	8	0	11	6	1	0	5	4	6	0	0	36	11	469	
7:15	7:30	0	6	0	14	0	8	5	1	0	6	6	5	0	3	32	7	533	
7:30	7:45	0	6	0	8	0	17	10	0	0	5	8	4	0	3	43	9	673	
7:45	8:00	0	3	0	22	0	33	12	1	0	6	4	6	0	1	71	13	793	
8:00	8:15	0	4	2	29	0	20	2	5	0	5	4	6	0	1	59	18	863	
8:15	8:30	0	3	1	32	0	34	12	2	0	7	6	3	0	4	100	29	939	Peak
8:30	8:45	0	7	1	31	0	41	9	4	0	10	6	3	0	1	98	22	869	
8:45	9:00	0	8	1	36	0	45	12	8	0	4	3	4	0	3	93	25		
9:00	9:15	0	8	4	40	0	29	11	3	0	5	4	2	0	6	81	38		
9:15	9:30	0	11	0	40	0	-6	10	6	0	6	2	1	0	2	60	31		
14:30	14:45	0	28	2	43	0	66	15	1	0	5	5	2	0	1	32	24	986	
14:45	15:00	0	35	3	48	0	74	11	4	0	4	5	2	0	5	54	29	1037	
15:00	15:15	0	33	1	42	0	58	8	5	0	3	8	4	0	6	38	18	1077	
15:15	15:30	0	26	2	49	0	74	15	9	0	5	3	1	0	6	49	25	1135	
15:30	15:45	0	34	7	45	0	76	11	12	0	1	3	2	0	3	59	22	1172	
15:45	16:00	0	26	3	52	0	102	13	9	0	5	9	4	0	7	57	27	1200	
16:00	16:15	0	20	1	51	0	87	21	6	0	2	4	5	0	7	46	32	1210	
16:15	16:30	0	39	1	58	0	84	18	4	0	3	9	4	0	4	44	33	1272	
16:30	16:45	0	34	5	67	0	72	12	4	0	4	11	4	0	6	49	35	1322	
16:45	17:00	0	34	3	62	0	112	21	7	0	1	5	4	0	3	46	26	1339	Peak
17:00	17:15	0	50	4	44	0	99	27	5	0	2	6	2	0	3	58	44	1319	
17:15	17:30	0	54	9	64	0	97	19	15	0	6	3	5	0	1	35	43		
17:30	17:45	0	42	5	51	0	98	14	11	0	5	5	5	0	6	40	38		
17:45	18:00	0	32	0	55	0	92	18	10	0	4	6	6	0	4	36	41		

Peak Time		North Approach Worth St				East Approach Union Rd				South Approach Worth St				West Approach Union Rd				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:15	9:15	0	26	7	139	0	149	44	17	0	26	19	12	0	14	372	114	939
16:45	17:45	0	180	21	221	0	406	81	38	0	14	19	16	0	13	179	151	1339

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

Graphic

Total
Light
Heavy





**ANNEXURE C: TCS PLANS
(3 SHEETS)**

[illegible]

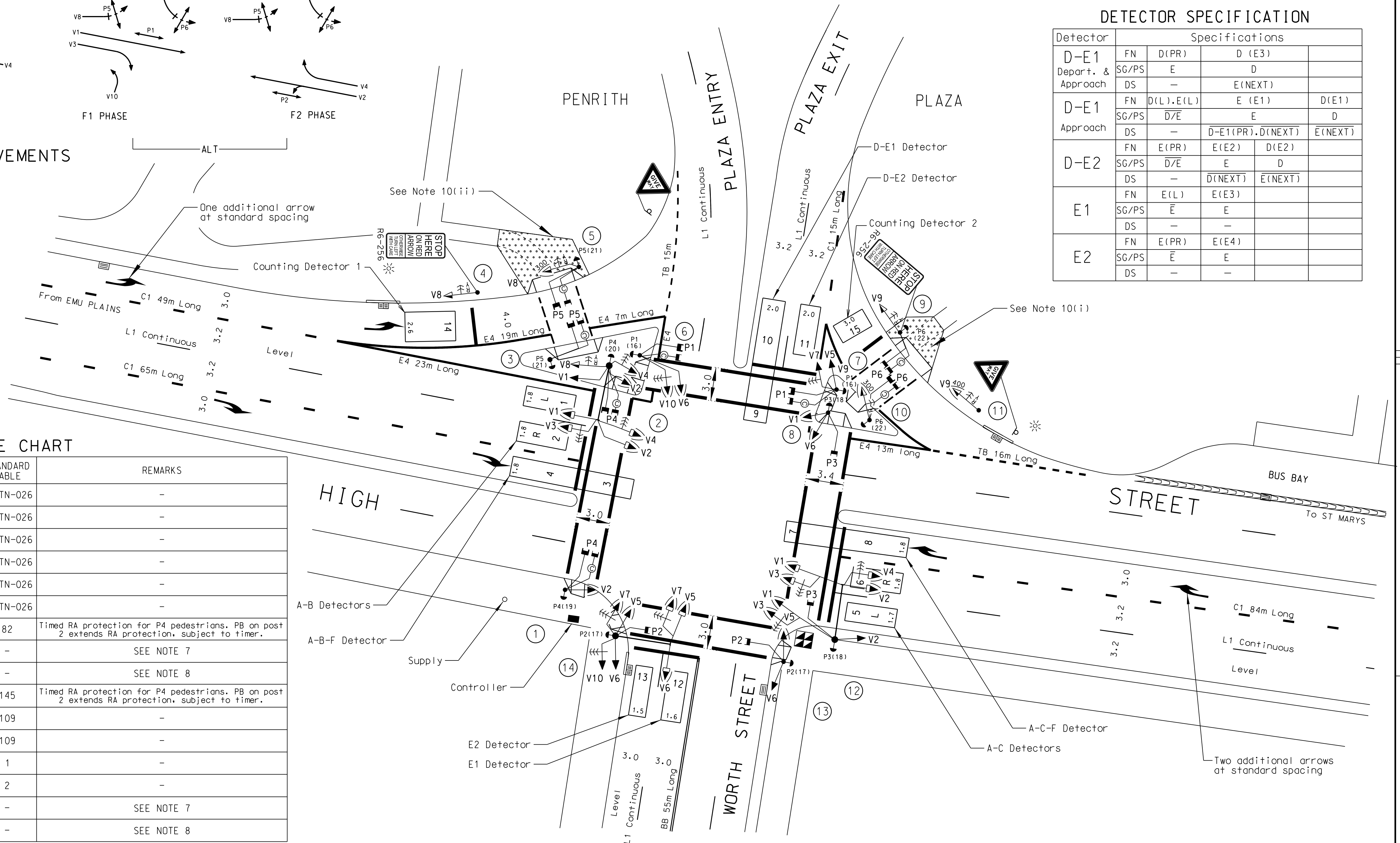
1. This site is SCATS linked.
2. Special STOP (R1-4) signs are placed on posts 7 & 14.
3. Audio tactile push buttons are provided on posts 1, 2, 3, 6, 7, 8, 9, 10, 12, 13 and 14.
4. Single Diamond overlap phasing in accordance with TS-TN-026.
5. New kerb ramps are to be constructed in accordance with Model Drawing MD.R173.B01.A.1.
6. XSF3 allows right turn filter in E Phase under flexilink and masterlink.
7. V8 and P5 displays associated with slip lane operate independently to the site. V8 is to rest in the "OFF STATE" and P5 is to rest displaying "DONT WALK". Push button P5 demand will display V8 yellow then Red and remain Red until "WALK and CLEARANCE" has expired followed by "OFF STATE" P5 is to have a delay timer.

8. V9 and P6 displays associated with slip lane operate independently to the site. V9 is to rest in the "OFF STATE" and P6 is to rest displaying "DONT WALK". Push button P6 demand will display V9 yellow then Red and remain Red until "WALK and CLEARANCE" has expired followed by "OFF STATE" P6 is to have a delay timer. If D or E phase is demanded then P6 will not introduce.
9. Provision is to be made in cabling and ducting for future three aspect control of slip lanes.
10. Civil Works
- (i) Remove 5 sqm concrete footpath and construct 12 sqm of concrete footpath, area shown.....
- (ii) Remove 9 sqm concrete footpath and construct 25 sqm of concrete footpath, area shown.....

Detector	Specifications			
D-E1 Depart. & Approach	FN	D(PR)	D (E3)	
	SG/PS	E	D	
	DS	—	E(NEXT)	
D-E1 Approach	FN	D(L).E(L)	E (E1)	D(E1)
	SG/PS	D/E	E	D
	DS	—	D-E1(PR).D(NEXT)	E(NEXT)
D-E2	FN	E(PR)	E(E2)	D(E2)
	SG/PS	D/E	E	D
	DS	—	D(NEXT)	E(NEXT)
E1	FN	E(L)	E(E3)	
	SG/PS	E	E	
	DS	—	—	
E2	FN	E(PR)	E(E4)	
	SG/PS	E	E	
	DS	—	—	

POST	TYPE	LENGTH	OFFSET	REMARKS
1	2	4.1	1.0	EXISTING
2	5L	-	2.0	EXISTING
3	2	3.2	1.0	NEW
4	2	4.1	1.0	NEW
5	2	4.1	1.0	NEW
6	2	4.1	1.0	EXISTING
7	2	4.1	1.0	EXISTING
8	2	4.1	1.0	NEW
9	2	4.1	1.0	NEW
10	2	4.1	1.0	NEW
11	2	4.1	1.0	NEW
12	5L	-	1.0	EXISTING
13	2	4.1	1.0	EXISTING
14	5L	-	1.0	EXISTING

SIGNAL GROUP	PHASE DURING WHICH GREEN DISPLAYED								STANDARD TABLE	REMARKS
	A	B	C	D	E	F	F1	F2		
V1	X	X					X		TS-TN-026	-
V2	X		X					X	TS-TN-026	-
V3		X				X	X		TS-TN-026	-
V4			X			X		X	TS-TN-026	-
V5				X	X				TS-TN-026	-
V6					X				TS-TN-026	-
V7				X					82	Timed RA protection for P4 pedestrians. PB on post 2 extends RA protection, subject to timer.
V8									-	SEE NOTE 7
V9									-	SEE NOTE 8
V10		X				X	X		145	Timed RA protection for P4 pedestrians. PB on post 2 extends RA protection, subject to timer.
P1	X	X					X		109	-
P2	X		X					X	109	-
P3				X	X				1	-
P4					X				2	-
P5	X	X	X	X	X	X	X	X	-	SEE NOTE 7
P6	X	X	X			X	X	X	-	SEE NOTE 8

[illegible]

PUBLIC UTILITY LEGEND		REFERENCE PLANS	
HYDRANT		SYMBOLS/ABBS.	V0003-6
STOP VALVE		STD POSIT	V0001-5
GAS VALVE		PRES. DETECT	V0005-17
SEWER MANHOLE		VEH. GROUP OP	TS-TN-019
TELECOM PIT		DET. LOGIC OP	TS-TN-020
ELECT LIGHT POLE		PED.MOVEMENT OP	TS-TN-021
POWER POLE			
STAY POLE			
TELEPHONE BOX		SURVEYOR :	
TELECOM PILLAR		DATE :	

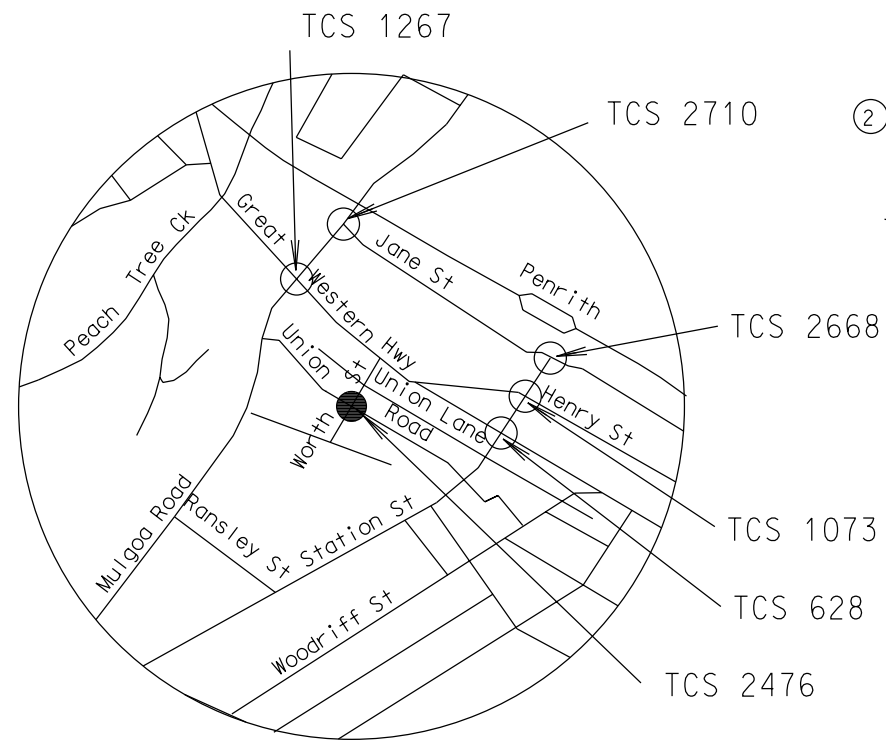
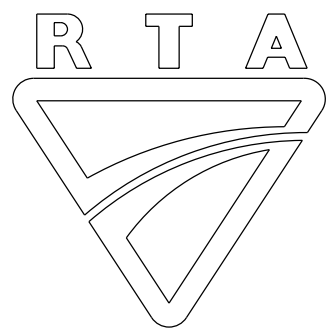
U.B.D. Ref.	Map 163 G9
I.S.G. E:	271 265
CO-ORDS N:	1 263 830
DESIGNED	L. NAGY
CHECKED	G. RUTTER
.....	
G. RUTTER	
SITE CHECKED	
.....	
G. EYRE	
RECOMMENDED	
.....	

APPROVED

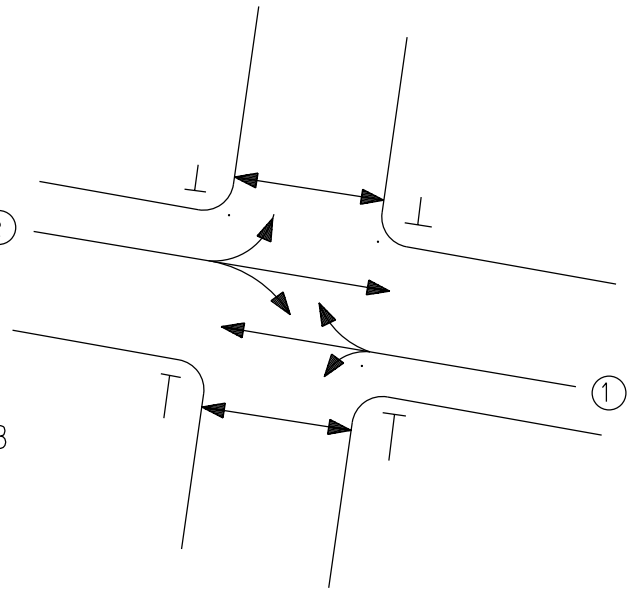
SIGNED
I. MCGRATH
NAME
DES & EST MANAGER
POSITION
FOR DIV ENG PARRAMATTA
30 SEPTEMBER 1991
DATE

Roads and Traffic Authority, N.S.W		
PENRITH COUNCIL AREA		
TRAFFIC SIGNALS AT		
HIGH STREET		
AND WORTH STREET		
DESIGN LAYOUT	PENRITH	TCS No 2622

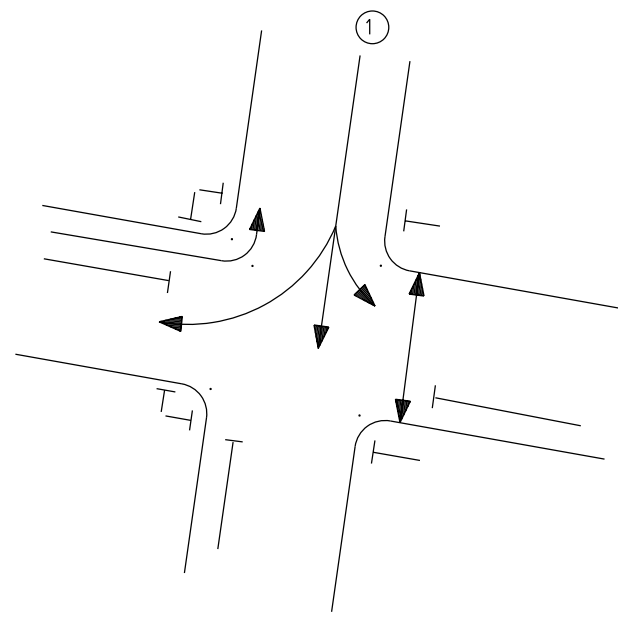
EXISTING ☐		PROPOSED ☒	
CADD FILE: K:/Signals/TCS/.../VV2622-1H.dgn			
SCALE 5  0 (1:200) 5 10			ISSUE
FILE 358 TS 212		SUPERSEDES SHEET 1/G	H
REGN. 7000.358.VV.2622			SHEET 1



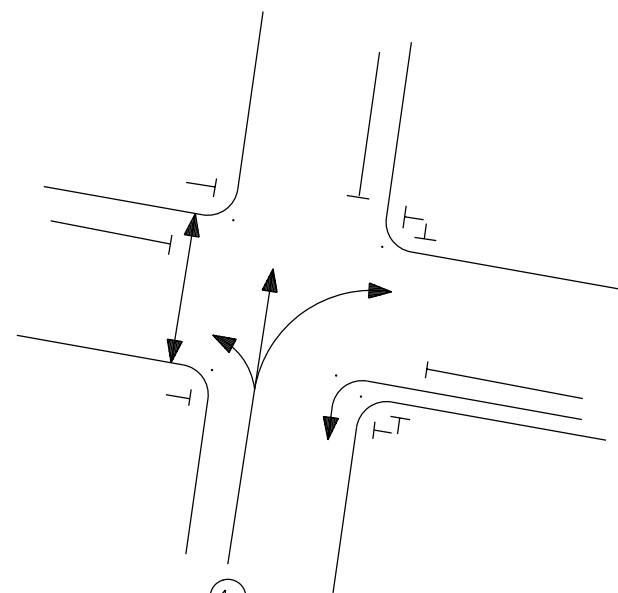
Not to Scale
LOCALITY SKETCH



A Phase



B Phase



C Phase

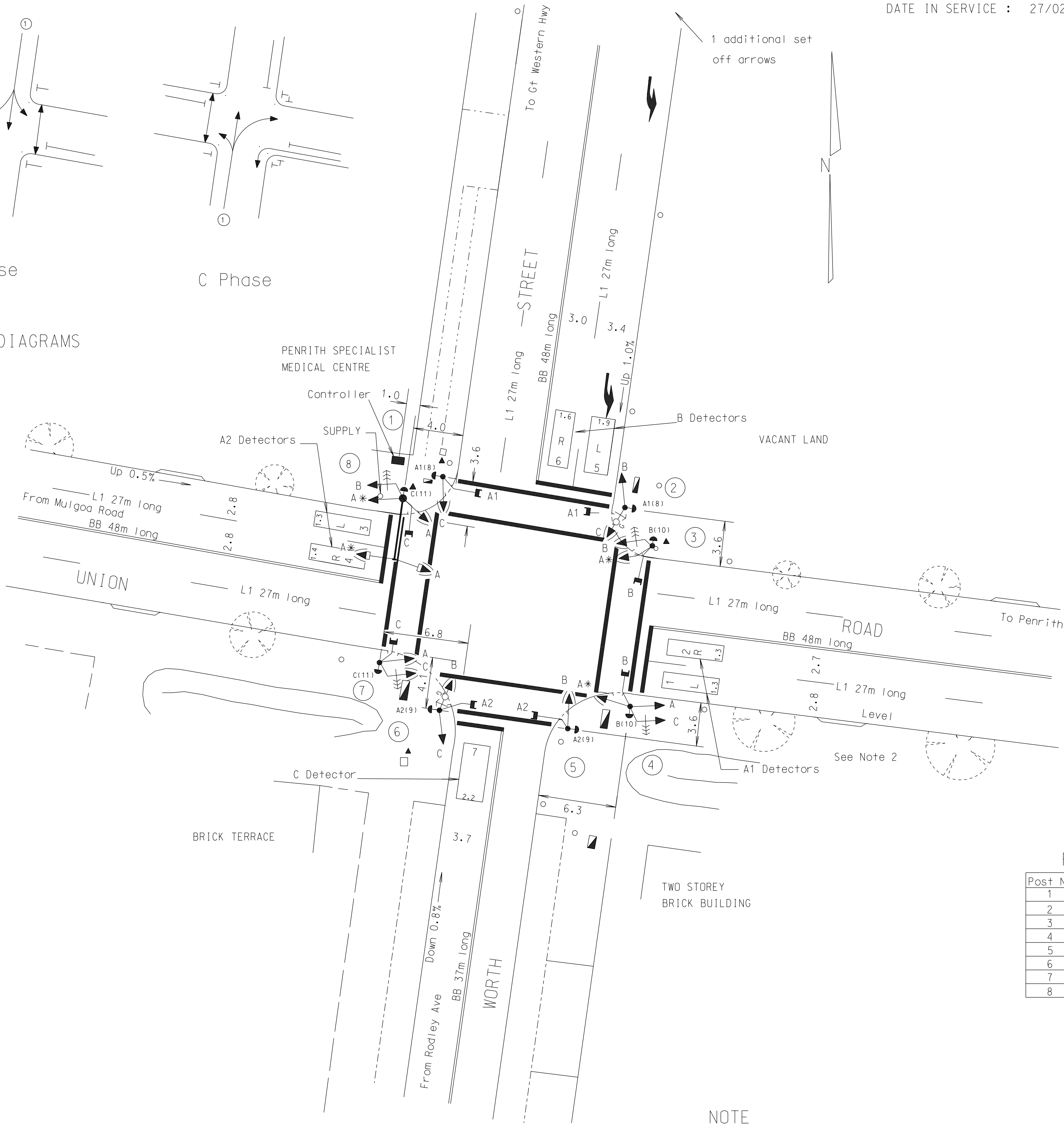
MOVEMENT DIAGRAMS

DETECTOR SPECIFICATION

Detector	Specifications			
	FN	A(L)	A(E1)	
A1	SG/PS	A	A	
	DS	—	—	
A2	FN	A(L)	A(E2)	
	SG/PS	A	A	
B	FN	B(L)	B(E1)	
	SG/PS	B	B	
C	FN	C(L)	C(E1)	
	SG/PS	C	C	
A1 P.B.	FN	A1(PB)	B(L)	
	SG/PS	A1(WALK)	A.A1(WALK)	
A2 P.B.	FN	A2(PB)	B(L)	
	SG/PS	A2(WALK)	A.A2(WALK)	
B P.B.	FN	B(PB)	A(L)	
	SG/PS	B(WALK)	B.B(WALK)	
C P.B.	FN	C(PB)	A(L)	
	SG/PS	C(WALK)	C.C(WALK)	

SPECIAL SIGNAL GROUP DISPLAY SEQUENCE

SIGNAL GROUP	TABLE TYPE	REMARKS
B (LT)	12	Timed R.A. protection for 'A1' pedestrians.
C (LT)	12	Timed R.A. protection for 'A2' pedestrians.



POSTS

Post No	Type	Length
1	2	NEW
2	2	NEW
3	2	NEW
4	2	NEW
5	2	NEW
6	2	NEW
7	2	NEW
8	5L	NEW

NOTE

- Out of service singposting: Stop signs at posts 2 & 6.
- This site is SCATS linked.
- Lanterns denoted by an asterisk are wired to a separate signal group.
- Audio tactile push buttons on all posts.

A ORIGINAL ISSUE
B Issue Office
Instruction 6-1-1992
- Add 4 aspect R/T
lantern post 2 & 6
- Add Audio tactile
PB's
- Remove L/T lantern
on post 8.
- Alter Det/S
C Issue J1 SWR 5492
Instruction 11.03.92
- Date in service add
- Length of BB line
altered in worth st
RUM 06/04/1992
D Issue J1 SWR 2464
Instruction 26.6.92
Replace post 3 to
type 2 post
KI 9/6/1992

PUBLIC UTILITY LEGEND		REFERENCE PLANS		U.B.D. Ref. 45A H-8.	
HYDRANT	□	SYMBOLS/ABBS.	VD003-6	I.S.C.	E: 271240
STOP VALVE	▲	STD POSIT	VD001-5	CD-ORDS	N: 1262570
GAS VALVE	#	DET SCHED EXP	VD018-10	DESIGNED	K. IRONSIDE
SEWER MANHOLE	⊗	PRES. DETECT	ZC005-9	CHECKED	G. RUTTER
TELECOM PIT	■	SSG DIS. SEQ.	VD018-8	DESIGNED & Est Manager	
ELECT LIGHT POLE	○			POSITION	
POWER POLE	○			for Divisional Engineer	
STAY POLE	○			DATE	
TELEPHONE BOX	□	SURVEYOR : (DIGITISED)			
TELECOM PILLAR	●	DATE : OCTOBER 1991			
		LOGIN : TCS_2476_01			

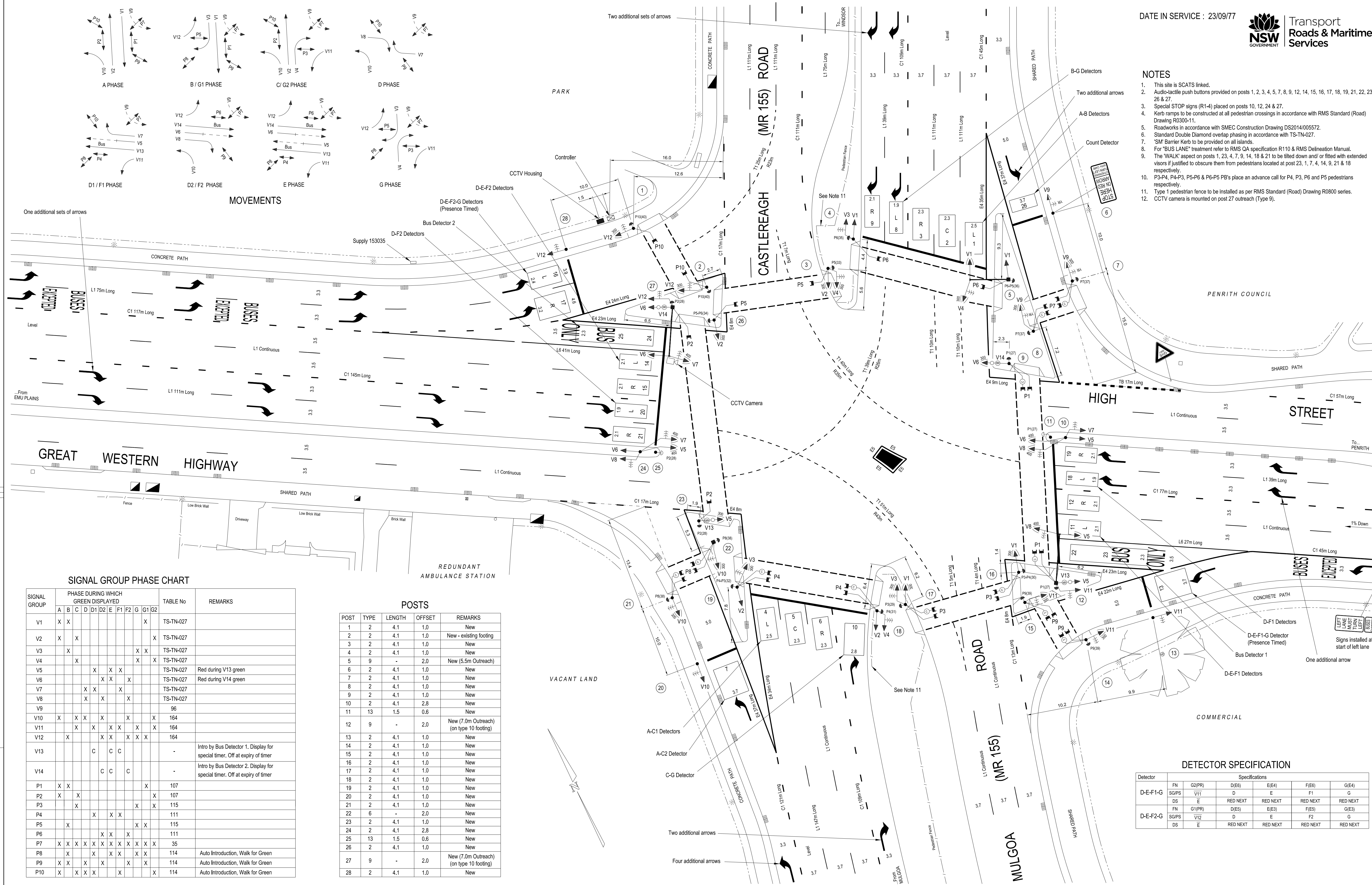
APPROVED
SIGNED
T. McGrath
NAME
POSITION
for Divisional Engineer
10 November 1991
DATE

Roads and Traffic Authority, N.S.W.
CITY OF PENRITH
WORTH STREET
AND UNION ROAD
AT PENRITH
DESIGN LAYOUT
TCS No VV.2476

REGION: SYDNEY WESTERN	DIVISION: PARRAMATTA OPS
DOCS DRAWING FILE: VV_2476_1A.DWG	LOGIN: TCS_2476_01
SCALE 5 0 (1:200) 5 10	ISSUE
FILE 358.TS.213	SUPERSEDES SHEET
REGN. 7000.358.VV.2476	SHEET 1

NOTES

- This site is SCATS linked.
- Audio-tactile push buttons provided on posts 1, 2, 3, 4, 5, 7, 8, 9, 12, 14, 15, 16, 17, 18, 19, 21, 22, 23, 26 & 27.
- Special STOP signs (R1-4) placed on posts 10, 12, 24 & 27.
- Kerb ramps to be constructed at all pedestrian crossings in accordance with RMS Standard (Road) Drawing R0300-11.
- Roadworks in accordance with SMEC Construction Drawing DS2014/005572.
- Standard Double Diamond overlap phasing in accordance with TS-TN-027.
- 'SM' Barrier Kerb to be provided on all islands.
- For 'BUS LANE' treatment refer to RMS QA specification R110 & RMS Delineation Manual.
- The 'WALK' aspect on posts 1, 23, 4, 7, 9, 14, 18 & 21 to be tilted down and/or fitted with extended visors if justified to obscure them from pedestrians located at post 23, 1, 7, 4, 14, 9, 21 & 18 respectively.
- P3-P4, P4-P3, P5-P6 & P6-P5 PB's place an advance call for P4, P3, P6 and P5 pedestrians respectively.
- Type 1 pedestrian fence to be installed as per RMS Standard (Road) Drawing R0800 series.
- CCTV camera is mounted on post 27 outreach (Type 9).



SIGNAL GROUP PHASE CHART

SIGNAL GROUP	PHASE DURING WHICH GREEN DISPLAYED											TABLE No	REMARKS	
	A	B	C	D	D1	D2	E	F1	F2	G	G1			G2
V1	X	X									X		TS-TN-027	
V2	X		X									X	TS-TN-027	
V3		X										X	TS-TN-027	
V4			X								X	X	TS-TN-027	
V5					X	X	X	X					TS-TN-027	Red during V13 green
V6					X	X	X	X					TS-TN-027	Red during V14 green
V7				X	X			X					TS-TN-027	
V8				X	X			X					TS-TN-027	
V9													96	
V10	X	X	X	X				X			X	X	164	
V11		X	X	X	X	X	X	X	X		X	X	164	
V12		X			X	X	X	X	X	X			164	
V13					C		C	C					-	Intro by Bus Detector 1. Display for special timer. Off at expiry of timer
V14						C	C	C					-	Intro by Bus Detector 2. Display for special timer. Off at expiry of timer
P1	X	X	X								X		107	
P2	X		X									X	107	
P3			X								X	X	115	
P4					X	X	X						111	
P5		X									X	X	115	
P6					X	X	X	X					111	
P7	X	X	X	X	X	X	X	X	X	X	X	X	35	
P8		X			X	X	X	X	X	X			114	Auto Introduction, Walk for Green
P9	X	X	X	X	X				X		X		114	Auto Introduction, Walk for Green
P10	X	X	X	X	X		X					X	114	Auto Introduction, Walk for Green

POSTS

POST	TYPE	LENGTH	OFFSET	REMARKS
1	2	4.1	1.0	New
2	2	4.1	1.0	New - existing footing
3	2	4.1	1.0	New
4	2	4.1	1.0	New
5	9	-	2.0	New (5.5m Outreach)
6	2	4.1	1.0	New
7	2	4.1	1.0	New
8	2	4.1	1.0	New
9	2	4.1	1.0	New
10	2	4.1	2.8	New
11	13	1.5	0.6	New
12	9	-	2.0	New (7.0m Outreach) (on type 10 footing)
13	2	4.1	1.0	New
14	2	4.1	1.0	New
15	2	4.1	1.0	New
16	2	4.1	1.0	New
17	2	4.1	1.0	New
18	2	4.1	1.0	New
19	2	4.1	1.0	New
20	2	4.1	1.0	New
21	2	4.1	1.0	New
22	6	-	2.0	New
23	2	4.1	1.0	New
24	2	4.1	2.8	New
25	13	1.5	0.6	New
26	2	4.1	1.0	New
27	9	-	2.0	New (7.0m Outreach) (on type 10 footing)
28	2	4.1	1.0	New

DETECTOR SPECIFICATION

Detector	Specifications					
	FN	G2(PR)	D(E)	E(E4)	F(E)	G(E4)
D-E-F1-G	SGPS	V11	D	E	F1	G
	DS	E	RED NEXT	RED NEXT	RED NEXT	RED NEXT
D-E-F2-G	FN	G1(PR)	D(E)	E(E3)	F(E)	G(E3)
	SGPS	V12	D	E	F2	G
	DS	E	RED NEXT	RED NEXT	RED NEXT	RED NEXT

PUBLIC UTILITY LEGEND

HYDRANT	
STOP VALVE	▲
GAS VALVE	
SEWER MANHOLE	
COMMS PIT	■
ELECT LIGHT POLE	
POWER POLE	
STAY POLE	⊙
TELEPHONE BOX	□
COMMS PILLAR	●

REFERENCE PLANS

SYMBOLS/ABRVS	VD003-6
STD POSN CMPT	VD001-5
INSTL STOP DET	VC005-17
VEH GROUP OP	TS-TN-019
DET LOGIC OP	TS-TN-020
PED MVT OP	TS-TN-021
DDO	TS-TN-027
BASE SOURCE	SMEC
DATE	2017

U.B.D. Ref.

Map 163 E9
I.S.G. E: 270 955
CO-ORDS N: 1 263 990
DESIGNED J BATES
CHECKED R BATES
SITE CHECKED J BATES
RECOMMENDED J BATES

DESIGN APPROVAL

APPROVED
POSITION DATE 17/10/18
DESIGN PREPARED BY B-Line Drafting on behalf of SMEC

RMS RECOMMENDATION

ROAD DESIGN ENGINEERING
NAME P. QUINN
POSITION TRAFFIC SIGNAL DESIGN MANAGER
DATE 07/11/2018
NETWORK OPERATIONS
NAME N. LEITCH
POSITION NETWORK OPERATIONS TEAM LEADER
DATE 14/11/2018

RMS ACCEPTANCE

ACCEPTED
NAME D. LANCE
POSITION NETWORK & SAFETY SERVICES MANAGER
DATE 20/11/2019
ACCEPTED BY
NETWORK & SAFETY SERVICES SECTION

ROADS AND MARITIME SERVICES

PENRITH COUNCIL AREA
TRAFFIC SIGNALS AT
GREAT WESTERN HIGHWAY (HW5),
CASTLEREAGH ROAD (MR 155) & MULGOA ROAD (MR 155)
PENRITH
DESIGN LAYOUT
TCS No 1267

EXISTING ☐ PROPOSED ☒

CADD FILE: VV1267_19A.dgn	ISSUE
SCALE 5 0 (1:250) 5 10	A
FILE SF2014/010106	SUPERSEDES SHEET/ISSUE 12/O
REG No. DS2014/001658	TCS No. 1267
	SHEET 19



**ANNEXURE D: PHASE LENGTH REVIEW
(3 SHEETS)**

Phasing Review

Review Completed By:
Date of Review Completed

18/05/2022

High Street / Worth Street

AM Peak 8:45 - 9:00 AM
AM Watched 8:45 AM - 9:00 AM

Multiply Factor
85400

Start Start of Green
End End of Red (Start of next Green)



AM Phase	Start	Finish	Time (Sec)	B	C	Start	Finish	Time (Sec)	D	Start	Finish	Time (Sec)	E	F	F1	F2	Cycle Time	
1	8:45:25 AM	8:45:54 AM	29	8:45:54 AM	8:45:54 AM	0	8:45:54 AM	8:45:54 AM	0	8:45:54 AM	8:46:20 AM	26	8:46:20 AM	8:46:20 AM	0	8:46:20 AM	8:46:20 AM	55
2	8:46:20 AM	8:47:07 AM	47	8:47:07 AM	8:47:07 AM	0	8:47:07 AM	8:47:07 AM	0	8:47:07 AM	8:47:37 AM	30	8:47:37 AM	8:47:37 AM	0	8:47:37 AM	8:47:37 AM	77
3	8:47:37 AM	8:48:23 AM	46	8:48:23 AM	8:48:23 AM	0	8:48:23 AM	8:48:23 AM	0	8:48:23 AM	8:48:52 AM	29	8:48:52 AM	8:48:52 AM	0	8:48:52 AM	8:48:52 AM	75
4	8:48:52 AM	8:49:49 AM	57	8:49:49 AM	8:49:49 AM	0	8:49:49 AM	8:49:49 AM	0	8:49:49 AM	8:50:30 AM	41	8:50:30 AM	8:50:42 AM	12	8:50:42 AM	8:50:42 AM	110
5	8:50:42 AM	8:51:10 AM	28	8:51:10 AM	8:51:10 AM	0	8:51:10 AM	8:51:10 AM	0	8:51:10 AM	8:51:26 AM	16	8:51:26 AM	8:51:26 AM	0	8:51:26 AM	8:51:26 AM	44
6	8:51:26 AM	8:52:36 AM	60	8:52:36 AM	8:52:36 AM	0	8:52:36 AM	8:52:36 AM	0	8:52:36 AM	8:53:07 AM	27	8:53:07 AM	8:53:07 AM	0	8:53:07 AM	8:53:07 AM	101
7	8:53:07 AM	8:53:42 AM	35	8:53:42 AM	8:53:42 AM	0	8:53:42 AM	8:53:42 AM	0	8:53:42 AM	8:54:18 AM	36	8:54:18 AM	8:54:30 AM	12	8:54:30 AM	8:54:30 AM	83
8	8:54:30 AM	8:54:51 AM	21	8:54:51 AM	8:54:51 AM	0	8:54:51 AM	8:54:51 AM	0	8:54:51 AM	8:55:25 AM	34	8:55:25 AM	8:55:25 AM	0	8:55:25 AM	8:55:25 AM	67
9	8:55:37 AM	8:55:51 AM	14	8:55:51 AM	8:55:51 AM	0	8:55:51 AM	8:55:51 AM	0	8:55:51 AM	8:56:25 AM	18	8:56:25 AM	8:56:25 AM	0	8:56:25 AM	8:56:25 AM	98
10	8:56:35 AM	8:57:03 AM	28	8:57:03 AM	8:57:03 AM	0	8:57:03 AM	8:57:03 AM	0	8:57:03 AM	8:57:36 AM	33	8:57:36 AM	8:57:36 AM	0	8:57:36 AM	8:57:36 AM	61
11	8:57:36 AM	8:58:25 AM	49	8:58:25 AM	8:58:25 AM	0	8:58:25 AM	8:58:25 AM	0	8:58:25 AM	8:59:10 AM	31	8:59:10 AM	8:59:10 AM	0	8:59:10 AM	8:59:23 AM	107
12	8:59:23 AM	8:59:58 AM	35	8:59:58 AM	8:59:58 AM	-32398	12:00:00 AM	8:59:58 AM	0	8:59:58 AM	8:59:58 AM	0	12:00:00 AM	8:59:58 AM	0	12:00:00 AM	8:59:23 AM	-6461
13	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0
14	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0
15	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0
16	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0
17	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0
18	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0
Average			37.416667	Average			Average			Average			Average			Average		
Mean			34.622951	Mean			Mean			Mean			Mean			Mean		
#NUM!			0	#NUM!			#NUM!			#NUM!			#NUM!			#NUM!		
Average			29.181818	Average			Average			Average			Average			Average		
Mean			28.217417	Mean			Mean			Mean			Mean			Mean		
#NUM!			0	#NUM!			#NUM!			#NUM!			#NUM!			#NUM!		
Average			3.181818	Average			Average			Average			Average			Average		
Mean			3.181818	Mean			Mean			Mean			Mean			Mean		
#NUM!			0	#NUM!			#NUM!			#NUM!			#NUM!			#NUM!		
Average			76.181818	Average			Average			Average			Average			Average		
Mean			73.278851	Mean			Mean			Mean			Mean			Mean		
#NUM!			0	#NUM!			#NUM!			#NUM!			#NUM!			#NUM!		

PM Peak 5:15 - 5:30 pm
AM Watched 5:15 - 5:30 pm

PM Phase	Start	Finish	Time (Sec)	B	C	D	Start	Finish	Time (Sec)	E	F	F1	F2			Cycle Time
1	5:15:25 PM	5:15:54 PM	29	5:15:54 PM	5:15:54 PM	0	5:15:54 PM	5:16:20 PM	26	5:16:20 PM	5:17:06 PM	5:17:25 PM	0	5:17:25 PM	5:17:25 PM	0
2	5:17:25 PM	5:17:52 PM	27	5:17:52 PM	5:17:52 PM	0	5:17:52 PM	5:18:17 PM	25	5:18:17 PM	5:19:00 PM	5:19:15 PM	0	5:19:15 PM	5:19:15 PM	0
3	5:19:15 PM	5:19:46 PM	31	5:19:46 PM	5:19:46 PM	0	5:19:46 PM	5:20:09 PM	23	5:20:09 PM	5:20:53 PM	5:21:07 PM	0	5:21:07 PM	5:21:07 PM	0
4	5:21:07 PM	5:21:35 PM	28	5:21:35 PM	5:21:35 PM	0	5:21:35 PM	5:22:01 PM	26	5:22:01 PM	5:22:32 PM	5:22:51 PM	19	5:22:51 PM	5:22:51 PM	0
5	5:22:51 PM	5:23:29 PM	38	5:23:29 PM	5:23:29 PM	0	5:23:29 PM	5:23:55 PM	26	5:23:55 PM	5:24:38 PM	5:24:53 PM	0	5:24:53 PM	5:24:53 PM	0
6	5:24:53 PM	5:25:31 PM	38	5:25:31 PM	5:25:31 PM	0	5:25:31 PM	5:26:00 PM	29	5:26:00 PM	5:26:53 PM	5:27:07 PM	0	5:27:07 PM	5:27:07 PM	0
7	5:27:07 PM	5:27:32 PM	25	5:27:32 PM	5:27:32 PM	0	5:27:32 PM	5:27:56 PM	24	5:27:56 PM	5:28:50 PM	5:29:06 PM	0	5:29:06 PM	5:29:06 PM	0
8	5:29:06 PM	5:29:24 PM	18	5:29:24 PM	5:29:24 PM	0	5:29:24 PM	5:29:49 PM	25	5:29:49 PM	5:30:50 PM	5:31:06 PM	0	5:31:06 PM	5:31:06 PM	-62946
9	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0
10	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0
11	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0
12	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0
13	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0
14	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0
15	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0
16	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0
17	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0
18	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	12:00:00 AM	0	12:00:00 AM	12:00:00 AM	0
Average																
Mean																
#NUM!																
Average																
Mean																
#NUM!																
Average																
Min																

18/05/2022

18/05/2022

Multiply Factor
86400

[illegible][illegible]

Phasing Review

Review Completed By:

Date of Review Completed 18/05/2022

Union Road / Worth Street

Start Start of Green
End End of Red (Start of next Green)

AM Peak 8:45 - 9:00 AM
AM Watched 8:45AM - 9:00AM

Multiply Factor
86400

AM	Start	Finish	Time (Sec)	Start	Finish	Time (Sec)	Start	Finish	Time (Sec)		Cycle Time (sec)
Phase	A			B			C				
1	8:45:15 AM	8:46:06 AM	51	8:46:06 AM	8:46:32 AM	26	8:46:32 AM	8:46:32 AM	0		77
2	8:46:32 AM	8:47:16 AM	44	8:47:16 AM	8:47:36 AM	20	8:47:36 AM	8:47:48 AM	12		76
3	8:47:48 AM	8:48:31 AM	43	8:48:31 AM	8:48:45 AM	14	8:48:45 AM	8:48:45 AM	0		57
4	8:48:45 AM	8:50:03 AM	78	8:50:03 AM	8:50:18 AM	15	8:50:18 AM	8:50:38 AM	20		113
5	8:50:38 AM	8:51:20 AM	42	8:51:20 AM	8:51:39 AM	19	8:51:39 AM	8:51:39 AM	0		61
6	8:51:39 AM	8:52:33 AM	54	8:52:33 AM	8:52:49 AM	16	8:52:49 AM	8:53:10 AM	21		91
7	8:53:10 AM	8:53:47 AM	37	8:53:47 AM	8:54:01 AM	14	8:54:01 AM	8:54:01 AM	0		51
8	8:54:01 AM	8:54:51 AM	50	8:54:51 AM	8:55:14 AM	23	8:55:14 AM	8:55:14 AM	0		73
9	8:55:14 AM	8:56:00 AM	46	8:56:00 AM	8:56:22 AM	22	8:56:22 AM	8:56:22 AM	0		68
10	8:56:22 AM	8:57:14 AM	52	8:57:14 AM	8:57:30 AM	16	8:57:30 AM	8:57:44 AM	14		82
11	8:57:44 AM	8:58:37 AM	53	8:58:37 AM	8:58:54 AM	17	8:58:54 AM	8:58:54 AM	0		70
12	8:58:54 AM	8:59:51 AM	57	8:59:51 AM		-32391	12:00:00 AM		0		-32334
13	12:00:00 AM		0	12:00:00 AM		0	12:00:00 AM		0		0
14	12:00:00 AM		0	12:00:00 AM		0	12:00:00 AM		0		0
15	12:00:00 AM		0	12:00:00 AM		0	12:00:00 AM		0		0
16	12:00:00 AM		0	12:00:00 AM		0	12:00:00 AM		0		0
17	12:00:00 AM		0	12:00:00 AM		0	12:00:00 AM		0		0
18	12:00:00 AM		0	12:00:00 AM		0	12:00:00 AM		0		0
Average			50.583333	Average		18.363636	Average		6.7	Average	74.454545
Mean			49.7194195	Mean		17.99226293	Mean		#NUM!	Mean	72.79234304
Min			37	Min		14	Min		12	Min	51
Max			78	Max		26	Max		21	Max	113

PM Peak 5:15-5:30pm
AM Watched 5:15-5:30pm

PM	Start	Finish	Time (Sec)	Start	Finish	Time (Sec)	Start	Finish	Time (Sec)		Cycle Time (sec)
Phase	A			B			C				
1			0	5:16:05 PM	5:16:36 PM	31	5:16:36 PM	5:16:57 PM	21		52
2	5:16:57 PM	5:18:04 PM	67	5:18:04 PM	5:18:31 PM	27	5:18:31 PM	5:18:52 PM	21		115
3	5:18:52 PM	5:19:56 PM	64	5:19:56 PM	5:20:42 PM	46	5:20:42 PM	5:20:42 PM	0		110
4	5:20:42 PM	5:21:47 PM	65	5:21:47 PM	5:22:22 PM	35	5:22:22 PM	5:22:40 PM	18		118
5	5:22:40 PM	5:23:40 PM	60	5:23:40 PM	5:24:20 PM	40	5:24:20 PM	5:24:20 PM	0		100
6	5:24:20 PM	5:25:46 PM	86	5:25:46 PM	5:26:25 PM	39	5:26:25 PM	5:26:39 PM	14		139
7	5:26:39 PM	5:27:42 PM	63	5:27:42 PM	5:28:22 PM	40	5:28:22 PM	5:28:40 PM	18		121
8	5:28:40 PM	5:29:35 PM	55	5:29:35 PM		-62975	12:00:00 AM		0		-62920
9	12:00:00 AM		0	12:00:00 AM		0	12:00:00 AM		0		0
10	12:00:00 AM		0	12:00:00 AM		0	12:00:00 AM		0		0
11	12:00:00 AM		0	12:00:00 AM		0	12:00:00 AM		0		0
12	12:00:00 AM		0	12:00:00 AM		0	12:00:00 AM		0		0
13	12:00:00 AM		0	12:00:00 AM		0	12:00:00 AM		0		0
14	12:00:00 AM		0	12:00:00 AM		0	12:00:00 AM		0		0
15	12:00:00 AM		0	12:00:00 AM		0	12:00:00 AM		0		0
16	12:00:00 AM		0	12:00:00 AM		0	12:00:00 AM		0		0
17	12:00:00 AM		0	12:00:00 AM		0	12:00:00 AM		0		0
18	12:00:00 AM		0	12:00:00 AM		0	12:00:00 AM		0		0
Average			65.7142857	Average		36.85714286	Average		13.1428571	Average	107.8571429
Mean			65.1525746	Mean		36.36441124	Mean		#NUM!	Mean	103.8817926
Min			55	Min		27	Min		14	Min	52
Max			86	Max		46	Max		21	Max	139



**ANNEXURE E: OBSERVED QUEUE LENGTHS AND
PEDESTRIAN VOLUMES
(3 SHEETS)**

High / Mulgoa

Leg	North						East						South						West					
Lane	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Turn Movement	Right	Right	Through	Through	Through	Left	Right	Right	Through	Through	Bus	Left	Right	Through	Through	Through	Left	Right	Right	Through	Through	Bus	Left	Left
8:45-9:00																								
1	9	5	6	6	9		0	1	4	1		1	2	20	20	5	2	2	5	5	4	0	4	3
2	7	5	0	1	1		0	1	4	3		0	1	15	15	5	2	0	0	0	0	0	3	3
3	16	13	5	10	5		3	3	1	9		1	2	10	10	5	2	6	8	5	6	0	13	12
4	9	5	10	8	8		1	2	5	1		1	4	15	15	5	2	2	6	3	5	0	9	7
5	11	6	9	10	7		3	1	7	2		1	3	9	9	5	2	2	3	3	5	0	10	10
6	7	5					2	2	3	1		2	5	11	10	5	2	2	5	6	7	1	11	7
7													2	11	11	5	2	4	10	8	5	0	10	5
8																								
9																								
10																								
Average	9.833333	6.5	6	7	6		1.5	1.666667	4	2.833333		1	2.714286	13	12.85714	5	2	2.571429	5.285714	4.285714	4.571429	0.142857	8.571429	6.714286
17:15-17:30																								
1	12	10	3	3	2		1	15+	15+			0	0	20+	20+	5	15±	2	5	4	3	0	5	3
2	10	10	7	9	6		5	2	15+	15+		0	4	20+	20+	5	15±	2	5	4	6	0	5	1
3	13	13	5	7	6		4	5	15+	15+		0	3	20+	20+	5	15±	1	2	1	7	0	4	3
4	15	14	7	5	5		5	3	15+	15+		1	0	10	8	5	15±	1	4	1	3	0	9	5
5	15	13	8	7	7		4	3	15+	15+		0	1	15±	15±	5	15±	2	4	1	3	0	6	4
6	14	11	4	3	3		3	3	15+	15+		1	2	15±	15±	5	15±	5	5	1	3	0	2	0
7	16	13	4	5	4		4	5	15+	15+			4	20+	20+	5	15±							
8	16	14																						
9	13	12																						
10	10	10																						
11	14	13																						
12																								
13																								
14																								

Pedestrian Counts		North	East	South	West
8:15	8:30	3	0	5	0
8:30	8:45	0	1	2	2
8:45	9:00	0	3	5	0
9:00	9:15	0	4	5	0
16:45	17:00	0	1	4	0
17:00	17:15	0	1	0	2
17:15	17:30	1	1	7	1
17:30	17:45	1	1	2	0

Union / Worth

Queue Lengths number of vehicles

Leg	North		East		South	West	
Lane	1	2	3	4	5	6	7
Cycle							
8:45-9:00							
1	0	5	3	1	1	0	2
2	0	5	2	0	3	1	0
3	2	1	2	0	1	5	0
4	0	1	12	0	4	4	1
5	0	3	8	0	1	9	0
6	0	2				6	0
7	0	1				3	0
8	0	4				1	0
9	0	3					
10	2	1					
11	1	2					
12	2	4					
Average	0.583333	2.666667	5.4	0.2	2	3.625	0.375
17:15-17:30							
1	5	4	6	0	3	3	0
2	5	8	8	0	5	3	1
3	6	10	2	1	2	6	2
4	5	7	9	0	1	3	0
5	1	8	9	0	2	2	0
6	7	8	6	2	2	1	0
7	3	7	7	1			
8	7	7	5	1			
9							
10							
11							
12							
Average	4.875	7.375	6.5	0.625	2.5	3	0.5

Pedestrian Counts		North	East	South	West
8:15	8:30	2	5	1	3
8:30	8:45	2	1	3	9
8:45	9:00	1	1	4	3
9:00	9:15	0	1	3	3
16:45	17:00	2	6	7	5
17:00	17:15	6	3	1	3
17:15	17:30	1	6	1	5
17:30	17:45	1	1	2	9

Worth / High											
Pedestrian Counts		North		East		South		West			
8:15	8:30	5	9	3	10						
8:30	8:45	1	10	2	17						
8:45	9:00	1	8	6	13						
9:00	9:15	1	8	16	10						
16:45	17:00	6	9	4	17						
17:00	17:15	4	5	8	17						
17:15	17:30	3	10	4	17						
17:30	17:45	2	6	4	14						
Queue Lengths number of vehicles											
Leg	North		East			South		West			
Lane	1	2	3	4	5	6	7	8	9	10	11
Cycle											
8:45-9:00											
1	0	1	1	2	0	4	1	0	0	2	
2	1	0	1	6	5	5	3	1	1	2	
3	1	0	1	3	1	3	5	0	4	3	
4	1	0	1	4	1	4	2	3	1	0	
5	1	0				3	2	1	0	3	
6								3	1	2	
7											
8											
9											
10											
11											
12											
Average	0.8	0.2	1	3.75	1.75	3.8	2.6	1.333333	1.166667	2	
17:15-17:30											
1	5	2	0	3	3	13	6	2	2	1	
2	4	3	3	6	6	7	12	3	0	3	
3	6	1	3	5	3	9	6	0	0	3	
4	5	4	1	2	4	6	10	3	2	3	
5	6	3	3	7	5	7	11	1	8	5	
6	8	3	2	3	3	6	8	3	1	3	
7	4	1	5	5	7			3	1	4	
8			3	2	3			0	3	3	
9			1	4	6			0	1	2	
10											
11											
Average	5.428571	2.428571	2.333333	4.111111	4.444444	8	8.833333	1.666667	2	3	



**ANNEXURE F: SIDRA RESULTS
(160 SHEETS)**



**EXISTING VOLUMES
(40 SHEETS)**

■ ■ Network: N101 [EX PM
(Network Folder: Existing
Peaks)]

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h	HV] %	[Total veh/h	HV] %	veh/h	v/c	%	sec		[Veh	Dist] m		m	%	%
East: High Street (E)															
Lane 1 ^d	508	0.8	508	0.8	1240	0.410	100	3.7	LOS A	0.8	5.9	Full	165	-18.4 ^{N3}	0.0
Lane 2	362	0.7	362	0.7	885	0.410	100	4.3	LOS A	0.6	4.5	Full	165	-32.3 ^{N3}	0.0
Approach	870	0.8	870	0.8		0.410		4.0	LOS A	0.8	5.9				
North: Penrith City Council															
Lane 1 ^d	151	0.0	151	0.0	711	0.212	100	2.1	LOS A	0.3	2.2	Full	500	-21.3 ^{N3}	0.0
Approach	151	0.0	151	0.0		0.212		2.1	LOS A	0.3	2.2				
West: High Street (W)															
Lane 1 ^d	352	0.3	352	0.3	1621	0.217	100	3.7	LOS A	0.5	3.7	Full	120	0.0	0.0
Lane 2	304	0.3	304	0.3	1400	0.217	100	3.8	LOS A	0.5	3.5	Full	120	-2.0 ^{N3}	0.0
Approach	657	0.3	657	0.3		0.217		3.7	LOS A	0.5	3.7				
Intersection	1678	0.5	1678	0.5		0.410		3.7	LOS A	0.8	5.9				

N3 Capacity Adjustment due to downstream lane blockage determined by the program.

Approach Lane Flows (veh/h)										
East: High Street (E)										
Mov. From E To Exit:	T1	R2	U	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	508	-	-	508	0.8	1240	0.410	100	NA	NA
Lane 2	317	40	6	362	0.7	885	0.410	100	NA	NA
Approach	824	40	6	870	0.8	0.410				
North: Penrith City Council										
Mov. From N To Exit:	L2	R2	U	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	75	75	1	151	0.0	711	0.212	100	NA	NA
Approach	75	75	1	151	0.0	0.212				
West: High Street (W)										

Mov. From W To Exit:	L2 N	T1 E	U W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	78	274	-	352	0.3	1621	0.217	100	NA	NA
Lane 2	-	293	11	304	0.3	1400	0.217	100	NA	NA
Approach	78	567	11	657	0.3		0.217			
Total %HV Deg.Satn (v/c)										
Intersection	1678	0.5		0.410						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: High Street (E) Merge Type: Not Applied											
Full Length Lane		1	Merge Analysis not applied.								
Full Length Lane		2	Merge Analysis not applied.								
North Exit: Penrith City Council Merge Type: Not Applied											
Full Length Lane		1	Merge Analysis not applied.								
West Exit: High Street (W) Merge Type: Not Applied											
Full Length Lane		1	Merge Analysis not applied.								
Full Length Lane		2	Merge Analysis not applied.								

MOVEMENT SUMMARY

 **Site: 101 [Ex AM - High Street Roundabout - Copy (Site Folder: Existing AM)]**

 **Network: N101 [EX AM (Network Folder: Existing Peaks)]**

Existing AM
High Street Roundabout
Job No: 220249
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
East: High Street (E)														
5	T1	321	4.8	321	4.8	0.119	3.4	LOS A	0.2	1.7	0.09	0.39	0.09	38.6
6	R2	34	3.8	34	3.8	0.119	7.4	LOS A	0.2	1.7	0.10	0.44	0.10	23.0
6u	U	5	28.6	5	28.6	0.119	10.8	LOS A	0.2	1.7	0.10	0.44	0.10	37.6
Approach		359	5.0	359	5.0	0.119	3.9	LOS A	0.2	1.7	0.09	0.40	0.09	32.6
North: Penrith City Council														
7	L2	11	0.0	11	0.0	0.033	1.8	LOS A	0.1	0.4	0.45	0.32	0.45	20.0
9	R2	18	0.0	18	0.0	0.033	1.8	LOS A	0.1	0.4	0.45	0.32	0.45	20.0
9u	U	1	0.0	1	0.0	0.033	12.2	LOS A	0.1	0.4	0.45	0.32	0.45	29.8
Approach		30	0.0	30	0.0	0.033	2.2	LOS A	0.1	0.4	0.45	0.32	0.45	20.5
West: High Street (W)														
10	L2	67	0.0	67	0.0	0.222	4.3	LOS A	0.5	3.5	0.11	0.38	0.11	22.3
11	T1	605	3.6	605	3.6	0.222	3.5	LOS A	0.5	3.5	0.11	0.38	0.11	36.4
12u	U	4	0.0	4	0.0	0.222	10.5	LOS A	0.5	3.5	0.12	0.37	0.12	36.6
Approach		676	3.2	676	3.2	0.222	3.6	LOS A	0.5	3.5	0.11	0.38	0.11	30.2
All Vehicles		1065	3.8	1065	3.8	0.222	3.7	LOS A	0.5	3.5	0.12	0.38	0.12	30.0

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

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

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

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■ ■ Network: N101 [EX AM
(Network Folder: Existing
Peaks)]

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Worth Street (S)											
P1	Full	6	54.2	LOS E	0.0	0.0	0.95	0.95	220.2	215.9	0.98
East: High Street (E)											
P2	Full	8	54.2	LOS E	0.0	0.0	0.95	0.95	223.8	220.5	0.99
North: Penrith Plaza											

P3 Full	1	54.2	LOS E	0.0	0.0	0.95	0.95	221.2	217.2	0.98
P3B Slip/ Bypass	9	54.2	LOS E	0.0	0.0	0.95	0.95	211.3	204.3	0.97
West: High Street (W)										
P4 Full	14	54.2	LOS E	0.0	0.0	0.95	0.95	223.8	220.5	0.99
P4B Slip/ Bypass	15	24.4	LOS C	0.0	0.0	0.90	0.90	181.6	204.3	1.12
All Pedestrians	54	46.0	LOS E	0.0	0.0	0.94	0.94	209.5	212.6	1.01

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

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

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

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MOVEMENT SUMMARY

 Site: 101 [Ex AM - High Street / Mulgoa Road / Castlereagh Road - Copy (Site Folder: Existing AM)]

 Network: N101 [EX AM (Network Folder: Existing Peaks)]

Existing AM

High Street / Mulgoa Road

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Mulgoa Road (S)														
1	L2	152	2.8	152	2.8	0.168	27.0	LOS B	3.5	25.0	0.59	0.72	0.59	41.3
2	T1	726	15.1	726	15.1	* 0.577	45.2	LOS D	10.0	79.0	0.89	0.76	0.89	27.7
3	R2	107	2.0	107	2.0	0.435	66.6	LOS E	4.2	30.0	0.96	0.79	0.96	19.4
Approach		985	11.7	985	11.7	0.577	44.8	LOS D	10.0	79.0	0.86	0.76	0.86	28.9
East: High Street (E)														
4	L2	53	5.9	53	5.9	0.111	41.6	LOS C	1.6	11.6	0.75	0.71	0.75	27.9
5	T1	215	3.9	215	3.9	* 0.610	68.3	LOS E	4.5	32.2	1.00	0.80	1.01	21.9
6	R2	70	3.0	70	3.0	0.273	73.4	LOS F	1.4	10.4	0.98	0.73	0.98	10.3
Approach		338	4.0	338	4.0	0.610	65.2	LOS E	4.5	32.2	0.96	0.77	0.97	20.5
North: Castlereagh Road (N)														
7	L2	134	5.5	134	5.5	0.218	21.6	LOS B	2.3	17.0	0.68	0.72	0.68	16.7
8	T1	912	12.6	912	12.6	0.448	31.8	LOS C	9.5	73.5	0.77	0.67	0.77	33.0
9	R2	539	5.3	539	5.3	* 0.596	55.0	LOS D	9.9	72.6	0.93	0.83	0.93	24.8
Approach		1585	9.5	1585	9.5	0.596	38.8	LOS C	9.9	73.5	0.82	0.73	0.82	29.0
West: High Street (W)														
10	L2	677	5.1	677	5.1	0.433	28.2	LOS B	8.7	63.9	0.67	0.77	0.67	34.0
11	T1	424	2.2	424	2.2	0.620	59.1	LOS E	8.3	58.9	0.98	0.82	0.98	21.1
12	R2	337	1.9	337	1.9	* 0.589	65.6	LOS E	6.7	47.4	0.98	0.81	0.98	28.8
Approach		1438	3.5	1438	3.5	0.620	46.1	LOS D	8.7	63.9	0.83	0.79	0.83	28.3
All Vehicles		4346	7.6	4346	7.6	0.620	44.6	LOS D	10.0	79.0	0.84	0.76	0.84	27.9

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

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

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

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

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

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Mulgoa Road (S)											
P11	Stage 1	5	64.1	LOS F	0.0	0.0	0.96	0.96	228.9	214.2	0.94
P12	Stage 2	5	64.1	LOS F	0.0	0.0	0.96	0.96	226.4	210.9	0.93
P1B	Slip/ Bypass	5	64.1	LOS F	0.0	0.0	0.96	0.96	221.3	204.3	0.92

East: High Street (E)											
P2 Full	3	64.1	LOS F	0.0	0.0	0.96	0.96	238.6	226.9	0.95	
P2B Slip/ Bypass	8	64.2	LOS F	0.0	0.0	0.96	0.96	221.3	204.3	0.92	
North: Castlereagh Road (N)											
P31 Stage 1	1	64.1	LOS F	0.0	0.0	0.96	0.96	231.4	217.5	0.94	
P32 Stage 2	1	64.1	LOS F	0.0	0.0	0.96	0.96	226.4	210.9	0.93	
P3B Slip/ Bypass	3	33.4	LOS D	0.0	0.0	0.91	0.91	190.5	204.3	1.07	
West: High Street (W)											
P4 Full	1	64.1	LOS F	0.0	0.0	0.96	0.96	238.4	226.6	0.95	
P4B Slip/ Bypass	1	64.1	LOS F	0.0	0.0	0.96	0.96	223.8	207.6	0.93	
All Pedestrians	35	61.3	LOS F	0.0	0.0	0.95	0.95	223.1	210.2	0.94	

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

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

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

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MOVEMENT SUMMARY

Site: 101 [Ex AM - Worth Street / Union Lane - Copy (Site Folder: Existing AM)]

Network: N101 [EX AM (Network Folder: Existing Peaks)]

Existing AM
Worth Street / Union Lane
Job No: 220249
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Worth Street (S)														
1	L2	30	0.0	30	0.0	0.078	4.1	LOS A	0.0	0.0	0.00	0.11	0.00	45.9
2	T1	265	3.0	265	3.0	0.078	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	46.3
Approach		295	2.7	295	2.7	0.078	0.4	NA	0.0	0.0	0.00	0.05	0.00	46.2
East: Union Lane (E)														
4	L2	17	0.0	17	0.0	0.016	3.7	LOS A	0.0	0.2	0.18	0.43	0.18	36.8
5	T1	1	0.0	1	0.0	0.016	5.5	LOS A	0.0	0.2	0.18	0.43	0.18	38.0
6	R2	17	34.6	17	34.6	0.040	9.0	LOS A	0.1	0.5	0.53	0.66	0.53	33.6
Approach		35	17.2	35	17.2	0.040	6.4	LOS A	0.1	0.5	0.35	0.55	0.35	35.2
North: Worth Street (N)														
8	T1	158	1.3	158	1.3	0.050	0.2	LOS A	0.1	0.4	0.06	0.05	0.06	44.6
9	R2	18	0.0	18	0.0	0.050	5.5	LOS A	0.1	0.4	0.14	0.12	0.14	39.6
Approach		175	1.1	175	1.1	0.050	0.7	NA	0.1	0.4	0.07	0.06	0.07	43.1
West: Union Lane (W)														
10	L2	14	0.0	14	0.0	0.019	5.0	LOS A	0.0	0.2	0.23	0.52	0.23	35.5
12	R2	4	0.0	4	0.0	0.019	8.4	LOS A	0.0	0.2	0.23	0.52	0.23	35.5
Approach		19	0.0	19	0.0	0.019	5.7	LOS A	0.0	0.2	0.23	0.52	0.23	35.5
All Vehicles		524	3.1	524	3.1	0.078	1.1	NA	0.1	0.5	0.05	0.10	0.05	41.0

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.

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

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

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

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

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

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■ ■ Network: N101 [EX AM
(Network Folder: Existing
Peaks)]

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)

- * Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Worth Street (S)											
P1	Full	4	59.1	LOS E	0.0	0.0	0.95	0.95	219.6	208.6	0.95
East: Union Road (E)											
P2	Full	1	59.1	LOS E	0.0	0.0	0.95	0.95	224.7	215.2	0.96
North: Worth Street (N)											

P3 Full	1	59.1	LOS E	0.0	0.0	0.95	0.95	224.7	215.2	0.96
West: Union Road (W)										
P4 Full	3	59.1	LOS E	0.0	0.0	0.95	0.95	224.7	215.2	0.96
All Pedestrians	9	59.1	LOS E	0.0	0.0	0.95	0.95	222.4	212.3	0.95

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

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

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

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LANE SUMMARY

 **Site: 101 [Ex AM - High Street Roundabout - Copy (Site Folder: Existing AM)]**

 **Network: N101 [EX AM (Network Folder: Existing Peaks)]**

Existing AM
High Street Roundabout
Job No: 220249
Site Category: (None)
Roundabout

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
East: High Street (E)															
Lane 1 ^d	190	4.8	190	4.8	1596	0.119	100	3.4	LOS A	0.2	1.7	Full	165	0.0	0.0
Lane 2	169	5.3	169	5.3	1417	0.119	100	4.4	LOS A	0.2	1.7	Full	165	0.0	0.0
Approach	359	5.0	359	5.0		0.119		3.9	LOS A	0.2	1.7				
North: Penrith City Council															
Lane 1 ^d	30	0.0	30	0.0	900	0.033	100	2.2	LOS A	0.1	0.4	Full	500	0.0	0.0
Approach	30	0.0	30	0.0		0.033		2.2	LOS A	0.1	0.4				
West: High Street (W)															
Lane 1 ^d	360	3.0	360	3.0	1619	0.222	100	3.6	LOS A	0.5	3.5	Full	120	0.0	0.0
Lane 2	316	3.6	316	3.6	1421	0.222	100	3.6	LOS A	0.5	3.5	Full	120	0.0	0.0
Approach	676	3.2	676	3.2		0.222		3.6	LOS A	0.5	3.5				
Intersection	1065	3.8	1065	3.8		0.222		3.7	LOS A	0.5	3.5				

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

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
East: High Street (E)											
Mov.	T1	R2	U	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov.	
From E To Exit:	W	N	E			Cap. veh/h	v/c	%	%	Lane No.	
Lane 1	190	-	-	190	4.8	1596	0.119	100	NA	NA	
Lane 2	131	34	5	169	5.3	1417	0.119	100	NA	NA	
Approach	321	34	5	359	5.0		0.119				
North: Penrith City Council											
Mov.	L2	R2	U	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov.	
From N To Exit:	E	W	N			Cap. veh/h	v/c	%	%	Lane No.	
Lane 1	11	18	1	30	0.0	900	0.033	100	NA	NA	
Approach	11	18	1	30	0.0		0.033				
West: High Street (W)											
Mov.	L2	T1	U	Total	%HV		Deg.	Lane	Prob.	Ov.	

From W To Exit:	N	E	W			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	67	293	-	360	3.0	1619	0.222	100	NA	NA
Lane 2	-	312	4	316	3.6	1421	0.222	100	NA	NA
Approach	67	605	4	676	3.2		0.222			
Total %HV Deg.Satn (v/c)										
Intersection	1065	3.8				0.222				

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
East Exit: High Street (E) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Penrith City Council Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: High Street (W) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										

LANE SUMMARY

 Site: 101 [Ex AM - High Street / Worth Street - Copy (Site Folder: Existing AM)]

 Network: N101 [EX AM (Network Folder: Existing Peaks)]

Existing AM
High Street / Worth Street
Job No: 220249
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
South: Worth Street (S)															
Lane 1	154	5.7	154	5.7	716	0.215	100	28.2	LOS B	3.5	25.7	Full	62	0.0	0.0
Lane 2	156	0.8	156	0.8	725	0.215	100	25.0	LOS B	3.5	25.0	Full	62	0.0	0.0
Approach	310	3.2	310	3.2		0.215		26.6	LOS B	3.5	25.7				
East: High Street (E)															
Lane 1	49	5.5	49	5.5	851	0.057	26 ⁷	21.6	LOS B	0.9	6.6	Full	500	0.0	0.0
Lane 2	199	4.3	199	4.3	903	0.220	100	19.0	LOS B	4.1	29.4	Full	500	0.0	0.0
Lane 3	81	0.0	81	0.0	457	0.177	100	27.1	LOS B	1.8	12.5	Short	70	0.0	NA
Approach	328	3.4	328	3.4		0.220		21.3	LOS B	4.1	29.4				
North: Penrith Plaza															
Lane 1	18	0.0	18	0.0	518	0.034	100	25.3	LOS B	0.4	2.5	Short	7	0.0	NA
Lane 2	19	0.0	19	0.0	813	0.023	63 ⁵	21.6	LOS B	0.4	2.7	Full	500	0.0	0.0
Lane 3	16	0.0	16	0.0	422	0.037	100	30.6	LOS C	0.4	2.5	Full	500	0.0	0.0
Approach	52	0.0	52	0.0		0.037		25.5	LOS B	0.4	2.7				
West: High Street (W)															
Lane 1	158	0.0	158	0.0	1231	0.129	100	5.6	LOS A	0.6	4.0	Short	60	0.0	NA
Lane 2	177	6.0	177	6.0	889	0.200	100	18.8	LOS B	3.6	26.3	Full	165	0.0	0.0
Lane 3	177	6.0	177	6.0	889	0.200	100	18.8	LOS B	3.6	26.3	Full	165	0.0	0.0
Lane 4	124	1.0	124	1.0	493	0.252	100	28.5	LOS C	2.9	20.3	Short	50	0.0	NA
Approach	637	3.5	637	3.5		0.252		17.4	LOS B	3.6	26.3				
Intersection	1328	3.3	1328	3.3		0.252		20.8	LOS B	4.1	29.4				

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

- ⁵ Lane under-utilisation found by the program
- ⁷ Lane under-utilisation specified by the user

Approach Lane Flows (veh/h)											
South: Worth Street (S)											
Mov. From S To Exit:	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Ov.	Ov. Lane No.
	W	N	E				veh/h v/c	%	%		
Lane 1	151	4	-	154	5.7		716 0.215	100	NA	NA	
Lane 2	-	116	40	156	0.8		725 0.215	100	NA	NA	

Approach	151	120	40	310	3.2	0.215				
East: High Street (E)										
Mov. From E To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	S	W	N							
Lane 1	45	4	-	49	5.5	851	0.057	26 ⁷	NA	NA
Lane 2	-	199	-	199	4.3	903	0.220	100	NA	NA
Lane 3	-	-	81	81	0.0	457	0.177	100	0.0	2
Approach	45	203	81	328	3.4	0.220				
North: Penrith Plaza										
Mov. From N To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	E	S	W							
Lane 1	18	-	-	18	0.0	518	0.034	100	0.0	2
Lane 2	-	19	-	19	0.0	813	0.023	63 ⁵	NA	NA
Lane 3	-	-	16	16	0.0	422	0.037	100	NA	NA
Approach	18	19	16	52	0.0	0.037				
West: High Street (W)										
Mov. From W To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	N	E	S							
Lane 1	158	-	-	158	0.0	1231	0.129	100	0.0	2
Lane 2	-	177	-	177	6.0	889	0.200	100	NA	NA
Lane 3	-	177	-	177	6.0	889	0.200	100	NA	NA
Lane 4	-	-	124	124	1.0	493	0.252	100	0.0	3
Approach	158	355	124	637	3.5	0.252				
Total %HV Deg.Satn (v/c)										
Intersection	1328	3.3	0.252							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

5 Lane under-utilisation found by the program

7 Lane under-utilisation specified by the user

Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Worth Street (S) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
East Exit: High Street (E) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
North Exit: Penrith Plaza Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
West Exit: High Street (W) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									

LANE SUMMARY

 Site: 101 [Ex AM - High Street / Mulgoa Road / Castlereagh Road - Copy (Site Folder: Existing AM)]

 Network: N101 [EX AM (Network Folder: Existing Peaks)]

Existing AM

High Street / Mulgoa Road

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
South: Mulgoa Road (S)															
Lane 1	152	2.8	152	2.8	902	0.168	100	27.0	LOS B	3.5	25.0	Short	126	0.0	NA
Lane 2	168	15.1	168	15.1	484	0.346	60 ⁷	42.5	LOS D	5.5	43.8	Full	500	0.0	0.0
Lane 3	279	15.1	279	15.1	484	0.577	100	46.1	LOS D	10.0	79.0	Full	500	0.0	0.0
Lane 4	279	15.1	279	15.1	484	0.577	100	46.1	LOS D	10.0	79.0	Full	500	0.0	0.0
Lane 5	107	2.0	107	2.0	247	0.435	100	66.6	LOS E	4.2	30.0	Short	95	0.0	NA
Approach	985	11.7	985	11.7		0.577		44.8	LOS D	10.0	79.0				
East: High Street (E)															
Lane 1	53	5.9	53	5.9	478	0.111	100	41.6	LOS C	1.6	11.6	Short	35	0.0	NA
Lane 2	1	100.0	1	100.0	152	0.007	1 ⁵	57.7	LOS E	0.0	0.5	Short	15	0.0	NA
Lane 3	107	3.4	107	3.4	175	0.610	100	68.4	LOS E	4.5	32.2	Full	120	0.0	0.0
Lane 4	107	3.4	107	3.4	175	0.610	100	68.4	LOS E	4.5	32.2	Full	120	0.0	0.0
Lane 5	35	3.0	35	3.0	129	0.273	100	73.4	LOS F	1.4	10.4	Short	63	0.0	NA
Lane 6	35	3.0	35	3.0	129	0.273	100	73.4	LOS F	1.4	10.4	Short	50	0.0	NA
Approach	338	4.0	338	4.0		0.610		65.2	LOS E	4.5	32.2				
North: Castlereagh Road (N)															
Lane 1	134	5.5	134	5.5	613	0.218	100	21.6	LOS B	2.3	17.0	Short	50	0.0	NA
Lane 2	281	12.6	281	12.6	627 ¹	0.448	100	31.2	LOS C	8.2	63.7	Full	115	0.0	0.0
Lane 3	316	12.6	316	12.6	705	0.448	100	32.0	LOS C	9.5	73.5	Full	115	0.0	8.7
Lane 4	316	12.6	316	12.6	705	0.448	100	32.0	LOS C	9.5	73.5	Full	115	0.0	8.7
Lane 5	269	5.3	269	5.3	452	0.596	100	55.0	LOS D	9.9	72.6	Short	95	0.0	NA
Lane 6	269	5.3	269	5.3	452	0.596	100	55.0	LOS D	9.9	72.6	Short	88	0.0	NA
Approach	1585	9.5	1585	9.5		0.596		38.8	LOS C	9.9	73.5				
West: High Street (W)															
Lane 1	339	5.1	339	5.1	783	0.433	100	28.2	LOS B	8.7	63.9	Short	85	0.0	NA
Lane 2	338	5.1	338	5.1	781 ¹	0.433	100	28.2	LOS B	8.7	63.7	Short	97	0.0	NA
Lane 3	1	100.0	1	100.0	253	0.004	1 ⁵	47.6	LOS D	0.0	0.4	Short	16	0.0	NA
Lane 4	212	2.0	212	2.0	341	0.620	100	59.1	LOS E	8.3	58.9	Full	500	0.0	0.0
Lane 5	212	2.0	212	2.0	341	0.620	100	59.1	LOS E	8.3	58.9	Full	500	0.0	0.0
Lane 6	168	1.9	168	1.9	286	0.589	100	65.6	LOS E	6.7	47.4	Short	123	0.0	NA
Lane 7	168	1.9	168	1.9	286	0.589	100	65.6	LOS E	6.7	47.4	Short	113	0.0	NA
Approach	1438	3.5	1438	3.5		0.620		46.1	LOS D	8.7	63.9				
Intersection	4346	7.6	4346	7.6		0.620		44.6	LOS D	10.0	79.0				

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

Lane LOS values are based on average delay per lane.

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

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

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

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

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
5 Lane under-utilisation found by the program
7 Lane under-utilisation specified by the user

Approach Lane Flows (veh/h)										
South: Mulgoa Road (S)										
Mov. From S To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	W	N	E							
Lane 1	152	-	-	152	2.8	902	0.168	100	0.0	2
Lane 2	-	168	-	168	15.1	484	0.346	60 ⁷	NA	NA
Lane 3	-	279	-	279	15.1	484	0.577	100	NA	NA
Lane 4	-	279	-	279	15.1	484	0.577	100	NA	NA
Lane 5	-	-	107	107	2.0	247	0.435	100	0.0	4
Approach	152	726	107	985	11.7		0.577			
East: High Street (E)										
Mov. From E To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	S	W	N							
Lane 1	53	-	-	53	5.9	478	0.111	100	0.0	3
Lane 2	-	1	-	1	100.0	152	0.007	1 ⁵	0.0	1
Lane 3	-	107	-	107	3.4	175	0.610	100	NA	NA
Lane 4	-	107	-	107	3.4	175	0.610	100	NA	NA
Lane 5	-	-	35	35	3.0	129	0.273	100	0.0	4
Lane 6	-	-	35	35	3.0	129	0.273	100	0.0	5
Approach	53	215	70	338	4.0		0.610			
North: Castlereagh Road (N)										
Mov. From N To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	E	S	W							
Lane 1	134	-	-	134	5.5	613	0.218	100	0.0	2
Lane 2	-	281	-	281	12.6	627 ¹	0.448	100	NA	NA
Lane 3	-	316	-	316	12.6	705	0.448	100	NA	NA
Lane 4	-	316	-	316	12.6	705	0.448	100	NA	NA
Lane 5	-	-	269	269	5.3	452	0.596	100	25.0	4
Lane 6	-	-	269	269	5.3	452	0.596	100	32.0	5
Approach	134	912	539	1585	9.5		0.596			
West: High Street (W)										
Mov. From W To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	N	E	S							
Lane 1	339	-	-	339	5.1	783	0.433	100	23.6	2
Lane 2	338	-	-	338	5.1	781 ¹	0.433	100	11.6	4
Lane 3	-	1	-	1	100.0	253	0.004	1 ⁵	0.0	2
Lane 4	-	212	-	212	2.0	341	0.620	100	NA	NA
Lane 5	-	212	-	212	2.0	341	0.620	100	NA	NA
Lane 6	-	-	168	168	1.9	286	0.589	100	0.0	5
Lane 7	-	-	168	168	1.9	286	0.589	100	0.0	6
Approach	677	424	337	1438	3.5		0.620			
Total %HV Deg.Satn (v/c)										
Intersection	4346	7.6		0.620						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
- 5 Lane under-utilisation found by the program
- 7 Lane under-utilisation specified by the user

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Mulgoa Road (S) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
East Exit: High Street (E) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Castlereagh Road (N) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
West Exit: High Street (W) Merge Type: Zipper												
Exit Short Lane	1	240	50.0	242	247	2.50	2.00	422	1503	0.281	0.0	0.1
Merge Lane	2	-	50.0	211	216	2.50	2.00	483	1543	0.313	0.0	0.1

LANE SUMMARY

Site: 101 [Ex AM - Worth Street / Union Lane - Copy (Site Folder: Existing AM)]

Network: N101 [EX AM (Network Folder: Existing Peaks)]

Existing AM
Worth Street / Union Lane
Job No: 220249
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
South: Worth Street (S)															
Lane 1	147	2.4	147	2.4	1886	0.078	100	0.8	LOS A	0.0	0.0	Short (P) Full	16	0.0	NA
Lane 2	148	3.0	148	3.0	1893	0.078	100	0.0	LOS A	0.0	0.0		55	0.0	0.0
Approach	295	2.7	295	2.7		0.078		0.4	NA	0.0	0.0				
East: Union Lane (E)															
Lane 1	18	0.0	18	0.0	1126	0.016	100	3.8	LOS A	0.0	0.2	Full	500	-4.5 ^{N3}	0.0
Lane 2	17	34.6	17	34.6	438	0.040	100	9.0	LOS A	0.1	0.5	Full	500	0.0	0.0
Approach	35	17.2	35	17.2		0.040		6.4	LOS A	0.1	0.5				
North: Worth Street (N)															
Lane 1	92	1.3	92	1.3	1834	0.050	100	0.0	LOS A	0.0	0.0	Full	62	-4.7 ^{N3}	0.0
Lane 2	84	1.0	84	1.0	1673	0.050	100	1.5	LOS A	0.1	0.4	Full	62	0.0	0.0
Approach	175	1.1	175	1.1		0.050		0.7	NA	0.1	0.4				
West: Union Lane (W)															
Lane 1	19	0.0	19	0.0	955	0.019	100	5.7	LOS A	0.0	0.2	Full	180	0.0	0.0
Approach	19	0.0	19	0.0		0.019		5.7	LOS A	0.0	0.2				
Intersection	524	3.1	524	3.1		0.078		1.1	NA	0.1	0.5				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab). Lane LOS values are based on average delay per lane.

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

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

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

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

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

^{N3} Capacity Adjustment due to downstream lane blockage determined by the program.

Approach Lane Flows (veh/h)										
South: Worth Street (S)										
Mov. From S To Exit:	L2	T1	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	30	117	147	2.4		1886	0.078	100	0.0	2
Lane 2	-	148	148	3.0		1893	0.078	100	NA	NA
Approach	30	265	295	2.7			0.078			
East: Union Lane (E)										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.

From E To Exit:	S	W	N			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	17	1	-	18	0.0	1126	0.016	100	NA	NA
Lane 2	-	-	17	17	34.6	438	0.040	100	NA	NA
Approach	17	1	17	35	17.2		0.040			
North: Worth Street (N)										
Mov.	T1	R2	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From N To Exit:	S	W								
Lane 1	92	-	92	1.3		1834	0.050	100	NA	NA
Lane 2	66	18	84	1.0		1673	0.050	100	NA	NA
Approach	158	18	175	1.1			0.050			
West: Union Lane (W)										
Mov.	L2	R2	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From W To Exit:	N	S								
Lane 1	14	4	19	0.0		955	0.019	100	NA	NA
Approach	14	4	19	0.0			0.019			
Total %HV Deg.Satn (v/c)										
Intersection	524	3.1		0.078						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Worth Street (S) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Worth Street (N) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Union Lane (W) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

 Site: 101 [Ex AM - Worth Street / Union Road - Copy (Site Folder: Existing AM)]

 Network: N101 [EX AM (Network Folder: Existing Peaks)]

Existing AM

Worth Street / Union Road

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
South: Worth Street (S)															
Lane 1	58	0.0	58	0.0	160	0.366	100	67.5	LOS E	2.2	15.6	Full	500	0.0	0.0
Approach	58	0.0	58	0.0		0.366		67.5	LOS E	2.2	15.6				
East: Union Road (E)															
Lane 1	63	2.5	63	2.5	1050	0.060	16 ⁵	14.8	LOS B	1.1	7.7	Short (P)	45	0.0	NA
Lane 2	154	3.1	154	3.1	405	0.381	100	29.5	LOS C	4.0	28.5	Full	500	0.0	0.0
Approach	218	2.9	218	2.9		0.381		25.3	LOS B	4.0	28.5				
North: Worth Street (N)															
Lane 1	143	1.1	143	1.1	395	0.362	100	47.0	LOS D	4.8	33.6	Full	55	0.0	4.7
Lane 2	34	0.0	34	0.0	404	0.084	100	43.6	LOS D	1.0	7.3	Full	55	0.0	0.0
Approach	177	0.9	177	0.9		0.362		46.4	LOS D	4.8	33.6				
West: Union Road (W)															
Lane 1	134	1.4	134	1.4	1213	0.110	31 ⁶	12.5	LOS A	1.8	13.1	Short (P)	95	0.0	NA
Lane 2	381	1.6	381	1.6	1057	0.361	100	16.7	LOS B	8.0	56.7	Full	500	0.0	0.0
Approach	515	1.6	515	1.6		0.361		15.6	LOS B	8.0	56.7				
Intersection	968	1.7	968	1.7		0.381		26.5	LOS B	8.0	56.7				

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

Lane LOS values are based on average delay per lane.

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

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

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

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

⁵ Lane under-utilisation found by the program

⁶ Lane under-utilisation due to downstream effects

Approach Lane Flows (veh/h)											
South: Worth Street (S)											
Mov. From S To Exit:	L2	T1	R2	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	W	N	E								
Lane 1	12	19	27	58	0.0		160	0.366	100	NA	NA
Approach	12	19	27	58	0.0			0.366			
East: Union Road (E)											
Mov. From E To Exit:	L2	T1	R2	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	S	W	N								

Lane 1	18	45	-	63	2.5	1050	0.060	16 ⁵	0.0	2
Lane 2	-	-	154	154	3.1	405	0.381	100	NA	NA
Approach	18	45	154	218	2.9		0.381			
North: Worth Street (N)										
Mov. From N To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	E	S	W							
Lane 1	143	-	-	143	1.1	395	0.362	100	NA	NA
Lane 2	-	7	27	34	0.0	404	0.084	100	NA	NA
Approach	143	7	27	177	0.9		0.362			
West: Union Road (W)										
Mov. From W To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	N	E	S							
Lane 1	117	16	-	134	1.4	1213	0.110	31 ⁶	0.0	2
Lane 2	-	367	14	381	1.6	1057	0.361	100	NA	NA
Approach	117	384	14	515	1.6		0.361			
Total %HV Deg. Satn (v/c)										
Intersection	968	1.7		0.381						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

⁵ Lane under-utilisation found by the program

⁶ Lane under-utilisation due to downstream effects

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Worth Street (S) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Union Road (E) Merge Type: Zipper												
Exit Short Lane	1	45	50.0	197	198	2.50	2.00	159	1566	0.102	0.0	0.1
Merge Lane	2	-	50.0	80	80	2.50	2.00	394	1709	0.230	0.0	0.0
North Exit: Worth Street (N) Merge Type: Zipper												
Exit Short Lane	1	10	50.0	77	78	2.50	2.00	137	1711	0.080	0.0	0.0
Merge Lane	2	-	50.0	68	69	2.50	2.00	154	1722	0.090	0.0	0.0
West Exit: Union Road (W) Merge Type: Zipper												
Exit Short Lane	1	40	50.0	13	13	2.50	2.00	57	1785	0.032	0.0	0.0
Merge Lane	2	-	50.0	29	29	2.50	2.00	27	1768	0.015	0.0	0.0

■ ■ Network: N101 [EX PM
(Network Folder: Existing
Peaks)]

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)

- * Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped	Dist]			sec	m	m/sec
South: Worth Street (S)											
P1	Full	1	59.1	LOS E	0.0	0.0	0.95	0.95	219.6	208.6	0.95
East: Union Road (E)											
P2	Full	6	59.2	LOS E	0.0	0.0	0.95	0.95	224.7	215.2	0.96
North: Worth Street (N)											

P3 Full	1	59.1	LOS E	0.0	0.0	0.95	0.95	224.7	215.2	0.96
West: Union Road (W)										
P4 Full	5	59.2	LOS E	0.0	0.0	0.95	0.95	224.7	215.2	0.96
All Pedestrians	14	59.2	LOS E	0.0	0.0	0.95	0.95	224.3	214.7	0.96

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

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

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

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MOVEMENT SUMMARY

Site: 101 [Ex PM - Worth Street / Union Lane - Copy (Site Folder: Existing PM)]

Network: N101 [EX PM (Network Folder: Existing Peaks)]

Existing PM
Worth Street / Union Lane
Job No: 220249
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total HV veh/h	%				[Veh. veh	Dist] m				
South: Worth Street (S)														
1	L2	11	0.0	11	0.0	0.162	4.1	LOS A	2.1	14.9	0.00	0.02	0.00	47.6
2	T1	619	0.3	619	0.3	0.162	0.0	LOS A	2.1	14.9	0.00	0.01	0.00	49.2
Approach		630	0.3	630	0.3	0.162	0.1	NA	2.1	14.9	0.00	0.01	0.00	49.1
East: Union Lane (E)														
4	L2	45	0.0	45	0.0	0.091	4.6	LOS A	0.1	0.7	0.35	0.52	0.35	36.2
5	T1	1	0.0	1	0.0	0.091	13.2	LOS A	0.1	0.7	0.35	0.52	0.35	37.6
6	R2	85	0.0	85	0.0	0.688	32.4	LOS C	0.7	5.0	0.82	1.13	1.42	23.5
Approach		131	0.0	131	0.0	0.688	22.7	LOS B	0.7	5.0	0.65	0.92	1.05	26.8
North: Worth Street (N)														
8	T1	399	0.3	399	0.3	0.144	0.2	LOS A	0.7	4.7	0.04	0.02	0.04	46.2
9	R2	15	0.0	15	0.0	0.144	7.3	LOS A	0.1	0.5	0.15	0.07	0.15	39.7
Approach		414	0.2	414	0.2	0.144	0.5	NA	0.7	4.7	0.05	0.02	0.05	45.3
West: Union Lane (W)														
10	L2	24	0.0	24	0.0	0.192	5.8	LOS A	0.2	1.2	0.54	0.70	0.54	27.5
12	R2	17	0.0	17	0.0	0.192	19.3	LOS B	0.2	1.2	0.54	0.70	0.54	27.5
Approach		42	0.0	42	0.0	0.192	11.5	LOS A	0.2	1.2	0.54	0.70	0.54	27.5
All Vehicles		1217	0.2	1217	0.2	0.688	3.0	NA	2.1	14.9	0.11	0.14	0.15	34.3

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

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

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

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

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

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

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

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MOVEMENT SUMMARY

 Site: 101 [Ex PM - High Street / Mulgoa Road / Castlereagh Road - Copy (Site Folder: Existing PM)]

 Network: N101 [EX PM (Network Folder: Existing Peaks)]

Existing PM

High Street / Mulgoa Road

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Mulgoa Road (S)														
1	L2	328	1.2	328	1.2	0.418	37.7	LOS C	9.6	67.7	0.76	0.79	0.76	37.3
2	T1	962	7.7	962	7.7	* 0.757	50.1	LOS D	14.6	108.6	0.96	0.84	0.98	26.2
3	R2	173	0.0	173	0.0	0.593	65.6	LOS E	6.8	47.9	0.98	0.81	0.98	19.6
Approach		1463	5.3	1463	5.3	0.757	49.1	LOS D	14.6	108.6	0.91	0.83	0.93	28.1
East: High Street (E)														
4	L2	124	0.0	124	0.0	0.185	30.8	LOS C	3.2	22.2	0.66	0.71	0.66	32.2
5	T1	572	1.2	572	1.2	* 0.919	75.0	LOS F	14.5	102.5	1.00	1.05	1.27	20.7
6	R2	195	0.5	195	0.5	0.529	71.0	LOS F	4.0	28.2	1.00	0.78	1.00	10.6
Approach		891	0.9	891	0.9	0.919	68.0	LOS E	14.5	102.5	0.95	0.94	1.12	19.9
North: Castlereagh Road (N)														
7	L2	164	0.6	164	0.6	0.256	20.8	LOS B	2.7	19.3	0.68	0.73	0.68	17.1
8	T1	1058	3.6	1058	3.6	0.581	39.8	LOS C	12.8	92.3	0.87	0.75	0.87	29.6
9	R2	689	3.9	689	3.9	* 0.900	75.9	LOS F	15.8	114.6	1.00	0.97	1.22	20.5
Approach		1910	3.5	1910	3.5	0.900	51.2	LOS D	15.8	114.6	0.90	0.83	0.98	25.0
West: High Street (W)														
10	L2	550	1.8	550	1.8	0.356	28.2	LOS B	6.9	49.2	0.65	0.76	0.65	34.1
11	T1	306	0.7	306	0.7	0.407	54.8	LOS D	5.6	39.5	0.92	0.77	0.92	22.1
12	R2	265	0.8	265	0.8	* 0.718	75.2	LOS F	5.7	39.9	1.00	0.84	1.09	26.8
Approach		1121	1.2	1121	1.2	0.718	46.6	LOS D	6.9	49.2	0.81	0.78	0.83	28.3
All Vehicles		5386	3.1	5386	3.1	0.919	52.5	LOS D	15.8	114.6	0.89	0.84	0.96	25.5

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

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

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

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

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

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Mulgoa Road (S)											
P11	Stage 1	7	64.1	LOS F	0.0	0.0	0.96	0.96	228.9	214.2	0.94
P12	Stage 2	7	64.1	LOS F	0.0	0.0	0.96	0.96	226.4	210.9	0.93
P1B	Slip/ Bypass	8	64.2	LOS F	0.0	0.0	0.96	0.96	221.3	204.3	0.92

East: High Street (E)											
P2 Full	1	64.1	LOS F	0.0	0.0	0.96	0.96	238.6	226.9	0.95	
P2B Slip/ Bypass	8	64.2	LOS F	0.0	0.0	0.96	0.96	221.3	204.3	0.92	
North: Castlereagh Road (N)											
P31 Stage 1	1	64.1	LOS F	0.0	0.0	0.96	0.96	231.4	217.5	0.94	
P32 Stage 2	1	64.1	LOS F	0.0	0.0	0.96	0.96	226.4	210.9	0.93	
P3B Slip/ Bypass	2	34.1	LOS D	0.0	0.0	0.91	0.91	191.2	204.3	1.07	
West: High Street (W)											
P4 Full	1	64.1	LOS F	0.0	0.0	0.96	0.96	238.4	226.6	0.95	
P4B Slip/ Bypass	2	64.1	LOS F	0.0	0.0	0.96	0.96	223.8	207.6	0.93	
All Pedestrians	40	62.6	LOS F	0.0	0.0	0.96	0.96	223.5	209.2	0.94	

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

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

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

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■ ■ Network: N101 [EX PM
(Network Folder: Existing
Peaks)]

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

- * Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Worth Street (S)											
P1	Full	4	54.2	LOS E	0.0	0.0	0.95	0.95	220.2	215.9	0.98
East: High Street (E)											
P2	Full	11	54.2	LOS E	0.0	0.0	0.95	0.95	223.8	220.5	0.99
North: Penrith Plaza											

P3 Full	3	54.2	LOS E	0.0	0.0	0.95	0.95	221.2	217.2	0.98
P3B Slip/ Bypass	14	54.2	LOS E	0.0	0.0	0.95	0.95	211.3	204.3	0.97
West: High Street (W)										
P4 Full	18	54.2	LOS E	0.1	0.1	0.95	0.95	223.8	220.5	0.99
P4B Slip/ Bypass	21	28.4	LOS C	0.0	0.0	0.90	0.90	185.5	204.3	1.10
All Pedestrians	71	46.5	LOS E	0.1	0.1	0.94	0.94	209.6	212.1	1.01

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

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

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

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MOVEMENT SUMMARY

 **Site: 101 [Ex PM - High Street Roundabout - Copy (Site Folder: Existing PM)]**

 **Network: N101 [EX PM (Network Folder: Existing Peaks)]**

Existing PM
High Street Roundabout
Job No: 220249
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist m]				
East: High Street (E)														
5	T1	824	0.8	824	0.8	0.410	3.7	LOS A	0.8	5.9	0.21	0.41	0.21	37.6
6	R2	40	0.0	40	0.0	0.410	7.7	LOS A	0.6	4.5	0.21	0.44	0.21	23.0
6u	U	6	0.0	6	0.0	0.410	10.8	LOS A	0.6	4.5	0.21	0.44	0.21	37.1
Approach		870	0.8	870	0.8	0.410	4.0	LOS A	0.8	5.9	0.21	0.41	0.21	34.4
North: Penrith City Council														
7	L2	75	0.0	75	0.0	0.212	2.0	LOS A	0.3	2.2	0.48	0.39	0.48	19.7
9	R2	75	0.0	75	0.0	0.212	2.0	LOS A	0.3	2.2	0.48	0.39	0.48	19.7
9u	U	1	0.0	1	0.0	0.212	12.4	LOS A	0.3	2.2	0.48	0.39	0.48	29.4
Approach		151	0.0	151	0.0	0.212	2.1	LOS A	0.3	2.2	0.48	0.39	0.48	19.7
West: High Street (W)														
10	L2	78	0.0	78	0.0	0.217	4.4	LOS A	0.5	3.7	0.13	0.39	0.13	22.2
11	T1	567	0.4	567	0.4	0.217	3.5	LOS A	0.5	3.7	0.13	0.38	0.13	36.0
12u	U	11	0.0	11	0.0	0.217	10.6	LOS A	0.5	3.5	0.13	0.38	0.13	36.1
Approach		657	0.3	657	0.3	0.217	3.7	LOS A	0.5	3.7	0.13	0.38	0.13	29.3
All Vehicles		1678	0.5	1678	0.5	0.410	3.7	LOS A	0.8	5.9	0.20	0.40	0.20	28.5

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

LANE SUMMARY

 **Site: 101 [Ex PM - Worth Street / Union Road - Copy (Site Folder: Existing PM)]**

 **Network: N101 [EX PM (Network Folder: Existing Peaks)]**

Existing PM

Worth Street / Union Road

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
South: Worth Street (S)															
Lane 1	52	0.0	52	0.0	87	0.591	100	75.3	LOS F	2.1	14.9	Full	500	0.0	0.0
Approach	52	0.0	52	0.0		0.591		75.3	LOS F	2.1	14.9				
East: Union Road (E)															
Lane 1	125	0.8	125	0.8	1201	0.104	14 ⁵	11.4	LOS A	1.9	13.1	Short (P)	45	0.0	NA
Lane 2	427	0.2	427	0.2	580 ¹	0.737	100	24.4	LOS B	11.5	80.6	Full	500	0.0	0.0
Approach	552	0.4	552	0.4		0.737		21.5	LOS B	11.5	80.6				
North: Worth Street (N)															
Lane 1	233	0.4	233	0.4	341	0.681	100	54.4	LOS D	7.8 ^{N4}	55.0 ^{N4}	Full	55	0.0	50.0
Lane 2	212	0.0	212	0.0	345	0.614	100	53.2	LOS D	7.7	53.7	Full	55	0.0	47.7
Approach	444	0.2	444	0.2		0.681		53.8	LOS D	7.8	55.0				
West: Union Road (W)															
Lane 1	159	0.6	159	0.6	1589	0.100	58 ⁵	6.1	LOS A	0.9	6.4	Short (P)	95	0.0	NA
Lane 2	202	0.5	202	0.5	1175	0.172	100	10.8	LOS A	3.2	22.3	Full	500	0.0	0.0
Approach	361	0.6	361	0.6		0.172		8.7	LOS A	3.2	22.3				
Intersection	1409	0.4	1409	0.4		0.737		30.4	LOS C	11.5	80.6				

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

Lane LOS values are based on average delay per lane.

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

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

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

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

¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

⁵ Lane under-utilisation found by the program

^{N4} Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)										
South: Worth Street (S)										
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit:	W	N	E			Cap. veh/h	v/c	%	%	
Lane 1	17	20	15	52	0.0	87	0.591	100	NA	NA
Approach	17	20	15	52	0.0		0.591			
East: Union Road (E)										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.

From E To Exit:	S	W	N			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	40	85	-	125	0.8	1201	0.104	14 ⁵	0.0	2
Lane 2	-	-	427	427	0.2	580 ¹	0.737	100	NA	NA
Approach	40	85	427	552	0.4		0.737			
North: Worth Street (N)										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	233	-	-	233	0.4	341	0.681	100	NA	NA
Lane 2	-	22	189	212	0.0	345	0.614	100	NA	NA
Approach	233	22	189	444	0.2		0.681			
West: Union Road (W)										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	159	-	-	159	0.6	1589	0.100	58 ⁵	0.0	2
Lane 2	-	188	14	202	0.5	1175	0.172	100	NA	NA
Approach	159	188	14	361	0.6		0.172			
Total %HV Deg. Satn (v/c)										
Intersection	1409	0.4		0.737						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
- ⁵ Lane under-utilisation found by the program

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Worth Street (S) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Union Road (E) Merge Type: Zipper												
Exit Short Lane	1	45	50.0	102	102	2.50	2.00	233	1684	0.138	0.0	0.0
Merge Lane	2	-	50.0	116	117	2.50	2.00	203	1667	0.122	0.0	0.1
North Exit: Worth Street (N) Merge Type: Zipper												
Exit Short Lane	1	10	50.0	214	214	2.50	2.00	179	1546	0.116	0.0	0.1
Merge Lane	2	-	50.0	89	90	2.50	2.00	427	1698	0.252	0.0	0.0
West Exit: Union Road (W) Merge Type: Zipper												
Exit Short Lane	1	40	50.0	95	95	2.50	2.00	102	1692	0.060	0.0	0.0
Merge Lane	2	-	50.0	51	51	2.50	2.00	189	1743	0.109	0.0	0.0

LANE SUMMARY

Site: 101 [Ex PM - Worth Street / Union Lane - Copy (Site Folder: Existing PM)]

Network: N101 [EX PM (Network Folder: Existing Peaks)]

Existing PM
Worth Street / Union Lane
Job No: 220249
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
South: Worth Street (S)															
Lane 1	315	0.3	315	0.3	1941	0.162	100	0.1	LOS A	2.1 ^{N5}	14.9 ^{N5}	Short (P)	16	0.0	NA
Lane 2	315	0.3	315	0.3	1944	0.162	100	0.0	LOS A	0.1 ^{N5}	0.4 ^{N5}		Full	55	0.0
Approach	630	0.3	630	0.3		0.162		0.1	NA	2.1	14.9				
East: Union Lane (E)															
Lane 1	46	0.0	46	0.0	504	0.091	100	4.8	LOS A	0.1 ^{N5}	0.7 ^{N5}	Full	500	-49.4 ^{N3}	0.0
Lane 2	85	0.0	85	0.0	124	0.688	100	32.4	LOS C	0.7	5.0	Full	500	-50.0 ^{N3}	0.0
Approach	131	0.0	131	0.0		0.688		22.7	LOS B	0.7	5.0				
North: Worth Street (N)															
Lane 1	280	0.3	280	0.3	1945	0.144	100	0.0	LOS A	0.7 ^{N5}	4.7 ^{N5}	Full	62	0.0	0.0
Lane 2	134	0.2	134	0.2	929	0.144	100	1.4	LOS A	0.1	0.5	Full	62	-44.7 ^{N3}	0.0
Approach	414	0.2	414	0.2		0.144		0.5	NA	0.7	4.7				
West: Union Lane (W)															
Lane 1	42	0.0	42	0.0	217	0.192	100	11.5	LOS A	0.2 ^{N5}	1.2 ^{N5}	Full	180	-49.1 ^{N3}	0.0
Approach	42	0.0	42	0.0		0.192		11.5	LOS A	0.2	1.2				
Intersection	1217	0.2	1217	0.2		0.688		3.0	NA	2.1	14.9				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab). Lane LOS values are based on average delay per lane.

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

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

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

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

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

^{N3} Capacity Adjustment due to downstream lane blockage determined by the program.

^{N5} Continuous Lane results determined by Back of Queue values of downstream lanes (proportional to lane movement flows).

Approach Lane Flows (veh/h)										
South: Worth Street (S)										
Mov.	L2	T1	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From S To Exit:	W	N			Cap. veh/h	v/c	%	%	No.	
Lane 1	11	304	315	0.3	1941	0.162	100	43.6	2	
Lane 2	-	315	315	0.3	1944	0.162	100	NA	NA	
Approach	11	619	630	0.3		0.162				
East: Union Lane (E)										
Mov.	L2	T1	R2	Total	%HV	Deg.	Lane	Prob.	Ov.	

From E To Exit:	S	W	N			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	45	1	-	46	0.0	504	0.091	100	NA	NA
Lane 2	-	-	85	85	0.0	124	0.688	100	NA	NA
Approach	45	1	85	131	0.0		0.688			
North: Worth Street (N)										
Mov.	T1	R2	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From N To Exit:	S	W								
Lane 1	280	-	280	0.3		1945	0.144	100	NA	NA
Lane 2	119	15	134	0.2		929	0.144	100	NA	NA
Approach	399	15	414	0.2			0.144			
West: Union Lane (W)										
Mov.	L2	R2	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From W To Exit:	N	S								
Lane 1	24	17	42	0.0		217	0.192	100	NA	NA
Approach	24	17	42	0.0			0.192			
Total %HV Deg.Satn (v/c)										
Intersection	1217	0.2		0.688						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Worth Street (S) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Worth Street (N) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Union Lane (W) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

 Site: 101 [Ex PM - High Street / Mulgoa Road / Castlereagh Road - Copy (Site Folder: Existing PM)]

 Network: N101 [EX PM (Network Folder: Existing Peaks)]

Existing PM

High Street / Mulgoa Road

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
South: Mulgoa Road (S)															
Lane 1	328	1.2	328	1.2	785	0.418	100	37.7	LOS C	9.6	67.7	Short	126	0.0	NA
Lane 2	223	7.7	223	7.7	491	0.454	60 ⁷	45.5	LOS D	7.8	57.9	Full	500	0.0	0.0
Lane 3	372	7.7	372	7.7	491	0.757	100	51.5	LOS D	14.6	108.6	Full	500	0.0	0.0
Lane 4	367	7.7	367	7.7	484 ¹	0.757	100	51.4	LOS D	14.3	106.6	Full	500	0.0	0.0
Lane 5	173	0.0	173	0.0	292	0.593	100	65.6	LOS E	6.8	47.9	Short	95	0.0	NA
Approach	1463	5.3	1463	5.3		0.757		49.1	LOS D	14.6	108.6				
East: High Street (E)															
Lane 1	124	0.0	124	0.0	673 ¹	0.185	100	30.8	LOS C	3.2	22.2	Short	35	0.0	NA
Lane 2	1	100.0	1	100.0	270	0.004	0 ⁵	45.5	LOS D	0.0	0.4	Short	15	0.0	NA
Lane 3	262	1.1	262	1.1	285 ¹	0.919	100	75.0	LOS F	12.1	85.3	Full	120	0.0	18.4
Lane 4	309	1.1	309	1.1	337 ¹	0.919	100	75.2	LOS F	14.5	102.5	Full	120	0.0	35.3
Lane 5	98	0.5	98	0.5	185	0.529	100	71.0	LOS F	4.0	28.2	Short	63	0.0	NA
Lane 6	98	0.5	98	0.5	185	0.529	100	71.0	LOS F	4.0	28.2	Short	50	0.0	NA
Approach	891	0.9	891	0.9		0.919		68.0	LOS E	14.5	102.5				
North: Castlereagh Road (N)															
Lane 1	164	0.6	164	0.6	641	0.256	100	20.8	LOS B	2.7	19.3	Short	50	0.0	NA
Lane 2	308	3.6	308	3.6	529 ¹	0.581	100	38.5	LOS C	10.0	72.3	Full	115	0.0	7.3
Lane 3	375	3.6	375	3.6	645	0.581	100	40.3	LOS C	12.8	92.3	Full	115	0.0	29.5
Lane 4	375	3.6	375	3.6	645	0.581	100	40.3	LOS C	12.8	92.3	Full	115	0.0	49.7 ⁸
Lane 5	344	3.9	344	3.9	383 ¹	0.900	100	76.2	LOS F	15.8	114.6	Short	95	0.0	NA
Lane 6	344	3.9	344	3.9	383 ¹	0.900	100	75.6	LOS F	15.8	114.6	Short	88	0.0	NA
Approach	1910	3.5	1910	3.5		0.900		51.2	LOS D	15.8	114.6				
West: High Street (W)															
Lane 1	276	1.8	276	1.8	775	0.356	100	28.2	LOS B	6.9	49.2	Short	85	0.0	NA
Lane 2	275	1.8	275	1.8	772 ¹	0.356	100	28.2	LOS B	6.9	49.0	Short	97	0.0	NA
Lane 3	1	100.0	1	100.0	270	0.004	1 ⁵	45.8	LOS D	0.0	0.4	Short	16	0.0	NA
Lane 4	153	0.3	153	0.3	375	0.407	100	54.9	LOS D	5.6	39.5	Full	500	0.0	0.0
Lane 5	153	0.3	153	0.3	375	0.407	100	54.9	LOS D	5.6	39.5	Full	500	0.0	0.0
Lane 6	132	0.8	132	0.8	184	0.718	100	75.2	LOS F	5.7	39.9	Short	123	0.0	NA
Lane 7	132	0.8	132	0.8	184	0.718	100	75.2	LOS F	5.7	39.9	Short	113	0.0	NA
Approach	1121	1.2	1121	1.2		0.718		46.6	LOS D	6.9	49.2				
Intersection	5386	3.1	5386	3.1		0.919		52.5	LOS D	15.8	114.6				

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

Lane LOS values are based on average delay per lane.

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

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

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

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

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
- 5 Lane under-utilisation found by the program
- 7 Lane under-utilisation specified by the user
- 8 Probability of Blockage has been set on the basis of a queue that overflows from a short lane.

Approach Lane Flows (veh/h)										
South: Mulgoa Road (S)										
Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	328	-	-	328	1.2	785	0.418	100	0.0	2
Lane 2	-	223	-	223	7.7	491	0.454	60 ⁷	NA	NA
Lane 3	-	372	-	372	7.7	491	0.757	100	NA	NA
Lane 4	-	367	-	367	7.7	484 ¹	0.757	100	NA	NA
Lane 5	-	-	173	173	0.0	292	0.593	100	0.0	4
Approach	328	962	173	1463	5.3		0.757			
East: High Street (E)										
Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	124	-	-	124	0.0	673 ¹	0.185	100	8.3	3
Lane 2	-	1	-	1	100.0	270	0.004	0 ⁵	0.0	1
Lane 3	-	262	-	262	1.1	285 ¹	0.919	100	NA	NA
Lane 4	-	309	-	309	1.1	337 ¹	0.919	100	NA	NA
Lane 5	-	-	98	98	0.5	185	0.529	100	0.0	4
Lane 6	-	-	98	98	0.5	185	0.529	100	0.0	5
Approach	124	572	195	891	0.9		0.919			
North: Castlereagh Road (N)										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	164	-	-	164	0.6	641	0.256	100	0.0	2
Lane 2	-	308	-	308	3.6	529 ¹	0.581	100	NA	NA
Lane 3	-	375	-	375	3.6	645	0.581	100	NA	NA
Lane 4	-	375	-	375	3.6	645	0.581	100	NA	NA
Lane 5	-	-	344	344	3.9	383 ¹	0.900	100	67.8	4
Lane 6	-	-	344	344	3.9	383 ¹	0.900	100	75.2	5
Approach	164	1058	689	1910	3.5		0.900			
West: High Street (W)										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	276	-	-	276	1.8	775	0.356	100	0.0	2
Lane 2	275	-	-	275	1.8	772 ¹	0.356	100	0.0	4
Lane 3	-	1	-	1	100.0	270	0.004	1 ⁵	0.0	2
Lane 4	-	153	-	153	0.3	375	0.407	100	NA	NA
Lane 5	-	153	-	153	0.3	375	0.407	100	NA	NA
Lane 6	-	-	132	132	0.8	184	0.718	100	0.0	5
Lane 7	-	-	132	132	0.8	184	0.718	100	0.0	6
Approach	550	306	265	1121	1.2		0.718			
Total %HV Deg.Satn (v/c)										
Intersection	5386	3.1		0.919						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
- 5 Lane under-utilisation found by the program
- 7 Lane under-utilisation specified by the user

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Mulgoa Road (S) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
East Exit: High Street (E) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Castlereagh Road (N) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
West Exit: High Street (W) Merge Type: Zipper												
Exit Short Lane	1	240	50.0	458	462	2.50	2.00	673	1188	0.566	0.5	1.3
Merge Lane	2	-	50.0	336	341	2.50	2.00	915	1373	0.666	0.2	0.7

LANE SUMMARY

 Site: 101 [Ex PM - High Street / Worth Street - Copy (Site Folder: Existing PM)]

 Network: N101 [EX PM (Network Folder: Existing Peaks)]

Existing PM

High Street / Worth Street

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
South: Worth Street (S)															
Lane 1	405	0.5	405	0.5	731	0.553	100	33.4	LOS C	8.8 ^{N4}	62.0 ^{N4}	Full	62	0.0	50.0
Lane 2	302	0.0	302	0.0	545	0.553	100	36.9	LOS C	8.9 ^{N4}	62.0 ^{N4}	Full	62	0.0	50.0
Approach	706	0.3	706	0.3		0.553		34.9	LOS C	8.9	62.0				
East: High Street (E)															
Lane 1	74	0.4	74	0.4	499	0.148	26 ⁷	39.5	LOS C	2.0	14.2	Full	500	0.0	0.0
Lane 2	292	1.6	292	1.6	512	0.570	100	41.1	LOS C	9.1	64.5	Full	500	0.0	0.0
Lane 3	145	0.0	145	0.0	504	0.287	100	27.2	LOS B	3.2	22.3	Short	70	0.0	NA
Approach	510	1.0	510	1.0		0.570		36.9	LOS C	9.1	64.5				
North: Penrith Plaza															
Lane 1	151	0.0	151	0.0	396 ¹	0.382	100	28.2	LOS B	3.4	24.0	Short	7	0.0	NA
Lane 2	247	0.0	247	0.0	554 ¹	0.446	55 ⁵	22.0	LOS B	5.5	38.5	Full	500	0.0	0.0
Lane 3	239	0.0	239	0.0	295	0.812	100	40.8	LOS C	6.4	45.1	Full	500	0.0	0.0
Approach	637	0.0	637	0.0		0.812		30.5	LOS C	6.4	45.1				
West: High Street (W)															
Lane 1	284	0.0	284	0.0	1165	0.244	100	7.0	LOS A	2.1	14.8	Short	60	0.0	NA
Lane 2	146	0.7	146	0.7	516	0.282	100	37.5	LOS C	4.1	29.1	Full	165	0.0	0.0
Lane 3	146	0.7	146	0.7	516	0.282	100	37.5	LOS C	4.1	29.1	Full	165	0.0	0.0
Lane 4	87	0.0	87	0.0	419	0.208	100	27.8	LOS B	1.9	13.0	Short	50	0.0	NA
Approach	663	0.3	663	0.3		0.282		23.1	LOS B	4.1	29.1				
Intersection	2517	0.4	2517	0.4		0.812		31.1	LOS C	9.1	64.5				

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

Lane LOS values are based on average delay per lane.

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

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

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

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

¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

⁵ Lane under-utilisation found by the program

⁷ Lane under-utilisation specified by the user

^{N4} Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)											
South: Worth Street (S)											
Mov.	L2	T1	R2	Total	%HV						
From S						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	W	N	E			veh/h	satn	Util.	SL Ov.	Lane	No.
							v/c	%	%		

Lane 1	341	63	-	405	0.5	731	0.553	100	NA	NA
Lane 2	-	236	66	302	0.0	545	0.553	100	NA	NA
Approach	341	299	66	706	0.3	0.553				
East: High Street (E)										
Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	57	16	-	74	0.4	499	0.148	26 ⁷	NA	NA
Lane 2	-	292	-	292	1.6	512	0.570	100	NA	NA
Lane 3	-	-	145	145	0.0	504	0.287	100	0.0	2
Approach	57	308	145	510	1.0	0.570				
North: Penrith Plaza										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	151	-	-	151	0.0	396 ¹	0.382	100	100.0	2
Lane 2	-	247	-	247	0.0	554 ¹	0.446	55 ⁵	NA	NA
Lane 3	-	-	239	239	0.0	295	0.812	100	NA	NA
Approach	151	247	239	637	0.0	0.812				
West: High Street (W)										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	284	-	-	284	0.0	1165	0.244	100	0.0	2
Lane 2	-	146	-	146	0.7	516	0.282	100	NA	NA
Lane 3	-	146	-	146	0.7	516	0.282	100	NA	NA
Lane 4	-	-	87	87	0.0	419	0.208	100	0.0	3
Approach	284	291	87	663	0.3	0.282				
Total %HV Deg.Satn (v/c)										
Intersection	2517	0.4	0.812							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
- 5 Lane under-utilisation found by the program
- 7 Lane under-utilisation specified by the user

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Worth Street (S) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
East Exit: High Street (E) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Penrith Plaza Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: High Street (W)												

Merge Type: Not Applied

Full Length Lane	1	Merge Analysis not applied.
Full Length Lane	2	Merge Analysis not applied.

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**EXISTING PLUS DEVELOPMENT VOLUMES
(40 SHEETS)**

LANE SUMMARY

 **Site: 101 [Fut PM - High Street Roundabout (Site Folder: Future PM)]**

 **Network: N101 [FUT PM (Network Folder: Future Peaks)]**

Future PM
High Street Roundabout
Job No: 220249
Site Category: (None)
Roundabout

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
East: High Street (E)															
Lane 1 ^d	531	0.8	531	0.8	1160	0.457	100	3.7	LOS A	0.9	6.3	Full	165	-23.8 ^{N3}	0.0
Lane 2	379	0.7	379	0.7	828	0.457	100	4.3	LOS A	0.7	4.7	Full	165	-36.7 ^{N3}	0.0
Approach	909	0.8	909	0.8		0.457		4.0	LOS A	0.9	6.3				
North: Penrith City Council															
Lane 1 ^d	151	0.0	151	0.0	678	0.223	100	2.1	LOS A	0.3	2.2	Full	500	-24.6 ^{N3}	0.0
Approach	151	0.0	151	0.0		0.223		2.1	LOS A	0.3	2.2				
West: High Street (W)															
Lane 1 ^d	358	0.3	358	0.3	1621	0.221	100	3.7	LOS A	0.5	3.7	Full	120	0.0	0.0
Lane 2	308	0.3	308	0.3	1393	0.221	100	3.8	LOS A	0.5	3.5	Full	120	-2.4 ^{N3}	0.0
Approach	666	0.3	666	0.3		0.221		3.7	LOS A	0.5	3.7				
Intersection	1726	0.5	1726	0.5		0.457		3.7	LOS A	0.9	6.3				

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

Lane LOS values are based on average delay per lane.

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

^d Dominant lane on roundabout approach

^{N3} Capacity Adjustment due to downstream lane blockage determined by the program.

Approach Lane Flows (veh/h)											
East: High Street (E)											
Mov.	T1	R2	U	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane No.
From E To Exit:	W	N	E			Cap. veh/h	v/c	%	%		
Lane 1	531	-	-	531	0.8	1160	0.457	100	NA	NA	
Lane 2	333	40	6	379	0.7	828	0.457	100	NA	NA	
Approach	863	40	6	909	0.8		0.457				
North: Penrith City Council											
Mov.	L2	R2	U	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane No.
From N To Exit:	E	W	N			Cap. veh/h	v/c	%	%		
Lane 1	75	75	1	151	0.0	678	0.223	100	NA	NA	
Approach	75	75	1	151	0.0		0.223				
West: High Street (W)											
Mov.	L2	T1	U	Total	%HV		Deg.	Lane	Prob.	Ov.	

From W To Exit:	N	E	W			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	78	280	-	358	0.3	1621	0.221	100	NA	NA
Lane 2	-	296	11	308	0.3	1393	0.221	100	NA	NA
Approach	78	576	11	666	0.3		0.221			
Total %HV Deg.Satn (v/c)										
Intersection	1726	0.5		0.457						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: High Street (E) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
North Exit: Penrith City Council Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: High Street (W) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									

MOVEMENT SUMMARY

 **Site: 101 [Fut AM - High Street Roundabout (Site Folder: Future AM)]**

 **Network: N101 [FUT AM (Network Folder: Future Peaks)]**

Future AM
High Street Roundabout
Job No: 220249
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
East: High Street (E)														
5	T1	378	4.1	378	4.1	0.137	3.4	LOS A	0.3	2.0	0.09	0.39	0.09	38.7
6	R2	34	3.8	34	3.8	0.137	7.4	LOS A	0.3	2.0	0.10	0.43	0.10	23.1
6u	U	5	28.6	5	28.6	0.137	10.8	LOS A	0.3	2.0	0.10	0.43	0.10	37.8
Approach		416	4.3	416	4.3	0.137	3.8	LOS A	0.3	2.0	0.09	0.39	0.09	33.3
North: Penrith City Council														
7	L2	11	0.0	11	0.0	0.034	1.9	LOS A	0.1	0.4	0.45	0.32	0.45	20.0
9	R2	18	0.0	18	0.0	0.034	1.9	LOS A	0.1	0.4	0.45	0.32	0.45	20.0
9u	U	1	0.0	1	0.0	0.034	12.2	LOS A	0.1	0.4	0.45	0.32	0.45	29.8
Approach		30	0.0	30	0.0	0.034	2.2	LOS A	0.1	0.4	0.45	0.32	0.45	20.5
West: High Street (W)														
10	L2	67	0.0	67	0.0	0.224	4.3	LOS A	0.5	3.6	0.11	0.38	0.11	22.3
11	T1	610	3.6	610	3.6	0.224	3.5	LOS A	0.5	3.6	0.11	0.38	0.11	36.4
12u	U	4	0.0	4	0.0	0.224	10.5	LOS A	0.5	3.5	0.12	0.37	0.12	36.5
Approach		681	3.2	681	3.2	0.224	3.6	LOS A	0.5	3.6	0.11	0.38	0.11	30.2
All Vehicles		1127	3.5	1127	3.5	0.224	3.6	LOS A	0.5	3.6	0.11	0.38	0.11	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.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 101 [Fut AM - High Street / Worth Street (Site Folder: Future AM)]

 Network: N101 [FUT AM (Network Folder: Future Peaks)]

Future AM
High Street / Worth Street
Job No: 220249
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Worth Street (S)														
1	L2	208	4.2	208	4.2	* 0.255	25.5	LOS B	4.5	32.7	0.65	0.73	0.65	9.0
2	T1	120	0.0	120	0.0	0.209	20.1	LOS B	3.5	24.7	0.63	0.58	0.63	33.2
3	R2	48	2.6	48	2.6	0.209	24.4	LOS B	3.5	24.7	0.63	0.58	0.63	33.0
Approach		375	2.7	375	2.7	0.255	23.7	LOS B	4.5	32.7	0.64	0.67	0.64	24.0
East: High Street (E)														
4	L2	50	5.1	50	5.1	0.065	25.5	LOS B	1.0	7.4	0.61	0.68	0.61	29.6
5	T1	203	4.3	203	4.3	0.250	22.9	LOS B	4.6	33.1	0.68	0.57	0.68	31.0
6	R2	81	0.0	81	0.0	0.201	32.0	LOS C	2.0	13.8	0.71	0.73	0.71	34.7
Approach		333	3.4	333	3.4	0.250	25.5	LOS B	4.6	33.1	0.67	0.62	0.67	32.1
North: Penrith Plaza														
7	L2	18	0.0	18	0.0	0.039	29.9	LOS C	0.4	2.8	0.66	0.65	0.66	35.6
8	T1	19	0.0	19	0.0	0.021	18.0	LOS B	0.4	2.5	0.56	0.41	0.56	33.8
9	R2	16	0.0	16	0.0	0.036	28.6	LOS C	0.3	2.4	0.64	0.65	0.64	28.4
Approach		52	0.0	52	0.0	0.039	25.2	LOS B	0.4	2.8	0.62	0.56	0.62	33.2
West: High Street (W)														
10	L2	158	0.0	158	0.0	0.129	5.7	LOS A	0.6	4.4	0.22	0.57	0.22	45.0
11	T1	355	6.0	355	6.0	0.223	22.6	LOS B	3.9	29.0	0.67	0.56	0.67	34.3
12	R2	129	1.0	129	1.0	* 0.301	33.9	LOS C	3.3	23.5	0.75	0.76	0.75	13.9
Approach		642	3.5	642	3.5	0.301	20.7	LOS B	3.9	29.0	0.57	0.60	0.57	33.5
All Vehicles		1403	3.1	1403	3.1	0.301	22.8	LOS B	4.6	33.1	0.62	0.62	0.62	31.2

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m					
South: Worth Street (S)											
P1	Full	6	54.2	LOS E	0.0	0.0	0.95	0.95	220.2	215.9	0.98
East: High Street (E)											
P2	Full	8	54.2	LOS E	0.0	0.0	0.95	0.95	223.8	220.5	0.99
North: Penrith Plaza											
P3	Full	1	54.2	LOS E	0.0	0.0	0.95	0.95	221.2	217.2	0.98

P3B Slip/ Bypass	9	54.2	LOS E	0.0	0.0	0.95	0.95	211.3	204.3	0.97
West: High Street (W)										
P4 Full	14	54.2	LOS E	0.0	0.0	0.95	0.95	223.8	220.5	0.99
P4B Slip/ Bypass	15	24.3	LOS C	0.0	0.0	0.90	0.90	181.5	204.3	1.13
All Pedestrians	54	46.0	LOS E	0.0	0.0	0.94	0.94	209.5	212.6	1.01

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

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

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

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P2 Full	3	64.1	LOS F	0.0	0.0	0.96	0.96	238.6	226.9	0.95
P2B Slip/ Bypass	8	64.2	LOS F	0.0	0.0	0.96	0.96	221.3	204.3	0.92
North: Castlereagh Road (N)										
P31 Stage 1	1	64.1	LOS F	0.0	0.0	0.96	0.96	231.4	217.5	0.94
P32 Stage 2	1	64.1	LOS F	0.0	0.0	0.96	0.96	226.4	210.9	0.93
P3B Slip/ Bypass	3	34.1	LOS D	0.0	0.0	0.91	0.91	191.2	204.3	1.07
West: High Street (W)										
P4 Full	1	64.1	LOS F	0.0	0.0	0.96	0.96	238.4	226.6	0.95
P4B Slip/ Bypass	1	64.1	LOS F	0.0	0.0	0.96	0.96	223.8	207.6	0.93
All Pedestrians	35	61.4	LOS F	0.0	0.0	0.95	0.95	223.1	210.2	0.94

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

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

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

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MOVEMENT SUMMARY

Site: 101 [Fut AM - Worth Street / Union Lane (Site Folder: Future AM)]

Network: N101 [FUT AM (Network Folder: Future Peaks)]

Future AM
Worth Street / Union Lane
Job No: 220249
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Worth Street (S)														
1	L2	67	0.0	67	0.0	0.088	4.1	LOS A	0.0	0.0	0.00	0.22	0.00	44.0
2	T1	265	3.0	265	3.0	0.088	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	44.2
Approach		332	2.4	332	2.4	0.088	0.8	NA	0.0	0.0	0.00	0.11	0.00	44.1
East: Union Lane (E)														
4	L2	17	0.0	17	0.0	0.017	3.7	LOS A	0.0	0.2	0.18	0.43	0.18	36.8
5	T1	1	0.0	1	0.0	0.017	6.0	LOS A	0.0	0.2	0.18	0.43	0.18	38.0
6	R2	17	34.6	17	34.6	0.046	10.5	LOS A	0.1	0.6	0.57	0.71	0.57	32.7
Approach		35	17.2	35	17.2	0.046	7.2	LOS A	0.1	0.6	0.37	0.57	0.37	34.7
North: Worth Street (N)														
8	T1	158	1.3	158	1.3	0.057	0.3	LOS A	0.1	0.5	0.08	0.07	0.08	43.0
9	R2	27	0.0	27	0.0	0.057	5.7	LOS A	0.1	0.5	0.19	0.17	0.19	38.5
Approach		184	1.1	184	1.1	0.057	1.0	NA	0.1	0.5	0.09	0.08	0.09	41.2
West: Union Lane (W)														
10	L2	80	0.0	80	0.0	0.103	5.8	LOS A	0.2	1.2	0.21	0.56	0.21	37.6
12	R2	20	0.0	20	0.0	0.103	9.9	LOS A	0.2	1.2	0.21	0.56	0.21	37.6
Approach		101	0.0	101	0.0	0.103	6.6	LOS A	0.2	1.2	0.21	0.56	0.21	37.6
All Vehicles		652	2.5	652	2.5	0.103	2.1	NA	0.2	1.2	0.08	0.20	0.08	39.9

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

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

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

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

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

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

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

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MOVEMENT SUMMARY

 Site: 101 [Fut AM - Worth Street / Union Road (Site Folder: Future AM)]

 Network: N101 [FUT AM (Network Folder: Future Peaks)]

Future AM
Worth Street / Union Road
Job No: 220249
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Worth Street (S)														
1	L2	12	0.0	12	0.0	0.366	67.4	LOS E	2.2	15.6	0.98	0.75	0.98	25.9
2	T1	19	0.0	19	0.0	* 0.366	67.5	LOS E	2.2	15.6	0.98	0.75	0.98	17.7
3	R2	27	0.0	27	0.0	0.366	67.4	LOS E	2.2	15.6	0.98	0.75	0.98	25.8
Approach		58	0.0	58	0.0	0.366	67.5	LOS E	2.2	15.6	0.98	0.75	0.98	23.6
East: Union Road (E)														
4	L2	18	8.9	18	8.9	0.062	19.1	LOS B	1.1	8.0	0.49	0.47	0.49	40.7
5	T1	45	0.0	45	0.0	0.062	14.5	LOS A	1.1	8.0	0.49	0.47	0.49	41.2
6	R2	159	3.0	159	3.0	0.425	32.2	LOS C	4.3	31.2	0.73	0.77	0.73	26.9
Approach		223	2.9	223	2.9	0.425	27.5	LOS B	4.3	31.2	0.67	0.68	0.67	31.7
North: Worth Street (N)														
7	L2	157	1.0	157	1.0	* 0.370	45.5	LOS D	5.2	36.4	0.89	0.73	0.89	21.6
8	T1	7	0.0	7	0.0	0.083	41.9	LOS C	1.1	7.6	0.82	0.61	0.82	22.5
9	R2	29	0.0	29	0.0	0.083	41.9	LOS C	1.1	7.6	0.82	0.61	0.82	22.5
Approach		193	0.8	193	0.8	0.370	44.8	LOS D	5.2	36.4	0.88	0.71	0.88	21.8
West: Union Road (W)														
10	L2	149	1.1	149	1.1	0.116	10.0	LOS A	1.7	12.3	0.31	0.61	0.31	39.6
11	T1	384	1.7	384	1.7	* 0.380	17.7	LOS B	8.5	60.6	0.61	0.55	0.61	40.2
12	R2	14	0.0	14	0.0	0.380	22.4	LOS B	8.5	60.6	0.61	0.55	0.61	39.7
Approach		547	1.5	547	1.5	0.380	15.7	LOS B	8.5	60.6	0.53	0.57	0.53	40.1
All Vehicles		1021	1.6	1021	1.6	0.425	26.7	LOS B	8.5	60.6	0.65	0.63	0.65	33.1

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.

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

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

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m					
South: Worth Street (S)											
P1	Full	4	59.1	LOS E	0.0	0.0	0.95	0.95	219.6	208.6	0.95
East: Union Road (E)											
P2	Full	1	59.1	LOS E	0.0	0.0	0.95	0.95	224.7	215.2	0.96
North: Worth Street (N)											
P3	Full	1	59.1	LOS E	0.0	0.0	0.95	0.95	224.7	215.2	0.96

West: Union Road (W)											
P4 Full	3	59.1	LOS E	0.0	0.0	0.95	0.95	224.7	215.2	0.96	
All Pedestrians	9	59.1	LOS E	0.0	0.0	0.95	0.95	222.4	212.3	0.95	

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

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

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

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LANE SUMMARY

 **Site: 101 [Fut AM - High Street Roundabout (Site Folder: Future AM)]**

 **Network: N101 [FUT AM (Network Folder: Future Peaks)]**

Future AM
High Street Roundabout
Job No: 220249
Site Category: (None)
Roundabout

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h	HV %	[Total veh/h	HV %	veh/h	v/c	%	sec		[Veh	Dist] m		m	%	%
East: High Street (E)															
Lane 1 ^d	221	4.1	221	4.1	1611	0.137	100	3.4	LOS A	0.3	2.0	Full	165	0.0	0.0
Lane 2	195	4.6	195	4.6	1425	0.137	100	4.3	LOS A	0.3	2.0	Full	165	0.0	0.0
Approach	416	4.3	416	4.3		0.137		3.8	LOS A	0.3	2.0				
North: Penrith City Council															
Lane 1 ^d	30	0.0	30	0.0	897	0.034	100	2.2	LOS A	0.1	0.4	Full	500	0.0	0.0
Approach	30	0.0	30	0.0		0.034		2.2	LOS A	0.1	0.4				
West: High Street (W)															
Lane 1 ^d	363	2.9	363	2.9	1619	0.224	100	3.6	LOS A	0.5	3.6	Full	120	0.0	0.0
Lane 2	318	3.5	318	3.5	1422	0.224	100	3.6	LOS A	0.5	3.5	Full	120	0.0	0.0
Approach	681	3.2	681	3.2		0.224		3.6	LOS A	0.5	3.6				
Intersection	1127	3.5	1127	3.5		0.224		3.6	LOS A	0.5	3.6				

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

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
East: High Street (E)											
Mov. From E To Exit:	T1	R2	U	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
	W	N	E			Cap. veh/h	v/c	%	%		
Lane 1	221	-	-	221	4.1	1611	0.137	100	NA	NA	
Lane 2	157	34	5	195	4.6	1425	0.137	100	NA	NA	
Approach	378	34	5	416	4.3		0.137				
North: Penrith City Council											
Mov. From N To Exit:	L2	R2	U	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
	E	W	N			Cap. veh/h	v/c	%	%		
Lane 1	11	18	1	30	0.0	897	0.034	100	NA	NA	
Approach	11	18	1	30	0.0		0.034				
West: High Street (W)											
Mov. From W To Exit:	L2	T1	U	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
	N	E	W			Cap. veh/h	v/c	%	%		

Lane 1	67	296	-	363	2.9	1619	0.224	100	NA	NA
Lane 2	-	314	4	318	3.5	1422	0.224	100	NA	NA
Approach	67	610	4	681	3.2		0.224			
Total %HV Deg.Satn (v/c)										
Intersection	1127	3.5		0.224						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: High Street (E) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
North Exit: Penrith City Council Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: High Street (W) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									

LANE SUMMARY

 Site: 101 [Fut AM - High Street / Worth Street (Site Folder: Future AM)]

 Network: N101 [FUT AM (Network Folder: Future Peaks)]

Future AM

High Street / Worth Street

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
South: Worth Street (S)															
Lane 1	208	4.2	208	4.2	814	0.255	100	25.5	LOS B	4.5	32.7	Full	62	0.0	0.0
Lane 2	168	0.7	168	0.7	804	0.209	82 ⁵	21.3	LOS B	3.5	24.7	Full	62	0.0	0.0
Approach	375	2.7	375	2.7		0.255		23.7	LOS B	4.5	32.7				
East: High Street (E)															
Lane 1	50	5.1	50	5.1	763	0.065	26 ⁷	25.5	LOS B	1.0	7.4	Full	500	0.0	0.0
Lane 2	203	4.3	203	4.3	810	0.250	100	22.9	LOS B	4.6	33.1	Full	500	0.0	0.0
Lane 3	81	0.0	81	0.0	403	0.201	100	32.0	LOS C	2.0	13.8	Short	70	0.0	NA
Approach	333	3.4	333	3.4		0.250		25.5	LOS B	4.6	33.1				
North: Penrith Plaza															
Lane 1	18	0.0	18	0.0	457	0.039	100	29.9	LOS C	0.4	2.8	Short	7	0.0	NA
Lane 2	19	0.0	19	0.0	910	0.021	57 ⁵	18.0	LOS B	0.4	2.5	Full	500	0.0	0.0
Lane 3	16	0.0	16	0.0	428	0.036	100	28.6	LOS C	0.3	2.4	Full	500	0.0	0.0
Approach	52	0.0	52	0.0		0.039		25.2	LOS B	0.4	2.8				
West: High Street (W)															
Lane 1	158	0.0	158	0.0	1229	0.129	100	5.7	LOS A	0.6	4.4	Short	60	0.0	NA
Lane 2	177	6.0	177	6.0	797	0.223	100	22.6	LOS B	3.9	29.0	Full	165	0.0	0.0
Lane 3	177	6.0	177	6.0	797	0.223	100	22.6	LOS B	3.9	29.0	Full	165	0.0	0.0
Lane 4	129	1.0	129	1.0	430	0.301	100	33.9	LOS C	3.3	23.5	Short	50	0.0	NA
Approach	642	3.5	642	3.5		0.301		20.7	LOS B	3.9	29.0				
Intersection	1403	3.1	1403	3.1		0.301		22.8	LOS B	4.6	33.1				

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

Lane LOS values are based on average delay per lane.

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

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

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

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

⁵ Lane under-utilisation found by the program

⁷ Lane under-utilisation specified by the user

Approach Lane Flows (veh/h)											
South: Worth Street (S)											
Mov. From S To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	208	-	-	208	4.2	814	0.255	100	NA	NA	
Lane 2	-	120	48	168	0.7	804	0.209	82 ⁵	NA	NA	
Approach	208	120	48	375	2.7		0.255				

East: High Street (E)										
Mov. From E To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	50	0	-	50	5.1	763	0.065	26 ⁷	NA	NA
Lane 2	-	203	-	203	4.3	810	0.250	100	NA	NA
Lane 3	-	-	81	81	0.0	403	0.201	100	0.0	2
Approach	50	203	81	333	3.4	0.250				
North: Penrith Plaza										
Mov. From N To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	18	-	-	18	0.0	457	0.039	100	0.0	2
Lane 2	-	19	-	19	0.0	910	0.021	57 ⁵	NA	NA
Lane 3	-	-	16	16	0.0	428	0.036	100	NA	NA
Approach	18	19	16	52	0.0	0.039				
West: High Street (W)										
Mov. From W To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	158	-	-	158	0.0	1229	0.129	100	0.0	2
Lane 2	-	177	-	177	6.0	797	0.223	100	NA	NA
Lane 3	-	177	-	177	6.0	797	0.223	100	NA	NA
Lane 4	-	-	129	129	1.0	430	0.301	100	0.0	3
Approach	158	355	129	642	3.5	0.301				
Total %HV Deg.Satn (v/c)										
Intersection	1403	3.1	0.301							

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LANE SUMMARY

 Site: 101 [Fut AM - High Street / Mulgoa Road / Castlereagh Road (Site Folder: Future AM)]

 Network: N101 [FUT AM (Network Folder: Future Peaks)]

Future AM

High Street / Mulgoa Road

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h	HV %	[Total veh/h	HV %	veh/h	v/c	%	sec		[Veh	Dist] m		m	%	%
South: Mulgoa Road (S)															
Lane 1	152	2.8	152	2.8	876	0.173	100	28.2	LOS B	3.6	25.7	Short	126	0.0	NA
Lane 2	168	15.1	168	15.1	460	0.364	60 ⁷	44.3	LOS D	5.7	44.8	Full	500	0.0	0.0
Lane 3	279	15.1	279	15.1	460	0.607	100	48.0	LOS D	10.2	80.8	Full	500	0.0	0.0
Lane 4	279	15.1	279	15.1	460	0.607	100	48.0	LOS D	10.2	80.8	Full	500	0.0	0.0
Lane 5	107	2.0	107	2.0	234	0.459	100	67.8	LOS E	4.3	30.3	Short	95	0.0	NA
Approach	985	11.7	985	11.7		0.607		46.5	LOS D	10.2	80.8				
East: High Street (E)															
Lane 1	53	5.9	53	5.9	489	0.109	100	40.9	LOS C	1.6	11.5	Short	35	0.0	NA
Lane 2	1	100.0	1	100.0	169	0.006	1 ⁵	55.6	LOS D	0.0	0.5	Short	15	0.0	NA
Lane 3	125	2.9	125	2.9	203	0.617	100	66.5	LOS E	5.2	37.1	Full	120	0.0	0.0
Lane 4	125	2.9	125	2.9	203	0.617	100	66.5	LOS E	5.2	37.1	Full	120	0.0	0.0
Lane 5	46	2.3	46	2.3	142	0.320	100	72.6	LOS F	1.9	13.4	Short	63	0.0	NA
Lane 6	46	2.3	46	2.3	142	0.320	100	72.6	LOS F	1.9	13.4	Short	50	0.0	NA
Approach	396	3.4	396	3.4		0.617		64.4	LOS E	5.2	37.1				
North: Castlereagh Road (N)															
Lane 1	136	5.4	136	5.4	633	0.215	100	20.7	LOS B	2.3	16.6	Short	50	0.0	NA
Lane 2	280	12.6	280	12.6	613 ¹	0.456	100	32.0	LOS C	8.3	64.3	Full	115	0.0	0.0
Lane 3	316	12.6	316	12.6	693	0.456	100	32.8	LOS C	9.6	74.5	Full	115	0.0	10.0
Lane 4	316	12.6	316	12.6	693	0.456	100	32.8	LOS C	9.6	74.5	Full	115	0.0	10.0
Lane 5	269	5.3	269	5.3	452	0.596	100	55.0	LOS D	9.9	72.6	Short	95	0.0	NA
Lane 6	269	5.3	269	5.3	452	0.596	100	55.0	LOS D	9.9	72.6	Short	88	0.0	NA
Approach	1587	9.5	1587	9.5		0.596		39.2	LOS C	9.9	74.5				
West: High Street (W)															
Lane 1	339	5.1	339	5.1	794	0.427	100	27.6	LOS B	8.6	63.0	Short	85	0.0	NA
Lane 2	338	5.1	338	5.1	791 ¹	0.427	100	27.5	LOS B	8.6	62.7	Short	97	0.0	NA
Lane 3	1	100.0	1	100.0	262	0.004	1 ⁵	46.7	LOS D	0.0	0.4	Short	16	0.0	NA
Lane 4	213	2.0	213	2.0	355	0.600	100	58.1	LOS E	8.2	58.7	Full	500	0.0	0.0
Lane 5	213	2.0	213	2.0	355	0.600	100	58.1	LOS E	8.2	58.7	Full	500	0.0	0.0
Lane 6	168	1.9	168	1.9	286	0.589	100	65.6	LOS E	6.7	47.4	Short	123	0.0	NA
Lane 7	168	1.9	168	1.9	286	0.589	100	65.6	LOS E	6.7	47.4	Short	113	0.0	NA
Approach	1441	3.5	1441	3.5		0.600		45.5	LOS D	8.6	63.0				
Intersection	4409	7.5	4409	7.5		0.617		45.1	LOS D	10.2	80.8				

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

Lane LOS values are based on average delay per lane.

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

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

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

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

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
- 5 Lane under-utilisation found by the program
- 7 Lane under-utilisation specified by the user

Approach Lane Flows (veh/h)										
South: Mulgoa Road (S)										
Mov. From S To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	W	N	E							
Lane 1	152	-	-	152	2.8	876	0.173	100	0.0	2
Lane 2	-	168	-	168	15.1	460	0.364	60 ⁷	NA	NA
Lane 3	-	279	-	279	15.1	460	0.607	100	NA	NA
Lane 4	-	279	-	279	15.1	460	0.607	100	NA	NA
Lane 5	-	-	107	107	2.0	234	0.459	100	0.0	4
Approach	152	726	107	985	11.7		0.607			
East: High Street (E)										
Mov. From E To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	S	W	N							
Lane 1	53	-	-	53	5.9	489	0.109	100	0.0	3
Lane 2	-	1	-	1	100.0	169	0.006	1 ⁵	0.0	1
Lane 3	-	125	-	125	2.9	203	0.617	100	NA	NA
Lane 4	-	125	-	125	2.9	203	0.617	100	NA	NA
Lane 5	-	-	46	46	2.3	142	0.320	100	0.0	4
Lane 6	-	-	46	46	2.3	142	0.320	100	0.0	5
Approach	53	252	91	396	3.4		0.617			
North: Castlereagh Road (N)										
Mov. From N To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	E	S	W							
Lane 1	136	-	-	136	5.4	633	0.215	100	0.0	2
Lane 2	-	280	-	280	12.6	613 ¹	0.456	100	NA	NA
Lane 3	-	316	-	316	12.6	693	0.456	100	NA	NA
Lane 4	-	316	-	316	12.6	693	0.456	100	NA	NA
Lane 5	-	-	269	269	5.3	452	0.596	100	25.0	4
Lane 6	-	-	269	269	5.3	452	0.596	100	32.0	5
Approach	136	912	539	1587	9.5		0.596			
West: High Street (W)										
Mov. From W To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	N	E	S							
Lane 1	339	-	-	339	5.1	794	0.427	100	22.2	2
Lane 2	338	-	-	338	5.1	791 ¹	0.427	100	10.2	4
Lane 3	-	1	-	1	100.0	262	0.004	1 ⁵	0.0	2
Lane 4	-	213	-	213	2.0	355	0.600	100	NA	NA
Lane 5	-	213	-	213	2.0	355	0.600	100	NA	NA
Lane 6	-	-	168	168	1.9	286	0.589	100	0.0	5
Lane 7	-	-	168	168	1.9	286	0.589	100	0.0	6
Approach	677	427	337	1441	3.5		0.600			
Total %HV Deg.Satn (v/c)										
Intersection	4409	7.5		0.617						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

- 5 Lane under-utilisation found by the program
- 7 Lane under-utilisation specified by the user

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Mulgoa Road (S)												
Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
East Exit: High Street (E)												
Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Castlereagh Road (N)												
Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
West Exit: High Street (W)												
Merge Type: Zipper												
Exit Short Lane	1	240	50.0	260	265	2.50	2.00	422	1478	0.286	0.0	0.2
Merge Lane	2	-	50.0	211	216	2.50	2.00	520	1543	0.337	0.0	0.1

LANE SUMMARY

Site: 101 [Fut AM - Worth Street / Union Lane (Site Folder: Future AM)]

Network: N101 [FUT AM (Network Folder: Future Peaks)]

Future AM
Worth Street / Union Lane
Job No: 220249
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
South: Worth Street (S)															
Lane 1	165	1.8	165	1.8	1878	0.088	100	1.7	LOS A	0.0	0.0	Short (P) Full	16	0.0	NA
Lane 2	167	3.0	167	3.0	1893	0.088	100	0.0	LOS A	0.0	0.0		55	0.0	0.0
Approach	332	2.4	332	2.4		0.088		0.8	NA	0.0	0.0				
East: Union Lane (E)															
Lane 1	18	0.0	18	0.0	1039	0.017	100	3.9	LOS A	0.0	0.2	Full	500	-11.3 ^{N3}	0.0
Lane 2	17	34.6	17	34.6	381	0.046	100	10.5	LOS A	0.1	0.6	Full	500	0.0	0.0
Approach	35	17.2	35	17.2		0.046		7.2	LOS A	0.1	0.6				
North: Worth Street (N)															
Lane 1	96	1.3	96	1.3	1697	0.057	100	0.0	LOS A	0.0	0.0	Full	62	-11.9 ^{N3}	0.0
Lane 2	89	0.9	89	0.9	1566	0.057	100	2.2	LOS A	0.1	0.5	Full	62	0.0	0.0
Approach	184	1.1	184	1.1		0.057		1.0	NA	0.1	0.5				
West: Union Lane (W)															
Lane 1	101	0.0	101	0.0	972	0.103	100	6.6	LOS A	0.2	1.2	Full	180	0.0	0.0
Approach	101	0.0	101	0.0		0.103		6.6	LOS A	0.2	1.2				
Intersection	652	2.5	652	2.5		0.103		2.1	NA	0.2	1.2				

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

Lane LOS values are based on average delay per lane.

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

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

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

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

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

^{N3} Capacity Adjustment due to downstream lane blockage determined by the program.

Approach Lane Flows (veh/h)										
South: Worth Street (S)										
Mov. From S To Exit:	L2	T1	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	W	N								
Lane 1	67	98	165	1.8		1878	0.088	100	0.0	2
Lane 2	-	167	167	3.0		1893	0.088	100	NA	NA
Approach	67	265	332	2.4			0.088			
East: Union Lane (E)										
Mov. From E To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	S	W	N							

Lane 1	17	1	-	18	0.0	1039	0.017	100	NA	NA
Lane 2	-	-	17	17	34.6	381	0.046	100	NA	NA
Approach	17	1	17	35	17.2		0.046			
North: Worth Street (N)										
Mov. From N To Exit:	T1	R2	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	S	W								
Lane 1	96	-	96	1.3		1697	0.057	100	NA	NA
Lane 2	62	27	89	0.9		1566	0.057	100	NA	NA
Approach	158	27	184	1.1			0.057			
West: Union Lane (W)										
Mov. From W To Exit:	L2	R2	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	N	S								
Lane 1	80	20	101	0.0		972	0.103	100	NA	NA
Approach	80	20	101	0.0			0.103			
Total %HV Deg.Satn (v/c)										
Intersection	652	2.5		0.103						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Worth Street (S) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
North Exit: Worth Street (N) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
West Exit: Union Lane (W) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									

LANE SUMMARY

 Site: 101 [Fut AM - Worth Street / Union Road (Site Folder: Future AM)]

 Network: N101 [FUT AM (Network Folder: Future Peaks)]

Future AM
Worth Street / Union Road
Job No: 220249
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]						[Veh]	[Dist m]				
South: Worth Street (S)															
Lane 1	58	0.0	58	0.0	160	0.366	100	67.5	LOS E	2.2	15.6	Full	500	0.0	0.0
Approach	58	0.0	58	0.0		0.366		67.5	LOS E	2.2	15.6				
East: Union Road (E)															
Lane 1	63	2.5	63	2.5	1021	0.062	15 ⁵	15.8	LOS B	1.1	8.0	Short (P)	45	0.0	NA
Lane 2	159	3.0	159	3.0	375	0.425	100	32.2	LOS C	4.3	31.2	Full	500	0.0	0.0
Approach	223	2.9	223	2.9		0.425		27.5	LOS B	4.3	31.2				
North: Worth Street (N)															
Lane 1	157	1.0	157	1.0	424	0.370	100	45.5	LOS D	5.2	36.4	Full	55	0.0	11.9
Lane 2	36	0.0	36	0.0	433	0.083	100	41.9	LOS C	1.1	7.6	Full	55	0.0	0.0
Approach	193	0.8	193	0.8		0.370		44.8	LOS D	5.2	36.4				
West: Union Road (W)															
Lane 1	156	1.1	156	1.1	1346	0.116	31 ⁶	9.8	LOS A	1.7	12.3	Short (P)	95	0.0	NA
Lane 2	391	1.6	391	1.6	1029	0.380	100	18.0	LOS B	8.5	60.6	Full	500	0.0	0.0
Approach	547	1.5	547	1.5		0.380		15.7	LOS B	8.5	60.6				
Intersection	1021	1.6	1021	1.6		0.425		26.7	LOS B	8.5	60.6				

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

- ⁵ Lane under-utilisation found by the program
- ⁶ Lane under-utilisation due to downstream effects

Approach Lane Flows (veh/h)											
South: Worth Street (S)											
Mov. From S To Exit:	L2	T1	R2	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	W	N	E								
Lane 1	12	19	27	58	0.0		160	0.366	100	NA	NA
Approach	12	19	27	58	0.0			0.366			
East: Union Road (E)											
Mov. From E To Exit:	L2	T1	R2	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	S	W	N								
Lane 1	18	45	-	63	2.5		1021	0.062	15 ⁵	0.0	2

Lane 2	-	-	159	159	3.0	375	0.425	100	NA	NA
Approach	18	45	159	223	2.9	0.425				
North: Worth Street (N)										
Mov. From N To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	E	S	W							
Lane 1	157	-	-	157	1.0	424	0.370	100	NA	NA
Lane 2	-	7	29	36	0.0	433	0.083	100	NA	NA
Approach	157	7	29	193	0.8	0.370				
West: Union Road (W)										
Mov. From W To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	N	E	S							
Lane 1	149	7	-	156	1.1	1346	0.116	31 ⁶	0.0	2
Lane 2	-	377	14	391	1.6	1029	0.380	100	NA	NA
Approach	149	384	14	547	1.5	0.380				
Total %HV Deg.Satn (v/c)										
Intersection	1021	1.6		0.425						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

5 Lane under-utilisation found by the program

6 Lane under-utilisation due to downstream effects

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Worth Street (S) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Union Road (E) Merge Type: Zipper												
Exit Short Lane	1	45	50.0	202	203	2.50	2.00	164	1560	0.105	0.0	0.1
Merge Lane	2	-	50.0	82	82	2.50	2.00	403	1707	0.236	0.0	0.0
North Exit: Worth Street (N) Merge Type: Zipper												
Exit Short Lane	1	10	50.0	80	81	2.50	2.00	169	1708	0.099	0.0	0.0
Merge Lane	2	-	50.0	84	85	2.50	2.00	159	1704	0.094	0.0	0.0
West Exit: Union Road (W) Merge Type: Zipper												
Exit Short Lane	1	40	50.0	14	14	2.50	2.00	57	1784	0.032	0.0	0.0
Merge Lane	2	-	50.0	29	29	2.50	2.00	29	1768	0.016	0.0	0.0

MOVEMENT SUMMARY

 Site: 101 [Fut PM - Worth Street / Union Road (Site Folder: Future PM)]

 Network: N101 [FUT PM (Network Folder: Future Peaks)]

Future PM

Worth Street / Union Road

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Worth Street (S)														
1	L2	17	0.0	17	0.0	0.591	75.3	LOS F	2.1	14.9	1.00	0.77	1.06	24.5
2	T1	20	0.0	20	0.0	* 0.591	75.5	LOS F	2.1	14.9	1.00	0.77	1.06	16.5
3	R2	15	0.0	15	0.0	0.591	75.3	LOS F	2.1	14.9	1.00	0.77	1.06	24.5
Approach		52	0.0	52	0.0	0.591	75.3	LOS F	2.1	14.9	1.00	0.77	1.06	21.9
East: Union Road (E)														
4	L2	40	0.0	40	0.0	0.103	14.1	LOS A	1.8	12.9	0.41	0.44	0.41	43.1
5	T1	85	1.2	85	1.2	0.103	9.5	LOS A	1.8	12.9	0.41	0.44	0.41	43.5
6	R2	436	0.2	436	0.2	* 0.787	29.0	LOS C	13.2	92.6	0.78	0.85	0.83	28.1
Approach		561	0.4	561	0.4	0.787	25.0	LOS B	13.2	92.6	0.69	0.76	0.73	32.2
North: Worth Street (N)														
7	L2	242	0.4	242	0.4	* 0.738	57.1	LOS E	7.8	55.0	1.00	0.90	1.06	19.3
8	T1	22	0.0	22	0.0	0.647	54.4	LOS D	7.8	54.8	0.98	0.82	0.98	19.8
9	R2	191	0.0	191	0.0	0.647	54.4	LOS D	7.8	54.8	0.98	0.82	0.98	19.8
Approach		455	0.2	455	0.2	0.738	55.8	LOS D	7.8	55.0	0.99	0.86	1.02	19.5
West: Union Road (W)														
10	L2	219	0.5	219	0.5	0.137	6.2	LOS A	1.3	9.1	0.17	0.59	0.17	43.0
11	T1	188	0.5	188	0.5	0.170	10.0	LOS A	3.1	21.8	0.43	0.39	0.43	43.8
12	R2	14	0.0	14	0.0	0.170	14.6	LOS B	3.1	21.8	0.43	0.39	0.43	43.3
Approach		421	0.5	421	0.5	0.170	8.2	LOS A	3.1	21.8	0.29	0.49	0.29	43.5
All Vehicles		1489	0.3	1489	0.3	0.787	31.4	LOS C	13.2	92.6	0.68	0.71	0.71	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.

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

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

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m					
South: Worth Street (S)											
P1	Full	1	59.1	LOS E	0.0	0.0	0.95	0.95	219.6	208.6	0.95
East: Union Road (E)											
P2	Full	6	59.2	LOS E	0.0	0.0	0.95	0.95	224.7	215.2	0.96
North: Worth Street (N)											
P3	Full	1	59.1	LOS E	0.0	0.0	0.95	0.95	224.7	215.2	0.96

West: Union Road (W)											
P4 Full	5	59.2	LOS E	0.0	0.0	0.95	0.95	224.7	215.2	0.96	
All Pedestrians	14	59.2	LOS E	0.0	0.0	0.95	0.95	224.3	214.7	0.96	

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

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

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

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MOVEMENT SUMMARY

Site: 101 [Fut PM - Worth Street / Union Lane (Site Folder: Future PM)]

Network: N101 [FUT PM (Network Folder: Future Peaks)]

Future PM
Worth Street / Union Lane
Job No: 220249
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Worth Street (S)														
1	L2	80	0.0	80	0.0	0.283	4.1	LOS A	0.0	0.0	0.00	0.13	0.00	45.5
2	T1	619	0.3	619	0.3	0.283	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	45.9
Approach		699	0.3	699	0.3	0.283	0.5	NA	0.0	0.0	0.00	0.06	0.00	45.8
East: Union Lane (E)														
4	L2	45	0.0	45	0.0	0.094	4.7	LOS A	0.2	1.3	0.37	0.53	0.37	36.2
5	T1	1	0.0	1	0.0	0.094	15.2	LOS B	0.2	1.3	0.37	0.53	0.37	37.6
6	R2	85	0.0	85	0.0	0.593	31.1	LOS C	0.7	5.2	0.85	1.10	1.32	23.9
Approach		131	0.0	131	0.0	0.593	22.0	LOS B	0.7	5.2	0.68	0.90	0.99	27.1
North: Worth Street (N)														
8	T1	399	0.3	399	0.3	0.157	0.4	LOS A	1.2	8.7	0.08	0.04	0.08	43.4
9	R2	32	0.0	32	0.0	0.157	7.8	LOS A	0.1	1.0	0.33	0.17	0.33	36.7
Approach		431	0.2	431	0.2	0.157	1.0	NA	1.2	8.7	0.10	0.05	0.10	41.7
West: Union Lane (W)														
10	L2	68	0.0	68	0.0	0.369	8.1	LOS A	0.4	2.5	0.49	0.72	0.59	27.5
12	R2	28	0.0	28	0.0	0.369	24.5	LOS B	0.4	2.5	0.49	0.72	0.59	27.5
Approach		97	0.0	97	0.0	0.369	12.9	LOS A	0.4	2.5	0.49	0.72	0.59	27.5
All Vehicles		1358	0.2	1358	0.2	0.593	3.6	NA	1.2	8.7	0.13	0.19	0.17	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.

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

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

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

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

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

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Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Mulgoa Road (S)											
P11	Stage 1	7	64.1	LOS F	0.0	0.0	0.96	0.96	228.9	214.2	0.94
P12	Stage 2	7	64.1	LOS F	0.0	0.0	0.96	0.96	226.4	210.9	0.93
P1B	Slip/ Bypass	8	64.2	LOS F	0.0	0.0	0.96	0.96	221.3	204.3	0.92
East: High Street (E)											

P2 Full	1	64.1	LOS F	0.0	0.0	0.96	0.96	238.6	226.9	0.95
P2B Slip/ Bypass	8	64.2	LOS F	0.0	0.0	0.96	0.96	221.3	204.3	0.92
North: Castlereagh Road (N)										
P31 Stage 1	1	64.1	LOS F	0.0	0.0	0.96	0.96	231.4	217.5	0.94
P32 Stage 2	1	64.1	LOS F	0.0	0.0	0.96	0.96	226.4	210.9	0.93
P3B Slip/ Bypass	2	34.1	LOS D	0.0	0.0	0.91	0.91	191.2	204.3	1.07
West: High Street (W)										
P4 Full	1	64.1	LOS F	0.0	0.0	0.96	0.96	238.4	226.6	0.95
P4B Slip/ Bypass	2	64.1	LOS F	0.0	0.0	0.96	0.96	223.8	207.6	0.93
All Pedestrians	40	62.6	LOS F	0.0	0.0	0.96	0.96	223.5	209.2	0.94

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

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

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

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Project: \\mte_nas1\mte storage\Jobs\2022\220249\MTE SIDRA\22 05 11 - AW.sip9

MOVEMENT SUMMARY

 Site: 101 [Fut PM - High Street / Worth Street (Site Folder: Future PM)]

 Network: N101 [FUT PM (Network Folder: Future Peaks)]

Future PM
High Street / Worth Street
Job No: 220249
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Worth Street (S)														
1	L2	380	0.5	380	0.5	0.410	18.9	LOS B	8.4	59.0	0.59	0.71	0.59	11.8
2	T1	299	0.0	299	0.0	0.410	21.1	LOS B	8.4	59.0	0.68	0.66	0.68	32.5
3	R2	72	0.0	72	0.0	0.410	26.9	LOS B	7.4	52.1	0.71	0.65	0.71	31.9
Approach		751	0.3	751	0.3	0.410	20.5	LOS B	8.4	59.0	0.64	0.69	0.64	26.7
East: High Street (E)														
4	L2	66	0.0	66	0.0	0.168	43.2	LOS D	2.1	15.0	0.83	0.73	0.83	23.3
5	T1	308	1.6	308	1.6	* 0.645	44.2	LOS D	9.7	69.0	0.95	0.81	0.95	22.9
6	R2	145	0.0	145	0.0	0.325	30.8	LOS C	3.5	24.2	0.80	0.75	0.80	35.1
Approach		519	1.0	519	1.0	0.645	40.3	LOS C	9.7	69.0	0.89	0.78	0.89	27.0
North: Penrith Plaza														
7	L2	151	0.0	151	0.0	* 0.428	31.8	LOS C	3.7	25.9	0.82	0.74	0.82	35.0
8	T1	247	0.0	247	0.0	0.408	18.8	LOS B	5.1	35.5	0.62	0.52	0.62	33.4
9	R2	239	0.0	239	0.0	* 0.835	55.5	LOS D	9.4	66.0	0.98	0.98	1.20	20.2
Approach		637	0.0	637	0.0	0.835	35.7	LOS C	9.4	66.0	0.80	0.75	0.88	28.2
West: High Street (W)														
10	L2	284	0.0	284	0.0	0.243	6.8	LOS A	2.0	13.9	0.29	0.60	0.29	44.1
11	T1	291	0.7	291	0.7	0.311	40.2	LOS C	4.3	30.2	0.87	0.70	0.87	27.5
12	R2	96	0.0	96	0.0	0.271	31.7	LOS C	2.2	15.6	0.86	0.75	0.86	14.6
Approach		672	0.3	672	0.3	0.311	24.8	LOS B	4.3	30.2	0.62	0.67	0.62	32.0
All Vehicles		2580	0.3	2580	0.3	0.835	29.4	LOS C	9.7	69.0	0.73	0.72	0.75	28.6

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Worth Street (S)											
P1	Full	4	54.2	LOS E	0.0	0.0	0.95	0.95	220.2	215.9	0.98
East: High Street (E)											
P2	Full	11	54.2	LOS E	0.0	0.0	0.95	0.95	223.8	220.5	0.99
North: Penrith Plaza											
P3	Full	3	54.2	LOS E	0.0	0.0	0.95	0.95	221.2	217.2	0.98

P3B Slip/ Bypass	14	54.2	LOS E	0.0	0.0	0.95	0.95	211.3	204.3	0.97
West: High Street (W)										
P4 Full	18	54.2	LOS E	0.1	0.1	0.95	0.95	223.8	220.5	0.99
P4B Slip/ Bypass	21	29.5	LOS C	0.0	0.0	0.90	0.90	186.7	204.3	1.09
All Pedestrians	71	46.8	LOS E	0.1	0.1	0.94	0.94	210.0	212.1	1.01

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

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

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

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MOVEMENT SUMMARY

 **Site: 101 [Fut PM - High Street Roundabout (Site Folder: Future PM)]**

 **Network: N101 [FUT PM (Network Folder: Future Peaks)]**

Future PM
High Street Roundabout
Job No: 220249
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
East: High Street (E)														
5	T1	863	0.8	863	0.8	0.457	3.7	LOS A	0.9	6.3	0.22	0.41	0.22	37.5
6	R2	40	0.0	40	0.0	0.457	7.7	LOS A	0.7	4.7	0.22	0.44	0.22	23.0
6u	U	6	0.0	6	0.0	0.457	10.8	LOS A	0.7	4.7	0.22	0.44	0.22	37.0
Approach		909	0.8	909	0.8	0.457	4.0	LOS A	0.9	6.3	0.22	0.41	0.22	34.4
North: Penrith City Council														
7	L2	75	0.0	75	0.0	0.223	2.1	LOS A	0.3	2.2	0.49	0.40	0.49	19.7
9	R2	75	0.0	75	0.0	0.223	2.1	LOS A	0.3	2.2	0.49	0.40	0.49	19.7
9u	U	1	0.0	1	0.0	0.223	12.4	LOS A	0.3	2.2	0.49	0.40	0.49	29.4
Approach		151	0.0	151	0.0	0.223	2.1	LOS A	0.3	2.2	0.49	0.40	0.49	19.7
West: High Street (W)														
10	L2	78	0.0	78	0.0	0.221	4.4	LOS A	0.5	3.7	0.13	0.39	0.13	22.2
11	T1	576	0.3	576	0.3	0.221	3.5	LOS A	0.5	3.7	0.13	0.38	0.13	36.0
12u	U	11	0.0	11	0.0	0.221	10.6	LOS A	0.5	3.5	0.13	0.38	0.13	36.1
Approach		666	0.3	666	0.3	0.221	3.7	LOS A	0.5	3.7	0.13	0.39	0.13	29.3
All Vehicles		1726	0.5	1726	0.5	0.457	3.7	LOS A	0.9	6.3	0.21	0.40	0.21	28.6

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

LANE SUMMARY

 Site: 101 [Fut PM - Worth Street / Union Road (Site Folder: Future PM)]

 Network: N101 [FUT PM (Network Folder: Future Peaks)]

Future PM

Worth Street / Union Road

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)

Lane Use and Performance																
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.	
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]						[Veh]	[Dist m]					
South: Worth Street (S)																
Lane 1	52	0.0	52	0.0	87	0.591	100	75.3	LOS F	2.1	14.9	Full	500	0.0	0.0	
Approach	52	0.0	52	0.0	0.591			75.3	LOS F	2.1	14.9					
East: Union Road (E)																
Lane 1	125	0.8	125	0.8	1216	0.103	13 ⁵	11.0	LOS A	1.8	12.9	Short (P)	45	0.0	NA	
Lane 2	436	0.2	436	0.2	554 ¹	0.787	100	29.0	LOS C	13.2	92.6		Full	500	0.0	0.0
Approach	561	0.4	561	0.4	0.787			25.0	LOS B	13.2	92.6					
North: Worth Street (N)																
Lane 1	242	0.4	242	0.4	327	0.738	100	57.1	LOS E	7.8 ^{N4}	55.0 ^{N4}	Full	55	0.0	50.0	
Lane 2	214	0.0	214	0.0	330	0.647	100	54.4	LOS D	7.8	54.8	Full	55	0.0	49.7	
Approach	455	0.2	455	0.2	0.738			55.8	LOS D	7.8	55.0					
West: Union Road (W)																
Lane 1	219	0.5	219	0.5	1592	0.137	81 ⁵	6.2	LOS A	1.3	9.1	Short (P)	95	0.0	NA	
Lane 2	202	0.5	202	0.5	1190	0.170	100	10.4	LOS A	3.1	21.8		Full	500	0.0	0.0
Approach	421	0.5	421	0.5	0.170			8.2	LOS A	3.1	21.8					
Intersection	1489	0.3	1489	0.3	0.787			31.4	LOS C	13.2	92.6					

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

Lane LOS values are based on average delay per lane.

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

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

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

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

¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

⁵ Lane under-utilisation found by the program

^{N4} Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)										
South: Worth Street (S)										
Mov. From S To Exit:	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
	W	N	E			Cap. veh/h	v/c	%	%	
Lane 1	17	20	15	52	0.0	87	0.591	100	NA	NA
Approach	17	20	15	52	0.0		0.591			
East: Union Road (E)										
Mov. From E	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane
						Cap.	Satn	Util.	SL Ov.	Lane

To Exit:	S	W	N			veh/h	v/c	%	%	No.
Lane 1	40	85	-	125	0.8	1216	0.103	13 ⁵	0.0	2
Lane 2	-	-	436	436	0.2	554 ¹	0.787	100	NA	NA
Approach	40	85	436	561	0.4		0.787			
North: Worth Street (N)										
Mov.	L2	T1	R2	Total	%HV					
From N						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:	E	S	W			veh/h	v/c	Util.	SL Ov.	Lane
Lane 1	242	-	-	242	0.4	327	0.738	100	NA	NA
Lane 2	-	22	191	214	0.0	330	0.647	100	NA	NA
Approach	242	22	191	455	0.2		0.738			
West: Union Road (W)										
Mov.	L2	T1	R2	Total	%HV					
From W						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:	N	E	S			veh/h	v/c	Util.	SL Ov.	Lane
Lane 1	219	-	-	219	0.5	1592	0.137	81 ⁵	0.0	2
Lane 2	-	188	14	202	0.5	1190	0.170	100	NA	NA
Approach	219	188	14	421	0.5		0.170			
Total %HV Deg. Satn (v/c)										
Intersection	1489	0.3					0.787			

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

⁵ Lane under-utilisation found by the program

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Worth Street (S) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Union Road (E) Merge Type: Zipper												
Exit Short Lane	1	45	50.0	102	102	2.50	2.00	242	1684	0.143	0.0	0.0
Merge Lane	2	-	50.0	121	121	2.50	2.00	203	1661	0.122	0.0	0.1
North Exit: Worth Street (N) Merge Type: Zipper												
Exit Short Lane	1	10	50.0	218	218	2.50	2.00	239	1540	0.155	0.0	0.1
Merge Lane	2	-	50.0	119	120	2.50	2.00	436	1663	0.262	0.0	0.1
West Exit: Union Road (W) Merge Type: Zipper												
Exit Short Lane	1	40	50.0	96	96	2.50	2.00	102	1691	0.060	0.0	0.0
Merge Lane	2	-	50.0	51	51	2.50	2.00	191	1743	0.110	0.0	0.0

LANE SUMMARY

Site: 101 [Fut PM - Worth Street / Union Lane (Site Folder: Future PM)]

Network: N101 [FUT PM (Network Folder: Future Peaks)]

Future PM
Worth Street / Union Lane
Job No: 220249
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
South: Worth Street (S)															
Lane 1	334	0.2	334	0.2	1178	0.283	100	1.0	LOS A	0.0	0.0	Short (P)	16	-38.7 ^{N3}	NA
Lane 2	365	0.3	365	0.3	1288	0.283	100	0.0	LOS A	0.0	0.0		55	-33.7 ^{N3}	0.0
Approach	699	0.3	699	0.3		0.283		0.5	NA	0.0	0.0				
East: Union Lane (E)															
Lane 1	46	0.0	46	0.0	487	0.094	100	4.9	LOS A	0.2 ^{N5}	1.3 ^{N5}	Full	500	-49.4 ^{N3}	0.0
Lane 2	85	0.0	85	0.0	144	0.593	100	31.1	LOS C	0.7	5.2	Full	500	-33.7 ^{N3}	0.0
Approach	131	0.0	131	0.0		0.593		22.0	LOS B	0.7	5.2				
North: Worth Street (N)															
Lane 1	306	0.3	306	0.3	1945	0.157	100	0.0	LOS A	1.2 ^{N5}	8.7 ^{N5}	Full	62	0.0	0.0
Lane 2	126	0.2	126	0.2	798	0.157	100	3.4	LOS A	0.1	1.0	Full	62	-42.4 ^{N3}	0.0
Approach	431	0.2	431	0.2		0.157		1.0	NA	1.2	8.7				
West: Union Lane (W)															
Lane 1	97	0.0	97	0.0	262	0.369	100	12.9	LOS A	0.4	2.5	Full	180	-46.7 ^{N3}	0.0
Approach	97	0.0	97	0.0		0.369		12.9	LOS A	0.4	2.5				
Intersection	1358	0.2	1358	0.2		0.593		3.6	NA	1.2	8.7				

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

Lane LOS values are based on average delay per lane.

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

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

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

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

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

^{N3} Capacity Adjustment due to downstream lane blockage determined by the program.

^{N5} Continuous Lane results determined by Back of Queue values of downstream lanes (proportional to lane movement flows).

Approach Lane Flows (veh/h)										
South: Worth Street (S)										
Mov. From S To Exit:	L2	T1	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	80	254	334	0.2		1178	0.283	100	0.0	2
Lane 2	-	365	365	0.3		1288	0.283	100	NA	NA
Approach	80	619	699	0.3			0.283			
East: Union Lane (E)										
Mov. From E	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane

To Exit:	S	W	N			veh/h	v/c	%	%	No.
Lane 1	45	1	-	46	0.0	487	0.094	100	NA	NA
Lane 2	-	-	85	85	0.0	144	0.593	100	NA	NA
Approach	45	1	85	131	0.0		0.593			
North: Worth Street (N)										
Mov.	T1	R2	Total	%HV		Cap.	Deg.	Lane	Prob.	Ov.
From N						veh/h	Satn	Util.	SL Ov.	Lane
To Exit:	S	W					v/c	%	%	No.
Lane 1	306	-	306	0.3		1945	0.157	100	NA	NA
Lane 2	93	32	126	0.2		798	0.157	100	NA	NA
Approach	399	32	431	0.2			0.157			
West: Union Lane (W)										
Mov.	L2	R2	Total	%HV		Cap.	Deg.	Lane	Prob.	Ov.
From W						veh/h	Satn	Util.	SL Ov.	Lane
To Exit:	N	S					v/c	%	%	No.
Lane 1	68	28	97	0.0		262	0.369	100	NA	NA
Approach	68	28	97	0.0			0.369			
Total %HV Deg.Satn (v/c)										
Intersection	1358	0.2		0.593						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Worth Street (S) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Worth Street (N) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Union Lane (W) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

 Site: 101 [Fut PM - High Street / Mulgoa Road / Castlereagh Road (Site Folder: Future PM)]

 Network: N101 [FUT PM (Network Folder: Future Peaks)]

Future PM

High Street / Mulgoa Road

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h	HV %	[Total veh/h	HV %	veh/h	v/c	%	sec		[Veh	Dist] m		m	%	%
South: Mulgoa Road (S)															
Lane 1	328	1.2	328	1.2	785	0.418	100	37.8	LOS C	9.6	67.7	Short	126	0.0	NA
Lane 2	224	7.7	224	7.7	491	0.456	60 ⁷	45.5	LOS D	7.8	58.0	Full	500	0.0	0.0
Lane 3	373	7.7	373	7.7	491	0.759	100	51.6	LOS D	14.6	109.0	Full	500	0.0	0.0
Lane 4	365	7.7	365	7.7	481 ¹	0.759	100	51.5	LOS D	14.2	106.2	Full	500	0.0	0.0
Lane 5	173	0.0	173	0.0	292	0.593	100	65.6	LOS E	6.8	47.9	Short	95	0.0	NA
Approach	1463	5.3	1463	5.3		0.759		49.2	LOS D	14.6	109.0				
East: High Street (E)															
Lane 1	124	0.0	124	0.0	684 ¹	0.182	100	30.2	LOS C	3.1	22.0	Short	35	0.0	NA
Lane 2	1	100.0	1	100.0	279	0.004	0 ⁵	44.8	LOS D	0.0	0.4	Short	15	0.0	NA
Lane 3	275	1.0	275	1.0	296 ¹	0.928	100	76.1	LOS F	12.8	90.4	Full	120	0.0	23.8
Lane 4	321	1.0	321	1.0	346 ¹	0.928	100	76.3	LOS F	15.2	107.5	Full	120	0.0	39.7
Lane 5	105	0.5	105	0.5	185	0.567	100	71.3	LOS F	4.3	30.4	Short	63	0.0	NA
Lane 6	105	0.5	105	0.5	185	0.567	100	71.3	LOS F	4.3	30.4	Short	50	0.0	NA
Approach	930	0.9	930	0.9		0.928		68.9	LOS E	15.2	107.5				
North: Castlereagh Road (N)															
Lane 1	167	0.6	167	0.6	636	0.262	100	20.9	LOS B	2.8	19.6	Short	50	0.0	NA
Lane 2	306	3.6	306	3.6	514 ¹	0.595	100	39.4	LOS C	10.1	72.6	Full	115	0.0	7.7
Lane 3	376	3.6	376	3.6	632	0.595	100	41.3	LOS C	13.0	93.6	Full	115	0.0	30.9
Lane 4	376	3.6	376	3.6	632	0.595	100	41.3	LOS C	13.0	93.6	Full	115	0.0	54.8 ⁸
Lane 5	344	3.9	344	3.9	367 ¹	0.939	100	84.2	LOS F	16.7	121.0	Short	95	0.0	NA
Lane 6	344	3.9	344	3.9	367 ¹	0.939	100	83.5	LOS F	16.7	121.0	Short	88	0.0	NA
Approach	1913	3.4	1913	3.4		0.939		54.5	LOS D	16.7	121.0				
West: High Street (W)															
Lane 1	276	1.8	276	1.8	775	0.356	100	28.2	LOS B	6.9	49.2	Short	85	0.0	NA
Lane 2	275	1.8	275	1.8	772 ¹	0.356	100	28.2	LOS B	6.9	49.0	Short	97	0.0	NA
Lane 3	1	100.0	1	100.0	279	0.004	1 ⁵	45.0	LOS D	0.0	0.4	Short	16	0.0	NA
Lane 4	155	0.3	155	0.3	389	0.399	100	53.9	LOS D	5.7	39.8	Full	500	0.0	0.0
Lane 5	155	0.3	155	0.3	389	0.399	100	53.9	LOS D	5.7	39.8	Full	500	0.0	0.0
Lane 6	132	0.8	132	0.8	184	0.718	100	75.2	LOS F	5.7	39.9	Short	123	0.0	NA
Lane 7	132	0.8	132	0.8	184	0.718	100	75.2	LOS F	5.7	39.9	Short	113	0.0	NA
Approach	1126	1.2	1126	1.2		0.718		46.3	LOS D	6.9	49.2				
Intersection	5433	3.1	5433	3.1		0.939		53.9	LOS D	16.7	121.0				

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

Lane LOS values are based on average delay per lane.

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

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

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

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

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
- 5 Lane under-utilisation found by the program
- 7 Lane under-utilisation specified by the user
- 8 Probability of Blockage has been set on the basis of a queue that overflows from a short lane.

Approach Lane Flows (veh/h)										
South: Mulgoa Road (S)										
Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	328	-	-	328	1.2	785	0.418	100	0.0	2
Lane 2	-	224	-	224	7.7	491	0.456	60 ⁷	NA	NA
Lane 3	-	373	-	373	7.7	491	0.759	100	NA	NA
Lane 4	-	365	-	365	7.7	481 ¹	0.759	100	NA	NA
Lane 5	-	-	173	173	0.0	292	0.593	100	0.0	4
Approach	328	962	173	1463	5.3		0.759			
East: High Street (E)										
Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	124	-	-	124	0.0	684 ¹	0.182	100	7.1	3
Lane 2	-	1	-	1	100.0	279	0.004	0 ⁵	0.0	1
Lane 3	-	275	-	275	1.0	296 ¹	0.928	100	NA	NA
Lane 4	-	321	-	321	1.0	346 ¹	0.928	100	NA	NA
Lane 5	-	-	105	105	0.5	185	0.567	100	0.0	4
Lane 6	-	-	105	105	0.5	185	0.567	100	4.2	5
Approach	124	597	209	930	0.9		0.928			
North: Castlereagh Road (N)										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	167	-	-	167	0.6	636	0.262	100	0.0	2
Lane 2	-	306	-	306	3.6	514 ¹	0.595	100	NA	NA
Lane 3	-	376	-	376	3.6	632	0.595	100	NA	NA
Lane 4	-	376	-	376	3.6	632	0.595	100	NA	NA
Lane 5	-	-	344	344	3.9	367 ¹	0.939	100	73.1	4
Lane 6	-	-	344	344	3.9	367 ¹	0.939	100	80.5	5
Approach	167	1058	689	1913	3.4		0.939			
West: High Street (W)										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	276	-	-	276	1.8	775	0.356	100	0.0	2
Lane 2	275	-	-	275	1.8	772 ¹	0.356	100	0.0	4
Lane 3	-	1	-	1	100.0	279	0.004	1 ⁵	0.0	2
Lane 4	-	155	-	155	0.3	389	0.399	100	NA	NA
Lane 5	-	155	-	155	0.3	389	0.399	100	NA	NA
Lane 6	-	-	132	132	0.8	184	0.718	100	0.0	5
Lane 7	-	-	132	132	0.8	184	0.718	100	0.0	6
Approach	550	311	265	1126	1.2		0.718			
Total %HV Deg.Satn (v/c)										
Intersection	5433	3.1		0.939						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at

entry to short lanes are not included.

- 5 Lane under-utilisation found by the program
- 7 Lane under-utilisation specified by the user

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow veh/h	Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Mulgoa Road (S) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
East Exit: High Street (E) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Castlereagh Road (N) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
West Exit: High Street (W) Merge Type: Zipper												
Exit Short Lane	1	240	50.0	470	475	2.50	2.00	673	1168	0.576	0.6	1.4
Merge Lane	2	-	50.0	336	341	2.50	2.00	940	1373	0.685	0.2	0.7

LANE SUMMARY

 Site: 101 [Fut PM - High Street / Worth Street (Site Folder: Future PM)]

 Network: N101 [FUT PM (Network Folder: Future Peaks)]

Future PM

High Street / Worth Street

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
South: Worth Street (S)															
Lane 1	434	0.5	434	0.5	1059	0.410	100	18.3	LOS B	8.4	59.0	Full	62	0.0	45.4
Lane 2	317	0.0	317	0.0	772	0.410	100	23.5	LOS B	7.4	52.1	Full	62	0.0	33.7
Approach	751	0.3	751	0.3		0.410		20.5	LOS B	8.4	59.0				
East: High Street (E)															
Lane 1	76	0.2	76	0.2	451	0.168	26 ⁷	42.7	LOS D	2.1	15.0	Full	500	0.0	0.0
Lane 2	299	1.6	299	1.6	464	0.645	100	44.3	LOS D	9.7	69.0	Full	500	0.0	0.0
Lane 3	145	0.0	145	0.0	445	0.325	100	30.8	LOS C	3.5	24.2	Short	70	0.0	NA
Approach	519	1.0	519	1.0		0.645		40.3	LOS C	9.7	69.0				
North: Penrith Plaza															
Lane 1	151	0.0	151	0.0	353 ¹	0.428	100	31.8	LOS C	3.7	25.9	Short	7	0.0	NA
Lane 2	247	0.0	247	0.0	605 ¹	0.408	49 ⁵	18.8	LOS B	5.1	35.5	Full	500	0.0	0.0
Lane 3	239	0.0	239	0.0	287	0.835	100	55.5	LOS D	9.4	66.0	Full	500	0.0	0.0
Approach	637	0.0	637	0.0		0.835		35.7	LOS C	9.4	66.0				
West: High Street (W)															
Lane 1	284	0.0	284	0.0	1169	0.243	100	6.8	LOS A	2.0	13.9	Short	60	0.0	NA
Lane 2	146	0.7	146	0.7	468	0.311	100	40.2	LOS C	4.3	30.2	Full	165	0.0	0.0
Lane 3	146	0.7	146	0.7	468	0.311	100	40.2	LOS C	4.3	30.2	Full	165	0.0	0.0
Lane 4	96	0.0	96	0.0	355	0.271	100	31.7	LOS C	2.2	15.6	Short	50	0.0	NA
Approach	672	0.3	672	0.3		0.311		24.8	LOS B	4.3	30.2				
Intersection	2580	0.3	2580	0.3		0.835		29.4	LOS C	9.7	69.0				

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

Lane LOS values are based on average delay per lane.

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

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

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

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

¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

⁵ Lane under-utilisation found by the program

⁷ Lane under-utilisation specified by the user

Approach Lane Flows (veh/h)											
South: Worth Street (S)											
Mov. From S To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	380	54	-	434	0.5	1059	0.410	100	NA	NA	
Lane 2	-	245	72	317	0.0	772	0.410	100	NA	NA	

Approach	380	299	72	751	0.3	0.410				
East: High Street (E)										
Mov. From E To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	S	W	N							
Lane 1	66	9	-	76	0.2	451	0.168	26 ⁷	NA	NA
Lane 2	-	299	-	299	1.6	464	0.645	100	NA	NA
Lane 3	-	-	145	145	0.0	445	0.325	100	0.0	2
Approach	66	308	145	519	1.0	0.645				
North: Penrith Plaza										
Mov. From N To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	E	S	W							
Lane 1	151	-	-	151	0.0	353 ¹	0.428	100	100.0	2
Lane 2	-	247	-	247	0.0	605 ¹	0.408	49 ⁵	NA	NA
Lane 3	-	-	239	239	0.0	287	0.835	100	NA	NA
Approach	151	247	239	637	0.0	0.835				
West: High Street (W)										
Mov. From W To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	N	E	S							
Lane 1	284	-	-	284	0.0	1169	0.243	100	0.0	2
Lane 2	-	146	-	146	0.7	468	0.311	100	NA	NA
Lane 3	-	146	-	146	0.7	468	0.311	100	NA	NA
Lane 4	-	-	96	96	0.0	355	0.271	100	0.0	3
Approach	284	291	96	672	0.3	0.311				
Total %HV Deg.Satn (v/c)										
Intersection	2580	0.3	0.835							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
- 5 Lane under-utilisation found by the program
- 7 Lane under-utilisation specified by the user

Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Worth Street (S) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
East Exit: High Street (E) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
North Exit: Penrith Plaza Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
West Exit: High Street (W) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									

Full Length Lane	2	Merge Analysis not applied.
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Project: \\mte_nas1\mte storage\Jobs\2022\220249\MTE SIDRA\22 05 11 - AW.sip9



**EXISTING PLUS GROWTH VOLUMES
(40 SHEETS)**

LANE SUMMARY

 **Site: 101 [Ex PM - High Street Roundabout - Copy (Site Folder: Existing PM)]**

 **Network: N101 [EX PM - Copy (Network Folder: Existing Peaks - Growth)]**

Existing PM
High Street Roundabout
Job No: 220249
Site Category: (None)
Roundabout
Design Life Analysis: Constant Number of Years = 14

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
East: High Street (E)															
Lane 1 ^d	573	0.8	563	0.9	739	0.761	100	3.8	LOS A	5.1 ^{N5}	35.7 ^{N5}	Full	165	-50.0 ^{N3}	0.0
Lane 2	541	0.8	532	0.8	699	0.761	100	4.5	LOS A	7.5 ^{N5}	52.9 ^{N5}	Full	165	-47.1 ^{N3}	0.0
Approach	1114	0.8	1095 ^{N1}	0.8		0.761		4.1	LOS A	7.5	52.9				
North: Penrith City Council															
Lane 1 ^d	193	0.0	193	0.0	565	0.342	100	2.7	LOS A	1.5 ^{N5}	10.6 ^{N5}	Full	500	-33.2 ^{N3}	0.0
Approach	193	0.0	193	0.0		0.342		2.7	LOS A	1.5	10.6				
West: High Street (W)															
Lane 1 ^d	456	0.3	456	0.3	1606	0.284	100	3.7	LOS A	0.7	5.2	Full	120	0.0	0.0
Lane 2	385	0.3	385	0.3	1357	0.284	100	3.9	LOS A	0.7	4.8	Full	120	-3.7 ^{N3}	0.0
Approach	841	0.3	841	0.3		0.284		3.8	LOS A	0.7	5.2				
Intersection	2148	0.5	2129 ^{N1}	0.5		0.761		3.9	LOS A	7.5	52.9				

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

Lane LOS values are based on average delay per lane.

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

^d Dominant lane on roundabout approach

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

^{N3} Capacity Adjustment due to downstream lane blockage determined by the program.

^{N5} Continuous Lane results determined by Back of Queue values of downstream lanes (proportional to lane movement flows).

Approach Lane Flows (veh/h)											
East: High Street (E)											
Mov. From E To Exit:	T1	R2	U	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	W	N	E								
Lane 1	563	-	-	563	0.9		739	0.761	100	NA	NA
Lane 2	474	50	8	532	0.8		699	0.761	100	NA	NA
Approach	1037	50	8	1095	0.8			0.761			
North: Penrith City Council											
Mov. From N To Exit:	L2	R2	U	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	E	W	N								
Lane 1	96	96	1	193	0.0		565	0.342	100	NA	NA

Approach	96	96	1	193	0.0		0.342				
West: High Street (W)											
Mov.	L2	T1	U	Total	%HV		Deg.	Lane	Prob.	Ov.	
From W							Satn	Util.	SL	SL	Lane
To Exit:	N	E	W				veh/h	v/c	%	%	No.
Lane 1	100	356	-	456	0.3		1606	0.284	100	NA	NA
Lane 2	-	371	15	385	0.3		1357	0.284	100	NA	NA
Approach	100	726	15	841	0.3			0.284			
Total %HV Deg.Satn (v/c)											
Intersection	2129	0.5		0.761							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: High Street (E)												
Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Penrith City Council												
Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: High Street (W)												
Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										

MOVEMENT SUMMARY

 **Site: 101 [Ex AM - High Street Roundabout - Copy (Site Folder: Existing AM)]**

 **Network: N101 [EX AM - Copy (Network Folder: Existing Peaks - Growth)]**

Existing AM
High Street Roundabout
Job No: 220249
Site Category: (None)
Roundabout
Design Life Analysis: Constant Number of Years = 14

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
East: High Street (E)														
5	T1	411	4.8	411	4.8	0.154	3.4	LOS A	0.3	2.3	0.11	0.39	0.11	38.4
6	R2	43	3.8	43	3.8	0.154	7.4	LOS A	0.3	2.3	0.12	0.44	0.12	23.0
6u	U	6	28.6	6	28.6	0.154	10.8	LOS A	0.3	2.3	0.12	0.44	0.12	37.4
Approach		460	5.0	460	5.0	0.154	3.9	LOS A	0.3	2.3	0.11	0.40	0.11	32.5
North: Penrith City Council														
7	L2	14	0.0	14	0.0	0.045	2.4	LOS A	0.1	0.6	0.51	0.38	0.51	19.9
9	R2	23	0.0	23	0.0	0.045	2.4	LOS A	0.1	0.6	0.51	0.38	0.51	19.9
9u	U	1	0.0	1	0.0	0.045	12.7	LOS A	0.1	0.6	0.51	0.38	0.51	29.7
Approach		39	0.0	39	0.0	0.045	2.7	LOS A	0.1	0.6	0.51	0.38	0.51	20.4
West: High Street (W)														
10	L2	85	0.0	85	0.0	0.287	4.4	LOS A	0.7	5.0	0.13	0.39	0.13	22.2
11	T1	774	3.6	774	3.6	0.287	3.6	LOS A	0.7	5.0	0.14	0.38	0.14	36.1
12u	U	6	0.0	6	0.0	0.287	10.6	LOS A	0.7	4.9	0.14	0.37	0.14	36.2
Approach		865	3.2	865	3.2	0.287	3.7	LOS A	0.7	5.0	0.14	0.38	0.14	30.0
All Vehicles		1363	3.8	1363	3.8	0.287	3.7	LOS A	0.7	5.0	0.14	0.39	0.14	29.9

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

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

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

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MOVEMENT SUMMARY

 Site: 101 [Ex AM - High Street / Worth Street - Copy (Site Folder: Existing AM)]

 Network: N101 [EX AM - Copy (Network Folder: Existing Peaks - Growth)]

Existing AM

High Street / Worth Street

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Design Life Analysis: Constant Number of Years = 14

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Worth Street (S)														
1	L2	193	5.8	193	5.8	0.288	30.4	LOS C	4.8	35.0	0.72	0.75	0.72	7.8
2	T1	153	0.0	153	0.0	0.288	26.0	LOS B	4.8	33.9	0.72	0.65	0.72	30.3
3	R2	51	3.1	51	3.1	* 0.288	30.4	LOS C	4.8	33.9	0.72	0.64	0.72	30.2
Approach		397	3.2	397	3.2	0.288	28.7	LOS C	4.8	35.0	0.72	0.70	0.72	22.9
East: High Street (E)														
4	L2	57	5.6	57	5.6	0.071	21.0	LOS B	1.1	8.3	0.54	0.65	0.54	32.2
5	T1	259	4.3	259	4.3	0.272	18.3	LOS B	5.2	37.7	0.62	0.53	0.62	33.5
6	R2	104	0.0	104	0.0	0.249	28.0	LOS B	2.4	16.7	0.67	0.73	0.67	36.0
Approach		420	3.4	420	3.4	0.272	21.1	LOS B	5.2	37.7	0.62	0.60	0.62	34.3
North: Penrith Plaza														
7	L2	23	0.0	23	0.0	0.047	25.5	LOS B	0.5	3.3	0.60	0.65	0.60	37.2
8	T1	24	0.0	24	0.0	0.031	23.0	LOS B	0.5	3.6	0.63	0.47	0.63	31.1
9	R2	20	0.0	20	0.0	0.056	34.5	LOS C	0.5	3.4	0.72	0.67	0.72	26.0
Approach		67	0.0	67	0.0	0.056	27.3	LOS B	0.5	3.6	0.65	0.59	0.65	32.4
West: High Street (W)														
10	L2	203	0.0	203	0.0	0.173	6.3	LOS A	1.0	6.8	0.27	0.59	0.27	44.6
11	T1	454	6.0	454	6.0	0.247	18.1	LOS B	4.6	33.6	0.61	0.52	0.61	36.6
12	R2	159	1.0	159	1.0	* 0.345	29.8	LOS C	3.9	27.3	0.72	0.76	0.72	15.2
Approach		816	3.5	816	3.5	0.345	17.4	LOS B	4.6	33.6	0.54	0.58	0.54	35.4
All Vehicles		1700	3.3	1700	3.3	0.345	21.4	LOS B	5.2	37.7	0.61	0.61	0.61	32.4

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.

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

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

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Worth Street (S)											
P1	Full	8	54.2	LOS E	0.0	0.0	0.95	0.95	220.2	215.9	0.98
East: High Street (E)											
P2	Full	11	54.2	LOS E	0.0	0.0	0.95	0.95	223.8	220.5	0.99

North: Penrith Plaza											
P3 Full	1	54.2	LOS E	0.0	0.0	0.95	0.95	221.2	217.2	0.98	
P3B Slip/ Bypass	12	54.2	LOS E	0.0	0.0	0.95	0.95	211.3	204.3	0.97	
West: High Street (W)											
P4 Full	18	54.2	LOS E	0.1	0.1	0.95	0.95	223.8	220.5	0.99	
P4B Slip/ Bypass	19	24.6	LOS C	0.0	0.0	0.90	0.90	181.8	204.3	1.12	
All Pedestrians	69	46.1	LOS E	0.1	0.1	0.94	0.94	209.6	212.6	1.01	

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

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

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

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MOVEMENT SUMMARY

 Site: 101 [Ex AM - High Street / Mulgoa Road / Castlereagh Road - Copy (Site Folder: Existing AM)]

 Network: N101 [EX AM - Copy (Network Folder: Existing Peaks - Growth)]

Existing AM

High Street / Mulgoa Road

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Design Life Analysis: Constant Number of Years = 14

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Mulgoa Road (S)														
1	L2	195	2.8	195	2.8	0.222	28.9	LOS C	4.7	33.8	0.63	0.73	0.63	40.5
2	T1	929	15.1	929	15.1	* 0.788	51.9	LOS D	14.7	115.8	0.96	0.87	1.01	25.7
3	R2	137	2.0	137	2.0	0.588	69.0	LOS E	5.6	39.5	0.99	0.80	0.99	18.9
Approach		1261	11.7	1261	11.7	0.788	50.2	LOS D	14.7	115.8	0.91	0.84	0.95	27.1
East: High Street (E)														
4	L2	68	5.9	68	5.9	0.142	42.1	LOS C	2.0	15.1	0.76	0.72	0.76	27.7
5	T1	275	3.9	275	3.9	* 0.741	70.2	LOS E	6.0	43.3	1.00	0.87	1.11	21.5
6	R2	90	3.0	90	3.0	0.388	75.5	LOS F	1.9	13.6	1.00	0.74	1.00	10.1
Approach		433	4.0	433	4.0	0.741	66.9	LOS E	6.0	43.3	0.96	0.82	1.03	20.1
North: Castlereagh Road (N)														
7	L2	171	5.5	171	5.5	0.304	23.3	LOS B	2.9	21.5	0.74	0.75	0.74	15.8
8	T1	1167	12.6	1167	12.6	0.598	33.9	LOS C	13.7	106.2	0.82	0.72	0.82	32.0
9	R2	690	5.3	690	5.3	* 0.762	58.4	LOS E	13.6	99.3	0.98	0.88	1.02	24.0
Approach		2028	9.5	2028	9.5	0.762	41.4	LOS C	13.7	106.2	0.87	0.78	0.88	28.1
West: High Street (W)														
10	L2	866	5.1	866	5.1	0.533	28.1	LOS B	11.7	85.1	0.70	0.79	0.70	34.1
11	T1	543	2.2	543	2.2	0.734	60.2	LOS E	10.9	77.8	1.00	0.87	1.03	20.8
12	R2	431	1.9	431	1.9	* 0.754	69.6	LOS E	9.0	64.3	1.00	0.87	1.08	28.0
Approach		1841	3.5	1841	3.5	0.754	47.3	LOS D	11.7	85.1	0.86	0.83	0.89	28.0
All Vehicles		5563	7.6	5563	7.6	0.788	47.3	LOS D	14.7	115.8	0.88	0.81	0.91	27.1

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.

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

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

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Mulgoa Road (S)											
P11	Stage 1	7	64.1	LOS F	0.0	0.0	0.96	0.96	228.9	214.2	0.94
P12	Stage 2	7	64.1	LOS F	0.0	0.0	0.96	0.96	226.4	210.9	0.93

P1B Slip/ Bypass	7	64.1	LOS F	0.0	0.0	0.96	0.96	221.3	204.3	0.92
East: High Street (E)										
P2 Full	4	64.1	LOS F	0.0	0.0	0.96	0.96	238.6	226.9	0.95
P2B Slip/ Bypass	11	64.2	LOS F	0.0	0.0	0.96	0.96	221.3	204.3	0.92
North: Castlereagh Road (N)										
P31 Stage 1	1	64.1	LOS F	0.0	0.0	0.96	0.96	231.4	217.5	0.94
P32 Stage 2	1	64.1	LOS F	0.0	0.0	0.96	0.96	226.4	210.9	0.93
P3B Slip/ Bypass	4	34.1	LOS D	0.0	0.0	0.91	0.91	191.2	204.3	1.07
West: High Street (W)										
P4 Full	1	64.1	LOS F	0.0	0.0	0.96	0.96	238.4	226.6	0.95
P4B Slip/ Bypass	1	64.1	LOS F	0.0	0.0	0.96	0.96	223.8	207.6	0.93
All Pedestrians	44	61.4	LOS F	0.0	0.0	0.95	0.95	223.1	210.2	0.94

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

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

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

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MOVEMENT SUMMARY

Site: 101 [Ex AM - Worth Street / Union Lane - Copy (Site Folder: Existing AM)]

Network: N101 [EX AM - Copy (Network Folder: Existing Peaks - Growth)]

Existing AM
Worth Street / Union Lane
Job No: 220249
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis: Constant Number of Years = 14

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Worth Street (S)														
1	L2	38	0.0	38	0.0	0.100	4.1	LOS A	0.0	0.0	0.00	0.11	0.00	45.9
2	T1	339	3.0	339	3.0	0.100	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	46.3
Approach		378	2.7	378	2.7	0.100	0.4	NA	0.0	0.0	0.00	0.05	0.00	46.2
East: Union Lane (E)														
4	L2	21	0.0	21	0.0	0.027	3.8	LOS A	0.0	0.2	0.19	0.44	0.19	36.7
5	T1	1	0.0	1	0.0	0.027	6.7	LOS A	0.0	0.2	0.19	0.44	0.19	38.0
6	R2	22	34.6	22	34.6	0.061	11.1	LOS A	0.1	0.8	0.59	0.74	0.59	32.3
Approach		45	17.2	45	17.2	0.061	7.5	LOS A	0.1	0.8	0.38	0.59	0.38	34.5
North: Worth Street (N)														
8	T1	202	1.3	202	1.3	0.074	0.2	LOS A	0.1	0.5	0.07	0.05	0.07	43.8
9	R2	22	0.0	22	0.0	0.074	5.9	LOS A	0.1	0.5	0.14	0.10	0.14	39.7
Approach		225	1.1	225	1.1	0.074	0.8	NA	0.1	0.5	0.08	0.06	0.08	42.6
West: Union Lane (W)														
10	L2	19	0.0	19	0.0	0.027	5.1	LOS A	0.0	0.3	0.27	0.53	0.27	34.7
12	R2	5	0.0	5	0.0	0.027	9.9	LOS A	0.0	0.3	0.27	0.53	0.27	34.7
Approach		24	0.0	24	0.0	0.027	6.2	LOS A	0.0	0.3	0.27	0.53	0.27	34.7
All Vehicles		671	3.1	671	3.1	0.100	1.2	NA	0.1	0.8	0.06	0.11	0.06	40.5

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

MOVEMENT SUMMARY

 Site: 101 [Ex AM - Worth Street / Union Road - Copy (Site Folder: Existing AM)]

 Network: N101 [EX AM - Copy (Network Folder: Existing Peaks - Growth)]

Existing AM

Worth Street / Union Road

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)

Design Life Analysis: Constant Number of Years = 14

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Worth Street (S)														
1	L2	16	0.0	16	0.0	0.468	68.1	LOS E	2.9	20.2	0.99	0.77	0.99	25.7
2	T1	25	0.0	25	0.0	* 0.468	68.3	LOS E	2.9	20.2	0.99	0.77	0.99	17.6
3	R2	34	0.0	34	0.0	0.468	68.2	LOS E	2.9	20.2	0.99	0.77	0.99	25.7
Approach		75	0.0	75	0.0	0.468	68.2	LOS E	2.9	20.2	0.99	0.77	0.99	23.5
East: Union Road (E)														
4	L2	23	8.9	23	8.9	0.077	18.3	LOS B	1.4	10.0	0.48	0.47	0.48	41.1
5	T1	58	0.0	58	0.0	0.077	13.6	LOS A	1.4	10.0	0.48	0.47	0.48	41.6
6	R2	198	3.1	198	3.1	* 0.617	36.9	LOS C	6.1	44.2	0.83	0.82	0.83	25.1
Approach		278	2.9	278	2.9	0.617	30.6	LOS C	6.1	44.2	0.73	0.71	0.73	30.4
North: Worth Street (N)														
7	L2	183	1.1	183	1.1	* 0.463	48.3	LOS D	6.2	44.1	0.92	0.76	0.92	21.0
8	T1	9	0.0	9	0.0	0.107	43.9	LOS D	1.3	9.4	0.84	0.63	0.84	22.0
9	R2	34	0.0	34	0.0	0.107	43.9	LOS D	1.3	9.4	0.84	0.63	0.84	22.0
Approach		226	0.9	226	0.9	0.463	47.5	LOS D	6.2	44.1	0.91	0.74	0.91	21.2
West: Union Road (W)														
10	L2	150	1.4	150	1.4	0.141	13.3	LOS A	2.4	17.1	0.40	0.62	0.40	37.3
11	T1	491	1.7	491	1.7	0.462	17.5	LOS B	11.0	78.3	0.63	0.58	0.63	40.2
12	R2	18	0.0	18	0.0	0.462	22.4	LOS B	11.0	78.3	0.64	0.58	0.64	39.7
Approach		660	1.6	660	1.6	0.462	16.7	LOS B	11.0	78.3	0.58	0.59	0.58	39.8
All Vehicles		1239	1.7	1239	1.7	0.617	28.5	LOS C	11.0	78.3	0.70	0.65	0.70	32.6

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.

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

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

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Worth Street (S)											
P1	Full	5	59.2	LOS E	0.0	0.0	0.95	0.95	219.6	208.6	0.95
East: Union Road (E)											
P2	Full	1	59.1	LOS E	0.0	0.0	0.95	0.95	224.7	215.2	0.96

North: Worth Street (N)											
P3	Full	1	59.1	LOS E	0.0	0.0	0.95	0.95	224.7	215.2	0.96
West: Union Road (W)											
P4	Full	4	59.1	LOS E	0.0	0.0	0.95	0.95	224.7	215.2	0.96
All Pedestrians		12	59.1	LOS E	0.0	0.0	0.95	0.95	222.4	212.3	0.95

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

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

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

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Project: \\mte_nas1\mte storage\Jobs\2022\220249\MTE SIDRA\22 05 11 - AW.sip9

LANE SUMMARY

 **Site: 101 [Ex AM - High Street Roundabout - Copy (Site Folder: Existing AM)]**

 **Network: N101 [EX AM - Copy (Network Folder: Existing Peaks - Growth)]**

Existing AM
High Street Roundabout
Job No: 220249
Site Category: (None)
Roundabout
Design Life Analysis: Constant Number of Years = 14

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
East: High Street (E)															
Lane 1 ^d	244	4.8	244	4.8	1586	0.154	100	3.4	LOS A	0.3	2.3	Full	165	0.0	0.0
Lane 2	216	5.3	216	5.3	1406	0.154	100	4.4	LOS A	0.3	2.3	Full	165	0.0	0.0
Approach	460	5.0	460	5.0		0.154		3.9	LOS A	0.3	2.3				
North: Penrith City Council															
Lane 1 ^d	39	0.0	39	0.0	854	0.045	100	2.7	LOS A	0.1	0.6	Full	500	0.0	0.0
Approach	39	0.0	39	0.0		0.045		2.7	LOS A	0.1	0.6				
West: High Street (W)															
Lane 1 ^d	461	3.0	461	3.0	1605	0.287	100	3.7	LOS A	0.7	5.0	Full	120	0.0	0.0
Lane 2	404	3.6	404	3.6	1407	0.287	100	3.7	LOS A	0.7	4.9	Full	120	0.0	0.0
Approach	865	3.2	865	3.2		0.287		3.7	LOS A	0.7	5.0				
Intersection	1363	3.8	1363	3.8		0.287		3.7	LOS A	0.7	5.0				

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

Lane LOS values are based on average delay per lane.

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
East: High Street (E)											
Mov.	T1	R2	U	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane No.
From E To Exit:	W	N	E			Cap. veh/h	v/c	%	%		
Lane 1	244	-	-	244	4.8	1586	0.154	100	NA	NA	
Lane 2	167	43	6	216	5.3	1406	0.154	100	NA	NA	
Approach	411	43	6	460	5.0		0.154				
North: Penrith City Council											
Mov.	L2	R2	U	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane No.
From N To Exit:	E	W	N			Cap. veh/h	v/c	%	%		
Lane 1	14	23	1	39	0.0	854	0.045	100	NA	NA	
Approach	14	23	1	39	0.0		0.045				
West: High Street (W)											
Mov.	L2	T1	U	Total	%HV		Deg.	Lane	Prob.	Ov.	

From W To Exit:	N	E	W			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	85	376	-	461	3.0	1605	0.287	100	NA	NA
Lane 2	-	399	6	404	3.6	1407	0.287	100	NA	NA
Approach	85	774	6	865	3.2		0.287			
Total %HV Deg.Satn (v/c)										
Intersection	1363	3.8			0.287					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: High Street (E) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
North Exit: Penrith City Council Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: High Street (W) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									

LANE SUMMARY

 Site: 101 [Ex AM - High Street / Worth Street - Copy (Site Folder: Existing AM)]

 Network: N101 [EX AM - Copy (Network Folder: Existing Peaks - Growth)]

Existing AM

High Street / Worth Street

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Design Life Analysis: Constant Number of Years = 14

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h	HV %	[Total veh/h	HV %	veh/h	v/c	%	sec		[Veh	Dist] m		m	%	%
South: Worth Street (S)															
Lane 1	198	5.7	198	5.7	687	0.288	100	30.3	LOS C	4.8	35.0	Full	62	0.0	0.0
Lane 2	200	0.8	200	0.8	694	0.288	100	27.2	LOS B	4.8	33.9	Full	62	0.0	0.0
Approach	397	3.2	397	3.2		0.288		28.7	LOS C	4.8	35.0				
East: High Street (E)															
Lane 1	62	5.5	62	5.5	880	0.071	26 ⁷	20.6	LOS B	1.1	8.3	Full	500	0.0	0.0
Lane 2	254	4.3	254	4.3	934	0.272	100	18.4	LOS B	5.2	37.7	Full	500	0.0	0.0
Lane 3	104	0.0	104	0.0	416	0.249	100	28.0	LOS B	2.4	16.7	Short	70	0.0	NA
Approach	420	3.4	420	3.4		0.272		21.1	LOS B	5.2	37.7				
North: Penrith Plaza															
Lane 1	23	0.0	23	0.0	478	0.047	100	25.5	LOS B	0.5	3.3	Short	7	0.0	NA
Lane 2	24	0.0	24	0.0	780	0.031	56 ⁵	23.0	LOS B	0.5	3.6	Full	500	0.0	0.0
Lane 3	20	0.0	20	0.0	357	0.056	100	34.5	LOS C	0.5	3.4	Full	500	0.0	0.0
Approach	67	0.0	67	0.0		0.056		27.3	LOS B	0.5	3.6				
West: High Street (W)															
Lane 1	203	0.0	203	0.0	1169	0.173	100	6.3	LOS A	1.0	6.8	Short	60	0.0	NA
Lane 2	227	6.0	227	6.0	920	0.247	100	18.1	LOS B	4.6	33.6	Full	165	0.0	0.0
Lane 3	227	6.0	227	6.0	920	0.247	100	18.1	LOS B	4.6	33.6	Full	165	0.0	0.0
Lane 4	159	1.0	159	1.0	461	0.345	100	29.8	LOS C	3.9	27.3	Short	50	0.0	NA
Approach	816	3.5	816	3.5		0.345		17.4	LOS B	4.6	33.6				
Intersection	1700	3.3	1700	3.3		0.345		21.4	LOS B	5.2	37.7				

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

Lane LOS values are based on average delay per lane.

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

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

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

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

⁵ Lane under-utilisation found by the program

⁷ Lane under-utilisation specified by the user

Approach Lane Flows (veh/h)											
South: Worth Street (S)											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From S To Exit:	W	N	E			Cap. veh/h	v/c	%	%	No.	
Lane 1	193	5	-	198	5.7	687	0.288	100	NA	NA	
Lane 2	-	148	51	200	0.8	694	0.288	100	NA	NA	

Approach	193	153	51	397	3.2	0.288				
East: High Street (E)										
Mov. From E To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	S	W	N							
Lane 1	57	5	-	62	5.5	880	0.071	26 ⁷	NA	NA
Lane 2	-	254	-	254	4.3	934	0.272	100	NA	NA
Lane 3	-	-	104	104	0.0	416	0.249	100	0.0	2
Approach	57	259	104	420	3.4	0.272				
North: Penrith Plaza										
Mov. From N To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	E	S	W							
Lane 1	23	-	-	23	0.0	478	0.047	100	0.0	2
Lane 2	-	24	-	24	0.0	780	0.031	56 ⁵	NA	NA
Lane 3	-	-	20	20	0.0	357	0.056	100	NA	NA
Approach	23	24	20	67	0.0	0.056				
West: High Street (W)										
Mov. From W To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	N	E	S							
Lane 1	203	-	-	203	0.0	1169	0.173	100	0.0	2
Lane 2	-	227	-	227	6.0	920	0.247	100	NA	NA
Lane 3	-	227	-	227	6.0	920	0.247	100	NA	NA
Lane 4	-	-	159	159	1.0	461	0.345	100	0.0	3
Approach	203	454	159	816	3.5	0.345				
Total %HV Deg.Satn (v/c)										
Intersection	1700	3.3	0.345							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

5 Lane under-utilisation found by the program

7 Lane under-utilisation specified by the user

Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Worth Street (S) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
East Exit: High Street (E) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
North Exit: Penrith Plaza Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
West Exit: High Street (W) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									

LANE SUMMARY

 Site: 101 [Ex AM - High Street / Mulgoa Road / Castlereagh Road - Copy (Site Folder: Existing AM)]

 Network: N101 [EX AM - Copy (Network Folder: Existing Peaks - Growth)]

Existing AM

High Street / Mulgoa Road

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Design Life Analysis: Constant Number of Years = 14

Lane Use and Performance																
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.	
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec			[Veh m]		m	%	%	
South: Mulgoa Road (S)																
Lane 1	195	2.8	195	2.8	876	0.222	100	28.9	LOS C	4.7	33.8	Short	126	0.0	NA	
Lane 2	217	15.1	217	15.1	460	0.473	60 ⁷	45.9	LOS D	7.6	60.2	Full	500	0.0	0.0	
Lane 3	362	15.1	362	15.1	460	0.788	100	53.9	LOS D	14.7	115.8	Full	500	0.0	0.0	
Lane 4	350	15.1	350	15.1	444 ¹	0.788	100	53.6	LOS D	14.0	111.0	Full	500	0.0	0.0	
Lane 5	137	2.0	137	2.0	234	0.588	100	69.0	LOS E	5.6	39.5	Short	95	0.0	NA	
Approach	1261	11.7	1261	11.7		0.788		50.2	LOS D	14.7	115.8					
East: High Street (E)																
Lane 1	68	5.9	68	5.9	478	0.142	100	42.1	LOS C	2.0	15.1	Short	35	0.0	NA	
Lane 2	1	100.0	1	100.0	160	0.008	1 ⁵	56.8	LOS E	0.0	0.6	Short	15	0.0	NA	
Lane 3	134	3.4	134	3.4	181 ¹	0.741	100	70.2	LOS E	5.7	41.4	Full	120	0.0	0.0	
Lane 4	140	3.4	140	3.4	189	0.741	100	70.3	LOS E	6.0	43.3	Full	120	0.0	0.0	
Lane 5	45	3.0	45	3.0	116	0.388	100	75.5	LOS F	1.9	13.6	Short	63	0.0	NA	
Lane 6	45	3.0	45	3.0	116	0.388	100	75.5	LOS F	1.9	13.6	Short	50	0.0	NA	
Approach	433	4.0	433	4.0		0.741		66.9	LOS E	6.0	43.3					
North: Castlereagh Road (N)																
Lane 1	171	5.5	171	5.5	564	0.304	100	23.3	LOS B	2.9	21.5	Short	50	0.0	NA	
Lane 2	336	12.6	336	12.6	562 ¹	0.598	100	32.5	LOS C	10.2	79.4	Full	115	0.0	15.8	
Lane 3	422	12.6	422	12.6	705	0.598	100	34.7	LOS C	13.7	106.2	Full	115	0.0	42.6	
Lane 4	410	12.6	410	12.6	685 ¹	0.598	100	34.4	LOS C	13.2	102.2	Full	115	0.0	39.0	
Lane 5	345	5.3	345	5.3	453 ¹	0.762	100	58.4	LOS E	13.6	99.3	Short	95	0.0	NA	
Lane 6	345	5.3	345	5.3	453 ¹	0.762	100	58.4	LOS E	13.6	99.3	Short	88	0.0	NA	
Approach	2028	9.5	2028	9.5		0.762		41.4	LOS C	13.7	106.2					
West: High Street (W)																
Lane 1	434	5.1	434	5.1	815	0.533	100	28.1	LOS B	11.7	85.1	Short	85	0.0	NA	
Lane 2	433	5.1	433	5.1	812 ¹	0.533	100	28.1	LOS B	11.6	84.8	Short	97	0.0	NA	
Lane 3	1	100.0	1	100.0	270	0.005	1 ⁵	45.9	LOS D	0.0	0.5	Short	16	0.0	NA	
Lane 4	271	2.0	271	2.0	369	0.734	100	60.2	LOS E	10.9	77.8	Full	500	0.0	0.0	
Lane 5	271	2.0	271	2.0	369	0.734	100	60.2	LOS E	10.9	77.8	Full	500	0.0	0.0	
Lane 6	216	1.9	216	1.9	286	0.754	100	69.6	LOS E	9.0	64.3	Short	123	0.0	NA	
Lane 7	216	1.9	216	1.9	286	0.754	100	69.6	LOS E	9.0	64.3	Short	113	0.0	NA	
Approach	1841	3.5	1841	3.5		0.754		47.3	LOS D	11.7	85.1					
Intersection	5563	7.6	5563	7.6		0.788		47.3	LOS D	14.7	115.8					

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

Lane LOS values are based on average delay per lane.

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

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

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

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

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
- 5 Lane under-utilisation found by the program
- 7 Lane under-utilisation specified by the user

Approach Lane Flows (veh/h)										
South: Mulgoa Road (S)										
Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	195	-	-	195	2.8	876	0.222	100	0.0	2
Lane 2	-	217	-	217	15.1	460	0.473	60 ⁷	NA	NA
Lane 3	-	362	-	362	15.1	460	0.788	100	NA	NA
Lane 4	-	350	-	350	15.1	444 ¹	0.788	100	NA	NA
Lane 5	-	-	137	137	2.0	234	0.588	100	0.0	4
Approach	195	929	137	1261	11.7		0.788			
East: High Street (E)										
Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	68	-	-	68	5.9	478	0.142	100	0.0	3
Lane 2	-	1	-	1	100.0	160	0.008	1 ⁵	0.0	1
Lane 3	-	134	-	134	3.4	181 ¹	0.741	100	NA	NA
Lane 4	-	140	-	140	3.4	189	0.741	100	NA	NA
Lane 5	-	-	45	45	3.0	116	0.388	100	0.0	4
Lane 6	-	-	45	45	3.0	116	0.388	100	0.0	5
Approach	68	275	90	433	4.0		0.741			
North: Castlereagh Road (N)										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	171	-	-	171	5.5	564	0.304	100	0.0	2
Lane 2	-	336	-	336	12.6	562 ¹	0.598	100	NA	NA
Lane 3	-	422	-	422	12.6	705	0.598	100	NA	NA
Lane 4	-	410	-	410	12.6	685 ¹	0.598	100	NA	NA
Lane 5	-	-	345	345	5.3	453 ¹	0.762	100	54.1	4
Lane 6	-	-	345	345	5.3	453 ¹	0.762	100	61.4	5
Approach	171	1167	690	2028	9.5		0.762			
West: High Street (W)										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	434	-	-	434	5.1	815	0.533	100	50.2	2
Lane 2	433	-	-	433	5.1	812 ¹	0.533	100	37.8	4
Lane 3	-	1	-	1	100.0	270	0.005	1 ⁵	0.0	2
Lane 4	-	271	-	271	2.0	369	0.734	100	NA	NA
Lane 5	-	271	-	271	2.0	369	0.734	100	NA	NA
Lane 6	-	-	216	216	1.9	286	0.754	100	0.0	5
Lane 7	-	-	216	216	1.9	286	0.754	100	0.0	6
Approach	866	543	431	1841	3.5		0.754			
Total %HV Deg.Satn (v/c)										
Intersection	5563	7.6		0.788						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
- 5 Lane under-utilisation found by the program
- 7 Lane under-utilisation specified by the user

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Mulgoa Road (S) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
East Exit: High Street (E) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Castlereagh Road (N) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
West Exit: High Street (W) Merge Type: Zipper												
Exit Short Lane	1	240	50.0	309	316	2.50	2.00	541	1408	0.384	0.1	0.3
Merge Lane	2	-	50.0	270	277	2.50	2.00	618	1463	0.423	0.0	0.2

▼ Site: 101 [Ex AM - Worth Street / Union Lane - Copy (Site Folder: Existing AM)]

Existing AM
Worth Street / Union Lane
Job No: 220249
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis: Constant Number of Years = 14

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

Approach Lane Flows (veh/h)										
South: Worth Street (S)										
Mov. From S To Exit:	L2	T1	Total	%HV		Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	38	150	188	2.4		1885	0.100	100	0.0	2
Lane 2	-	189	189	3.0		1893	0.100	100	NA	NA
Approach	38	339	378	2.7			0.100			
East: Union Lane (E)										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.

From E To Exit:	S	W	N			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	21	1	-	22	0.0	827	0.027	100	NA	NA
Lane 2	-	-	22	22	34.6	366	0.061	100	NA	NA
Approach	21	1	22	45	17.2		0.061			
North: Worth Street (N)										
Mov.	T1	R2	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From N To Exit:	S	W								
Lane 1	101	-	101	1.3		1356	0.074	100	NA	NA
Lane 2	101	22	124	1.0		1671	0.074	100	NA	NA
Approach	202	22	225	1.1			0.074			
West: Union Lane (W)										
Mov.	L2	R2	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From W To Exit:	N	S								
Lane 1	19	5	24	0.0		881	0.027	100	NA	NA
Approach	19	5	24	0.0			0.027			
Total %HV Deg.Satn (v/c)										
Intersection	671	3.1		0.100						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Worth Street (S)												
Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Worth Street (N)												
Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Union Lane (W)												
Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

 Site: 101 [Ex AM - Worth Street / Union Road - Copy (Site Folder: Existing AM)]

 Network: N101 [EX AM - Copy (Network Folder: Existing Peaks - Growth)]

Existing AM

Worth Street / Union Road

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)

Design Life Analysis: Constant Number of Years = 14

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h	HV %	[Total veh/h	HV %	veh/h	v/c	%	sec		[Veh	Dist] m		m	%	%
South: Worth Street (S)															
Lane 1	75	0.0	75	0.0	160	0.468	100	68.2	LOS E	2.9	20.2	Full	500	0.0	0.0
Approach	75	0.0	75	0.0		0.468		68.2	LOS E	2.9	20.2				
East: Union Road (E)															
Lane 1	81	2.5	81	2.5	1050	0.077	12 ⁵	15.0	LOS B	1.4	10.0	Short (P)	45	0.0	NA
Lane 2	198	3.1	198	3.1	320	0.617	100	36.9	LOS C	6.1	44.2	Full	500	0.0	0.0
Approach	278	2.9	278	2.9		0.617		30.6	LOS C	6.1	44.2				
North: Worth Street (N)															
Lane 1	183	1.1	183	1.1	395	0.463	100	48.3	LOS D	6.2	44.1	Full	55	0.0	29.6
Lane 2	43	0.0	43	0.0	404	0.107	100	43.9	LOS D	1.3	9.4	Full	55	0.0	0.0
Approach	226	0.9	226	0.9		0.463		47.5	LOS D	6.2	44.1				
West: Union Road (W)															
Lane 1	171	1.4	171	1.4	1212	0.141	31 ⁶	12.7	LOS A	2.4	17.1	Short (P)	95	0.0	NA
Lane 2	488	1.6	488	1.6	1056	0.462	100	18.1	LOS B	11.0	78.3	Full	500	0.0	0.0
Approach	660	1.6	660	1.6		0.462		16.7	LOS B	11.0	78.3				
Intersection	1239	1.7	1239	1.7		0.617		28.5	LOS C	11.0	78.3				

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

Lane LOS values are based on average delay per lane.

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

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

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

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

⁵ Lane under-utilisation found by the program

⁶ Lane under-utilisation due to downstream effects

Approach Lane Flows (veh/h)											
South: Worth Street (S)											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From S To Exit:	W	N	E			Cap. veh/h	v/c	%	%	No.	
Lane 1	16	25	34	75	0.0	160	0.468	100	NA	NA	
Approach	16	25	34	75	0.0		0.468				
East: Union Road (E)											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From E						Cap.					

To Exit:	S	W	N			veh/h	v/c	%	%	No.
Lane 1	23	58	-	81	2.5	1050	0.077	12 ⁵	0.0	2
Lane 2	-	-	198	198	3.1	320	0.617	100	NA	NA
Approach	23	58	198	278	2.9		0.617			
North: Worth Street (N)										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From N						Cap.	Satn	Util.	SL Ov.	Lane
To Exit:	E	S	W			veh/h	v/c	%	%	No.
Lane 1	183	-	-	183	1.1	395	0.463	100	NA	NA
Lane 2	-	9	34	43	0.0	404	0.107	100	NA	NA
Approach	183	9	34	226	0.9		0.463			
West: Union Road (W)										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From W						Cap.	Satn	Util.	SL Ov.	Lane
To Exit:	N	E	S			veh/h	v/c	%	%	No.
Lane 1	150	21	-	171	1.4	1212	0.141	31 ⁶	0.0	2
Lane 2	-	470	18	488	1.6	1056	0.462	100	NA	NA
Approach	150	491	18	660	1.6		0.462			
Total %HV Deg.Satn (v/c)										
Intersection	1239	1.7		0.617						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

⁵ Lane under-utilisation found by the program

⁶ Lane under-utilisation due to downstream effects

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Worth Street (S) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Union Road (E) Merge Type: Zipper												
Exit Short Lane	1	45	50.0	252	254	2.50	2.00	204	1493	0.137	0.0	0.1
Merge Lane	2	-	50.0	102	103	2.50	2.00	504	1683	0.299	0.0	0.1
North Exit: Worth Street (N) Merge Type: Zipper												
Exit Short Lane	1	10	50.0	99	100	2.50	2.00	175	1686	0.104	0.0	0.0
Merge Lane	2	-	50.0	88	88	2.50	2.00	198	1700	0.116	0.0	0.0
West Exit: Union Road (W) Merge Type: Zipper												
Exit Short Lane	1	40	50.0	17	17	2.50	2.00	73	1781	0.041	0.0	0.0
Merge Lane	2	-	50.0	37	37	2.50	2.00	34	1759	0.019	0.0	0.0

MOVEMENT SUMMARY

 Site: 101 [Ex PM - Worth Street / Union Road - Copy (Site Folder: Existing PM)]

 Network: N101 [EX PM - Copy (Network Folder: Existing Peaks - Growth)]

Existing PM

Worth Street / Union Road

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)

Design Life Analysis: Constant Number of Years = 14

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Worth Street (S)														
1	L2	22	0.0	22	0.0	0.756	77.7	LOS F	2.8	19.5	1.00	0.85	1.22	24.1
2	T1	26	0.0	26	0.0	* 0.756	77.9	LOS F	2.8	19.5	1.00	0.85	1.22	16.2
3	R2	19	0.0	19	0.0	0.756	77.7	LOS F	2.8	19.5	1.00	0.85	1.22	24.1
Approach		66	0.0	66	0.0	0.756	77.7	LOS F	2.8	19.5	1.00	0.85	1.22	21.5
East: Union Road (E)														
4	L2	51	0.0	51	0.0	0.130	13.8	LOS A	2.3	16.4	0.41	0.45	0.41	43.2
5	T1	109	1.2	109	1.2	0.130	9.3	LOS A	2.3	16.4	0.41	0.45	0.41	43.6
6	R2	547	0.2	547	0.2	* 1.056	102.7	LOS F	33.7	236.1	1.00	1.17	1.52	13.1
Approach		707	0.4	707	0.4	1.056	81.9	LOS F	33.7	236.1	0.87	1.00	1.27	17.6
North: Worth Street (N)														
7	L2	298	0.4	298	0.4	* 0.997	91.1	LOS F	7.8	55.0	1.00	1.29	1.44	14.6
8	T1	28	0.0	28	0.0	0.857	64.9	LOS E	7.9	55.0	1.00	1.03	1.19	18.0
9	R2	242	0.0	242	0.0	0.857	65.0	LOS E	7.9	55.0	1.00	1.03	1.19	18.0
Approach		568	0.2	568	0.2	0.997	78.6	LOS F	7.9	55.0	1.00	1.16	1.32	16.0
West: Union Road (W)														
10	L2	203	0.6	203	0.6	0.128	6.2	LOS A	1.2	8.4	0.17	0.59	0.17	43.0
11	T1	241	0.5	241	0.5	0.216	10.0	LOS A	4.0	28.3	0.44	0.40	0.44	43.9
12	R2	18	0.0	18	0.0	0.216	14.5	LOS A	4.0	28.3	0.44	0.40	0.44	43.3
Approach		462	0.6	462	0.6	0.216	8.5	LOS A	4.0	28.3	0.32	0.48	0.32	43.6
All Vehicles		1804	0.4	1804	0.4	1.056	61.9	LOS E	33.7	236.1	0.77	0.92	1.04	21.1

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.

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

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

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Worth Street (S)											
P1	Full	1	59.1	LOS E	0.0	0.0	0.95	0.95	219.6	208.6	0.95
East: Union Road (E)											
P2	Full	8	59.2	LOS E	0.0	0.0	0.95	0.95	224.7	215.2	0.96

North: Worth Street (N)											
P3	Full	1	59.1	LOS E	0.0	0.0	0.95	0.95	224.7	215.2	0.96
West: Union Road (W)											
P4	Full	7	59.2	LOS E	0.0	0.0	0.95	0.95	224.7	215.2	0.96
All Pedestrians		18	59.2	LOS E	0.0	0.0	0.95	0.95	224.3	214.7	0.96

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

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

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

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Project: \\mte_nas1\mte storage\Jobs\2022\220249\MTE SIDRA\22 05 11 - AW.sip9

MOVEMENT SUMMARY

Site: 101 [Ex PM - Worth Street / Union Lane - Copy (Site Folder: Existing PM)]

Network: N101 [EX PM - Copy (Network Folder: Existing Peaks - Growth)]

Existing PM
Worth Street / Union Lane
Job No: 220249
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis: Constant Number of Years = 14

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist] m				km/h
South: Worth Street (S)														
1	L2	14	0.0	13	0.0	0.264	4.1	LOS A	0.0	0.0	0.00	0.03	0.00	47.4
2	T1	792	0.3	764	0.3	0.264	0.0	LOS A	2.6	18.5	0.00	0.01	0.00	49.1
Approach		806	0.3	777 ^{N1}	0.3	0.264	0.1	NA	2.6	18.5	0.00	0.01	0.00	49.0
East: Union Lane (E)														
4	L2	57	0.0	57	0.0	0.121	4.6	LOS A	1.2	8.4	0.36	0.53	0.36	36.1
5	T1	1	0.0	1	0.0	0.121	20.3	LOS B	1.2	8.4	0.36	0.53	0.36	37.5
6	R2	109	0.0	109	0.0	1.375	223.2	LOS F	5.1	36.0	1.00	2.71	5.86	6.6
Approach		168	0.0	168	0.0	1.375	146.8	LOS F	5.1	36.0	0.78	1.95	3.93	9.3
North: Worth Street (N)														
8	T1	511	0.3	511	0.3	0.145	0.4	LOS A	5.9	41.4	0.06	0.02	0.06	44.5
9	R2	20	0.0	20	0.0	0.145	8.8	LOS A	3.2	22.1	0.15	0.05	0.15	39.7
Approach		530	0.2	530	0.2	0.145	0.7	NA	5.9	41.4	0.07	0.02	0.07	43.9
West: Union Lane (W)														
10	L2	31	0.0	31	0.0	0.360	9.4	LOS A	0.3	2.2	0.57	0.74	0.69	20.7
12	R2	22	0.0	22	0.0	0.360	34.1	LOS C	0.3	2.2	0.57	0.74	0.69	20.7
Approach		53	0.0	53	0.0	0.360	19.8	LOS B	0.3	2.2	0.57	0.74	0.69	20.7
All Vehicles		1558	0.2	1529 ^{N1}	0.3	1.375	17.1	NA	5.9	41.4	0.13	0.25	0.48	16.3

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

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

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

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

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

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

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

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

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Project: \\mte_nas1\mte storage\Jobs\2022\220249\MTE SIDRA\22 05 11 - AW.sip9

MOVEMENT SUMMARY

 Site: 101 [Ex PM - High Street / Mulgoa Road / Castlereagh Road - For Growth (Site Folder: Existing PM)]

 Network: N101 [EX PM - Copy (Network Folder: Existing Peaks - Growth)]

Existing PM

High Street / Mulgoa Road

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Design Life Analysis: Constant Number of Years = 14

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Mulgoa Road (S)														
1	L2	419	1.2	419	1.2	0.534	40.2	LOS C	13.0	92.2	0.81	0.82	0.81	36.6
2	T1	1232	7.7	1232	7.7	* 1.007	82.0	LOS F	27.1	202.3	0.98	1.08	1.27	19.2
3	R2	221	0.0	221	0.0	0.795	72.3	LOS F	9.5	66.6	1.00	0.89	1.12	18.3
Approach		1873	5.3	1873	5.3	1.007	71.5	LOS F	27.1	202.3	0.95	1.00	1.15	22.6
East: High Street (E)														
4	L2	159	0.0	157	0.0	0.237	32.1	LOS C	4.2	29.1	0.68	0.73	0.68	31.6
5	T1	732	1.2	722	1.2	* 1.165	150.0	LOS F	17.0	120.0	1.00	1.41	1.72	12.0
6	R2	250	0.5	247	0.5	0.668	72.8	LOS F	5.2	36.6	1.00	0.83	1.05	10.4
Approach		1141	0.9	1125 ^N ₁	0.9	1.165	116.7	LOS F	17.0	120.0	0.96	1.19	1.43	13.0
North: Castlereagh Road (N)														
7	L2	210	0.6	210	0.6	0.207	12.9	LOS A	3.0	21.1	0.40	0.67	0.40	23.4
8	T1	1354	3.6	1354	3.6	0.797	44.4	LOS D	20.1	145.3	0.92	0.85	0.97	28.0
9	R2	881	3.9	881	3.9	* 1.202	169.6	LOS F	31.7	229.1	1.00	1.28	1.78	10.8
Approach		2445	3.5	2445	3.5	1.202	86.8	LOS F	31.7	229.1	0.91	0.99	1.21	17.2
West: High Street (W)														
10	L2	705	1.8	705	1.8	0.455	29.7	LOS C	9.4	67.1	0.69	0.78	0.69	33.4
11	T1	392	0.7	392	0.7	0.521	56.2	LOS D	7.4	51.9	0.95	0.79	0.95	21.8
12	R2	339	0.8	339	0.8	* 0.919	88.3	LOS F	8.1	57.2	1.00	0.97	1.34	24.5
Approach		1435	1.2	1435	1.2	0.919	50.8	LOS D	9.4	67.1	0.84	0.83	0.92	27.0
All Vehicles		6894	3.1	6878 ^N ₁	3.1	1.202	80.0	LOS F	31.7	229.1	0.91	0.99	1.17	19.3

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.

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

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

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

* Critical Movement (Signal Timing)

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

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Mulgoa Road (S)											
P11	Stage 1	9	64.2	LOS F	0.0	0.0	0.96	0.96	228.9	214.2	0.94

P12 Stage 2	9	64.2	LOS F	0.0	0.0	0.96	0.96	226.4	210.9	0.93
P1B Slip/ Bypass	11	64.2	LOS F	0.0	0.0	0.96	0.96	221.3	204.3	0.92
East: High Street (E)										
P2 Full	1	64.1	LOS F	0.0	0.0	0.96	0.96	238.6	226.9	0.95
P2B Slip/ Bypass	11	64.2	LOS F	0.0	0.0	0.96	0.96	221.3	204.3	0.92
North: Castlereagh Road (N)										
P31 Stage 1	1	64.1	LOS F	0.0	0.0	0.96	0.96	231.4	217.5	0.94
P32 Stage 2	1	64.1	LOS F	0.0	0.0	0.96	0.96	226.4	210.9	0.93
P3B Slip/ Bypass	3	64.1	LOS F	0.0	0.0	0.96	0.96	221.3	204.3	0.92
West: High Street (W)										
P4 Full	1	64.1	LOS F	0.0	0.0	0.96	0.96	238.4	226.6	0.95
P4B Slip/ Bypass	3	64.1	LOS F	0.0	0.0	0.96	0.96	223.8	207.6	0.93
All Pedestrians	51	64.2	LOS F	0.0	0.0	0.96	0.96	225.1	209.2	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.

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■ ■ Network: N101 [EX PM - Copy (Network Folder: Existing Peaks - Growth)]

Design Life Analysis: Constant Number of Years = 14

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

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Worth Street (S)											
P1	Full	5	54.2	LOS E	0.0	0.0	0.95	0.95	220.2	215.9	0.98
East: High Street (E)											

P2 Full	13	54.2	LOS E	0.0	0.0	0.95	0.95	223.8	220.5	0.99
North: Penrith Plaza										
P3 Full	4	54.2	LOS E	0.0	0.0	0.95	0.95	221.2	217.2	0.98
P3B Slip/ Bypass	18	54.2	LOS E	0.1	0.1	0.95	0.95	211.3	204.3	0.97
West: High Street (W)										
P4 Full	23	54.2	LOS E	0.1	0.1	0.95	0.95	223.8	220.5	0.99
P4B Slip/ Bypass	27	34.5	LOS D	0.1	0.1	0.90	0.90	191.7	204.3	1.07
All Pedestrians	90	48.3	LOS E	0.1	0.1	0.94	0.94	211.5	212.1	1.00

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

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

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

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MOVEMENT SUMMARY

 **Site: 101 [Ex PM - High Street Roundabout - Copy (Site Folder: Existing PM)]**

 **Network: N101 [EX PM - Copy (Network Folder: Existing Peaks - Growth)]**

Existing PM
High Street Roundabout
Job No: 220249
Site Category: (None)
Roundabout
Design Life Analysis: Constant Number of Years = 14

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %	v/c	sec		[Veh. veh	Dist] m				km/h
East: High Street (E)														
5	T1	1055	0.8	1037	0.9	0.761	3.9	LOS A	7.5	52.9	0.26	0.43	0.26	37.0
6	R2	51	0.0	50	0.0	0.761	7.9	LOS A	7.5	52.9	0.27	0.45	0.27	22.9
6u	U	8	0.0	8	0.0	0.761	11.0	LOS A	7.5	52.9	0.27	0.45	0.27	36.6
Approach		1114	0.8	1095 ^N ₁	0.8	0.761	4.1	LOS A	7.5	52.9	0.26	0.43	0.26	34.0
North: Penrith City Council														
7	L2	96	0.0	96	0.0	0.342	2.7	LOS A	1.5	10.6	0.56	0.50	0.56	19.5
9	R2	96	0.0	96	0.0	0.342	2.7	LOS A	1.5	10.6	0.56	0.50	0.56	19.5
9u	U	1	0.0	1	0.0	0.342	13.0	LOS A	1.5	10.6	0.56	0.50	0.56	29.3
Approach		193	0.0	193	0.0	0.342	2.7	LOS A	1.5	10.6	0.56	0.50	0.56	19.6
West: High Street (W)														
10	L2	100	0.0	100	0.0	0.284	4.4	LOS A	0.7	5.2	0.16	0.39	0.16	22.2
11	T1	726	0.4	726	0.4	0.284	3.6	LOS A	0.7	5.2	0.16	0.39	0.16	35.6
12u	U	15	0.0	15	0.0	0.284	10.6	LOS A	0.7	4.8	0.17	0.39	0.17	35.7
Approach		841	0.3	841	0.3	0.284	3.8	LOS A	0.7	5.2	0.16	0.39	0.16	29.1
All Vehicles		2148	0.5	2129 ^N ₁	0.5	0.761	3.9	LOS A	7.5	52.9	0.25	0.42	0.25	28.2

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

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

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

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

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LANE SUMMARY

Site: 101 [Ex PM - Worth Street / Union Road - Copy (Site Folder: Existing PM)]

■ ■ Network: N101 [EX PM - Copy (Network Folder: Existing Peaks - Growth)]

Existing PM

Worth Street / Union Road

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)

Design Life Analysis: Constant Number of Years = 14

Lane Use and Performance																
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.	
	[Total veh/h	HV %	[Total veh/h	HV %	veh/h	v/c	%	sec			[Veh	Dist] m		m	%	%
South: Worth Street (S)																
Lane 1	66	0.0	66	0.0	87	0.756	100	77.7	LOS F	2.8	19.5	Full	500	0.0	0.0	
Approach	66	0.0	66	0.0	0.756			77.7	LOS F	2.8	19.5					
East: Union Road (E)																
Lane 1	160	0.8	160	0.8	1231	0.130	12 ⁵	10.8	LOS A	2.3	16.4	Short (P)	45	0.0	NA	
Lane 2	547	0.2	547	0.2	518 ¹	1.056	100	102.7	LOS F	33.7	236.1	Full	500	0.0	0.0	
Approach	707	0.4	707	0.4	1.056			81.9	LOS F	33.7	236.1					
North: Worth Street (N)																
Lane 1	298	0.4	298	0.4	299	0.997	100	91.1	LOS F	7.8 ^{N4}	55.0 ^{N4}	Full	55	0.0	50.0	
Lane 2	271	0.0	271	0.0	316	0.857	100	64.9	LOS E	7.9 ^{N4}	55.0 ^{N4}	Full	55	0.0	50.0	
Approach	568	0.2	568	0.2	0.997			78.6	LOS F	7.9	55.0					
West: Union Road (W)																
Lane 1	203	0.6	203	0.6	1589	0.128	59 ⁵	6.2	LOS A	1.2	8.4	Short (P)	95	0.0	NA	
Lane 2	259	0.5	259	0.5	1198	0.216	100	10.3	LOS A	4.0	28.3	Full	500	0.0	0.0	
Approach	462	0.6	462	0.6	0.216			8.5	LOS A	4.0	28.3					
Intersection	1804	0.4	1804	0.4	1.056			61.9	LOS E	33.7	236.1					

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

Lane LOS values are based on average delay per lane.

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

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

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

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

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

- 5 Lane under-utilisation found by the program

- N4** Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)										
South: Worth Street (S)										
Mov. From S To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	22	26	19	66	0.0	87	0.756	100	NA	NA
Approach	22	26	19	66	0.0	0.756				
East: Union Road (E)										

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	51	109	-	160	0.8	1231	0.130	12 ⁵	0.0	2
Lane 2	-	-	547	547	0.2	518 ¹	1.056	100	NA	NA
Approach	51	109	547	707	0.4		1.056			
North: Worth Street (N)										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	298	-	-	298	0.4	299	0.997	100	NA	NA
Lane 2	-	28	242	271	0.0	316	0.857	100	NA	NA
Approach	298	28	242	568	0.2		0.997			
West: Union Road (W)										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	203	-	-	203	0.6	1589	0.128	59 ⁵	0.0	2
Lane 2	-	241	18	259	0.5	1198	0.216	100	NA	NA
Approach	203	241	18	462	0.6		0.216			
Total %HV Deg.Satn (v/c)										
Intersection	1804	0.4		1.056						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

⁵ Lane under-utilisation found by the program

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Worth Street (S) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Union Road (E) Merge Type: Zipper												
Exit Short Lane	1	45	50.0	130	130	2.50	2.00	298	1650	0.180	0.0	0.1
Merge Lane	2	-	50.0	149	149	2.50	2.00	260	1627	0.160	0.0	0.1
North Exit: Worth Street (N) Merge Type: Zipper												
Exit Short Lane	1	10	50.0	259	259	2.50	2.00	229	1486	0.154	0.0	0.1
Merge Lane	2	-	50.0	114	115	2.50	2.00	518	1669	0.310	0.0	0.1
West Exit: Union Road (W) Merge Type: Zipper												
Exit Short Lane	1	40	50.0	121	121	2.50	2.00	131	1661	0.079	0.0	0.1
Merge Lane	2	-	50.0	65	66	2.50	2.00	242	1726	0.140	0.0	0.0

LANE SUMMARY

Site: 101 [Ex PM - Worth Street / Union Lane - Copy (Site Folder: Existing PM)]

Network: N101 [EX PM - Copy (Network Folder: Existing Peaks - Growth)]

Existing PM
Worth Street / Union Lane
Job No: 220249
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis: Constant Number of Years = 14

Lane Use and Performance																
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.	
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%	
South: Worth Street (S)																
Lane 1	273	0.3	263	0.3	995	0.264	100	0.2	LOS A	0.0	0.0	Short (P)	16	-48.7 ^{N7}	NA	
Lane 2	533	0.3	514	0.3	1944	0.264	100	0.0	LOS A	2.6 ^{N5}	18.5 ^{N5}		Full	55	0.0	0.0
Approach	806	0.3	777 ^{N1}	0.3		0.264		0.1	NA	2.6	18.5					
East: Union Lane (E)																
Lane 1	59	0.0	59	0.0	486	0.121	100	5.0	LOS A	1.2 ^{N5}	8.4 ^{N5}	Full	500	-49.4 ^{N3}	0.0	
Lane 2	109	0.0	109	0.0	79	1.375	100	223.2	LOS F	5.1	36.0	Full	500	-50.0 ^{N3}	0.0	
Approach	168	0.0	168	0.0		1.375		146.8	LOS F	5.1	36.0					
North: Worth Street (N)																
Lane 1	282	0.3	282	0.3	1945	0.145	100	0.0	LOS A	5.9 ^{N5}	41.4 ^{N5}	Full	62	0.0	12.7	
Lane 2	248	0.2	248	0.2	1707	0.145	100	1.4	LOS A	3.2 ^{N5}	22.1 ^{N5}	Full	62	0.0	0.0	
Approach	530	0.2	530	0.2		0.145		0.7	NA	5.9	41.4					
West: Union Lane (W)																
Lane 1	53	0.0	53	0.0	148	0.360	100	19.8	LOS B	0.3 ^{N5}	2.2 ^{N5}	Full	180	-50.0 ^{N7}	0.0	
Approach	53	0.0	53	0.0		0.360		19.8	LOS B	0.3	2.2					
Intersection	1558	0.2	1529 ^{N1}	0.3		1.375		17.1	NA	5.9	41.4					

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

Lane LOS values are based on average delay per lane.

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

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

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

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

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

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

^{N3} Capacity Adjustment due to downstream lane blockage determined by the program.

^{N5} Continuous Lane results determined by Back of Queue values of downstream lanes (proportional to lane movement flows).

^{N7} The capacity reduction has been determined from the queue blockage probability of a Site further downstream due to intermediate continuous lanes.

Approach Lane Flows (veh/h)										
South: Worth Street (S)										
Mov. From S To Exit:	L2	T1	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	13	250	263	0.3		995	0.264	100	0.0	2
Lane 2	-	514	514	0.3		1944	0.264	100	NA	NA

Approach	13	764	777	0.3			0.264			
East: Union Lane (E)										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From E							Satn	Util.	SL	Lane
To Exit:	S	W	N			Cap.	v/c	%	%	No.
						veh/h				
Lane 1	57	1	-	59	0.0	486	0.121	100	NA	NA
Lane 2	-	-	109	109	0.0	79	1.375	100	NA	NA
Approach	57	1	109	168	0.0		1.375			
North: Worth Street (N)										
Mov.	T1	R2	Total	%HV			Deg.	Lane	Prob.	Ov.
From N							Satn	Util.	SL	Lane
To Exit:	S	W				Cap.	v/c	%	%	No.
						veh/h				
Lane 1	282	-	282	0.3		1945	0.145	100	NA	NA
Lane 2	228	20	248	0.2		1707	0.145	100	NA	NA
Approach	511	20	530	0.2			0.145			
West: Union Lane (W)										
Mov.	L2	R2	Total	%HV			Deg.	Lane	Prob.	Ov.
From W							Satn	Util.	SL	Lane
To Exit:	N	S				Cap.	v/c	%	%	No.
						veh/h				
Lane 1	31	22	53	0.0		148	0.360	100	NA	NA
Approach	31	22	53	0.0			0.360			
Total %HV Deg.Satn (v/c)										
Intersection	1529	0.3		1.375						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Worth Street (S) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
North Exit: Worth Street (N) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
West Exit: Union Lane (W) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									

LANE SUMMARY

 Site: 101 [Ex PM - High Street / Mulgoa Road / Castlereagh Road - For Growth (Site Folder: Existing PM)]

 Network: N101 [EX PM - Copy (Network Folder: Existing Peaks - Growth)]

Existing PM

High Street / Mulgoa Road

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Design Life Analysis: Constant Number of Years = 14

Lane Use and Performance																
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.	
	[Total veh/h	HV %	[Total veh/h	HV %						[Veh	Dist] m					
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%	
South: Mulgoa Road (S)																
Lane 1	419	1.2	419	1.2	785	0.534	100	40.2	LOS C	13.0	92.2	Short	126	0.0	NA	
Lane 2	297	7.7	297	7.7	491	0.604	60 ⁷	47.8	LOS D	10.8	80.8	Full	500	0.0	0.0	
Lane 3	495	7.7	495	7.7	491	1.007	100	92.2	LOS F	27.1	202.3	Full	500	0.0	0.0	
Lane 4	440	7.7	440	7.7	438 ¹	1.007	100	93.7	LOS F	24.3	181.3	Full	500	0.0	0.0	
Lane 5	221	0.0	221	0.0	279	0.795	100	72.3	LOS F	9.5	66.6	Short	95	0.0	NA	
Approach	1873	5.3	1873	5.3		1.007		71.5	LOS F	27.1	202.3					
East: High Street (E)																
Lane 1	159	0.0	157	0.0	661 ¹	0.237	100	32.1	LOS C	4.2	29.1	Short	35	0.0	NA	
Lane 2	1	100.0	1	100.0	270	0.005	0 ⁵	46.2	LOS D	0.0	0.5	Short	15	0.0	NA	
Lane 3	333	1.1	328	1.1	282 ¹	1.165	100	151.1	LOS F	17.0 ^{N4}	120.0 ^{N4}	Full	120	0.0	50.0	
Lane 4	398	1.1	392	1.1	337 ¹	1.165	100	149.5	LOS F	17.0 ^{N4}	120.0 ^{N4}	Full	120	0.0	50.0	
Lane 5	125	0.5	123	0.5	185	0.668	100	72.8	LOS F	5.2	36.6	Short	63	0.0	NA	
Lane 6	125	0.5	123	0.5	185	0.668	100	72.8	LOS F	5.2	36.6	Short	50	0.0	NA	
Approach	1141	0.9	1125 ^{N1}	0.9		1.165		116.7	LOS F	17.0	120.0					
North: Castlereagh Road (N)																
Lane 1	210	0.6	210	0.6	1014	0.207	100	12.9	LOS A	3.0	21.1	Short	50	0.0	NA	
Lane 2	395	3.6	395	3.6	495 ¹	0.797	100	43.6	LOS D	14.3	102.9	Full	115	0.0	39.6	
Lane 3	525	3.6	525	3.6	659	0.797	100	45.4	LOS D	20.1	145.3	Full	115	0.0	72.3	
Lane 4	434	3.6	434	3.6	544 ¹	0.797	100	44.0	LOS D	15.9	114.7	Full	115	0.0	100.0 ⁸	
Lane 5	450	3.9	450	3.9	374 ¹	1.202	100	169.7	LOS F	31.7	229.1	Short	95	0.0	NA	
Lane 6	432	3.9	432	3.9	359 ¹	1.202	100	169.6	LOS F	30.4	220.3	Short	88	0.0	NA	
Approach	2445	3.5	2445	3.5		1.202		86.8	LOS F	31.7	229.1					
West: High Street (W)																
Lane 1	353	1.8	353	1.8	775	0.455	100	29.7	LOS C	9.4	67.1	Short	85	0.0	NA	
Lane 2	352	1.8	352	1.8	772 ¹	0.455	100	29.7	LOS C	9.4	66.8	Short	97	0.0	NA	
Lane 3	1	100.0	1	100.0	270	0.005	1 ⁵	45.9	LOS D	0.0	0.5	Short	16	0.0	NA	
Lane 4	195	0.3	195	0.3	375	0.521	100	56.3	LOS D	7.4	51.9	Full	500	0.0	0.0	
Lane 5	195	0.3	195	0.3	375	0.521	100	56.3	LOS D	7.4	51.9	Full	500	0.0	0.0	
Lane 6	169	0.8	169	0.8	184	0.919	100	88.3	LOS F	8.1	57.2	Short	123	0.0	NA	
Lane 7	169	0.8	169	0.8	184	0.919	100	88.3	LOS F	8.1	57.2	Short	113	0.0	NA	
Approach	1435	1.2	1435	1.2		0.919		50.8	LOS D	9.4	67.1					
Intersection	6894	3.1	6878 ^{N1}	3.1		1.202		80.0	LOS F	31.7	229.1					

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

Lane LOS values are based on average delay per lane.

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

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

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

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

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

5 Lane under-utilisation found by the program

7 Lane under-utilisation specified by the user

8 Probability of Blockage has been set on the basis of a queue that overflows from a short lane.

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

N4 Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)										
South: Mulgoa Road (S)										
Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	419	-	-	419	1.2	785	0.534	100	21.1	2
Lane 2	-	297	-	297	7.7	491	0.604	60 ⁷	NA	NA
Lane 3	-	495	-	495	7.7	491	1.007	100	NA	NA
Lane 4	-	440	-	440	7.7	438 ¹	1.007	100	NA	NA
Lane 5	-	-	221	221	0.0	279	0.795	100	17.2	4
Approach	419	1232	221	1873	5.3		1.007			
East: High Street (E)										
Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	157	-	-	157	0.0	661 ¹	0.237	100	32.9	3
Lane 2	-	1	-	1	100.0	270	0.005	0 ⁵	0.0	1
Lane 3	-	328	-	328	1.1	282 ¹	1.165	100	NA	NA
Lane 4	-	392	-	392	1.1	337 ¹	1.165	100	NA	NA
Lane 5	-	-	123	123	0.5	185	0.668	100	0.1	4
Lane 6	-	-	123	123	0.5	185	0.668	100	21.0	5
Approach	157	722	247	1125	0.9		1.165			
North: Castlereagh Road (N)										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	210	-	-	210	0.6	1014	0.207	100	0.0	2
Lane 2	-	395	-	395	3.6	495 ¹	0.797	100	NA	NA
Lane 3	-	525	-	525	3.6	659	0.797	100	NA	NA
Lane 4	-	434	-	434	3.6	544 ¹	0.797	100	NA	NA
Lane 5	-	-	450	450	3.9	374 ¹	1.202	100	100.0	4
Lane 6	-	-	432	432	3.9	359 ¹	1.202	100	100.0	5
Approach	210	1354	881	2445	3.5		1.202			
West: High Street (W)										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	353	-	-	353	1.8	775	0.455	100	28.1	2
Lane 2	352	-	-	352	1.8	772 ¹	0.455	100	16.0	4
Lane 3	-	1	-	1	100.0	270	0.005	1 ⁵	0.0	2
Lane 4	-	195	-	195	0.3	375	0.521	100	NA	NA
Lane 5	-	195	-	195	0.3	375	0.521	100	NA	NA
Lane 6	-	-	169	169	0.8	184	0.919	100	0.0	5
Lane 7	-	-	169	169	0.8	184	0.919	100	0.0	6
Approach	705	392	339	1435	1.2		0.919			

	Total	%HV	Deg.Satn (v/c)
Intersection	6878	3.1	1.202

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
- 5 Lane under-utilisation found by the program
- 7 Lane under-utilisation specified by the user

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Mulgoa Road (S) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
East Exit: High Street (E) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Castlereagh Road (N) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
West Exit: High Street (W) Merge Type: Zipper												
Exit Short Lane	1	240	50.0	489	494	2.50	2.00	795	1137	0.699	0.6	1.9
Merge Lane	2	-	50.0	397	403	2.50	2.00	978	1282	0.762	0.3	1.4

LANE SUMMARY

Site: 101 [Ex PM - High Street / Worth Street - Copy - For Growth (Site Folder: Existing PM)]

■ ■ Network: N101 [EX PM - Copy (Network Folder: Existing Peaks - Growth)]

Existing PM

High Street / Worth Street

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Design Life Analysis: Constant Number of Years = 14

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h	HV %]	[Total veh/h	HV %]	veh/h	v/c	%	sec		[Veh	Dist]		m	%	%
South: Worth Street (S)															
Lane 1	472	0.5	450	0.6	712	0.631	100	35.7	LOS C	8.8 ^{N4}	62.0 ^{N4}	Full	62	0.0	50.0
Lane 2	432	0.0	411	0.0	651	0.631	100	32.6	LOS C	8.9 ^{N4}	62.0 ^{N4}	Full	62	0.0	50.0
Approach	904	0.3	861 ^{N1}	0.3		0.631		34.2	LOS C	8.9	62.0				
East: High Street (E)															
Lane 1	88	0.3	88	0.3	611	0.144	26 ⁷	30.9	LOS C	2.1	14.6	Full	500	-10.8 ^{N7}	0.0
Lane 2	380	1.6	380	1.6	687 ¹	0.554	100	32.1	LOS C	10.7	76.0	Full	500	0.0	0.0
Lane 3	185	0.0	185	0.0	402	0.461	100	35.4	LOS C	4.8	33.5	Short	70	0.0	NA
Approach	653	1.0	653	1.0		0.554		32.9	LOS C	10.7	76.0				
North: Penrith Plaza															
Lane 1	193	0.0	193	0.0	239 ¹	0.809	100	43.8	LOS D	5.8	40.5	Short	7	0.0	NA
Lane 2	316	0.0	316	0.0	582 ¹	0.543	59 ⁵	17.0	LOS B	6.4	44.8	Full	500	-12.7 ^{N7}	0.0
Lane 3	306	0.0	306	0.0	333	0.921	100	50.1	LOS D	9.0	63.1	Full	500	0.0	0.0
Approach	816	0.0	816	0.0		0.921		35.8	LOS C	9.0	63.1				
West: High Street (W)															
Lane 1	364	0.0	364	0.0	1090	0.333	100	10.2	LOS A	4.3	29.9	Short	60	0.0	NA
Lane 2	187	0.7	186	0.7	307	0.608	100	51.7	LOS D	6.4	44.8	Full	165	0.0	0.0
Lane 3	187	0.7	186	0.7	307	0.608	100	51.7	LOS D	6.4	44.8	Full	165	0.0	0.0
Lane 4	112	0.0	112	0.0	179	0.624	100	58.4	LOS E	4.0	27.8	Short	50	0.0	NA
Approach	848	0.3	848	0.3		0.624		34.8	LOS C	6.4	44.8				
Intersection	3222	0.4	3178 ^{N1}	0.4		0.921		34.5	LOS C	10.7	76.0				

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

Lane LOS values are based on average delay per lane.

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

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

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

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

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
- 5 Lane under-utilisation found by the program
- 7 Lane under-utilisation specified by the user
- N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.
- N4 Average back of queue has been restricted to the available queue storage space.
- N7 The capacity reduction has been determined from the queue blockage probability of a Site further downstream due to intermediate continuous lanes.

Approach Lane Flows (veh/h)

South: Worth Street (S)

Full Length Lane	1	Merge Analysis not applied.
Full Length Lane	2	Merge Analysis not applied.
West Exit: High Street (W) Merge Type: Not Applied		
Full Length Lane	1	Merge Analysis not applied.
Full Length Lane	2	Merge Analysis not applied.



**EXISTING PLUS GROWTH PLUS DEVELOPMENT
VOLUMES
(40 SHEETS)**

LANE SUMMARY

 **Site: 101 [Fut PM - High Street Roundabout (Site Folder: Future PM)]**

 **Network: N101 [FUT PM - Copy (Network Folder: Future Peaks - Growth)]**

Future PM
High Street Roundabout
Job No: 220249
Site Category: (None)
Roundabout
Design Life Analysis: Constant Number of Years = 14

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
East: High Street (E)															
Lane 1 ^d	593	0.8	574	0.8	740	0.775	100	3.9	LOS A	6.1 ^{N5}	42.8 ^{N5}	Full	165	-50.0 ^{N3}	0.0
Lane 2	559	0.7	541	0.7	697	0.775	100	4.5	LOS A	8.3 ^{N5}	58.4 ^{N5}	Full	165	-47.2 ^{N3}	0.0
Approach	1153	0.8	1115 ^{N1}	0.8		0.775		4.1	LOS A	8.3	58.4				
North: Penrith City Council															
Lane 1 ^d	193	0.0	193	0.0	564	0.343	100	2.8	LOS A	1.6 ^{N5}	11.5 ^{N5}	Full	500	-33.2 ^{N3}	0.0
Approach	193	0.0	193	0.0		0.343		2.8	LOS A	1.6	11.5				
West: High Street (W)															
Lane 1 ^d	461	0.3	461	0.3	1609	0.286	100	3.7	LOS A	0.8	5.3	Full	120	0.0	0.0
Lane 2	389	0.3	389	0.3	1360	0.286	100	3.9	LOS A	0.7	4.9	Full	120	-3.6 ^{N3}	0.0
Approach	850	0.3	850	0.3		0.286		3.8	LOS A	0.8	5.3				
Intersection	2196	0.5	2158 ^{N1}	0.5		0.775		3.9	LOS A	8.3	58.4				

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

Lane LOS values are based on average delay per lane.

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

^d Dominant lane on roundabout approach

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

^{N3} Capacity Adjustment due to downstream lane blockage determined by the program.

^{N5} Continuous Lane results determined by Back of Queue values of downstream lanes (proportional to lane movement flows).

Approach Lane Flows (veh/h)											
East: High Street (E)											
Mov. From E To Exit:	T1	R2	U	Total	%HV						
	W	N	E			Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	574	-	-	574	0.8	740	0.775	100	NA	NA	
Lane 2	484	49	8	541	0.7	697	0.775	100	NA	NA	
Approach	1058	49	8	1115	0.8		0.775				
North: Penrith City Council											
Mov. From N To Exit:	L2	R2	U	Total	%HV						
	E	W	N			Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	96	96	1	193	0.0	564	0.343	100	NA	NA	

Approach	96	96	1	193	0.0		0.343				
West: High Street (W)											
Mov.	L2	T1	U	Total	%HV		Deg.	Lane	Prob.	Ov.	
From W							Satn	Util.	SL	SL	Lane
To Exit:	N	E	W				veh/h	v/c	%	%	No.
Lane 1	100	361	-	461	0.3		1609	0.286	100	NA	NA
Lane 2	-	375	15	389	0.3		1360	0.286	100	NA	NA
Approach	100	735	15	850	0.3			0.286			
Total %HV Deg.Satn (v/c)											
Intersection	2158	0.5		0.775							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: High Street (E) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Penrith City Council Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: High Street (W) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										

MOVEMENT SUMMARY

 **Site: 101 [Fut AM - High Street Roundabout (Site Folder: Future AM)]**

 **Network: N101 [FUT AM - Copy (Network Folder: Future Peaks - Growth)]**

Future AM
High Street Roundabout
Job No: 220249
Site Category: (None)
Roundabout
Design Life Analysis: Constant Number of Years = 14

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
East: High Street (E)														
5	T1	468	4.2	468	4.2	0.172	3.4	LOS A	0.4	2.6	0.11	0.39	0.11	38.5
6	R2	43	3.8	43	3.8	0.172	7.4	LOS A	0.4	2.6	0.11	0.43	0.11	23.0
6u	U	6	28.6	6	28.6	0.172	10.8	LOS A	0.4	2.6	0.11	0.43	0.11	37.7
Approach		517	4.5	517	4.5	0.172	3.8	LOS A	0.4	2.6	0.11	0.39	0.11	33.0
North: Penrith City Council														
7	L2	14	0.0	14	0.0	0.045	2.4	LOS A	0.1	0.6	0.51	0.38	0.51	19.9
9	R2	23	0.0	23	0.0	0.045	2.4	LOS A	0.1	0.6	0.51	0.38	0.51	19.9
9u	U	1	0.0	1	0.0	0.045	12.7	LOS A	0.1	0.6	0.51	0.38	0.51	29.7
Approach		39	0.0	39	0.0	0.045	2.7	LOS A	0.1	0.6	0.51	0.38	0.51	20.4
West: High Street (W)														
10	L2	85	0.0	85	0.0	0.289	4.4	LOS A	0.7	5.2	0.13	0.39	0.13	22.2
11	T1	779	3.6	779	3.6	0.289	3.6	LOS A	0.7	5.2	0.14	0.38	0.14	36.1
12u	U	6	0.0	6	0.0	0.289	10.6	LOS A	0.7	5.1	0.14	0.37	0.14	36.2
Approach		870	3.2	870	3.2	0.289	3.7	LOS A	0.7	5.2	0.14	0.38	0.14	30.1
All Vehicles		1425	3.6	1425	3.6	0.289	3.7	LOS A	0.7	5.2	0.14	0.39	0.14	30.1

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

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

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

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MOVEMENT SUMMARY

 Site: 101 [Fut AM - High Street / Worth Street (Site Folder: Future AM)]

 Network: N101 [FUT AM - Copy (Network Folder: Future Peaks - Growth)]

Future AM

High Street / Worth Street

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Design Life Analysis: Constant Number of Years = 14

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Worth Street (S)														
1	L2	250	4.5	250	4.5	0.395	31.1	LOS C	7.0	50.4	0.75	0.76	0.75	7.8
2	T1	153	0.0	153	0.0	0.395	36.2	LOS C	7.0	50.4	0.84	0.74	0.84	26.2
3	R2	59	2.7	59	2.7	* 0.395	42.6	LOS D	5.4	38.2	0.86	0.74	0.86	25.6
Approach		462	2.8	462	2.8	0.395	34.3	LOS C	7.0	50.4	0.80	0.75	0.80	19.7
East: High Street (E)														
4	L2	62	5.2	62	5.2	0.103	32.6	LOS C	1.5	11.1	0.71	0.71	0.71	26.7
5	T1	259	4.3	259	4.3	* 0.395	31.5	LOS C	6.9	50.5	0.80	0.68	0.80	27.2
6	R2	104	0.0	104	0.0	0.298	35.5	LOS C	2.7	19.2	0.77	0.75	0.77	33.6
Approach		425	3.4	425	3.4	0.395	32.6	LOS C	6.9	50.5	0.78	0.70	0.78	29.3
North: Penrith Plaza														
7	L2	23	0.0	23	0.0	0.037	16.2	LOS B	0.3	2.4	0.45	0.61	0.45	41.1
8	T1	24	0.0	24	0.0	0.045	33.9	LOS C	0.6	4.4	0.76	0.56	0.76	26.3
9	R2	20	0.0	20	0.0	0.104	51.4	LOS D	0.6	4.3	0.88	0.70	0.88	21.1
Approach		67	0.0	67	0.0	0.104	33.1	LOS C	0.6	4.4	0.69	0.62	0.69	30.1
West: High Street (W)														
10	L2	203	0.0	203	0.0	0.231	12.7	LOS A	2.7	18.6	0.51	0.67	0.51	39.9
11	T1	454	6.0	454	6.0	0.198	10.1	LOS A	3.4	25.1	0.46	0.39	0.46	41.5
12	R2	164	1.0	164	1.0	* 0.235	16.4	LOS B	2.4	17.2	0.62	0.71	0.62	22.1
Approach		821	3.5	821	3.5	0.235	12.0	LOS A	3.4	25.1	0.50	0.52	0.50	38.9
All Vehicles		1775	3.2	1775	3.2	0.395	23.5	LOS B	7.0	50.5	0.65	0.63	0.65	30.9

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.

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

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

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped	Dist]			sec	m	m/sec
					ped	m					
South: Worth Street (S)											
P1	Full	8	54.2	LOS E	0.0	0.0	0.95	0.95	220.2	215.9	0.98
East: High Street (E)											
P2	Full	11	54.2	LOS E	0.0	0.0	0.95	0.95	223.8	220.5	0.99

North: Penrith Plaza											
P3 Full	1	54.2	LOS E	0.0	0.0	0.95	0.95	221.2	217.2	0.98	
P3B Slip/ Bypass	12	54.2	LOS E	0.0	0.0	0.95	0.95	211.3	204.3	0.97	
West: High Street (W)											
P4 Full	18	54.2	LOS E	0.1	0.1	0.95	0.95	223.8	220.5	0.99	
P4B Slip/ Bypass	19	25.5	LOS C	0.0	0.0	0.90	0.90	182.7	204.3	1.12	
All Pedestrians	69	46.3	LOS E	0.1	0.1	0.94	0.94	209.8	212.6	1.01	

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 [Fut AM - High Street / Mulgoa Road / Castlereagh Road (Site Folder: Future AM)]

 Network: N101 [FUT AM - Copy (Network Folder: Future Peaks - Growth)]

Future AM

High Street / Mulgoa Road

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Design Life Analysis: Constant Number of Years = 14

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Mulgoa Road (S)														
1	L2	195	2.8	195	2.8	0.222	29.0	LOS C	4.7	33.8	0.63	0.73	0.63	40.5
2	T1	929	15.1	929	15.1	* 0.766	50.0	LOS D	14.3	112.8	0.95	0.85	0.98	26.2
3	R2	137	2.0	137	2.0	0.588	69.0	LOS E	5.6	39.5	0.99	0.80	0.99	18.9
Approach		1261	11.7	1261	11.7	0.766	48.9	LOS D	14.3	112.8	0.91	0.82	0.93	27.6
East: High Street (E)														
4	L2	68	5.9	68	5.9	0.139	41.3	LOS C	2.0	14.9	0.75	0.72	0.75	28.0
5	T1	312	3.4	312	3.4	* 0.802	71.6	LOS F	7.2	51.4	1.00	0.91	1.17	21.2
6	R2	111	2.4	111	2.4	0.476	76.1	LOS F	2.4	16.8	1.00	0.75	1.00	10.1
Approach		491	3.6	491	3.6	0.802	68.4	LOS E	7.2	51.4	0.97	0.85	1.07	19.7
North: Castlereagh Road (N)														
7	L2	173	5.4	173	5.4	0.314	23.8	LOS B	3.0	22.2	0.75	0.75	0.75	15.6
8	T1	1167	12.6	1167	12.6	0.601	33.9	LOS C	13.8	106.9	0.82	0.72	0.82	32.0
9	R2	690	5.3	690	5.3	* 0.792	61.1	LOS E	14.0	102.2	0.99	0.89	1.06	23.4
Approach		2030	9.5	2030	9.5	0.792	42.3	LOS C	14.0	106.9	0.87	0.78	0.90	27.7
West: High Street (W)														
10	L2	866	5.1	866	5.1	0.540	28.8	LOS C	11.8	86.5	0.71	0.79	0.71	33.7
11	T1	546	2.2	546	2.2	0.738	60.3	LOS E	11.0	78.4	1.00	0.87	1.04	20.8
12	R2	431	1.9	431	1.9	* 0.790	72.1	LOS F	9.3	65.8	1.00	0.89	1.12	27.4
Approach		1844	3.5	1844	3.5	0.790	48.3	LOS D	11.8	86.5	0.86	0.84	0.90	27.7
All Vehicles		5626	7.5	5626	7.5	0.802	48.0	LOS D	14.3	112.8	0.89	0.82	0.92	26.8

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.

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

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

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Mulgoa Road (S)											
P11	Stage 1	7	64.1	LOS F	0.0	0.0	0.96	0.96	228.9	214.2	0.94
P12	Stage 2	7	64.1	LOS F	0.0	0.0	0.96	0.96	226.4	210.9	0.93

P1B Slip/ Bypass	7	64.1	LOS F	0.0	0.0	0.96	0.96	221.3	204.3	0.92
East: High Street (E)										
P2 Full	4	64.1	LOS F	0.0	0.0	0.96	0.96	238.6	226.9	0.95
P2B Slip/ Bypass	11	64.2	LOS F	0.0	0.0	0.96	0.96	221.3	204.3	0.92
North: Castlereagh Road (N)										
P31 Stage 1	1	64.1	LOS F	0.0	0.0	0.96	0.96	231.4	217.5	0.94
P32 Stage 2	1	64.1	LOS F	0.0	0.0	0.96	0.96	226.4	210.9	0.93
P3B Slip/ Bypass	4	33.7	LOS D	0.0	0.0	0.91	0.91	190.9	204.3	1.07
West: High Street (W)										
P4 Full	1	64.1	LOS F	0.0	0.0	0.96	0.96	238.4	226.6	0.95
P4B Slip/ Bypass	1	64.1	LOS F	0.0	0.0	0.96	0.96	223.8	207.6	0.93
All Pedestrians	44	61.4	LOS F	0.0	0.0	0.95	0.95	223.1	210.2	0.94

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

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

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

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MOVEMENT SUMMARY

Site: 101 [Fut AM - Worth Street / Union Lane (Site Folder: Future AM)]

Network: N101 [FUT AM - Copy (Network Folder: Future Peaks - Growth)]

Future AM
Worth Street / Union Lane
Job No: 220249
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis: Constant Number of Years = 14

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Worth Street (S)														
1	L2	75	0.0	75	0.0	0.127	4.1	LOS A	0.0	0.0	0.00	0.21	0.00	44.1
2	T1	339	3.0	339	3.0	0.127	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	44.7
Approach		415	2.5	415	2.5	0.127	0.7	NA	0.0	0.0	0.00	0.10	0.00	44.4
East: Union Lane (E)														
4	L2	21	0.0	21	0.0	0.031	3.8	LOS A	0.0	0.2	0.19	0.44	0.19	36.7
5	T1	1	0.0	1	0.0	0.031	7.3	LOS A	0.0	0.2	0.19	0.44	0.19	38.0
6	R2	22	34.6	22	34.6	0.076	13.3	LOS A	0.1	0.9	0.64	0.81	0.64	31.2
Approach		45	17.2	45	17.2	0.076	8.6	LOS A	0.1	0.9	0.41	0.62	0.41	33.8
North: Worth Street (N)														
8	T1	202	1.3	202	1.3	0.084	0.4	LOS A	0.1	0.8	0.10	0.07	0.10	41.9
9	R2	31	0.0	31	0.0	0.084	6.1	LOS A	0.1	0.8	0.19	0.14	0.19	38.8
Approach		234	1.1	234	1.1	0.084	1.1	NA	0.1	0.8	0.11	0.08	0.11	40.7
West: Union Lane (W)														
10	L2	85	0.0	85	0.0	0.159	5.8	LOS A	0.2	1.4	0.23	0.57	0.23	36.7
12	R2	21	0.0	21	0.0	0.159	11.8	LOS A	0.2	1.4	0.23	0.57	0.23	36.7
Approach		106	0.0	106	0.0	0.159	7.0	LOS A	0.2	1.4	0.23	0.57	0.23	36.7
All Vehicles		799	2.6	799	2.6	0.159	2.1	NA	0.2	1.4	0.09	0.18	0.09	39.4

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

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

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

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

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

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

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

MOVEMENT SUMMARY

 Site: 101 [Fut AM - Worth Street / Union Road (Site Folder: Future AM)]

 Network: N101 [FUT AM - Copy (Network Folder: Future Peaks - Growth)]

Future AM

Worth Street / Union Road

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)

Design Life Analysis: Constant Number of Years = 14

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Worth Street (S)														
1	L2	16	0.0	16	0.0	0.468	68.1	LOS E	2.9	20.2	0.99	0.77	0.99	25.7
2	T1	25	0.0	25	0.0	* 0.468	68.3	LOS E	2.9	20.2	0.99	0.77	0.99	17.6
3	R2	34	0.0	34	0.0	0.468	68.2	LOS E	2.9	20.2	0.99	0.77	0.99	25.7
Approach		75	0.0	75	0.0	0.468	68.2	LOS E	2.9	20.2	0.99	0.77	0.99	23.5
East: Union Road (E)														
4	L2	23	8.9	23	8.9	0.077	18.3	LOS B	1.4	10.0	0.48	0.47	0.48	41.1
5	T1	58	0.0	58	0.0	0.077	13.6	LOS A	1.4	10.0	0.48	0.47	0.48	41.6
6	R2	203	3.0	203	3.0	* 0.660	38.9	LOS C	6.6	47.2	0.86	0.83	0.87	24.5
Approach		283	2.9	283	2.9	0.660	32.1	LOS C	6.6	47.2	0.75	0.73	0.76	29.9
North: Worth Street (N)														
7	L2	197	1.0	197	1.0	* 0.498	48.8	LOS D	6.8	47.9	0.93	0.77	0.93	20.9
8	T1	9	0.0	9	0.0	0.112	44.0	LOS D	1.4	9.9	0.84	0.64	0.84	22.0
9	R2	36	0.0	36	0.0	0.112	44.0	LOS D	1.4	9.9	0.84	0.64	0.84	22.0
Approach		242	0.8	242	0.8	0.498	47.9	LOS D	6.8	47.9	0.91	0.75	0.91	21.1
West: Union Road (W)														
10	L2	182	1.1	182	1.1	0.144	10.5	LOS A	2.3	16.0	0.33	0.62	0.33	39.3
11	T1	491	1.7	491	1.7	0.471	17.7	LOS B	11.3	80.4	0.64	0.58	0.64	40.2
12	R2	18	0.0	18	0.0	0.471	22.5	LOS B	11.3	80.4	0.64	0.58	0.64	39.6
Approach		692	1.5	692	1.5	0.471	16.0	LOS B	11.3	80.4	0.55	0.59	0.55	40.0
All Vehicles		1292	1.6	1292	1.6	0.660	28.5	LOS C	11.3	80.4	0.69	0.66	0.69	32.5

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

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

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

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

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

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
					[Ped	Dist]					
		ped/h	sec		ped	m					
South: Worth Street (S)											
P1	Full	5	59.2	LOS E	0.0	0.0	0.95	0.95	219.6	208.6	0.95
East: Union Road (E)											
P2	Full	1	59.1	LOS E	0.0	0.0	0.95	0.95	224.7	215.2	0.96

North: Worth Street (N)											
P3	Full	1	59.1	LOS E	0.0	0.0	0.95	0.95	224.7	215.2	0.96
West: Union Road (W)											
P4	Full	4	59.1	LOS E	0.0	0.0	0.95	0.95	224.7	215.2	0.96
All Pedestrians		12	59.1	LOS E	0.0	0.0	0.95	0.95	222.4	212.3	0.95

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

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

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

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LANE SUMMARY

 **Site: 101 [Fut AM - High Street Roundabout (Site Folder: Future AM)]**

 **Network: N101 [FUT AM - Copy (Network Folder: Future Peaks - Growth)]**

Future AM
High Street Roundabout
Job No: 220249
Site Category: (None)
Roundabout
Design Life Analysis: Constant Number of Years = 14

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h	HV] %	[Total veh/h	HV] %						[Veh	Dist] m				
	veh/h		veh/h	%	veh/h	v/c	%	sec					m	%	%
East: High Street (E)															
Lane 1 ^d	274	4.2	274	4.2	1598	0.172	100	3.4	LOS A	0.4	2.6	Full	165	0.0	0.0
Lane 2	242	4.7	242	4.7	1412	0.172	100	4.3	LOS A	0.4	2.6	Full	165	0.0	0.0
Approach	517	4.5	517	4.5		0.172		3.8	LOS A	0.4	2.6				
North: Penrith City Council															
Lane 1 ^d	39	0.0	39	0.0	853	0.045	100	2.7	LOS A	0.1	0.6	Full	500	0.0	0.0
Approach	39	0.0	39	0.0		0.045		2.7	LOS A	0.1	0.6				
West: High Street (W)															
Lane 1 ^d	464	2.9	464	2.9	1606	0.289	100	3.7	LOS A	0.7	5.2	Full	120	0.0	0.0
Lane 2	407	3.6	407	3.6	1408	0.289	100	3.7	LOS A	0.7	5.1	Full	120	0.0	0.0
Approach	870	3.2	870	3.2		0.289		3.7	LOS A	0.7	5.2				
Intersection	1425	3.6	1425	3.6		0.289		3.7	LOS A	0.7	5.2				

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

Lane LOS values are based on average delay per lane.

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

Roundabout Capacity Model: SIDRA Standard.

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

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

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

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
East: High Street (E)											
Mov.	T1	R2	U	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane No.
From E To Exit:	W	N	E			Cap. veh/h	v/c	%	%		
Lane 1	274	-	-	274	4.2	1598	0.172	100	NA	NA	
Lane 2	194	43	6	242	4.7	1412	0.172	100	NA	NA	
Approach	468	43	6	517	4.5		0.172				
North: Penrith City Council											
Mov.	L2	R2	U	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane No.
From N To Exit:	E	W	N			Cap. veh/h	v/c	%	%		
Lane 1	14	23	1	39	0.0	853	0.045	100	NA	NA	
Approach	14	23	1	39	0.0		0.045				
West: High Street (W)											
Mov.	L2	T1	U	Total	%HV		Deg.	Lane	Prob.	Ov.	

From W To Exit:	N	E	W			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	85	378	-	464	2.9	1606	0.289	100	NA	NA
Lane 2	-	401	6	407	3.6	1408	0.289	100	NA	NA
Approach	85	779	6	870	3.2		0.289			
Total %HV Deg.Satn (v/c)										
Intersection	1425	3.6			0.289					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: High Street (E) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
North Exit: Penrith City Council Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: High Street (W) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									

LANE SUMMARY

 Site: 101 [Fut AM - High Street / Worth Street (Site Folder: Future AM)]

 Network: N101 [FUT AM - Copy (Network Folder: Future Peaks - Growth)]

Future AM

High Street / Worth Street

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Design Life Analysis: Constant Number of Years = 14

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]						[Veh]	[Dist m]				
South: Worth Street (S)															
Lane 1	277	4.1	277	4.1	702	0.395	100	30.7	LOS C	7.0	50.4	Full	62	0.0	30.8
Lane 2	185	0.9	185	0.9	469	0.395	100	39.6	LOS C	5.4	38.2	Full	62	0.0	5.6
Approach	462	2.8	462	2.8		0.395		34.3	LOS C	7.0	50.4				
East: High Street (E)															
Lane 1	63	5.2	63	5.2	616	0.103	26 ⁷	32.5	LOS C	1.5	11.1	Full	500	0.0	0.0
Lane 2	258	4.3	258	4.3	654	0.395	100	31.5	LOS C	6.9	50.5	Full	500	0.0	0.0
Lane 3	104	0.0	104	0.0	347	0.298	100	35.5	LOS C	2.7	19.2	Short	70	0.0	NA
Approach	425	3.4	425	3.4		0.395		32.6	LOS C	6.9	50.5				
North: Penrith Plaza															
Lane 1	23	0.0	23	0.0	620	0.037	100 ⁵	16.2	LOS B	0.3	2.4	Short	7	0.0	NA
Lane 2	24	0.0	24	0.0	536	0.045	43 ⁵	33.9	LOS C	0.6	4.4	Full	500	0.0	0.0
Lane 3	20	0.0	20	0.0	191	0.104	100	51.4	LOS D	0.6	4.3	Full	500	0.0	0.0
Approach	67	0.0	67	0.0		0.104		33.1	LOS C	0.6	4.4				
West: High Street (W)															
Lane 1	203	0.0	203	0.0	877	0.231	100	12.7	LOS A	2.7	18.6	Short	60	0.0	NA
Lane 2	227	6.0	227	6.0	1150	0.198	100	10.1	LOS A	3.4	25.1	Full	165	0.0	0.0
Lane 3	227	6.0	227	6.0	1150	0.198	100	10.1	LOS A	3.4	25.1	Full	165	0.0	0.0
Lane 4	164	1.0	164	1.0	698	0.235	100	16.4	LOS B	2.4	17.2	Short	50	0.0	NA
Approach	821	3.5	821	3.5		0.235		12.0	LOS A	3.4	25.1				
Intersection	1775	3.2	1775	3.2		0.395		23.5	LOS B	7.0	50.5				

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

Lane LOS values are based on average delay per lane.

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

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

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

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

⁵ Lane under-utilisation found by the program

⁷ Lane under-utilisation specified by the user

Approach Lane Flows (veh/h)											
South: Worth Street (S)											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From S To Exit:	W	N	E			Cap. veh/h	v/c	%	%	No.	
Lane 1	250	27	-	277	4.1	702	0.395	100	NA	NA	
Lane 2	-	126	59	185	0.9	469	0.395	100	NA	NA	

Approach	250	153	59	462	2.8	0.395				
East: High Street (E)										
Mov. From E To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	S	W	N							
Lane 1	62	1	-	63	5.2	616	0.103	26 ⁷	NA	NA
Lane 2	-	258	-	258	4.3	654	0.395	100	NA	NA
Lane 3	-	-	104	104	0.0	347	0.298	100	0.0	2
Approach	62	259	104	425	3.4	0.395				
North: Penrith Plaza										
Mov. From N To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	E	S	W							
Lane 1	23	-	-	23	0.0	620	0.037	100	0.0	2
Lane 2	-	24	-	24	0.0	536	0.045	43 ⁵	NA	NA
Lane 3	-	-	20	20	0.0	191	0.104	100	NA	NA
Approach	23	24	20	67	0.0	0.104				
West: High Street (W)										
Mov. From W To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	N	E	S							
Lane 1	203	-	-	203	0.0	877	0.231	100	0.0	2
Lane 2	-	227	-	227	6.0	1150	0.198	100	NA	NA
Lane 3	-	227	-	227	6.0	1150	0.198	100	NA	NA
Lane 4	-	-	164	164	1.0	698	0.235	100	0.0	3
Approach	203	454	164	821	3.5	0.235				
Total %HV Deg.Satn (v/c)										
Intersection	1775	3.2	0.395							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

5 Lane under-utilisation found by the program

7 Lane under-utilisation specified by the user

Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Worth Street (S) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
East Exit: High Street (E) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
North Exit: Penrith Plaza Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
West Exit: High Street (W) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									

LANE SUMMARY

 Site: 101 [Fut AM - High Street / Mulgoa Road / Castlereagh Road (Site Folder: Future AM)]

 Network: N101 [FUT AM - Copy (Network Folder: Future Peaks - Growth)]

Future AM

High Street / Mulgoa Road

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Design Life Analysis: Constant Number of Years = 14

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h	HV %	[Total veh/h	HV %	veh/h	v/c	%	sec		[Veh	Dist] m		m	%	%
South: Mulgoa Road (S)															
Lane 1	195	2.8	195	2.8	876	0.222	100	29.0	LOS C	4.7	33.8	Short	126	0.0	NA
Lane 2	217	15.1	217	15.1	472	0.460	60 ⁷	45.0	LOS D	7.5	59.4	Full	500	0.0	0.0
Lane 3	362	15.1	362	15.1	472	0.766	100	51.7	LOS D	14.3	112.8	Full	500	0.0	0.0
Lane 4	351	15.1	351	15.1	458 ¹	0.766	100	51.4	LOS D	13.7	108.7	Full	500	0.0	0.0
Lane 5	137	2.0	137	2.0	234	0.588	100	69.0	LOS E	5.6	39.5	Short	95	0.0	NA
Approach	1261	11.7	1261	11.7		0.766		48.9	LOS D	14.3	112.8				
East: High Street (E)															
Lane 1	68	5.9	68	5.9	489	0.139	100	41.3	LOS C	2.0	14.9	Short	35	0.0	NA
Lane 2	1	100.0	1	100.0	169	0.008	1 ⁵	55.9	LOS D	0.0	0.6	Short	15	0.0	NA
Lane 3	148	3.0	148	3.0	184 ¹	0.802	100	71.5	LOS F	6.5	46.4	Full	120	0.0	0.0
Lane 4	163	3.0	163	3.0	203	0.802	100	71.9	LOS F	7.2	51.4	Full	120	0.0	0.0
Lane 5	55	2.4	55	2.4	116	0.476	100	76.1	LOS F	2.4	16.8	Short	63	0.0	NA
Lane 6	55	2.4	55	2.4	116	0.476	100	76.1	LOS F	2.4	16.8	Short	50	0.0	NA
Approach	491	3.6	491	3.6		0.802		68.4	LOS E	7.2	51.4				
North: Castlereagh Road (N)															
Lane 1	173	5.4	173	5.4	553	0.314	100	23.8	LOS B	3.0	22.2	Short	50	0.0	NA
Lane 2	336	12.6	336	12.6	560 ¹	0.601	100	32.5	LOS C	10.3	79.5	Full	115	0.0	15.9
Lane 3	424	12.6	424	12.6	705	0.601	100	34.7	LOS C	13.8	106.9	Full	115	0.0	43.1
Lane 4	407	12.6	407	12.6	678 ¹	0.601	100	34.3	LOS C	13.1	101.5	Full	115	0.0	39.0 ⁸
Lane 5	345	5.3	345	5.3	435 ¹	0.792	100	61.1	LOS E	14.0	102.2	Short	95	0.0	NA
Lane 6	345	5.3	345	5.3	435 ¹	0.792	100	61.0	LOS E	14.0	102.2	Short	88	0.0	NA
Approach	2030	9.5	2030	9.5		0.792		42.3	LOS C	14.0	106.9				
West: High Street (W)															
Lane 1	434	5.1	434	5.1	804	0.540	100	28.8	LOS C	11.8	86.5	Short	85	0.0	NA
Lane 2	433	5.1	433	5.1	801 ¹	0.540	100	28.8	LOS C	11.8	86.1	Short	97	0.0	NA
Lane 3	1	100.0	1	100.0	270	0.005	1 ⁵	45.9	LOS D	0.0	0.5	Short	16	0.0	NA
Lane 4	272	2.0	272	2.0	369	0.738	100	60.4	LOS E	11.0	78.4	Full	500	0.0	0.0
Lane 5	272	2.0	272	2.0	369	0.738	100	60.4	LOS E	11.0	78.4	Full	500	0.0	0.0
Lane 6	216	1.9	216	1.9	273	0.790	100	72.1	LOS F	9.3	65.8	Short	123	0.0	NA
Lane 7	216	1.9	216	1.9	273	0.790	100	72.1	LOS F	9.3	65.8	Short	113	0.0	NA
Approach	1844	3.5	1844	3.5		0.790		48.3	LOS D	11.8	86.5				
Intersection	5626	7.5	5626	7.5		0.802		48.0	LOS D	14.3	112.8				

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

Lane LOS values are based on average delay per lane.

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

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

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

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

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
- 5 Lane under-utilisation found by the program
- 7 Lane under-utilisation specified by the user
- 8 Probability of Blockage has been set on the basis of a queue that overflows from a short lane.

Approach Lane Flows (veh/h)										
South: Mulgoa Road (S)										
Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	195	-	-	195	2.8	876	0.222	100	0.0	2
Lane 2	-	217	-	217	15.1	472	0.460	60 ⁷	NA	NA
Lane 3	-	362	-	362	15.1	472	0.766	100	NA	NA
Lane 4	-	351	-	351	15.1	458 ¹	0.766	100	NA	NA
Lane 5	-	-	137	137	2.0	234	0.588	100	0.0	4
Approach	195	929	137	1261	11.7		0.766			
East: High Street (E)										
Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	68	-	-	68	5.9	489	0.139	100	0.0	3
Lane 2	-	1	-	1	100.0	169	0.008	1 ⁵	0.0	1
Lane 3	-	148	-	148	3.0	184 ¹	0.802	100	NA	NA
Lane 4	-	163	-	163	3.0	203	0.802	100	NA	NA
Lane 5	-	-	55	55	2.4	116	0.476	100	0.0	4
Lane 6	-	-	55	55	2.4	116	0.476	100	0.0	5
Approach	68	312	111	491	3.6		0.802			
North: Castlereagh Road (N)										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	173	-	-	173	5.4	553	0.314	100	0.0	2
Lane 2	-	336	-	336	12.6	560 ¹	0.601	100	NA	NA
Lane 3	-	424	-	424	12.6	705	0.601	100	NA	NA
Lane 4	-	407	-	407	12.6	678 ¹	0.601	100	NA	NA
Lane 5	-	-	345	345	5.3	435 ¹	0.792	100	56.9	4
Lane 6	-	-	345	345	5.3	435 ¹	0.792	100	64.2	5
Approach	173	1167	690	2030	9.5		0.792			
West: High Street (W)										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	434	-	-	434	5.1	804	0.540	100	51.6	2
Lane 2	433	-	-	433	5.1	801 ¹	0.540	100	39.3	4
Lane 3	-	1	-	1	100.0	270	0.005	1 ⁵	0.0	2
Lane 4	-	272	-	272	2.0	369	0.738	100	NA	NA
Lane 5	-	272	-	272	2.0	369	0.738	100	NA	NA
Lane 6	-	-	216	216	1.9	273	0.790	100	0.0	5
Lane 7	-	-	216	216	1.9	273	0.790	100	0.5	6
Approach	866	546	431	1844	3.5		0.790			
Total %HV Deg.Satn (v/c)										
Intersection	5626	7.5		0.802						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
- 5 Lane under-utilisation found by the program
- 7 Lane under-utilisation specified by the user

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow veh/h	Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Mulgoa Road (S) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
East Exit: High Street (E) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Castlereagh Road (N) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
West Exit: High Street (W) Merge Type: Zipper												
Exit Short Lane	1	240	50.0	328	335	2.50	2.00	541	1382	0.391	0.2	0.3
Merge Lane	2	-	50.0	270	277	2.50	2.00	655	1463	0.448	0.0	0.2

LANE SUMMARY

Site: 101 [Fut AM - Worth Street / Union Lane (Site Folder: Future AM)]

Network: N101 [FUT AM - Copy (Network Folder: Future Peaks - Growth)]

Future AM
Worth Street / Union Lane
Job No: 220249
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis: Constant Number of Years = 14

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
South: Worth Street (S)															
Lane 1	188	1.8	188	1.8	1482	0.127	100	1.6	LOS A	0.0	0.0	Short (P) Full	16	-21.1 ^{N3}	NA
Lane 2	227	3.0	227	3.0	1787	0.127	100	0.0	LOS A	0.0	0.0		55	-5.6 ^{N3}	0.0
Approach	415	2.5	415	2.5		0.127		0.7	NA	0.0	0.0				
East: Union Lane (E)															
Lane 1	22	0.0	22	0.0	736	0.031	100	4.0	LOS A	0.0	0.2	Full	500	-35.7 ^{N3}	0.0
Lane 2	22	34.6	22	34.6	293	0.076	100	13.3	LOS A	0.1	0.9	Full	500	-5.6 ^{N3}	0.0
Approach	45	17.2	45	17.2		0.076		8.6	LOS A	0.1	0.9				
North: Worth Street (N)															
Lane 1	101	1.3	101	1.3	1211	0.084	100	0.0	LOS A	0.0	0.0	Full	62	-37.1 ^{N3}	0.0
Lane 2	132	1.0	132	1.0	1585	0.084	100	2.0	LOS A	0.1	0.8	Full	62	0.0	0.0
Approach	234	1.1	234	1.1		0.084		1.1	NA	0.1	0.8				
West: Union Lane (W)															
Lane 1	106	0.0	106	0.0	665	0.159	100	7.0	LOS A	0.2	1.4	Full	180	-26.3 ^{N3}	0.0
Approach	106	0.0	106	0.0		0.159		7.0	LOS A	0.2	1.4				
Intersection	799	2.6	799	2.6		0.159		2.1	NA	0.2	1.4				

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

Lane LOS values are based on average delay per lane.

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

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

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

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

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

^{N3} Capacity Adjustment due to downstream lane blockage determined by the program.

Approach Lane Flows (veh/h)										
South: Worth Street (S)										
Mov.	L2	T1	Total	%HV						
From S										
To Exit:	W	N			Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.	
Lane 1	75	113	188	1.8	1482	0.127	100	0.0	2	
Lane 2	-	227	227	3.0	1787	0.127	100	NA	NA	
Approach	75	339	415	2.5		0.127				
East: Union Lane (E)										
Mov.	L2	T1	R2	Total	%HV					
						Deg.	Lane	Prob.	Ov.	

From E To Exit:	S	W	N			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	21	1	-	22	0.0	736	0.031	100	NA	NA
Lane 2	-	-	22	22	34.6	293	0.076	100	NA	NA
Approach	21	1	22	45	17.2		0.076			
North: Worth Street (N)										
Mov.	T1	R2	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From N To Exit:	S	W								
Lane 1	101	-	101	1.3		1211	0.084	100	NA	NA
Lane 2	101	31	132	1.0		1585	0.084	100	NA	NA
Approach	202	31	234	1.1			0.084			
West: Union Lane (W)										
Mov.	L2	R2	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From W To Exit:	N	S								
Lane 1	85	21	106	0.0		665	0.159	100	NA	NA
Approach	85	21	106	0.0			0.159			
Total %HV Deg. Satn (v/c)										
Intersection	799	2.6		0.159						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Worth Street (S)												
Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Worth Street (N)												
Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Union Lane (W)												
Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

 Site: 101 [Fut AM - Worth Street / Union Road (Site Folder: Future AM)]

 Network: N101 [FUT AM - Copy (Network Folder: Future Peaks - Growth)]

Future AM

Worth Street / Union Road

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)

Design Life Analysis: Constant Number of Years = 14

Lane Use and Performance																
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.	
	[Total veh/h	HV %	[Total veh/h	HV %	veh/h	v/c	%	sec		[Veh	Dist] m		m	%	%	
South: Worth Street (S)																
Lane 1	75	0.0	75	0.0	160	0.468	100	68.2	LOS E	2.9	20.2	Full	500	0.0	0.0	
Approach	75	0.0	75	0.0		0.468		68.2	LOS E	2.9	20.2					
East: Union Road (E)																
Lane 1	81	2.5	81	2.5	1050	0.077	12 ⁵	15.0	LOS B	1.4	10.0	Short (P)	45	0.0	NA	
Lane 2	203	3.0	203	3.0	307	0.660	100	38.9	LOS C	6.6	47.2		Full	500	0.0	0.0
Approach	283	2.9	283	2.9		0.660		32.1	LOS C	6.6	47.2					
North: Worth Street (N)																
Lane 1	197	1.0	197	1.0	396	0.498	100	48.8	LOS D	6.8	47.9	Full	55	0.0	37.1	
Lane 2	45	0.0	45	0.0	404	0.112	100	44.0	LOS D	1.4	9.9	Full	55	0.0	0.0	
Approach	242	0.8	242	0.8		0.498		47.9	LOS D	6.8	47.9					
West: Union Road (W)																
Lane 1	193	1.2	193	1.2	1343	0.144	31 ⁶	10.2	LOS A	2.3	16.0	Short (P)	95	0.0	NA	
Lane 2	498	1.6	498	1.6	1057	0.471	100	18.2	LOS B	11.3	80.4		Full	500	0.0	0.0
Approach	692	1.5	692	1.5		0.471		16.0	LOS B	11.3	80.4					
Intersection	1292	1.6	1292	1.6		0.660		28.5	LOS C	11.3	80.4					

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

Lane LOS values are based on average delay per lane.

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

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

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

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

⁵ Lane under-utilisation found by the program

⁶ Lane under-utilisation due to downstream effects

Approach Lane Flows (veh/h)											
South: Worth Street (S)											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From S To Exit:	W	N	E			Cap. veh/h	v/c	%	%	No.	
Lane 1	16	25	34	75	0.0	160	0.468	100	NA	NA	
Approach	16	25	34	75	0.0		0.468				
East: Union Road (E)											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From E						Cap.	v/c	%	%	No.	

To Exit:	S	W	N			veh/h	v/c	%	%	No.
Lane 1	23	58	-	81	2.5	1050	0.077	12 ⁵	0.0	2
Lane 2	-	-	203	203	3.0	307	0.660	100	NA	NA
Approach	23	58	203	283	2.9		0.660			
North: Worth Street (N)										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From N						Cap.	Satn	Util.	SL Ov.	Lane
To Exit:	E	S	W			veh/h	v/c	%	%	No.
Lane 1	197	-	-	197	1.0	396	0.498	100	NA	NA
Lane 2	-	9	36	45	0.0	404	0.112	100	NA	NA
Approach	197	9	36	242	0.8		0.498			
West: Union Road (W)										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From W						Cap.	Satn	Util.	SL Ov.	Lane
To Exit:	N	E	S			veh/h	v/c	%	%	No.
Lane 1	182	11	-	193	1.2	1343	0.144	31 ⁶	0.0	2
Lane 2	-	480	18	498	1.6	1057	0.471	100	NA	NA
Approach	182	491	18	692	1.5		0.471			
Total %HV Deg.Satn (v/c)										
Intersection	1292	1.6					0.660			

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

⁵ Lane under-utilisation found by the program

⁶ Lane under-utilisation due to downstream effects

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Worth Street (S) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Union Road (E) Merge Type: Zipper												
Exit Short Lane	1	45	50.0	257	259	2.50	2.00	208	1487	0.140	0.0	0.1
Merge Lane	2	-	50.0	104	105	2.50	2.00	514	1681	0.306	0.0	0.1
North Exit: Worth Street (N) Merge Type: Zipper												
Exit Short Lane	1	10	50.0	101	103	2.50	2.00	207	1683	0.123	0.0	0.0
Merge Lane	2	-	50.0	104	104	2.50	2.00	203	1681	0.121	0.0	0.0
West Exit: Union Road (W) Merge Type: Zipper												
Exit Short Lane	1	40	50.0	18	18	2.50	2.00	73	1780	0.041	0.0	0.0
Merge Lane	2	-	50.0	37	37	2.50	2.00	36	1759	0.021	0.0	0.0

MOVEMENT SUMMARY

 Site: 101 [Fut PM - Worth Street / Union Road (Site Folder: Future PM)]

 Network: N101 [FUT PM - Copy (Network Folder: Future Peaks - Growth)]

Future PM

Worth Street / Union Road

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)

Design Life Analysis: Constant Number of Years = 14

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Worth Street (S)														
1	L2	22	0.0	22	0.0	0.756	77.7	LOS F	2.8	19.5	1.00	0.85	1.22	24.1
2	T1	26	0.0	26	0.0	* 0.756	77.9	LOS F	2.8	19.5	1.00	0.85	1.22	16.2
3	R2	19	0.0	19	0.0	0.756	77.7	LOS F	2.8	19.5	1.00	0.85	1.22	24.1
Approach		66	0.0	66	0.0	0.756	77.7	LOS F	2.8	19.5	1.00	0.85	1.22	21.5
East: Union Road (E)														
4	L2	51	0.0	51	0.0	0.130	13.8	LOS A	2.3	16.4	0.41	0.45	0.41	43.2
5	T1	109	1.2	109	1.2	0.130	9.3	LOS A	2.3	16.4	0.41	0.45	0.41	43.6
6	R2	556	0.2	556	0.2	* 1.130	131.7	LOS F	37.8	265.0	1.00	1.25	1.69	10.8
Approach		716	0.4	716	0.4	1.130	104.6	LOS F	37.8	265.0	0.87	1.07	1.40	14.8
North: Worth Street (N)														
7	L2	307	0.4	307	0.4	* 1.027	98.7	LOS F	7.8	55.0	1.00	1.35	1.50	13.7
8	T1	28	0.0	28	0.0	0.864	65.5	LOS E	7.9	55.0	1.00	1.04	1.20	17.9
9	R2	244	0.0	244	0.0	0.864	65.6	LOS E	7.9	55.0	1.00	1.04	1.20	17.9
Approach		579	0.2	579	0.2	1.027	83.1	LOS F	7.9	55.0	1.00	1.20	1.36	15.4
West: Union Road (W)														
10	L2	263	0.5	263	0.5	0.165	6.3	LOS A	1.6	11.3	0.17	0.59	0.17	42.9
11	T1	241	0.5	241	0.5	0.216	10.0	LOS A	4.0	28.3	0.44	0.40	0.44	43.9
12	R2	18	0.0	18	0.0	0.216	14.5	LOS A	4.0	28.3	0.44	0.40	0.44	43.3
Approach		522	0.5	522	0.5	0.216	8.3	LOS A	4.0	28.3	0.30	0.50	0.30	43.5
All Vehicles		1884	0.3	1883	0.3	1.130	70.4	LOS E	37.8	265.0	0.76	0.94	1.08	19.4

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.

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

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

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Worth Street (S)											
P1	Full	1	59.1	LOS E	0.0	0.0	0.95	0.95	219.6	208.6	0.95
East: Union Road (E)											
P2	Full	8	59.2	LOS E	0.0	0.0	0.95	0.95	224.7	215.2	0.96

North: Worth Street (N)											
P3	Full	1	59.1	LOS E	0.0	0.0	0.95	0.95	224.7	215.2	0.96
West: Union Road (W)											
P4	Full	7	59.2	LOS E	0.0	0.0	0.95	0.95	224.7	215.2	0.96
All Pedestrians		18	59.2	LOS E	0.0	0.0	0.95	0.95	224.3	214.7	0.96

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

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

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

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MOVEMENT SUMMARY

Site: 101 [Fut PM - Worth Street / Union Lane (Site Folder: Future PM)]

Network: N101 [FUT PM - Copy (Network Folder: Future Peaks - Growth)]

Future PM
Worth Street / Union Lane
Job No: 220249
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis: Constant Number of Years = 14

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist] m				km/h
South: Worth Street (S)														
1	L2	83	0.0	81	0.0	0.265	4.1	LOS A	0.0	0.0	0.00	0.15	0.00	45.2
2	T1	792	0.3	730	0.3	0.265	0.0	LOS A	2.6	18.2	0.00	0.04	0.00	46.6
Approach		875	0.3	811 ^{N1}	0.3	0.265	0.4	NA	2.6	18.2	0.00	0.05	0.00	46.2
East: Union Lane (E)														
4	L2	57	0.0	57	0.0	0.125	4.7	LOS A	1.3	9.1	0.38	0.54	0.38	36.0
5	T1	1	0.0	1	0.0	0.125	22.0	LOS B	1.3	9.1	0.38	0.54	0.38	37.4
6	R2	109	0.0	109	0.0	1.493	273.7	LOS F	5.9	41.4	1.00	2.86	6.34	5.6
Approach		168	0.0	168	0.0	1.493	179.7	LOS F	5.9	41.4	0.78	2.05	4.26	8.0
North: Worth Street (N)														
8	T1	511	0.3	511	0.3	0.158	0.7	LOS A	6.9	48.7	0.11	0.04	0.11	41.1
9	R2	37	0.0	37	0.0	0.158	9.2	LOS A	3.1	21.8	0.28	0.10	0.28	37.5
Approach		547	0.2	547	0.2	0.158	1.2	NA	6.9	48.7	0.12	0.04	0.12	40.4
West: Union Lane (W)														
10	L2	75	0.0	75	0.0	0.606	18.4	LOS B	0.8	5.5	0.51	0.83	0.92	17.7
12	R2	33	0.0	33	0.0	0.606	46.1	LOS D	0.8	5.5	0.51	0.83	0.92	17.7
Approach		108	0.0	108	0.0	0.606	27.0	LOS B	0.8	5.5	0.51	0.83	0.92	17.7
All Vehicles		1699	0.2	1635 ^{N1}	0.2	1.493	20.9	NA	6.9	48.7	0.16	0.31	0.54	15.1

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

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

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

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

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

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

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

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

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MOVEMENT SUMMARY

 Site: 101 [Fut PM - High Street / Mulgoa Road / Castlereagh Road - For Growth (Site Folder: Future PM)]

 Network: N101 [FUT PM - Copy (Network Folder: Future Peaks - Growth)]

Future PM

High Street / Mulgoa Road

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Design Life Analysis: Constant Number of Years = 14

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Mulgoa Road (S)														
1	L2	419	1.2	419	1.2	0.534	40.3	LOS C	13.0	92.2	0.81	0.82	0.81	36.6
2	T1	1232	7.7	1232	7.7	* 1.007	82.0	LOS F	27.1	202.3	0.98	1.08	1.27	19.2
3	R2	221	0.0	221	0.0	0.795	72.3	LOS F	9.5	66.6	1.00	0.89	1.12	18.3
Approach		1873	5.3	1873	5.3	1.007	71.5	LOS F	27.1	202.3	0.95	1.00	1.15	22.6
East: High Street (E)														
4	L2	159	0.0	154	0.0	0.233	32.1	LOS C	4.1	28.6	0.68	0.73	0.68	31.6
5	T1	757	1.2	735	1.2	* 1.183	156.9	LOS F	17.0	120.0	1.00	1.43	1.76	11.5
6	R2	264	0.5	257	0.5	0.695	73.4	LOS F	5.5	38.3	1.00	0.84	1.07	10.4
Approach		1180	0.9	1146 ^N ₁	0.9	1.183	121.4	LOS F	17.0	120.0	0.96	1.21	1.46	12.6
North: Castlereagh Road (N)														
7	L2	213	0.6	213	0.6	0.210	13.0	LOS A	3.0	21.5	0.41	0.67	0.41	23.4
8	T1	1354	3.6	1354	3.6	0.798	44.5	LOS D	20.2	145.7	0.92	0.85	0.97	28.0
9	R2	881	3.9	881	3.9	* 1.202	169.6	LOS F	31.7	229.1	1.00	1.28	1.78	10.8
Approach		2448	3.5	2448	3.5	1.202	86.8	LOS F	31.7	229.1	0.91	0.99	1.21	17.2
West: High Street (W)														
10	L2	705	1.8	705	1.8	0.455	29.7	LOS C	9.4	67.1	0.69	0.78	0.69	33.4
11	T1	397	0.6	397	0.6	0.528	56.3	LOS D	7.5	52.6	0.95	0.80	0.95	21.7
12	R2	339	0.8	339	0.8	* 0.919	88.3	LOS F	8.1	57.2	1.00	0.97	1.34	24.5
Approach		1440	1.2	1440	1.2	0.919	50.8	LOS D	9.4	67.1	0.84	0.83	0.92	27.0
All Vehicles		6941	3.1	6907 ^N ₁	3.1	1.202	80.9	LOS F	31.7	229.1	0.91	0.99	1.17	19.1

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.

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

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

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

* Critical Movement (Signal Timing)

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

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Mulgoa Road (S)											
P11	Stage 1	9	64.2	LOS F	0.0	0.0	0.96	0.96	228.9	214.2	0.94

P12 Stage 2	9	64.2	LOS F	0.0	0.0	0.96	0.96	226.4	210.9	0.93
P1B Slip/ Bypass	11	64.2	LOS F	0.0	0.0	0.96	0.96	221.3	204.3	0.92
East: High Street (E)										
P2 Full	1	64.1	LOS F	0.0	0.0	0.96	0.96	238.6	226.9	0.95
P2B Slip/ Bypass	11	64.2	LOS F	0.0	0.0	0.96	0.96	221.3	204.3	0.92
North: Castlereagh Road (N)										
P31 Stage 1	1	64.1	LOS F	0.0	0.0	0.96	0.96	231.4	217.5	0.94
P32 Stage 2	1	64.1	LOS F	0.0	0.0	0.96	0.96	226.4	210.9	0.93
P3B Slip/ Bypass	3	64.1	LOS F	0.0	0.0	0.96	0.96	221.3	204.3	0.92
West: High Street (W)										
P4 Full	1	64.1	LOS F	0.0	0.0	0.96	0.96	238.4	226.6	0.95
P4B Slip/ Bypass	3	64.1	LOS F	0.0	0.0	0.96	0.96	223.8	207.6	0.93
All Pedestrians	51	64.2	LOS F	0.0	0.0	0.96	0.96	225.1	209.2	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.

■ ■ Network: N101 [FUT PM - Copy (Network Folder: Future Peaks - Growth)]

Design Life Analysis: Constant Number of Years = 14

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

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Worth Street (S)											
P1	Full	5	54.2	LOS E	0.0	0.0	0.95	0.95	220.2	215.9	0.98
East: High Street (E)											

P2 Full	13	54.2	LOS E	0.0	0.0	0.95	0.95	223.8	220.5	0.99
North: Penrith Plaza										
P3 Full	4	54.2	LOS E	0.0	0.0	0.95	0.95	221.2	217.2	0.98
P3B Slip/ Bypass	18	54.2	LOS E	0.1	0.1	0.95	0.95	211.3	204.3	0.97
West: High Street (W)										
P4 Full	23	54.2	LOS E	0.1	0.1	0.95	0.95	223.8	220.5	0.99
P4B Slip/ Bypass	27	34.0	LOS D	0.1	0.1	0.90	0.90	191.1	204.3	1.07
All Pedestrians	90	48.2	LOS E	0.1	0.1	0.94	0.94	211.3	212.1	1.00

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

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

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

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MOVEMENT SUMMARY

 Site: 101 [Fut PM - High Street Roundabout (Site Folder: Future PM)]

 Network: N101 [FUT PM - Copy (Network Folder: Future Peaks - Growth)]

Future PM
High Street Roundabout
Job No: 220249
Site Category: (None)
Roundabout
Design Life Analysis: Constant Number of Years = 14

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %	v/c	sec		[Veh. veh	Dist] m				km/h
East: High Street (E)														
5	T1	1094	0.8	1058	0.8	0.775	3.9	LOS A	8.3	58.4	0.26	0.43	0.26	37.0
6	R2	51	0.0	49	0.0	0.775	7.9	LOS A	8.3	58.4	0.27	0.45	0.27	22.9
6u	U	8	0.0	8	0.0	0.775	11.0	LOS A	8.3	58.4	0.27	0.45	0.27	36.6
Approach		1153	0.8	1115 ^N ₁	0.8	0.775	4.1	LOS A	8.3	58.4	0.26	0.43	0.26	34.1
North: Penrith City Council														
7	L2	96	0.0	96	0.0	0.343	2.7	LOS A	1.6	11.5	0.56	0.51	0.56	19.5
9	R2	96	0.0	96	0.0	0.343	2.7	LOS A	1.6	11.5	0.56	0.51	0.56	19.5
9u	U	1	0.0	1	0.0	0.343	13.0	LOS A	1.6	11.5	0.56	0.51	0.56	29.3
Approach		193	0.0	193	0.0	0.343	2.8	LOS A	1.6	11.5	0.56	0.51	0.56	19.6
West: High Street (W)														
10	L2	100	0.0	100	0.0	0.286	4.4	LOS A	0.8	5.3	0.16	0.39	0.16	22.2
11	T1	735	0.3	735	0.3	0.286	3.6	LOS A	0.8	5.3	0.16	0.39	0.16	35.6
12u	U	15	0.0	15	0.0	0.286	10.6	LOS A	0.7	4.9	0.17	0.39	0.17	35.7
Approach		850	0.3	850	0.3	0.286	3.8	LOS A	0.8	5.3	0.16	0.39	0.16	29.1
All Vehicles		2196	0.5	2158 ^N ₁	0.5	0.775	3.9	LOS A	8.3	58.4	0.25	0.42	0.25	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.

Roundabout Capacity Model: SIDRA Standard.

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

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

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

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

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LANE SUMMARY

Site: 101 [Fut PM - Worth Street / Union Road (Site Folder: Future PM)]

■ ■ Network: N101 [FUT PM - Copy (Network Folder: Future Peaks - Growth)]

Future PM

Worth Street / Union Road

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)

Design Life Analysis: Constant Number of Years = 14

Lane Use and Performance																
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.	
	[Total veh/h	HV %	[Total veh/h	HV %	veh/h	v/c	%	sec		[Veh	Dist] m		m	%	%	
South: Worth Street (S)																
Lane 1	66	0.0	66	0.0	87	0.756	100	77.7	LOS F	2.8	19.5	Full	500	0.0	0.0	
Approach	66	0.0	66	0.0		0.756		77.7	LOS F	2.8	19.5					
East: Union Road (E)																
Lane 1	160	0.8	160	0.8	1231	0.130	12 ⁵	10.8	LOS A	2.3	16.4	Short (P)	45	0.0	NA	
Lane 2	556	0.2	556	0.2	492 ¹	1.130	100	131.7	LOS F	37.8	265.0		Full	500	0.0	0.0
Approach	716	0.4	716	0.4		1.130		104.6	LOS F	37.8	265.0					
North: Worth Street (N)																
Lane 1	307	0.4	307	0.4	299	1.027	100	98.7	LOS F	7.8 ^{N4}	55.0 ^{N4}	Full	55	0.0	50.0	
Lane 2	273	0.0	273	0.0	316	0.864	100	65.6	LOS E	7.9 ^{N4}	55.0 ^{N4}	Full	55	0.0	50.0	
Approach	579	0.2	579	0.2		1.027		83.1	LOS F	7.9	55.0					
West: Union Road (W)																
Lane 1	263	0.5	263	0.5	1592	0.165	77 ⁵	6.3	LOS A	1.6	11.3	Short (P)	95	0.0	NA	
Lane 2	259	0.5	259	0.5	1198	0.216	100	10.3	LOS A	4.0	28.3		Full	500	0.0	0.0
Approach	522	0.5	522	0.5		0.216		8.3	LOS A	4.0	28.3					
Intersection	1884	0.3	1883	0.3		1.130		70.4	LOS E	37.8	265.0					

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

Lane LOS values are based on average delay per lane.

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

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

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

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

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

- 5 Lane under-utilisation found by the program

- N4** Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)										
South: Worth Street (S)										
Mov. From S To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	22	26	19	66	0.0	87	0.756	100	NA	NA
Approach	22	26	19	66	0.0	0.756				
East: Union Road (E)										

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	51	109	-	160	0.8	1231	0.130	12 ⁵	0.0	2
Lane 2	-	-	556	556	0.2	492 ¹	1.130	100	NA	NA
Approach	51	109	556	716	0.4		1.130			
North: Worth Street (N)										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	307	-	-	307	0.4	299	1.027	100	NA	NA
Lane 2	-	28	244	273	0.0	316	0.864	100	NA	NA
Approach	307	28	244	579	0.2		1.027			
West: Union Road (W)										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	263	-	-	263	0.5	1592	0.165	77 ⁵	0.0	2
Lane 2	-	241	18	259	0.5	1198	0.216	100	NA	NA
Approach	263	241	18	522	0.5		0.216			
Total %HV Deg.Satn (v/c)										
Intersection	1883	0.3		1.130						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

⁵ Lane under-utilisation found by the program

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Flow veh/h	Opposing Flow pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Worth Street (S) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Union Road (E) Merge Type: Zipper												
Exit Short Lane	1	45	50.0	130	130	2.50	2.00	299	1650	0.181	0.0	0.1
Merge Lane	2	-	50.0	149	150	2.50	2.00	260	1626	0.160	0.0	0.1
North Exit: Worth Street (N) Merge Type: Zipper												
Exit Short Lane	1	10	50.0	246	246	2.50	2.00	289	1503	0.192	0.0	0.1
Merge Lane	2	-	50.0	144	145	2.50	2.00	492	1632	0.301	0.0	0.1
West Exit: Union Road (W) Merge Type: Zipper												
Exit Short Lane	1	40	50.0	122	122	2.50	2.00	131	1660	0.079	0.0	0.1
Merge Lane	2	-	50.0	65	66	2.50	2.00	244	1726	0.142	0.0	0.0

LANE SUMMARY

Site: 101 [Fut PM - Worth Street / Union Lane (Site Folder: Future PM)]

Network: N101 [FUT PM - Copy (Network Folder: Future Peaks - Growth)]

Future PM
Worth Street / Union Lane
Job No: 220249
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis: Constant Number of Years = 14

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
South: Worth Street (S)															
Lane 1	318	0.2	295	0.2	1112	0.265	100	1.1	LOS A	0.0	0.0	Short (P)	16	-42.1 ^{N7}	NA
Lane 2	557	0.3	516	0.3	1944	0.265	100	0.0	LOS A	2.6 ^{N5}	18.2 ^{N5}		Full	55	0.0
Approach	875	0.3	811 ^{N1}	0.3		0.265		0.4	NA	2.6	18.2				
East: Union Lane (E)															
Lane 1	59	0.0	59	0.0	472	0.125	100	5.1	LOS A	1.3 ^{N5}	9.1 ^{N5}	Full	500	-49.4 ^{N3}	0.0
Lane 2	109	0.0	109	0.0	73	1.493	100	273.7	LOS F	5.9	41.4	Full	500	-50.0 ^{N3}	0.0
Approach	168	0.0	168	0.0		1.493		179.7	LOS F	5.9	41.4				
North: Worth Street (N)															
Lane 1	308	0.3	308	0.3	1945	0.158	100	0.0	LOS A	6.9 ^{N5}	48.7 ^{N5}	Full	62	0.0	27.6
Lane 2	239	0.2	239	0.2	1510	0.158	100	2.8	LOS A	3.1 ^{N5}	21.8 ^{N5}	Full	62	0.0	0.0
Approach	547	0.2	547	0.2		0.158		1.2	NA	6.9	48.7				
West: Union Lane (W)															
Lane 1	108	0.0	108	0.0	179	0.606	100	27.0	LOS B	0.8	5.5	Full	180	-50.0 ^{N7}	0.0
Approach	108	0.0	108	0.0		0.606		27.0	LOS B	0.8	5.5				
Intersection	1699	0.2	1635 ^{N1}	0.2		1.493		20.9	NA	6.9	48.7				

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

Lane LOS values are based on average delay per lane.

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

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

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

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

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

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

^{N3} Capacity Adjustment due to downstream lane blockage determined by the program.

^{N5} Continuous Lane results determined by Back of Queue values of downstream lanes (proportional to lane movement flows).

^{N7} The capacity reduction has been determined from the queue blockage probability of a Site further downstream due to intermediate continuous lanes.

Approach Lane Flows (veh/h)										
South: Worth Street (S)										
Mov. From S To Exit:	L2	T1	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	81	214	295	0.2		1112	0.265	100	0.0	2
Lane 2	-	516	516	0.3		1944	0.265	100	NA	NA

Approach	81	730	811	0.3			0.265			
East: Union Lane (E)										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From E							Satn	Util.	SL	Lane
To Exit:	S	W	N			Cap.	v/c	%	%	No.
	veh/h									
Lane 1	57	1	-	59	0.0	472	0.125	100	NA	NA
Lane 2	-	-	109	109	0.0	73	1.493	100	NA	NA
Approach	57	1	109	168	0.0		1.493			
North: Worth Street (N)										
Mov.	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	
From N						Satn	Util.	SL	SL	Lane
To Exit:	S	W				v/c	%	%	%	No.
						veh/h				
Lane 1	308	-	308	0.3		1945	0.158	100	NA	NA
Lane 2	203	37	239	0.2		1510	0.158	100	NA	NA
Approach	511	37	547	0.2			0.158			
West: Union Lane (W)										
Mov.	L2	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	
From W						Satn	Util.	SL	SL	Lane
To Exit:	N	S				v/c	%	%	%	No.
						veh/h				
Lane 1	75	33	108	0.0		179	0.606	100	NA	NA
Approach	75	33	108	0.0			0.606			
Total %HV Deg.Satn (v/c)										
Intersection	1635	0.2		1.493						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Worth Street (S)											
Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
North Exit: Worth Street (N)											
Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
West Exit: Union Lane (W)											
Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									

LANE SUMMARY

 Site: 101 [Fut PM - High Street / Mulgoa Road / Castlereagh Road - For Growth (Site Folder: Future PM)]

 Network: N101 [FUT PM - Copy (Network Folder: Future Peaks - Growth)]

Future PM

High Street / Mulgoa Road

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Design Life Analysis: Constant Number of Years = 14

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h	HV %	[Total veh/h	HV %	veh/h	v/c	%	sec		[Veh	Dist] m		m	%	%
South: Mulgoa Road (S)															
Lane 1	419	1.2	419	1.2	785	0.534	100	40.3	LOS C	13.0	92.2	Short	126	0.0	NA
Lane 2	297	7.7	297	7.7	491	0.604	60 ⁷	47.8	LOS D	10.8	80.8	Full	500	0.0	0.0
Lane 3	495	7.7	495	7.7	491	1.007	100	92.2	LOS F	27.1	202.3	Full	500	0.0	0.0
Lane 4	440	7.7	440	7.7	438 ¹	1.007	100	93.7	LOS F	24.3	181.3	Full	500	0.0	0.0
Lane 5	221	0.0	221	0.0	279	0.795	100	72.3	LOS F	9.5	66.6	Short	95	0.0	NA
Approach	1873	5.3	1873	5.3		1.007		71.5	LOS F	27.1	202.3				
East: High Street (E)															
Lane 1	159	0.0	154	0.0	661 ¹	0.233	100	32.1	LOS C	4.1	28.6	Short	35	0.0	NA
Lane 2	1	100.0	1	100.0	270	0.005	0 ⁵	46.2	LOS D	0.0	0.5	Short	15	0.0	NA
Lane 3	346	1.0	336	1.0	284 ¹	1.183	100	157.9	LOS F	17.0 ^{N4}	120.0 ^{N4}	Full	120	0.0	50.0
Lane 4	410	1.0	398	1.0	336 ¹	1.183	100	156.5	LOS F	17.0 ^{N4}	120.0 ^{N4}	Full	120	0.0	50.0
Lane 5	132	0.5	128	0.5	185	0.695	100	73.4	LOS F	5.5	38.3	Short	63	0.0	NA
Lane 6	132	0.5	128	0.5	185	0.695	100	73.4	LOS F	5.5	38.3	Short	50	0.0	NA
Approach	1180	0.9	1146 ^N ₁	0.9		1.183		121.4	LOS F	17.0	120.0				
North: Castlereagh Road (N)															
Lane 1	213	0.6	213	0.6	1012	0.210	100	13.0	LOS A	3.0	21.5	Short	50	0.0	NA
Lane 2	394	3.6	394	3.6	494 ¹	0.798	100	43.7	LOS D	14.2	102.7	Full	115	0.0	39.4
Lane 3	526	3.6	526	3.6	659	0.798	100	45.4	LOS D	20.2	145.7	Full	115	0.0	72.5
Lane 4	434	3.6	434	3.6	543 ¹	0.798	100	44.1	LOS D	15.9	114.9	Full	115	0.0	100.0 ⁸
Lane 5	450	3.9	450	3.9	374 ¹	1.202	100	169.7	LOS F	31.7	229.1	Short	95	0.0	NA
Lane 6	432	3.9	432	3.9	359 ¹	1.202	100	169.6	LOS F	30.4	220.3	Short	88	0.0	NA
Approach	2448	3.5	2448	3.5		1.202		86.8	LOS F	31.7	229.1				
West: High Street (W)															
Lane 1	353	1.8	353	1.8	775	0.455	100	29.7	LOS C	9.4	67.1	Short	85	0.0	NA
Lane 2	352	1.8	352	1.8	772 ¹	0.455	100	29.7	LOS C	9.4	66.8	Short	97	0.0	NA
Lane 3	1	100.0	1	100.0	270	0.005	1 ⁵	45.9	LOS D	0.0	0.5	Short	16	0.0	NA
Lane 4	198	0.3	198	0.3	375	0.528	100	56.4	LOS D	7.5	52.6	Full	500	0.0	0.0
Lane 5	198	0.3	198	0.3	375	0.528	100	56.4	LOS D	7.5	52.6	Full	500	0.0	0.0
Lane 6	169	0.8	169	0.8	184	0.919	100	88.3	LOS F	8.1	57.2	Short	123	0.0	NA
Lane 7	169	0.8	169	0.8	184	0.919	100	88.3	LOS F	8.1	57.2	Short	113	0.0	NA
Approach	1440	1.2	1440	1.2		0.919		50.8	LOS D	9.4	67.1				
Intersection	6941	3.1	6907 ^N ₁	3.1		1.202		80.9	LOS F	31.7	229.1				

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

Lane LOS values are based on average delay per lane.

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

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

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

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

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
- 5 Lane under-utilisation found by the program
- 7 Lane under-utilisation specified by the user
- 8 Probability of Blockage has been set on the basis of a queue that overflows from a short lane.
- N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.
- N4 Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)										
South: Mulgoa Road (S)										
Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	419	-	-	419	1.2	785	0.534	100	21.1	2
Lane 2	-	297	-	297	7.7	491	0.604	60 ⁷	NA	NA
Lane 3	-	495	-	495	7.7	491	1.007	100	NA	NA
Lane 4	-	440	-	440	7.7	438 ¹	1.007	100	NA	NA
Lane 5	-	-	221	221	0.0	279	0.795	100	17.2	4
Approach	419	1232	221	1873	5.3		1.007			
East: High Street (E)										
Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	154	-	-	154	0.0	661 ¹	0.233	100	31.2	3
Lane 2	-	1	-	1	100.0	270	0.005	0 ⁵	0.0	1
Lane 3	-	336	-	336	1.0	284 ¹	1.183	100	NA	NA
Lane 4	-	398	-	398	1.0	336 ¹	1.183	100	NA	NA
Lane 5	-	-	128	128	0.5	185	0.695	100	4.4	4
Lane 6	-	-	128	128	0.5	185	0.695	100	25.4	5
Approach	154	735	257	1146	0.9		1.183			
North: Castlereagh Road (N)										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	213	-	-	213	0.6	1012	0.210	100	0.0	2
Lane 2	-	394	-	394	3.6	494 ¹	0.798	100	NA	NA
Lane 3	-	526	-	526	3.6	659	0.798	100	NA	NA
Lane 4	-	434	-	434	3.6	543 ¹	0.798	100	NA	NA
Lane 5	-	-	450	450	3.9	374 ¹	1.202	100	100.0	4
Lane 6	-	-	432	432	3.9	359 ¹	1.202	100	100.0	5
Approach	213	1354	881	2448	3.5		1.202			
West: High Street (W)										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	353	-	-	353	1.8	775	0.455	100	28.1	2
Lane 2	352	-	-	352	1.8	772 ¹	0.455	100	16.0	4
Lane 3	-	1	-	1	100.0	270	0.005	1 ⁵	0.0	2
Lane 4	-	198	-	198	0.3	375	0.528	100	NA	NA
Lane 5	-	198	-	198	0.3	375	0.528	100	NA	NA
Lane 6	-	-	169	169	0.8	184	0.919	100	0.0	5
Lane 7	-	-	169	169	0.8	184	0.919	100	0.0	6
Approach	705	397	339	1440	1.2		0.919			

	Total	%HV	Deg.Satn (v/c)
Intersection	6907	3.1	1.202

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
- 5 Lane under-utilisation found by the program
- 7 Lane under-utilisation specified by the user

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Mulgoa Road (S) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
East Exit: High Street (E) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Castlereagh Road (N) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
West Exit: High Street (W) Merge Type: Zipper												
Exit Short Lane	1	240	50.0	490	495	2.50	2.00	795	1136	0.700	0.6	1.9
Merge Lane	2	-	50.0	397	403	2.50	2.00	980	1282	0.764	0.3	1.4

LANE SUMMARY

 Site: 101 [Fut PM - High Street / Worth Street - For Growth
(Site Folder: Future PM)]

 Network: N101 [FUT PM -
Copy (Network Folder: Future
Peaks - Growth)]

Future PM

High Street / Worth Street

Job No: 220249

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Design Life Analysis: Constant Number of Years = 14

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h	HV %	[Total veh/h	HV %	veh/h	v/c	%	sec		[Veh	Dist] m		m	%	%
South: Worth Street (S)															
Lane 1	496	0.5	452	0.5	725	0.624	100	35.0	LOS C	8.8 ^{N4}	62.0 ^{N4}	Full	62	0.0	50.0
Lane 2	453	0.0	413	0.0	662	0.624	100	31.8	LOS C	8.9 ^{N4}	62.0 ^{N4}	Full	62	0.0	50.0
Approach	949	0.3	865 ^{N1}	0.3		0.624		33.5	LOS C	8.9	62.0				
East: High Street (E)															
Lane 1	83	0.0	83	0.0	493	0.167	27 ⁵	32.1	LOS C	2.0	14.0	Full	500	-27.6 ^{N7}	0.0
Lane 2	395	1.6	395	1.6	641 ¹	0.616	100	32.4	LOS C	11.2	79.7	Full	500	0.0	0.0
Lane 3	185	0.0	185	0.0	395	0.469	100	35.5	LOS C	4.8	33.6	Short	70	0.0	NA
Approach	662	1.0	662	1.0		0.616		33.3	LOS C	11.2	79.7				
North: Penrith Plaza															
Lane 1	193	0.0	193	0.0	235 ¹	0.824	100	45.1	LOS D	5.9	41.2	Short	7	0.0	NA
Lane 2	316	0.0	316	0.0	514 ¹	0.615	65 ⁵	18.0	LOS B	6.8	47.4	Full	500	-27.6 ^{N7}	0.0
Lane 3	306	0.0	306	0.0	322	0.951	100	59.6	LOS E	9.6	67.1	Full	500	0.0	0.0
Approach	816	0.0	816	0.0		0.951		40.0	LOS C	9.6	67.1				
West: High Street (W)															
Lane 1	364	0.0	364	0.0	1097	0.332	100	10.1	LOS A	4.2	29.7	Short	60	0.0	NA
Lane 2	187	0.7	186	0.7	323	0.578	100	50.6	LOS D	6.3	44.2	Full	165	0.0	0.0
Lane 3	187	0.7	186	0.7	323	0.578	100	50.6	LOS D	6.3	44.2	Full	165	0.0	0.0
Lane 4	121	0.0	121	0.0	185	0.654	100	58.4	LOS E	4.3	30.2	Short	50	0.0	NA
Approach	857	0.3	857	0.3		0.654		34.5	LOS C	6.3	44.2				
Intersection	3285	0.4	3201 ^{N1}	0.4		0.951		35.4	LOS C	11.2	79.7				

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

Lane LOS values are based on average delay per lane.

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

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

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

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

¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

⁵ Lane under-utilisation found by the program

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

^{N4} Average back of queue has been restricted to the available queue storage space.

^{N7} The capacity reduction has been determined from the queue blockage probability of a Site further downstream due to intermediate continuous lanes.

Approach Lane Flows (veh/h)

South: Worth Street (S)

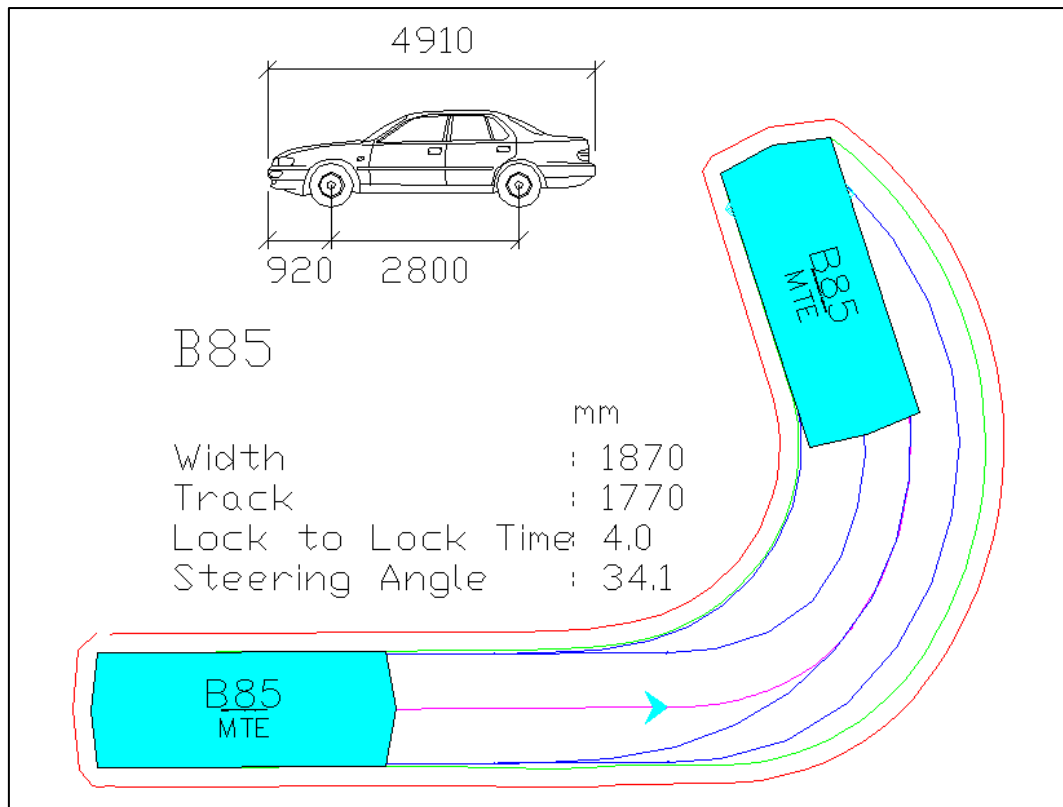
Mov. From S To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	436	17	-	452	0.5	725	0.624	100	NA	NA
Lane 2	-	330	83	413	0.0	662	0.624	100	NA	NA
Approach	436	347	83	865	0.3	0.624				
East: High Street (E)										
Mov. From E To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	83	-	-	83	0.0	493	0.167	27 ⁵	NA	NA
Lane 2	-	395	-	395	1.6	641 ¹	0.616	100	NA	NA
Lane 3	-	-	185	185	0.0	395	0.469	100	0.0	2
Approach	83	395	185	662	1.0	0.616				
North: Penrith Plaza										
Mov. From N To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	193	-	-	193	0.0	235 ¹	0.824	100	100.0	2
Lane 2	-	316	-	316	0.0	514 ¹	0.615	65 ⁵	NA	NA
Lane 3	-	-	306	306	0.0	322	0.951	100	NA	NA
Approach	193	316	306	816	0.0	0.951				
West: High Street (W)										
Mov. From W To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	364	-	-	364	0.0	1097	0.332	100	0.0	2
Lane 2	-	186	-	186	0.7	323	0.578	100	NA	NA
Lane 3	-	186	-	186	0.7	323	0.578	100	NA	NA
Lane 4	-	-	121	121	0.0	185	0.654	100	3.7	3
Approach	364	373	121	857	0.3	0.654				
Total %HV Deg.Satn (v/c)										
Intersection	3201	0.4	0.951							

Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Worth Street (S) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
East Exit: High Street (E) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
North Exit: Penrith Plaza Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									

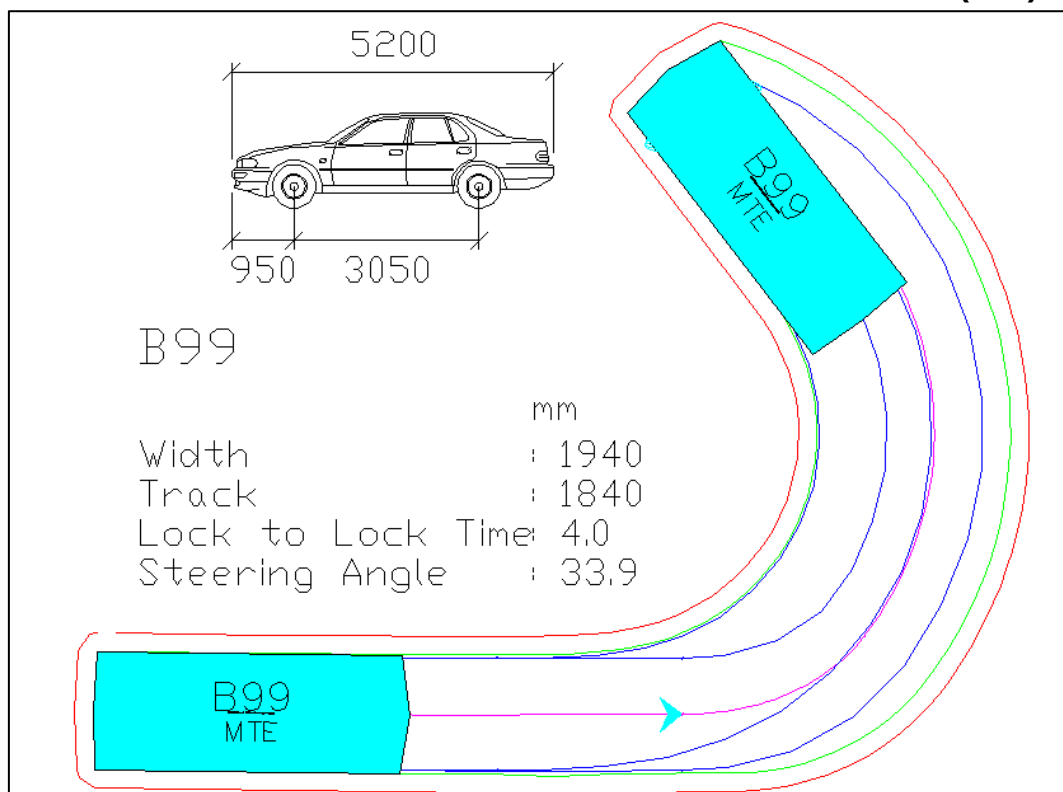
Full Length Lane	2	Merge Analysis not applied.
West Exit: High Street (W) Merge Type: Not Applied		
Full Length Lane	1	Merge Analysis not applied.
Full Length Lane	2	Merge Analysis not applied.



**ANNEXURE G: SWEPT PATH TESTING
(8 SHEETS)**

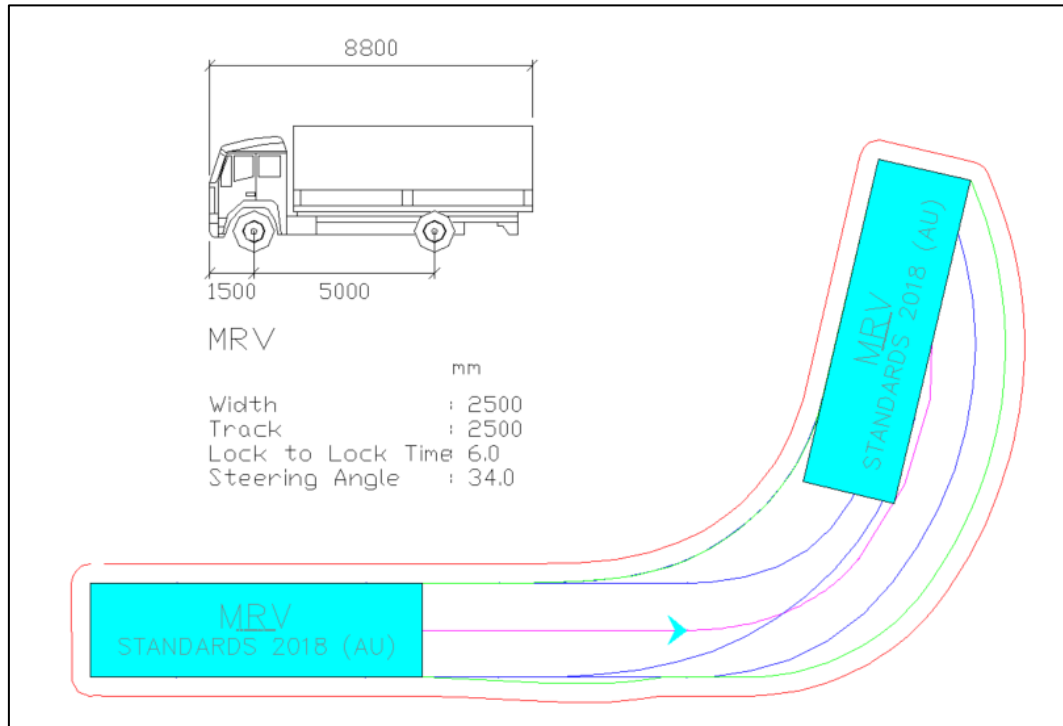


AUSTRALIAN STANDARD 85TH PERCENTILE SIZE VEHICLE (B85)

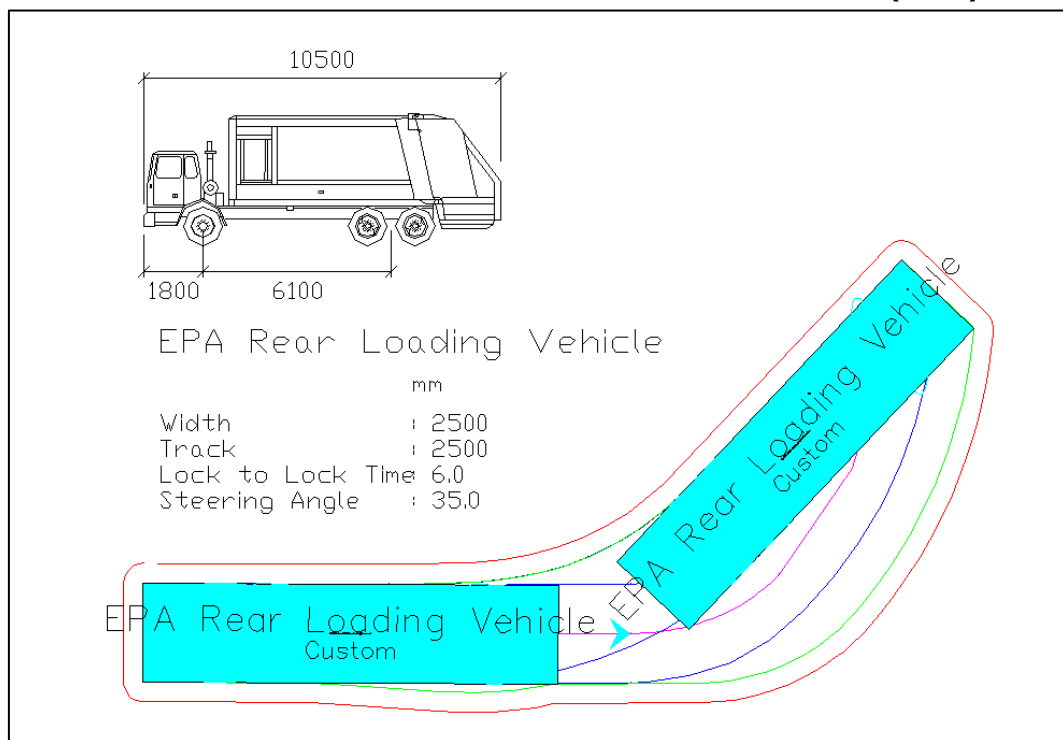


AUSTRALIAN STANDARD 99.8TH PERCENTILE SIZE VEHICLE (B99)

Blue – Tyre Path
Green – Vehicle Body
Red – 300mm Clearance

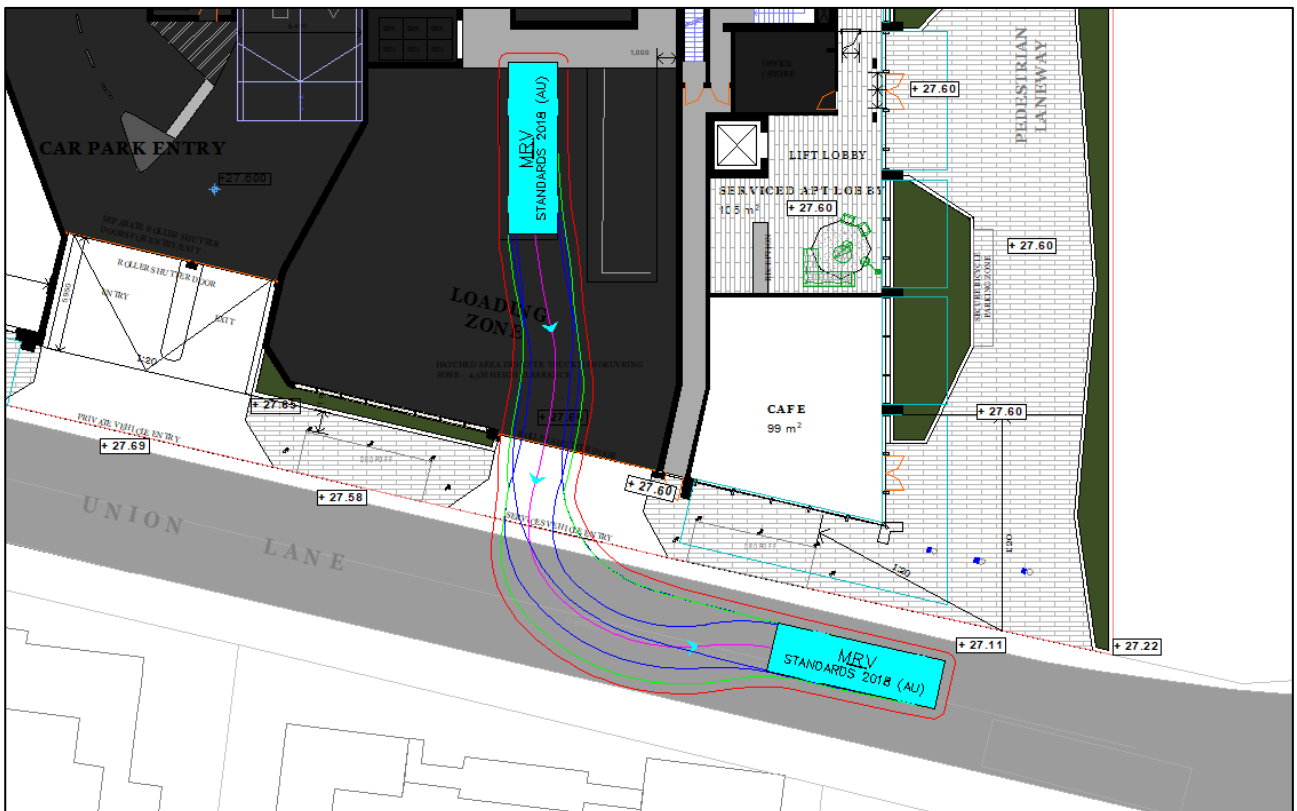
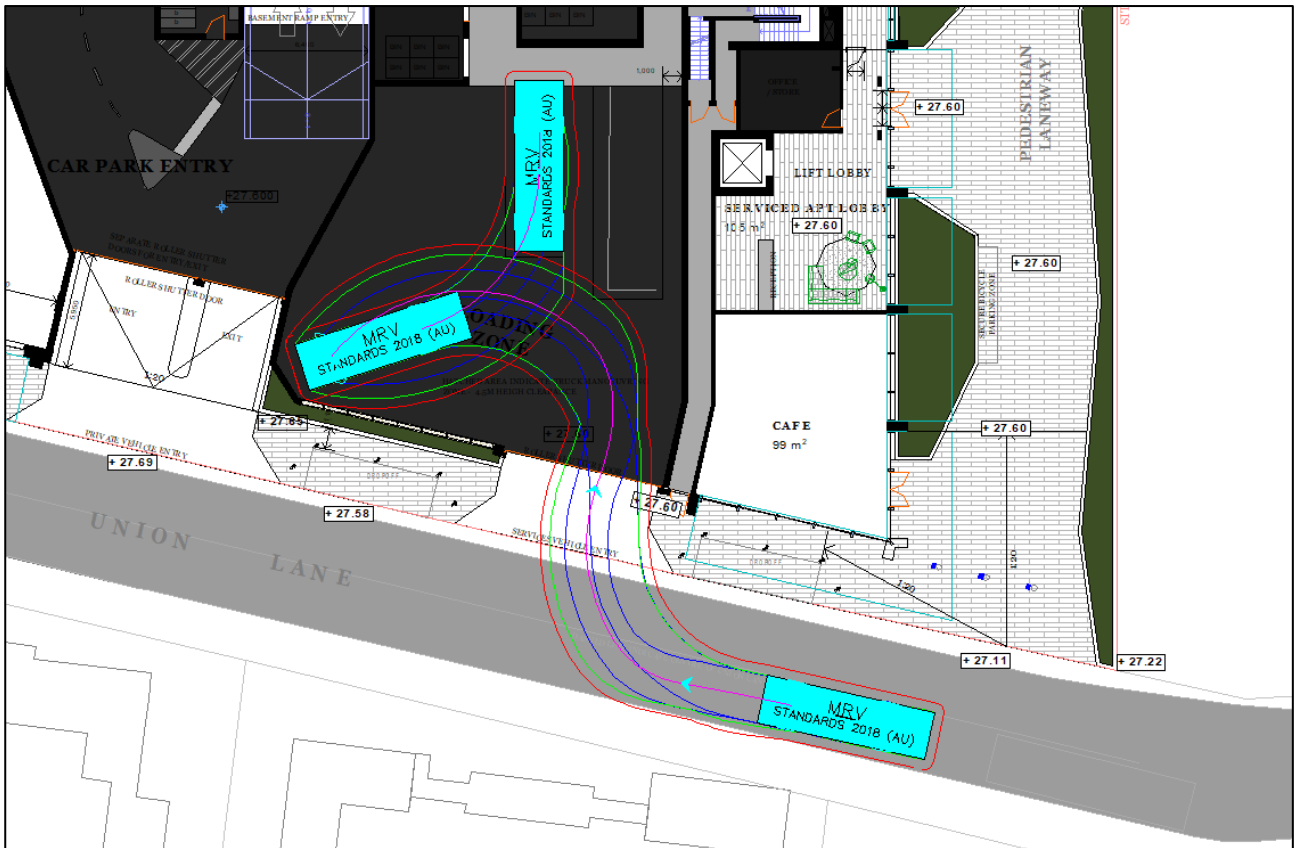


AUSTRALIAN STANDARD MEDIUM RIGID VEHICLE (MRV)

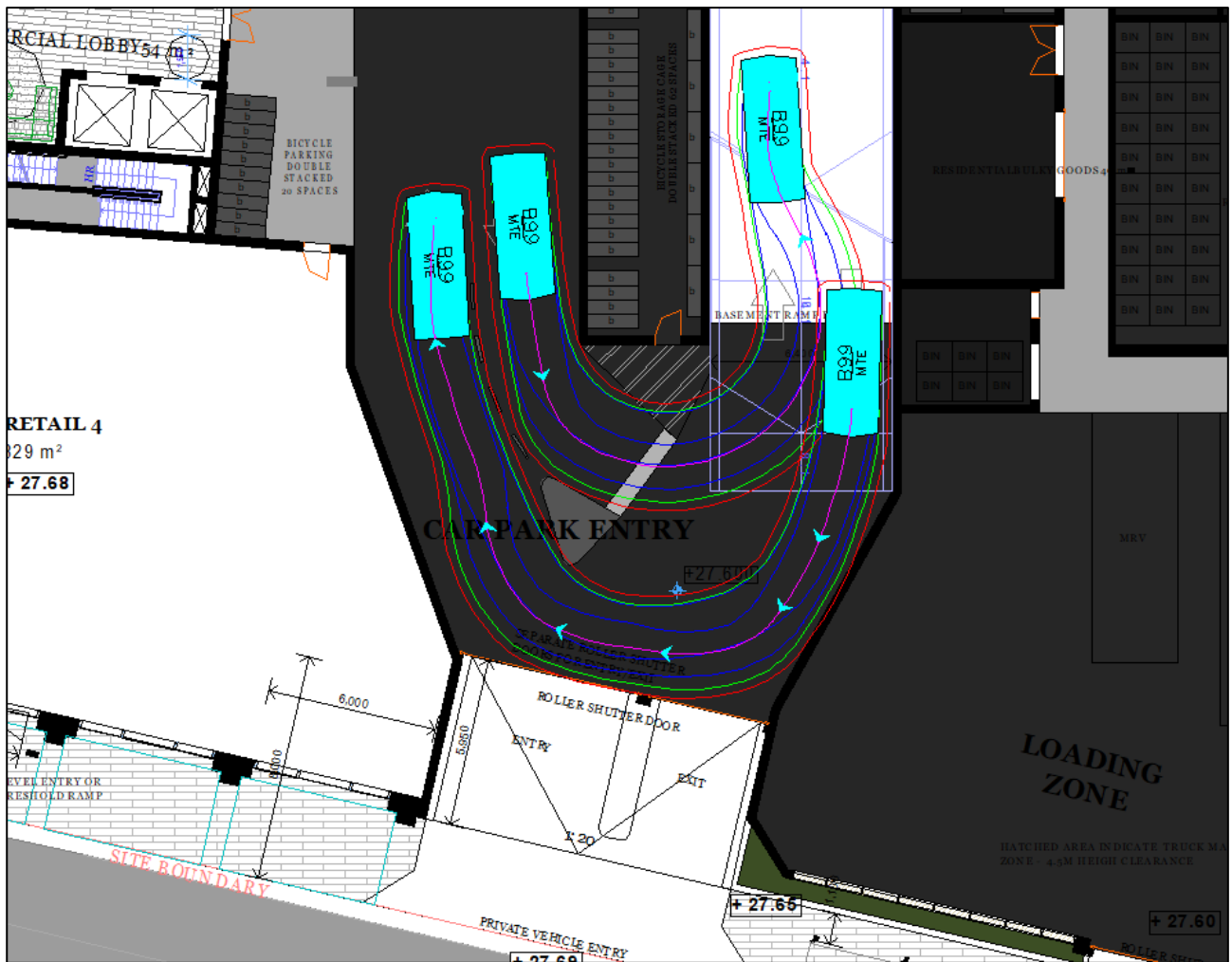


EPA REAR LOADING WASTE COLLECTION VEHICLE

Blue – Tyre Path
Green – Vehicle Body
Red – 500mm Clearance

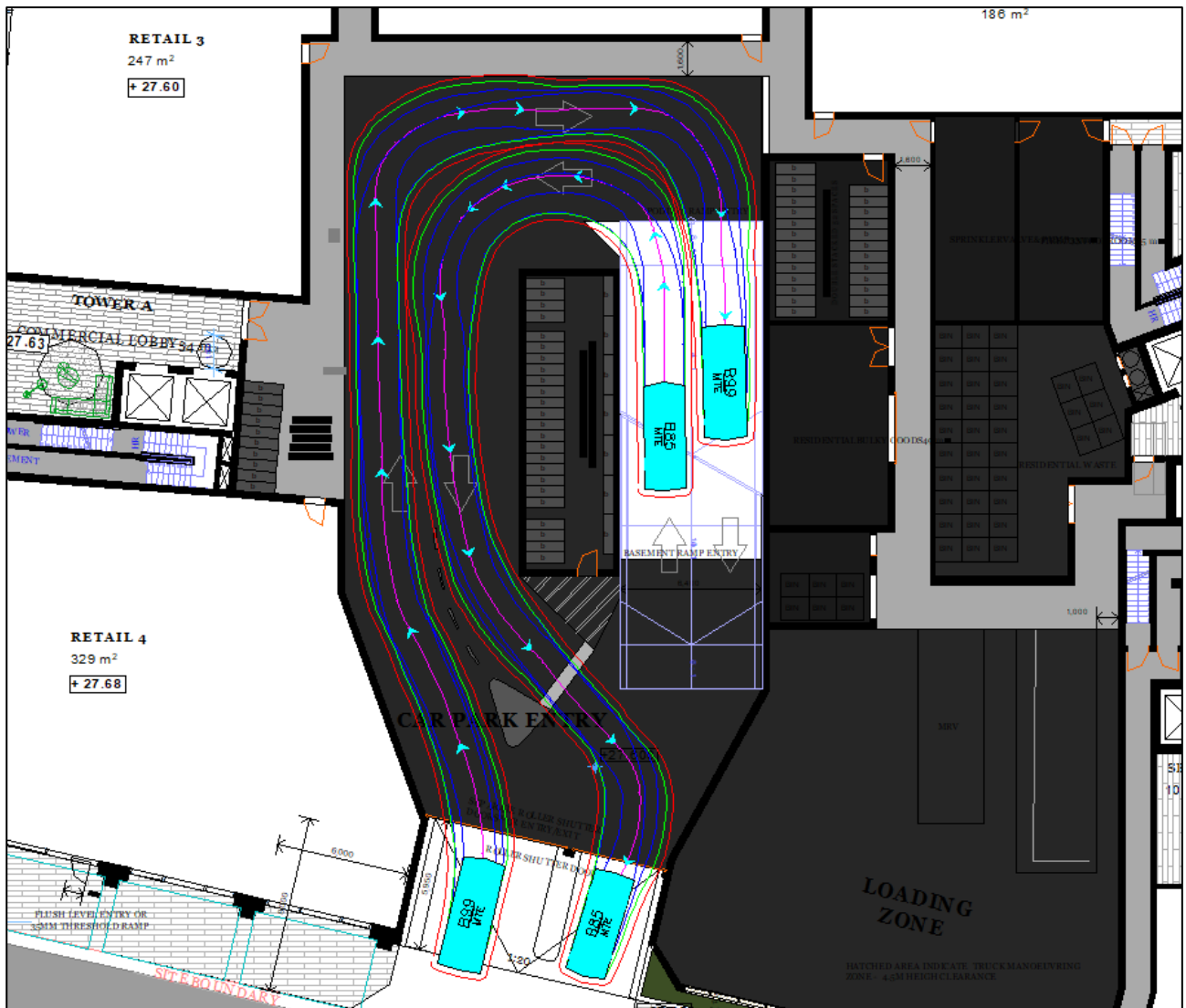


MRV ENTRY / EXIT FROM WESTERN LOADING SPACE
Successful – 2 Manoeuvres REVERSE IN / 1 Manoeuvre FORWARD OUT

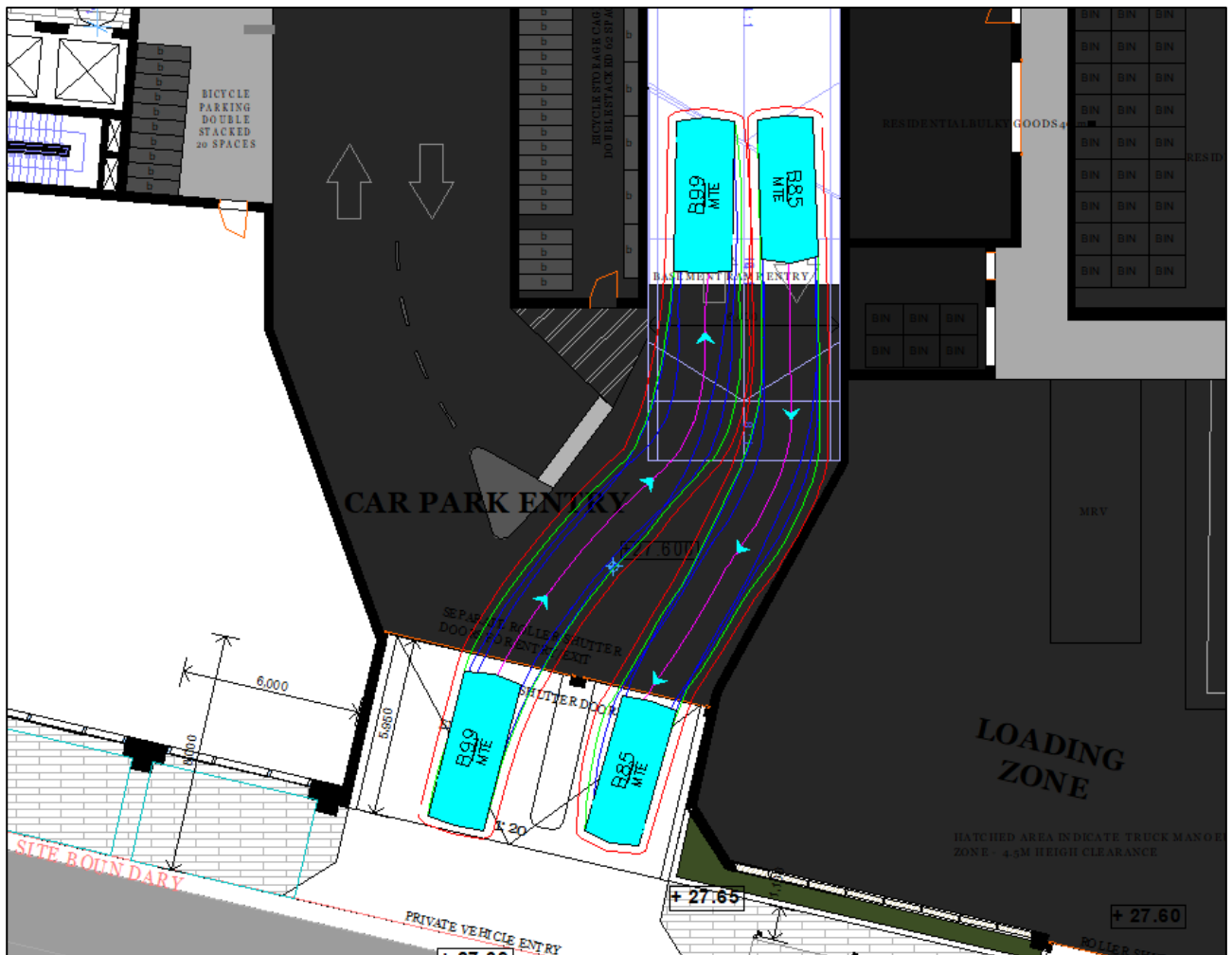


B99 RECIRCULATION BETWEEN BASEMENT AND LEVEL 1 Successful

It should be noted that this manoeuvre will occur infrequently.



B99 PASSING B85 ON GROUND LEVEL TO LEVEL 1
Successful



B99 PASSING B85 ON GROUND LEVEL TO BASEMENT
Successful