Traffic Impact Assessment

Planning Proposal
17-20 & 23-24 Loftus Crescent, Homebush

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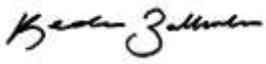
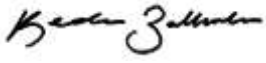
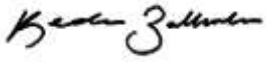
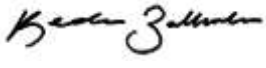
v01	31/10/2017	Ben Liddell	Kedar Ballurkar	
v02	01/11/2017	Kedar Ballurkar	Kedar Ballurkar	
v03	02/11/2017	Kedar Ballurkar	Kedar Ballurkar	
v04	06/09/2018	Kedar Ballurkar	Kedar Ballurkar	

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Contents

1. Introduction

1.1 Introduction

TRAFFIX has been commissioned by Homebush Investments No. 1 Pty Ltd to undertake a Traffic Impact Assessment in relation to a Planning Proposal at 17-20 & 23-24 Loftus Crescent, Homebush. Approval is sought to vary Floor Space Ratio and Height of Building controls in the Strathfield Local Environmental Plan 2012 for the subject site. A concept design, comprising of high density residential and retail uses has been envisaged by the proponent that would reflect these new controls.

In this regard, we have reviewed all relevant documentation provided to us and undertaken detailed site investigations. This report therefore examines the likely traffic impacts and parking requirements of the proposed concept design.

It has been concluded that the planning proposal is supportable on traffic planning grounds at this initial assessment stage with the results of our assessment summarised in the following sections:

- Section 2: Describes the site and its location
- Section 3: Documents existing traffic conditions
- Section 4: Describes the proposed development
- Section 5: Assesses the parking requirements
- Section 6: Assesses traffic impacts
- Section 7: Discusses access and internal design aspects
- Section 8: Presents the overall study conclusions

2. Location and Site

The site is located at 17-20 & 23-24 Loftus Crescent, Homebush approximately 11.5 kilometres west of the Sydney CBD and 250 metres from Homebush Railway Station. It consists of two separated parcels of land either side of the properties at 21-22 Loftus Crescent. The site is situated within the Strathfield Council Local Government Area and is currently zoned as B4-Mixed Use and R4-High Density Residential and is subject to this Council's relevant controls.

Both parcels of land have rectangular shaped configuration with a total area of 2,945.98m^2. It has a northern frontage to Loftus Lane that measures approximately 94 metres, an eastern frontage to Subway Lane that measures approximately 39 metres and a southern frontage to Loftus Crescent that measures 97metres. Low density residential developments boarder the western property boundary.

The proposed development site presently accommodates six (6) single-storey dwellings. All existing properties have vehicular access via Loftus Lane with on-street parking available on Loftus Crescent.

A Location Plan is presented in **Figure 1**, with a Site Plan presented in **Figure 2**. Reference should also be made to the Photographic Record presented in **Appendix A**, which provides an appreciation of the general character of roads and other key attributes in proximity to the site.

Having regard for the above, the traffic modelling undertaken as part of this study includes the following key intersections and links:

- Parramatta Road (Great Western Highway) / Bridge Street
- Parramatta Road (Great Western Highway) / Knight Street
- Loftus Crescent / Subway Lane
- The Crescent / Subway Lane

Figure 1: Location Plan

Figure 2: Site Plan

3. Existing Traffic Conditions

3.1 Road Network

The road hierarchy in the vicinity of the site is shown in **Figure 3** with the following roads of particular interest:

- M4 Western Motorway: an RMS State Road (6004) that is a key part of Sydney's orbital road network and links central Sydney to the North-West Suburbs. The M4 is a 46 kilometre long tolled road that generally runs in an east-west direction and links Strathfield in the east and Lapstone in the west. Access to the M4 near the site is available via Homebush Bay Drive. The M4 generally accommodates three lanes in each direction within a divided carriageway.
- Parramatta Road: an RMS Highway (HW5) that generally runs in an east-west direction that links central Sydney in the east and Penrith in the west. It has a posted speed limit of 60 km/h and generally accommodates three lanes in each direction within an undivided carriageway within the vicinity of the site.
- The Crescent: a local collector road that generally runs in an east-west direction between Homebush Road in the east and Bridge Road in the west. It has a posted speed limit of 50km/h and carries one lane in each direction with unrestricted parking permitted along the kerbside parking lanes. A 40km/h School Zone is located near The Crescent and Subway Lane roundabout intersection.
- Loftus Crescent: a local road that generally runs in an east-west direction between Station Street in the east and Bridge Road in the west. It has a speed limit of 50km/h and carries one lane in each direction with unrestricted parking permitted along the southern kerbside parking lane and "2P 8am-6pm Mon-Sat Permit Holders Excepted" parking restrictions along the northern kerbside lane. Properties along Loftus Crescent have access via Loftus Lane to the north.
- Loftus Lane: a local road that generally runs in an east-west direction between Subway Lane in the east and Crane Street in the west. It has a speed limit of 50km/h. No Stopping restrictions are in place on bothn side adjacent to the

subject site. The majority of properties along Loftus Crescent have garage access to Loftus Lane.

- Subway Lane: a local road that runs in a north-south direction between Parramatta Road in the north and Loftus Crescent in the south. It has a one-way restriction in the northern direction.

It can be seen from **Figure 3** that the site is conveniently located with respect to the arterial and local road systems serving the region. It is therefore able to effectively distribute traffic onto the wider road network, minimising traffic impacts.

The existing performance of the surrounding network is discussed further in **Section 6.**

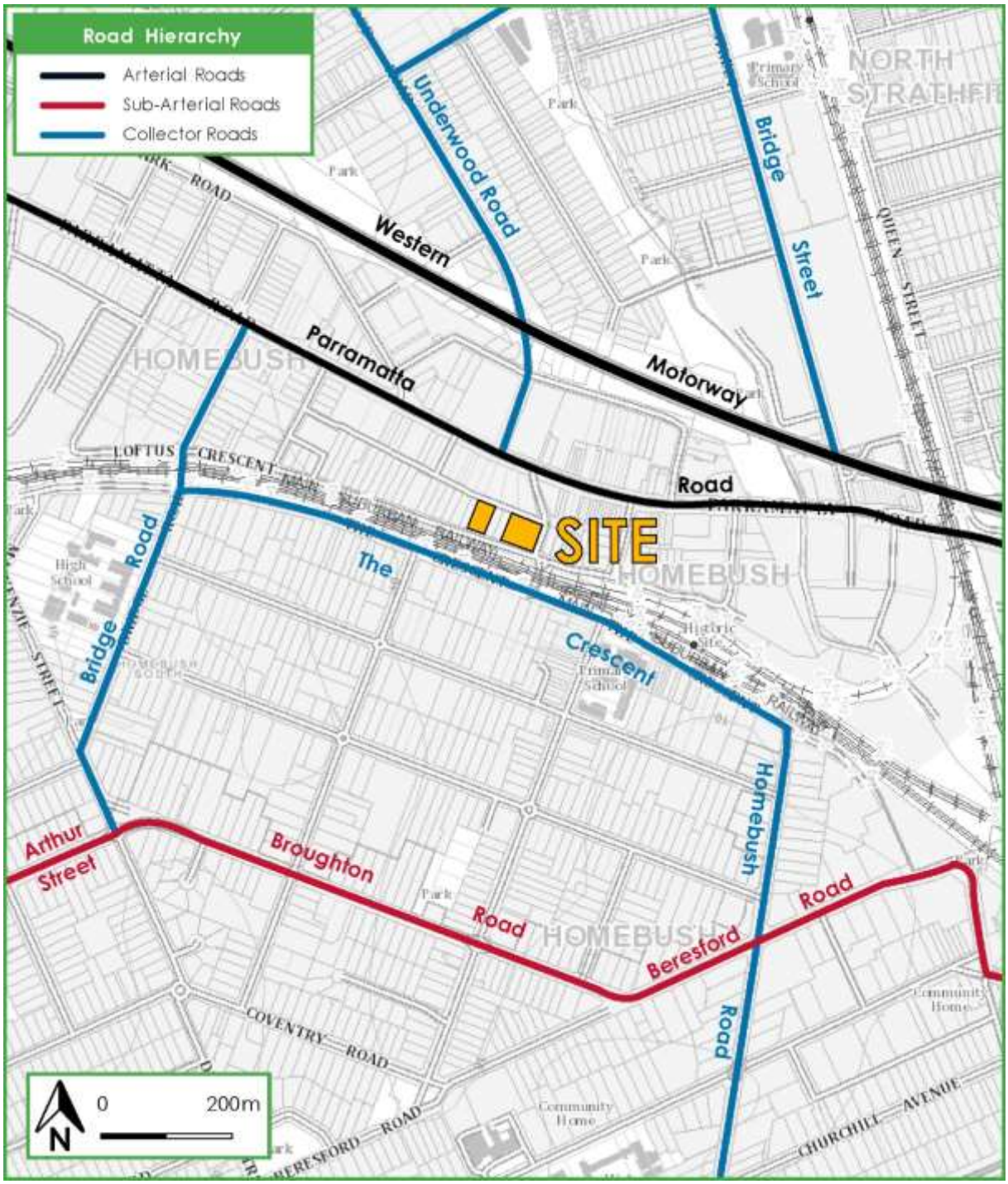


Figure 3: Road Hierarchy

3.2 Key Intersections

Four (4) key intersections have been identified around the subject site. The intersections are briefly described in **Table 1**. These intersections are generally at the junction of two or more main thoroughfares and will be utilised by road users associated with future developments.

Table 1: Intersections

No.	Intersection	Road Authority	Brief Description
1	Parramatta Road and Bridge Road	RMS	The intersection of Parramatta Road and Bridge Road is a three-legged signalised intersection. Parramatta Road generally runs in an east-west direction while Bridge Road runs in a north-south direction. The Parramatta Road westbound approach provides three through lanes with a shared left-turn. The Bridge Road northbound approach provides one dedicated right-turn lane and one left/right turn lane. The Parramatta Road eastbound approach provides two through lanes and a dedicated right-turn lane. The dedicated east bound right-turn lane extends for approximately 150 metres. Signalised pedestrian crossings are provided on the southern and western legs. 
2	Parramatta Road and Knight Street	RMS	The intersection of Parramatta Road and Knight Street is a three-legged signalised intersection. Parramatta Road generally runs in an east-west direction while Knight Street runs in a north-south direction. Parramatta Road westbound approach provides three through lanes with a shared left-turn. The Knight Street northbound approach provides one dedicated right-turn lane and one dedicated left-turn lane. Parramatta Road eastbound approach provides three through

			lanes with shared right-turn. The kerb side through lane merges approximately 47 metres after the intersection. Signalised pedestrian crossings are provided the southern and western legs. 
3	Loftus Crescent and Subway Lane	SC	The intersection of Loftus Crescent and Subway Lane is a four-legged single lane roundabout. Loftus Crescent generally runs in an east-west direction while Subway Lane runs in a north-south direction. The Subway Lane southbound approach provides a one-way single lane with a small splitter island. The Loftus Crescent westbound approach provides a single lane with a pedestrian refuge splitter island. The Subway Lane northbound approach provides a single lane and small splitter island. The Loftus Crescent eastbound approach provides a single lane that intersects with the Subway Lane southbound lane and is controlled by a stop control. A small pedestrian refuge splitter island is also provided. The centre island is approximately 5.5 metres in diametre. 
4	The Crescent and Subway Lane	SC	The intersection of The Crescent and Subway Lane is a three-legged single lane roundabout. The Crescent generally runs in an east-west direction while Subway Lane runs in a north-south direction. All

			approaches provide a single lane with small concrete splitter islands. The centre island is approximately 7.5 metres in diametre. 

3.3 Public Transport

The existing bus services that operate in the locality are shown in **Figure 4**. The site benefits from excellent bus services being situated within 400 metres of bus stops. These bus services provide connections to such centres as Parramatta, Burwood, Sydney Olympic Park and Strathfield.

In addition Homebush Railway Station is located approximately 250 metres to the east of the subject site as shown. This station provides services along the T1 and T2 lines including connections to Lidcombe, Parramatta, Liverpool and the Sydney CBD. Rail services to the City from Homebush Railway Station depart every 12-15 minutes during morning and evening peak periods.

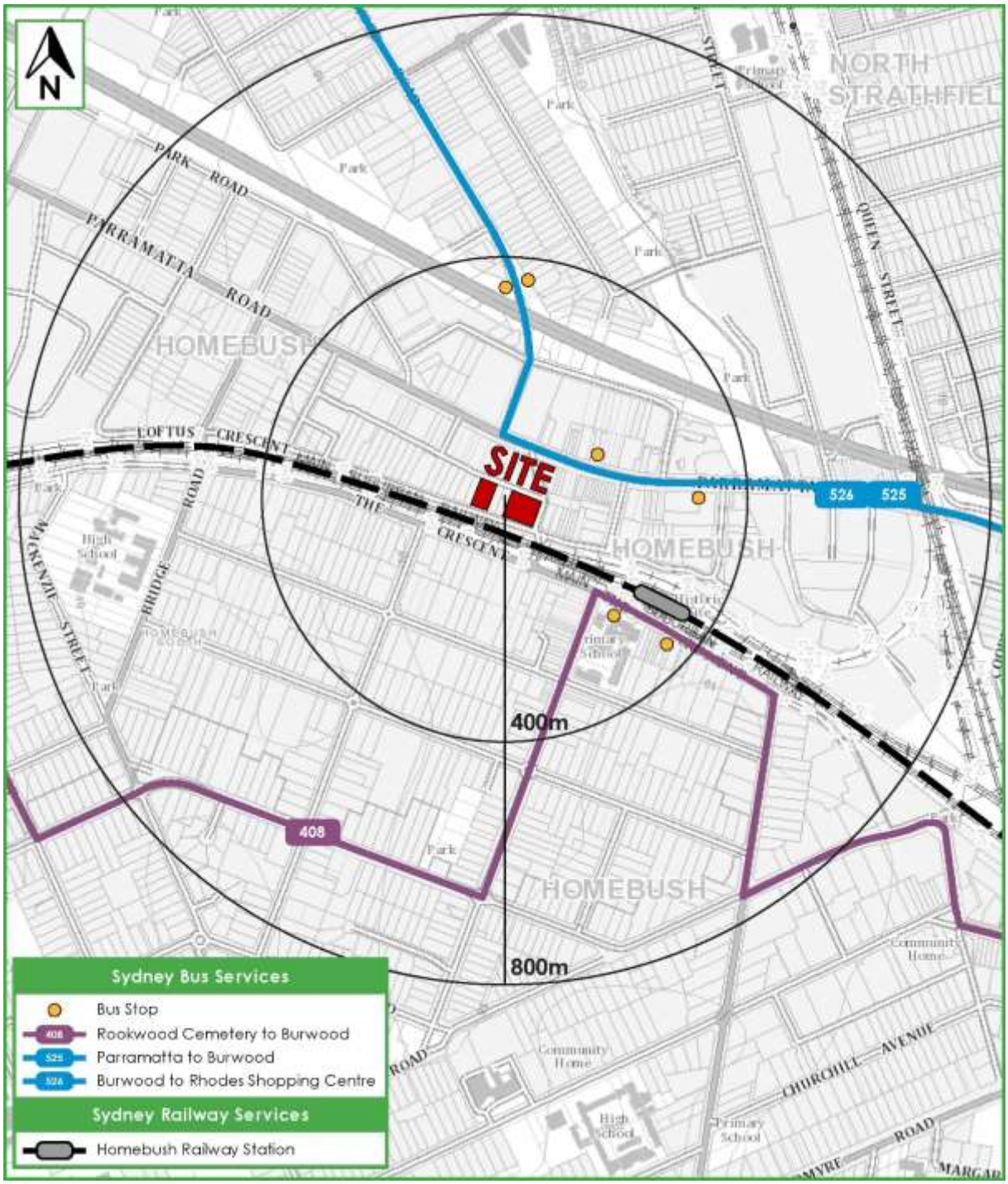


Figure 4: Public Transport

3.4 Existing Site Generation

As previously mentioned, the subject site is currently occupied by six (6) dwelling houses. The RMS *Technical Direction TDT 2013/04a* for low density residential dwellings indicates that the houses would each generate 0.95 and 0.99 peak hour vehicle trips in the morning and evening peak hours respectively. When applying these rates to the existing site, with an 80/20 split, the traffic generation is considered to be:

- 6 vehicle trips per hour (1 in, 5 out) in the AM peak period.
- 6 vehicle trips per hour (5 in, 1 out) in the PM peak period.

4. Description of the Proposal

A full description of the changes sought under the *Strathfield Local Environmental Plan 2012* can be found in the Planning Proposal. In summary, approval is sought to change the Floor Space Ratio controls of the site from partially 2.25:1 and 2.7:1 to 3.6:1 and the height of building permissible from 16 metres to 75 metres.

For the purpose of this preliminary assessment, a concept development for two detached buildings incorporating these proposed controls has been drafted with yields summarised in **Table 2**.

Table 2: Summary of Future Development Potential

Property	Land Use	Yield
23-24 Loftus Crescent	High Density Residential	80
	Commercial (Retail)	-
17-20 Loftus Crescent	High Density Residential	50
	Commercial (Retail)	700m^2 GFA

The parking requirements and traffic impacts arising from the development are discussed in **Section 5** and **Section 6**, respectively. Reference should also be made to the concept design plans submitted separately which are presented in **Appendix B**, along with a full schedule of yields. It is notable that accesses are proposed on Loftus Lanes, which has been accounted for when assessing the traffic impacts.

5. Parking Requirements

5.1 Parking Controls

The conceptual development lies within 800m of Homebush Railway Station and therefore eligible to provide parking in accordance with the Apartment Design Guide ("ADG") and State Environmental Planning Policy 65 ("SEPP 65"). The ADG states that the parking requirement for the development will be the lesser provision of what is required under the *RMS Guide to Traffic Generating Developments* ("RMS Guide") or Council's Development Control Plan. A comparison of the car parking requirements under the *Strathfield Council Development Control Plan No. 20* ("DCP") and the RMS Guide is shown in **Table 3** and **Table 4**, for the buildings at No. 23-24 & No. 17-20, respectively.

Table 3: Parking Requirements for 23-24 Loftus Crescent

Type	No. / Area	RMS Guide Minimum Parking Rate	DCP Minimum Parking Rate	Minimum Requirement under RMS Guide	Minimum Requirement under DCP
Residential Flat Building					
1 Bedroom	22	0.6 spaces per unit	1 spaces per unit	13	22
2 Bedroom	28	0.9 spaces per unit	1 space per unit	25	28
3 Bedroom	-	1.4 spaces per unit	1.5 space per unit	-	-
Visitor	50	0.2 spaces per unit	0.2 spaces per units	10	10
			Total	**48**	**60**

It can be seen from Table 3 that the building at No. 23-24 is required to provide a minimum of 48 car parking spaces in accordance with the RMS Guide, which has a lesser requirement to the DCP and can therefore be adopted in accordance with the ADG.

Table 4: Parking Requirements for 17-20 Loftus Crescent

Type	No. / Area	RMS Guide Minimum Parking Rate	DCP Minimum Parking Rate	Minimum Requirement under RMS Guide	Minimum Requirement under DCP
Residential Flat Building					
1 Bedroom	45	0.6 spaces per unit	1 spaces per unit	27	45
2 Bedroom	35	0.9 spaces per unit	1 space per unit	32	35
3 Bedroom	-	1.4 spaces per unit	1.5 space per unit	-	-
Visitor	80	0.2 spaces per unit	0.2 spaces per units	16	16
			Sub-Total	**75**	**96**
Retail					
Retail	700m^2	-	For shops less than 500m^2 GFA, one space per 50m^2	-	-
			For shops between 500m^2 and 1000 m^2 GFA, one space per 40m^2	-	18
			For shops above 1000m^2 GFA, one space per 25m^2	-	-
			Sub-Total	**18**	
			Total	**93**	**114**

It can be seen from Table 4 that the building at No. 17-20 is required to provide a minimum of 93 car parking spaces including 75 residential spaces and 18 retail spaces. The residential parking provision corresponds with the RMS Guide, which has a lesser requirement to the DCP and can therefore be adopted in accordance with the ADG.

5.2 Other Parking Controls

A subsequent Development Application would need to consider additional parking controls that may include the following:

- Accessible parking
- Motorcycle parking
- Bicycle facilities
- Servicing and waste collection
- Car wash bays

6. Traffic Impacts

6.1 Development Scheme for Sensitivity Testing

As the number of apartments proposed and gross floor areas for retail uses could vary in a subsequent development application, a development scheme of a substantially greater scale has been assessed in order to perform a sensitivity test on the local road network. That is, a grossly exaggerated number of apartments and retail gross floor area has been adopted for software modelling to identify any potential weakness in intersection modelling. The assessed development scheme is shown in **Table 4**.

Table 4: Sensitivity Test Development Scheme

Land Use	Yield
High Density Residential	425 units
Commercial (Retail)	3,045m^2 GFA

6.2 Trip Generation

Residential Use

The RMS Technical Direction (TDT 2013/04a) provides revised trip generation advice for high density residential developments. The average Sydney weekday trip rates provided by TDT 2013/04a have been adopted for assessing the traffic generating potential of high density residential uses at the subject site. These rates are considered appropriate due to the high density residential yield proposed and the proximity to various public transport options that link Homebush to numerous major centres. The relevant trip rates are as follows:

- 0.19 vehicle trips per unit during the morning peak hour; and
- 0.15 vehicle trips per unit during the evening peak hour.

Retail Use

The RMS Guide to Traffic Generating Developments predicts a trip generation rate of 46 trips per 1000m^2 in the Thursday PM peak for a secondary retail unit.

As such with a total retail gross floor area of 3,045m^2, the retail units in the development scheme for sensitivity testing are predicted to generate a maximum peak of 140 trips (70 in and 70 out) for the Thursday PM peak. It is noted that there is no specific rate for the morning peak, therefore the total number of trips was derived from the total number of staff car parks required under the Strathfield Council DCP No.20. The DCP requires that for shops less than 500m^2 GFA they require one space per 50 m^2. Plans for the actual concept development indicate each tenancy will have than 500m^2. This assumption generates approximately 60 trips in the AM, assuming all staff were to arrive in a single hour.

It is emphasised that the adopted RMS rate would assume a provision of parking that would support customer demands. In this regard, the parking rates specific to the site imply a constrained provision that would be expected to limit the amount of traffic generation to the site (i.e. on-site staff parking only). Nonetheless, the guideline rate has been adopted to provide a conservative analysis.

Combined Rate

Application of these trip rates to the development scheme for sensitivity testing (425 residential units and 3045m^2 gross floor area of retail space) results in the following traffic generation in **Table 5**.

Table 5: Proposed Traffic Generation Summary

Use	Area/No.	Peak Period	Vehicle Generation Rate	Estimated Generation
Proposed				
Residential	425 units	Morning	0.19 / unit	81
		Evening	0.15 / unit	64
Retail	3,045m^2 (GFA)	Morning	See above	60
		Evening	46 per 1000m^2	140
Total			**Morning**	**141**
			Evening	**204**

A directional split of 80:20 has been applied to the residential units and a 50:50 split applied to the retail. This results in the following predicted trip generation volumes:

- 141 vehicle per hour (64 in, 77 out) during the morning peak hour; and
- 204 vehicle per hour (121 in, 83 out) during the evening peak hour.

6.3 Net Traffic Impact

The existing site only generates six (6) trips in the AM and PM peak hours and is therefore considered negligible when determining the net traffic impact of the site.

6.4 Traffic Distribution

In order to estimate the expected distribution of traffic from the subject development an interrogation of the journey to work data supplied by the NSW Government Bureau of Transport Statistics has been undertaken. The surveys of residents and commuters who drive to and from zone TZ963, centred on Loftus Crescent, indicate the following distribution for the subject intersections:

Retail – Inbound Movements

- 51% arrive to the site from the west via Bridge Street from such suburbs as Parramatta, Blacktown and Penrith
- 28% arrive to the site from the north via Crane Street from such suburbs as Ryde, Gosford and Ku-ring-gai
- 9% arrive to the site from the south via Subway Lane from such suburbs as Strathfield, Canterbury and Burwood.
- 8% arrive to the site from the east via Subway Lane from such suburbs as Marrickville, Canada Bay and Sydenham.
- 4% arrive to the site from the south-west via Loftus Crescent from such suburbs as Bankstown.

Retail – Outbound Movements

- 55% leave the site towards the west via Crane Street to such suburbs as Parramatta, Blacktown and Penrith.
- 28% leave the site towards the north via Knight Street to such suburbs as Ryde, Gosford and Ku-ring-gai.
- 9% leave the site towards the south via Subway Lane to such suburbs as Strathfield, Canterbury and Burwood.
- 8% leave the site towards the east via Knight Street to such suburbs as Marrickville, Canada Bay and Sydenham.

Residential – Inbound Movements

- 31% arrive to the site from the east via Subway Lane from such suburbs as Marrickville, Canada Bay and Sydenham.
- 26% arrive to the site from the south via Subway Lane from such suburbs as Strathfield, Canterbury and Burwood.
- 24% arrive to the site from the north via Crane Street from such suburbs as Ryde, Gosford and Ku-ring-gai
- 18% arrive to the site from the west via Bridge Street from such suburbs as Parramatta, Blacktown and Penrith

Residential – Outbound Movements

- 31% leave the site towards the east via Knight Street to such suburbs as Marrickville, Canada Bay and Sydenham.
- 26% leave the site towards the south via Subway Lane to such suburbs as Strathfield, Canterbury and Burwood.
- 24% leave the site towards the north via Knight Street to such suburbs as Ryde, Gosford and Ku-ring-gai.
- 18% leave the site towards the west via Crane Street to such suburbs as Parramatta, Blacktown and Penrith.

Collectively, the development volumes assessed have been distributed across the road network as illustrated in **Figure 5** and **Figure 6**, for AM and PM peak periods respectively. The analysis assumes that access to the site will be achieved from Loftus Lane, in accordance with the concept plans.

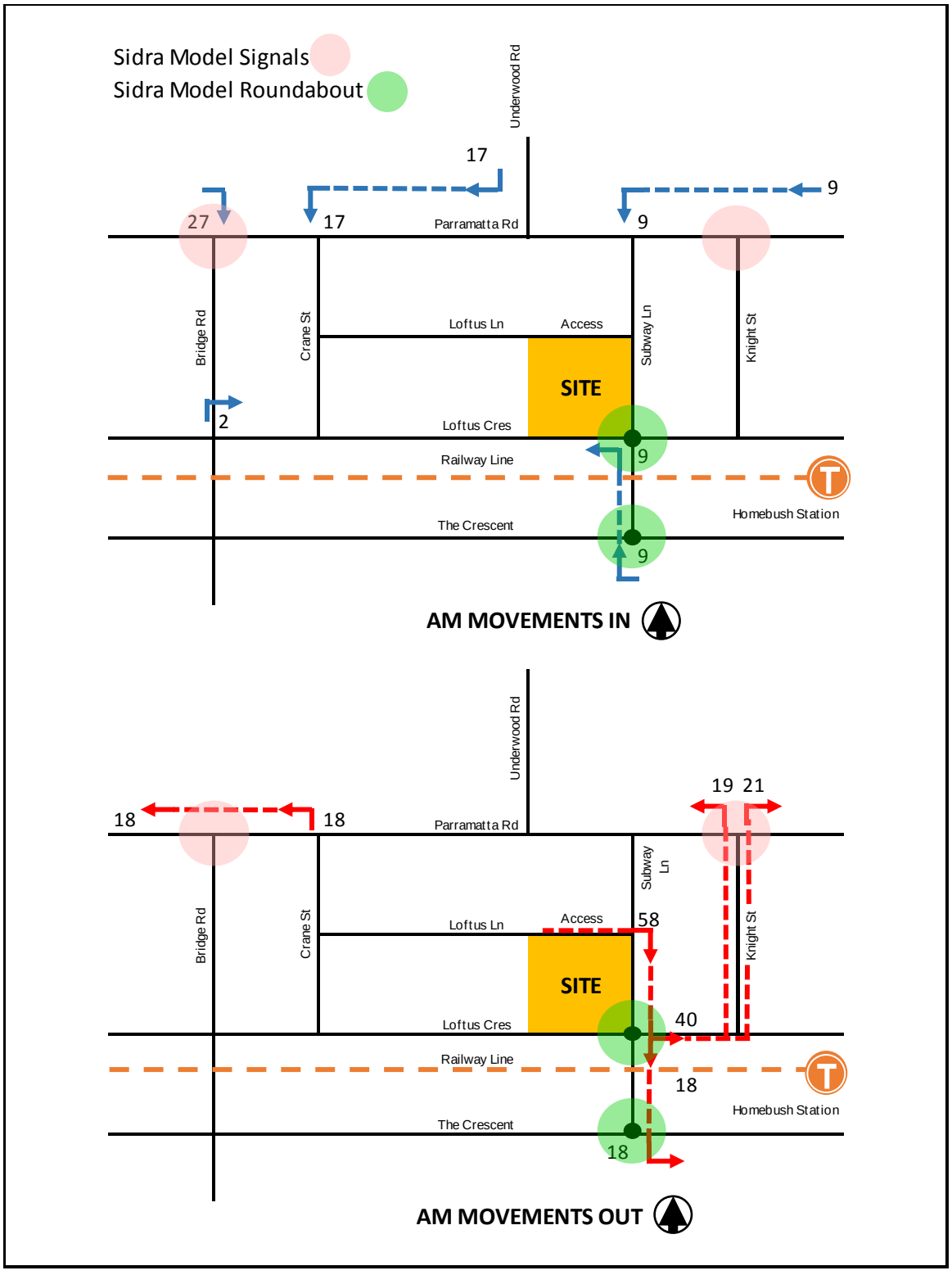


Figure 5: AM Peak Period Distribution (Vehicle Trips per Hour)

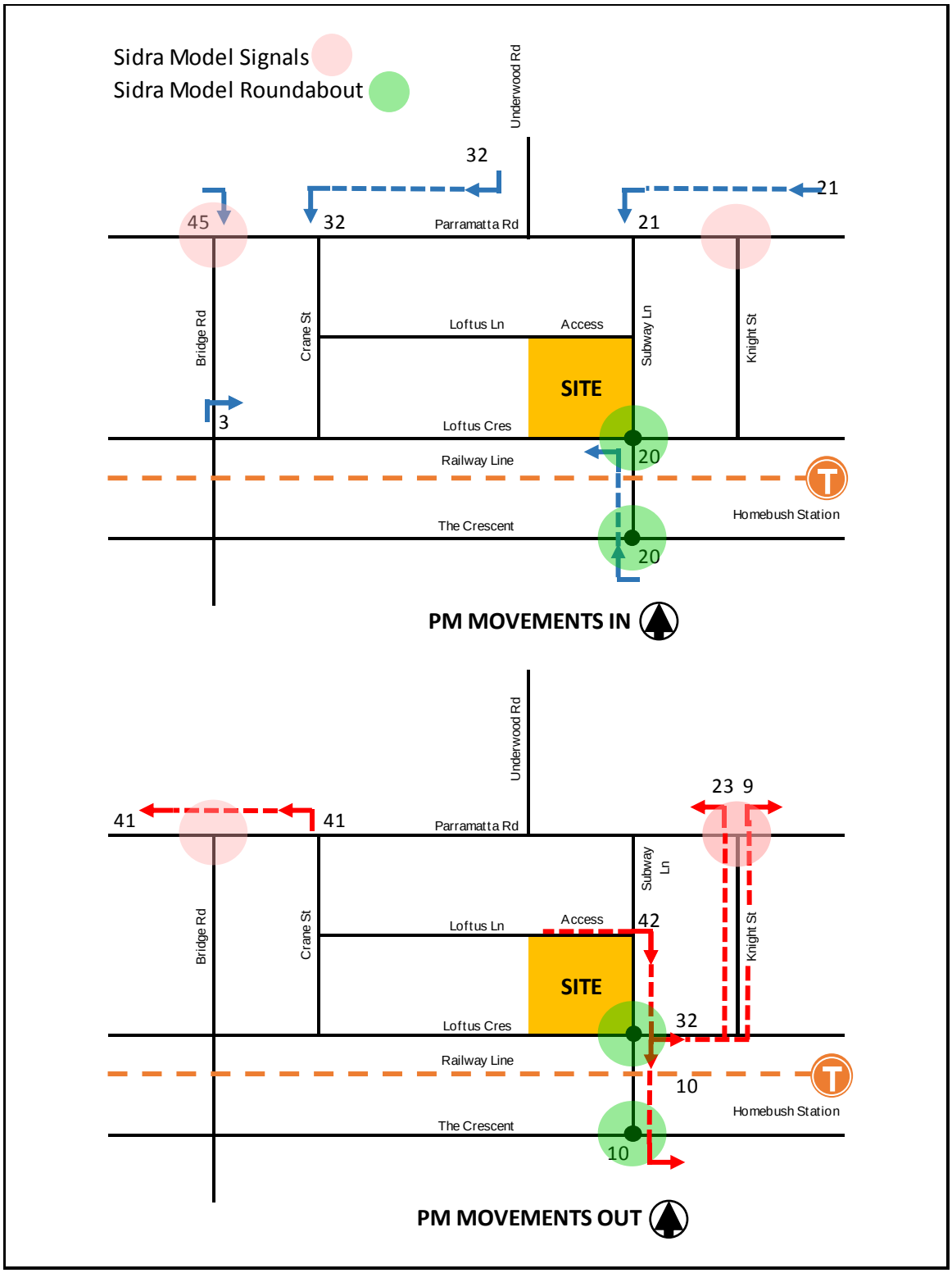


Figure 6: PM Peak Period Distribution (Vehicle Trips per Hour)

6.5 Peak Period Intersection Performance

To enable the a software modelling assessment, traffic count surveys were undertaken of the most critical intersections immediately surrounding the site as identified in **Section 3.2**, being the intersections of Parramatta Road / Bridge Road, Parramatta Road / Knight Street, Loftus Crescent / Subway Lane and The Crescent / Subway Lane. These were undertaken on a typical weekday between the 7-9AM and 4-6PM network peak periods on Monday 23rd October 2017.

The results of these surveys were analysed using the SIDRA computer program to determine their performance characteristics under existing traffic conditions. The SIDRA model produces a range of outputs, the most useful of which are the Degree of Saturation (DOS) and Average Vehicle Delay per vehicle (AVD). The AVD is in turn related to a level of service (LOS) criteria. These performance measures can be interpreted using the following explanations:

DOS - the DOS is a measure of the operational performance of individual intersections. As both queue length and delay increase rapidly as DOS approaches 1, it is usual to attempt to keep DOS to less than 0.9. When DOS exceeds 0.9 residual queues can be anticipated, as occurs at many major intersections throughout the metropolitan area during peak periods. For intersections controlled by roundabout or give way/stop control, satisfactory intersection operation is generally indicated by a DOS of 0.8 or less.

AVD - the AVD for individual intersections provides a measure of the operational performance of an intersection. In general, levels of acceptability of AVD for individual intersections depend on the time of day (motorists generally accept higher delays during peak commuter periods) and the road system being modelled (motorists are more likely to accept longer delays on side streets than on the main road system).

LOS - this is a comparative measure which provides an indication of the operating performance of an intersection as shown below:

Table 6: Intersection Performance Indicators

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity

C	29 to 42	Satisfactory	Satisfactory but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode	At capacity and requires other control mode
F	More than 70	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control mode or major treatment.

In order to undertake a comparison between the existing 'base case' and the 'proposed' traffic scenarios the net traffic generation predicted in **Section 6.2** has been distributed onto the key intersections. This distribution is in accordance with the NSW Bureau of Transport Statistics Journey to Work data identified in **Section 6.3** and the distribution patterns identified in the traffic surveys. A summary of the modelled results are provided below. Reference should also be made to the SIDRA outputs provided in **Appendix C** which provide detailed results for individual lanes and approaches.

Table 7: Intersection Performance: Am and Pm Peak Hour

Intersection Description	Control Type	Model	Period	Degree of Saturation	Intersection Delay	Level of Service
Parramatta Road / Bridge Road	Signals	AM	Existing	0.823	29.7	C
		AM	Future	0.848	30.7	C
		PM	Existing	0.727	24.7	B
		PM	Future	0.745	25.7	B
Parramatta Road / Knight Street	Signals	AM	Existing	0.763	15.1	B
		AM	Future	0.899	17.5	B
		PM	Existing	0.449	10	A
		PM	Future	0.467	11.1	A
Loftus Crescent / Subway Lane	Roundabout*	AM	Existing	0.348	5.5	A
		AM	Future	0.365	5.6	A
		PM	Existing	0.445	6.2	A
		PM	Future	0.461	6.3	A
Loftus Crescent / Subway Lane	Stop	AM	Existing	0.101	7.2	A
		AM	Future	0.123	7.5	A
		PM	Existing	0.183	7.5	A
		PM	Future	0.217	7.7	A

The Crescent / Subway Lane	Roundabout*	AM	Existing	0.497	8.9	A
		AM	Future	0.512	7	A
		PM	Existing	0.600	8.3	A
		PM	Future	0.611	8.5	A

*Movement for priority control intersections assessed for worst performing movement in accordance with RMS guidelines.

It can be seen from **Table 7** that the key intersections surrounding the site being Parramatta Road / Bridge Road, Parramatta Road / Knight Street, Loftus Crescent / Subway Lane and The Crescent / Subway Lane operate satisfactorily, with acceptable delays and spare capacity under the existing 'base case' scenario.

Under the 'future scenario, with the addition of development traffic in both the AM and the PM peak periods, these intersections maintain a good level of service with significant spare capacity resulting in a negligible change to the overall results for degree of saturation and intersection delay.

Furthermore, it can be seen that the intersection of Parramatta Road / Bridge Road to the west of site records a minimal change to intersection delay in the AM peak and PM peak, maintaining an acceptable level of service of 'C' in the AM peak period and 'B' in the PM peak period.

For the intersection of Parramatta Road / Knight Street the future scenarios record an acceptable level of service 'B' in the AM peak period and 'A' in the PM peak period with spare capacity in both peaks.

At Loftus Crescent / Subway Lane, the existing and future conditions record a level of service 'A' in the AM and PM peak with excellent operation / delay and spare capacity.

The intersection of The Crescent / Subway Lane also records a level of service 'A' in the AM and PM peak periods with excellent operation / delay and spare capacity.

In this regard the impacts of the planning proposal on the wider network are considered acceptable with no external improvements required to support the assessed development scheme. It is emphasised that the concept development is of a substantially lower scale and it is thus considered that any increases to intersection delays will be minimal.

7. Conclusions

In summary:

- TRAFFIX has been commissioned by Homebush Investments No. 1 Pty Ltd to undertake a Traffic Impact Assessment to evaluate a Planning Proposal for a conceptual development at 17-20 & 23-24 Loftus Crescent, Homebush.
- Based on the changes sought to the *Strathfield Local Environmental Plan 2012*, the development potential of the site could be for a building containing 50 apartments at No. 23-24 and a building containing 80 apartments and 700m^2 gross floor area of commercial space at No. 17-20.
- The car parking requirements for the above yields have been assessed to be 48 parking spaces for No. 23-23 and 93 parking spaces for No. 17-20. This is based on residential parking rates published under the RMS *Guide to Traffic Generating Developments*, which provides a lesser requirement to the *Strathfield Council Development Control Plan No. 20*, and can thus be adopted in accordance with the *Apartment Design Guide* and *State Environmental Planning Policy No. 65*.
- Not accounting for the existing land use, sensitivity testing has been assessed for a development scheme of a substantially larger scale, which generates the following traffic volumes:
    - 141 vehicle trips per hour during the morning peak period; and
    - 204 vehicle trips per hour during the evening peak period.
- In terms of the overall network performance arising from the Planning Proposal itself, as required under RMS Guidelines, two scenarios have been considered as follows:
    - Existing Model – All intersections operate well with acceptable delays and spare capacity.
    - Existing + Development Model – The additional generated traffic for the assessed development scheme will operate similarly to the existing situation during both weekday peak periods.

    As the concept development is of a substantially lower scale. It is expected that future development will have minimal impact on the operation of the surrounding network in the vicinity of the site, as such no external improvements are considered to be required to support the development at this planning proposal stage.

The above demonstrates that the Planning Proposal is supportable on traffic planning grounds, based on the concept plan that has been adopted for assessment purposes, recognising that further detailed investigations will be undertaken at the future development application stage.

Appendix A

Photographic Record

View looking east at the subject site frontage along Loftus Lane.

View looking west at the subject site frontage along Loftus Lane.

View looking north from the intersection of Loftus Lane and Subway Lane.

View looking south from the intersection of Loftus Lane and Subway Lane.

View looking east at rear of the subject site on Loftus Crescent.

View looking east at the intersection of Loftus Crescent and Subway Lane.

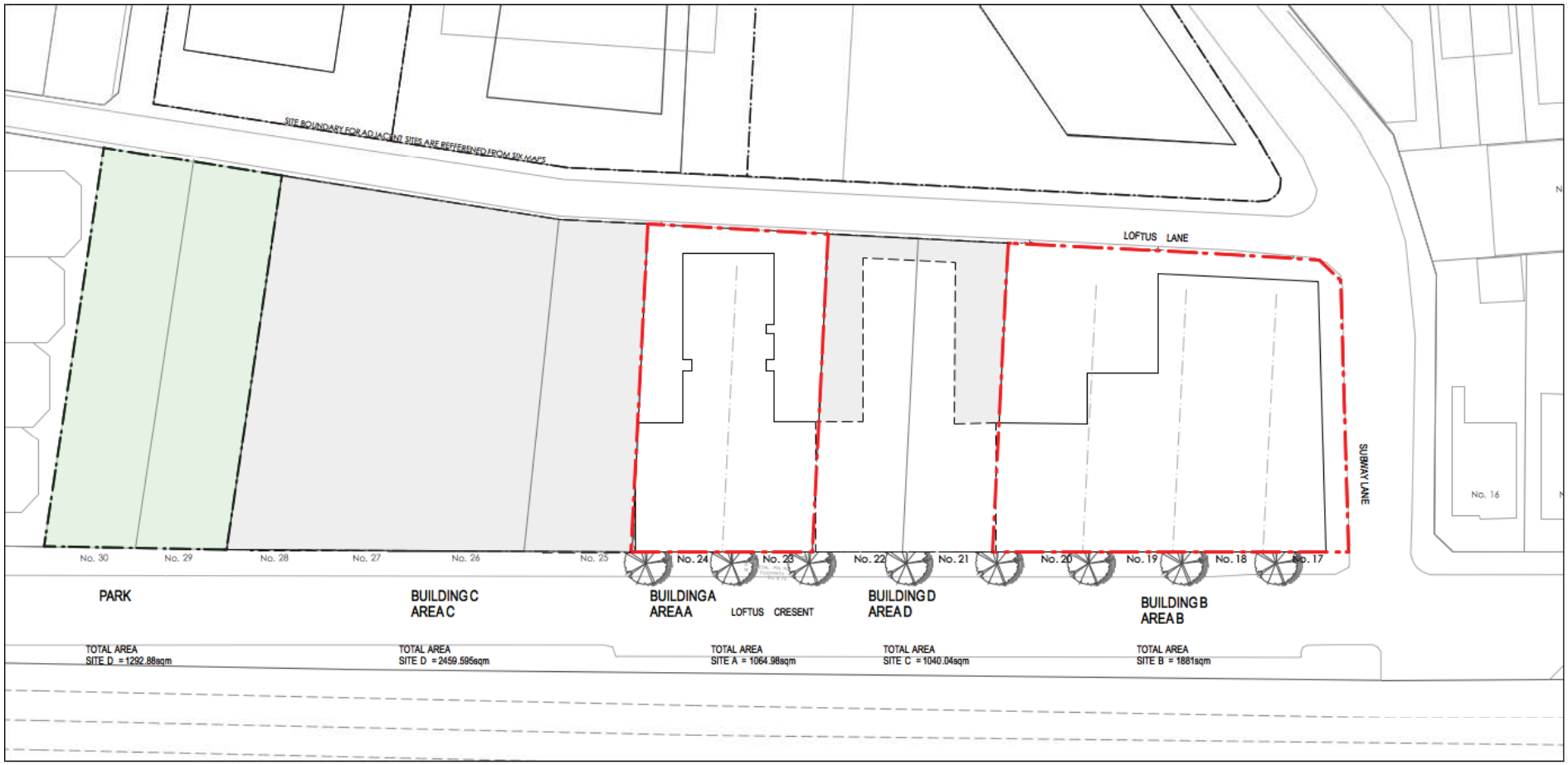
View looking east at the intersection of Parramatta Road and Bridge Road.

View looking east at the intersection of Parramatta Road and Knight Street.

Appendix B

Concept Plans and Yields

FSR CALCULATION PLAN



TOTAL SITE AREA	TOTAL GFA	FSR
BUILDING A (SUBJECT SITE)	3835	3.60
BUILDING B (SUBJECT SITE)	6815	3.6

1:500

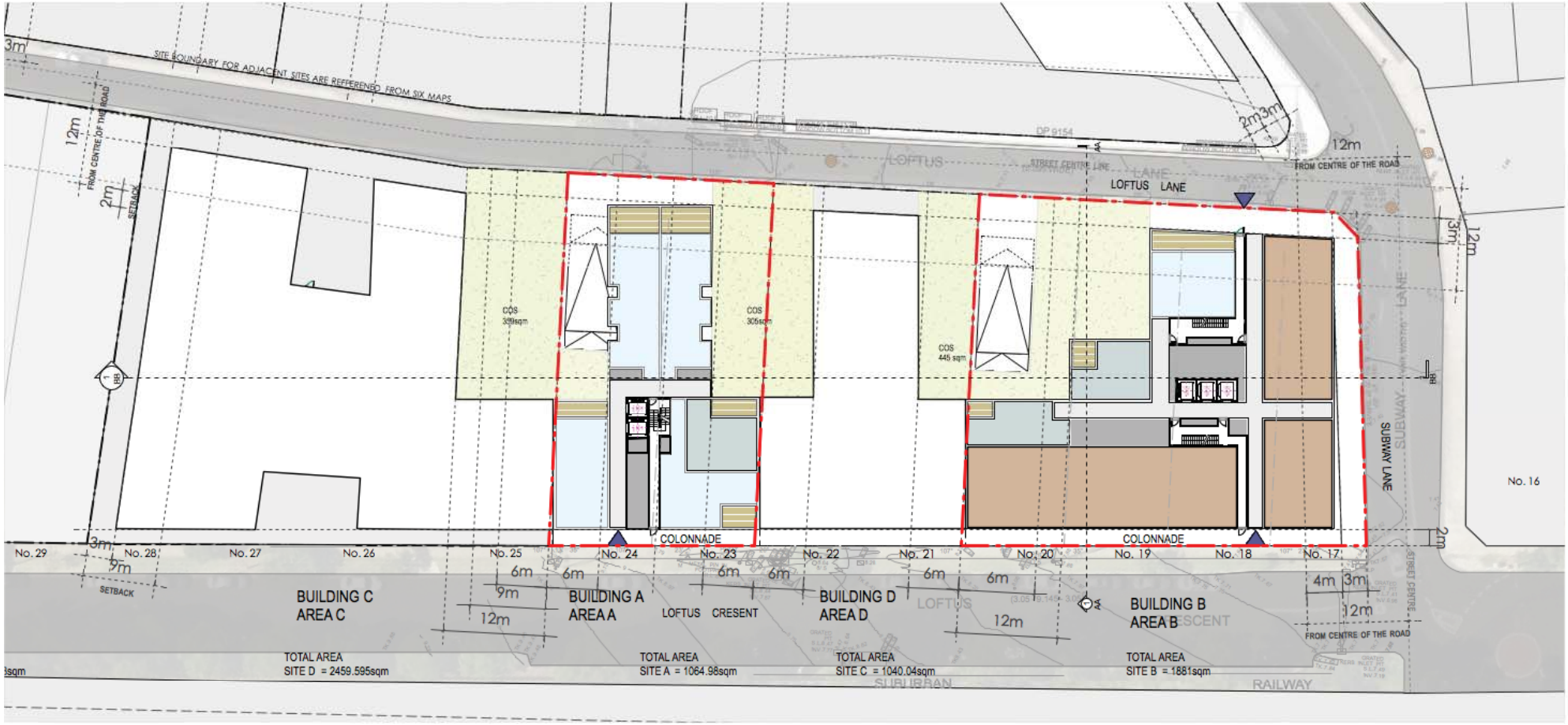
TYPICAL BASEMENT PLAN

KEY

POTENTIAL DEVELOPMENT BUILDING ENVELOPE

SUBJECT SITE

1:500



KEY

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- SUBJECT SITE
- LAND DEDICATION
- 1 BEDROOM APARTMENT
- 2 BEDROOMS APARTMENT
- 3 BEDROOMS APARTMENT
- COMMERCIAL / RETAIL
- ENTRY
- COS — COMMUNAL OPEN SPACE

1:500

KEY

- POTENTIAL DEVELOPMENT BUILDING ENVELOPE
- SUBJECT SITE
- LAND DEDICATION
- 1 BEDROOM APARTMENT
- 2 BEDROOMS APARTMENT
- 3 BEDROOMS APARTMENT
- COMMERCIAL / RETAIL
- ENTRY
- COS — COMMUNAL OPEN SPACE

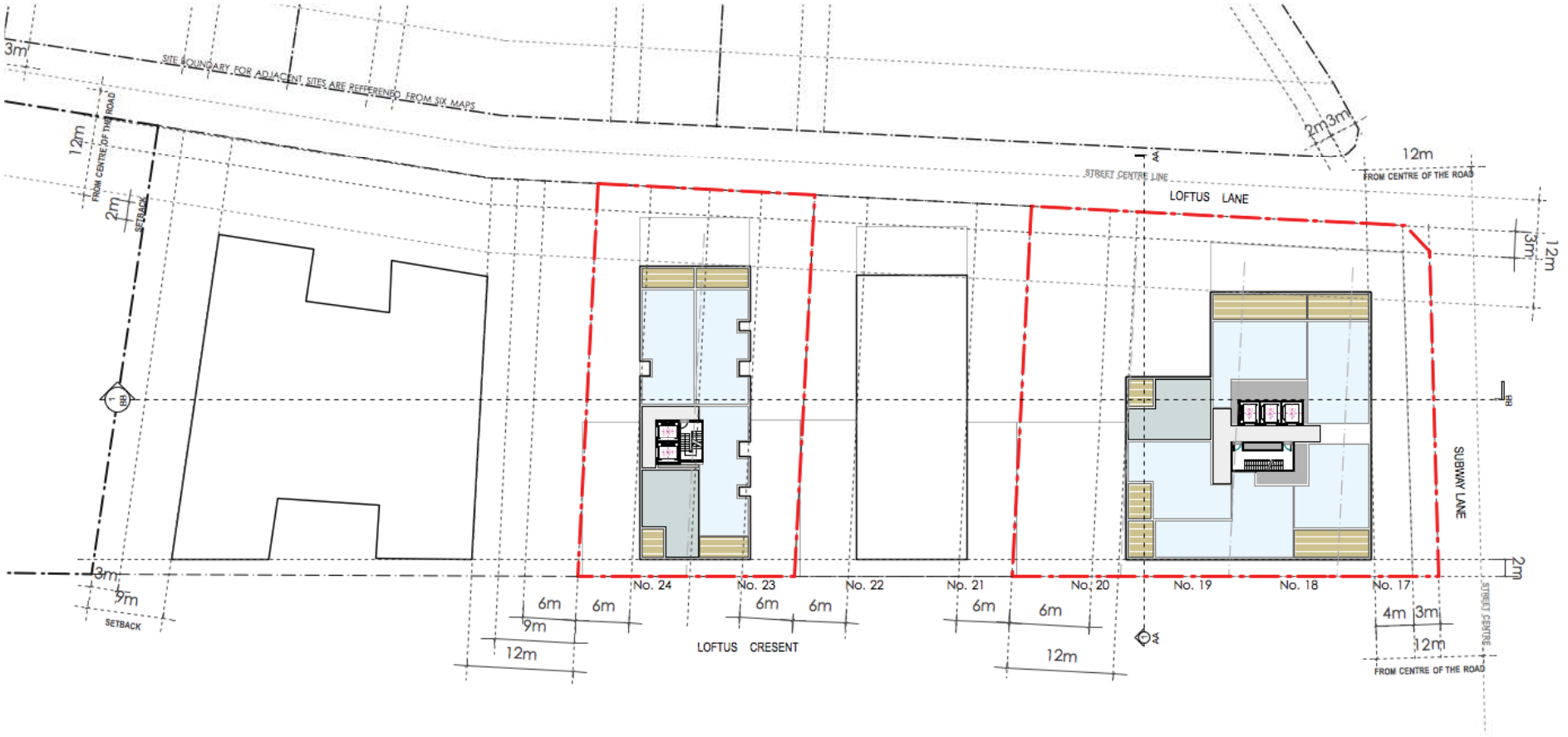
1:500

TYPICAL L05 FLOOR PLAN

KEY

- POTENTIAL DEVELOPMENT BUILDING ENVELOPE
- SUBJECT SITE
- LAND DEDICATION
- 1 BEDROOM APARTMENT
- 2 BEDROOMS APARTMENT
- 3 BEDROOMS APARTMENT
- COMMERCIAL / RETAIL
- ENTRY
- COS — COMMUNAL OPEN SPACE

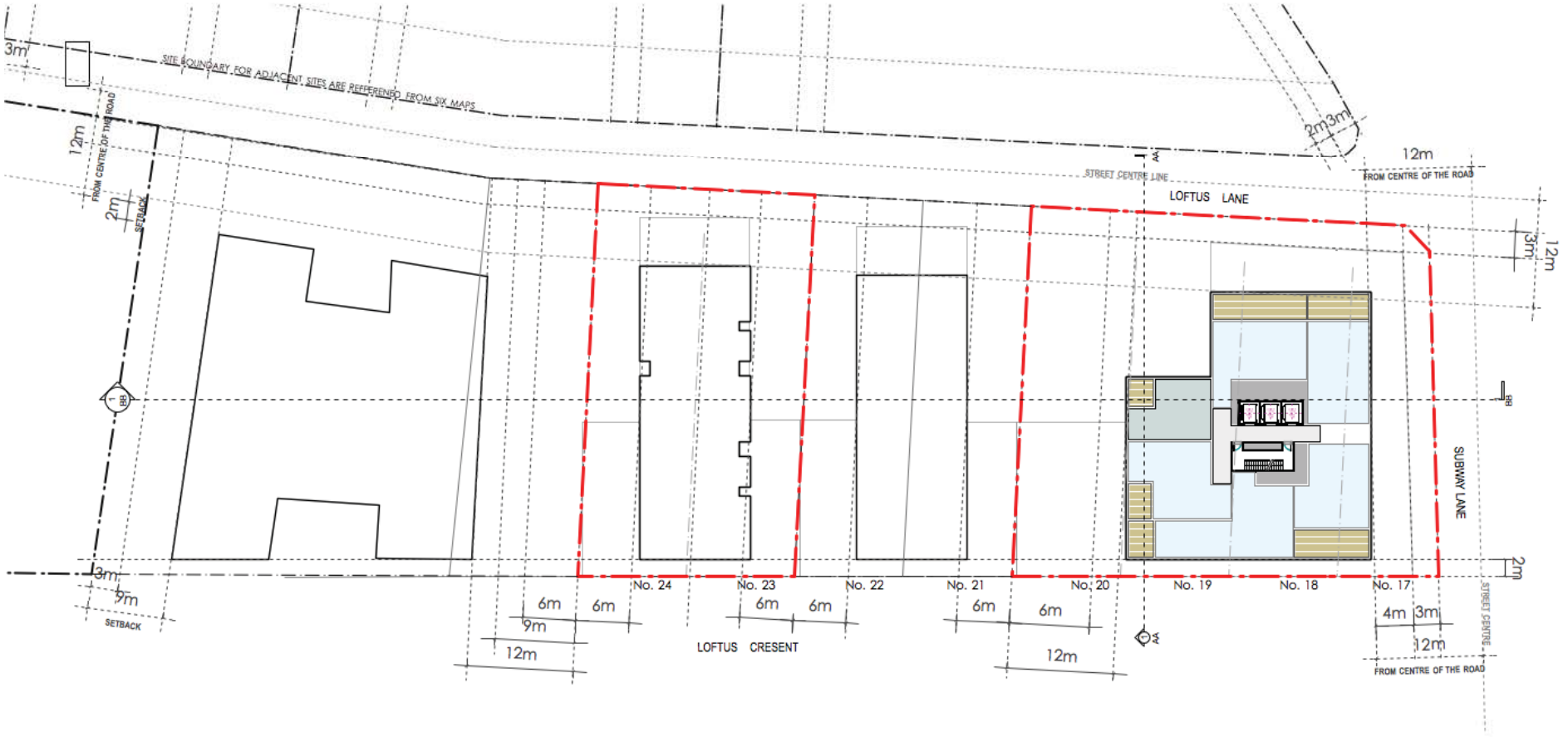
1:500



KEY

- POTENTIAL DEVELOPMENT BUILDING ENVELOPE
- SUBJECT SITE
- LAND DEDICATION
- 1 BEDROOM APARTMENT
- 2 BEDROOMS APARTMENT
- 3 BEDROOMS APARTMENT
- COMMERCIAL / RETAIL
- ENTRY
- COS — COMMUNAL OPEN SPACE

1:500



KEY

- POTENTIAL DEVELOPMENT BUILDING ENVELOPE
- SUBJECT SITE
- LAND DEDICATION
- 1 BEDROOM APARTMENT
- 2 BEDROOMS APARTMENT
- 3 BEDROOMS APARTMENT
- COMMERCIAL / RETAIL
- ENTRY
- COS — COMMUNAL OPEN SPACE

1:500

23-24 LOFTUS CRESCENT 1064.98 M²

YIELD SUMMARY

BUILDING A	NO. OF STOREY	GFA/LEVEL (M2)	COMMERCIAL GFA/LEVEL (M2)	UNITS/LEVEL	1 BED	2 BED	3 BED	2 HR SOLAR	CROSS VENT	TOTAL GFA (M2)	TOTAL UNITS
LEVEL 1 RESIDENTIAL	1	465		3	1	4		4	4	465	5
TYPICAL LEVEL 2 - 4 RESIDENTIAL	3	528		7	15	6		15	9	1584	21
TYPICAL LEVEL 5 RESIDENTIAL	1	295		4	1	3	0	3	4	295	4
TYPICAL LEVEL 6 - 10 RESIDENTIAL	5	295		4	5	15	0	16	20	1475	20
					22	**28**	**0**	**38**	**37**		
SUB TOTAL	**10**				**44%**	**56%**	**0%**	**76.0%**	**74%**	**3819**	**50**
								min. 70%	min. 60%		

TOTAL COM. GFA	0	M²
TOTAL RES. GFA	3819	M²
TOTAL LAND CONTRIBUTION	0	M²
TOTAL NO. OF UNITS	50	
TOTAL GFA	3819	M²
TOTAL FSR	3.6	:1

17-20 LOFTUS CRESCENT 1881 M²

BUILDING B	NO. OF STOREY	RESIDENTIAL GFA/LEVEL (M2)	COMMERCIAL GFA/LEVEL (M2)	UNITS/LEVEL	1 BED	2 BED	3 BED	2 HR SOLAR	CROSS VENT	TOTAL GFA (M2)	TOTAL UNITS
LEVEL 1 COMMERCIAL	1	235	700	NA	2	1		3	3	935	3
TYPICAL LEVEL 2 - 4 RESIDENTIAL	3	810		12	33	3		10	21	2430	36
TYPICAL LEVEL 5 RESIDENTIAL	1	420		5	4	1	0	9	4	420	5
TYPICAL LEVEL 6 - 10 RESIDENTIAL	5	495		6	5	25	0	4	26	2475	30
TYPICAL LEVEL 11 RESIDENTIAL	1	495		6	1	5	0	31	6	495	6
					45	**35**	**0**	**57**	**60**		
SUB TOTAL	**11**				**56%**	**44%**	**0%**	**71%**	**75%**	**6755**	**80**
								min. 70%	min. 60%		

TOTAL COM. GFA	700	M²
TOTAL RES. GFA	6055	M²
TOTAL LAND CONTRIBUTION	0	M²
TOTAL NO. OF UNITS	80	
TOTAL GFA	6755	M²
TOTAL FSR	3.6	:1

TOTAL SITE A, B AREA 2945.98 M²

BUILDINGS A, B		
TOTAL SITE AREA	2945.98	
TOTAL COM. GFA	700	M²
TOTAL RES. GFA	9874	M²
TOTAL LAND CONTRIBUTION	0	M²
TOTAL NO. OF UNITS	130	
TOTAL GFA	10574	M²
TOTAL FSR	3.6	:1

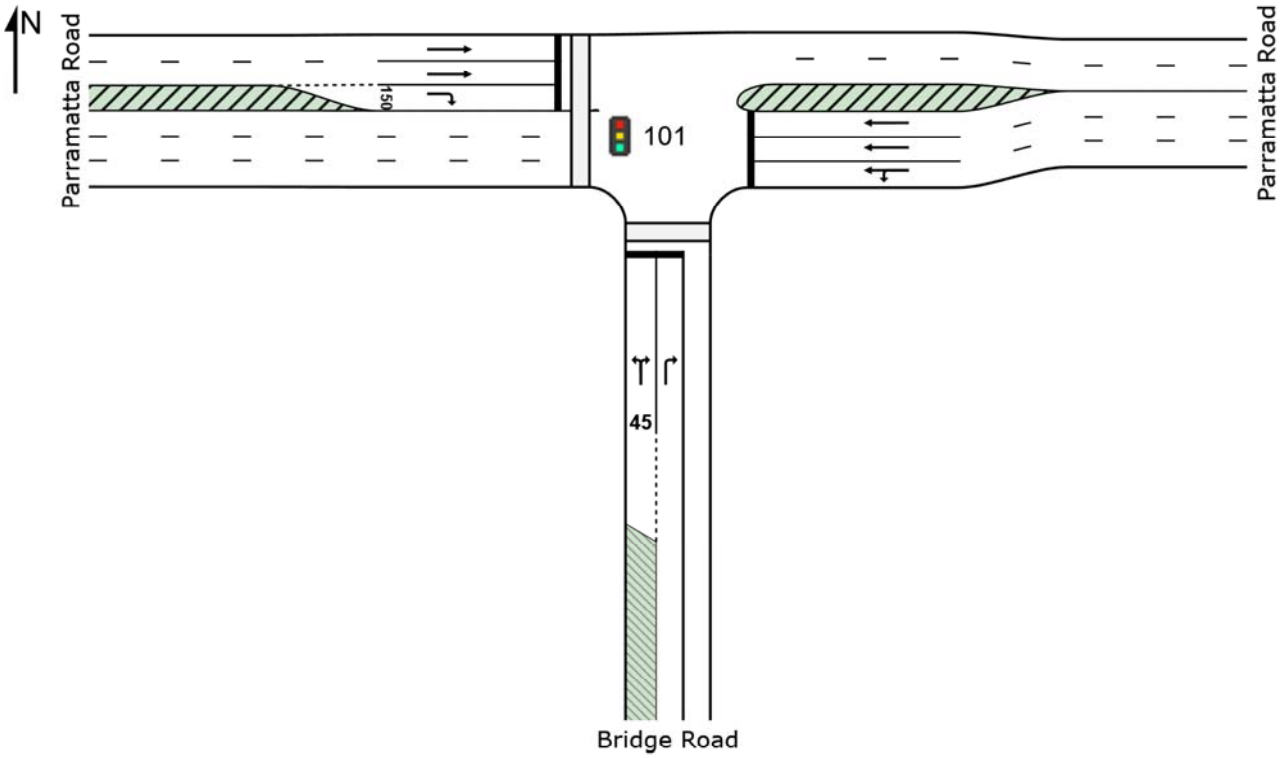
Appendix C

SIDRA Intersection Modelling Outputs

SITE LAYOUT

Site: 101 [Site 1 - AM]

Parramatta Rd and Bridge Rd Intersection
Signals - Fixed Time Isolated



MOVEMENT SUMMARY

Site: 101 [Site 1 - AM]

Parramatta Rd and Bridge Rd Intersection
Signals - Fixed Time Isolated Cycle Time = 110 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bridge Road											
1	L2	352	3.0	0.823	32.1	LOS C	14.0	100.7	0.63	0.82	33.7
3	R2	298	1.4	0.724	48.7	LOS D	15.3	108.7	0.98	0.87	26.0
Approach		649	2.3	0.823	39.7	LOS C	15.3	108.7	0.79	0.84	30.0
East: Parramatta Road											
4	L2	219	4.3	0.754	38.8	LOS C	23.3	169.5	0.92	0.85	30.3
5	T1	1288	4.7	0.754	33.6	LOS C	24.3	176.7	0.94	0.85	29.8
Approach		1507	4.7	0.754	34.4	LOS C	24.3	176.7	0.93	0.85	29.9
West: Parramatta Road											
11	T1	948	9.2	0.399	9.0	LOS A	11.5	86.9	0.49	0.44	47.4
12	R2	392	2.2	0.736	45.5	LOS D	17.2	122.3	0.96	1.04	29.8
Approach		1340	7.1	0.736	19.6	LOS B	17.2	122.3	0.63	0.61	38.6
All Vehicles		3497	5.2	0.823	29.7	LOS C	24.3	176.7	0.79	0.76	32.8

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	27.0	LOS C	0.1	0.1	0.70	0.70
P4	West Full Crossing	53	43.8	LOS E	0.1	0.1	0.89	0.89
All Pedestrians		105	35.4	LOS D			0.80	0.80

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 [Site 1 - PM]

Parramatta Rd and Bridge Rd Intersection
Signals - Fixed Time Isolated Cycle Time = 115 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bridge Road											
1	L2	205	0.5	0.727	27.1	LOS B	7.3	51.6	0.60	0.76	35.7
3	R2	155	0.7	0.699	59.9	LOS E	8.8	62.0	1.00	0.85	23.4
Approach		360	0.6	0.727	41.2	LOS C	8.8	62.0	0.77	0.79	29.6
East: Parramatta Road											
4	L2	308	0.7	0.698	35.8	LOS C	23.4	166.4	0.88	0.82	31.1
5	T1	1241	3.4	0.698	30.7	LOS C	24.3	174.8	0.89	0.80	31.2
Approach		1549	2.9	0.698	31.7	LOS C	24.3	174.8	0.89	0.80	31.1
West: Parramatta Road											
11	T1	1131	0.9	0.387	4.4	LOS A	10.1	70.9	0.35	0.32	53.1
12	R2	468	0.4	0.687	38.1	LOS C	18.7	131.1	0.90	1.01	32.1
Approach		1599	0.8	0.687	14.3	LOS A	18.7	131.1	0.51	0.52	42.4
All Vehicles		3508	1.7	0.727	24.7	LOS B	24.3	174.8	0.71	0.67	35.2

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	25.2	LOS C	0.1	0.1	0.66	0.66
P4	West Full Crossing	53	51.8	LOS E	0.2	0.2	0.95	0.95
All Pedestrians		105	38.5	LOS D			0.81	0.81

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

MOVEMENT SUMMARY

Site: 101 [Site 1 - Future AM]

Parramatta Rd and Bridge Rd Intersection
Signals - Fixed Time Isolated Cycle Time = 110 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bridge Road											
1	L2	352	3.0	0.848	36.3	LOS C	15.0	107.8	0.63	0.84	32.2
3	R2	298	1.4	0.754	50.8	LOS D	15.8	111.8	0.99	0.88	25.5
Approach		649	2.3	0.848	42.9	LOS D	15.8	111.8	0.80	0.86	29.0
East: Parramatta Road											
4	L2	219	4.3	0.763	39.3	LOS C	23.9	173.5	0.93	0.86	30.2
5	T1	1307	4.7	0.763	34.1	LOS C	24.8	180.7	0.94	0.86	29.6
Approach		1526	4.6	0.763	34.9	LOS C	24.8	180.7	0.94	0.86	29.7
West: Parramatta Road											
11	T1	948	9.2	0.393	8.5	LOS A	11.2	84.5	0.48	0.43	48.0
12	R2	420	2.0	0.767	46.8	LOS D	18.7	132.9	0.97	1.06	29.4
Approach		1368	7.0	0.767	20.2	LOS B	18.7	132.9	0.63	0.62	38.2
All Vehicles		3544	5.1	0.848	30.7	LOS C	24.8	180.7	0.79	0.77	32.3

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	27.0	LOS C	0.1	0.1	0.70	0.70
P4	West Full Crossing	53	44.6	LOS E	0.1	0.1	0.90	0.90
All Pedestrians		105	35.8	LOS D			0.80	0.80

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 [Site 1 - Future PM]

Parramatta Rd and Bridge Rd Intersection
Signals - Fixed Time Isolated Cycle Time = 115 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bridge Road											
1	L2	205	0.5	0.728	26.6	LOS B	7.2	51.0	0.59	0.75	35.9
3	R2	155	0.7	0.699	59.9	LOS E	8.8	62.0	1.00	0.85	23.4
Approach		360	0.6	0.728	40.9	LOS C	8.8	62.0	0.77	0.79	29.7
East: Parramatta Road											
4	L2	308	0.7	0.733	37.1	LOS C	24.7	175.5	0.90	0.84	30.7
5	T1	1284	3.3	0.733	32.0	LOS C	25.6	184.2	0.91	0.82	30.6
Approach		1593	2.8	0.733	33.0	LOS C	25.6	184.2	0.91	0.82	30.6
West: Parramatta Road											
11	T1	1131	0.9	0.387	4.4	LOS A	10.1	70.9	0.35	0.32	53.1
12	R2	516	0.4	0.745	39.6	LOS C	20.4	143.5	0.93	1.03	31.6
Approach		1646	0.8	0.745	15.4	LOS B	20.4	143.5	0.53	0.54	41.5
All Vehicles		3599	1.6	0.745	25.7	LOS B	25.6	184.2	0.72	0.69	34.7

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

Movement Performance - Pedestrians

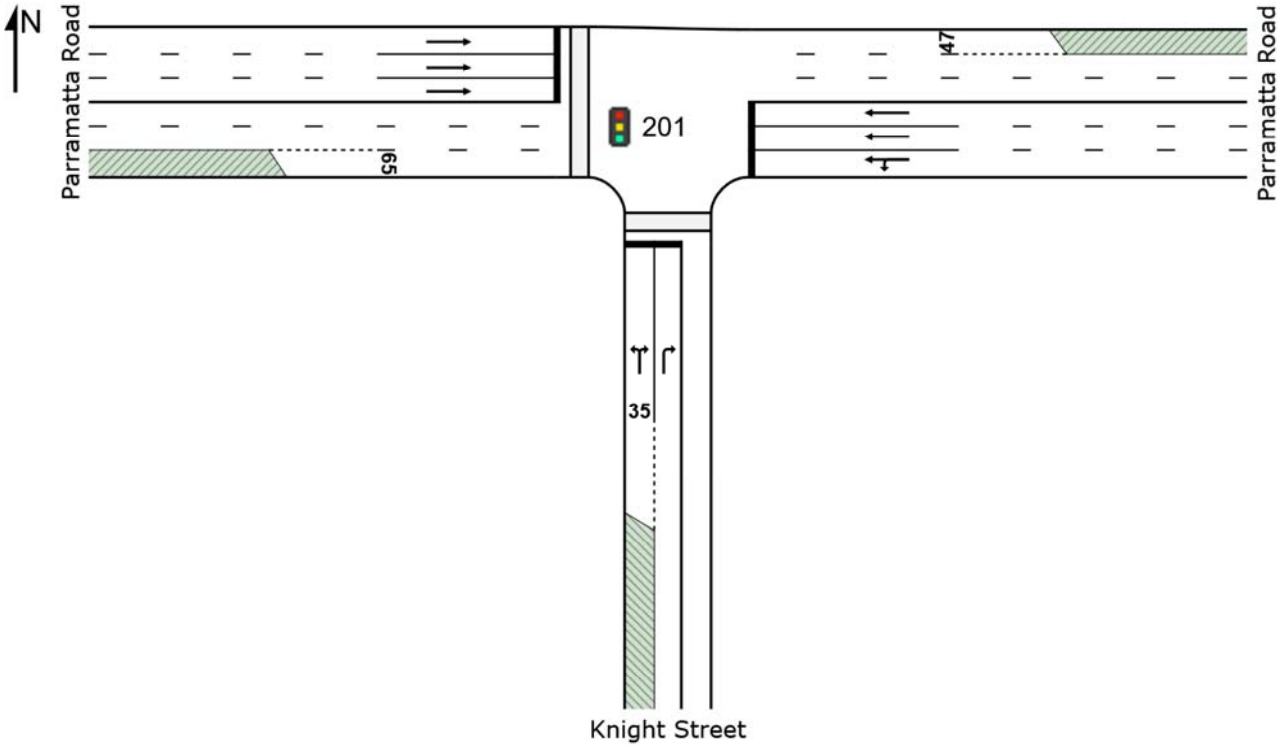
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	25.8	LOS C	0.1	0.1	0.67	0.67
P4	West Full Crossing	53	51.8	LOS E	0.2	0.2	0.95	0.95
All Pedestrians		105	38.8	LOS D			0.81	0.81

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

SITE LAYOUT

Site: 201 [Site 2 - AM]

Parramatta Rd and Knight St Intersection
Signals - Fixed Time Isolated



Organisation: TRAFFIX PTY LTD | Created: Tuesday, 31 October 2017 4:44:49 PM
Project: T:\Synergy\Projects\17\17.468\Modelling\Using Full PM Rate\Parramatta Rd-Knight St Intersection FULL PM RATE.sip7

MOVEMENT SUMMARY

Site: 201 [Site 2 - AM]

Parramatta Rd and Knight St Intersection
Signals - Fixed Time Isolated Cycle Time = 120 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Knight Street											
1	L2	145	0.7	0.763	57.2	LOS E	11.7	82.4	0.97	0.88	23.3
3	R2	277	1.1	0.763	55.9	LOS D	12.4	87.8	0.97	0.87	25.7
Approach		422	1.0	0.763	56.3	LOS D	12.4	87.8	0.97	0.87	24.9
East: Parramatta Road											
4	L2	209	1.5	0.213	13.0	LOS A	5.6	39.6	0.40	0.62	43.2
5	T1	1504	5.0	0.567	9.4	LOS A	20.7	151.3	0.53	0.50	44.9
Approach		1714	4.6	0.567	9.8	LOS A	20.7	151.3	0.52	0.51	44.5
West: Parramatta Road											
11	T1	1094	9.0	0.380	7.5	LOS A	11.1	83.9	0.43	0.38	47.4
Approach		1094	9.0	0.380	7.5	LOS A	11.1	83.9	0.43	0.38	47.4
All Vehicles		3229	5.6	0.763	15.1	LOS B	20.7	151.3	0.55	0.52	39.4

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	7.7	LOS A	0.1	0.1	0.36	0.36
P4	West Full Crossing	53	49.6	LOS E	0.2	0.2	0.91	0.91
All Pedestrians		105	28.7	LOS C			0.63	0.63

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: 201 [Site 2 - PM]

Parramatta Rd and Knight St Intersection
Signals - Fixed Time Isolated Cycle Time = 115 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Knight Street											
1	L2	85	0.0	0.447	54.9	LOS D	5.9	41.6	0.96	0.78	23.8
3	R2	153	2.1	0.447	53.4	LOS D	6.6	46.8	0.96	0.79	26.2
Approach		238	1.3	0.447	53.9	LOS D	6.6	46.8	0.96	0.79	25.4
East: Parramatta Road											
4	L2	141	1.5	0.168	10.9	LOS A	3.9	27.5	0.34	0.54	45.3
5	T1	1304	4.0	0.449	6.1	LOS A	13.1	95.0	0.42	0.39	49.0
Approach		1445	3.7	0.449	6.6	LOS A	13.1	95.0	0.41	0.41	48.4
West: Parramatta Road											
11	T1	1247	1.9	0.393	5.6	LOS A	10.9	77.7	0.38	0.34	50.0
Approach		1247	1.9	0.393	5.6	LOS A	10.9	77.7	0.38	0.34	50.0
All Vehicles		2931	2.8	0.449	10.0	LOS A	13.1	95.0	0.44	0.41	44.1

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	6.0	LOS A	0.1	0.1	0.32	0.32
P4	West Full Crossing	53	51.8	LOS E	0.2	0.2	0.95	0.95
All Pedestrians		105	28.9	LOS C			0.64	0.64

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: 201 [Site 2 - Future AM]

Parramatta Rd and Knight St Intersection
Signals - Fixed Time Isolated Cycle Time = 120 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Knight Street											
1	L2	165	0.6	0.899	70.2	LOS E	14.6	102.9	0.98	1.01	20.7
3	R2	299	1.1	0.899	69.3	LOS E	15.9	112.5	0.98	1.00	22.9
Approach		464	0.9	0.899	69.6	LOS E	15.9	112.5	0.98	1.00	22.2
East: Parramatta Road											
4	L2	209	1.5	0.214	13.0	LOS A	5.6	39.9	0.40	0.62	43.2
5	T1	1514	5.0	0.570	9.4	LOS A	20.9	152.7	0.54	0.50	44.8
Approach		1723	4.6	0.570	9.8	LOS A	20.9	152.7	0.52	0.52	44.5
West: Parramatta Road											
11	T1	1094	9.0	0.380	7.5	LOS A	11.1	83.9	0.43	0.38	47.4
Approach		1094	9.0	0.380	7.5	LOS A	11.1	83.9	0.43	0.38	47.4
All Vehicles		3281	5.6	0.899	17.5	LOS B	20.9	152.7	0.55	0.54	37.6

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	7.7	LOS A	0.1	0.1	0.36	0.36
P4	West Full Crossing	53	49.6	LOS E	0.2	0.2	0.91	0.91
All Pedestrians		105	28.7	LOS C			0.63	0.63

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: 201 [Site 2 - Future PM]

Parramatta Rd and Knight St Intersection
Signals - Fixed Time Isolated Cycle Time = 115 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Knight Street											
1	L2	109	0.0	0.458	53.2	LOS D	6.7	46.9	0.96	0.79	24.2
3	R2	162	1.9	0.458	51.6	LOS D	7.4	52.6	0.95	0.79	26.7
Approach		272	1.2	0.458	52.2	LOS D	7.4	52.6	0.95	0.79	25.7
East: Parramatta Road											
4	L2	141	1.5	0.175	11.6	LOS A	4.2	29.8	0.36	0.54	44.8
5	T1	1326	3.9	0.467	7.0	LOS A	14.3	103.7	0.45	0.42	47.8
Approach		1467	3.7	0.467	7.5	LOS A	14.3	103.7	0.44	0.43	47.3
West: Parramatta Road											
11	T1	1247	1.9	0.402	6.4	LOS A	11.7	83.0	0.41	0.37	48.9
Approach		1247	1.9	0.402	6.4	LOS A	11.7	83.0	0.41	0.37	48.9
All Vehicles		2986	2.7	0.467	11.1	LOS A	14.3	103.7	0.47	0.44	43.0

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

Movement Performance - Pedestrians

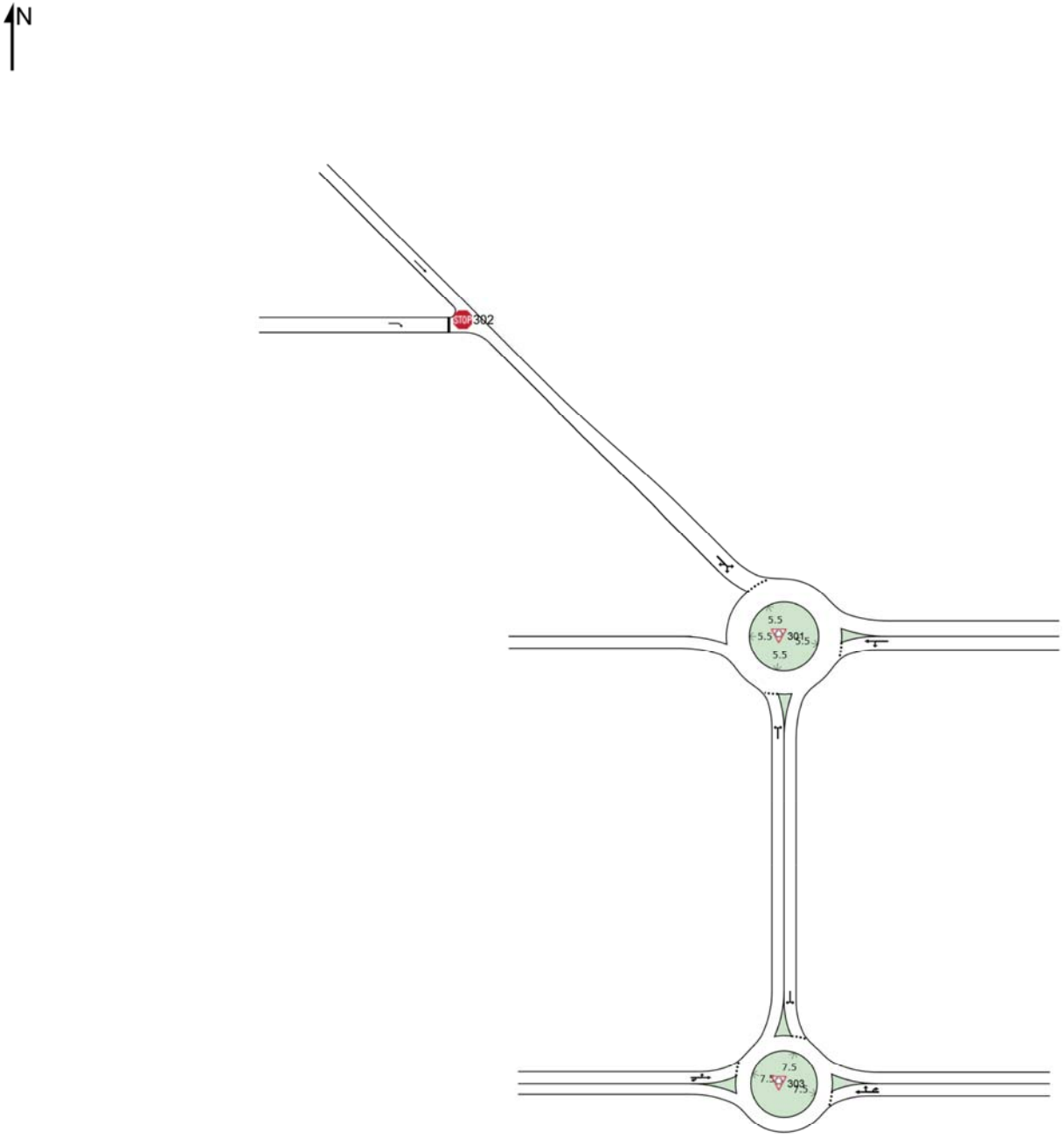
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	6.6	LOS A	0.1	0.1	0.34	0.34
P4	West Full Crossing	53	50.8	LOS E	0.2	0.2	0.94	0.94
All Pedestrians		105	28.7	LOS C			0.64	0.64

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 LAYOUT

Network: N101 [Subway Lane Roundabouts - AM]

New Network



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
301	NA	Site 3.1 AM
302	NA	Site 3.1.2 AM
303	NA	Site 3.2 AM

MOVEMENT SUMMARY

Site: 301 [Site 3.1 AM]

Network: N101 [Subway Lane Roundabouts - AM]

Subway Ln and Loftus Cres Roundabout

Roundabout

Movement Performance - Vehicles													
Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Subway Lane													
1	L2	126	1.7	126	1.7	0.325	2.8	LOS A	2.4	17.1	0.11	0.58	43.5
3	R2	373	1.1	373	1.1	0.325	4.7	LOS A	2.4	17.1	0.11	0.58	44.0
Approach		499	1.3	499	1.3	0.325	4.2	LOS A	2.4	17.1	0.11	0.58	43.8
East: Loftus Crescent													
4	L2	367	0.6	367	0.6	0.348	5.5	LOS A	2.1	15.0	0.39	0.57	43.0
5	T1	8	0.0	8	0.0	0.348	4.8	LOS A	2.1	15.0	0.39	0.57	45.9
Approach		376	0.6	376	0.6	0.348	5.5	LOS A	2.1	15.0	0.39	0.57	43.2
NorthWest: Subway Lane													
27a	L1	41	0.0	41	0.0	0.183	2.5	LOS A	0.7	4.8	0.39	0.65	44.5
29a	R1	129	0.0	129	0.0	0.183	4.2	LOS A	0.7	4.8	0.39	0.65	13.3
29b	R3	4	0.0	4	0.0	0.183	5.4	LOS A	0.7	4.8	0.39	0.65	44.6
Approach		175	0.0	175	0.0	0.183	3.8	LOS A	0.7	4.8	0.39	0.65	36.4
All Vehicles		1049	0.8	1049	0.8	0.348	4.6	LOS A	2.4	17.1	0.26	0.59	43.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 302 [Site 3.1.2 AM]

Network: N101 [Subway Lane Roundabouts - AM]

Subway Ln and Loftus Cres Intersection
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
NorthWest: Subway Lane													
28	T1	77	0.0	77	0.0	0.042	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
Approach		77	0.0	77	0.0	0.042	0.0	NA	0.0	0.0	0.00	0.00	50.0
West: Loftus Crescent													
12a	R1	98	0.0	98	0.0	0.101	7.2	LOS A	0.3	2.3	0.17	0.90	42.1
Approach		98	0.0	98	0.0	0.101	7.2	LOS A	0.3	2.3	0.17	0.90	42.1
All Vehicles		175	0.0	175	0.0	0.101	4.0	NA	0.3	2.3	0.10	0.51	45.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 303 [Site 3.2 AM]

Network: N101 [Subway Lane Roundabouts - AM]

Subway Ln and The Crescent Intersection
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: The Crescent													
5	T1	191	1.7	191	1.7	0.497	4.8	LOS A	4.7	33.0	0.48	0.58	45.3
6	R2	411	1.5	411	1.5	0.497	7.6	LOS A	4.7	33.0	0.48	0.58	41.8
6u	U	4	0.0	4	0.0	0.497	8.9	LOS A	4.7	33.0	0.48	0.58	45.4
Approach		605	1.6	605	1.6	0.497	6.7	LOS A	4.7	33.0	0.48	0.58	43.4
North: Subway Lane													
7	L2	393	0.3	393	0.3	0.495	4.6	LOS A	4.2	29.4	0.66	0.65	43.0
9	R2	104	1.0	104	1.0	0.495	6.9	LOS A	4.2	29.4	0.66	0.65	43.6
Approach		497	0.4	497	0.4	0.495	5.1	LOS A	4.2	29.4	0.66	0.65	43.2
West: The Crescent													
10	L2	88	0.0	88	0.0	0.385	7.8	LOS A	2.6	18.7	0.72	0.75	41.5
11	T1	217	1.9	217	1.9	0.385	7.5	LOS A	2.6	18.7	0.72	0.75	45.1
12u	U	1	0.0	1	0.0	0.385	11.6	LOS A	2.6	18.7	0.72	0.75	45.3
Approach		306	1.4	306	1.4	0.385	7.6	LOS A	2.6	18.7	0.72	0.75	44.5
All Vehicles		1408	1.1	1408	1.1	0.497	6.3	LOS A	4.7	33.0	0.59	0.64	43.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 301 [Site 3.1 PM]

Network: N101 [Subway Lane Roundabouts - PM]

Subway Ln and Loftus Cres Roundabout

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Subway Lane													
1	L2	39	5.4	39	5.4	0.186	2.9	LOS A	1.2	8.6	0.13	0.59	43.1
3	R2	224	0.9	224	0.9	0.186	4.7	LOS A	1.2	8.6	0.13	0.59	43.7
Approach		263	1.6	263	1.6	0.186	4.4	LOS A	1.2	8.6	0.13	0.59	43.6
East: Loftus Crescent													
4	L2	366	0.9	366	0.9	0.445	6.2	LOS A	2.4	16.9	0.50	0.63	42.6
5	T1	15	7.1	15	7.1	0.445	5.7	LOS A	2.4	16.9	0.50	0.63	45.6
Approach		381	1.1	381	1.1	0.445	6.2	LOS A	2.4	16.9	0.50	0.63	42.8
NorthWest: Subway Lane													
27a	L1	34	0.0	34	0.0	0.270	1.9	LOS A	0.9	6.4	0.32	0.62	44.9
29a	R1	209	1.0	209	1.0	0.270	3.6	LOS A	0.9	6.4	0.32	0.62	14.5
29b	R3	5	20.0	5	20.0	0.270	5.0	LOS A	0.9	6.4	0.32	0.62	44.4
Approach		248	1.3	248	1.3	0.270	3.4	LOS A	0.9	6.4	0.32	0.62	33.3
All Vehicles		893	1.3	893	1.3	0.445	4.9	LOS A	2.4	16.9	0.34	0.62	42.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.2 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 302 [Site 3.1.2 PM]

Network: N101 [Subway Lane Roundabouts - PM]

Subway Ln and Loftus Cres Intersection
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
NorthWest: Subway Lane													
28	T1	103	1.0	103	1.0	0.068	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
Approach		103	1.0	103	1.0	0.068	0.0	NA	0.0	0.0	0.00	0.00	50.0
West: Loftus Crescent													
12a	R1	145	1.4	145	1.4	0.183	7.5	LOS A	0.5	3.7	0.22	0.90	42.0
Approach		145	1.4	145	1.4	0.183	7.5	LOS A	0.5	3.7	0.22	0.90	42.0
All Vehicles		248	1.3	248	1.3	0.183	4.4	NA	0.5	3.7	0.13	0.53	45.0

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.2 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 303 [Site 3.2 PM]

Network: N101 [Subway Lane Roundabouts - PM]

Subway Ln and The Crescent Intersection
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: The Crescent													
5	T1	144	0.0	144	0.0	0.288	4.4	LOS A	2.2	15.3	0.35	0.55	45.7
6	R2	202	1.6	202	1.6	0.288	7.2	LOS A	2.2	15.3	0.35	0.55	42.4
6u	U	6	0.0	6	0.0	0.288	8.5	LOS A	2.2	15.3	0.35	0.55	45.8
Approach		353	0.9	353	0.9	0.288	6.1	LOS A	2.2	15.3	0.35	0.55	44.3
North: Subway Lane													
7	L2	496	0.6	496	0.6	0.600	5.9	LOS A	5.8	40.7	0.76	0.73	41.9
9	R2	80	2.6	80	2.6	0.600	8.3	LOS A	5.8	40.7	0.76	0.73	42.3
Approach		576	0.9	576	0.9	0.600	6.3	LOS A	5.8	40.7	0.76	0.73	42.0
West: The Crescent													
10	L2	61	1.7	61	1.7	0.324	5.9	LOS A	2.2	15.4	0.52	0.58	42.9
11	T1	265	0.0	265	0.0	0.324	5.5	LOS A	2.2	15.4	0.52	0.58	46.0
12u	U	2	0.0	2	0.0	0.324	9.6	LOS A	2.2	15.4	0.52	0.58	46.1
Approach		328	0.3	328	0.3	0.324	5.6	LOS A	2.2	15.4	0.52	0.58	45.6
All Vehicles		1257	0.8	1257	0.8	0.600	6.0	LOS A	5.8	40.7	0.58	0.64	43.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.2 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 301 [Site 3.1 Future AM]

Network: N101 [Subway Lane Roundabouts - Future AM]

Subway Ln and Loftus Cres Roundabout

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Subway Lane													
1	L2	136	1.6	136	1.6	0.331	2.8	LOS A	2.5	17.6	0.11	0.58	43.5
3	R2	373	1.1	373	1.1	0.331	4.7	LOS A	2.5	17.6	0.11	0.58	44.0
Approach		508	1.2	508	1.2	0.331	4.2	LOS A	2.5	17.6	0.11	0.58	43.8
East: Loftus Crescent													
4	L2	367	0.6	367	0.6	0.365	5.6	LOS A	2.2	15.5	0.42	0.58	42.9
5	T1	8	0.0	8	0.0	0.365	5.0	LOS A	2.2	15.5	0.42	0.58	45.8
Approach		376	0.6	376	0.6	0.365	5.6	LOS A	2.2	15.5	0.42	0.58	43.0
NorthWest: Subway Lane													
27a	L1	83	0.0	83	0.0	0.248	2.6	LOS A	1.0	6.8	0.41	0.65	44.6
29a	R1	148	0.0	148	0.0	0.248	4.3	LOS A	1.0	6.8	0.41	0.65	13.3
29b	R3	4	0.0	4	0.0	0.248	5.5	LOS A	1.0	6.8	0.41	0.65	44.7
Approach		236	0.0	236	0.0	0.248	3.7	LOS A	1.0	6.8	0.41	0.65	39.3
All Vehicles		1120	0.8	1120	0.8	0.365	4.6	LOS A	2.5	17.6	0.28	0.60	43.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.0 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 302 [Site 3.1.2 Future AM]

Network: N101 [Subway Lane Roundabouts - Future AM]

Subway Ln and Loftus Cres Intersection
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
NorthWest: Subway Lane													
28	T1	138	0.0	138	0.0	0.087	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
Approach		138	0.0	138	0.0	0.087	0.0	NA	0.0	0.0	0.00	0.00	50.0
West: Loftus Crescent													
12a	R1	98	0.0	98	0.0	0.123	7.5	LOS A	0.3	2.4	0.24	0.90	41.9
Approach		98	0.0	98	0.0	0.123	7.5	LOS A	0.3	2.4	0.24	0.90	41.9
All Vehicles		236	0.0	236	0.0	0.123	3.1	NA	0.3	2.4	0.10	0.37	46.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.0 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 303 [Site 3.2 Future AM]

Network: N101 [Subway Lane Roundabouts - Future AM]

Subway Ln and The Crescent Intersection
Roundabout

Movement Performance - Vehicles													
Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: The Crescent													
5	T1	191	1.7	191	1.7	0.504	4.8	LOS A	4.8	33.9	0.49	0.58	45.3
6	R2	420	1.5	420	1.5	0.504	7.6	LOS A	4.8	33.9	0.49	0.58	41.7
6u	U	4	0.0	4	0.0	0.504	8.9	LOS A	4.8	33.9	0.49	0.58	45.4
Approach		615	1.5	615	1.5	0.504	6.7	LOS A	4.8	33.9	0.49	0.58	43.3
North: Subway Lane													
7	L2	412	0.3	412	0.3	0.512	4.6	LOS A	4.4	31.0	0.67	0.65	43.0
9	R2	104	1.0	104	1.0	0.512	7.0	LOS A	4.4	31.0	0.67	0.65	43.5
Approach		516	0.4	516	0.4	0.512	5.1	LOS A	4.4	31.0	0.67	0.65	43.1
West: The Crescent													
10	L2	88	0.0	88	0.0	0.389	7.9	LOS A	2.7	18.9	0.73	0.75	41.4
11	T1	217	1.9	217	1.9	0.389	7.6	LOS A	2.7	18.9	0.73	0.75	45.1
12u	U	1	0.0	1	0.0	0.389	11.7	LOS A	2.7	18.9	0.73	0.75	45.2
Approach		306	1.4	306	1.4	0.389	7.7	LOS A	2.7	18.9	0.73	0.75	44.4
All Vehicles		1437	1.1	1437	1.1	0.512	6.3	LOS A	4.8	33.9	0.60	0.64	43.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.0 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 301 [Site 3.1 Future PM]

Network: N101 [Subway Lane Roundabouts - Future PM]

Subway Ln and Loftus Cres Roundabout

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Subway Lane													
1	L2	60	3.5	60	3.5	0.200	2.9	LOS A	1.3	9.4	0.13	0.58	43.3
3	R2	224	0.9	224	0.9	0.200	4.7	LOS A	1.3	9.4	0.13	0.58	43.8
Approach		284	1.5	284	1.5	0.200	4.3	LOS A	1.3	9.4	0.13	0.58	43.7
East: Loftus Crescent													
4	L2	366	0.9	366	0.9	0.461	6.3	LOS A	2.4	17.2	0.52	0.64	42.6
5	T1	15	7.1	15	7.1	0.461	5.8	LOS A	2.4	17.2	0.52	0.64	45.5
Approach		381	1.1	381	1.1	0.461	6.3	LOS A	2.4	17.2	0.52	0.64	42.8
NorthWest: Subway Lane													
27a	L1	67	0.0	67	0.0	0.316	2.0	LOS A	1.1	7.7	0.33	0.62	45.1
29a	R1	220	1.0	220	1.0	0.316	3.6	LOS A	1.1	7.7	0.33	0.62	14.6
29b	R3	5	20.0	5	20.0	0.316	5.0	LOS A	1.1	7.7	0.33	0.62	44.6
Approach		293	1.1	293	1.1	0.316	3.3	LOS A	1.1	7.7	0.33	0.62	37.4
All Vehicles		958	1.2	958	1.2	0.461	4.8	LOS A	2.4	17.2	0.35	0.62	42.5

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.8 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 302 [Site 3.1.2 Future PM]

Network: N101 [Subway Lane Roundabouts - Future PM]

Subway Ln and Loftus Cres Intersection
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
NorthWest: Subway Lane													
28	T1	147	0.7	147	0.7	0.109	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
Approach		147	0.7	147	0.7	0.109	0.0	NA	0.0	0.0	0.00	0.00	50.0
West: Loftus Crescent													
12a	R1	145	1.4	145	1.4	0.217	7.7	LOS A	0.5	3.8	0.27	0.90	41.9
Approach		145	1.4	145	1.4	0.217	7.7	LOS A	0.5	3.8	0.27	0.90	41.9
All Vehicles		293	1.1	293	1.1	0.217	3.8	NA	0.5	3.8	0.13	0.45	45.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.8 %
Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 303 [Site 3.2 Future PM]

Network: N101 [Subway Lane Roundabouts - Future PM]

Subway Ln and The Crescent Intersection
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: The Crescent													
5	T1	144	0.0	144	0.0	0.304	4.4	LOS A	2.3	16.5	0.35	0.56	45.6
6	R2	223	1.4	223	1.4	0.304	7.2	LOS A	2.3	16.5	0.35	0.56	42.4
6u	U	6	0.0	6	0.0	0.304	8.5	LOS A	2.3	16.5	0.35	0.56	45.8
Approach		374	0.8	374	0.8	0.304	6.1	LOS A	2.3	16.5	0.35	0.56	44.2
North: Subway Lane													
7	L2	506	0.6	506	0.6	0.611	6.1	LOS A	6.1	42.8	0.77	0.74	41.8
9	R2	80	2.6	80	2.6	0.611	8.5	LOS A	6.1	42.8	0.77	0.74	42.2
Approach		586	0.9	586	0.9	0.611	6.4	LOS A	6.1	42.8	0.77	0.74	41.8
West: The Crescent													
10	L2	61	1.7	61	1.7	0.333	6.1	LOS A	2.3	15.8	0.54	0.60	42.8
11	T1	265	0.0	265	0.0	0.333	5.7	LOS A	2.3	15.8	0.54	0.60	45.9
12u	U	2	0.0	2	0.0	0.333	9.8	LOS A	2.3	15.8	0.54	0.60	46.1
Approach		328	0.3	328	0.3	0.333	5.8	LOS A	2.3	15.8	0.54	0.60	45.6
All Vehicles		1288	0.7	1288	0.7	0.611	6.2	LOS A	6.1	42.8	0.59	0.65	43.8

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.
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Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 1.8 %
Number of Iterations: 10 (maximum specified: 10)

Appendix D

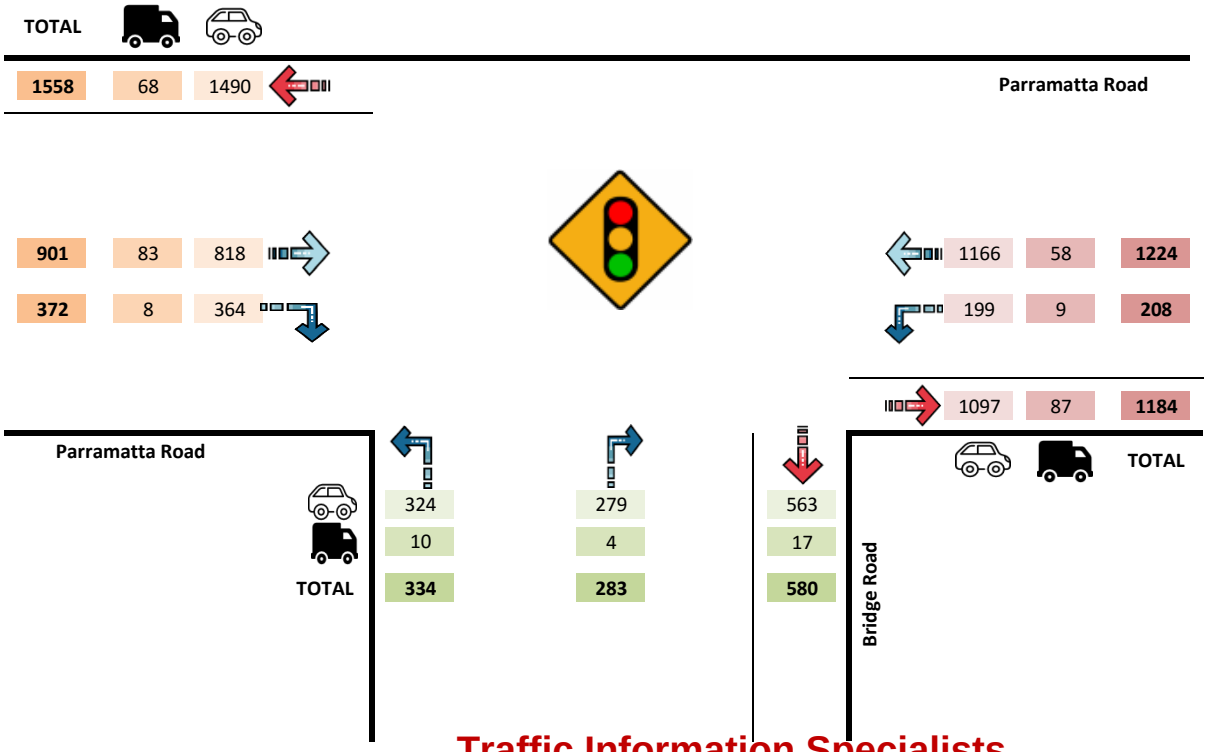
Traffic Survey Data

Location	-	**Duration**	0700 - 0900
	Parramatta Road		1600 - 1800
	Bridge Road		-
	Parramatta Road	**Day/Date**	Monday, 23 October 2017
Suburb	HOMEBUSH	**Weather**	-

DATA SELECTION

Select Time:

TIME RANGE		
PEAK	-	AM
PEAK		
7:45	-	8:45



Traffic Information Specialists

ABN: 42 613 389 923

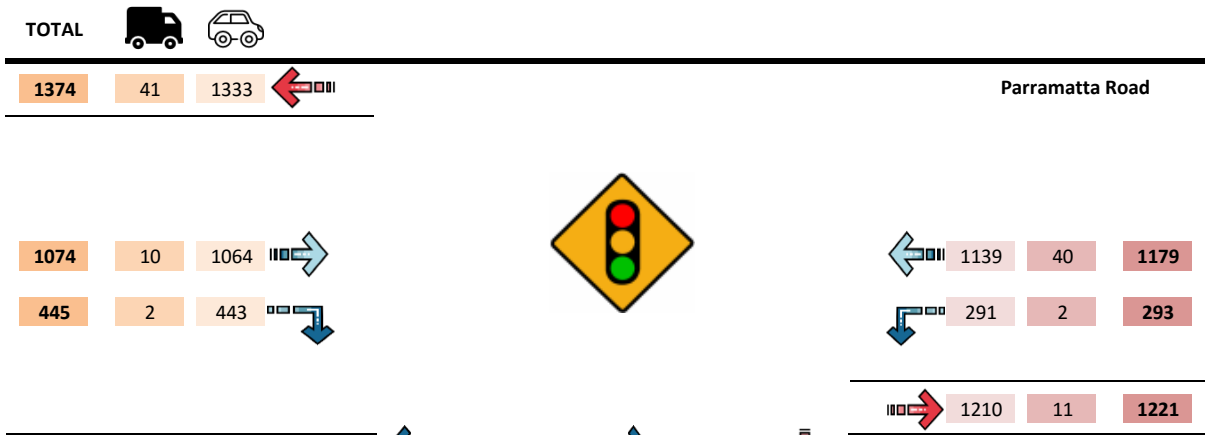
Email info@trafficinfospecialist.com.au

Location	-	**Duration**	0700 - 0900
	Parramatta Road		1600 - 1800
	Bridge Road		-
	Parramatta Road	**Day/Date**	Monday, 23 October 2017
Suburb	HOMEBUSH	**Weather**	-

DATA SELECTION

Select Time: PEAK

TIME RANGE		
PEAK	-	PM
PEAK		
17:00	-	18:00



Traffic Information Specialists

ABN: 42 613 389 923

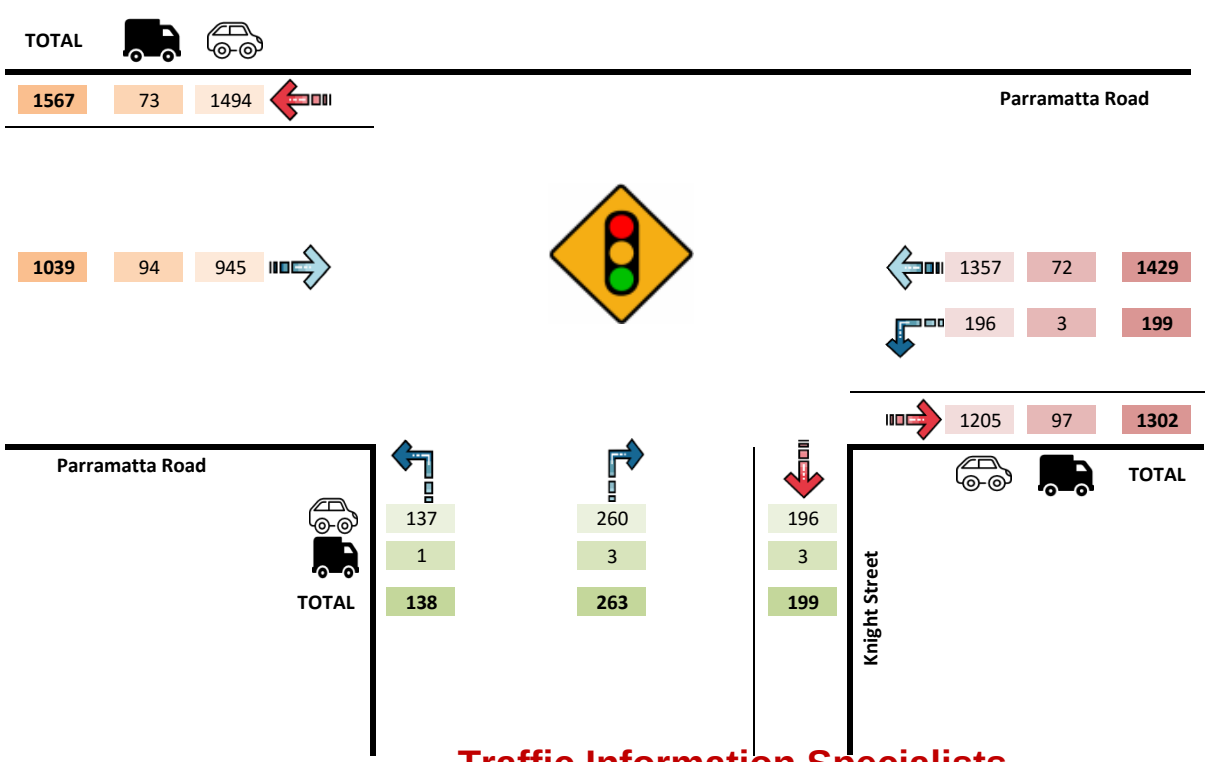
Email info@trafficinfospecialist.com.au

Location	-	**Duration**	0700 - 0900
	Parramatta Road		1600 - 1800
	Knight Street		-
	Parramatta Road	**Day/Date**	Monday, 23 October 2017
Suburb	HOMEBUSH	**Weather**	-

DATA SELECTION

Select Time:

TIME RANGE		
PEAK	-	AM
PEAK		
7:45	-	8:45



Traffic Information Specialists

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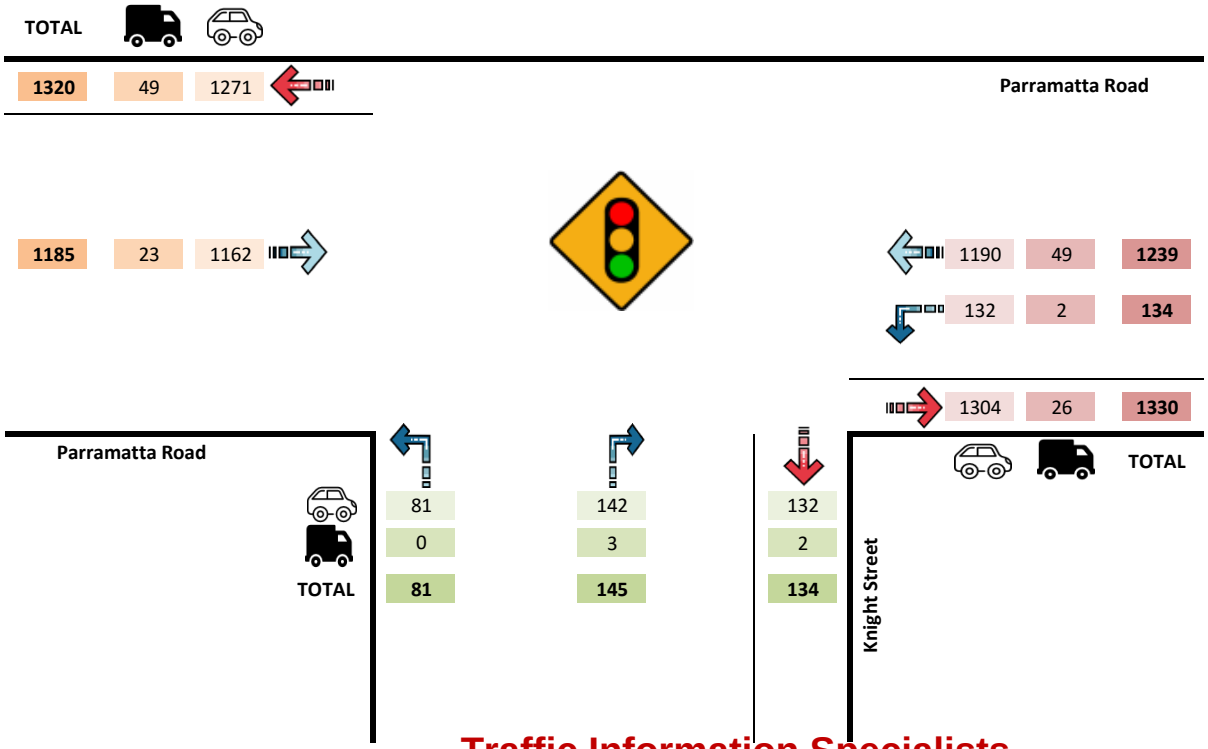
Email info@trafficinfospecialist.com.au

Location	-	**Duration**	0700 - 0900
	Parramatta Road		1600 - 1800
	Knight Street		-
	Parramatta Road	**Day/Date**	Monday, 23 October 2017
Suburb	HOMEBUSH	**Weather**	-

DATA SELECTION

Select Time: PEAK

TIME RANGE		
PEAK	-	PM
PEAK		
17:00	-	18:00



Traffic Information Specialists

ABN: 42 613 389 923

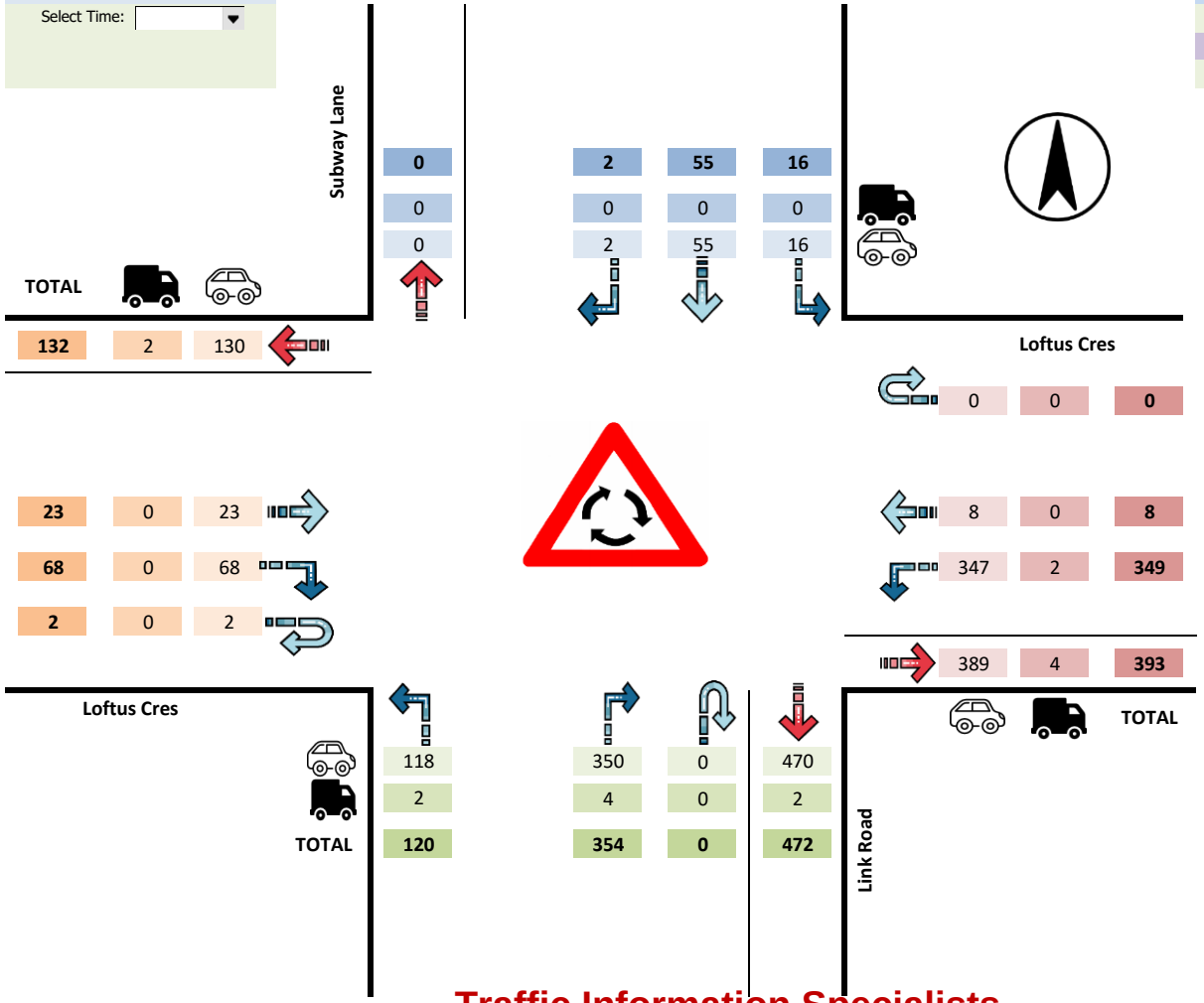
Email info@trafficinfospecialist.com.au

Location	Subway Lane	Duration	0700 - 0900
	Loftus Cres		1600 - 1800
	Link Road		-
	Loftus Cres	Day/Date	Monday, 23 October 2017
Suburb	HOMEBUSH	Weather	-

DATA SELECTION

Select Time:

TIME RANGE		
PEAK	-	AM
PEAK		
7:45	-	8:45



Traffic Information Specialists

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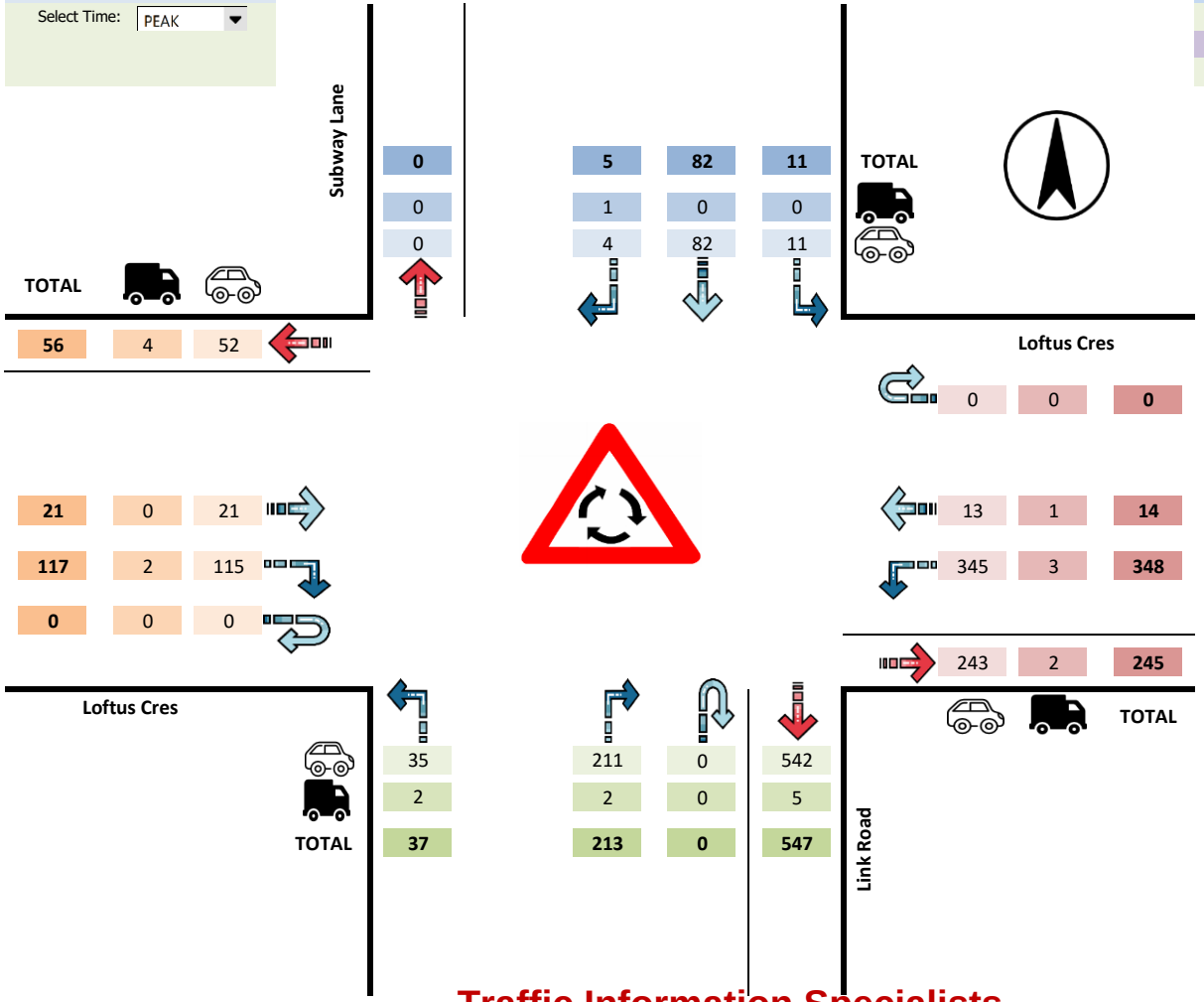
Location	Subway Lane	Duration	0700 - 0900
	Loftus Cres		1600 - 1800
	Link Road		-
	Loftus Cres	Day/Date	Monday, 23 October 2017
Suburb	HOMEBUSH	Weather	-

DATA SELECTION

Select Time: PEAK

TIME RANGE		
PEAK	-	PM
PEAK		
17:00	-	18:00



Traffic Information Specialists

ABN: 42 613 389 923

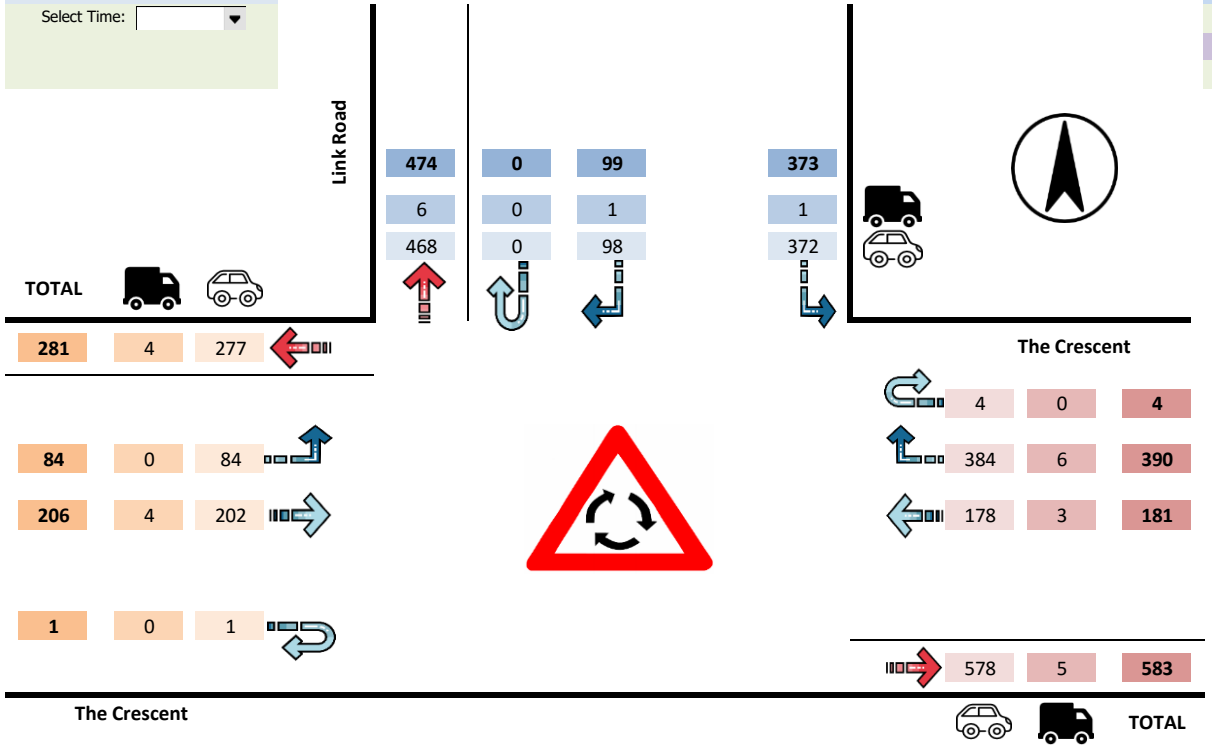
Email info@trafficinfospecialist.com.au

Location	Link Road	Duration	0700 - 0900
	The Crescent		1600 - 1800
	-		-
	The Crescent	Day/Date	Monday, 23 October 2017
Suburb	HOMEBUSH	Weather	-

DATA SELECTION

Select Time:

TIME RANGE		
PEAK	-	AM
PEAK		
7:45	-	8:45



Traffic Information Specialists

ABN: 42 613 389 923

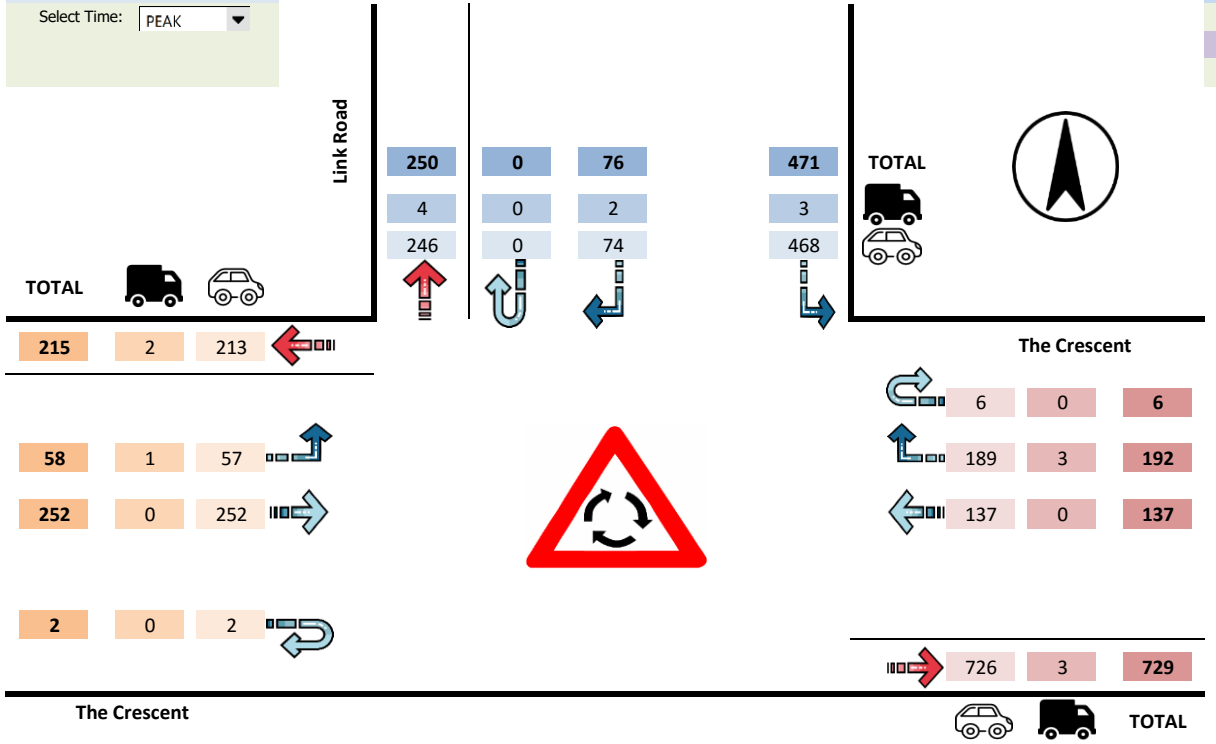
Email info@trafficinfospecialist.com.au

Location	Link Road	**Duration**	0700 - 0900
	The Crescent		1600 - 1800
	-		-
	The Crescent	**Day/Date**	Monday, 23 October 2017
Suburb	HOMEBUSH	**Weather**	-

DATA SELECTION

Select Time: PEAK

TIME RANGE		
PEAK	-	PM
PEAK		
17:00	-	18:00



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