TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

TRAFFIC IMPACT ASSESSMENT (TIA)

Planning Proposal
Hollylea Road, Leumeah

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TRAFFIX

CONTENTS

1. INTRODUCTION

TRAFFIX has been commissioned by Samaro Homes to undertake a Traffic Impact Assessment in relation to a Planning Proposal at Hollylea Road in Leumeah. Approval is sought for nine (9) land parcels to be rezoned as *'B4 - Mixed Use'* under the *Campbelltown Local Environmental Plan 2015* as well as to vary the Floor Space Ratio controls for the site.

A Concept Scheme has been prepared by Hatch comprising residential, retail and commercial land uses. This report assesses the traffic impacts and parking requirements arising from this scheme, which is considered to be representative of the site being developed to its full potential based on the proposed planning controls.

The report is structured as follows:

- 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: Responds to TfNSW Letter
- Section 9: Presents the overall study conclusions

2. LOCATION AND SITE

The subject site is located in Leumeah and encompasses nine (9) parcels of land fronting Hollylea Road. In a regional context, it lies approximately 150 metres southwest of Leumeah Station.

The site has an irregular shaped configuration with a site area of approximately 3.2 hectares. It has a single frontage to Hollylea Road to the west that is approximately 315 metres in length. The site is otherwise bound by a restaurant development to the north and by vacant crown land to the west and to the south.

Under the Campbelltown Local Environmental Plan 2015, the site has a 'B5 – Business Development' zoning. A summary of the properties and existing developments operating within the site is provided in **Table 1**.

Table 1: Existing Developments On-Site

Address	Land Use	Estimated GFA
2 Hollyea Road	Bulky Goods	2,000m^2
4A Hollylea Road		
4 Hollylea Road	Used Car Yard	1,000m^2
6 Hollylea Road	Automotive Services and Dog Wash Service	1,000m^2
8 Hollylea Road		
10 Hollylea Road	Automotive Service	500m^2
12 Hollylea Road		1,400m^2
14 Hollylea Road	Trailer Hire	1,000m^2
Campbelltown Road (Section Lot)	Vacant	-

Collectively, a total of 13 vehicular crossings service these properties, all of which are located on Hollylea Road.

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.

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:

- Campbelltown Road: a TfNSW Main Road (MR 177) that generally runs in a north-south direction between the Hume Highway in the north and Moore Street in the south. Campbelltown Road carries approximately 45,000 vehicles per day (ADDT 2018) in both directions In the vicinity of the site. It has a posted speed limit of 60 km/h and generally accommodates two (2) lanes of traffic in either direction within a divided carriageway. 'No Stopping' restrictions are in place on both kerbsides within the vicinity of the site.
- Plough Inn Road: an unclassified Regional Road (7190) that runs in an east-west direction between Leumeah Railway Station commuter carpark in the east and Campbelltown Road in the west. In the vicinity of the site, Plough Inn Road has a posted speed limit of 60 km/h and accommodates two (2) lanes of traffic in either direction within a divided carriageway. 'No Stopping' on-street parking restrictions are in place along its northern kerbside and unrestricted kerb side parallel parking is permitted along its southern kerbside, east of its intersection with Hollylea Road.
- Harbord Road: a local road that generally runs in a north – south direction between North Steyne Road in the north and Campbelltown Road in the south. In the vicinity of the site, Harbord Street is subject to a speed limit of 50 km/h and accommodates a single lane of traffic in either direction and 'No Stopping' restrictions are in place long both kerbsides in the vicinity of the site.
- Hollylea Road: a local road that generally runs in a north-south direction between two cul-de-sacs which are formed in the north and in the south. Hollylea Road is subject to 50km/hr speed zoning and permits travel in both directions. Hollylea Road permits

unrestricted parallel kerbside parking along both kerbsides in the vicinity of the site.

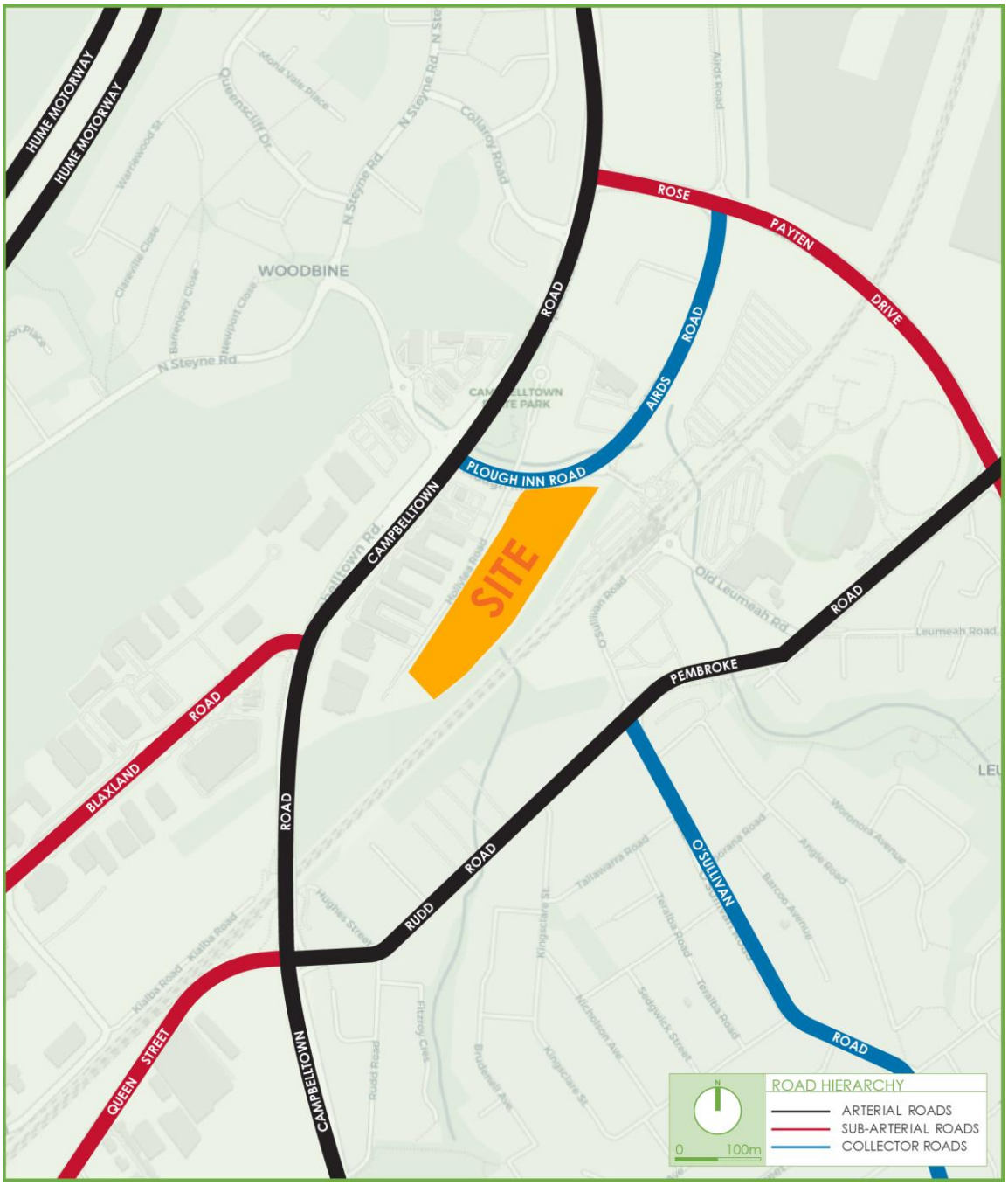


Figure 3: Road Hierarchy

3.2 Key Intersections

Two (2) key intersections have been identified in the vicinity of the site. These intersections are located at the junction of main thoroughfares that will be utilised by users associated with future developments.

3.2.1 Plough Inn Road and Hollylea Road

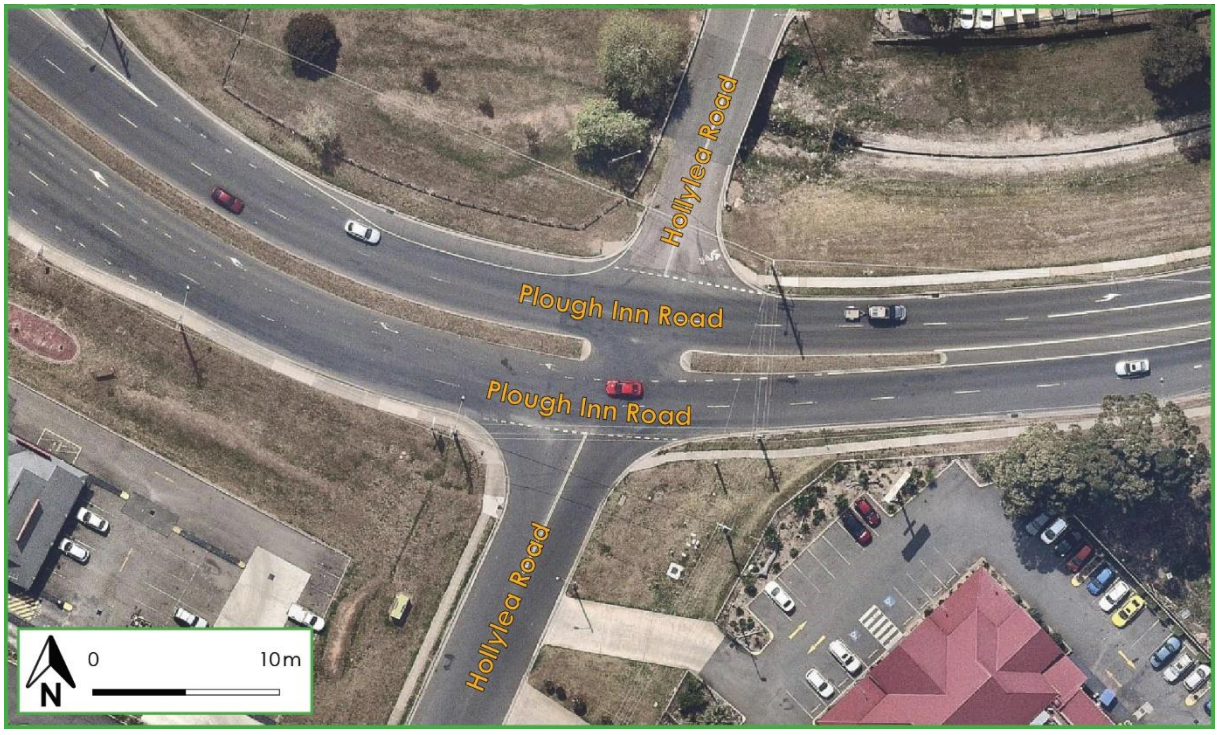


Figure 4: Intersection of Plough Inn Road and Hollylea Road

It can be seen from **Figure 4** that the intersection of Plough Inn Road and Hollylea Road is a four-legged priority controlled intersection, with priority given to Plough Inn Road, which is separated by a divided carriageway. The main attributes of each approach are outlined below:

- Plough Inn Road (east and west legs)
  - The eastern approach provides two (2) through lanes of traffic, with a single additional slip lane provided for traffic from Campbelltown Road (southbound) that ends prior to the intersection.
  - The western approach provides two (2) through lanes of traffic however, permissible on-street parking prior to the intersection can limit it to one (1) through lane of traffic.

- Hollylea Road (north and south legs)
  - Both approaches provide one (1) lane of traffic from which all turns can be made. It is noted that both approaches provide a width large enough for a vehicle to turn left, while simultaneously allowing another vehicle to turn right or head straight.

3.2.2 Campbelltown Road, Plough Inn Road and Harbord Road

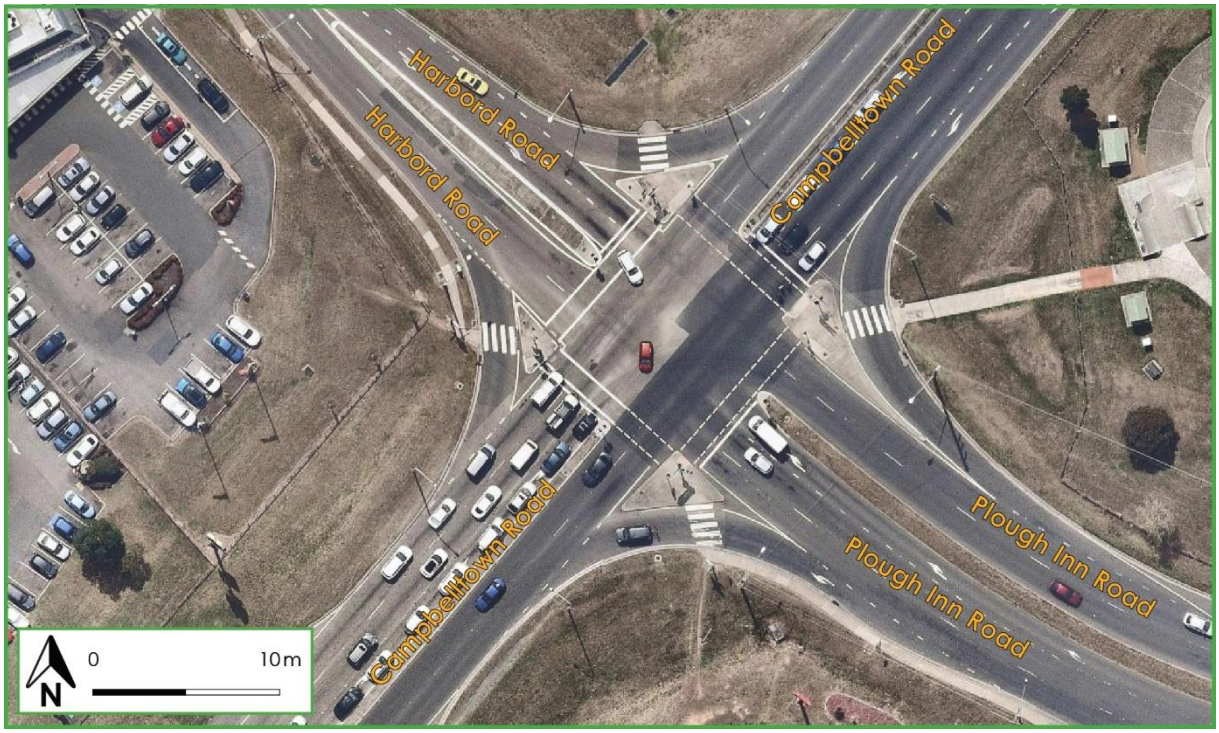


Figure 5: Intersection of Campbelltown Road, Plough Inn Road and Harbord Road

It can be seen from **Figure 5** that the intersection of Campbelltown Road, Plough Inn Road and Harbord Road is a four-legged signalised cross-intersection, with all legs provided with signalised pedestrian crossings, as well as left-turn slip lanes with a zebra crossing. The main attributes of each approach are outlined below:

- Campbelltown Road (north and south legs)
  - The northern approach provides two (2) through lanes of traffic, one (1) right-turn only lane and a single additional slip lane for left-turns onto Harbord Road.
  - The southern approach provides two (2) through lanes of traffic, one (1) right-turn only lane and one (1) left-turn only lane onto Plough Inn Road.
- Plough Inn Road (east leg)

- The western approach provides two (2) through lanes of traffic, one (1) right-turn only lane and one (1) left-turn only lane onto Campbelltown Road (southbound).

- Harbord Road (west leg)
  - The eastern approach provides one (1) through lane, one (1) right-turn only lane and a single additional slip lane for left-turns onto Campbelltown Road (northbound).

3.3 Public Transport

The public transport services operating in the locality is illustrated in **Figure 6**. It is evident that the site is within 150 metres of Leumeah Station which is serviced by the T8 Airport and South Line. This line offers direct services to the Sydney central business district as well as key regional destinations such as Campbelltown to the south and Liverpool to the north.

There are also various bus stops located within 400 metres (optimal walking distance) of the site. These bus stops are serviced by the following routes:

- 870 – Campbelltown to Liverpool
- 871 – Campbelltown to Liverpool via Glenfield
- 872 – Campbelltown to Liverpool via Macquarie Fields
- 877 – Campbelltown to Kearns via Eagle Vale and Eschol Park (Loop Service)
- 878 – Kearns to Campbelltown Eschol Park
- 879 – Leumeah to Campbelltown via Blair Athol
- 881 – Campbelltown to Leumeah North (Loop Service)

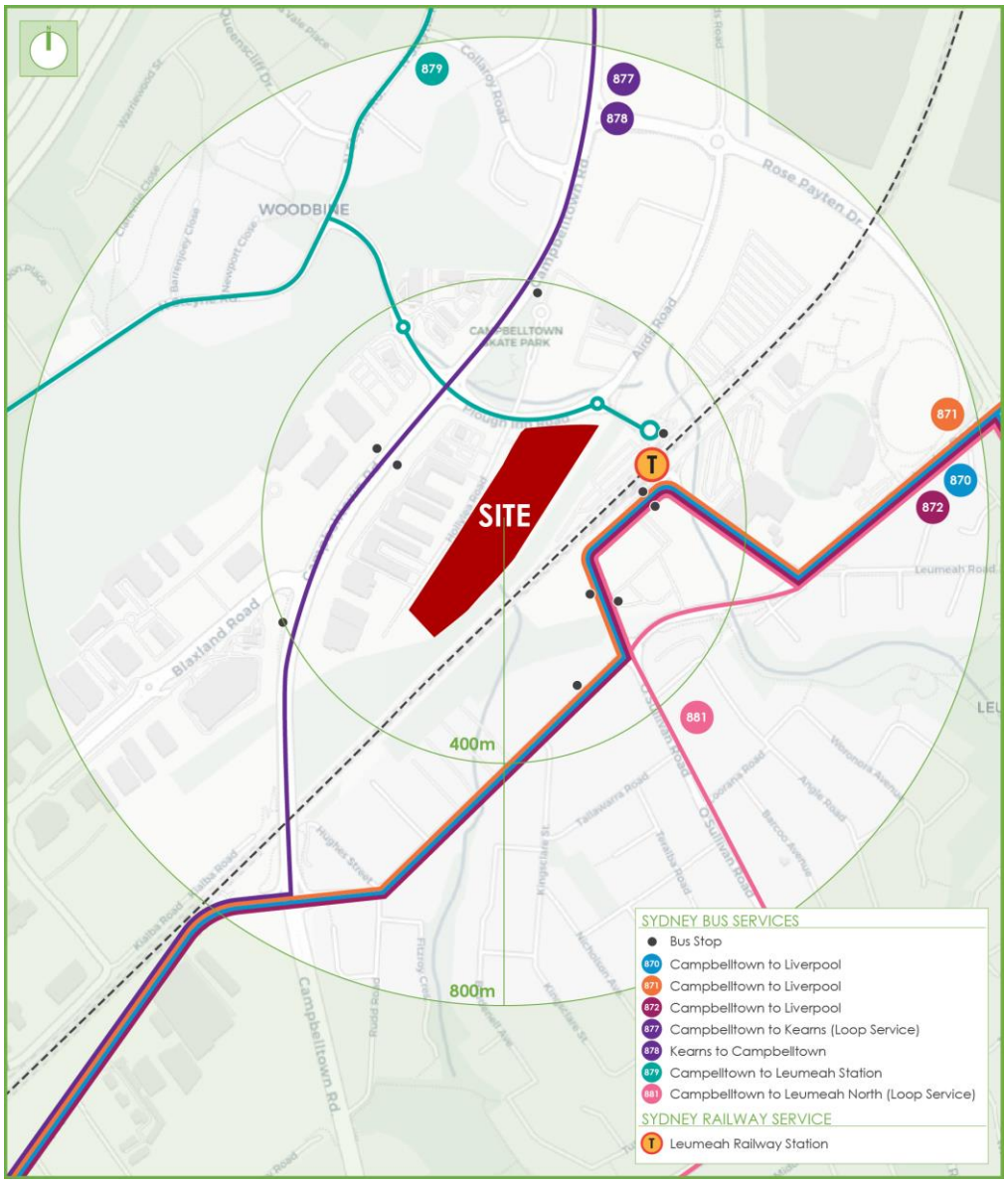


Figure 6: Public Transport

4. DESCRIPTION OF PROPOSED DEVELOPMENT

A full description of the changes sought under the *Campbelltown Local Environmental Plan 2015* can be found in the Planning Proposal, prepared separately. In summary, approval is sought to rezone the site for *'B4 – Mixed Use'* development as well as to vary the floor space ratio controls for the site.

A Concept Scheme has been developed by Hatch which incorporates a maximum height of 12 storeys and floor space ratio of 3.1:1 and this is considered to be representative of the site as developed to its full potential under the proposed planning controls. This comprises of residential, retail and commercial land uses, with the maximum yields summarised in **Table 2**.

Table 2: Concept Scheme Yields

Land Use	Approximate Yield
Residental	1,022 Units (95,247m^2 GFA)
Retail/Commercial	21,349m^2 GFA

For the purposes of assessment, it is assumed that 50% of the retail/commercial component will be situated at ground level with all vehicular access provided from Hollylea Road. The following breakdown has also been assumed for the residential component:

- One Bedroom: 30% (307 dwellings)
- Two Bedroom: 60% (613 dwellings)
- Three Bedroom: 10% (102 dwellings)

The parking requirements and traffic impacts arising from the Concept Scheme are discussed in **Sections 5** and **Section 6**, respectively. Potential improvements to the active transport network are discussed in **Section 7**. Reference should also be made to the Concept Drawings prepared by Hatch which are presented in **Appendix B**.

5. PARKING REQUIREMENTS

Parking for new developments are ordinarily governed by the *Campbelltown Development Control Plan (DCP) 2015*. Notwithstanding, *State Environmental Planning Policy (Housing)* stipulates that an alternative parking assessment for residential flat buildings can be undertaken in accordance with the *Apartment Design Guide (ADG)*. In turn, the ADG stipulates that for qualifying sites, the lower car parking provision can be adopted from either Council's Development Control Plan or the Roads and Maritime Services *Guide to Traffic Generating Developments (Guide)*.

In this respect, the site meets one of the qualifying conditions by being located within 800 metres of a railway station (Leumeah Station). An assessment of the parking requirements for the Concept Scheme under both the TfnSW Guide and the DCP is thus provided in **Table 3**.

Table 3: Car Parking Requirements under the DCP and TfNSW Guide

Type	No. / Area	TfNSW Minimum Parking Rate[1]	DCP Minimum Parking Rate	Minimum TfNSW Requirement	Minimum DCP Requirement
Residential[2]					
1 Bed	307	0.6 spaces per dwelling	1 space per dwelling plus an additional space for every 4 dwellings or Section thereof.	881.5	1,277.5
2 Bed	613	0.9 spaces per dwelling			
3 Bed	102	1.4 spaces per dwelling			
Visitor	1,022	1 space per 5 dwellings	1 space per 10 dwellings or Section thereof	204.4	102.2
			Sub-Total	**1,086**	**1,380**
Retail and Commercial[2]					
Retail/ Comm	21,349	-	1 space per 25m^2 at ground level and one space per 35m^2 on upper levels.	-	854
			Total	**1,940**	**2,234**

[1] Leumeah assumed to be a "Metropolitan Sub-Regional Centre" under the "A Plan fo4r Growing Sydney" document.

[2] Rates adopted for mixed-use developments in Zones B3 and B4.

It can be seen from **Table 3** that the Concept Scheme has been assessed as requiring a minimum of 2,234 car parking spaces under the DCP; or a reduced requirement for 1,940 spaces in accordance with the TfNSW rates for the residential component. As permitted under SEPP Housing, the lower TfNSW requirement is able to be adopted in accordance with the ADG.

In both cases, it is expected that the site is sufficiently large enough to accommodate the requisite parking provision within a single or two level basement levels, noting that there are no evident constraints in respect of either the access opportunities from Hollylea Road or the site topography.

Accordingly, it is expected that the parking demands associated with any future development scheme as enabled by the Planning Proposal could be accommodated on-site.

6. TRAFFIC AND TRANSPORT IMPACTS

6.1 Existing Site Generation

The existing developments on-site are discussed in Section 3.1 and predominantly comprise automotive related and bulky goods retail related uses. The TfNSW *Guide to Traffic Generating Developments* has been referenced as a source of suitable trip rate for each land use.

For automotive related uses, the most suitable trip rate in the TfNSW Guide was found to be that specified for factories, which is for 1.0 vehicle trip per 100m^2 gross floor area during the PM peak hour. This is considered to be appropriate when noting the trip rates published for actual automotive uses (such as motor showrooms and tyre retail outlets) are expressed as a function of site area, thus resulting in significantly higher traffic volumes given these existing properties are on overly large sites.

Whilst no trip generation rate is published during the AM peak period, this is assumed to be 33% of the PM peak period rate to represent staff arrivals. Accordingly, the total 4,900m^2 gross floor area of automotive related uses on-site is estimated to generate the following traffic:

- 16 vehicle trips per hour during the AM peak period (13 in and 3 out); and
- 49 vehicle trips per hour during the PM peak period (25 in and 24 out).

For bulky goods retail stores, the TfNSW *Technical Direction TDT 2013* publishes updated trip rates based on surveys conducted in 2009. It recommends a trip generation rate of 2.7 vehicle trips per hour during peak periods, acknowledging that this does not coincide with the network AM peak period. Accordingly, when also adopting an AM peak period rate to be 33% of the published rate, the 2,000m^2 gross floor area of bulky goods retail uses on-site is estimated to generate the following traffic:

- 18 vehicle trips per hour during the AM peak period (14 in and 4 out); and
- 54 vehicle trips per hour during the PM peak period (27 in and 27 out).

Having regard for the above uses, the existing developments on the site generates the following traffic:

- 34 vehicle trips per hour during the AM peak period (27 in, and 7 out); and
- 103 vehicle trips per hour during the PM peak period (52 in, 51 out).

It is noted that that these traffic volumes are captured in the intersection surveys described in Section 3.4, together with the associated intersection performance (modelling) assessment undertaken for existing conditions.

6.2 Existing Intersection Performance

Traffic surveys were undertaken of the abovementioned intersections, which are considered to be most critical in relation to the site. These counts were undertaken on Wednesday 25 June 2024 during the network peak periods, being between 7:00am and 9:00am (AM Peak Period) and 4:00pm and 6:00pm (PM peak period).

The traffic volumes in these surveys formed the base case volumes for software modelling undertaken to assess intersection performance characteristics under existing traffic conditions. The SIDRA Intersection 8 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. In this regard, a practical limit at 1.1 can be assumed. 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 in **Table 4** below.

Table 4 – Intersection Performance Indicators (TfNSW)

Level of Service (LoS)	Average Delay per Vehicle (sec/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.

A summary of the modelled results is provided below in **Table 5**, with the results for an additional scenario assessing the upgrades layout for the intersection at Campbelltown Road as envisaged by Council. Reference should also be made to the SIDRA outputs provided in **Appendix C** which provide detailed results for individual lanes and approaches.

Table 5 – Existing Intersection Performance

Intersection	Layout	Control Type	Period	Degree of Saturation (DoS)	Intersection Delay	Level of Service
Hollylea Road and Plough Inn Road	Existing	Priority[1]	AM	0.129	23.6	B
			PM	0.205	19.2	B
	Upgraded	Priority[1]	AM	0.164	27.4	B
			PM	0.180	18.8	B
Campbelltown Road, Plough Inn Road and Harbord Road	Existing	Signalised	AM	1.605	91.4	F
			PM	1.166	129.4	F
	Upgraded	Signalised	AM	0.869	39.7	C
			PM	0.88	45.5	D

[1] Movement with the worst-case delay adopted in accordance the TfNSW *Guide To Traffic Generating Developments* for a priority controlled intersection.

It can be seen from **Table 5** that the intersection of Plough Inn Road and Hollylea Road operates with a Level of Service C during both AM and PM peak periods, thereby performing satisfactorily under TfNSW Guidelines.

The intersection of Campbelltown Road, Plough Inn Road and Harbord Road is currently operating above capacity during the AM Peak Period with a Level of Service F during the AM peak, and at full capacity with a Level of Service E during the PM peak period. Notwithstanding, the performance of the intersection will improve significantly to a minimum Level of Service D when incorporating the upgrades proposed by Council.

6.3 Development Trip Generation

The impacts of the proposed development on the external road network have been assessed having regard for the indicative yield scenarios as summarised in **Section 4** above. This assessment has been undertaken in accordance with the requirements of the TfNSW Guideline to Traffic Generating Developments (2002) and as such, the traffic generation rates published in the Guide have been adopted for each individual land use. The result of this assessment is summarised below.

6.3.1 Residential

In August 2013, TfNSW released Technical Direction TDT 2013/04a, which provides revised trip generation advice for a number of land uses based on survey data obtained since 2009. One of the land uses covered by TDT 2013/04a is high density residential development. The average Sydney weekday trip rates provided by TDT 2013/04a have been adopted for assessing the traffic generating potential of the subject development. 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.

Application of these trip rates to the 1,022 residential units proposed, and adopting an 80:20 split, results in the following predicted trip generation volumes:

- 194 vehicle trips per hour during the morning peak period; and (39 in, 155 out)
- 153 vehicle trips per hour during the evening peak period. (122 in, 31 out)

6.3.2 Retail/Commercial

The TfNSW *Guide to Traffic Generating Developments* provides traffic generation rates for secondary retail stores, which it defines as retail stores tending not to be the primary attractor to a development. It recommends a trip generation rate of 4.6 vehicle trips per 100m^2 gross leasable floor space (assumed equivalent to gross floor area) during the Thursday PM peak hour. This is considered to be an appropriate trip rate for assessment of the Planning Proposal, noting that only a supermarket would be expected to have greater trip generating potential, with other commercial uses such as office and business premises' generating less traffic per equivalent floor space. However, with a significant number of employees and customers to the development expected to be from the proposed residential component and existing commuters to Leumeah Railway Station it is expected these linked trips to account for 40% of vehicle trips. When also assuming the AM peak period traffic generation to be one third of the PM peak period rate, the 21,349m^2 gross floor area of combined retail/commercial space as envisaged in the Concept Scheme is estimated to generate the following traffic:

- 118 vehicle trips per hour during the AM peak period; and (94 in, 24 out)
- 589 vehicle trips per hour during the PM peak period. (295 in, 295 out)

6.3.3 Combined Generation

Having regard for the above volumes, the Concept Scheme is estimated to generate the following traffic:

- 342 vehicle trips per hour during the AM peak period; and, (133 in, 179 out)
- 595 vehicle trips per hour during the PM peak period. (417 in, 326 out)

6.4 Traffic Distribution

To assess the intersection performance, the above traffic volumes have been distributed across the road network. Given the limited availability of journey to work data for the locality (from place of residence), splits have been adopted from the turning movements established in the traffic surveys and are summarised in **Table 6** and **Table 7**, for vehicles entering and exiting the site respectively.

Table 6: Distribution of Traffic Travelling to the Site

Origin	AM Percentage	AM Volumes	PM Percentage	PM Volumes
Plough Inn Road (East)	31%	25	40%	78
Campbelltown Road (South; via Plough Inn Road)	43%	35	27%	53
Harbord Road (via Plough Inn Road)	23%	19	28%	54
Campbelltown Road (North; via Plough Inn Road)	3%	3	5%	11
Total	100%	82	100%	196

Table 7: Distribution of Traffic Travelling From the Site

Destination	AM Percentage	AM Volumes	PM Percentage	PM Volumes
Plough Inn Road (East)	30%	43	20%	24
Campbelltown Road (South; via Plough Inn Road)	40%	57	51%	60
Harbord Road (West; via Plough Inn Road)	26%	37	23%	27
Campbelltown Road (North; via Plough Inn Road)	4%	6	6%	8
Total	100%	143	100%	119

6.5 Peak Period Intersection Performance

The traffic impacts arising from the Concept Scheme have been assessed by loading the distributed traffic volumes in Section 6.2 to the SIDRA Intersection model discussed in **Section 6.2**. The results of this software modelling are summarised in **Table 8** below, with detailed outputs provided in **Appendix C** for individual lanes and approaches.

Table 8 – Existing & Future Intersection Performance

Intersection	Layout	Scenario	Period	Degree of Saturation (DoS)	Intersection Delay	Level of Service
Hollylea Road and Plough Inn Road	Existing - Priority[1]	Existing	AM	0.129	23.6	B
			PM	0.205	19.2	B
		Existing plus Development	AM	0.249	29.0	C
			PM	0.683	39.4	C
Campbelltown Road, Plough Inn Road and Harbord Road	Existing - Signalised	Existing	AM	1.605	91.4	F
			PM	1.166	129.4	F
		Existing plus Development	AM	1.064	86.4	F
			PM	1.186	157.7	F

[1] Movement with the worst-case delay adopted in accordance the TfNSW *Guide To Traffic Generating Developments* for a priority controlled intersection.

It can be seen from Table 8 that the intersection of Hollylea Road and Plough Inn Road will operate with a Level of Service of C during both AM and PM peak periods, which is considered satisfactory operation.

Under its existing layout, the introduction of development volumes on the intersection of Campbelltown Road, Plough Road Inn and Harbord Road will continue to result in a Level of Service of F during both AM and PM peak periods. Therefore, the existing intersection already requires upgrades to accommodate the existing volumes on Campbelltown Road. It is also noted that once a LoS F is reached minor changes to traffic volumes can result in significant changes to the average delay. As such, the significant increases in average delay are considered the result of the existing operation of the intersection at LoS F. Any future upgrades should consider the potential for additional capacity to allow for future development including the subject development. However addressing existing capacity constraints is not considered the responsibility of this assessment.

Any future Development Application will have the potential to vary the amount and type of retail/commercial floor space and further modelling will be required at this stage.

6.6 2036 Intersection Performance

A previous assessment of the 2036 intersection performance was previously provided as part of a response to comments received from Transport for NSW (ref: 18.106r02v02; dated : 31 March 2020). As updated surveys have been undertaken as part of this assessment an analysis of the

increase in traffic volumes was undertaken for the critical intersection of Campbelltown Road, Harbord Road and Plough In Road. It found an overall increase of 2.7% in the AM peak period (0.45% annually) and a decrease of 2.3% in the PM peak period (-0.38% annually). Therefore, the previous assessment of a 2% compounding growth rate for 18 years from 2018 was not an accurate assessment of current growth in traffic volumes observed. As such an assessment of the 2036 scenario is not considered relevant due to the limited increases in traffic volumes observed over the previous six years.

7. ACTIVE TRANSPORT NETWORK

The active transport network observed in the vicinity of the site was observed to be poor, with pedestrian connectivity to Leumeah Station limited to a bridge to the north of the site at the intersection of Plough Inn Road and Airds Road. This intersection also forms the terminal for an existing bicycle route extending north, with no dedicated means for cyclists to access the station from the south.

In this regard, the Planning Proposal provides an opportunity to improve the local pedestrian and cyclist network, given the very close proximity of the site to Leumeah Station. An active transport plan has been drafted, with an extract provided in **Figure 7**. It is evident that a pedestrian through-link can be provided at the northern end of the site, which provides an alternative route from the station (or the eastern side) to Plough Road Inn. Furthermore, it is anticipated that the crown land east of the site can facilitate an extension of the existing bicycle path to the north, potentially providing a regionally significant connection to Campbelltown to the south. In this respect, the path could form an effective frontage to any future development on-site, thus appealing to cyclists and pedestrians by creating an open environment.

It is also expected that vehicular conflicts could be reduced with the consolidation of basements for future development on-site, where access points can be reduced and located south of the through-link.

Figure 7: Active Transport Network

8. RESPONSE TO TFNSW

Transport for NSW provided a letter dated 6 August 2024 which included comments regarding the previous traffic report submitted, provided for reference in **Appendix D**. This report has been provided to address these comments while also reflecting the changes to the scheme. TRAFFIX has responded to each of the comments received.

> *The traffic survey and report were completed back in 2018. There have been significant changes in the area and the network traffic over the past 6 years. Given that the assessment was more than 5 years old, an updated traffic report with the proposed changes above must be submitted to TfNSW for review.*

TRAFFIX Response

Additional surveys were conducted in 2024 of the intersections previously surveyed and the traffic modelling updated with the latest survey result.

> *The traffic assessment assumed that Campbelltown Road at the intersection of Campbelltown Road / Plough Inn Road is to be upgraded to 6-lanes in the future. Transport for NSW currently do not have any funding to undertake any planning/development for the upgrade of Campbelltown Road.*
>
> *Therefore, traffic assessment should be based on the existing Campbelltown 4-lane configuration and any worsening traffic impacts (however minor) the development makes to our State network should be accompanied by a proposed mitigation measure (i.e. Green Travel Plan, alternative access, etc.). As even under the scenario of the intersection upgrade of Campbelltown Road and Plough Inn Road to 6 lanes the modelling shows it still operates at an unacceptable level of Service as shown on Pages 15 and 17 of the Traffic Report.*
>
> *The traffic model should account for the possible future scenarios - without the development, with the development, and with the development considering the proposed mitigation measure to compensate for the additional traffic demand to the signalised intersection and State network.*

TRAFFIX Response

Section 6 has been has been updated to exclude consideration of the 3-lane Campbelltown Road upgrades. The report now considers the existing operation and the existing plus development operation only.

> *The traffic generation rates used should also be reviewed and adjusted accordingly based on the site location. The traffic report used traffic generation rates based on average Sydney Metropolitan Area (St. Leonards, Chatswood, Parramatta, etc.). Campbelltown is at the outskirt of Sydney Metropolitan Area where it can be observed that the use of private vehicles is still the preference of residents. It is recommended that the traffic generation rates to be used must be in between the Sydney Metropolitan Area rates and Regional Area rates. This applies not just for the residential but also to the commercial and retail portions.*

TRAFFIX Response

The proposal considers an integrated development with residential, commercial and retail uses in close proximity to existing transport links including rail and bus services. The use of a higher traffic generation rate for the existing area is unlikely to be reflective of this type of development. In addition, being within 800m of Leumeah Railway Station will result in the use of SEPP minimum parking rates, which will be less than the DCP parking rates used for similar developments in the area. Therefore, the rates specified in this report are considered appropriate for this type of development.

It is also noted that the assessment assumes all apartments are typical residential use. The proposal does include a proportion of seniors living as part of the residential component. Seniors rates have not been considered as the peaks are generally outside the typical residential peak periods (i.e. commuting to/from work, school etc.). Therefore, the assessment is considered a conservative assessment of the development.

9. CONCLUSIONS

Based on the above, the following matters are noteworthy:

- TRAFFIX has been commissioned by Samaro Homes to undertake a Traffic Impact Assessment to evaluate a Planning Proposal at Holleylea Road in Leumeah. Approval is sought for nine (9) land parcels to be rezoned as 'B4 – Mixed Use' as well as changes to floor space ratio controls.
- A Concept Scheme has been formulated by Hatch which is considered to be reflective of the site developed at full potential when adopting the proposed controls. It comprises 1,022 residential dwellings and 21,349m^2 gross floor area of retail/commercial floor space.
- Under the *Campbelltown Development Control Plan 2015*, the Concept Scheme has been assessed to generate a minimum requirement for 2,234 car parking spaces. This reduces to 1,940 spaces based on TfNSW parking rates for residential uses as permissible under SEPP Housing. It is expected that either quantum of parking could be provided on-site.
- The Concept Scheme is estimated to generate a net increase of 342 vehicle trips per hour during the AM peak period and 595 vehicle trips per hour during the PM peak period. The traffic impacts have been assessed using SIDRA Intersection software modelling, with result that:
  - A Level of Service of C has been maintained for the intersection of Plough Inn Road and Hollylea Road, which is satisfactory performance; and
  - A Level of Service of F will continue to occur with the current layout of the intersection of Campbelltown Road and Plough Inn Road.

  Nevertheless, any future development application will also afford the opportunity to vary the amount or type of retail/commercial floor space to achieve an optimal outcome.
- The Planning Proposal presents an opportunity for significant improvements to the active transport network by facilitating more pedestrian and cycling connections in proximity to Leumeah Station.

This assessment demonstrates that the Planning Proposal is supportable on transport planning grounds, based on the Concept Scheme that has been adopted for assessment purposes and recognising that further investigations will be undertaken at any future development application stage..

APPENDIX A

Photographic Record

View looking south-west from Harbord Road, Plough Inn Road and Campbelltown Road Intersection.

View looking south from Campbelltown Road onto Harbord Road, Plough Inn Road and Campbelltown Road Intersection

View looking north-east from Harbord Road, Plough Inn Road and Campbelltown Road Intersection.

View looking north at Plough Inn Road and Hollylea Road intersection.

View looking south from Hollylea Road Intersection.

View looking south down Hollylea Road towards subject site.

View looking south down Hollylea Road towards subject site.

View looking north along Hollylea Road from cul-de-sac.

APPENDIX B

Concept Plans

HOLLYLEA RD PLANNING PROPOSAL

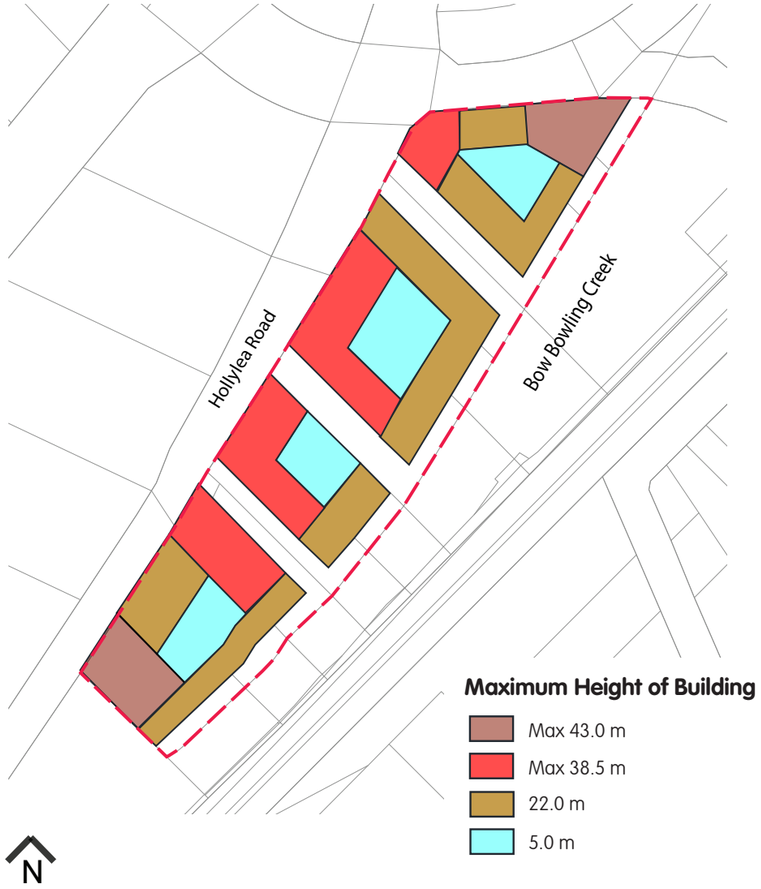
MARCH 2024

REVISED DESIGN PACKAGE

HATCH

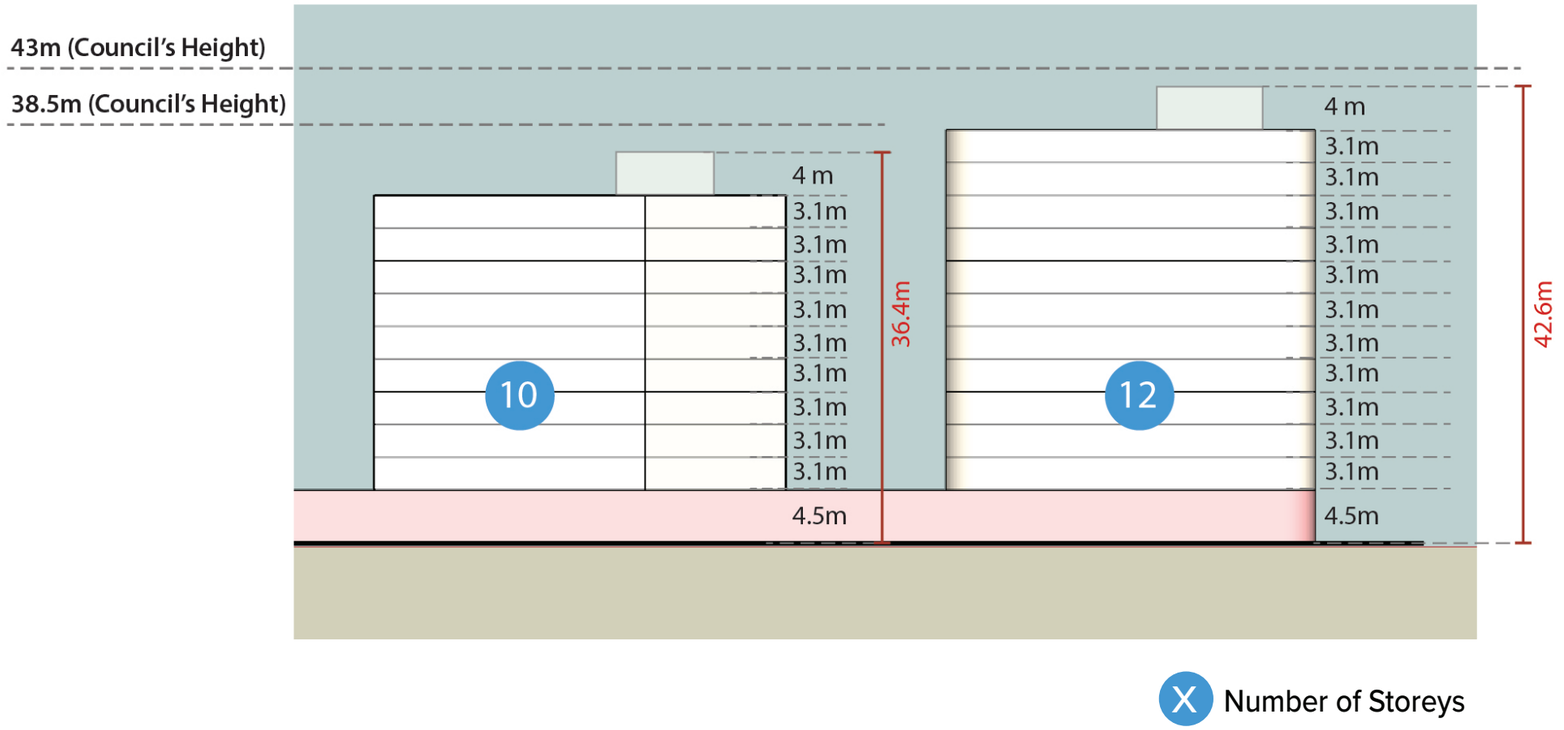
HEIGHT ANALYSIS

The height analysis demonstrates that in order to achieve the identified number of storeys, it is required to either increase the height in LEP Maps or include a 'Clause' to exempt plant and lift overruns in building height calculation/ RL of a building.



Proposed Height Map

Council's proposed heights in metres plus lift overrun and plant room.

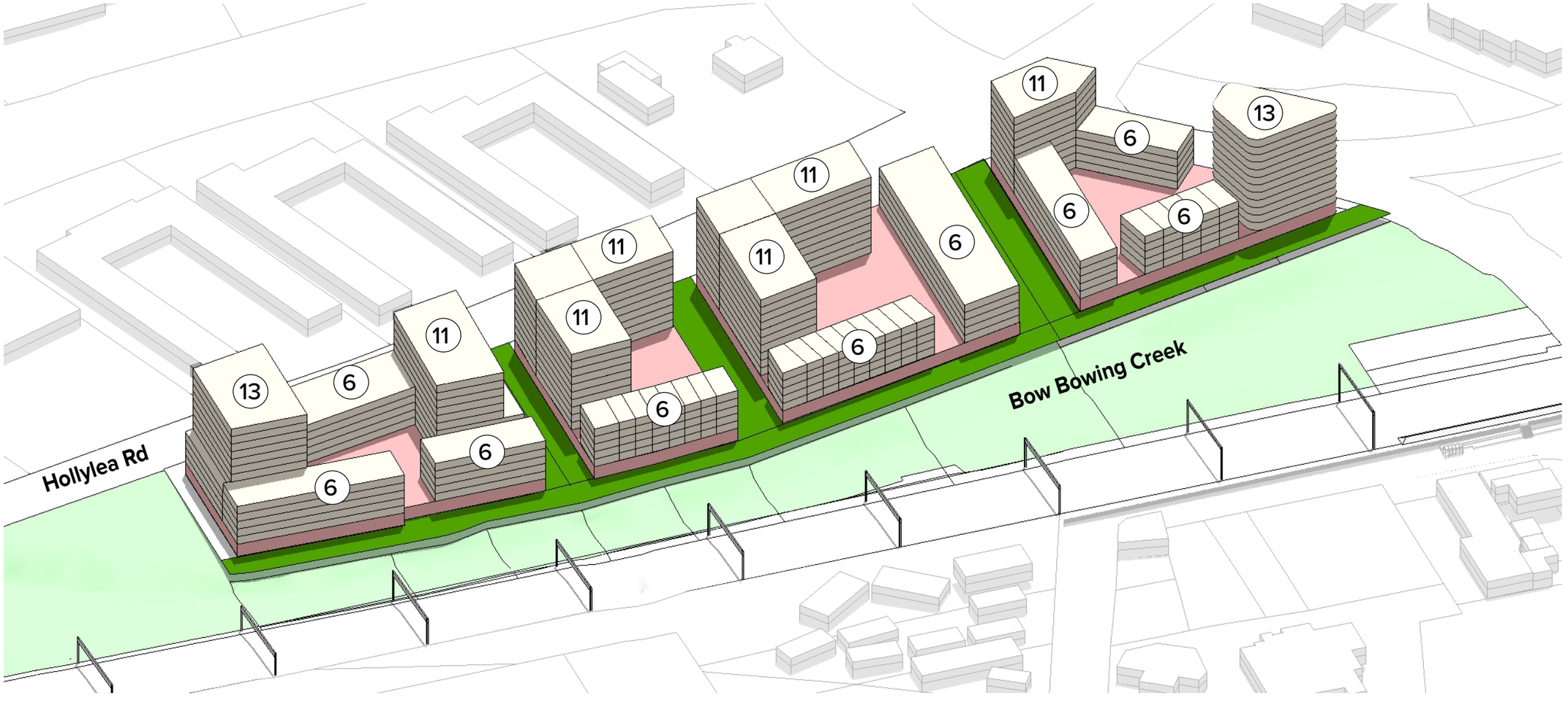


Floor Height Detail

Note: The graphic illustrates that height of buildings will be reduced by 1 storey through inclusion of lift overrun/ plant room.

REVISED DESIGN

An FSR of 3.08:1 is achieved by implementing Council's proposed heights throughout the site.



REVISED OPTION

Total FSR: 3.08:1

(X) Number of storeys

FSR AND HEIGHT CONFLICT

Unrealised GFA in Council's Proposed FSR

The 3d model demonstrates that an FSR of 2.7:1 "undercooks" the site by not realising more than 14,000 sqm GFA throughout the development.

Unrealised GFA	Yield
14,396 sqm	164 Apt. Units

Apartments	Unit mix (%)	Unit size (m^2)
1B	30%	50
2B	60%	80
3B	10%	115

Assumption for Apartments

SHADOW ANALYSIS (WINTER SOLSTICE)

9AM

10AM

11AM

12PM

1PM

2PM

3PM

Proposed public open spaces receive direct sunlight in mid-winter:

- **Creek corridor and promenade in the morning**
- **Plaza and green through-site links in the afternoon**

Note: refer page 7 for solar access to communal open spaces.

ADG COMPLIANCE

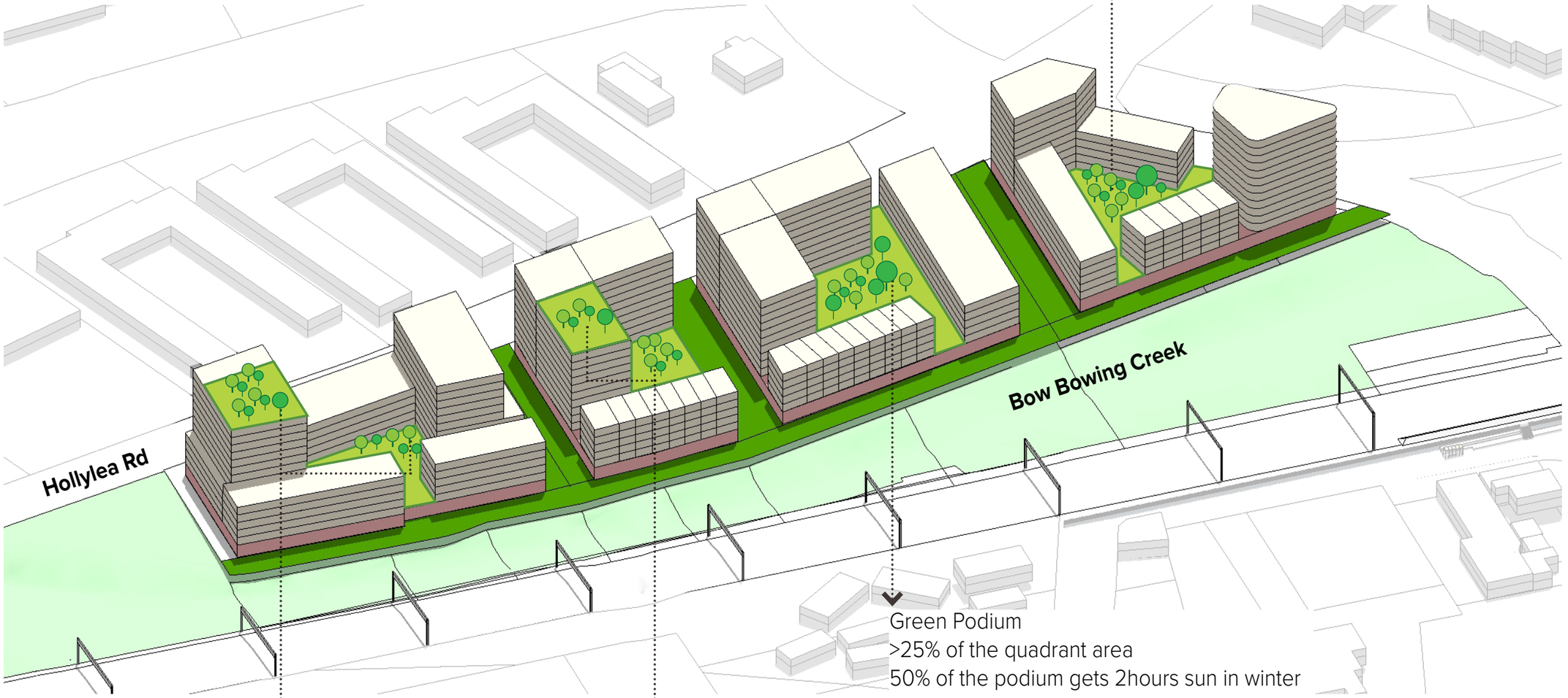
Building Depth for Residential Use

Proposed building depths for residential uses are compliant with the Apartment Design Guide requirements.

Note: Building depth is not shown for non-residential uses including potential seniors living which is not subject to ADG compliance.

ADG COMPLIANCE

Proposed Communal Open Space



Green Podium
>25% of the quadrant area
50% of the podium gets 2hours sun in winter

Green Podium
>25% of the quadrant area
50% of the podium gets 2hours sun in winter

Green Podium and Green Roof
>25% of the quadrant area
Green roof gets full sun in winter

Green Podium and Green Roof
>25% of the quadrant area
Green roof gets full sun in winter

More than 25% of the whole site is allocated to communal open space including green podiums and green roofs.
Minimum 50% of the communal open spaces receive 2 hour direct sunlight in mid-winter.

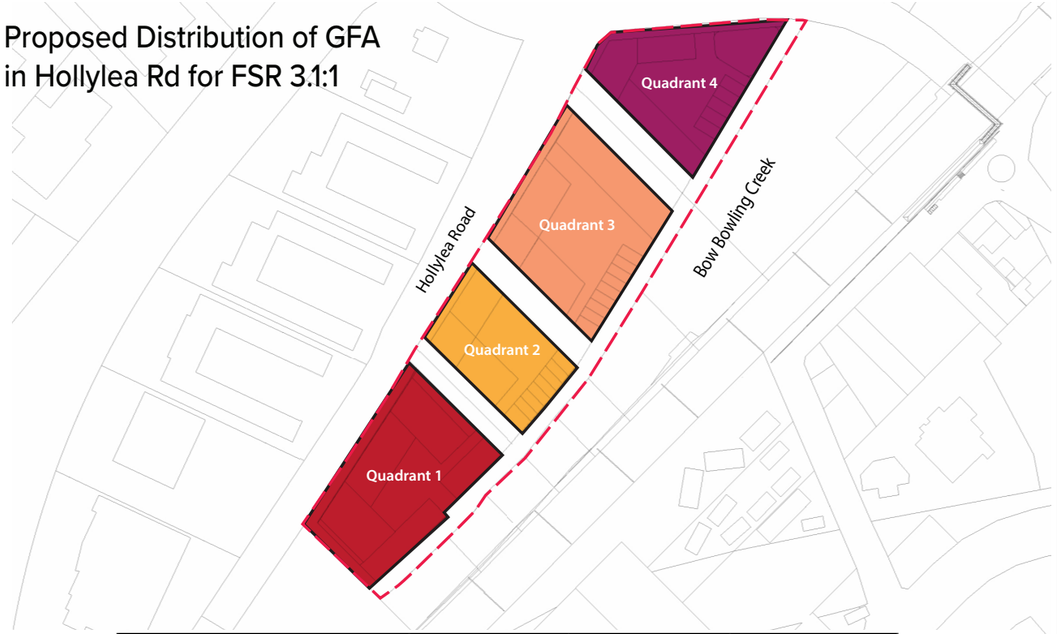
DISTRIBUTION OF GFA

Precedent for FSR Replacement within LEP/ SEPPs (Frasers Town Centre - Edmondson Park South)

State Environmental Planning Policy (State Significant Precincts) 2005:

Clause	Provision	Council Comment
Clause 19 – Floor space ratio	The maximum floor space ratio of a building on any land within the Edmondson Park South site is not to exceed the floor space ratio shown for the land on the Floor Space Ratio Map. Site affected by 2.5:1 FSR.	**Complies** As per Council's assessment the total GFA within the town centre core east is 65,925 sqm. The site area of town centre core east is 29,935 sqm. Accordingly, the proposed FSR is 2.2:1.

Proposed Distribution of GFA in Hollylea Rd for FSR 3.1:1



	Quadrant	Net Developable Site Area (m²)	Allowable GFA (m²) Ground Floor Non-Residential	Allowable GFA (m²) Residential	
	1	8,092	6,010	30,503	
	2	4,682	3,736	16,992	
	3	8,530	6,772	27,764	
	4	6,552	4,831	19,988	
Total	**– – – Site Area (m²) = 37,590**	**27,856**	**21,349**	**95,247**	**FSR = 3.1:1**

Note: Up to 10% of the maximum residential GFA may be transferred from one quadrant to another.

MOD 6 of the concept approval was sought by Frasers to reflect the redistribution of floor space within the different quadrants as per their most up-to-date site:

<table>
<tr><th>MOD 6 Condition</th><th>Applicants Comment</th><th>Council Comment</th></tr>
<tr>
<td>1.3A Future development application within the Frasers Town centre Core are not to exceed the GFA and building heights specified in the table below:

a)
<table>
<tr><th>TCC Quadrant</th><th>Gross floor area (m2)</th><th>Maximum height (RL)</th></tr>
<tr><td>North West</td><td>20,000</td><td>99.5</td></tr>
<tr><td>North East</td><td>41,500</td><td>105.8</td></tr>
<tr><td>South West</td><td>55,500</td><td>95.7</td></tr>
<tr><td>South East</td><td>28,025</td><td>96.4</td></tr>
<tr><td>Total</td><td>145,025</td><td></td></tr>
</table>
</td>
<td>Amended GFA

North East Quadrant: 41,696m²

South East Quadrant: 23,388m²

Total GFA: 65,084m²</td>
<td>
<table>
<tr><th>TCC Quadrant</th><th>Gross floor area (m2)</th><th>Proposed GFA</th></tr>
<tr><td>North West</td><td>20,000</td><td>N/A</td></tr>
<tr><td>North East</td><td>41,500</td><td>41,747</td></tr>
<tr><td>South West</td><td>55,500</td><td>N/A</td></tr>
<tr><td>South East</td><td>28,025</td><td>24,178</td></tr>
<tr><td>Total</td><td>145,025</td><td>65,925</td></tr>
</table>
Maximum height in North East Quadrant is 105.8(RL)
• Building 10 maximum 88.750(RL)
• Building 11 maximum 97.485(RL)
• Building 12 maximum 105.7(RL)
• Building 13 maximum 97.150(RL)

Maximum height in South East Quadrant is 96.4(RL)
• Building 6 maximum 85.820(RL)
• Building 7 maximum 96.320(RL)
</td>
</tr>
<tr>
<td>1.3A b) Notwithstanding the GFA figures in a) above, GFA in any quadrant may exceed the maximum by up to 10 per cent, provided that the total GFA for all quadrants is not to exceed: and</td>
<td>Consistent.</td>
<td>
<table>
<tr><th>TCC Quadrant</th><th>Gross floor area (m2)</th><th>Proposed GFA</th></tr>
<tr><td>North West</td><td>20,000</td><td>N/A</td></tr>
<tr><td>North East</td><td>41,500</td><td>41,747</td></tr>
<tr><td>South West</td><td>55,500</td><td>N/A</td></tr>
<tr><td>South East</td><td>28,025</td><td>24,178</td></tr>
<tr><td>Total</td><td>145,025</td><td>65,925</td></tr>
</table>
GFA is 0.6% over in North East, however, is an exceedance of less that 10% and does not cause an exceedance of GFA in all quadrants.
</td>
</tr>
</table>

HATCH

APPENDIX C

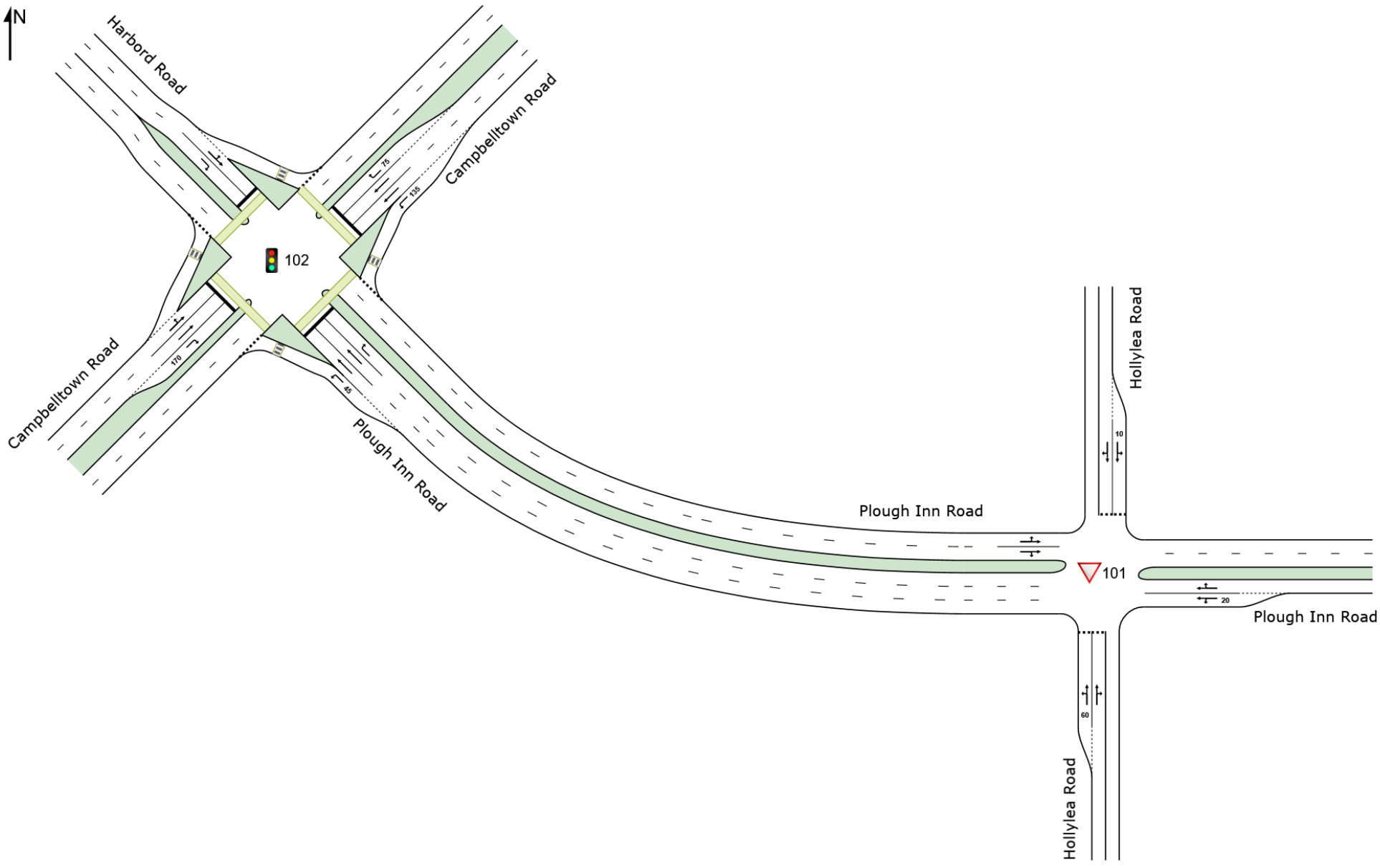
SIDRA Outputs

NETWORK LAYOUT

Network: N101 [Plough Inn Road Network EX AM (Network Folder: General)]

New Network
Network Category: Existing AM

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	Plough Inn Rd Hollylea Rd EX AM
102	NA	Campbelltown Rd Plough Inn Rd EX AM

MOVEMENT SUMMARY

Site: 101 [Plough Inn Rd Hollylea Rd EX AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Plough Inn Road Network EX AM (Network Folder: General)]

Intersection: Plough Inn Road and Hollylea Road

Site Category: Existing AM
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Hollylea Road															
1	L2	All MCs	65	17.7	65	17.7	0.067	6.5	LOS A	0.1	0.7	0.27	0.57	0.27	46.0
2	T1	All MCs	1	100.0	1	100.0	0.056	23.6	LOS B	0.1	0.6	0.68	0.85	0.68	34.2
3	R2	All MCs	17	12.5	17	12.5	0.056	14.8	LOS B	0.1	0.6	0.68	0.85	0.68	36.8
Approach			83	17.7	83	17.7	0.067	8.4	LOS A	0.1	0.7	0.36	0.63	0.36	43.0
East: Plough Inn Road															
4	L2	All MCs	55	7.7	55	7.7	0.124	5.6	LOS A	0.0	0.0	0.00	0.15	0.00	52.0
5	T1	All MCs	385	7.4	385	7.4	0.124	0.0	LOS A	0.0	0.1	0.01	0.07	0.01	55.5
6	R2	All MCs	3	33.3	3	33.3	0.124	6.8	LOS A	0.0	0.1	0.02	0.02	0.02	45.8
Approach			443	7.6	443	7.6	0.124	0.8	NA	0.0	0.1	0.01	0.08	0.01	54.2
North: Hollylea Road															
7	L2	All MCs	2	0.0	2	0.0	0.004	6.4	LOS A	0.0	0.0	0.42	0.52	0.42	36.7
8	T1	All MCs	2	50.0	2	50.0	0.019	17.5	LOS B	0.0	0.2	0.64	0.74	0.64	36.4
9	R2	All MCs	3	33.3	3	33.3	0.019	18.9	LOS B	0.0	0.2	0.71	0.81	0.71	21.5
Approach			7	28.6	7	28.6	0.019	14.9	LOS B	0.0	0.2	0.61	0.70	0.61	31.3
West: Plough Inn Road															
10	L2	All MCs	9	0.0	7	0.0	0.129	5.5	LOS A	0.0	0.0	0.00	0.02	0.00	50.9
11	T1	All MCs	412	1.8	326	1.8	0.129	0.5	LOS A	0.2	1.6	0.09	0.13	0.09	54.9
12	R2	All MCs	96	11.0	76	11.1	0.129	7.9	LOS A	0.2	1.6	0.36	0.46	0.36	47.3
Approach			517	3.5	409	3.5	0.129	2.0	NA	0.2	1.6	0.14	0.19	0.14	52.3
All Vehicles			1051	6.5	943	7.3	0.129	2.1	NA	0.2	1.6	0.10	0.18	0.10	51.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 201 [Plough Inn Rd Hollylea Rd EX + DEV AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N103 [Plough Inn Road Network EX + DEV AM (Network Folder: General)]

Intersection: Plough Inn Road and Hollylea Road

Site Category: Existing + Development AM
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Hollylea Road															
1	L2	All MCs	197	5.9	197	5.9	0.238	6.2	LOS A	0.3	2.1	0.26	0.56	0.26	46.1
2	T1	All MCs	1	100.0	1	100.0	0.249	34.7	LOS C	0.4	2.8	0.77	0.93	0.86	32.4
3	R2	All MCs	74	2.9	74	2.9	0.249	18.1	LOS B	0.4	2.8	0.77	0.93	0.86	35.0
Approach			272	5.4	272	5.4	0.249	9.6	LOS A	0.4	2.8	0.40	0.66	0.43	41.6
East: Plough Inn Road															
4	L2	All MCs	98	4.3	98	4.3	0.146	5.6	LOS A	0.0	0.0	0.00	0.26	0.00	50.6
5	T1	All MCs	385	7.4	385	7.4	0.146	0.0	LOS A	0.0	0.2	0.01	0.09	0.01	54.2
6	R2	All MCs	3	33.3	3	33.3	0.146	7.3	LOS A	0.0	0.2	0.02	0.02	0.02	45.8
Approach			486	6.9	486	6.9	0.146	1.2	NA	0.0	0.2	0.01	0.13	0.01	52.4
North: Hollylea Road															
7	L2	All MCs	2	0.0	2	0.0	0.006	7.0	LOS A	0.0	0.1	0.57	0.56	0.57	33.8
8	T1	All MCs	2	50.0	2	50.0	0.028	23.1	LOS B	0.0	0.3	0.73	0.80	0.73	32.7
9	R2	All MCs	3	33.3	3	33.3	0.028	29.0	LOS C	0.0	0.3	0.82	0.92	0.82	16.4
Approach			7	28.6	7	28.6	0.028	21.0	LOS B	0.0	0.3	0.72	0.78	0.72	26.7
West: Plough Inn Road															
10	L2	All MCs	9	0.0	9	0.0	0.206	5.5	LOS A	0.0	0.0	0.00	0.01	0.00	51.0
11	T1	All MCs	412	1.8	396	1.8	0.206	0.1	LOS A	0.3	2.2	0.01	0.03	0.01	58.7
12	R2	All MCs	193	5.5	185	5.5	0.206	8.2	LOS A	0.3	2.2	0.45	0.69	0.45	43.7
Approach			614	2.9	591	2.9	0.206	2.7	NA	0.3	2.2	0.15	0.24	0.15	50.4
All Vehicles			1379	5.0	1356	5.0	0.249	3.6	NA	0.4	2.8	0.15	0.29	0.16	47.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 201 [Plough Inn Rd Hollylea Rd EX PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N102 [Plough Inn Road Network EX PM (Network Folder: General)]

Intersection: Plough Inn Road and Hollylea Road

Site Category: Existing PM
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Hollylea Road															
1	L2	All MCs	113	2.8	113	2.8	0.155	6.6	LOS A	0.2	1.2	0.33	0.60	0.33	45.7
2	T1	All MCs	1	0.0	1	0.0	0.139	15.0	LOS B	0.2	1.3	0.78	0.90	0.78	36.5
3	R2	All MCs	38	0.0	38	0.0	0.139	17.9	LOS B	0.2	1.3	0.78	0.90	0.78	35.5
Approach			152	2.1	152	2.1	0.155	9.4	LOS A	0.2	1.3	0.45	0.68	0.45	41.9
East: Plough Inn Road															
4	L2	All MCs	58	3.6	58	3.6	0.205	5.6	LOS A	0.0	0.0	0.00	0.12	0.00	52.8
5	T1	All MCs	611	1.4	611	1.4	0.205	0.0	LOS A	0.0	0.1	0.01	0.05	0.01	56.6
6	R2	All MCs	4	0.0	4	0.0	0.205	6.1	LOS A	0.0	0.1	0.01	0.01	0.01	52.1
Approach			673	1.6	673	1.6	0.205	0.5	NA	0.0	0.1	0.01	0.06	0.01	55.6
North: Hollylea Road															
7	L2	All MCs	11	0.0	11	0.0	0.013	6.6	LOS A	0.0	0.1	0.39	0.55	0.39	38.2
8	T1	All MCs	1	0.0	1	0.0	0.013	14.8	LOS B	0.0	0.1	0.39	0.55	0.39	46.0
9	R2	All MCs	18	0.0	18	0.0	0.072	19.2	LOS B	0.1	0.7	0.79	0.91	0.79	20.5
Approach			29	0.0	29	0.0	0.072	14.5	LOS B	0.1	0.7	0.63	0.77	0.63	27.8
West: Plough Inn Road															
10	L2	All MCs	9	0.0	9	0.0	0.157	5.5	LOS A	0.0	0.0	0.00	0.02	0.00	50.9
11	T1	All MCs	333	3.2	333	3.2	0.157	0.4	LOS A	0.3	1.8	0.07	0.10	0.07	55.7
12	R2	All MCs	112	0.9	112	0.9	0.157	8.9	LOS A	0.3	1.8	0.53	0.69	0.53	44.5
Approach			454	2.6	454	2.6	0.157	2.6	NA	0.3	1.8	0.18	0.25	0.18	50.7
All Vehicles			1307	1.9	1307	1.9	0.205	2.6	NA	0.3	1.8	0.13	0.21	0.13	49.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 401 [Plough Inn Rd Hollylea Rd EX + DEV PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N104 [Plough Inn Road Network EX + DEV PM (Network Folder: General)]

Intersection: Plough Inn Road and Hollylea Road

Site Category: Existing + Development PM
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Hollylea Road															
1	L2	All MCs	387	0.8	387	0.8	0.683	8.2	LOS A	6.5	46.2	0.59	0.67	0.74	43.7
2	T1	All MCs	1	0.0	1	0.0	0.604	33.9	LOS C	1.1	7.6	0.93	1.10	1.46	25.7
3	R2	All MCs	106	0.0	106	0.0	0.604	39.4	LOS C	1.1	7.6	0.93	1.10	1.46	24.8
Approach			495	0.6	495	0.6	0.683	14.9	LOS B	6.5	46.2	0.67	0.77	0.90	36.2
East: Plough Inn Road															
4	L2	All MCs	234	0.9	234	0.9	0.223	5.6	LOS A	3.2	22.3	0.00	0.33	0.00	50.1
5	T1	All MCs	611	1.4	611	1.4	0.223	0.0	LOS A	3.2	22.3	0.01	0.11	0.01	53.4
6	R2	All MCs	4	0.0	4	0.0	0.223	6.1	LOS A	0.0	0.2	0.01	0.01	0.01	52.1
Approach			848	1.2	848	1.2	0.223	1.6	NA	3.2	22.3	0.01	0.17	0.01	51.4
North: Hollylea Road															
7	L2	All MCs	11	0.0	11	0.0	0.015	6.8	LOS A	0.0	0.2	0.45	0.56	0.45	37.0
8	T1	All MCs	1	0.0	1	0.0	0.015	23.1	LOS B	0.0	0.2	0.45	0.56	0.45	45.0
9	R2	All MCs	18	0.0	18	0.0	0.150	35.9	LOS C	0.2	1.3	0.91	0.96	0.91	13.0
Approach			29	0.0	29	0.0	0.150	25.0	LOS B	0.2	1.3	0.73	0.80	0.73	20.4
West: Plough Inn Road															
10	L2	All MCs	9	0.0	9	0.0	0.172	5.5	LOS A	0.0	0.0	0.00	0.02	0.00	50.9
11	T1	All MCs	333	3.2	319	3.2	0.172	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.3
12	R2	All MCs	375	0.3	357	0.3	0.555	13.0	LOS A	1.1	7.9	0.76	1.00	1.10	38.9
Approach			717	1.6	685	1.6	0.555	6.8	NA	1.1	7.9	0.40	0.53	0.57	43.6
All Vehicles			2089	1.2	2058	1.2	0.683	6.9	NA	6.5	46.2	0.31	0.44	0.42	42.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Campbelltown Rd Plough Inn Rd EX AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Plough Inn Road Network EX AM (Network Folder: General)]

Intersection: Campbelltown Road, Plough Inn Road and Harbord Road

Site Category: Existing AM
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Plough Inn Road															
4	L2	All MCs	314	4.0	314	4.0	0.435	35.1	LOS C	8.7	62.9	0.70	0.77	0.70	29.5
5	T1	All MCs	97	6.5	97	6.5	0.194	66.0	LOS E	1.9	14.4	0.93	0.70	0.93	10.6
6	R2	All MCs	23	27.3	23	27.3	0.319	85.3	LOS F	1.1	9.3	1.00	0.72	1.00	17.6
Approach			434	5.8	434	5.8	0.435	44.7	LOS D	8.7	62.9	0.77	0.75	0.77	21.9
NorthEast: Campbelltown Road															
7	L2	All MCs	31	17.2	31	17.2	0.026	18.3	LOS B	0.3	2.2	0.26	0.60	0.26	46.4
8	T1	All MCs	1621	4.8	1621	4.8	*0.903	43.6	LOS D	33.5	244.4	0.88	0.86	0.95	38.3
9	R2	All MCs	128	1.6	128	1.6	0.874	107.8	LOS F	6.4	45.2	1.00	0.96	1.30	17.0
Approach			1780	4.8	1780	4.8	0.903	47.8	LOS D	33.5	244.4	0.88	0.86	0.96	31.2
NorthWest: Harbord Road															
10	L2	All MCs	122	2.6	122	2.6	0.914	33.3	LOS C	13.4	95.6	1.00	1.10	1.27	18.8
11	T1	All MCs	168	1.9	168	1.9	*0.914	111.8	LOS F	13.4	95.6	1.00	1.10	1.27	5.2
12	R2	All MCs	137	2.3	137	2.3	*1.605	636.3	LOS F	17.1	122.1	1.00	1.74	3.36	2.7
Approach			427	2.2	427	2.2	1.605	257.3	LOS F	17.1	122.1	1.00	1.30	1.94	4.9
SouthWest: Campbelltown Road															
1	L2	All MCs	115	0.9	115	0.9	0.707	6.8	LOS A	9.2	66.9	0.43	0.50	0.43	25.4
2	T1	All MCs	1201	5.2	1201	5.2	0.707	11.0	LOS A	17.0	124.1	0.50	0.50	0.50	50.1
3	R2	All MCs	326	3.9	326	3.9	*1.505	499.9	LOS F	34.7	250.7	1.00	1.89	3.09	2.6
Approach			1642	4.6	1642	4.6	1.505	107.8	LOS F	34.7	250.7	0.60	0.78	1.01	16.9
All Vehicles			4283	4.6	4283	4.6	1.605	91.4	LOS F	34.7	250.7	0.77	0.86	1.06	19.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Plough Inn Road											
P2	Full	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
NorthEast: Campbelltown Road											
P3	Full	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
NorthWest: Harbord Road											
P4	Full	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
SouthWest: Campbelltown Road											
P1	Full	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
All Pedestrians		211	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24

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: 302 [Campbelltown Rd Plough Inn Rd EX + DEV AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N103 [Plough Inn Road Network EX + DEV AM (Network Folder: General)]

Intersection: Campbelltown Road, Plough Inn Road and Harbord Road

Site Category: Existing + Development AM
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Plough Inn Road															
4	L2	All MCs	389	3.2	389	3.2	0.593	58.2	LOS E	11.1	79.9	0.81	0.95	0.81	24.5
5	T1	All MCs	146	4.3	146	4.3	0.289	72.2	LOS F	3.0	21.7	0.94	0.73	0.94	10.5
6	R2	All MCs	31	20.7	31	20.7	* 0.404	85.7	LOS F	1.4	11.7	1.00	0.73	1.00	17.6
Approach			566	4.5	566	4.5	0.593	63.3	LOS E	11.1	79.9	0.86	0.88	0.86	17.3
NorthEast: Campbelltown Road															
7	L2	All MCs	35	15.2	35	15.2	0.033	34.0	LOS C	0.5	4.2	0.39	0.62	0.39	40.5
8	T1	All MCs	1621	4.8	1621	4.8	* 1.053	130.3	LOS F	53.8	391.9	1.00	1.36	1.48	20.2
9	R2	All MCs	128	1.6	128	1.6	0.807	81.5	LOS F	4.2	29.5	1.00	0.86	1.19	24.1
Approach			1784	4.8	1784	4.8	1.053	124.9	LOS F	53.8	391.9	0.99	1.31	1.44	17.6
NorthWest: Harbord Road															
10	L2	All MCs	122	2.6	122	2.6	0.917	37.2	LOS C	15.2	108.2	1.00	1.10	1.26	18.7
11	T1	All MCs	201	1.6	201	1.6	* 0.917	105.1	LOS F	15.2	108.2	1.00	1.10	1.26	5.2
12	R2	All MCs	137	2.3	137	2.3	1.021	133.1	LOS F	8.3	59.3	1.00	1.14	1.66	10.9
Approach			460	2.1	460	2.1	1.021	95.4	LOS F	15.2	108.2	1.00	1.11	1.38	11.1
SouthWest: Campbelltown Road															
1	L2	All MCs	115	0.9	115	0.9	0.790	8.0	LOS A	16.9	122.6	0.75	0.74	0.76	21.7
2	T1	All MCs	1201	5.2	1201	5.2	0.790	21.9	LOS B	23.2	169.3	0.75	0.71	0.75	43.4
3	R2	All MCs	386	3.3	386	3.3	* 1.064	155.5	LOS F	25.8	185.9	1.00	1.24	1.67	8.1
Approach			1702	4.5	1702	4.5	1.064	51.3	LOS D	25.8	185.9	0.81	0.83	0.96	27.6
All Vehicles			4513	4.3	4513	4.3	1.064	86.4	LOS F	53.8	391.9	0.91	1.06	1.18	19.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Plough Inn Road											
P2	Full	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
NorthEast: Campbelltown Road											
P3	Full	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
NorthWest: Harbord Road											
P4	Full	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
SouthWest: Campbelltown Road											
P1	Full	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
All Pedestrians		211	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24

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: 202 [Campbelltown Rd Plough Inn Rd EX PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N102 [Plough Inn Road Network EX PM (Network Folder: General)]

Intersection: Campbelltown Road, Plough Inn Road and Harbord Road

Site Category: Existing PM
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Plough Inn Road															
4	L2	All MCs	411	1.5	411	1.5	0.574	53.8	LOS D	11.8	83.7	0.79	0.91	0.79	26.3
5	T1	All MCs	187	1.1	187	1.1	0.346	72.0	LOS F	3.8	27.1	0.95	0.75	0.95	10.5
6	R2	All MCs	57	1.9	57	1.9	0.517	83.0	LOS F	2.6	18.5	1.00	0.76	1.00	18.1
Approach			655	1.4	655	1.4	0.574	61.6	LOS E	11.8	83.7	0.85	0.85	0.85	17.5
NorthEast: Campbelltown Road															
7	L2	All MCs	40	2.6	40	2.6	0.032	24.9	LOS B	0.5	3.3	0.31	0.61	0.31	44.3
8	T1	All MCs	1467	3.2	1467	3.2	0.907	67.7	LOS E	36.1	259.5	1.00	1.00	1.10	30.8
9	R2	All MCs	229	0.9	229	0.9	* 1.166	262.5	LOS F	18.2	128.4	1.00	1.34	2.09	7.8
Approach			1737	2.8	1737	2.8	1.166	92.5	LOS F	36.1	259.5	0.98	1.03	1.22	21.3
NorthWest: Harbord Road															
10	L2	All MCs	134	0.8	134	0.8	0.757	49.9	LOS D	10.9	77.1	1.00	1.05	1.04	20.5
11	T1	All MCs	140	1.5	140	1.5	* 0.757	86.5	LOS F	10.9	77.1	1.00	1.05	1.04	5.9
12	R2	All MCs	122	1.7	122	1.7	* 1.109	197.8	LOS F	8.7	62.1	1.00	1.25	1.96	7.8
Approach			396	1.3	396	1.3	1.109	108.5	LOS F	10.9	77.1	1.00	1.11	1.33	10.9
SouthWest: Campbelltown Road															
1	L2	All MCs	162	0.0	162	0.0	1.153	170.2	LOS F	67.1	478.6	1.00	1.42	1.92	6.9
2	T1	All MCs	1746	2.7	1746	2.7	* 1.153	196.9	LOS F	82.9	593.4	1.00	1.60	1.91	12.9
3	R2	All MCs	282	4.1	282	4.1	0.902	102.3	LOS F	14.1	102.5	1.00	1.00	1.24	13.3
Approach			2191	2.6	2191	2.6	1.153	182.8	LOS F	82.9	593.4	1.00	1.51	1.82	11.9
All Vehicles			4978	2.5	4978	2.5	1.166	129.4	LOS F	82.9	593.4	0.97	1.22	1.44	14.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Plough Inn Road											
P2	Full	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
NorthEast: Campbelltown Road											
P3	Full	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
NorthWest: Harbord Road											
P4	Full	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
SouthWest: Campbelltown Road											
P1	Full	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
All Pedestrians		211	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24

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: 402 [Campbelltown Rd Plough Inn Rd EX + DEV PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N104 [Plough Inn Road Network EX + DEV PM (Network Folder: General)]

Intersection: Campbelltown Road, Plough Inn Road and Harbord Road

Site Category: Existing + Development PM
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Plough Inn Road															
4	L2	All MCs	585	1.1	585	1.1	0.913	89.5	LOS F	14.2	100.0	1.00	1.14	1.16	18.8
5	T1	All MCs	266	0.8	266	0.8	0.515	78.7	LOS F	5.6	39.8	0.98	0.79	0.98	10.2
6	R2	All MCs	78	1.4	78	1.4	* 1.059	158.8	LOS F	5.0	35.7	1.00	1.11	1.85	11.2
Approach			929	1.0	929	1.0	1.059	92.2	LOS F	14.2	100.0	0.99	1.03	1.16	13.0
NorthEast: Campbelltown Road															
7	L2	All MCs	62	1.7	62	1.7	0.058	36.0	LOS C	1.1	7.8	0.44	0.65	0.44	38.3
8	T1	All MCs	1467	3.2	1467	3.2	1.020	125.4	LOS F	48.8	350.7	1.00	1.32	1.41	20.5
9	R2	All MCs	229	0.9	229	0.9	* 1.166	267.7	LOS F	18.2	128.4	1.00	1.34	2.09	7.8
Approach			1759	2.8	1759	2.8	1.166	140.8	LOS F	48.8	350.7	0.98	1.30	1.47	15.9
NorthWest: Harbord Road															
10	L2	All MCs	134	0.8	134	0.8	1.080	108.3	LOS F	26.0	183.3	1.00	1.34	1.72	10.5
11	T1	All MCs	263	0.8	263	0.8	* 1.080	107.4	LOS F	26.0	183.3	1.00	1.34	1.72	2.5
12	R2	All MCs	122	1.7	122	1.7	0.908	94.7	LOS F	6.2	44.2	1.00	0.99	1.37	14.2
Approach			519	1.0	519	1.0	1.080	104.6	LOS F	26.0	183.3	1.00	1.26	1.64	7.0
SouthWest: Campbelltown Road															
1	L2	All MCs	162	0.0	162	0.0	1.186	196.7	LOS F	71.9	512.3	1.00	1.48	2.05	6.2
2	T1	All MCs	1746	2.7	1746	2.7	* 1.186	223.2	LOS F	86.1	616.3	1.00	1.68	2.04	11.6
3	R2	All MCs	401	2.9	401	2.9	1.033	150.3	LOS F	25.4	182.3	1.00	1.19	1.55	9.3
Approach			2309	2.5	2309	2.5	1.186	208.7	LOS F	86.1	616.3	1.00	1.58	1.95	10.5
All Vehicles			5517	2.2	5517	2.2	1.186	157.7	LOS F	86.1	616.3	0.99	1.37	1.63	12.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Plough Inn Road											
P2	Full	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
NorthEast: Campbelltown Road											
P3	Full	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
NorthWest: Harbord Road											
P4	Full	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
SouthWest: Campbelltown Road											
P1	Full	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
All Pedestrians		211	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24

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

APPENDIX D

TfNSW Letter

Transport for NSW

6 August 2024

TfNSW Reference: SYD24-01073/02

Ms Lindy Deitz
General Manager
Campbelltown City Council
PO Box 57
Campbelltown NSW 2560

Attention: Simon Rees

PLANNING PROPOSAL – 2 TO 14 HOLLYLEA ROAD AND 5 TO 7 PLOUGH INN ROAD, LEUMEAH.

Dear Ms Deitz,

Transport for NSW (TfNSW) apologises for the delay in providing its comments on the Planning Proposal ('proposal') for 2 - 14 Hollylea Road and 5 – 7 Plough Inn Road Leumeah (the 'site') referred to us via the Planning Portal on 10 July 2024.

The site consists of 12 lots, in an irregular shape, and has an area of 3.8 ha and is located to the southwest of Leumeah Railway Station and Bow Bowing Creek. The land is presently zoned E3 Productivity Support and occupied by a variety of light industrial / commercial premises.

TfNSW notes that Proposal seeks to amend the Campbelltown Local Environmental Plan (CLEP) 2015 by:

- Rezoning the subject site from E3 Productivity Support to a combination of MU1 Mixed Use, RE1 Public Recreation and RE2 Private Recreation.
- Amending the Maximum Height of Building Map from 15m for the subject site to a range of maximum building heights (5m, 22m, 38.5m and 43m).
- Amending the Floor Space Ratio Map to introduce an FSR control of 2.7:1 for the subject site.
- Amending the Land Reserve Acquisition Map to include the area between 2 and 2A Hollylea Road Leumeah and an area along the south eastern boundary of the subject site adjacent to Bow Bowing Creek.
- Amending Clauses 5.1 and 5.1A to include the land that is proposed to be rezoned as RE1 Public Recreation, with Council being identified as the acquisition authority for the land.
- Amending Schedule 1 Additional Permitted Uses to permit with consent Industrial Retail Outlets and Industrial Training Facilities uses on the subject site.

TfNSW has reviewed the documentation provided, and our detailed comments are provided at **Attachment A** for your consideration. TfNSW requests the amendments to the Planning Proposal, draft Site Specific DCP and Traffic Report outlined in **Attachment A** are updated prior to Statutory exhibition.

Should you have any questions or further enquiries in relation to this matter, Jeanne Roach, Land Use Planner would be pleased to receive your call on phone 0459 880 838 or via email: development.sydney@transport.nsw.gov.au

Yours sincerely,

Peter Mann
Senior Manager Strategic Land Use - Western
Planning and Programs, Greater Sydney Division

Level 4, 4 Parramatta Square, 12 Darcy Street
Parramatta NSW 2150
PO Box 973 Parramatta CBD NSW 2124

W transport.nsw.gov.au

Attachment A: – Detailed TfNSW Comments- Planning Proposal 2 – 14 Hollylea Road and 5 – 7 Plough Inn Road, Leumeah.
(Date: 31 July 2024)

General Comments

- The Traffic Report (Response to Request for Information) prepared by Traffix dated 31 March 2020 ('Traffic Report') relates to a Traffic Impact Assessment (TIA) prepared for a previous Planning Proposal dated 29 November 2018 and needs to be updated to reflect the current aspects of the current Proposal dated February 2024.
- The Planning Proposal and Transport Report are to be updated to include the proposed residential dwelling densities prior to exhibition.
- The Transport Report and the Draft Site Specific Development Control Plan (DCP) are to be updated to include parking rates prior to exhibition. Council should consider prescribing the parking rates as a maximum.

Traffic Report - Prepared by Traffix dated 31 March 2020.

- The traffic survey and report were completed back in 2018. There have been significant changes in the area and the network traffic over the past 6 years. Given that the assessment was more than 5 years old, an updated traffic report with the proposed changes above must be submitted to TfNSW for review.
- The traffic assessment assumed that Campbelltown Road at the intersection of Campbelltown Road / Plough Inn Road is to be upgraded to 6-lanes in the future. Transport for NSW currently do not have any funding to undertake any planning/development for the upgrade of Campbelltown Road.
- Therefore, traffic assessment should be based on the existing Campbelltown 4-lane configuration and any worsening traffic impacts (however minor) the development makes to our State network should be accompanied by a proposed mitigation measure (i.e. Green Travel Plan, alternative access, etc.). As even under the scenario of the intersection upgrade of Campbelltown Road and Plough Inn Road to 6 lanes the modelling shows it still operates at an unacceptable level of Service as shown on Pages 15 and 17 of the Traffic Report.
- The traffic model should account for the possible future scenarios - without the development, with the development, and with the development considering the proposed mitigation measure to compensate for the additional traffic demand to the signalised intersection and State network.
- The traffic generation rates used should also be reviewed and adjusted accordingly based on the site location. The traffic report used traffic generation rates based on average Sydney Metropolitan Area (St. Leonards, Chatswood, Parramatta, etc.). Campbelltown is at the outskirt of Sydney Metropolitan Area where it can be observed that the use of private vehicles is still the preference of residents. It is recommended that the traffic generation rates to be used must be in between the Sydney Metropolitan Area rates and Regional Area rates. This applies not just for the residential but also to the commercial and retail portions.

Sydney Trains

Existing load restrictions and vehicle capacity of the Rose Payten Drive overbridge should be considered when determining the maximum allowable density at the subject site. A Traffic Impact Assessment should be prepared to identify any likely impacts of expected future development on this overbridge including any associated construction vehicles.

- The likely density outcomes of the site should be based on the provision of a suitable setback from the rail corridor that will enable the construction and long-term maintenance of structures without any reliance on access to, or for support structures to be placed within TAHE owned land.

- It is imperative that future planning for these locations consider the overall drainage impacts of developments onto the rail corridor. In this regard, Council must be satisfied that drainage from new developments can be adequately disposed of and managed without any reliance on TAHE owned land, including the rail corridor. We request this matter be considered early in the process to ascertain the need for alternate solution, collection of developer contributions or re-consideration of development potential.

- The proposed planning controls whilst supported in principle, will require the future potential Applicant/Developer to approach TfNSW (Heavy Rail – Sydney Trains) early in the design process (as part of pre-DA discussion) to ensure that all relevant Sydney Trains matters of consideration are taken into account and are incorporated in the future design of the development. These considerations include, but are not limited to, geotechnical and structural details and construction methodology, electrolysis report, and relevant requirements and standards within State Environment Planning Policy (Infrastructure) 2007, 'Development Near Rail Corridors and Busy Roads – Interim Guidelines', Asset Management Branch etc.

- The likely noise and vibration impact of the rail corridor will need to form the basis of early design decisions. In this regard, Council should refer to the Department of Planning – Development Near Rail Corridors and Busy Roads – Interim Guidelines.

- Among other TfNSW Airspace and External Developments Standards, future developments must ensure that appropriate anti-throw measures have been incorporated where balconies that are proposed within 20m of, and are facing the rail corridor. Development within this distance must have measures installed to the satisfaction of Sydney Trains (e.g awning windows, louvres, enclosed balconies, window restrictors) which may impact on the developments ability to achieve other requirements such as solar access and cross ventilation as stipulated in Council's DCP or the Apartment Design Guide.

- Sydney Trains currently have an access gate leading into the rail corridor that is accessed through the public car park located south of the site. It is requested that Council consider this access gate in any future construction phase on the subject site. Sydney Trains requires ongoing 24/7 access by rail vehicles, plant and equipment to support maintenance and emergency activities to the rail corridor.

- TfNSW and Sydney Trains have not reviewed the current station capacity and train services at the nearby heavy rail corridor as part of this referral. The uplift in density may have the potential to impact existing rail services and capacity. We recommend that Council liaise with the relevant section of TfNSW to ascertain potential station upgrades and/or augmented rail service requisites stemming from the Planning Proposal and its intended future use.