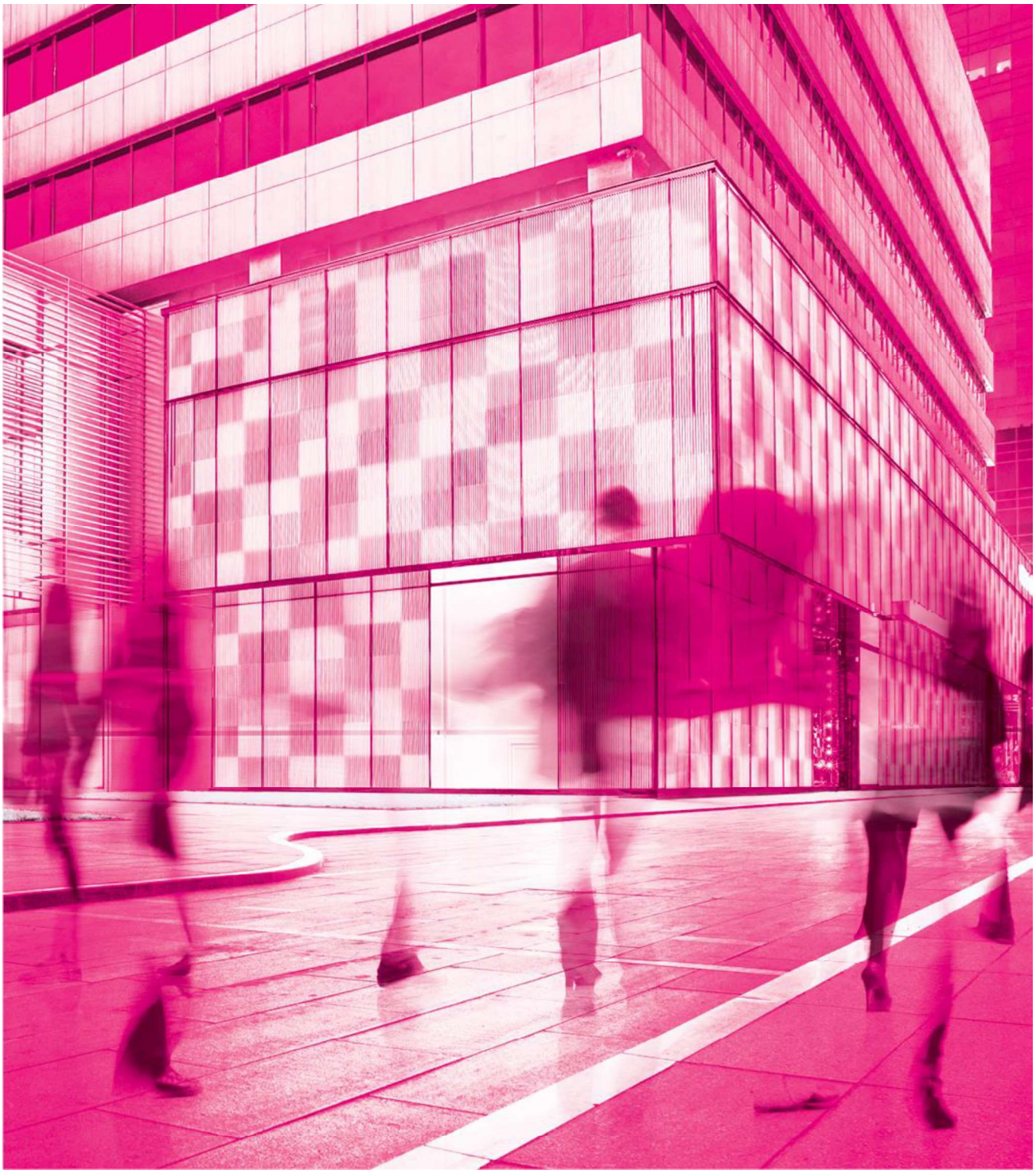

traffic impact assessment;

The Meadows, Bardia

For Monarch Investment Group

14 August 2018

parking;
traffic;
civil design;
communication;

ptc.

Document Control

The Meadows, Bardia, Traffic impact assessment

Issue	Date	Issue Details	Author	Reviewed	For the attention of
1	09/08/2018	Draft report	EY	AU	Alicia Conlon (DFP Planning)
2	14/08/2018	Final report	EY	AU	Alicia Conlon (DFP Planning)
3					

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Contents

1. Introduction

1.1 Project Summary

ptc. has been engaged by Monarch Investments Pty Ltd c/o DFP Planning Pty Ltd, to prepare an assessment of the parking and traffic considerations associated with the proposed rezoning of land zoned RE2 Private Recreation to R3 Medium Density Residential in Lots 9 and 10 of DP270983 within The Meadows, Bardia.

The proposed rezoning of the land is to accommodate the potential development of 27 residential lots. The SIDRA traffic model previously prepared by **ptc.** (previously Parking and Traffic Consultants) for The Meadows has been updated with the additional forecast traffic generation from these 27 residential lots and is presented in this report.

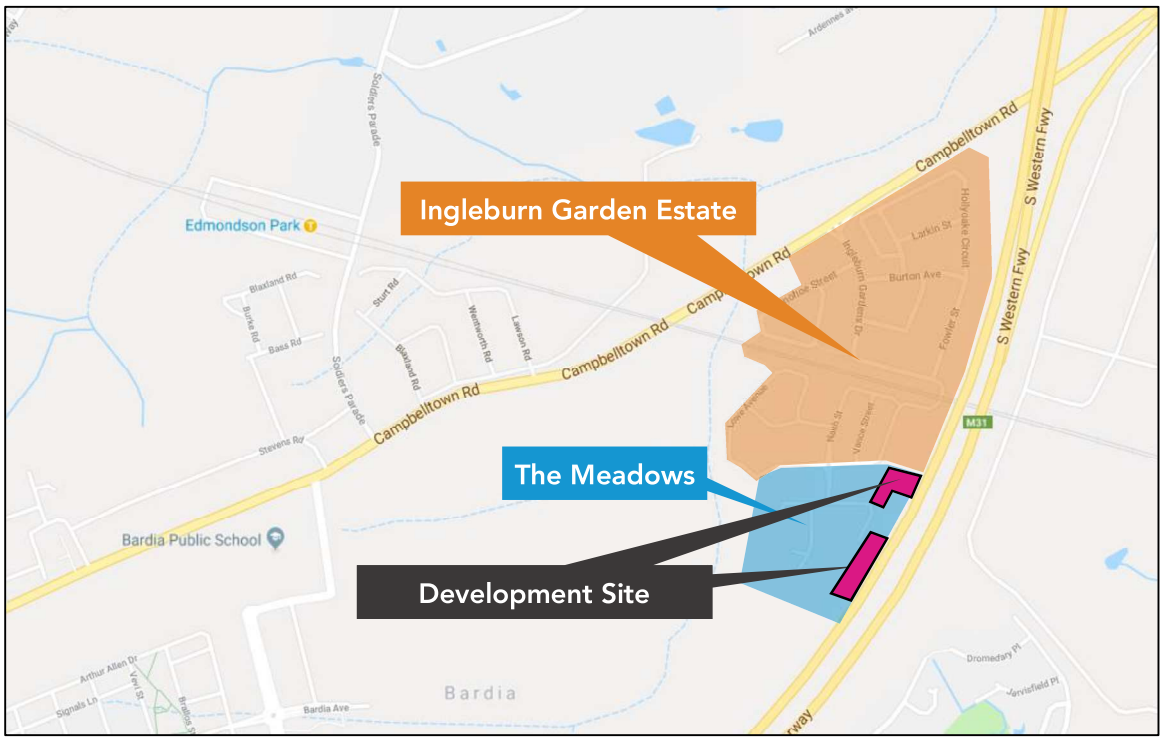


Figure 1: Site Location

1.2 Purpose of this Report

This report presents the following considerations in relation to the Traffic and Parking assessment of the Proposal:

Section 2	A description of the proposal,
Section 3	A description of the road network serving the development property,
Section 4	Determination of the traffic activity associated with the development proposal, and the adequacy of the surrounding road network,
Section 5	Assessment of the proposed parking provision in the context of the relevant planning control requirements,
Section 6	Access Assessment, and
Section 7	Summary

2. The Development

2.1 Site Context

The site is located in the suburb of Ingleburn, which is approximately 45 km South West of the Sydney CBD and is within the Campbelltown City Council LGA. The site is located on the western side of the Hume Motorway and south of the South West Rail Link corridor between Glenfield and Leppington. The proposed rezoning comprises Lots 9 and 10 of DP270983 and lies within The Meadows, Bardia development which extends from the Ingleburn Gardens development.

Access to The Meadows is provided via Ingleburn Gardens Drive, a central spine road which runs through the Ingleburn Garden Estate into The Meadows (see Figure 1). The signalised intersection, Campbelltown Road, Ingleburn Gardens Drive is the sole connection to the rest of the Sydney road network.

The surrounding land use of the site is presented in Figure 2 and an aerial view of the site is provided in Figure 3.

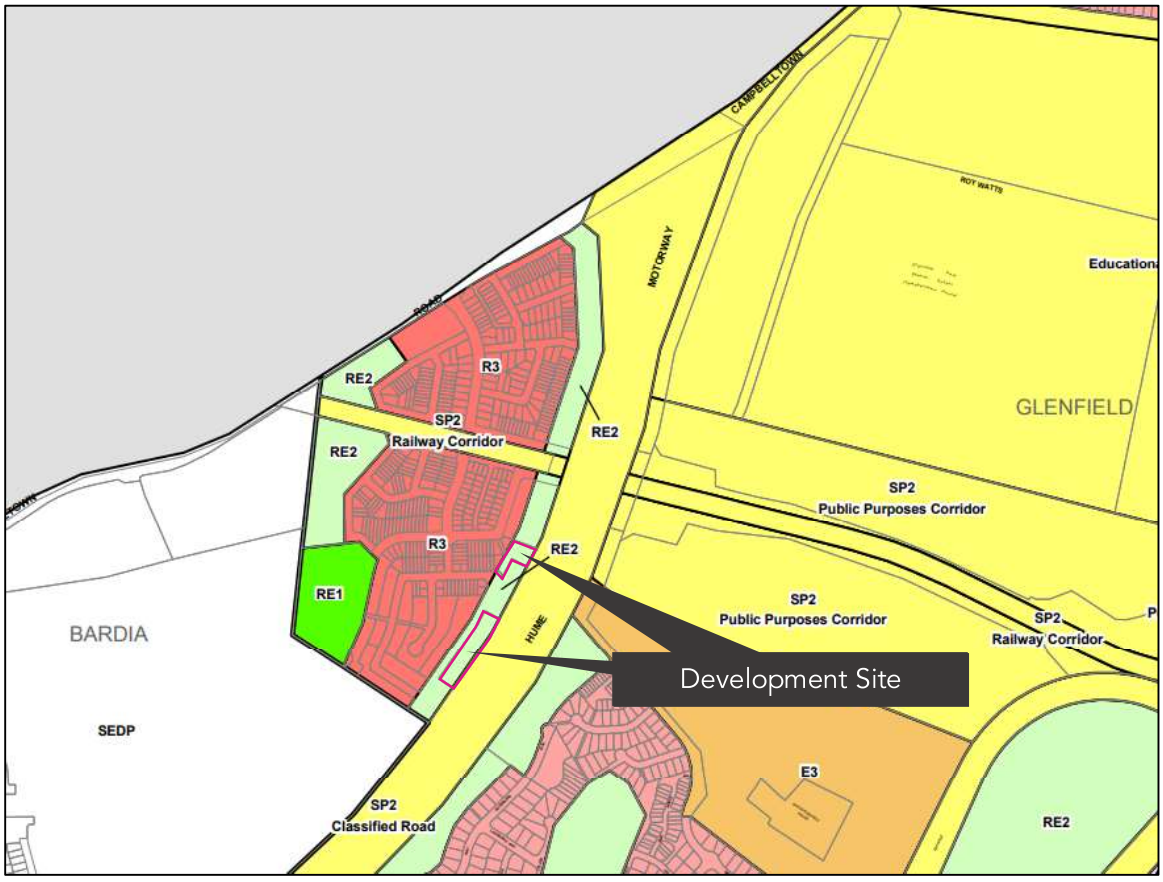


Figure 2: Surrounding Zoning (Source: Campbelltown LEP 2015, Sheet 11)

Figure 3: Site Aerial View

2.2 Proposed Development

The proposal is the rezoning of land currently zoned RE2 Private Recreation to R3 Medium Density Residential in Lots 9 and 10 of DP270983 within The Meadows (see Figure 3). The total area of the proposed rezoned land is 8,100m^2.

This proposed rezoning is to accommodate the potential development of 27 residential lots. Access to these lots will utilise the Webber Circuit which is currently under construction. This connects to the existing internal road network of Ingleburn Gardens Estate and The Meadows, and to the greater Sydney road network via the signalised intersection, Campbelltown Road/Ingleburn Gardens Drive. One of the lots in Lot 10 will be an access handle[1], providing access to the other 4 lots in Lot 10. Therefore, the proposed increase in yield is 26 dwellings – these will be primarily two storey dwellings with a couple of single storey dwellings, in line with the existing developments within the surrounding area.

Details of the overall layout and the proposed rezoning and presented in Figure 4 and Attachment 1 in the drawings prepared by Monarch Investment Group.

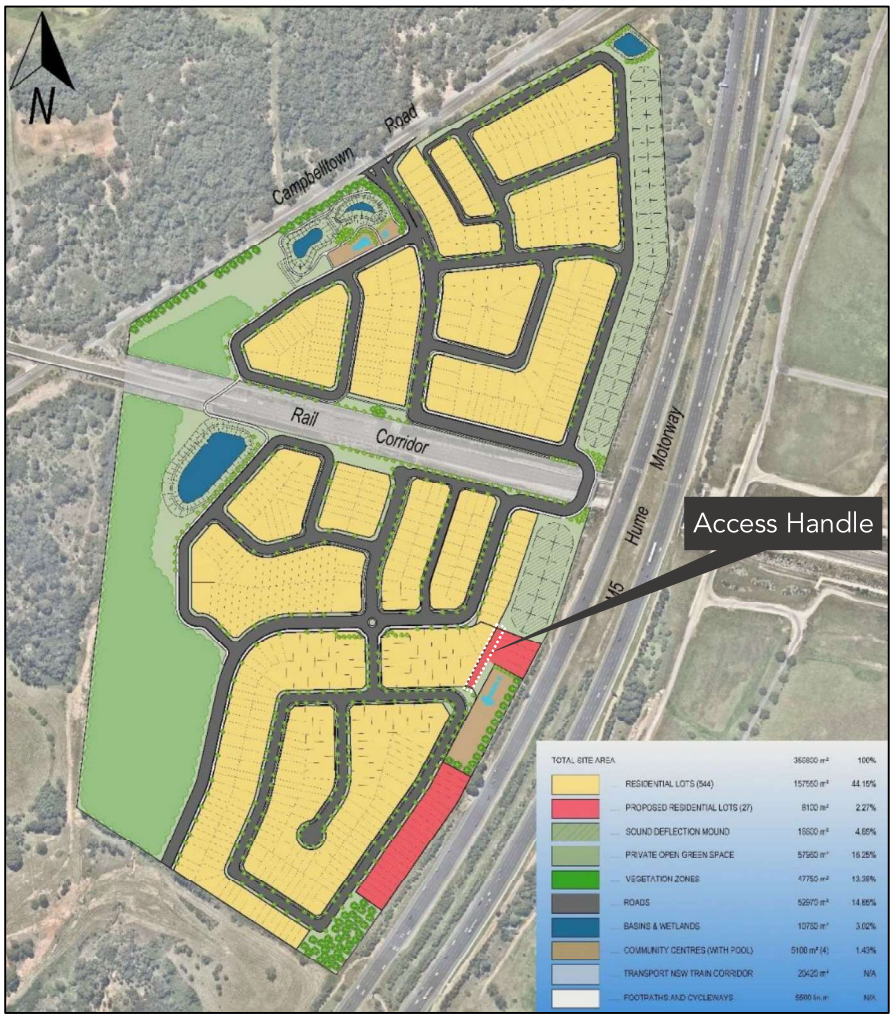


Figure 4: Development Proposal

[1] Land on which an access driveway or access corridor is situated, providing vehicular, pedestrian, or services access from the street

3. Existing Transport Facilities

3.1 Road Hierarchy

The site is located in the suburb of Ingleburn and the development is serviced by Campbelltown Road. The road network servicing the area comprises a number of State Roads, making the site easily accessible from different regions. The road network in this area also comprises local streets providing direct access to the surrounding retail, commercial and residential land uses.

Figure 5: Road Hierarchy

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

State Roads	- Freeways and Primary Arterials (RMS Managed)
Regional Roads	- Secondary or Sub Arterials (Council Managed, partly funded by the State)
Local Roads	- Collector and Local Access Roads (Council Managed)

The road network servicing the site includes:

Campbelltown Road	
Road Classification	State Road
Alignment	East – West
Number of Lanes	1 lane in each direction
Carriageway Type	Undivided
Carriageway Width	12m
Speed Limit	80 km/h
School Zone	No
Parking Controls	No Parking
Forms Site Frontage	No

Figure 6: Campbelltown Road

Ingleburn Gardens Drive	
Road Classification	Local Road
Alignment	Varies
Number of Lanes	1 lane in each direction
Carriageway Type	Undivided
Carriageway Width	12m
Speed Limit	50 km/h
School Zone	No
Parking Controls	Unrestricted
Forms Site Frontage	No

Figure 7: Ingleburn Gardens Drive

3.1 Public Transport

The locality has been assessed in the context of available forms of public transport that may be utilised by prospective residents and visitors. When defining accessibility, reference is made to the NSW Planning Guidelines for Walking and Cycling (2004) (the Cycling and Walking Guide), where a distance of 400-800m is recommended as a comfortable walkable catchment to access public transport and local amenities. The document also suggests a distance of 1,500m as a suitable catchment for cycling.

Figure 8 illustrates the walkable 400m and 800m catchments from the development site. As indicated by the figure, there are no public transport options within a comfortable walking distance of the site. The closest train station, Edmondson Park Station, is 1.3km away (straight-line distance) / 2.4km away (vehicular route). There is also no pedestrian infrastructure on Campbelltown Road.

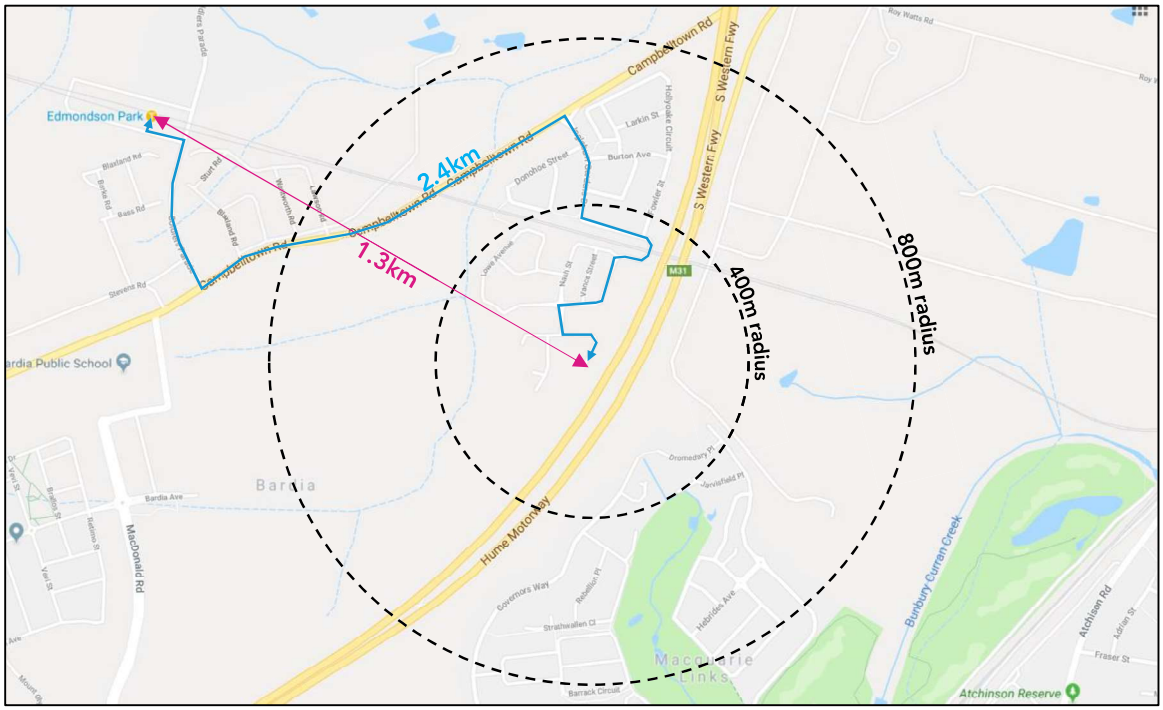


Figure 8: 400m and 800m Walkable Catchment Map

3.1.1 Trains

Edmondson Park Station is located approximately a 2.4km drive from the site. The provision of a commuter car park for approximately 315 vehicles, and cycle racks and lockers, makes the station accessible for commuters utilising a mix of travel modes.

The station serves the T2 Inner West & Leppington Line and T5 Cumberland Line. The T2 line operates frequent services, with trains every 3-10 minutes during Mon-Fri peak hours and up to every 15-20 minutes outside of peak hours and during weekends. The T5 line operates every 30 minutes from Mon-Sun.

3.2 Active Transport

3.2.1 Cycling

Cycling infrastructure is well developed near the site. Within the Estate, road widths are generous and facilitate shared cycling and vehicular traffic. There are also dedicated cycle lanes on Campbelltown Road and on the Hume Motorway/South Western Freeway, providing accessibility to Edmondson Park Train Station and the greater Edmondson Park suburb.

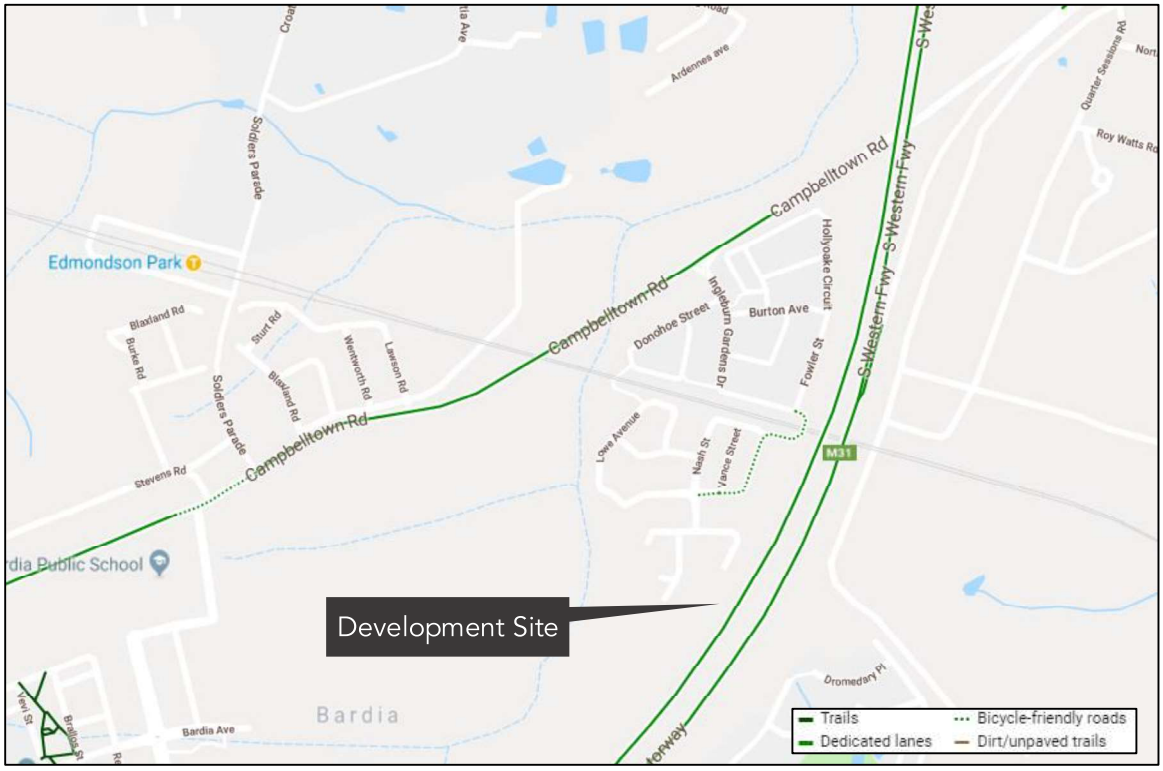


Figure 9: Local bicycle network (Source: Google Maps)

3.2.2 Walking

There is a moderate level of pedestrian amenity within Ingleburn Gardens Estate with provision of footpaths and ramps on most streets within the Estate. The level of pedestrian facilities is in line with similar developments of a residential nature, although there are few dedicated pedestrian crossing areas.

Figure 10: Median Island with Pedestrian Crossing Facility

4. Traffic Impact Assessment

4.1 Traffic Generation

The traffic generation of the proposed development has been established with reference to the *RMS Guide to Traffic Generating Developments*, which presents the traffic generation rates for a number of land uses. The Guide was last updated in October 2002 and is largely based on surveys undertaken during the nineties.

RMS is currently updating the Guide to include more recent data and revised land use traffic generation rates, however as an interim measure RMS has recently published a Technical Direction titled *TDT 2013/04a – Guide to Traffic Generating Developments – Updated Traffic Surveys*, which provides preliminary updated traffic generation rates for a number of land-uses including residential development.

The proposed residential rezoning is anticipated to accommodate low-density development and the updated traffic surveys provide the following traffic generation rates:

- Weekday average morning peak vehicle trips: 0.99 per dwelling (maximum 1.39)
- Weekday average evening peak vehicle trips: 0.95 per dwelling (maximum 1.32)

To present a robust assessment of the traffic activity associated with the proposal, the maximum rate recommended by the RMS Technical Direction is adopted. This is due to poor public transport infrastructure within a comfortable walking distance, therefore the large majority of trips will be private vehicle-based.

The proposal involves rezoning land to accommodate the potential development of 27 residential lots. **ptc.** prepared a report for the previous proposal involving land subdivision in the Ingleburn Gardens Estate to create 212 residential dwellings (*PTC Parking & Traffic Assessment - Ingleburn Gardens 02-03-16*). As part of the previous traffic assessment, another 60 undeveloped lots were incorporated into the assessment to provide a robust approach. The survey data and traffic modelling from the previous report is adopted as the base model for this report.

The traffic associated with the proposal has been calculated with reference to the maximum figures detailed above and the results are summarised in Table 1.

Table 1: Proposed Traffic Generation

Land Use	Number of dwellings	Weekday AM Peak		Weekday PM Peak	
		Rate (trips/dwelling)	Total Trips (veh/hour)	Rate (trips/dwelling)	Total Trips (veh/hour)
Previously assessed dwelling houses	272	1.39	378	1.32	359
Proposed residential lots	26[2]	1.39	36	1.32	34

The projected peak hour generation of traffic activity associated with the proposed 26 residential dwellings is 36 vehicular trips during the AM peak and 34 vehicular trips during the PM peak. It is assumed that during the AM peak, 20% of trips will be inbound and 80% will be outbound. The opposite is adopted for the PM peak.

[2] One of the lots will be an access handle, hence there will be 26 dwellings rather than 27

Thus, as part of this proposal, there are expected to be an additional 7 inbound / 29 outbound trips during the AM peak and 27 inbound / 7 outbound trips during the PM peak.

4.2 Base Model

As discussed in the previous section, the base model for this assessment has been derived from ptc.'s previous assessment of the Ingleburn Gardens Estate and forecast traffic generation from the development of 272 dwelling houses. As part of this previous assessment, survey data was collected for the signalised intersection, Campbelltown Road and Ingleburn Garden Drive, on Thursday 8 October 2015. Typically, survey data is limited to two years old, however, given the low traffic generation of this proposal (36 trips during the AM peak and 34 during the PM peak – 2.4% and 2.3% of the total post-development projected traffic volumes, respectively), the use of data 3 years old is considered relevant.

The peak hour intersection survey results from the previous assessment are presented in Figure 11, and the previous assessment's post-development results are presented in Figure 12.

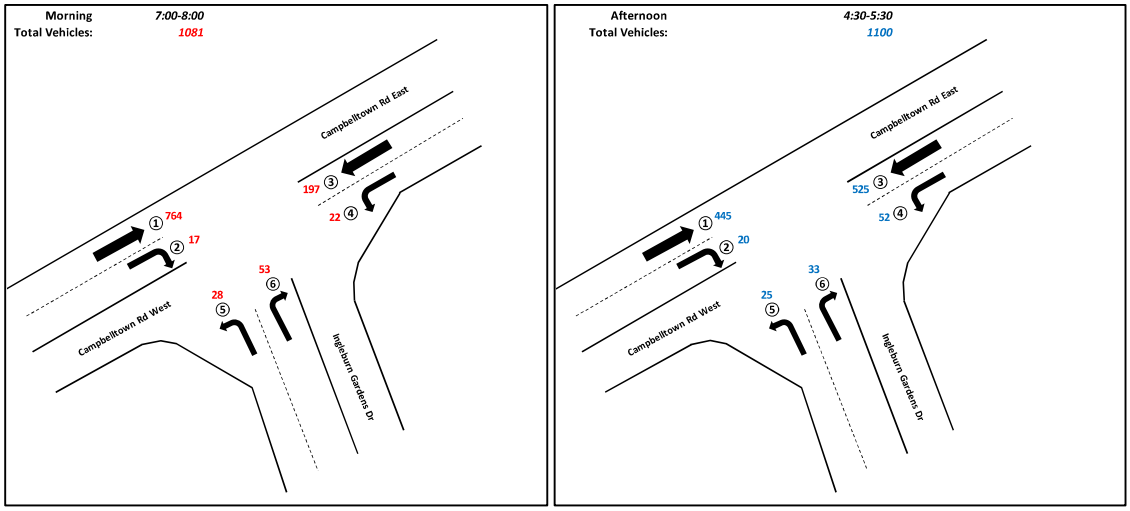


Figure 11: Morning and Evening Peak Hour Traffic Survey Results (08/10/2015)

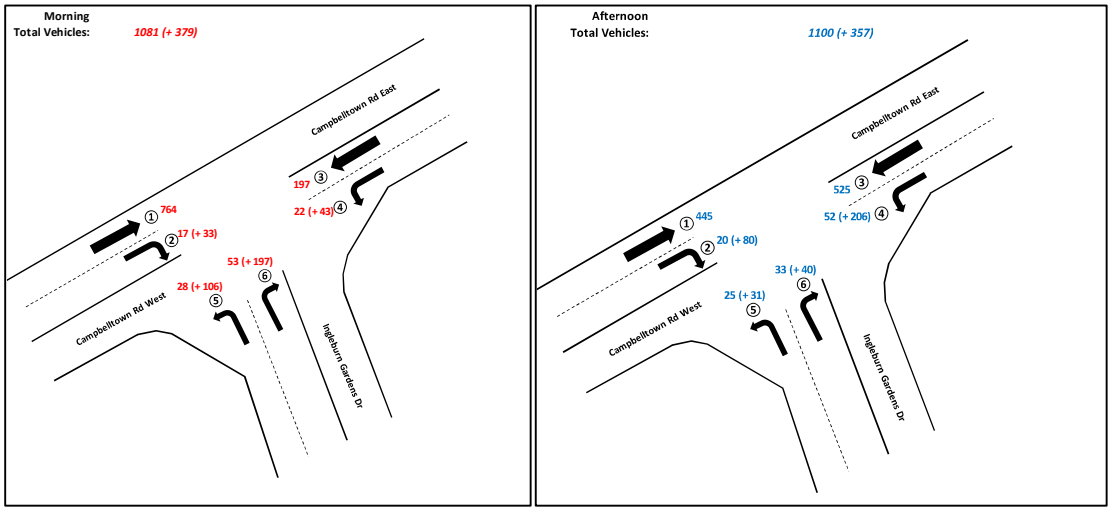


Figure 12: Development Traffic Morning and Evening Peak Hour (as per 2016 report)

4.3 Trip Distribution

To distribute the traffic activity associated with the proposal at the Campbelltown Road / Ingleburn Gardens Drive intersection, an identical approach to the previous report is undertaken whereby the forecast turning proportions are derived from the turning proportions observed during the peak periods in the traffic survey.

From the surveys, the following turning proportions have been observed and are summarised in Table 2:

Table 2: Traffic Distribution (as per surveys on 08/10/2015)

Time Period	From	To	Number of vehicles	Proportion
AM Peak	Ingleburn Gardens Drive	Campbelltown Road (west)	28	28 / (28+53) = 35%
	Ingleburn Gardens Drive	Campbelltown Road (east)	53	53 / (28+53) = 65%
	Campbelltown Road (west)	Ingleburn Gardens Drive	17	17 / (17+22) = 44%
	Campbelltown Road (east)	Ingleburn Gardens Drive	22	22 / (17+22) = 56%
PM Peak	Ingleburn Gardens Drive	Campbelltown Road (west)	14	14 / (14+22) = 43%
	Ingleburn Gardens Drive	Campbelltown Road (east)	22	22 / (14+22) = 57%
	Campbelltown Road (west)	Ingleburn Gardens Drive	20	20 / (20+52) = 35%
	Campbelltown Road (east)	Ingleburn Gardens Drive	52	52 / (20+52) = 65%

This results in the traffic distribution as illustrated in Figure 13. The base numbers include the surveyed volumes and the development traffic volumes determined in the 2016 Traffic Impact Assessment (i.e. the numbers expressed in Figure 12). The additional traffic generation as a result of the proposed 26 dwellings is indicated in the figure by the numbers in the brackets.

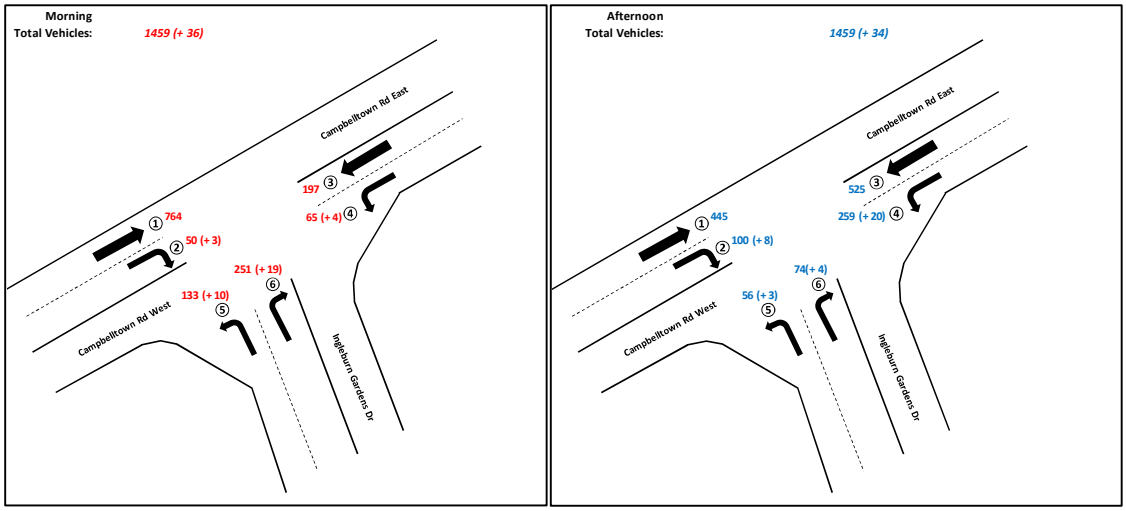


Figure 13: Development Traffic Morning and Evening Peak Hour (additional 26 dwellings)

4.4 Intersection Modelling

In order to determine the future performance of the Campbelltown Road / Ingleburn Gardens Drive intersection, an assessment has been undertaken using the SIDRA modelling software, which presents a range of performance indicators (Level of Service, Average Delay, etc.).

Typically, there are four performance indicators used to summarise the performance of an intersection, being:

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

Table 3: Level of Service Criteria

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

A summary of the SIDRA modelling results is presented in Table 4:

Table 4: SIDRA Modelling Results for Campbelltown Road / Ingleburn Gardens Drive (pre and post-development)

Time	Model	Level of Service	Average Delay (s)	Degree of Saturation (v/c)	95% Queue Length (veh)
AM Peak	2015 Survey	A	9.5	0.762	14.0
	2016 Report	A	13.2	0.823	15.6
	2018 Update	B	14.7	0.838	17.6
PM Peak	2015 Survey	A	9.6	0.720	9.6
	2016 Report	A	8.2	0.523	8.2
	2018 Update	A	8.3	0.523	7.0

As indicated by the traffic modelling results, the proposed increase of 27 lots/26 dwellings results in a very minor influence upon the Campbelltown Road / Ingleburn Gardens Drive intersection. In the AM peak the Level of Service (LoS) increases from an A to a B, continuing to present an acceptable level of performance. The average delay increases by 1.5 sec, the degree of saturation by 1.5%, and the 95th percentile queue length by 2 vehicles. In the PM peak, the LoS remains at a LoS A, the average delay increases by 0.1 sec, the degree of saturation remains constant and the 95th percentile queue length decreases by 1.2 vehicles. This can be attributed to the traffic volumes being more efficiently served by the signal phases and timings.

Therefore, the proposed development is anticipated to sufficiently accommodated within the existing road network without any significant influences upon the local traffic performance.

5. Parking Provision

5.1 Planning Policy Requirements

Typically, parking requirements are established with reference to the local planning controls i.e. Development Control Plan (DCP) and Local Environmental Plan (LEP). In regard to the proposed subdivision of the site, Campbelltown City Council has developed the *Edmondson Park Smart Growth DCP*, adopted in 2007 and incorporated as Part 6, Volume 2 of *Campbelltown (Sustainable City) DCP*.

Section 2.8 Transport Development Standard D6.2 specifies that:

"Car parking shall be provided for residential dwelling developments at the following minimum rates."

Table 5: Car Parking Provision Requirements as per the *Edmondson Park Smart Growth DCP*

Number of Bedrooms per Dwelling	Car Parking Spaces per dwelling
Bedsitter or 1 bedroom	0.75
2 bedroom	1
3 or more bedrooms	1.5
Visitor spaces	0.2

Notes:

* Visitor spaces are required for all multiunit dwelling developments in addition to resident spaces. These may be provided on-site, on-street, or a combination of both. On street parking shall be unallocated and available to the public.

* Car parking calculations are to be rounded up.

5.2 Car Parking Requirements

The proposal is still at an early stage, seeking the rezoning of land to accommodate the potential development of 27 residential lots. As the proposal develops, a detailed parking assessment statement of the parking provision including compliance with the relevant applicable standards (i.e. AS2890 suite) should be prepared and submitted to Council during the development application (DA) stage.

6. Access Assessment

6.1 Vehicular Access

The proposed lots will be accessed via Webber Circuit, which is currently under construction as part of The Meadows development. This Circuit links to the rest of the internal road network providing access to and throughout The Meadows and Ingleburn Gardens Estate.

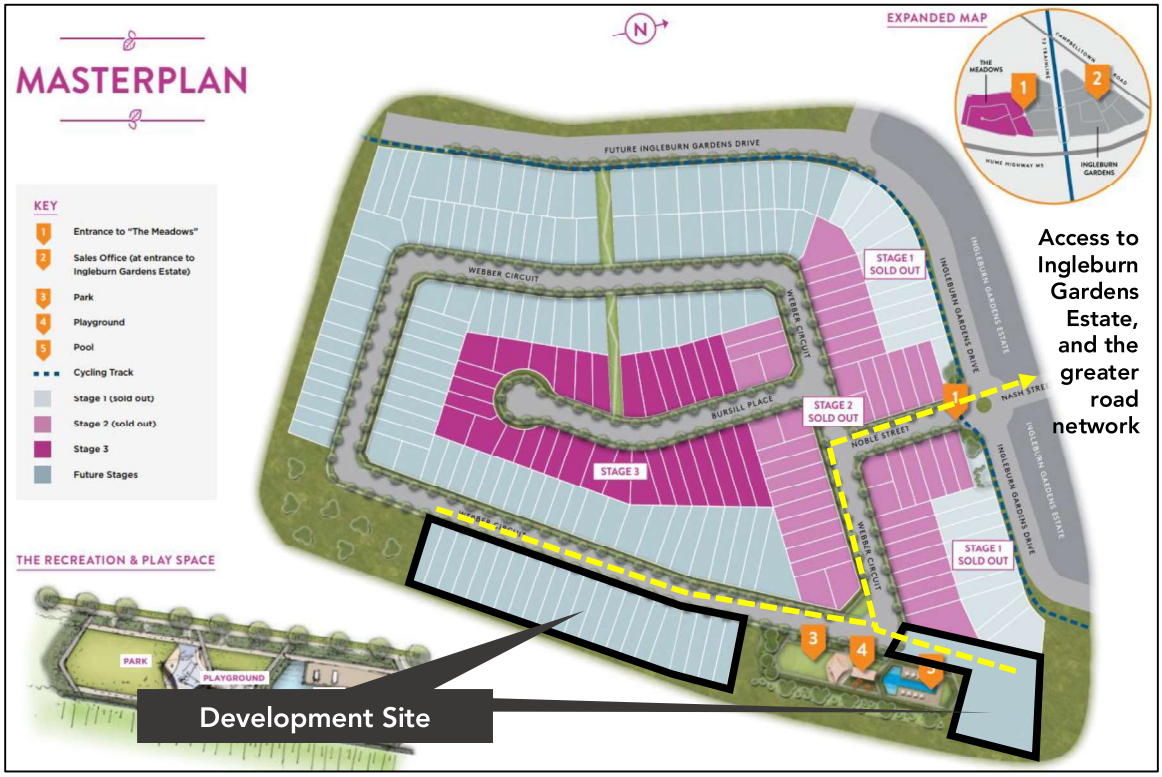


Figure 14: Proposed Vehicular Access

Access to the external road network will be via Ingleburn Gardens Drive, leading to the existing signalised intersection of Ingleburn Gardens Drive and Campbelltown Road. This intersection was constructed as part of the previous development of Ingleburn Gardens Estate.

6.2 Emergency Vehicle Access

Emergency vehicles will be able to access the site via Ingleburn Gardens Drive. The geometry of internal roadway will be designed to accommodate vehicles up to a Heavy Rigid Vehicle (HRV 12.5m long) which is represents the design envelope that includes emergency vehicles including fire appliances. The proposed rezoning will not affect existing emergency vehicle access and the emergency vehicle access for the proposed 27 lots will be the same as for the remainder of The Meadows.

6.3 Waste Collection

Waste collection is proposed to be similar to the existing developments in the area, with the option of Council collection or private collection. As discussed, the roadways have been designed to accommodate vehicles up to an HRV, thus encompassing refuse collection vehicles which are typically smaller than an HRV.

7. Conclusion

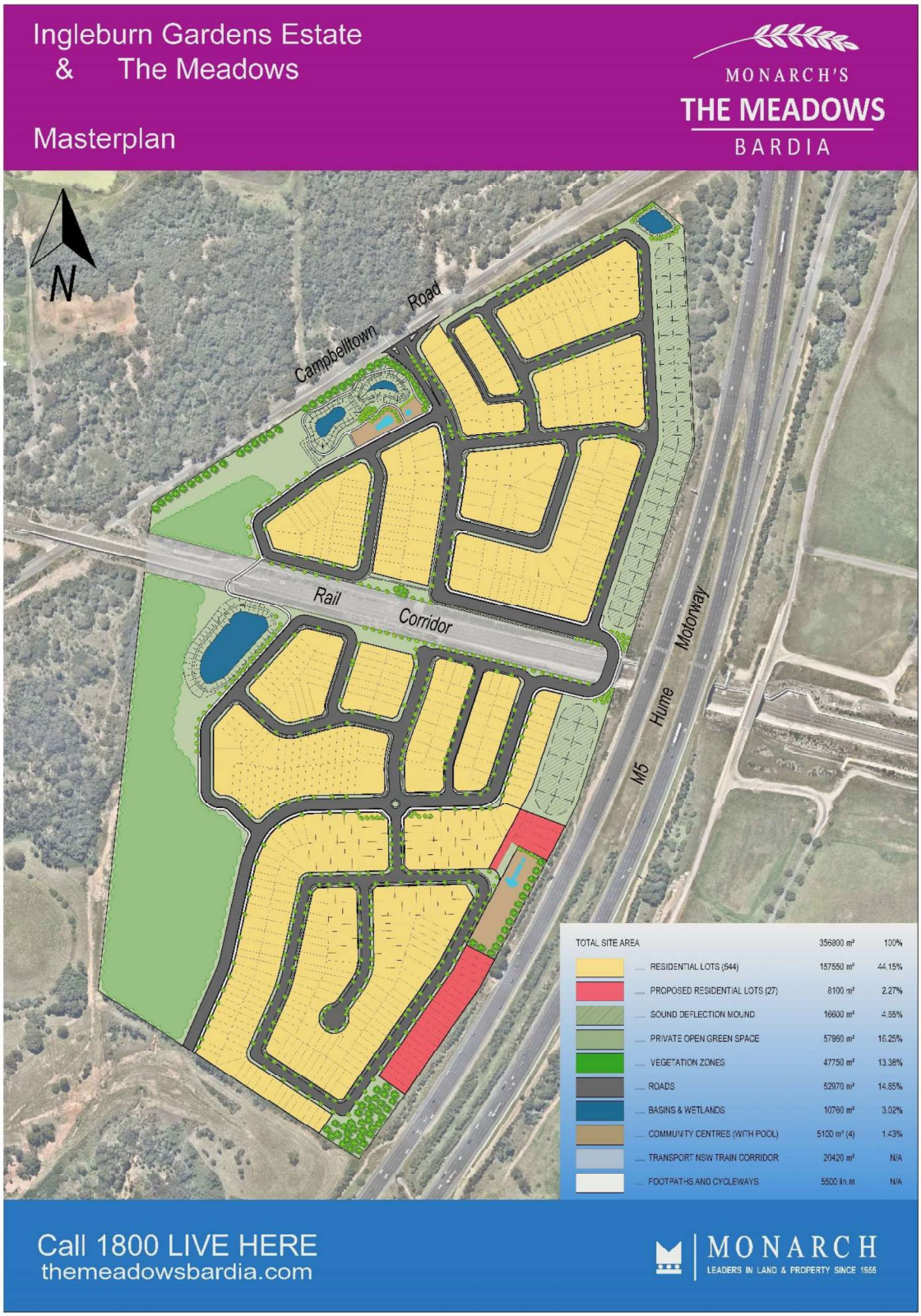
ptc. has been engaged by Monarch Investments Pty. Ltd. to provide a traffic and parking assessment to accompany the proposal to Campbelltown City Council to rezone lane currently zoned RE2 Private Recreation to R3 Medium Density Residential in The Meadows, Bardia. This is to accommodate the potential development of 27 residential lots accommodating 26 two-storey/one-storey dwellings (and one access handle).

An update of the traffic modelling, previously completed for 212 residential lots (The Meadows, Bardia) and 60 undeveloped lots, has been undertaken to incorporate the additional forecast traffic generation from the potential 26 dwellings. These 26 dwellings are anticipated to generate 7 inbound trips and 29 outbound trips in the AM peak and 27 inbound trips and 7 outbound trips in the PM peak. Based on the updated SIDRA traffic modelling and assessment of the internal road network (Ingleburn Gardens Drive), this additional traffic generation is not expected to significantly reduce the existing amenity of the Campbelltown Road/Ingleburn Gardens Drive signalised intersection, with the intersection operating at a LoS B in the AM peak and LoS A in the PM peak.

The access arrangements i.e. proposed internal road arrangement and connection to the external road network indicates that the site will be safely accessible by all users including emergency vehicles and refuse collection vehicles.

In light of the above, the proposed development is endorsed in the context of parking and traffic.

Attachment 1 Proposed Rezoning Overview



Attachment 2 SIDRA Movement Summary

MOVEMENT SUMMARY

Site: 1 [Ingelburn Rd | Campbelltown Rd - AM - SURVEY]

Survey Data from 8 Oct 2015
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 40 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
SouthEast: Ingelburns Garden Dr (S)												
21	L2	29	0.0	0.029	5.9	LOS A	0.1	0.8	0.37	0.58	0.37	53.3
23	R2	56	0.0	0.203	21.9	LOS B	1.0	7.2	0.91	0.73	0.91	43.1
Approach		85	0.0	0.203	16.4	LOS B	1.0	7.2	0.72	0.68	0.72	46.2
NorthEast: Campbelltown Rd (NE)												
24	L2	23	0.0	0.019	8.3	LOS A	0.1	0.5	0.31	0.65	0.31	54.1
25	T1	207	0.0	0.196	5.0	LOS A	2.1	14.5	0.53	0.44	0.53	72.2
Approach		231	0.0	0.196	5.3	LOS A	2.1	14.5	0.51	0.46	0.51	69.8
SouthWest: Campbelltown Rd (SW)												
31	T1	804	0.0	0.762	9.9	LOS A	14.0	98.2	0.83	0.80	0.94	65.7
32	R2	18	0.0	0.027	12.3	LOS A	0.2	1.3	0.52	0.68	0.52	50.2
Approach		822	0.0	0.762	10.0	LOS A	14.0	98.2	0.83	0.80	0.93	65.3
All Vehicles		1138	0.0	0.762	9.5	LOS A	14.0	98.2	0.75	0.72	0.83	64.1

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	Distance m	Prop. Queued	Effective Stop Rate
P5	SouthEast Full Crossing	53	9.1	LOS A	0.0	0.0	0.68	0.68
P6	NorthEast Full Crossing	53	14.5	LOS B	0.1	0.1	0.85	0.85
P8	SouthWest Full Crossing	53	14.5	LOS B	0.1	0.1	0.85	0.85
All Pedestrians		158	12.7	LOS B			0.79	0.79

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.

Organisation: PARKING AND TRAFFIC CONSULTANTS | Processed: Monday, August 6, 2018 11:02:41 AM
Project: Z:\PCI - PROJECT WORK FILES\NSW\Monarch Investments- Ingleburn Gardens Estate\Analysis\180806 - ptc. - Ingleburn Rd Campbelltown Rd.sip8

MOVEMENT SUMMARY

Site: 1 [Ingelburn Rd | Campbelltown Rd - AM - BASE (2016 model)]

Base Model (survey plus previously assessed 272 dwellings)
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 40 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
SouthEast: Ingelburns Garden Dr (S)												
21	L2	141	0.0	0.136	6.0	LOS A	0.6	4.4	0.40	0.62	0.40	53.2
23	R2	263	0.0	0.823	27.1	LOS B	6.1	42.6	1.00	1.04	1.47	40.5
Approach		404	0.0	0.823	19.8	LOS B	6.1	42.6	0.79	0.89	1.10	44.2
NorthEast: Campbelltown Rd (NE)												
24	L2	68	0.0	0.058	8.4	LOS A	0.2	1.6	0.33	0.66	0.33	54.1
25	T1	207	0.0	0.206	5.5	LOS A	2.2	15.4	0.56	0.47	0.56	71.3
Approach		276	0.0	0.206	6.2	LOS A	2.2	15.4	0.50	0.51	0.50	66.1
SouthWest: Campbelltown Rd (SW)												
31	T1	804	0.0	0.798	12.3	LOS A	15.6	109.3	0.88	0.88	1.05	63.1
32	R2	53	0.0	0.082	13.1	LOS A	0.6	4.0	0.57	0.71	0.57	49.7
Approach		857	0.0	0.798	12.3	LOS A	15.6	109.3	0.86	0.87	1.02	62.0
All Vehicles		1537	0.0	0.823	13.2	LOS A	15.6	109.3	0.78	0.81	0.95	56.7

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	Distance m	Prop. Queued	Effective Stop Rate
P5	SouthEast Full Crossing	53	9.8	LOS A	0.0	0.0	0.70	0.70
P6	NorthEast Full Crossing	53	14.5	LOS B	0.1	0.1	0.85	0.85
P8	SouthWest Full Crossing	53	14.5	LOS B	0.1	0.1	0.85	0.85
All Pedestrians		158	12.9	LOS B			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.

Organisation: PARKING AND TRAFFIC CONSULTANTS | Processed: Monday, August 6, 2018 11:02:41 AM
Project: Z:\PCI - PROJECT WORK FILES\NSW\Monarch Investments- Ingleburn Gardens Estate\Analysis\180806 - ptc. - Ingleburn Rd Campbelltown Rd.sip8

MOVEMENT SUMMARY

Site: 1 [Ingelburn Rd | Campbelltown Rd - AM - DEVELOPMENT (2018 model)]

Development Model (additional 26 dwellings)
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 40 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
SouthEast: Ingelburns Garden Dr (S)												
21	L2	151	0.0	0.143	6.1	LOS A	0.7	4.7	0.41	0.62	0.41	53.2
23	R2	284	0.0	0.777	24.9	LOS B	6.2	43.6	1.00	0.97	1.32	41.6
Approach		435	0.0	0.777	18.4	LOS B	6.2	43.6	0.79	0.85	1.00	45.0
NorthEast: Campbelltown Rd (NE)												
24	L2	73	0.0	0.061	8.4	LOS A	0.2	1.6	0.33	0.67	0.33	54.1
25	T1	207	0.0	0.216	6.2	LOS A	2.3	16.2	0.59	0.49	0.59	70.5
Approach		280	0.0	0.216	6.7	LOS A	2.3	16.2	0.52	0.53	0.52	65.3
SouthWest: Campbelltown Rd (SW)												
31	T1	804	0.0	0.838	15.5	LOS B	17.6	123.0	0.92	0.96	1.19	59.7
32	R2	56	0.0	0.091	13.7	LOS A	0.6	4.5	0.60	0.72	0.60	49.2
Approach		860	0.0	0.838	15.4	LOS B	17.6	123.0	0.90	0.94	1.15	58.9
All Vehicles		1575	0.0	0.838	14.7	LOS B	17.6	123.0	0.81	0.85	1.00	55.2

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	Distance m	Prop. Queued	Effective Stop Rate
P5	SouthEast Full Crossing	53	10.5	LOS B	0.0	0.0	0.73	0.73
P6	NorthEast Full Crossing	53	14.5	LOS B	0.1	0.1	0.85	0.85
P8	SouthWest Full Crossing	53	14.5	LOS B	0.1	0.1	0.85	0.85
All Pedestrians		158	13.2	LOS B			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.

Organisation: PARKING AND TRAFFIC CONSULTANTS | Processed: Monday, August 6, 2018 11:02:42 AM
Project: Z:\PCI - PROJECT WORK FILES\NSW\Monarch Investments- Ingleburn Gardens Estate\Analysis\180806 - ptc. - Ingleburn Rd Campbelltown Rd.sip8

MOVEMENT SUMMARY

Site: 1 [Ingelburn Rd | Campbelltown Rd - PM - SURVEY]

Survey Data from 8 Oct 2015
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
SouthEast: Ingelburns Garden Dr (S)												
21	L2	26	0.0	0.037	8.5	LOS A	0.2	1.3	0.66	0.64	0.66	51.4
23	R2	35	0.0	0.095	15.9	LOS B	0.4	3.1	0.84	0.70	0.84	46.4
Approach		61	0.0	0.095	12.7	LOS A	0.4	3.1	0.77	0.67	0.77	48.4
NorthEast: Campbelltown Rd (NE)												
24	L2	55	0.0	0.047	8.7	LOS A	0.2	1.2	0.43	0.67	0.43	53.7
25	T1	553	0.0	0.720	10.1	LOS A	7.9	55.3	0.90	0.84	1.05	65.5
Approach		607	0.0	0.720	10.0	LOS A	7.9	55.3	0.86	0.82	0.99	64.2
SouthWest: Campbelltown Rd (SW)												
31	T1	468	0.0	0.610	8.3	LOS A	5.8	40.9	0.84	0.74	0.87	67.7
32	R2	21	0.0	0.069	18.9	LOS B	0.3	2.0	0.87	0.69	0.87	46.0
Approach		489	0.0	0.610	8.8	LOS A	5.8	40.9	0.85	0.73	0.87	66.3
All Vehicles		1158	0.0	0.720	9.6	LOS A	7.9	55.3	0.85	0.78	0.93	64.0

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	Distance m	Prop. Queued	Effective Stop Rate
P5	SouthEast Full Crossing	53	9.6	LOS A	0.0	0.0	0.80	0.80
P6	NorthEast Full Crossing	53	9.6	LOS A	0.0	0.0	0.80	0.80
P8	SouthWest Full Crossing	53	9.6	LOS A	0.0	0.0	0.80	0.80
All Pedestrians		158	9.6	LOS A			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.

Organisation: PARKING AND TRAFFIC CONSULTANTS | Processed: Monday, August 6, 2018 11:02:42 AM
Project: Z:\PCI - PROJECT WORK FILES\NSW\Monarch Investments- Ingleburn Gardens Estate\Analysis\180806 - ptc. - Ingleburn Rd Campbelltown Rd.sip8

MOVEMENT SUMMARY

Site: 1 [Ingelburn Rd | Campbelltown Rd - PM - BASE (2016 model)]

Base Model (survey plus previously assessed 272 dwellings)
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 40 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
SouthEast: Ingelburns Garden Dr (S)												
21	L2	59	0.0	0.078	7.5	LOS A	0.4	2.9	0.52	0.63	0.52	52.2
23	R2	77	0.0	0.280	22.2	LOS B	1.4	10.1	0.92	0.74	0.92	42.9
Approach		136	0.0	0.280	15.8	LOS B	1.4	10.1	0.75	0.70	0.75	46.5
NorthEast: Campbelltown Rd (NE)												
24	L2	272	0.0	0.240	9.0	LOS A	1.3	9.1	0.44	0.71	0.44	53.7
25	T1	553	0.0	0.523	6.3	LOS A	7.0	48.9	0.68	0.59	0.68	70.3
Approach		824	0.0	0.523	7.2	LOS A	7.0	48.9	0.60	0.63	0.60	63.8
SouthWest: Campbelltown Rd (SW)												
31	T1	468	0.0	0.444	5.9	LOS A	5.6	39.0	0.64	0.55	0.64	70.8
32	R2	105	0.0	0.254	16.6	LOS B	1.5	10.6	0.73	0.76	0.73	47.4
Approach		574	0.0	0.444	7.9	LOS A	5.6	39.0	0.65	0.59	0.65	65.0
All Vehicles		1534	0.0	0.523	8.2	LOS A	7.0	48.9	0.63	0.62	0.63	62.2

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	Distance m	Prop. Queued	Effective Stop Rate
P5	SouthEast Full Crossing	53	9.1	LOS A	0.0	0.0	0.68	0.68
P6	NorthEast Full Crossing	53	14.5	LOS B	0.1	0.1	0.85	0.85
P8	SouthWest Full Crossing	53	14.5	LOS B	0.1	0.1	0.85	0.85
All Pedestrians		158	12.7	LOS B			0.79	0.79

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.

Organisation: PARKING AND TRAFFIC CONSULTANTS | Processed: Monday, August 6, 2018 11:02:43 AM
Project: Z:\PCI - PROJECT WORK FILES\NSW\Monarch Investments- Ingleburn Gardens Estate\Analysis\180806 - ptc. - Ingleburn Rd Campbelltown Rd.sip8

MOVEMENT SUMMARY

Site: 1 [Ingelburn Rd | Campbelltown Rd - PM - DEVELOPMENT (2018 model)]

Development Model (additional 26 dwellings)
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 40 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
SouthEast: Ingelburns Garden Dr (S)												
21	L2	62	0.0	0.082	7.5	LOS A	0.4	3.0	0.52	0.64	0.52	52.2
23	R2	82	0.0	0.299	22.2	LOS B	1.5	10.8	0.93	0.75	0.93	42.9
Approach		144	0.0	0.299	15.9	LOS B	1.5	10.8	0.75	0.70	0.75	46.5
NorthEast: Campbelltown Rd (NE)												
24	L2	294	0.0	0.262	9.0	LOS A	1.4	10.0	0.45	0.71	0.45	53.6
25	T1	553	0.0	0.523	6.3	LOS A	7.0	48.9	0.68	0.59	0.68	70.3
Approach		846	0.0	0.523	7.2	LOS A	7.0	48.9	0.60	0.63	0.60	63.4
SouthWest: Campbelltown Rd (SW)												
31	T1	468	0.0	0.444	5.9	LOS A	5.6	39.0	0.64	0.55	0.64	70.8
32	R2	113	0.0	0.272	16.7	LOS B	1.6	11.4	0.73	0.76	0.73	47.3
Approach		581	0.0	0.444	8.0	LOS A	5.6	39.0	0.65	0.59	0.65	64.6
All Vehicles		1572	0.0	0.523	8.3	LOS A	7.0	48.9	0.63	0.63	0.63	61.8

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	Distance m	Prop. Queued	Effective Stop Rate
P5	SouthEast Full Crossing	53	9.1	LOS A	0.0	0.0	0.68	0.68
P6	NorthEast Full Crossing	53	14.5	LOS B	0.1	0.1	0.85	0.85
P8	SouthWest Full Crossing	53	14.5	LOS B	0.1	0.1	0.85	0.85
All Pedestrians		158	12.7	LOS B			0.79	0.79

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.

Organisation: PARKING AND TRAFFIC CONSULTANTS | Processed: Monday, August 6, 2018 11:02:43 AM
Project: Z:\PCI - PROJECT WORK FILES\NSW\Monarch Investments- Ingleburn Gardens Estate\Analysis\180806 - ptc. - Ingleburn Rd Campbelltown Rd.sip8

Setbacks to the Hume Highway

Drawing Prepared by:
DFP Planning Pty Ltd
PO BOX 230,
Pennant Hills, 1715

02 9980 6933
www.dfpplanning.com.au

Client:
Monarch Investments

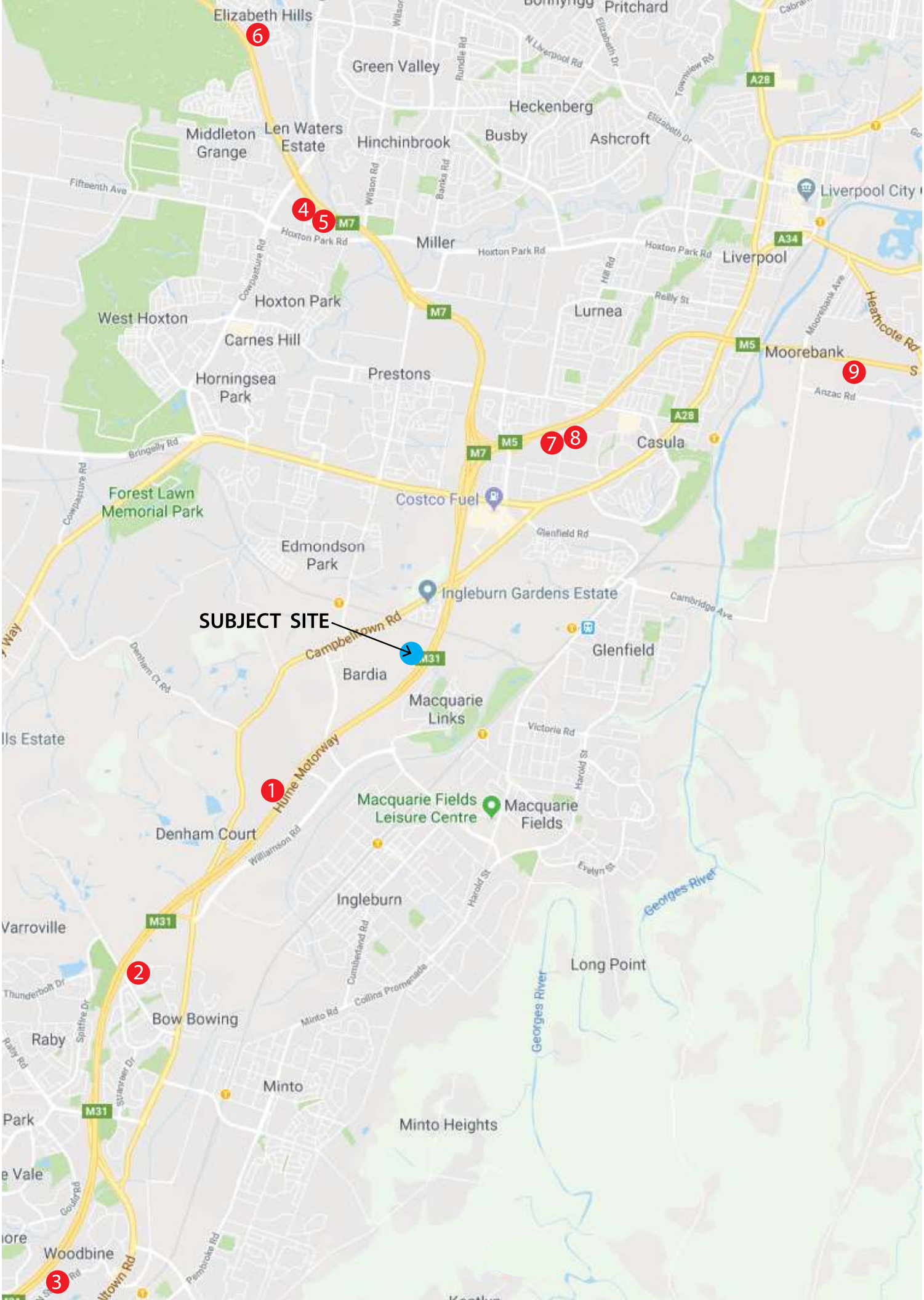
Suite 12
33 Ryde Road
Pymble, NSW 2073

N

Title:
Setback Distances to Hume Highway

At:
Lot 9 and 10, DP 270983
and surrounding sites

Date:	11/12/19
P. No:	5285N
Rev:	A
Drawn:	A.R


SUBJECT SITE
1
2
3
4
5
6
7
8
9
Elizabeth Hills
Green Valley
Heckenberg
Middleton Grange
Len Waters Estate
Hinchinbrook
Busby
Ashcroft
Liverpool City
Miller
Hoxton Park
West Hoxton
Carnes Hill
Horningsea Park
Prestons
Lurnea
Liverpool
Moorebank
Casula
Forest Lawn Memorial Park
Costco Fuel
Edmondson Park
Ingleburn Gardens Estate
Glenfield
Bardia
Macquarie Links
Macquarie Fields Leisure Centre
Macquarie Fields
Denham Court
Ingleburn
Varroville
Long Point
Bow Bowing
Raby
Minto
Minto Heights
Woodbine
Hume Motorway
Campbelltown Rd
Georges River
M7
M5
M31
A28
A34


1
5 Gibson Road,
Denham Court
HUME MOTORWAY
3.7m
27.7m


4
9m
LIGHTNING RIDGE RD, HINCHINBROOK
WESTLINK M7
22m
15m


7
SOUTH WESTERN MOTORWAY
30m
28m
21m
19m
FLAME TREE STREET, CASULA


2
HUME MOTORWAY
25m
10m
40 Lochalsh St,
St Andrews


5
19m
WESTLINK M7
20m
19m
26m
INVERELL AVE, HINCHINBROOK


8
SOUTH WESTERN MOTORWAY
33m
32m
31m
35m
POPPLE CLOSE
GUISE AVENUE, CASULA


3
HUME MOTORWAY
35m
37m
BUNDEENA ROAD, WOODBINE


6
28m
27m
28m
32m
WESTLINK M7
DOBROYD DRIVE, ELIZABETH HILLS


9
SOUTH WESTERN MOTORWAY
21m
24m
25m
22m
18m
25m
WOMBEYAN COURT, WATTLE GROVE
BUNGONIA COURT

28 April 2020

TfNSW Reference: SYD20/00252/01
Council Reference: 634/020/E-PP

The General Manager
Campbelltown City Council
PO Box 57
CAMPBELLTOWN NSW 2560

Attention: Alex Saprun

PLANNING PROPOSAL FOR TWO RESIDUAL LOTS – THE MEADOWS, BARDIA

Dear Sir/Madam

Reference is made to Council's correspondence dated 2 April 2020, regarding the abovementioned application which was referred to Transport for NSW (TfNSW) for comment.

TfNSW has reviewed the submitted application and raises no objection to the application. TfNSW requests that the following conditions are incorporated into any consent issued by Council:

1. The subject property abuts a Declared Freeway (Hume Motorway) as shown by blue colour on attached Aerial 'X' & 'Y'. Access is denied across this boundary.

2. Any new buildings or structures (including proposed sound wall), together with any improvements integral to the future use of the site are to be wholly within the freehold property (unlimited height or depth), along the Hume Motorway Boundary.

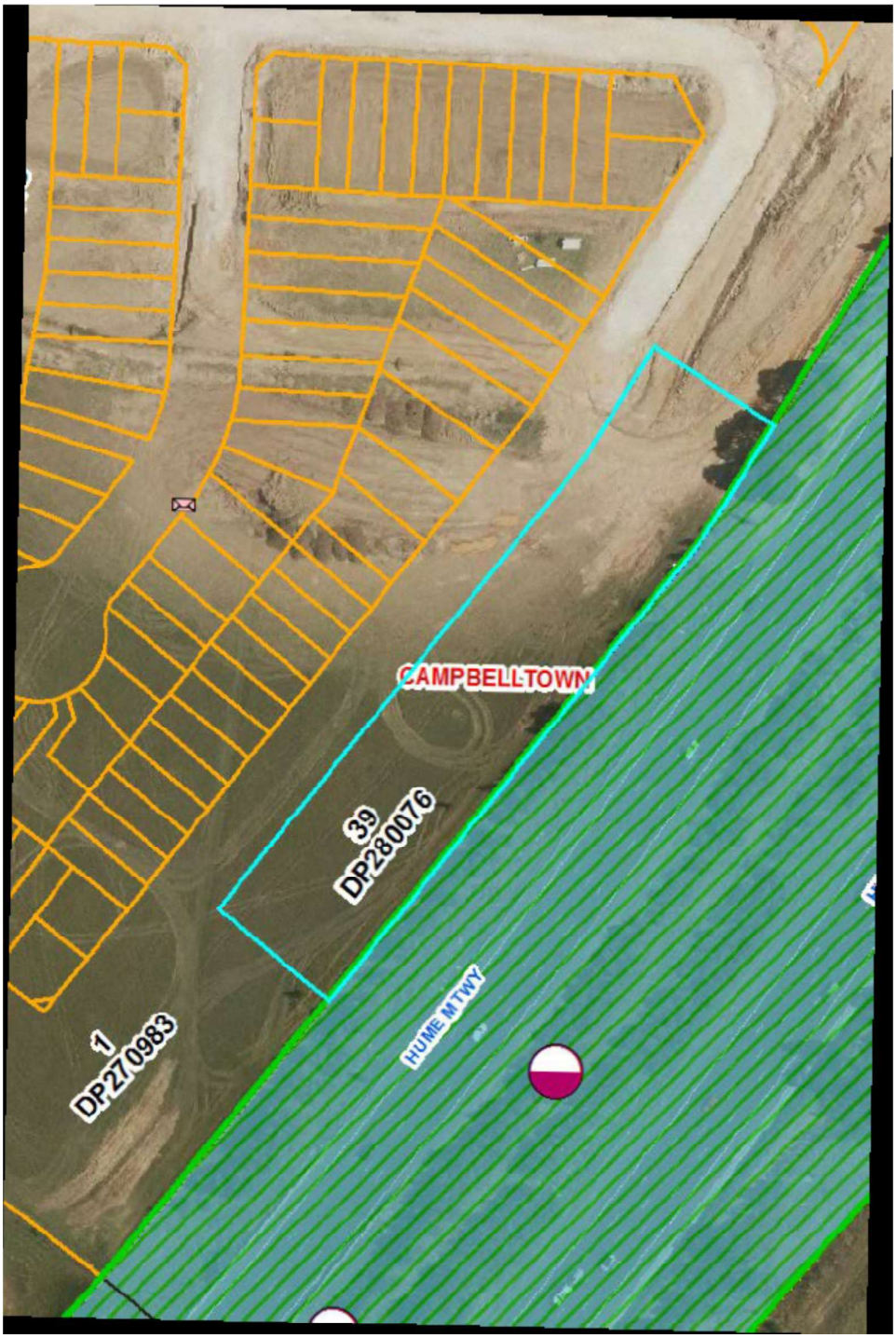
3. Any Detailed design plans and hydraulic calculations of any changes to the TfNSW's stormwater drainage system are to be submitted to TfNSW for approval, prior to the commencement of any works. Documents should be submitted to Development.Sydney@rms.nsw.gov.au
   A plan checking fee will be payable and a performance bond may be required before TfNSW approval is issued.

If you have any further questions, Sandra Grimes, Development Assessment Officer, would be pleased to take your call on (02) 9563 8651 or please email development.sydney@rms.nsw.gov.au. I hope this has been of assistance.

Yours sincerely

Pahee Rathan
Senior Land Use Assessment Coordinator

‘X’



‘Y’


2
2
DP280032
1
DP270621
2
DP280064
DP280064
4
40
DP280076
52
DP280064
CAMPBELLTOWN
1
DP270983