Traffic and Transport Assessment

Section 96A Residential Subdivision, Wincity Sunbury

CG140997

Prepared for
Wincity Development

4 December 2015

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Shaping the Future

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Version	Date	Author	Author Initials	Reviewer	Reviewer Initials
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Table of Contents

Appendices

Tables

Figures

1 Introduction

Cardno was retained by Wincity Development to undertake a traffic and transport assessment for the initial stages of development of the land at 45 Gellies Road and 170 Lancefield Road, Sunbury.

A Section 96A application is being sought for the subdivision and town centre development as the Precinct Structure Plan (Sunbury East / Lancefield Road) for the development area is not yet completed.

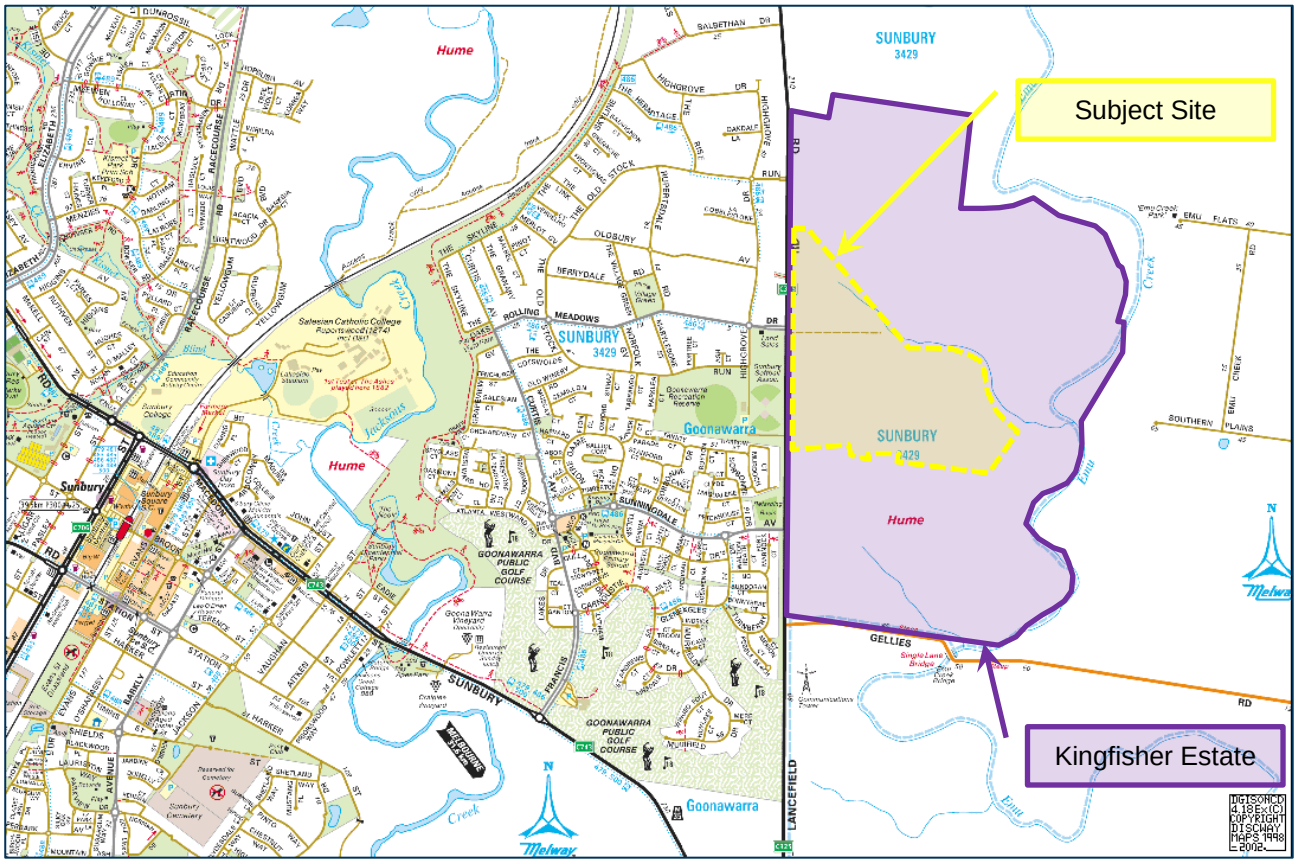
In the course of preparing this assessment, the subject site and its environs have been inspected, plans of the development examined, and all relevant traffic data analysed.

2 Existing Conditions

2.1 Location and Land Use

The subject site is located within the proposed Kingfisher Estate on the east side of Melbourne-Lancefield Road, north of Gellies Road, as shown in Figure 2-1.

Figure 2-1 Locality Plan



Land use to the west of Melbourne-Lancefield road is predominantly residential in nature, with rural land to the north, east and south.

The subject site is currently largely vacant agricultural land, with a dwelling and associated buildings.

2.2 Road Network

2.2.1 Melbourne-Lancefield Road

Lancefield Road is a Primary Arterial Road, running north from Sunbury Road within the East Sunbury Growth Area, to Clarkefield, Romsey and Lancefield, continuing further north to the Northern Highway at Tooborac.

A speed limit of 100km/h currently applies along Lancefield Road through the East Sunbury Growth Area.

A 20m road widening reserve (via a Public Acquisition Overlay) is provided along Lancefield Road for the purposes of future duplication.

Figure 2-2 Melbourne – Lancefield Road, looking north through East Sunbury

2.2.2 Gellies Road

Gellies Road is a major local road which operates in an east-west orientation from Melbourne – Lancefield Road, deviating to a north-south orientation where it becomes Wildwood Road North.

Gellies Road operates with one trafficable lane in each direction, narrowing at the bridge over Jacksons Creek which caters for one vehicle at a time.

The intersection of Melbourne – Lancefield Road / Gellies Road is unsignalised, as shown in Figure 2-3.

Figure 2-3 Intersection Melbourne – Lancefield Road / Gellies Road

2.2.3 Sunningdale Avenue

Sunningdale Avenue is a local road operating from Melbourne-Lancefield Road in the east to the intersection of Francis Boulevard and Curtis Avenue in the west.

The intersection of Melbourne-Lancefield Road / Sunningdale Avenue is unsignalised with auxilary left and right turn lanes, as depicted in Figure 2-4

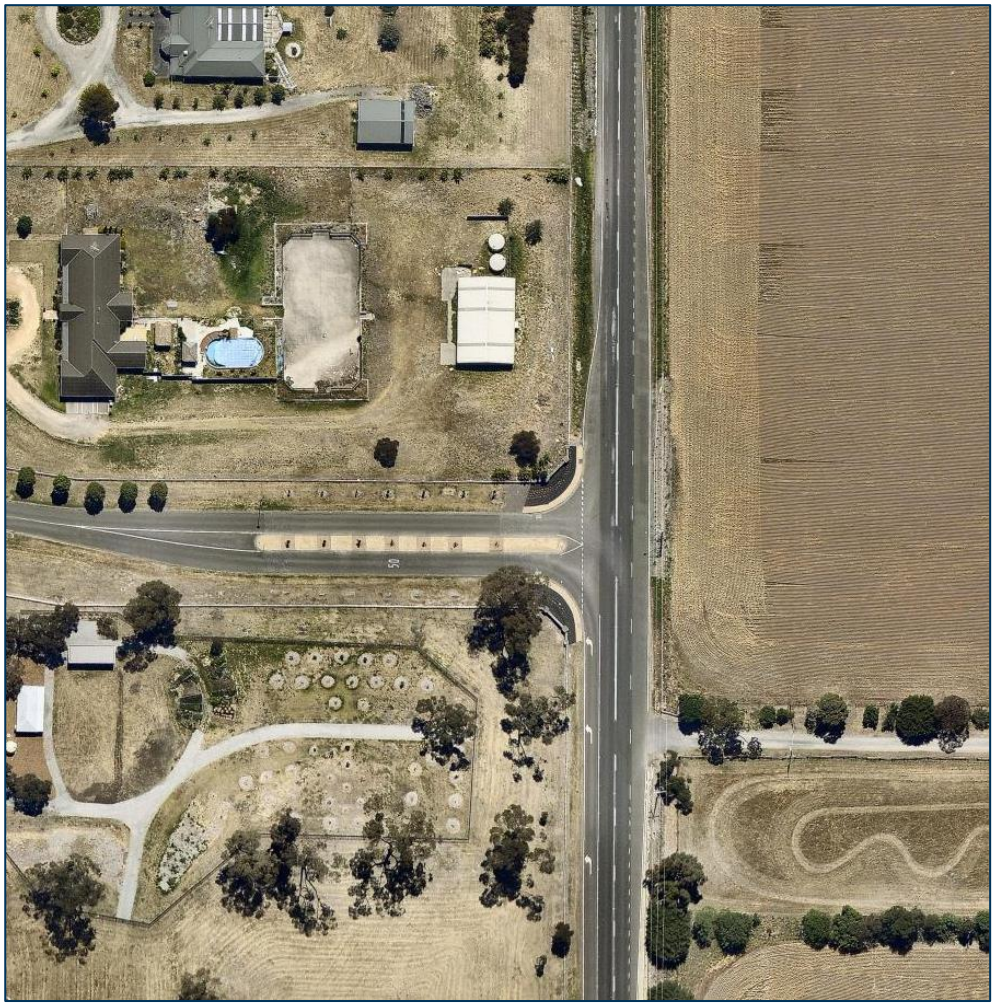
Figure 2-4 Intersection Melbourne-Lancefield Road / Sunningdale Avenue

2.2.4 Rolling Meadows Drive

Rolling Meadows Drive is a local collector road operating from Melbourne-Lancefield Road in the east to Curtis Avenue in the west. Rolling Meadows Drive operates with a speed limit of 50km/h.

The intersection of Melbourne-Lancefield Road / Rolling Meadows Drive is unsignalised with auxiliary left and right turn lanes, as shown in Figure 2-5.

Figure 2-5 Intersection Melbourne-Lancefield / Rolling Meadows Drive



2.3 Sustainable Transport

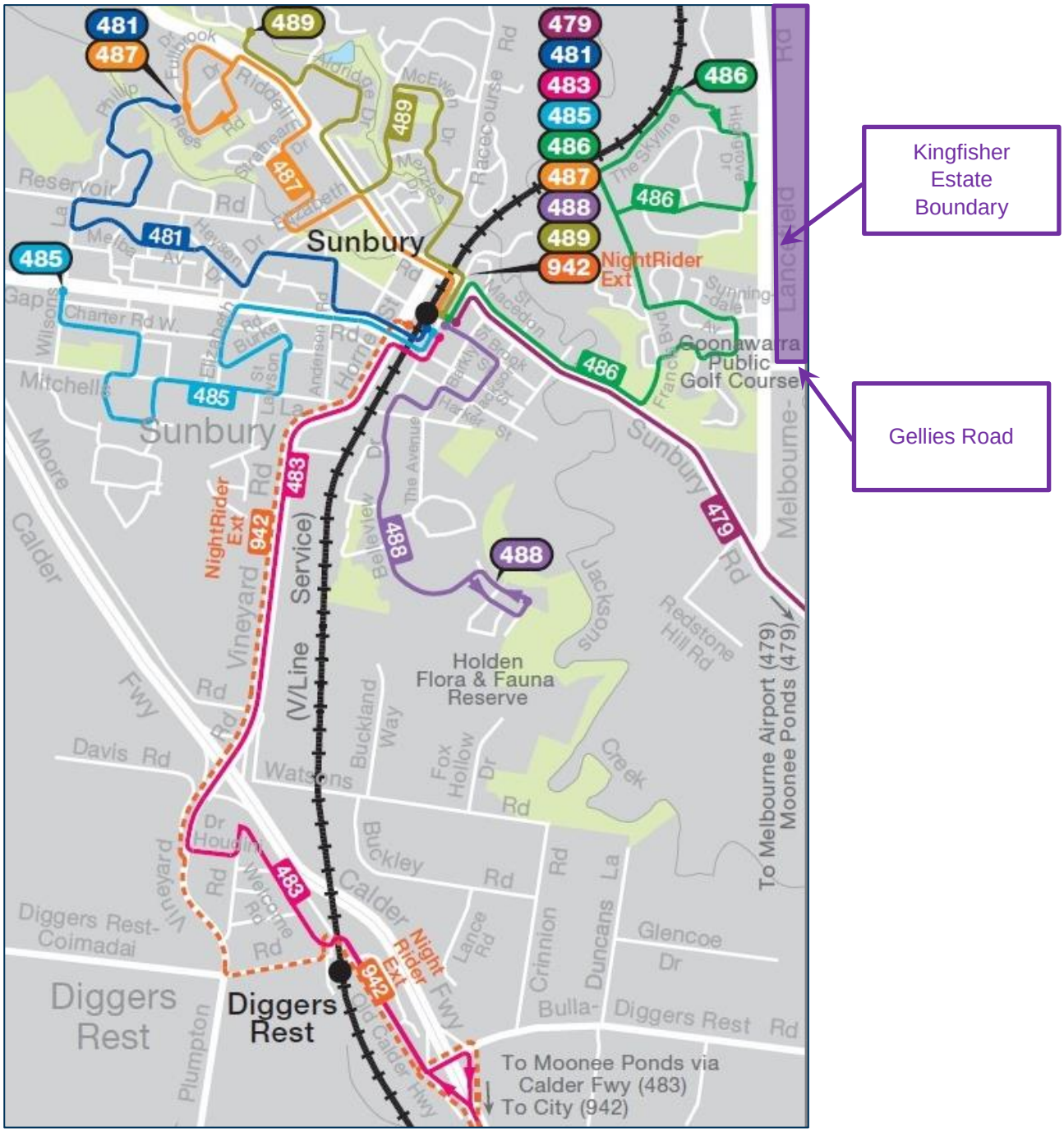
2.3.1 Public Transport

Due to the undeveloped nature of the subject land, there is only limited public transport within the vicinity.

Bus Route 486 operates along Sunningdale Avenue near the southern side of the site, and along Rolling Meadows Drive at the northern end of the site. This service operates between Rolling Meadows and Sunbury Railway Station, providing residents with a convenient connection to the train services.

It is expected that as the area develops, public transport will be extended and improved to service the subject land and surrounding developments.

Figure 2-6 Sunbury Public Transport Map

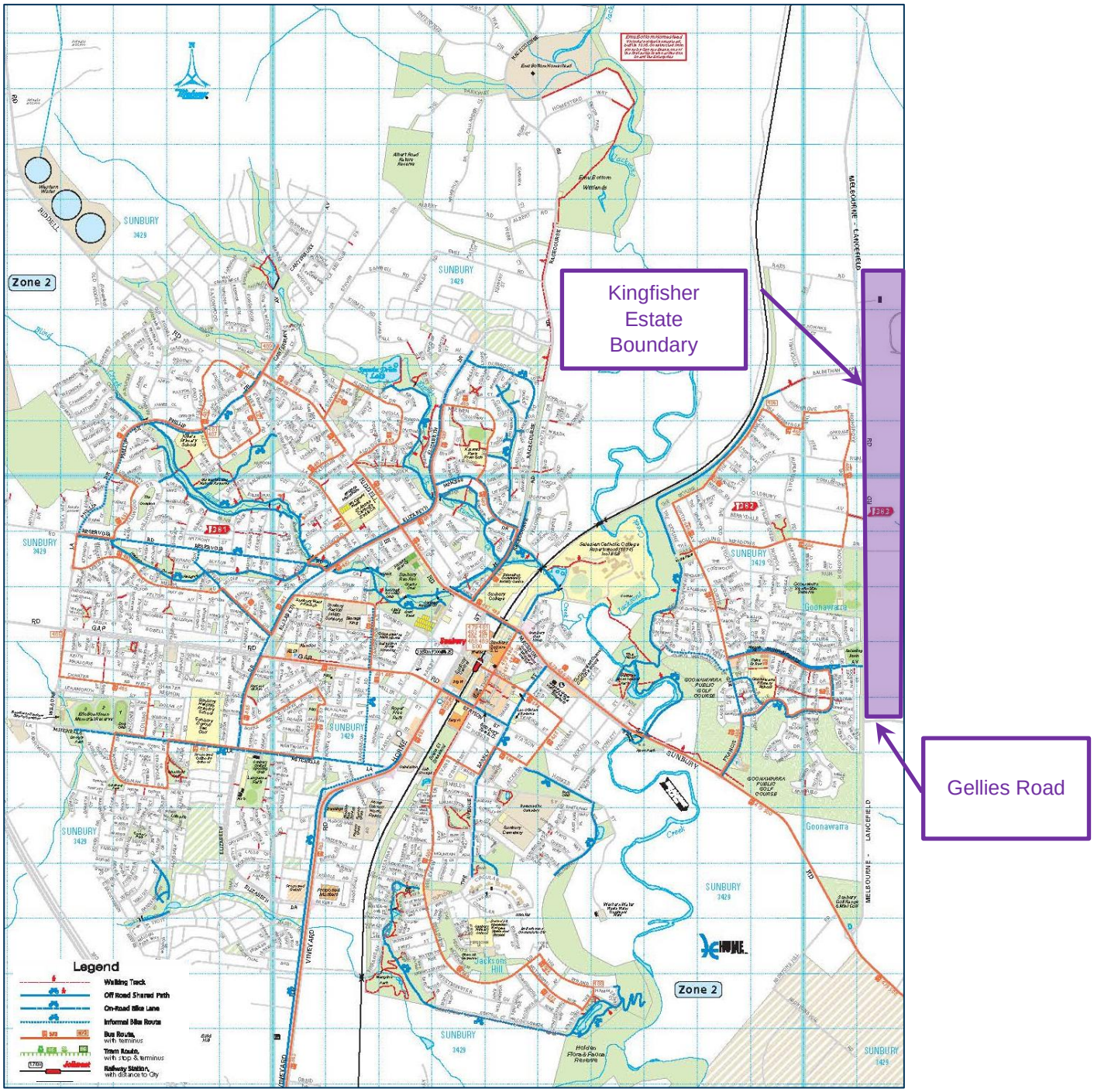


2.3.2 Bicycle Network

The subject site and surrounding area are located at the edge of the urban growth boundary, and is currently being developed. As such, the site has limited access to the principle bicycle network.

Hume City Council published a Travel Smart map for Sunbury in 2014, showing on-road bicycle lanes on Sunningdale Avenue, in addition to an off-road shared path along Sunningdale Avenue between Sorbonne Drive and Notre Dame Drive. An excerpt of the plan is shown in Figure 2-7.

Figure 2-7 Excerpt from Hume City Council Travel Smart Map



3 Background

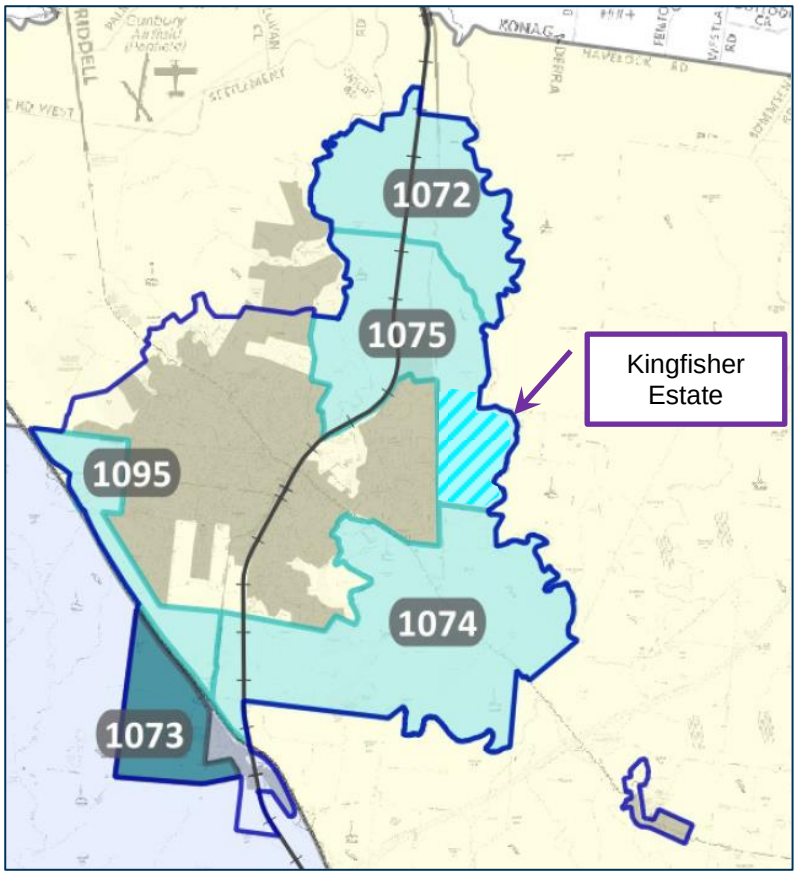
3.1 Precinct Structure Plan

The subject site is located within the proposed Kingfisher Estate, which forms the southern part of the Precinct Structure Plan (PSP) Area 1075 known as Lancefield Road, as shown in Figure 3-1

The Lancefield Road PSP is currently being prepared by the Metropolitan Planning Authority (MPA). The Lancefield Road PSP covers an area of approximately 700 hectares, with a projected yield of 6,000 dwellings.

A number of precinct structure plans are being prepared in the area surrounding the site. To the north is the Sunbury North PSP (Area 1072). To the south is the Sunbury South PSP (Area 1074) which is being prepared simultaneously with the Lancefield Road PSP to provide a coordinated framework for development.

Figure 3-1 Hume City Council Precinct Structure Plan Areas



3.2 Kingfisher Estate

The land at 45 Gellies Road and 170 Lancefield Road, Sunbury is proposed to be developed for the purposes of a residential subdivision, with a town centre providing retail, office and associated services also located on the land.

Current plans for the estate estimate a total yield of around 2,100 conventional residential lots and 200 medium density lots.

3.3 Traffic Volumes

3.3.1 2015 Turning Movement Surveys

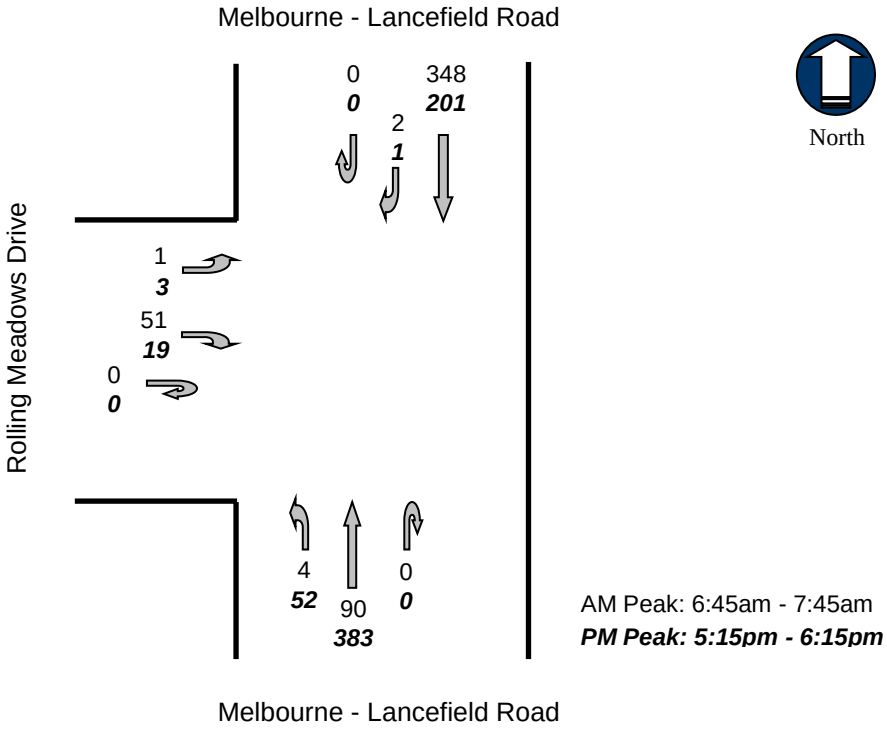
Cardno commissioned turning movement surveys at the intersection of Melbourne – Lancefield Road / Rolling Meadows Drive on Friday, 1st May 2015, during the following periods:

> 6:30am to 9:30am

> 3:00pm to 7:00pm

The results of the survey are summarised in Figure 3-2.

Figure 3-2 Melbourne – Lancefield Road / Rolling Meadows Drive



The survey showed that Melbourne – Lancefield Road carried in the order of 493 vehicles south of Rolling Meadows Drive during the morning peak, and 655 vehicles during the afternoon peak.

Based upon these volumes, it is estimated that Melbourne – Lancefield Road currently carries in the order of 4,930 – 6,550 vehicles per day, based upon the assumption that the peak hours represent 10% of the daily traffic volumes.

3.3.2 VicRoads

VicRoads published the Traffic Volume Data for Victoria (July 2014), which included traffic volumes for Melbourne – Lancefield Road between Sunbury Road and Gellies Road, as summarised Table 3-1.

Table 3-1 Daily Traffic Volumes – Melbourne – Lancefield Road

Direction	2003	2010	2011	2012	2013
Northbound	2,400	2,500	2,600	3,300	4,000
Southbound	2,400	2,600	2,700	3,300	4,000
Total	**4,800**	**5,100**	**5,300**	**6,600**	**8,000**

A review of the data from 2003 to 2013 indicates an average compounding growth rate of 5.2%.

Furthermore, VicRoads have published a Traffic Profile for Melbourne - Lancefield Road between Sunbury Road and Gellies Road. The data provides profiles for northbound and southbound traffic flows, as summarised in Table 3-2.

Table 3-2 Daily Traffic Volumes – Melbourne – Lancefield Road

Direction	Mon	Tue	Wed	Thu	Fri	Weekday Average
Northbound	2,962	3,088	3,118	3,118	3,366	3,130
Southbound	3,127	3,194	3,324	3,295	3,388	3,266
Total	**6,089**	**6,282**	**6,442**	**6,413**	**6,754**	**6,396**

The traffic volumes indicate an average weekday volume of 6,396 vehicles per day, which is consistent with the upper estimate made based upon the peak hour traffic volumes.

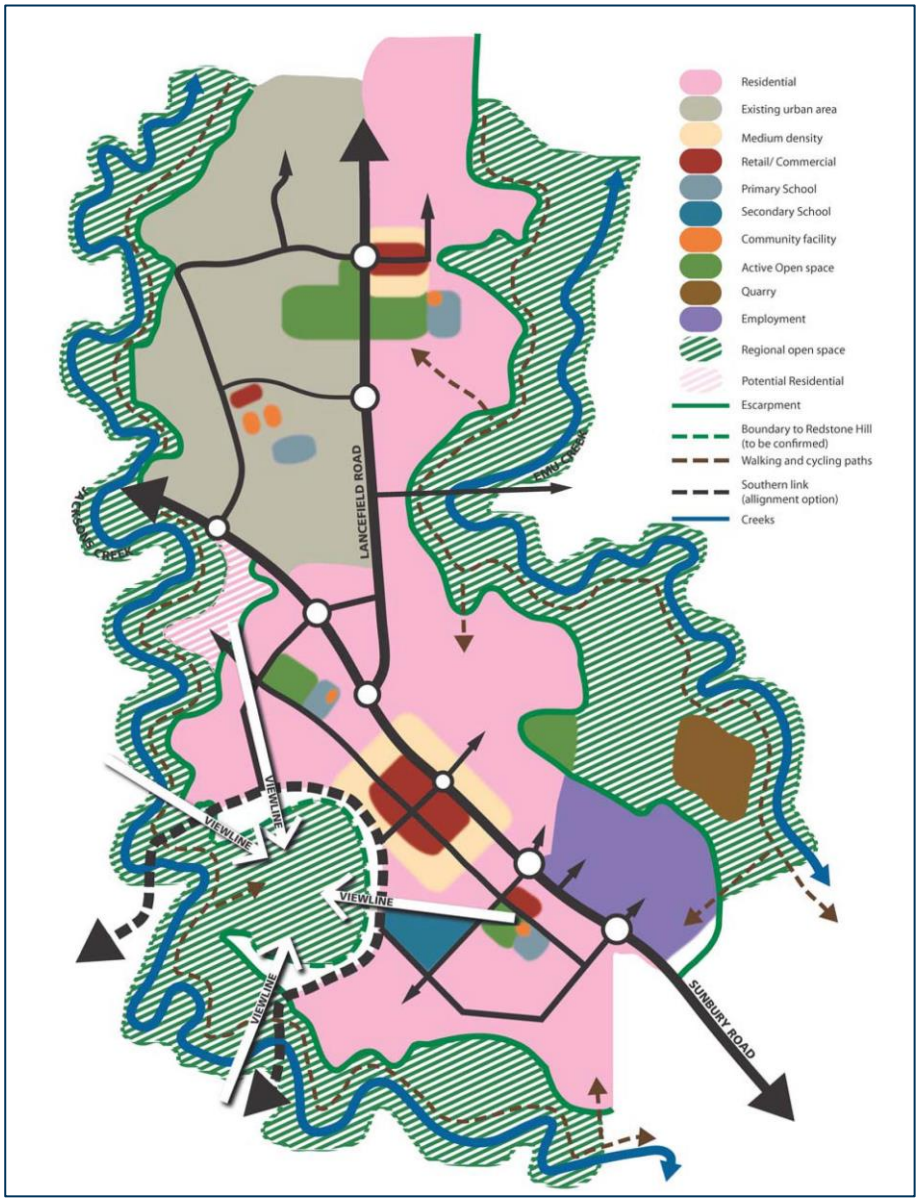
3.4 The Northern Link

The Sunbury HIGAP Spatial Strategy July 2012, prepared by Hume City Council, details the outcomes of a comprehensive planning process for the Sunbury area. The Strategy is intended to inform Council's future planning for Sunbury.

The subject site is located within the Sunbury South East Precinct as defined by the Strategy, as shown in Figure 3-3.

The Strategy details the plans for a proposed road crossing of Jackson's Creek, to the north of the site, generally known as the Northern Link. The timeframe for construction of the Northern Link is put at 15+ years.

Figure 3-3 Sunbury HIGAPS Spatial Strategy – South East Precinct



4 Proposed Development

4.1 96A Application

It is proposed to submit a 96A Application for the development of part of the Central Precinct as the first stage of the overall Kingfisher Estate development.

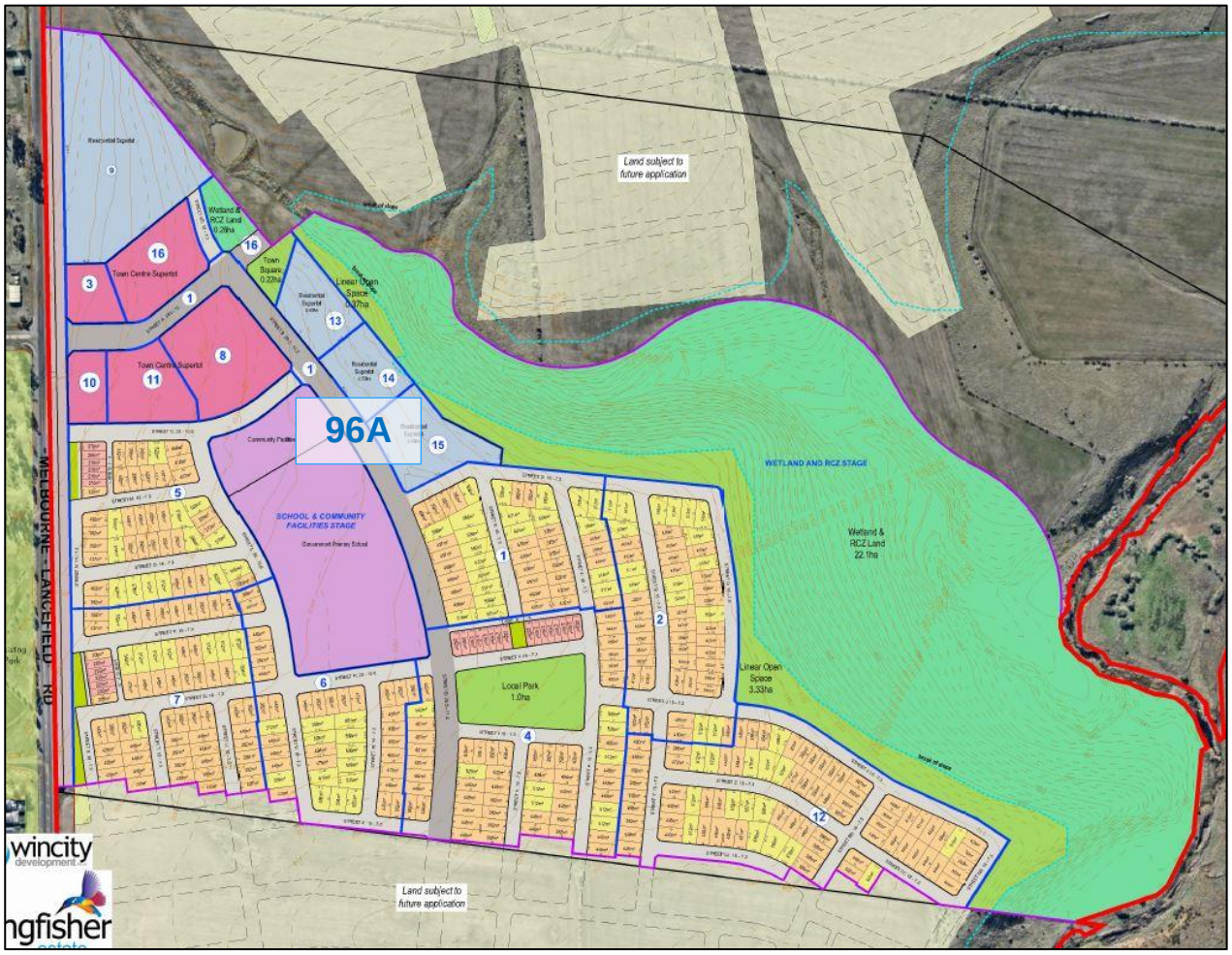
It is anticipated that approximately 419 residential lots and 200 medium density apartments will be developed in addition to the retail and office uses within the town centre, as summarised in Table 4-1.

Table 4-1 Development Schedule

Land Use	Description	Area/No. (Stage 1)	Area/No. (Full Development)
Town Centre	Supermarket	3200 m^2	5300 m^2
	Retail	1600 m^2	2900 m^2
	Non retail commercial (Offices)	1000 m^2	2000 m^2
	Fast Food / Service Station	1200 m^2	1200 m^2
	Emergency services hub	500 m^2	500 m^2
School	-	N/A	
Residential	Standard density	419 lots	
	Medium density	200 apartments	

The proposed development plan forming the current 96A Application is shown in Figure 4-1 (excerpt from Subdivision Masterplan, Taylors, November 2015).

Figure 4-1 Development Plan

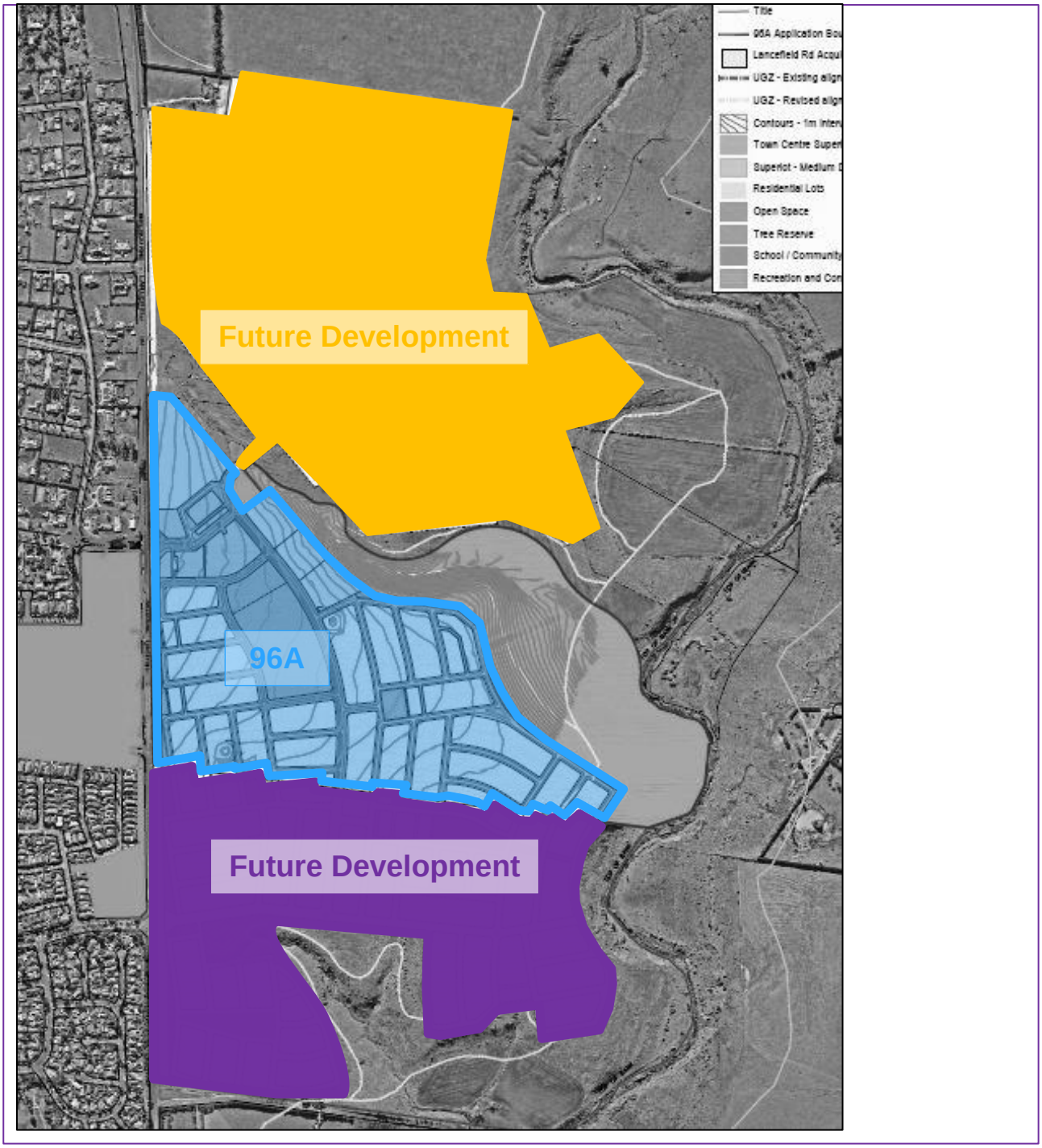


4.2 Development Staging – Kingfisher Estate

It is anticipated that the development will be constructed in stages, with Stage 1 comprising the current 96A application, incorporating the Town Centre, 419 residential lots and 200 medium density lots within four superlots.

Approximately 1681 lots will be developed for the remainder of land, to both the north and the south respectively, with the proposed Staging is shown in Figure 4-2.

Figure 4-2 Staging Plan

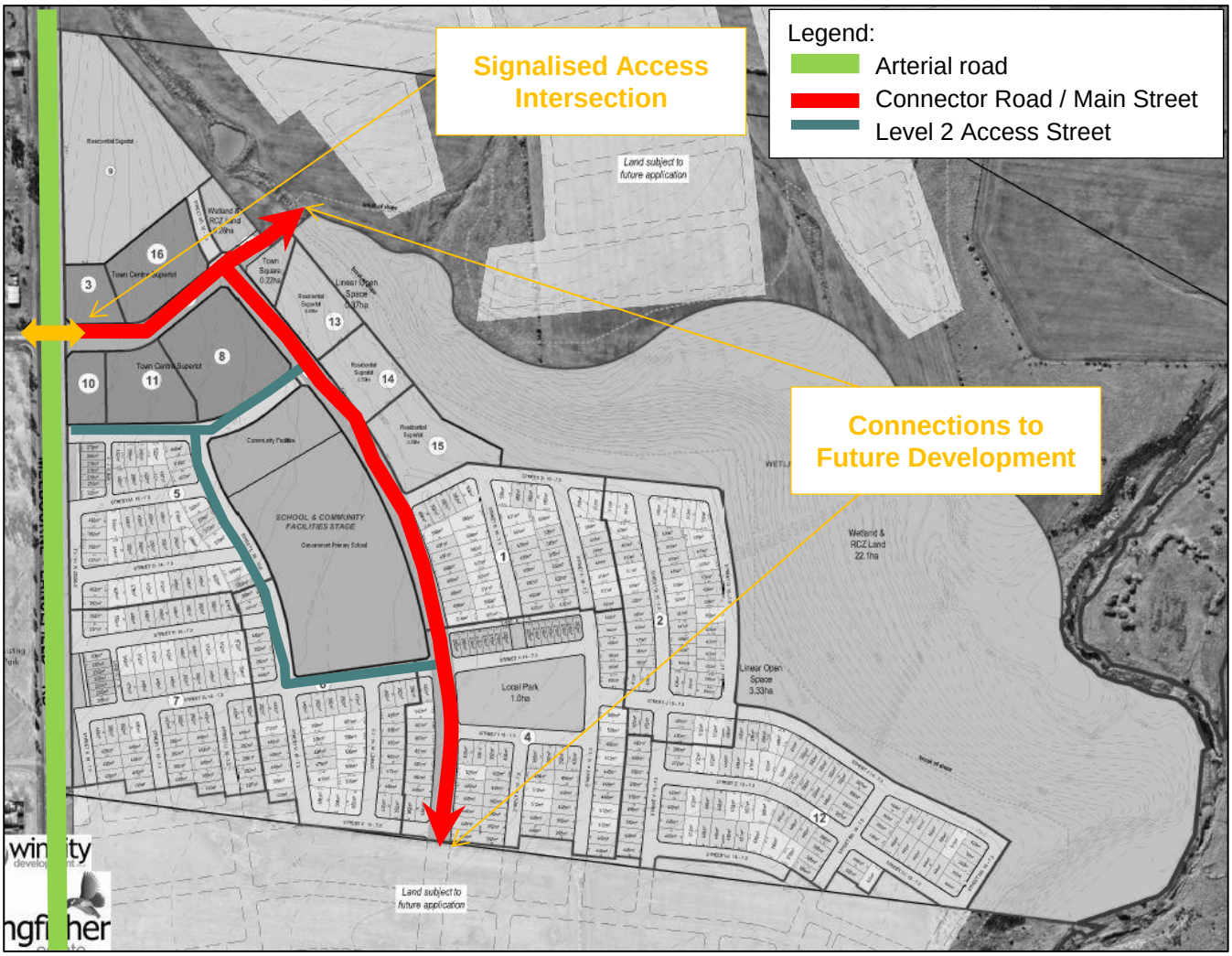


4.3 Access and Road Network

Access to the site from the external road network is proposed to be provided via a signalised intersection opposite Rolling Meadows Drive. Future access to the surrounding subdivision will be provided at the northern and southern ends of the site in order to provide connectivity and circulation for Estate traffic.

Figure 4-3 shows the proposed road network for the 96A Application.

Figure 4-3 Proposed Road Network – 96A Application



Following construction of Stage 1 or at such time as development proceeds to the south, the eastern approach to the intersection of Melbourne-Lancefield Road / Sunningdale Avenue will be constructed to provide a secondary access to the site. Internal road cross sections across the remainder of the site will be consistent with those proposed for Stage 1.

The layout of the northern precinct has not yet been determined, however the road network will be designed with cross sections consistent with those of the Central Precinct. Access to the Northern Precinct will be available via construction of a T-intersection on Melbourne – Lancefield Road to the north of Rolling Meadows Drive, and also via an internal connection to the Town Centre, as shown in Figure 4-3.

Ultimately, Melbourne-Lancefield Road will be duplicated, with the process being undertaken progressively as development of the area continues. All access points to the Kingfisher Estate from Melbourne – Lancefield Road will be designed to accommodate the duplicated cross section of Melbourne-Lancefield Road.

5 Traffic Generation

5.1 Residential

Subdivisions in the City of Hume would be expected to generate traffic movements at a rate of approximately 10 movements per lot per day. Medium density dwelling typically display lower traffic generation rates than standard residential lots. For the purpose of this assessment, it will be assumed that medium density dwellings will be generated at a rate of 5 vehicle movements per dwelling per day. Peak hour traffic generation typically represents 10% of daily traffic generation rates.

Of these movements, approximately 10% are expected to occur in the Lancefield direction, at least in the short-medium term, until such time as development north of the site significantly increases, and the Northern Link is constructed.

Table 5-1 provides a summary of peak hour movements for various stages of development.

Table 5-1 Kingfisher Estate Traffic Generation Summary

	Stage (Lot Yield)	Projected Traffic Volumes		
		In	Out	Total
Daily (vm/d)	96A (419 Lots + 200 apartments)	2,595	2,595	5,190
	Balance of Site (1,681 Lots)	8,405	8,405	16,810
	Total (2,500 Lots)	11,000	11,000	22,000
AM Peak (vm/hr)	96A (419 Lots + 200 apartments)	156	363	519
	Balance of Central (538 Lots)	161	377	538
	Total (2,300 Lots)	1,540	660	2,200
PM Peak (vm/hr)	96A (419 Lots + 200 apartments)	208	311	519
	Balance of Central (538 Lots)	323	215	538
	Total (2,300 Lots)	1,320	880	2,200

5.2 Town Centre

Traffic volumes generated by Town Centres are a function of the size of the centre, the level of car parking provided, the quality, size, range and type of goods offered for sale, the catchment population density, public transport, road accessibility and the level of competition in the area.

Surveys undertaken at major shopping centres in the Melbourne metropolitan area indicate that peak traffic generation often occurs on a Saturday, however the impact of traffic generated by a shopping centre is usually greatest during the Friday evening peak period, when the traffic generated by the retail components of the precinct combine with the peak commuter volumes to produce the greatest total volume on the adjacent road network. Conversely, during the weekday morning commuter peak, town centre traffic generation is minimal.

At the majority of Town Centres, a component of customer traffic is diverted linked trips from the surrounding road network, in particular during the Friday evening commuter period. Diverted linked trips relate to the vehicles already on the adjacent road network that are merely rerouted to the development. Studies show that at Town Centres, this figure can range from 20% to 30%.

Furthermore, as the town centre is to be located within a relatively large residential subdivision, it is anticipated that a significant proportion of traffic associated will be from residents of the Kingfisher Estate, who would therefore not access the external road network for access to the site.

Given the size of the Town Centre, it is anticipated that adopting a traffic generation of 12 vehicle movements per 100 square metres would be appropriate. In order to provide a conservative assessment, no

reduction will be made for diverted trips, however it will be assumed that 30% of traffic associated with the Town Centre will be generated by the Kingfisher Estate.

Table 5-2 Town Centre Traffic Generation

Period	In	Out	Total
AM Peak	82	82	164
PM Peak	344	345	689
Saturday	344	345	689

5.3 Office

Surveys undertaken at offices of varying sizes and parking provision show that peak activity occurs in the morning and afternoon periods corresponding to tenants respectively arriving at work and departing.

The traffic generation of an office is generally a function of the number of parking spaces provided with approximately 60% of available spaces being occupied during the morning peak, and 50% of the available spaces being vacated during the afternoon peak. Counter flows of approximately 10% are experienced during both peak periods.

Table 5-3 Office Traffic Generation

Period	In	Out	Total
AM Peak	42	4	46
PM Peak	4	35	39

5.4 Service Centre and Emergency Services

It is assumed that the majority of traffic accessing the service centre will constitute “passing” traffic, that being traffic already on Melbourne – Lancefield Road calling in on their way to their ultimate destination. Therefore, it has been assumed that the service centre traffic is implicitly included in either the natural growth on the adjoining road network, or in the traffic generation associated with the Town Centre and residential subdivision.

6 Traffic Impact Assessment

6.1 Methodology

The traffic assessment for the purposes of this report has been undertaken for the initial stage, summarised as follows:

> Initial Stage 1:

- Town Centre
- 419 Residential Lots and 200 medium density
- No Northern Link
- Signalised access to/from Rolling Meadows Drive only

Based on advice provided by Metropolitan Planning Authority and Hume Council, the ultimate signalised intersection at Lancefield Road / Rolling Meadows Drive will contain on right turning lane from south to west. This intersection turning lane will reach capacity at a point where further development of lots will take place, and therefore a sensitivity analysis of additional traffic has been undertaken to estimate this trigger point to construct the Sunningdale Avenue signals.

6.2 Stage 1

Stage 1 will see the construction of the Town Centre, 200 medium density lots and 419 surrounding residential lots, with sole access via the signalised intersection of Melbourne – Lancefield Road / Rolling Meadows Drive / Subject Site.

Due to the subject site virtually being on the northern fringe of urban growth at the moment, it has been assumed that the majority of traffic accessing the site will do so from the south, with very little development traffic accessing to or from the north in the short term. This is likely to be the case for the immediate future, until such time as urban growth extends to the north and the Northern Link is constructed to give better connectivity to Melbourne – Lancefield Road.

Advice provided by the MPA and Hume Council suggested there would be single right turn lanes at the Lancefield Road / Rolling Meadows Drive intersection ultimately, therefore the proposed signalised intersection has been designed to incorporate a single right turn facility on the south approach. A concept functional plan of this intersection is shown in Appendix A.

The intersection has been designed to incorporate slip lanes on the north and east approach, facilitating left turn manoeuvres into and out of the site.

The layout of the intersection has been influenced by the need to ensure that the capacity of the intersection is not compromised as the Kingfisher Estate continues beyond Stage 1, and until such time as the duplication of Melbourne – Lancefield Road occurs.

The results of a SIDRA Intersection analysis for the access intersection after completion of Stage 1 is shown in Table 6-1.

Table 6-1 SIDRA Intersection Results – Stage 1

	Approach	Degree of Saturation	95th%ile Queue	Average Delay
AM Peak	Melbourne - Lancefield Rd (n)	0.31	45.1 m	24.3 sec
	Site Access (e)	0.32	26.9 m	14.7 sec
	Melbourne - Lancefield Rd (s)	0.32	32.1 m	13.8 sec
	Rolling Meadows Drive (w)	0.26	22.8 m	36.9 sec
	Intersection	**0.32**	**45.1 m**	**18.8 sec**
PM Peak	Melbourne - Lancefield Rd (n)	0.720	52.8 m	30.1 sec
	Site Access (e)	0.693	37.9 m	16.3 sec
	Melbourne - Lancefield Rd (s)	0.735	76.1 m	11.2 sec
	Rolling Meadows Drive (w)	0.384	27.1 m	39.8 sec
	Intersection	**0.59**	**76.1 m**	**16.7 sec**

The results indicate that the intersection will operate well within capacity during both the morning and afternoon peak periods once the 96A application area is operational, with acceptable queues and delays on all approaches. Summaries of the SIDRA Intersection output are provided at Appendix C.

6.3 Trigger Point

The major traffic generation within Stage 1 is to/from the south, meaning that heavy south to east right turns in the PM peaks is the critical traffic movement.

Current southbound traffic volumes in the PM peak are approximately 200 vph, which are the opposing movement to the south to east right turn. As southbound traffic increases, the ability to make this right turn diminishes. In order for the intersection to near capacity (degree of saturation to reach 0.9), the number of southbound vehicles would need to triple to around 600 vph. This volume would only occur if significant development occurred to the north of the site in the PSP1075 area.

In light of the above, there is likely to be capacity for additional traffic generated by further development of the Kingfisher Estate to the north or south, prior to the requirement for the introduction of the signalised intersection at Sunningdale Road. This would be identified as part of future applications for these stages.

7 Residential Subdivision Design

7.1 Growth Areas Authority Standards

The Growth Area Authority has published the Engineering Design and Construction Manual, which documents various standards for the design and construction of residential subdivisions, including the standard road cross-sections shown in Table 7-1.

Table 7-1 Standard Cross-Sections

	Access Lane	Access Place	Access Street 1	Access Street 2	Connector Street	Trunk Collector	Arterial
Traffic Volume	300 vpd	300-1000 vpd	1000-2000 vpd	2000-3000 vpd	3000-7000 vpd	7000-12000 vpd	12000-60000 vpd
Target Operating Speed	10 km/h	15 km/h	30 km/h	40 km/h	50 km/h	60 km/h	60-80 km/h
Carriageway Width	6m	5.5m	7.3m	6m	7m	2 x 3.5m lanes each way	2 x 10.5m (6 lane) 2 x 7.0m (4 lane)
Parking Within Street	None	Unmarked	Unmarked	2.3m marked both sides	2.3m marked both sides	2.3m marked both sides	None
Verge Width	As required for services	4.5 / 4.2m	4.5 / 4.2m	4.7m min each side	5m min each side	5.25m min each side	5m min
Footpath Provision	None	2 x 1.5m	2 x 1.5m	2 x 1.5m	2 x 1.5m	2 x 1.5m	2 x 1.5m min
Cycle Provision	None	None	None	Optional	2 x 1.7m	2 x 1.7m	2 x 2.0m

7.2 Internal Road Network and Accessibility

A summary of the internal road hierarchy is provided in Table 7-2.

Table 7-2 Proposed Cross-Sections

Road Hierarchy	Ultimate Road Reserve	Carriageway	Indicative Vehicles per Day (vpd)	Speed Limit km/hr	Cycle Path
Entrance Road	30.0m	2 x 4.2m lanes, 6m median.	3,000-7,000 vpd	50km/h	-
Connector Road	25.5m	7.0m		50km/h	3.0m bike path off-road
Main Street	24.0m	8.4m		50km/h	On-road
Local Access Level 2	20.0m	6.0m		50km/h	On-road
Local Access	16.0m	7.3m		50km/h	On-road
Local Access (adjacent to open space)	14.0m	7.3m		50km/h	On-road
Laneway	7.0m	6.0m		50km/h	On-road

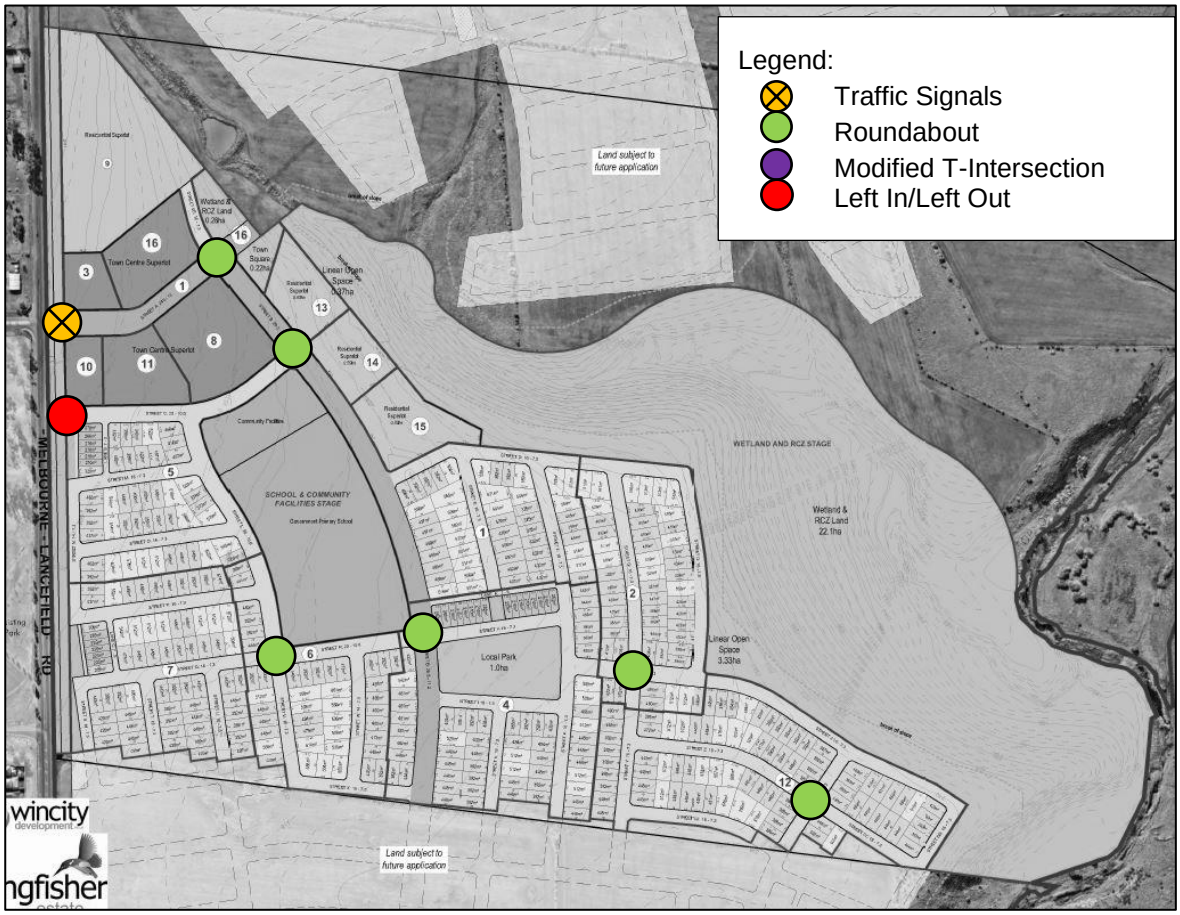
The proposed road cross sections for the subdivision are attached at Appendix B. It is of note that the connector road is designed to allow for the provision of a future bus route.

7.3 Local Area Traffic Management

Intersection treatments and local area traffic management devices are proposed to be used to control vehicle speeds and assign priority at intersections within the development. The majority of intersections within the subdivision have been designed as T-intersections in order to provide a safe environment. An illustration of the local area traffic management treatments is shown in Figure 7-1.

Speed control devices and threshold treatments could also be utilised on local roads where lengths exceed 200m, however the precise location of these devices would be determined at a detailed design stage.

Figure 7-1 Local Area Traffic Management Treatments



8 Conclusions

Based on the preceding discussion, it is concluded that:

> The land subject to the 96A application is proposed to include a retail/commercial Town Centre, a 419 lot residential subdivision, 200 medium density lots, open space and a future school site.

> The development forms the first stage of the development of the land on the north-east corner of the intersection of Melbourne – Lancefield Road / Gellies Road.

> The proposed road hierarchy has been designed in accordance with the guidelines prepared by the Metropolitan Planning Authority.

> The subject site is anticipated to generate in the order of 729 vehicle movements in the morning peak and 1,247 vehicle movements in the afternoon peak.

> Access to the estate will initially be provided via the construction of the eastern approach to the intersection of Melbourne – Lancefield Road / Rolling Meadows Drive. The intersection will be signalised.

> The proposed access intersection will adequately accommodate the traffic generated by the proposed residential subdivision.

> Following development of land to the south of the 96A application, an additional access to the estate will be provided via the construction of the eastern approach to the intersection of Melbourne – Lancefield Road / Sunningdale Avenue.

> Analysis of the access arrangements for the site has confirmed that there is sufficient capacity within the access intersections to accommodate traffic associated with the development under the Stage 1 presented in this report.

Section 96A Residential Subdivision,
Wincity Sunbury

APPENDIX A

PROPOSED ACCESS INTERSECTION LAYOUT

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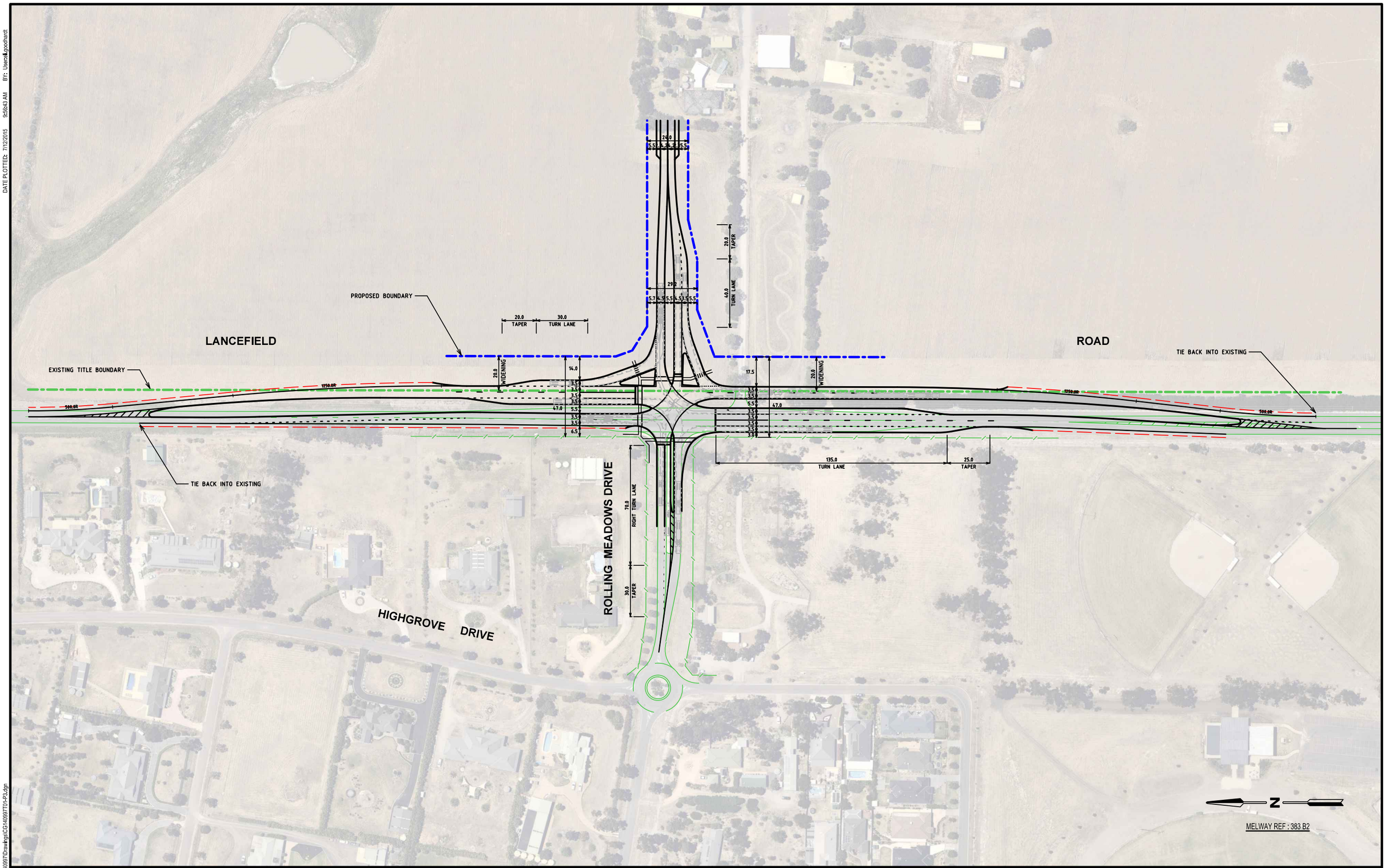
DATE PLOTTED: 7/12/2015 9:58:43 AM BY: Usersagoodhardt



Rev	Date	Description	Drawn	Appr.
P3	04.12.15	CLIENT COMMENTS	EG	TM
P2	28.05.15	ISSUE FOR IFORMATION - SIDRA OUTPUT INCORPORATED	BVH	TM
P1	10.12.14	ISSUED FOR INFORMATION	BVH	TM

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WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES SHOWN ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE.

1. BASE INFORMATION (TRACED / AERIAL PHOTOGRAPHY)
2. ALL DIMENSIONS TO FACE OF KERB AND CHANNEL U.N.O
3. DECLARED ROAD - LANCEFIELD ROAD (SPEED ZONE 100KM/H)
   LOCAL ROAD - ROLLING MEADOWS DRV (SPEED ZONE 50KM/H)

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Checked	TM
Authorised	TM

Client: CLIENT COMPANY NAME
Project: LANCEFIELD ROAD / ROLLING MEADOWS DRIVE
Title: CONCEPT FUNCTIONAL DESIGN
Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Date	Scale	Size
05.12.14	1:2000	A3

Project Number		Revision
CG140997	T 01	P3

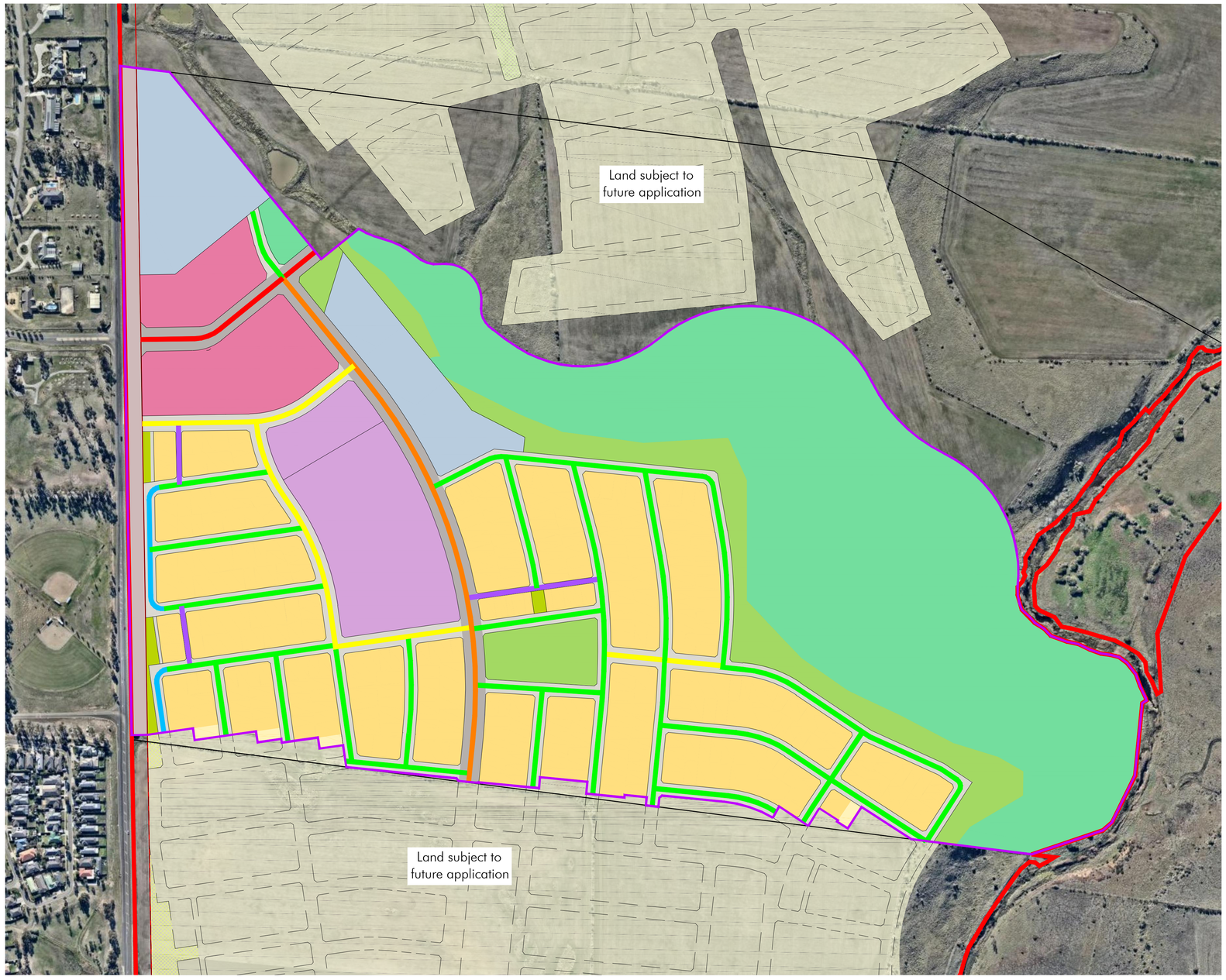
CAD FILE: C:\DRAFT\AFP\2014\CG140997\Drawings\CG140997T01+P3.dgn

Section 96A Residential Subdivision,
Wincity Sunbury

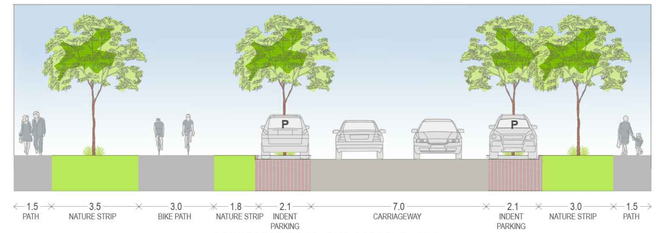
APPENDIX B

PROPOSED ROAD CROSS SECTIONS

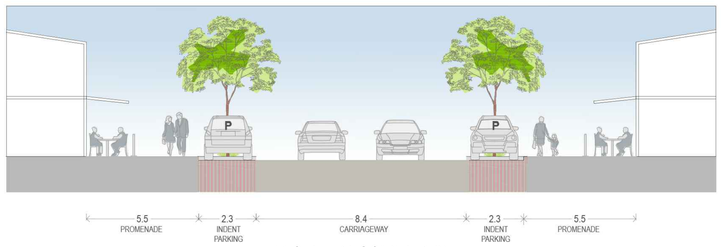
Cardno
Shaping the Future



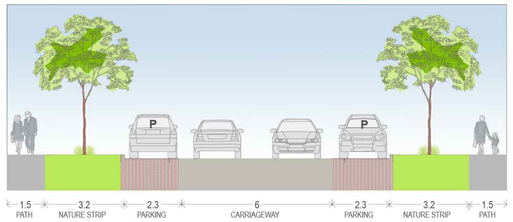
ROAD CROSS SECTIONS



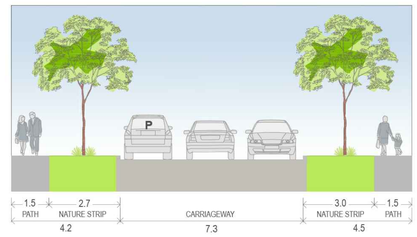
CONNECTOR ROAD (BUS CAPABLE): 25.5m



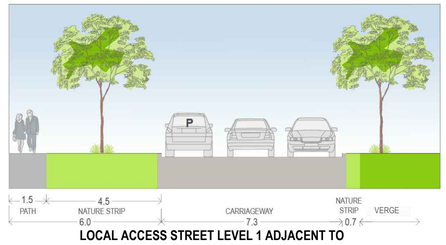
MAIN STREET (BUS CAPABLE): 24m



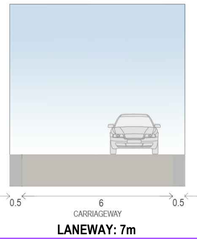
LOCAL ACCESS STREET LEVEL 2: 20m



LOCAL ACCESS STREET LEVEL 1: 16m



LOCAL ACCESS STREET LEVEL 1 ADJACENT TO MELBOURNE-LANCEFIELD ROAD: 14m



LANEWAY: 7m

LEGEND

- Title
- 96A Application Boundary
- Connector Road (25.5m)
- Main Street (24m)
- Local Access Street Level 2 (20m)
- Local Access Street Level 1 (16m)
- Local Access Street Level 1 Adjacent to Melbourne-Lancefield Road(14m)
- Laneway (7m)

NOTE

Refer to Concept Functional Design in Traffic Engineers Report for Melbourne-Lancefield Road ultimate cross-section and signalised intersection design details.

wincity development

kingfisher estate

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Taylors Development Strategists - ABN 48 042 392 373

N

0 30 60 90 120 150 metres
Scale 1:3000 @ A1

Job No. 08618 | APP 13 | RHP
Date. NOV 2015
By. AJD Ckd. AGT

170 Lancefield & 45 Gellies Road
SUNBURY
Hume Council

ROAD HEIRARCHY PLAN

Section 96A Residential Subdivision,
Wincity Sunbury

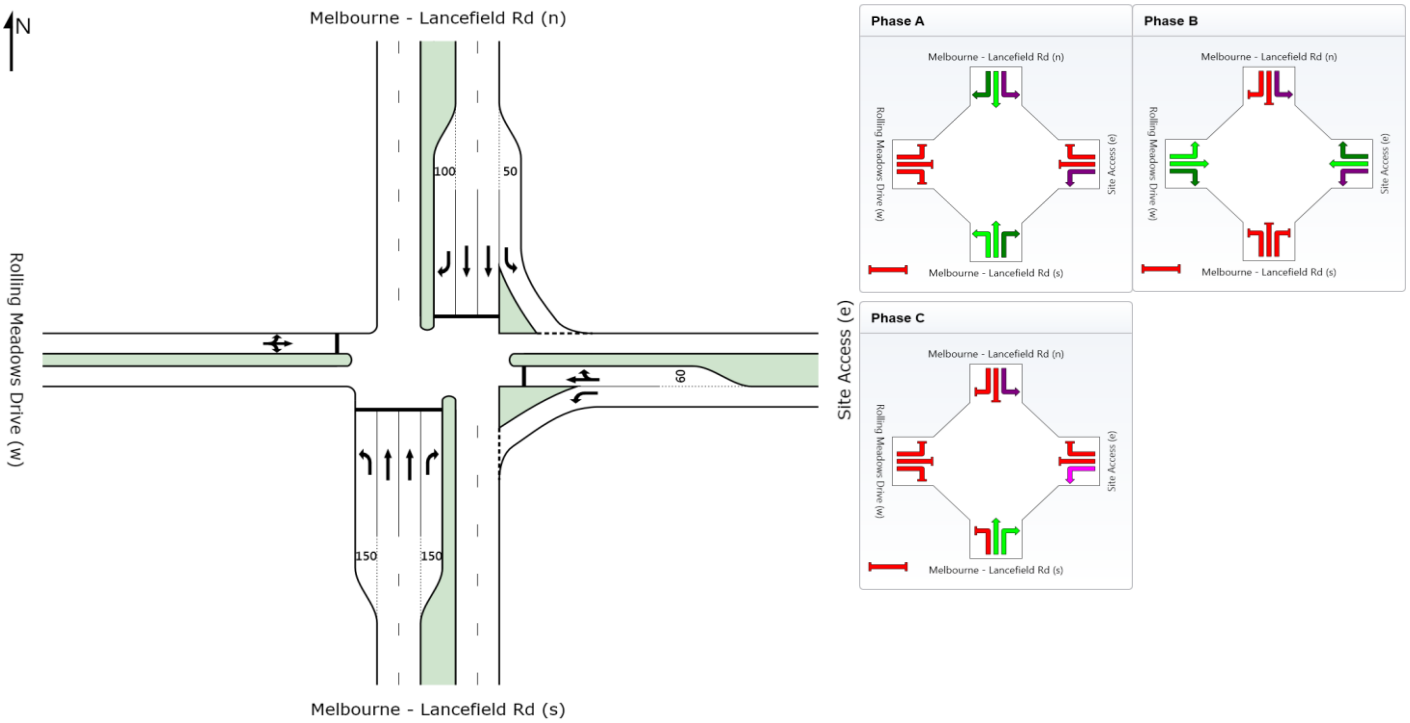
APPENDIX C

SIDRA RESULTS

Cardno
Shaping the Future

Lancefield Rd / Site Access / Rolling Meadows Drive - Stage 1 AM

Signals N:\WINDOWS\2014\CG140997 Kingfisher\Traffic\SIDRA\CG140997SID004.sip[La RM SA Stage 1 AM - Single RT]



Phase	Grn	Total	%
	28	34	38%
	20	26	29%
	24	30	33%
Cycle		90	sec

Melbourne - Lancefield Rd (n)

	App	R	T	L
	24.3	30.9	25.6	8.6
	45.1	0.4	45.1	1.2
	0.312	0.005	0.312	0.036
	400	2	366	32
	19	0	18	1
	381	2	348	31

Rolling Meadows Drive (w)

L	40	22.8	0.256	1	0	1	495	10	505	0.320	26.9	14.7	**App**
T	31.8	22.8	0.256	32	1	31	50	1	51	0.320	26.9	40	**R**
R	39.8	22.8	0.256	54	1	53	50	1	51	0.320	26.9	32	**T**
App	36.9	22.8	*0.256*	*87*	*2*	*85*	395	8	403	0.317	25.3	9.3	**L**

Site Access (e)

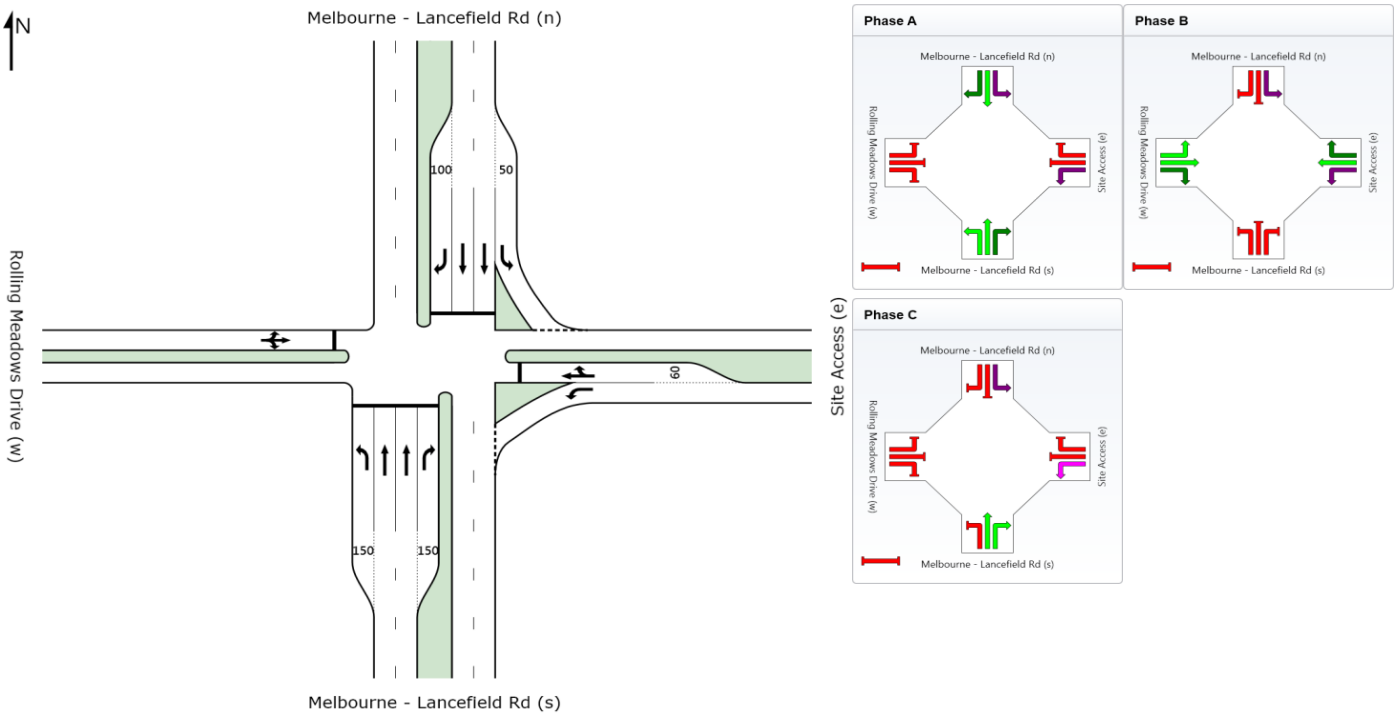
1296	4	90	241	*335*	**LV***
41	0	5	5	*10*	**HV***
1337	4	95	246	*345*	**Total Vol***
0.320	0.007	0.039	0.319	*0.319*	**DoS**
45.1	0.9	5.4	32.1	*32.1*	**95th %ile Back of Queue (m)**
18.8	30.8	6.1	16.5	*13.8*	**Average Delay (sec)**
Intersection	**L**	**T**	**R**	***App***	

***Output Volumes**

Melbourne - Lancefield Rd (s)

Lancefield Rd / Site Access / Rolling Meadows Drive - Stage 1 PM

Signals N:\WINDOWS\2014\CG140997 Kingfisher\Traffic\SIDRA\CG140997SID004.sip[La RM SA Stage 1 PM - Single RT]



Phase	Grn	Total	%
	16	22	24%
	14	20	22%
	42	48	53%
Cycle		90	sec

Melbourne - Lancefield Rd (n)

	App	R	T	L
	30.1	41.2	36.7	10.3
	52.8	0.3	52.8	4.9
	0.525	0.005	0.525	0.116
	283	1	212	70
	12	0	11	1
	271	1	201	69

Rolling Meadows Drive (w)

L	46.1	27.1	0.351	3	0	3		620	12	632	0.547	37.9	16.3	**App**
T	37.9	27.1	0.351	70	1	69		61	1	62	0.547	37.9	48.3	**R**
R	45.8	27.1	0.351	20	0	20		61	1	62	0.547	37.9	40.4	**T**
App	*39.8*	*27.1*	*0.351*	93	*1*	92		498	10	508	0.360	35.1	9.5	**L**

Site Access (e)

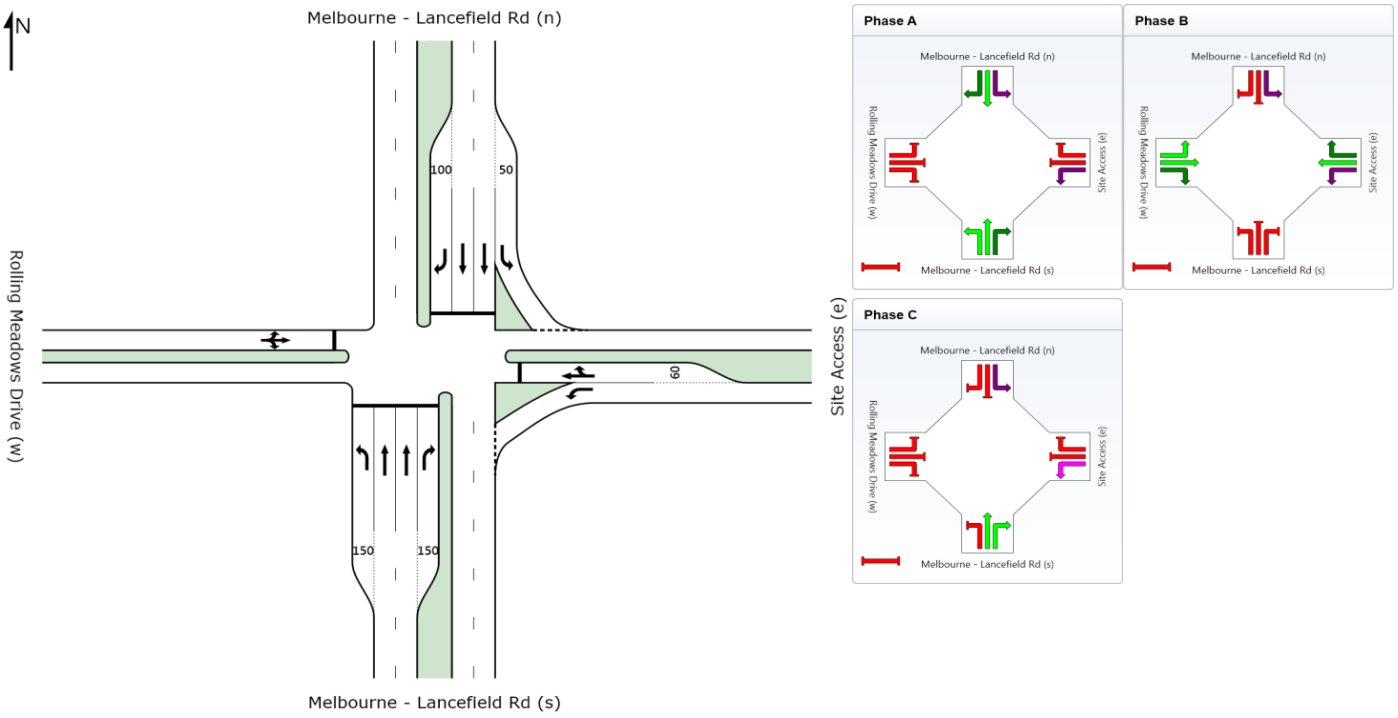
1985	54	383	565	*1002*	**LV***
58	1	20	12	33	**HV***
2043	55	403	577	*1035*	**Total Vol***
0.591	0.050	0.150	0.591	*0.591*	**DoS**
76.1	5	20.5	76.1	*76.1*	**95th %ile Back of Queue (m)**
16.7	12.3	4.4	15.9	*11.2*	**Average Delay (sec)**
Intersection	**L**	**T**	**R**	***App***	

***Output Volumes**

Melbourne - Lancefield Rd (s)

Lancefield Rd / Site Access / Rolling Meadows Drive - Stage 1 PM

Signals N:\WINDOWS\2014\CG140997 Kingfisher\Traffic\SIDRA\CG140997SID004.sip[La RM SA Stage 1 PM - Single RT - Sensitivity 600sb]



Phase	Grn	Total	%
	37	43	48%
	12	18	20%
	23	29	32%
Cycle		90	sec

Melbourne - Lancefield Rd (n)

	App	R	T	L
	21.4	24.7	22.4	12
	138.2	0.2	138.2	6.5
	0.678	0.002	0.678	0.120
	703	1	632	70
	33	0	32	1
	670	1	600	69

Rolling Meadows Drive (w)

L	48.4	28.1	0.411	3	0	3		620	12	632	0.649	*81.5*	22	***App***
T	40.2	28.1	0.411	70	1	69		61	1	62	0.649	39.9	51.7	**R**
R	48.2	28.1	0.411	20	0	20		61	1	62	0.649	39.9	43.8	**T**
App	*42.2*	*28.1*	*0.411*	93	*1*	92		498	10	508	0.487	81.5	15.7	**L**

Site Access (e)

2384	54	383	565	*1002*	**LV***
79	1	20	12	33	**HV***
2463	55	403	577	*1035*	**Total Vol***
0.870	0.048	0.146	0.870	*0.870*	**DoS**
145.1	4.6	18.9	145.1	*145.1*	**95th %ile Back of Queue (m)**
23.4	11.7	3.8	39.2	*23.9*	**Average Delay (sec)**
Intersection	**L**	**T**	**R**	***App***	

***Output Volumes**

Melbourne - Lancefield Rd (s)