PROPOSED RESIDENTIAL SUBDIVISION

230 SIXTH AVENUE, AUSTRAL

Traffic Impact Assessment

November 2016
(Rev C)

Reference 16140

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LIST OF ILLUSTRATIONS

1. INTRODUCTION

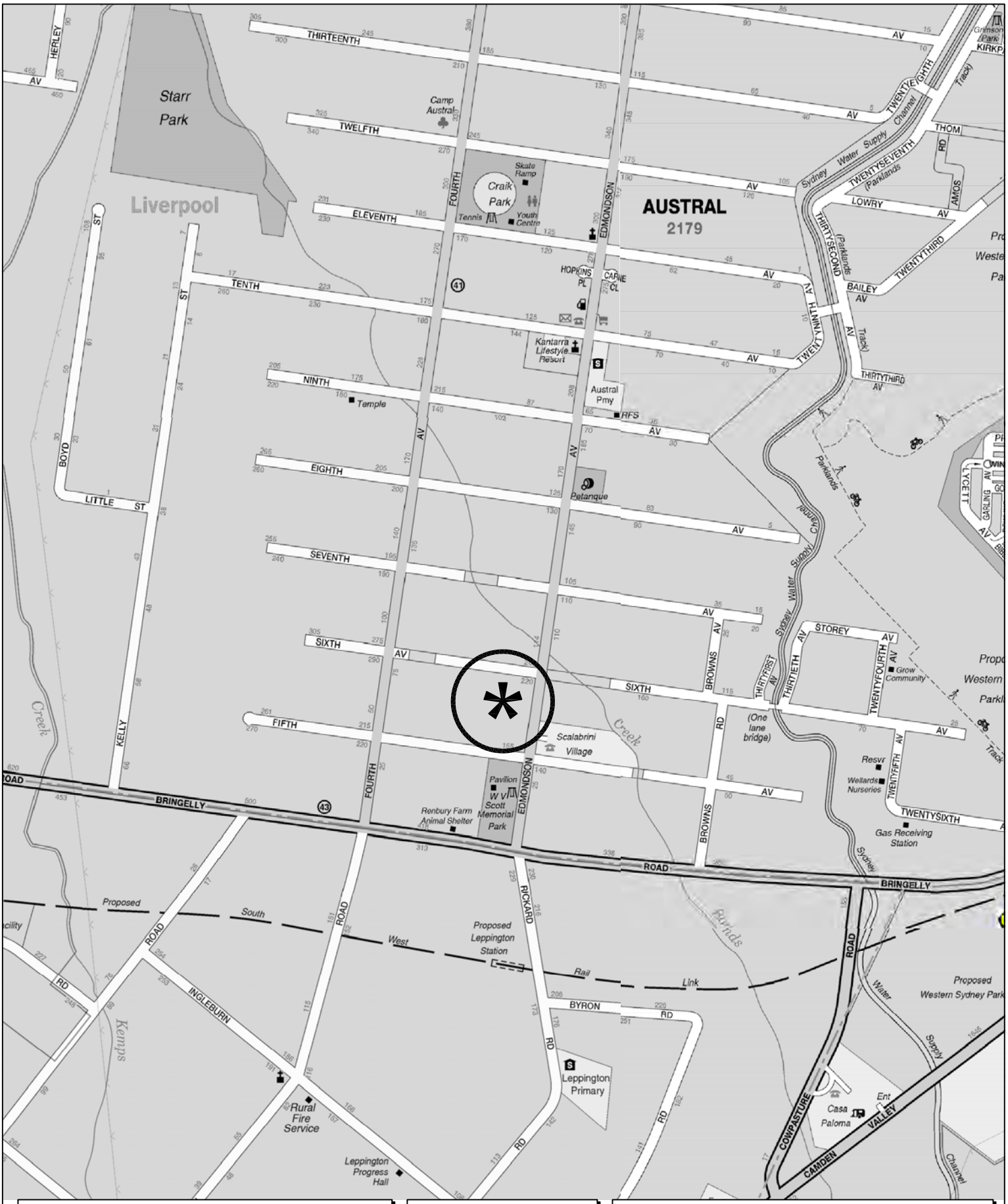
This report has been prepared to accompany a Development Application to Liverpool City Council for a proposed residential subdivision on a consolidation of 230 Sixth Avenue, Austral (Figure 1).

The Austral and Leppington North area is a large new urban precinct which will benefit from good transport services (focused on the new Leppington Railway Station) as well as large open space areas, retail and educational facilities. The precinct will also have ready access to the arterial road system and the major regional facilities available nearby in Liverpool CBD.

The development site is located in the southern part of the precinct, just to the north of Bringelly Road and the Railway Station, with frontage to the southern side of Sixth Avenue. The subdivision application proposes a total of 125 lots (133 dwellings) with an access road system connecting to Fifth Avenue and other future roads.

The purpose of this report is to:

* describe the site, the planning undertaken for the area and the proposed subdivision
* describe the existing road network and the prevailing traffic conditions
* describe the future road network and traffic management circumstances
* assess the potential traffic implications of development on the proposed lots
* assess the suitability of the proposed subdivision access road and traffic control arrangements
* assess the appropriateness of provisions for lot access and servicing



LEGEND

LOCATION

FIG 1

2. PROPOSED DEVELOPMENT SCHEME

2.1 SITE, CONTEXT AND EXISTING USE

The site (Figure 2) is a consolidation of 3 Lots which occupies a total area of 48,572m^2 with frontage to Sixth Avenue, Edmondson Avenue and Fifth Avenue. The site, which is located in the southern part of the Austral Precinct just to the north of Bringelly Road, currently comprises a rural residential dwellings with some out buildings and a dam.

Austral and Leppington North is a developing new precinct situated to the east of the expansive Western Sydney Parklands with Kemps Creek running just to the west. Rural residential properties adjoin the site and the large Scalabrini Retirement Village is located on the eastern side of Edmondson Avenue while the Scott Memorial Park extends to the south of Fifth Avenue.

2.2 PRECINCT PLANNING

Austral and Leppington North has been master planned to:

- create a primarily residential neighbourhood providing for some 17,500 homes
- reduce environmental impact and facilitate greater social interaction
- provide a mix of housing types and active streets
- provide open space amenity with 135.4ha of parkland
- focus on Leppington major centre, Austral local centre and 3 neighbourhood centres
- provide 2 high schools and 5 primary schools
- ensure to full advantage is made of the proposed rail and bus services as well as cyclist and pedestrian networks

LEGEND

N

SITE

FIG 2

The Indicative Layout Plan for Austral and Leppington North is reproduced from the DCP overleaf which illustrates the broad development outcome along with, the development footprint, land uses, density, open space, transport linkages and location of community facilities and schools. Whilst there is flexibility permitted in much of the future access road system there are a number of "fixed" roads.

2.3 PROPOSED SUBDIVISION SCHEME

The proposed subdivision will adopt a conventional 'grid' format with 16.0m wide "local streets" (9m wide carriageway) and 7m wide laneways. The existing frontage streets extending along the southern, eastern and western sides will only have "half road construction" with the other half being provided with the development of adjoining subdivision.

The proposed subdivision will comprise a total of 125 lots which will provide for a wide range of dwelling types as follows:

12 x 2 Bed Manor Houses
26 x 2-4 Bed Terraces
59 x 4-5 Bed Detached Double
36 x 3-4 Bed Semi Detached
Total: 133 dwellings

Details of the proposed scheme are provided on the plans prepared by Mott MacDonald Australia and MPS Architects which accompany the Development Application and are reproduced in part in Appendix A.

NSW GOVERNMENT Planning & Infrastructure

Kemps Creek

Western Sydney Parklands

Western Sydney Parklands

Western Sydney Parklands

North Rossmore

Gurner Avenue

Fifteenth Avenue

Fourth Avenue

Edmondson Avenue

Twelfth Avenue

Tenth Avenue

Boyd Street

Kelly Street

Little Street

Eighth Avenue

Sixth Avenue

Browns Road

Bringelly Road

Dickson Road

Eastwood Road

Inglebum Road

Rickard Road

Byron Road

Cowpastures Road

Camden Valley Way

Rossmore

Catherine Fields North

Leppington

East Leppington

AUSTRAL & LEPPINGTON NORTH PRECINCTS

INDICATIVE LAYOUT PLAN

- Land to which this Plan applies
- Precinct Boundary
- Indicative School Location
- Retail/Commercial Area
- Light Industrial
- Bulky Goods
- Medium Density Residential
- Low Density Residential
- Environmental Living
- Rural Transition
- Business Park
- Mixed Use
- Retail Core
- Civic Precinct
- Community Centre
- Major Road
- Local Road
- Private Open Space
- Passive Open Space
- Active Open Space
- Drainage
- Environmental Conservation
- Environmental Protection Overlay
- Canal
- SWRL Corridor
- Existing Easements
- Substation
- Commuter Carparking
- Bus Interchange
- Pedestrian Link/Plaza

0 200m 500m 1km

3. EXISTING ROAD NETWORK AND TRAFFIC CONDITIONS

3.1 ROAD NETWORK

The existing road network serving the site (Figure 3) comprises:

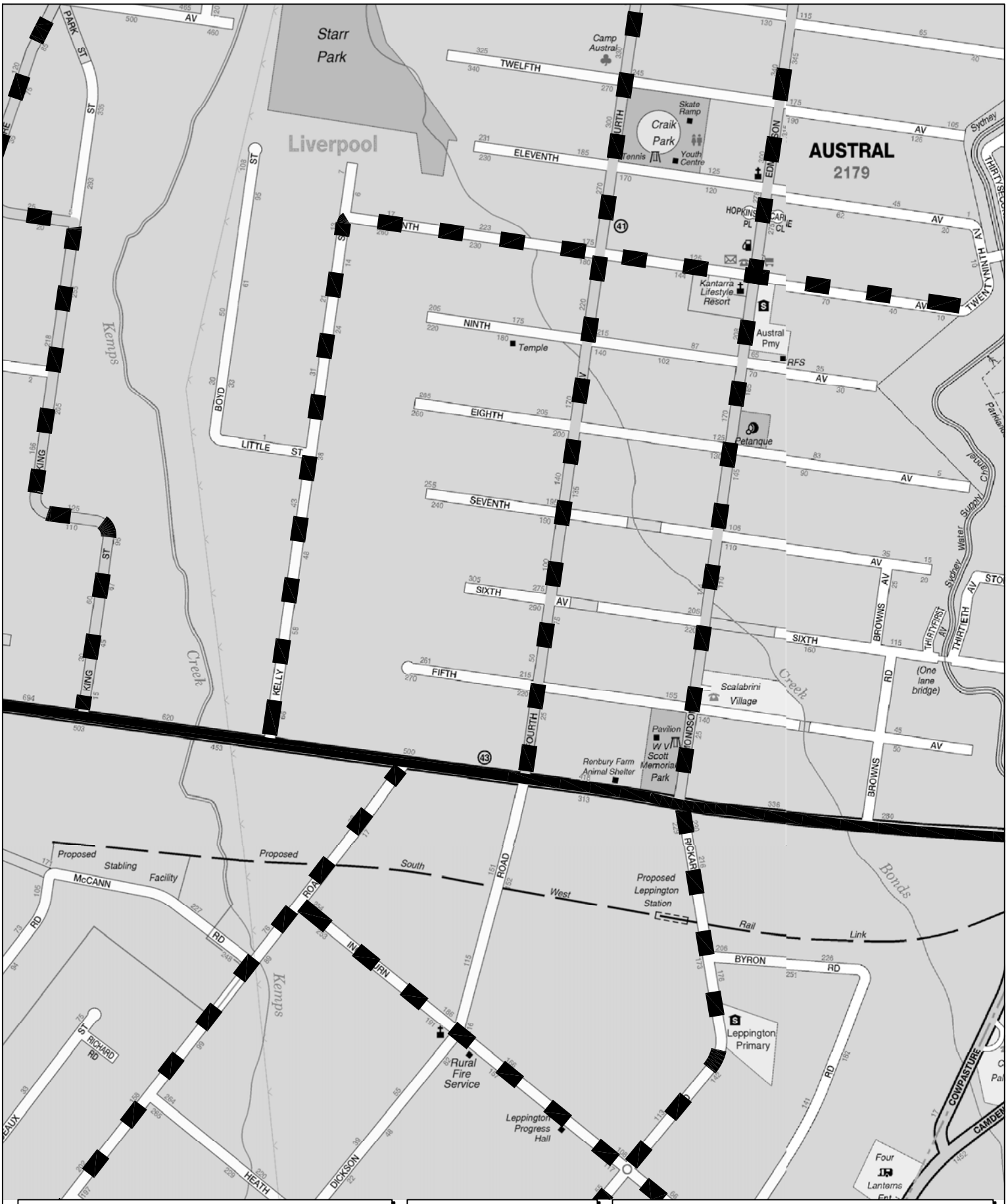
- *Camden Valley Way* – a State Road and arterial route which connects between the Hume Highway at Casula and Camden
- *Cowpasture Road* – a State Road and arterial route which connects between the Horsley Drive at Bossley Park and Camden Valley Way at Horningsea Park
- *Bringelly Road* – a State Road and subarterial route which connects between Cowpasture Road/Camden Valley Way at Horningsea Park and The Northern Road at Bringelly
- *Cowpasture Road (South)* – a State Road and Collector route which connects between Camden Valley Way and Bringelly Road
- *Fourth Avenue and Edmondson Avenue* – Collector Roads connecting to Bringelly Road
- *Sixth Avenue* – a local access road

Six Avenue, Edmondson Avenue and Fifth Avenue currently have two lane 2 way sealed roadways with gravel shoulders and no kerb/gutter while Edmondson Avenue to the south of Fifth Avenue is subject to upgrading roadworks.

3.2 TRAFFIC CONTROLS

The limited existing traffic controls on the road network (Figure 4) comprise:

- the 50 kmph speed restriction on the local and collector road system



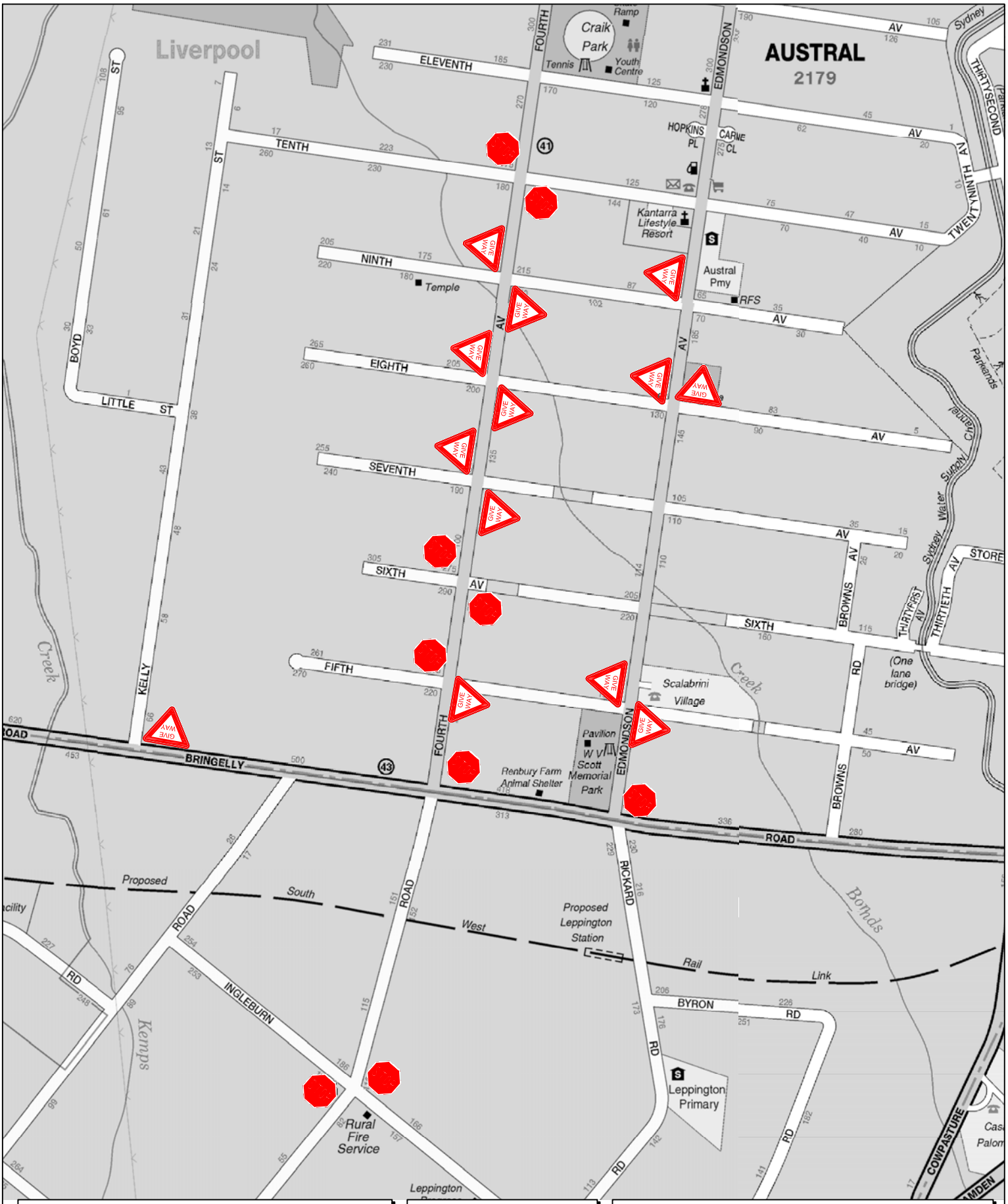
LEGEND

- ARTERIAL
- SUB-ARTERIAL
- COLLECTOR

N

ROAD NETWORK

FIG 3



LEGEND

- TRAFFIC SIGNAL CONTROL
- ROUNDABOUT
- RESTRICTED TURNING MOVEMENT
- STOP SIGN
- GIVE WAY SIGNS

N

TRAFFIC CONTROLS

FIG 4

- the traffic signals at the Bringelly Road, Cowpasture Road and Camden Valley Way intersection
- the various GIVEWAY and STOP sign controls at intersections in the area

3.3 TRAFFIC CONDITIONS

The existing traffic volumes on Bringelly Road to the west of Camden Valley Way are as follows:

AADT	AM Peak	PM Peak
9,090	700	800

The operational performance of intersections in the vicinity of the site during the morning and afternoon peak periods is quite satisfactory at the present time without any undue queuing or congestion.

The existing traffic flows along Edmondson Avenue are as follows:

	AM	PM
Northbound	140	110
Southbound	100	130

3.4 TRANSPORT SERVICES

There is currently only limited bus service provision along Bringelly Road at present however the new South-West Rail Link with a station at Leppington is now operating providing connections to Glenfield and Liverpool, which are serviced by the South, Airport/East Hills and Cumberland Lines.

There are two Interline Bus Services routes currently operating along sections of Bringelly Road. Route 856 operates from Liverpool to Bringelly, via Bringelly Road, Ingleburn Road and Camden Valley Way with hourly during peak periods and infrequently during non-peak times. This bus service is timed to arrive at Liverpool Station to connect with onward rail services to the City.

Route 855 operates between Austral to Liverpool, via Fifteenth Avenue, Cowpasture Road and the Hume Highway with weekday services operating hourly between 06:00-10:00, however, only three services are provided in the afternoon.

4. FUTURE ROAD NETWORK, TRAFFIC AND TRANSPORT CIRCUMSTANCES

4.1 ROAD NETWORK

RMS have commenced the upgrading of Bringelly Road over the 10km length between Camden Valley Way and The Northern Road and this work will complement the completed and current (planning and construction) for Camden Valley Way and The Northern Road plan deleted.

The upgrade works on Bringelly Road will be staged with construction potentially being undertaken between 2016 and 2036. The staging proposals indicate that Bringelly Road will be 2 lanes each way between 2016 and 2031 with supplementary turning lanes at intersections and 3 lanes each way after 2031.

The proposed road hierarchy for the precinct is indicated on the plan reproduced from the DCP overleaf showing a Transit Boulevard along Edmondson Avenue and sub-arterial/collector status on Fourth Avenue while Fifth Avenue will remain a local access road.

4.2 TRAFFIC CONTROLS

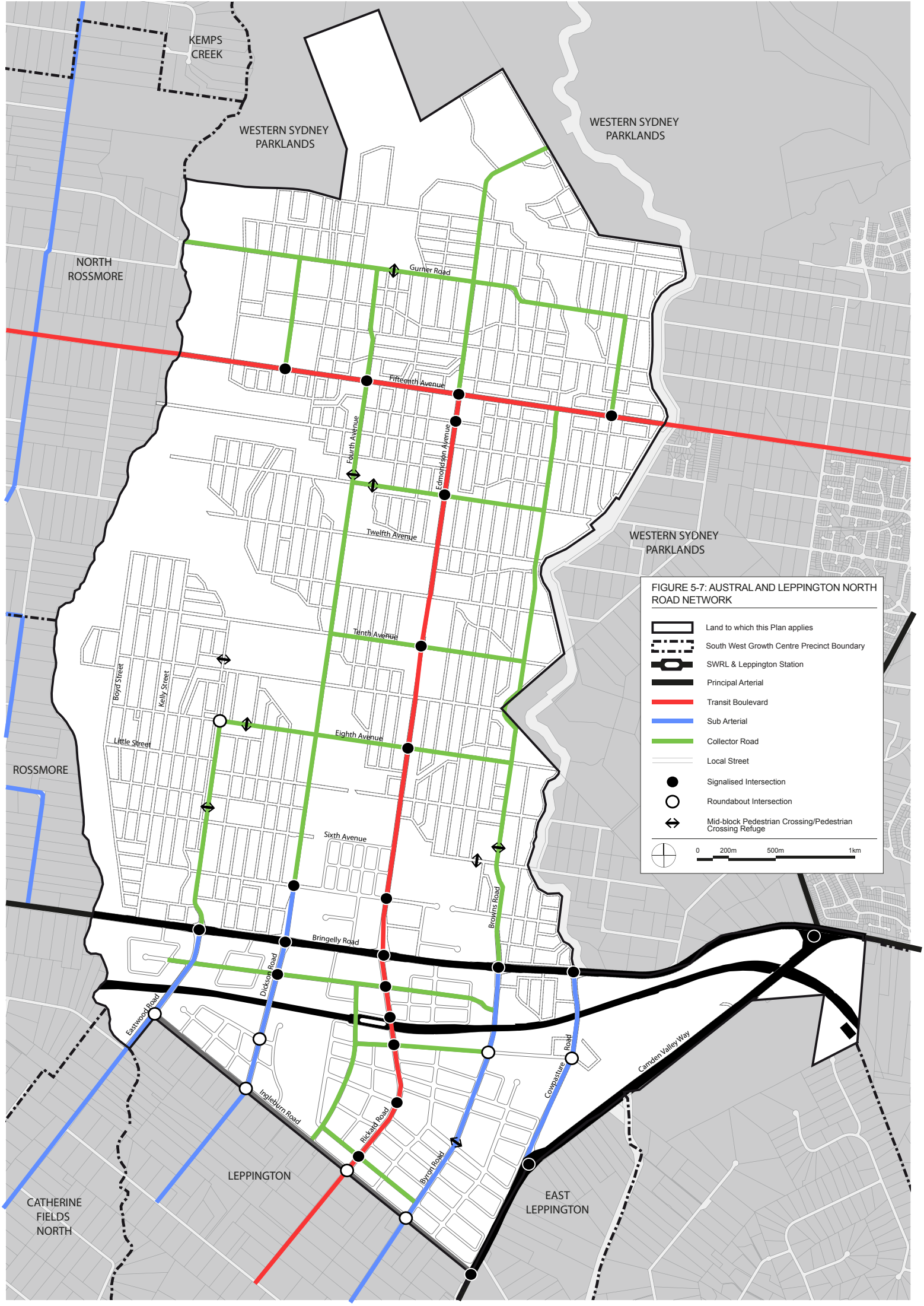
The Bringelly Road upgrade project includes the provision of traffic signals at a number of access intersections. The plans also indicate the provision of Bus Priority measures with bus stops located at regular points. There is also provision for pedestrians and cyclists with a shared pathway along the northern side of Bringelly Road and controlled crossings at the intersection signals. The proposed principal intersection controls in the area are shown in the plan overleaf which include the Fourth Avenue/Fifth Avenue and Bringelly Road/Fourth Avenue/Dickson Road intersections.

Table 1: Intersection upgrade staging

Intersection	2011	2016	2021	2026	2031	2036
The Northern Road	Existing layout	Extend turning bay lengths	Upgrade intersection - **two lanes** on Bringelly Road approaches	-	-	Ultimate layout
Kelvin Park Drive	Existing layout	-	Upgrade intersection - **signalisation** and **two lanes** on Bringelly Road approaches	-	-	Ultimate layout
Jersey Road	Existing layout	-	Upgrade intersection * - **signalisation** and **two lanes** on Bringelly Road approaches	-	-	Ultimate layout
Masterfield Street	Existing layout	-	Upgrade intersection - **two lanes** on Bringelly Road approaches (priority intersection)	-	Upgrade intersection - **signalisation** and **two lanes** on Bringelly Road approaches	Ultimate layout
North Avenue	Existing layout	-	Upgrade intersection *- **signalisation** and **two lanes** on Bringelly Road approaches	-	-	Ultimate layout
King Street	Existing layout	-	Upgrade intersection - **signalisation** and **two lanes** on Bringelly Road approaches	-	-	Ultimate layout
Eastwood Road	Existing layout	-	Upgrade intersection *- **signalisation** and **three lanes** on Bringelly Road approaches	-	-	Ultimate layout
Fourth Avenue	Existing layout	-	Upgrade intersection - **signalisation** and **three lanes** on Bringelly Road approaches	-	-	Ultimate layout
Edmondson Avenue	Existing layout	Upgrade intersection - **signalisation** and **three lanes** on Bringelly Road approaches	-	Ban northbound and southbound right turn movements	Ban eastbound right turn movement	Ultimate layout
Browns Road	Existing layout	-	Upgrade to T intersection - **signalisation** and **three lanes** on Bringelly Road approaches	-	-	Ultimate layout
Cowpasture Road	Existing layout	Upgrade intersection - **signalisation** and **two lanes** on Bringelly Road approaches	-	-	Upgrade intersection - **three lanes** on Bringelly Road approaches	Ultimate layout

Source: AECOM, 2011

*- including an interim U-turn facilities to assist with local access with the upgrade of Bringelly Road to a divided carriageway


KEMPS CREEK
WESTERN SYDNEY PARKLANDS
WESTERN SYDNEY PARKLANDS
NORTH ROSSMORE
Gurner Road
Fifteenth Avenue
Fourth Avenue
Edmondson Avenue
Twelfth Avenue
WESTERN SYDNEY PARKLANDS
Tenth Avenue
Boyd Street
Kelly Street
Little Street
Eighth Avenue
ROSSMORE
Sixth Avenue
Browns Road
Bringelly Road
Dickson Road
Eastwood Road
Camden Valley Way
Cowpasture Road
Ingleburn Road
Rickard Road
Byron Road
LEPPINGTON
EAST LEPPINGTON
CATHERINE FIELDS NORTH
FIGURE 5-7: AUSTRAL AND LEPPINGTON NORTH ROAD NETWORK
Land to which this Plan applies
South West Growth Centre Precinct Boundary
SWRL & Leppington Station
Principal Arterial
Transit Boulevard
Sub Arterial
Collector Road
Local Street
Signalised Intersection
Roundabout Intersection
Mid-block Pedestrian Crossing/Pedestrian Crossing Refuge
0
200m
500m
1km

4.3 TRAFFIC CONDITIONS

The projected traffic volumes at the intersections along Bringelly Road are identified in the AECOM Study for 2016, 2021, 2026 and 2031 weekday morning and afternoon peak periods.

The operational performance of access intersections as undertaken by AECOM having regard for the staging of the upgrade works and increasing traffic demands reveals that satisfactory operational performances will be achieved.

4.4 TRANSPORT SERVICES

Precinct planning for release areas along Bringelly Road are aimed to ensure the provision of appropriate direct links for buses, pedestrians and cyclists enabling non-car trips both directly to adjacent suburbs and to connect with regional public transport services. The design for Bringelly Road addresses the need for supporting infrastructure including a shared pathway and bus priority measures that will enable the establishment of good bus service connections to employment and/or rail interchange nodes including Leppington, Liverpool, Campbelltown and Camden and connection to the open space network.

RAIL SERVICES

The new South West Rail Link (SWRL) from Glenfield to Leppington has stations at Edmondson Park and Leppington with bus interchanges, pedestrian and cyclist facilities as well as “kiss and ride” zones and commuter car parking.

The SWRL offers a heavy rail transport option for the future residents of SWGC by providing frequent train services to Glenfield and the rest of the CityRail network.
The current service provides four services per hour throughout the day with up to 12 trains per hour in peak periods. The frequency of service is likely to be increased over time as demand increases and service provision is influenced by patronage demand as well operating requirements of the network.

It is expected that Bringelly Road and Rickard Road will be the main access arterial road to Leppington Station and its interchange where a total of 800 commuter car parking spaces and bus stops are provided.

BUS SERVICES

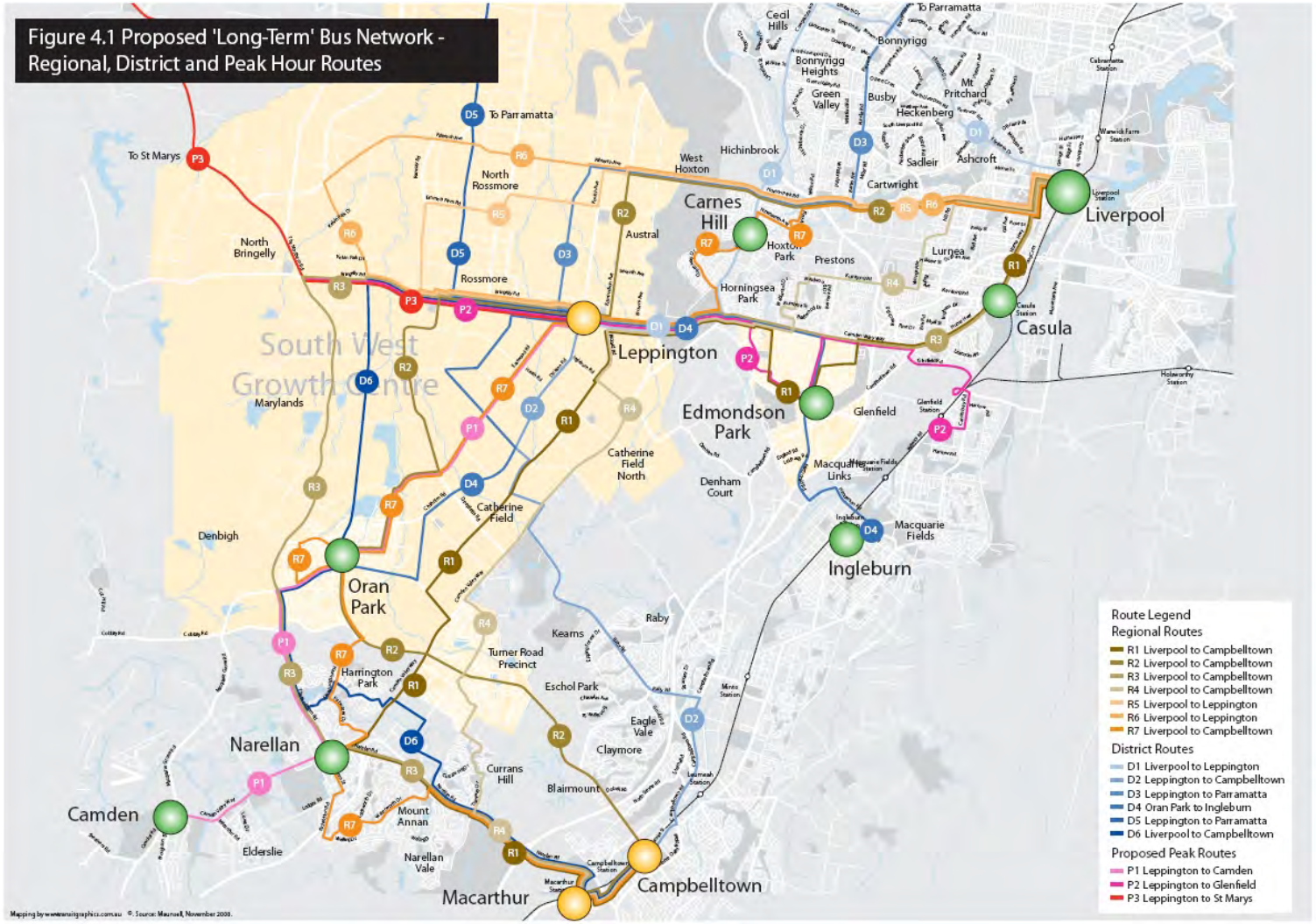
The South West Sector Bus Servicing Plan provides a long-term bus servicing strategy to cater for the future urban growth in the SWGC.

The aim of the strategy is to ensure that new residents and workers in the area have a travel choice that includes public transport and that the staging of precinct releases is consistent from a public transport efficiency perspective. The strategy focuses on the SWGC but also gives consideration to suburbs and centres which are located adjacent and beyond in order to ensure integration of the bus networks within the wider South Western Sydney area.

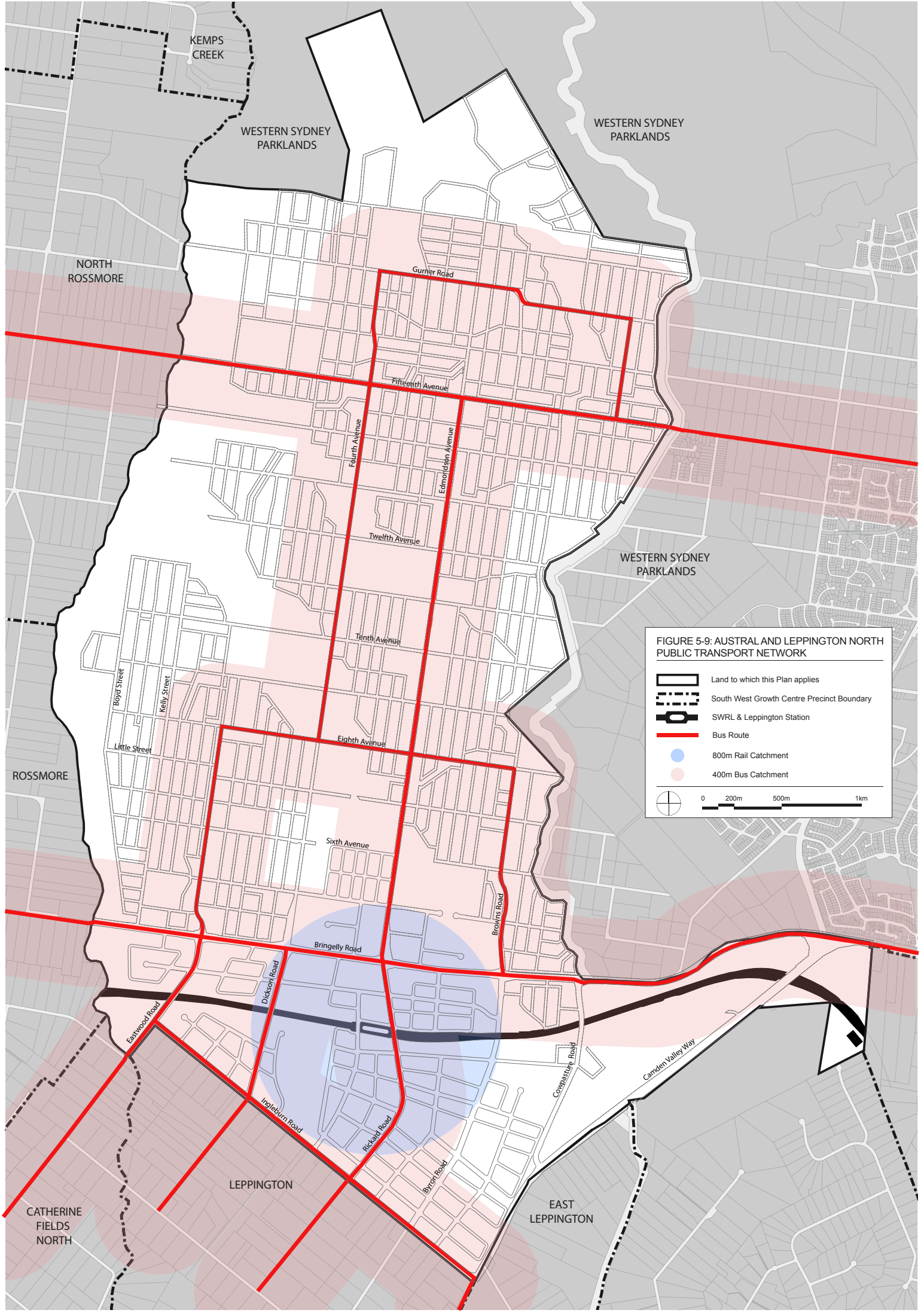
The 'long-term' bus network proposal consists of seven regional, six district and three peak hour only bus routes to provide a network that links the proposed major centres (Liverpool, Campbelltown, Parramatta, Oran Park and Leppington) and supports accessibility to each of the SWGC precincts. The 'long-term' bus network plan is shown on the diagrams reproduced overleaf.

The South West Sector Bus Servicing Plan provides a guide to the potential bus networks that would be operating along Bringelly Road. Bringelly Road is seen as the most significant east-west bus corridor as the majority of proposed bus routes will be travelling on sections of Bringelly Road connecting Campbelltown, Oran Park, Leppington and Liverpool. Given its significance as a bus corridor, bus priority measures are planned for the corridor to cater for the increasing number of buses and shorter travel times for buses, with a particular focus into Leppington Town Centre and Station.

Figure 20 Long-term' South west sector bus servicing plan



Source: AECOM, 2009


KEMPS CREEK
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NORTH ROSSMORE
Gurner Road
Fifteenth Avenue
Fourth Avenue
Edmondson Avenue
Twelfth Avenue
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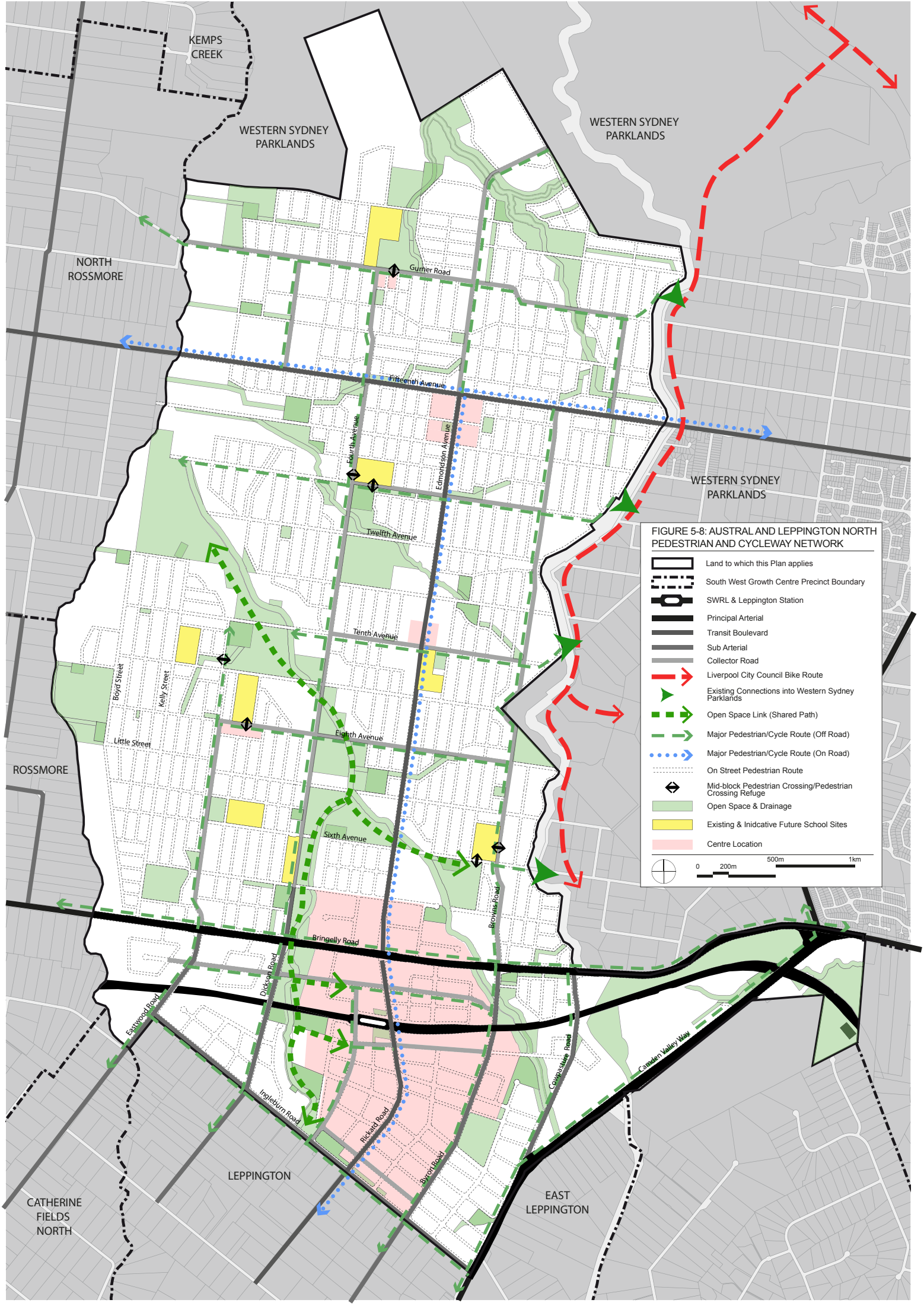
Boyd Street
Kelly Street
Little Street
Eighth Avenue
ROSSMORE
Sixth Avenue
Browns Road
Bringelly Road
Dickson Road
Eastwood Road
Cowpasture Road
Camden Valley Way
Ingleburn Road
Rickard Road
Byron Road
LEPPINGTON
EAST LEPPINGTON
CATHERINE FIELDS NORTH
FIGURE 5-9: AUSTRAL AND LEPPINGTON NORTH PUBLIC TRANSPORT NETWORK
Land to which this Plan applies
South West Growth Centre Precinct Boundary
SWRL & Leppington Station
Bus Route
800m Rail Catchment
400m Bus Catchment
0
200m
500m
1km

The likely peak hour headway will be 30 minutes for District Bus Routes and 15 minutes for Regional and Peak Bus Routes. There will be 26 planned bus routes serving Leppington Station in the long-term, with a peak hour bus flow of approximately 80 to 90 buses to Leppington Station via Bringelly Road.

BICYCLE AND PEDESTRIAN NETWORK

Details of the planned bicycle and pedestrian network are provided on the diagram overleaf. There will be shared pathways along Bringelly Road and Fourth Avenue as well as the collector roads together with major open space linkages. On-street bicycle lanes will be provided along Edmondson Avenue as part of the regional network and all local and collector roads will have paved footways while the traffic signals at the Fourth Avenue intersections will facilitate pedestrian crossing to/from the bus routes.


KEMPS CREEK
WESTERN SYDNEY PARKLANDS
WESTERN SYDNEY PARKLANDS
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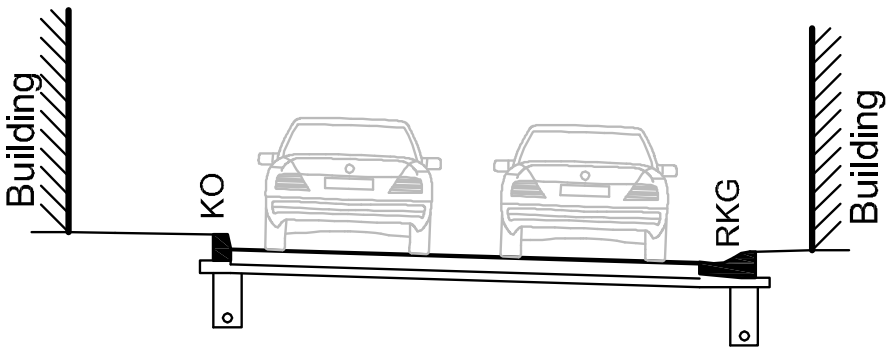
WESTERN SYDNEY PARKLANDS
ROSSMORE
LEPPINGTON
CATHERINE FIELDS NORTH
EAST LEPPINGTON
Gurner Road
Fifteenth Avenue
Fourth Avenue
Edmondson Avenue
Twelfth Avenue
Tenth Avenue
Eighth Avenue
Sixth Avenue
Boyd Street
Kelly Street
Little Street
Bringelly Road
Dickson Road
Eastwood Road
Inglebirn Road
Rickard Road
Byron Road
Browns Road
Cowpasture Road
Camden Valley Way
FIGURE 5-8: AUSTRAL AND LEPPINGTON NORTH PEDESTRIAN AND CYCLEWAY NETWORK
Land to which this Plan applies
South West Growth Centre Precinct Boundary
SWRL & Leppington Station
Principal Arterial
Transit Boulevard
Sub Arterial
Collector Road
Liverpool City Council Bike Route
Existing Connections into Western Sydney Parklands
Open Space Link (Shared Path)
Major Pedestrian/Cycle Route (Off Road)
Major Pedestrian/Cycle Route (On Road)
On Street Pedestrian Route
Mid-block Pedestrian Crossing/Pedestrian Crossing Refuge
Open Space & Drainage
Existing & Inidcative Future School Sites
Centre Location
0
200m
500m
1km

5. PROPOSED SUBDIVISION ROAD SYSTEM

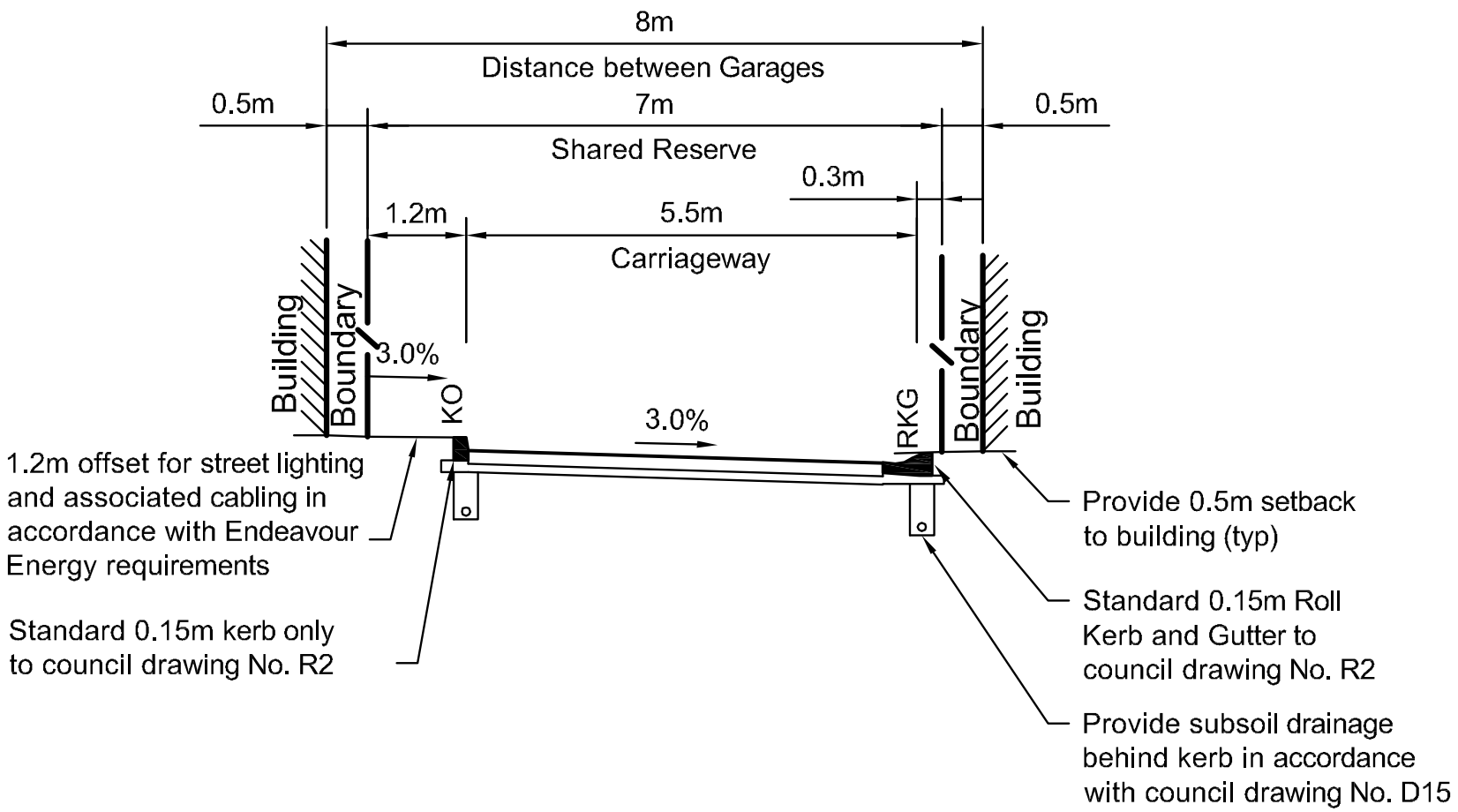
The proposed new access road system will reflect that shown in the Indicative Layout Plan apart from the addition of 2 laneways which enable vehicle access and refuse removal to be undertaken from the rear of lots rather than at frontages.

The only traffic control which will be required will be GIVE WAY signs at the intersections as shown overleaf. It is apparent that the proposed subdivision road system will be compliant with the DCP requirements.



Laneway

1:100



8m Laneway

1:100

Sign Posting Schedule

SP1 All signposting to be accordance with the current R.M.S. regulatory signs manual and AS1742.2

Sign	No
R5-40(L&R)	20
R2-2 (R)	2
R2-2 (L)	1
R2-6A(L)	1
R2-6A(R)	1
R1-2A	4

Note:
Details shown on this plan are subject to LTC approval

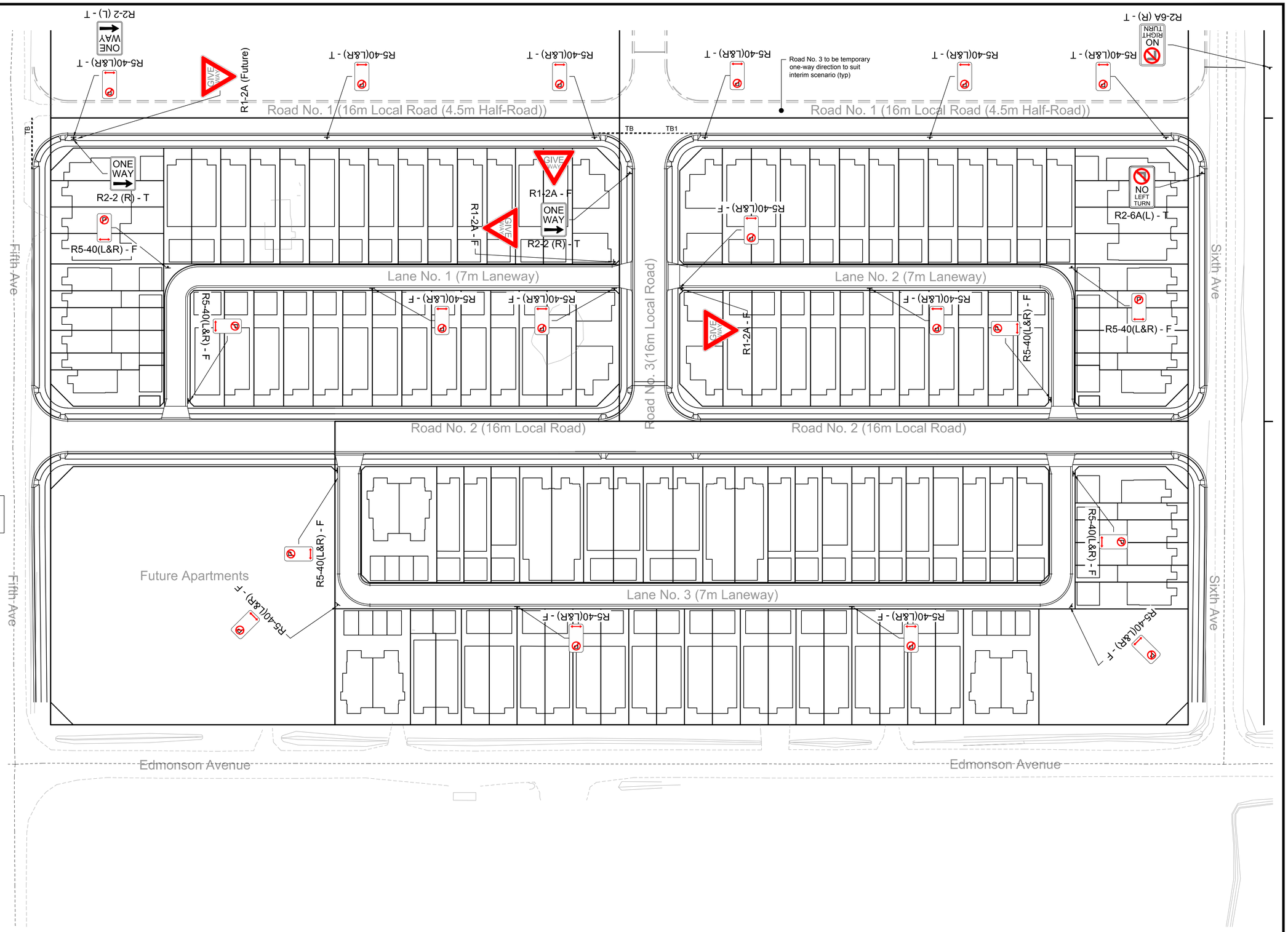
Sign Key Legend

R5-40(L) - T,F

RMS Signage Code

If "T" = Sign is temporary only to suit interim scenario and is to be removed following full width construction of Road No.1

If "F" = Signage is permanent to suit final developed scenario and is to remain following full width construction of Road No.1



Preliminary - Not for Construction

Rev	Date	Drawn	Description	Ch'k'd	App'd
P2	21.10.16	DRC	Re-Issued for Information	DR	AC
P1	20.10.16	DRC	Issued for Information	DR	AC

1:500 0 25m 50m

Mott MacDonald
Level 10, 383 Kent Street
Sydney, NSW 2000
Australia
PO Box Q1678, QVB Sydney
NSW 1230, Australia
T +61 (0)2 9098 6800
W www.mottmac.com

Client: Vantage Property Group Pty Ltd
Suite 205 12 O'Connell Street
Sydney NSW 2000

Title: 230 Sixth Avenue Austral
Development Application
Signposting and Linemarking Plan

Designed	D.Reily		Eng check	D.Reily	
Drawn	D.Chapman		Coordination	J.Gilligan	
Dwg check	A.Singh		Approved	A.Cameron	
Scale at A1	1:500	Status	PRE	Rev P2	Sec STD

Drawing Number
MMD-369954-C-DR-AB-XX-0140

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6. TRAFFIC

The RMS Development Guidelines specify a peak traffic generation rate of 0.85 vtph per dwelling for new residential suburbs noting that up to 25% of trips may not be on the external road network (i.e. to/from local schools and shops etc). However there is no survey assessment basis to this criteria and the more recent RMS Circular adds confusion to the situation as the surveyed precincts include school, retail, hospital and medical centre facilities and present a variation in excess of 100%.

TTPA undertook a very extensive survey of the traffic generation of Glenmore Park Stage 1 (Appendix C) which comprised some 5,447 dwellings and established an "external" generation rate of 0.65vtph per dwelling in the peak periods. It is understood that this is very similar to the generation rate used by the Growth Centres in its modeling for new release areas.

None the less, if the RMS criteria is applied to the 133 dwellings which the proposed subdivision will provide for the resultant peak period generation is some 113vtph as follows:

AM		**PM**	
IN	**OUT**	**IN**	**OUT**
28	85	85	28

The proposed subdivision lot yield is compliant with the DCP provisions and therefore the traffic generation outcome will be entirely in accordance with the assessment of the traffic outcome for development of Austral and Leppington (in fact the outcome will be better due to the likely lower traffic generation outcome).

7. PARKING, ACCESS AND SERVICING

PARKING AND ACCESS

The DCP requires that:

- Driveways are to be located to avoid unnecessary removal of existing vegetation as far as possible
- Driveway crossings are to be minimised
- The need for on-street parking is to be minimised
- One parking space provided for 1 and 2 bedroom dwellings and 2 parking spaces provided for 3+ dwellings
- Parking spaces are to be convenient, safe and have sufficient space for vehicle manoeuvrability

It is apparent that the proposed lots and their relationship to the access road system will be able to be developed for dwellings with compliant provisions for access and parking.

SERVICING

Refuse will be removed from the street by Council's collection service. Service personnel and small service vehicles may be able to park in the frontage driveways. However, the nature of the proposed local road carriageways will suitably provide for the on-street standing of service and delivery vehicles.

The geometry of the proposed local road network will accord with Council's design criteria and will accommodate the turning and manoeuvring requirements of Council's refuse vehicles and other service/delivery vehicles as indicated on the turning path diagram in Appendix E.

8. CONCLUSION

The proposed subdivision in Sixth Avenue at Austral will provide for the development of some133 dwellings. Assessment of the proposal has concluded that:

* the proposed road system will be appropriate and compliant with the DCP specifications
* the provisions for vehicle access and servicing will be satisfactory
* there will be no adverse traffic implications

APPENDIX A

SUBDIVISION PLANS

CIVIC PRECINCT

PARK

Legend

- PROPOSED 1800 MM FENCE / SCREEN 50% TRANSPARENT
- PROPOSED 1800 MM LAPPED & CAPPED FENCE
- LAWN AREA
- COBBLESTONE ROAD STRIPS
- PROPOSED CARPARK
- PEBBLE MULCH
- PROPOSED BITUMEN ROAD

Project

EDMONDSON AVE, AUSTRAL

CLIENTS

vantage property

Notes

1. All dimensions and levels shall be verified by Contractor on site prior to commencement of work.
2. Do not scale from drawings.
3. If in doubt contact Landscape Architect.
4. This design is copyright and shall not be copied, utilised or reproduced in any way without prior written permission of A Total Concept Landscape Architects.
5. This plan has been prepared for DA purposes only.
6. All Building Works shall be installed to Structural Engineers detail

Revision	Description	Date
A	PRELIMINARY	28/10/15

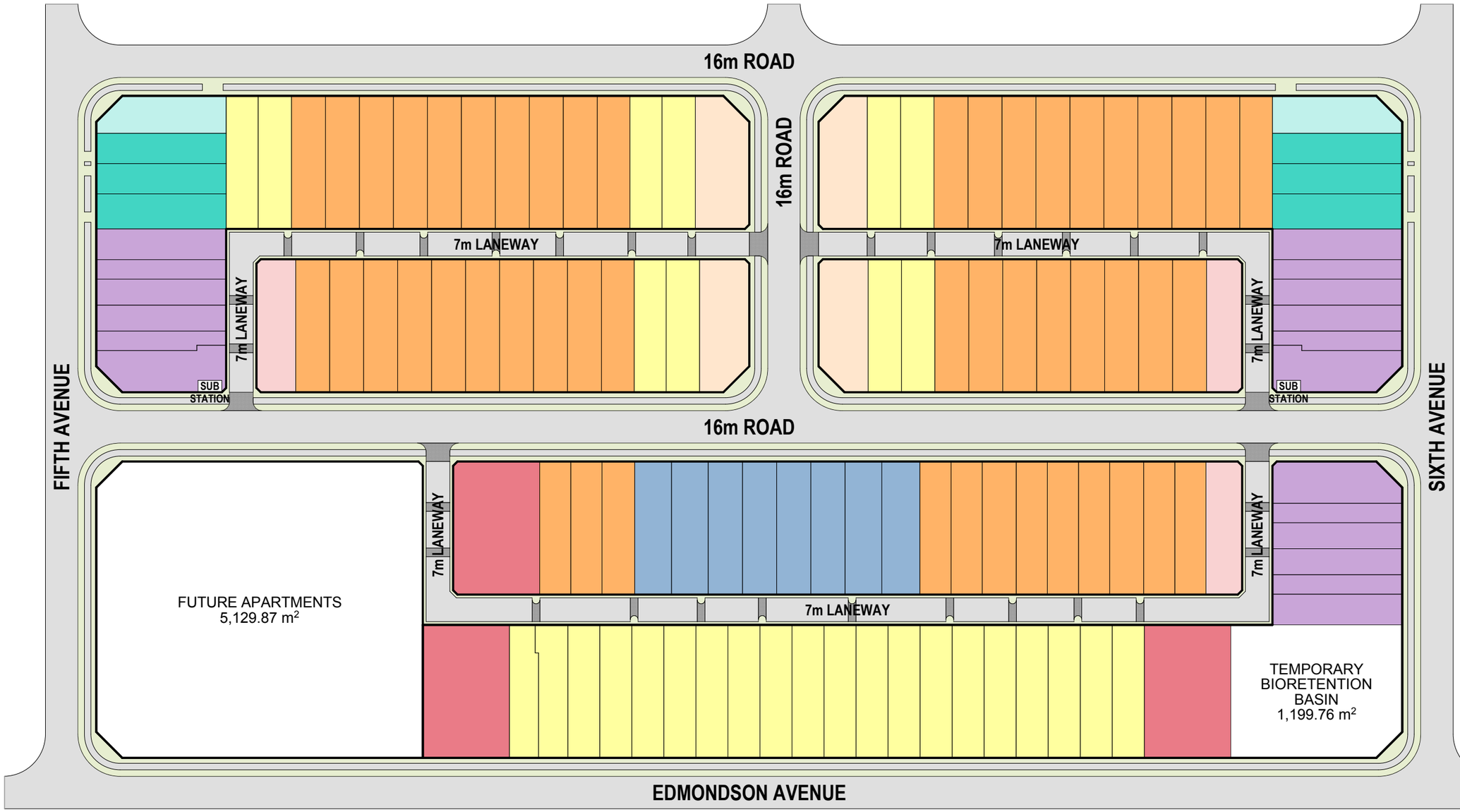
DRAWING
LANDSCAPE MASTER PLAN

ADDRESS
EDMONDSON AVENUE, AUSTRAL

DWG # L/01

A Total Concept Landscape Architects & Swimming Pool Designers
65 West Street, North Sydney NSW 2060
Tel: (02) 9957 5122 Fx: (02) 9957 5922

DATE #	28/10/16
SCALE @ A1	1:500
DRAWN	TC
CHKD	SW
PROJECT #	



DEVELOPMENT SUMMARY

MANOR HOUSE 2 BEDROOM 1 CAR GARAGE 1 STOREY		12
REAR LOADED TERRACE 2/3 BEDROOM 1/2 CAR GARAGE 2 STOREY		18
FRONT LOADED TERRACE 4 BEDROOM 1 CAR GARAGE 2 STOREY		6
SIDE LOADED TERRACE 4 BEDROOM 2 CAR GARAGE 2 STOREY		2
DETACHED DOUBLE 4/5 BEDROOM 2 CAR GARAGE 2 STOREY		52
DETACHED DOUBLE /2 BED FONZIE 4 BEDROOM 2 CAR GARAGE 2 STOREY		4
DETACHED DOUBLE /STUDIO FONZIE 4 BEDROOM 2 CAR GARAGE 2 STOREY		3
SEMI-ATTACHED DOUBLE 4 BEDROOM 2 CAR GARAGE 2 STOREY		28
SEMI-ATTACHED SINGLE 3/4 BEDROOM 2 CAR GARAGE 2 STOREY		8
TOTAL		133

STRUCTURE PLAN

0 10 20 30 40 50m

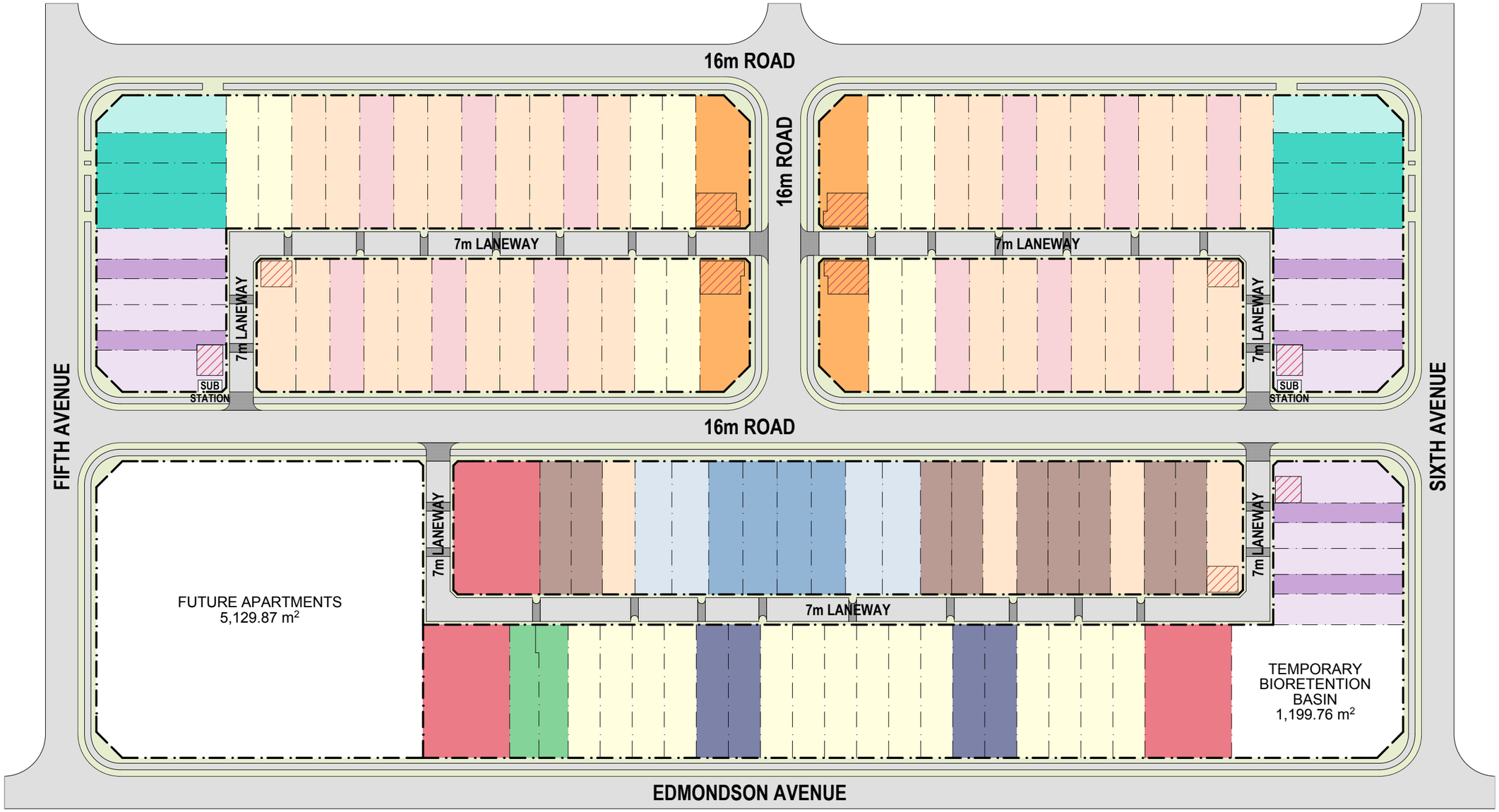
Scale 1:1000@A3

F:\Projects\2875-Edmondson Ave, Austral\03 Drawings\02 Da\161024 - SITE PLAN.pln

EDMONDSON AVENUE, AUSTRAL

vantage property

MPS Architects
1300 368 090
www.mps.net.au
1 Nov 2016
MPS 2875
DA03



DEVELOPMENT SUMMARY

MANOR HOUSE 2 BEDROOM 1 CAR GARAGE 1 STOREY		12
REAR LOADED TERRACE TYPE A 2 BEDROOM 1 CAR GARAGE 2 STOREY		6
REAR LOADED TERRACE TYPE B 3 BEDROOM 2 CAR GARAGE 2 STOREY		12
FRONT LOADED TERRACE 4 BEDROOM 1 CAR GARAGE 2 STOREY		6
SIDE LOADED TERRACE 4 BEDROOM 2 CAR GARAGE 2 STOREY		2
DETACHED DOUBLE TYPE B 4 BEDROOM 2 CAR GARAGE 2 STOREY		32
DETACHED DOUBLE TYPE D 5 BEDROOM 2 CAR GARAGE 2 STOREY		12
DETACHED DOUBLE TYPE E 4 BEDROOM 2 CAR GARAGE 2 STOREY		4
DETACHED DOUBLE TYPE F 4 BEDROOM 2 CAR GARAGE 2 STOREY		9
SEMI-ATTACHED DOUBLE TYPE B 4 BEDROOM 2 CAR GARAGE 2 STOREY		24
SEMI-ATTACHED DOUBLE TYPE C 5 BEDROOM 2 CAR GARAGE 2 STOREY		4
SEMI-ATTACHED DOUBLE TYPE D 4 BEDROOM 2 CAR GARAGE 2 STOREY		2
SEMI-ATTACHED SINGLE TYPE A 3 BEDROOM 2 CAR GARAGE 2 STOREY		4
SEMI-ATTACHED SINGLE TYPE B 4 BEDROOM 2 CAR GARAGE 2 STOREY		4
TOTAL		133
FONZIE 1 BEDROOM		10

DWELLING TYPE PLAN

0 10 20 30 40 50m

Scale 1:1000@A3

F:\Projects\2875-Edmondson Ave, Austral\03 Drawings\02 Da\161024 - SITE PLAN.pln

EDMONDSON AVENUE, AUSTRAL

vantage property

N

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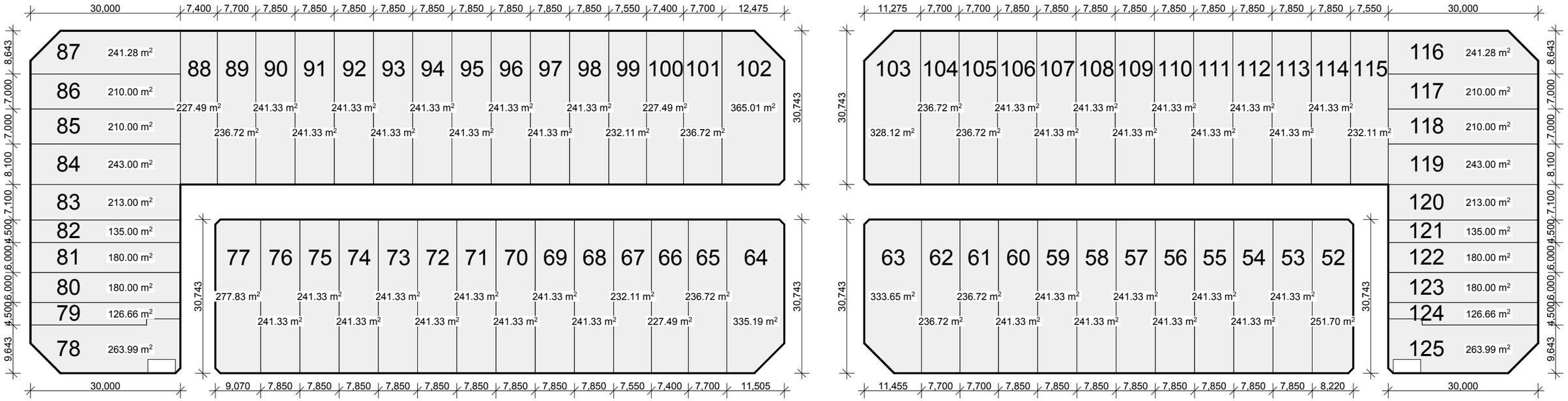
1 Nov 2016
MPS 2875
DA04



LOT PLAN

Not to scale

F:\Projects\2875-Edmondson Ave, Austral\03 Drawings\02 Da\161024 - SITE PLAN.pln

EDMONDSON AVENUE, AUSTRAL

vantage property

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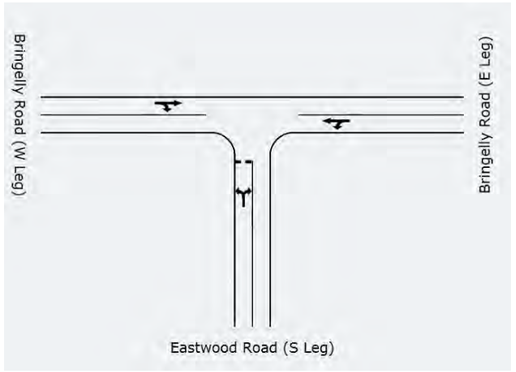
1 Nov 2016
MPS 2875
DA05

APPENDIX B

PROPOSED BRINGELLY ROAD UPGRADING

2016: Bringelly Road – Eastwood Road to Camden Valley Way



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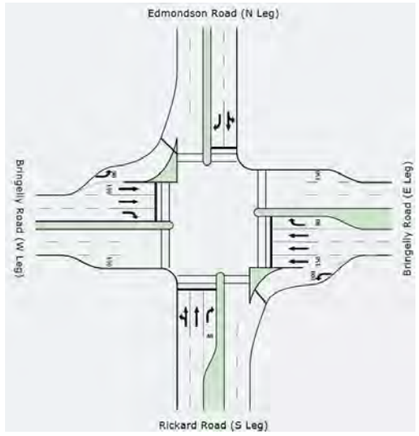

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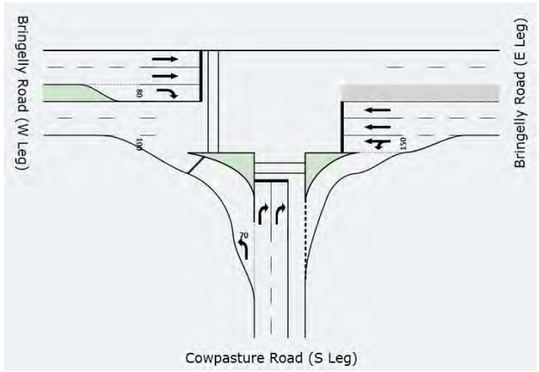
PM	C	0.769	110.5	WB T



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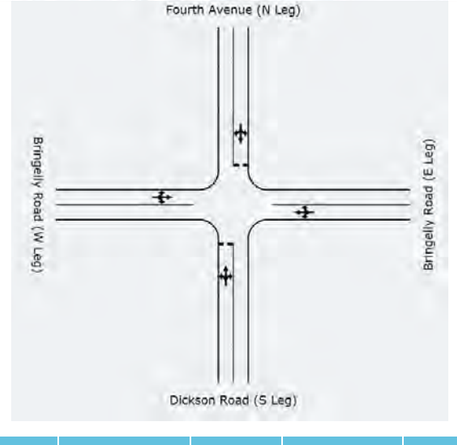
PM	B	0.707	111.2	WB T



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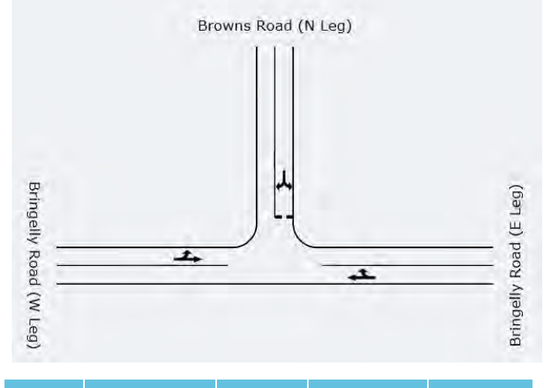

	Int. LoS	DoS	Worst Q	App
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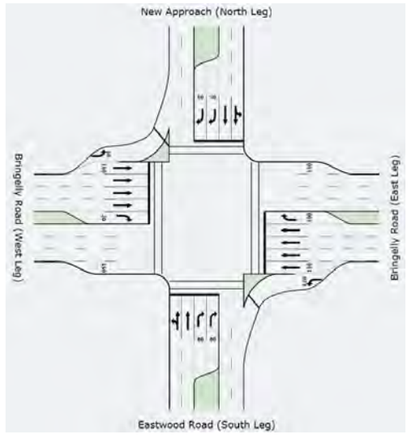
PM	A	0.490	67.1	WB

AECOM

2031: Bringelly Road – Eastwood Road to Camden Valley Way



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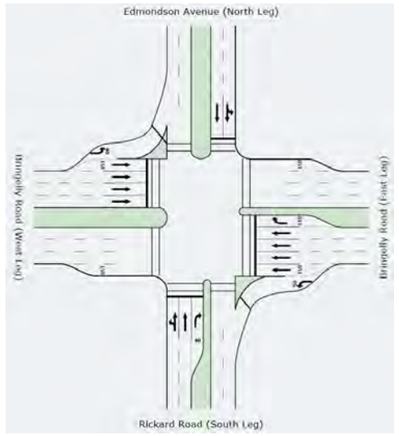
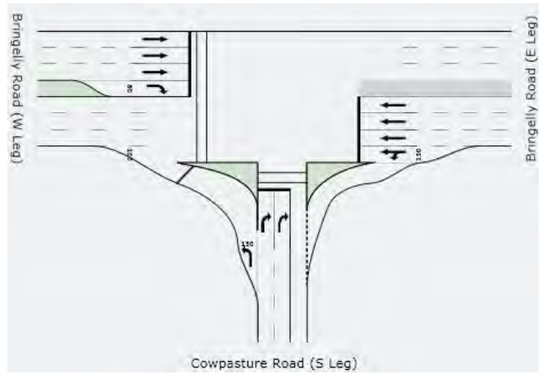
AM	D	0.859	294.5	EB T
PM	D	0.977	210.6	WB T



	Int. LoS	DoS	Worst Q	App
AM	C	0.727	229.3	EB T
PM	C	0.635	173.8	WB T



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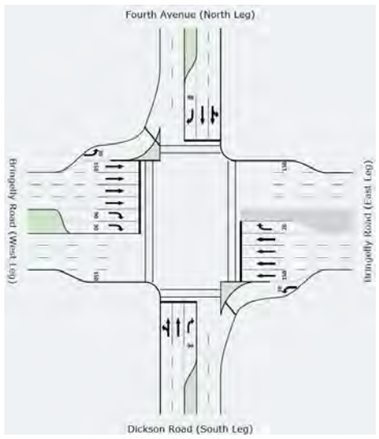
AM	B	0.773	124.0	EB T
PM	C	0.903	329.8	WB T



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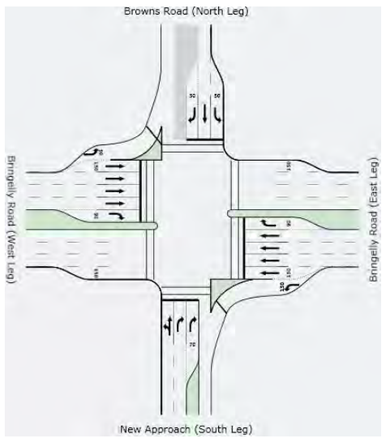
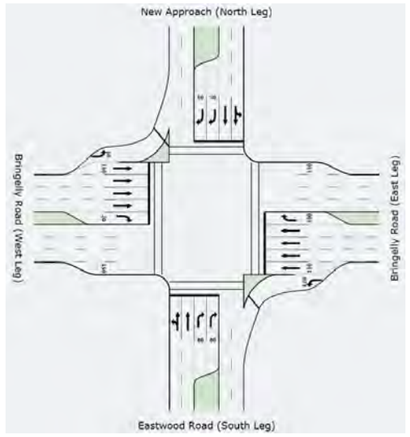
AM	C	0.849	249.8	EB T
PM	D	0.900	361.4	WB T

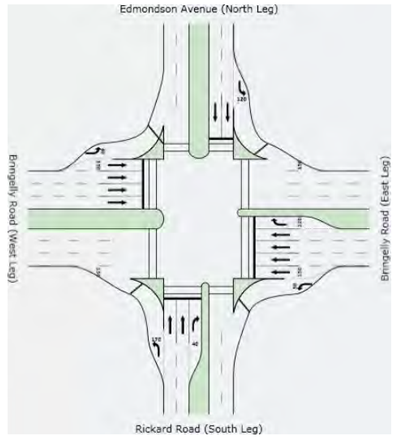


	Int. LoS	DoS	Worst Q	App
AM	D	0.881	330.7	EB T
PM	D	0.936	418.3	WB T

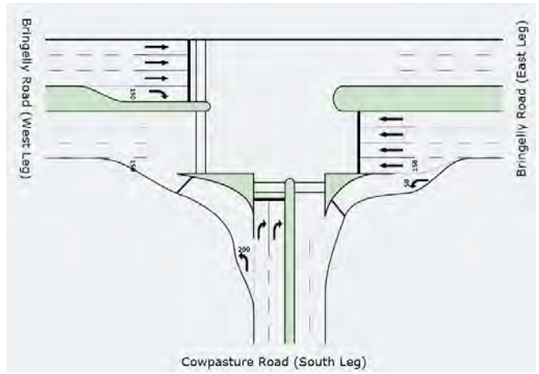
2036: Bringelly Road – Eastwood Road to Camden Valley Way



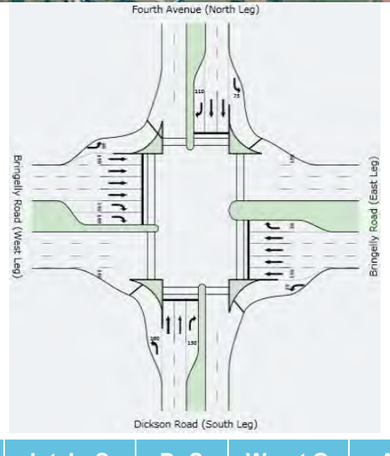
	Int. LoS	DoS	Worst Q	App
AM	C	0.908	337.2	EB T
PM	B	0.756	126.2	EB T



	Int. LoS	DoS	Worst Q	App
AM	C	0.928	479.0	EB T
PM	C	0.762	225.4	WB T



	Int. LoS	DoS	Worst Q	App
AM	C	0.790	245.1	EB T
PM	C	0.916	420.3	WB T



	Int. LoS	DoS	Worst Q	App
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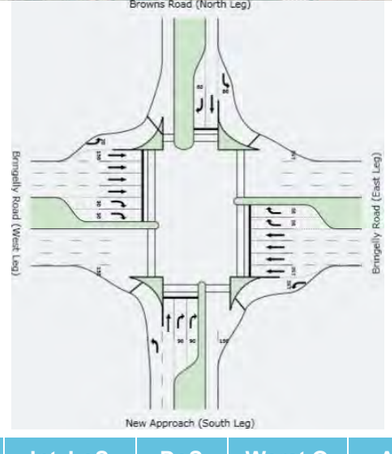
PM	C	0.821	230.6	WB T



	Int. LoS	DoS	Worst Q	App
AM	D	0.936	497.8	EB T
PM	D	0.933	494.5	WB T

AECOM

APPENDIX C

EXTRACTS FROM DCP

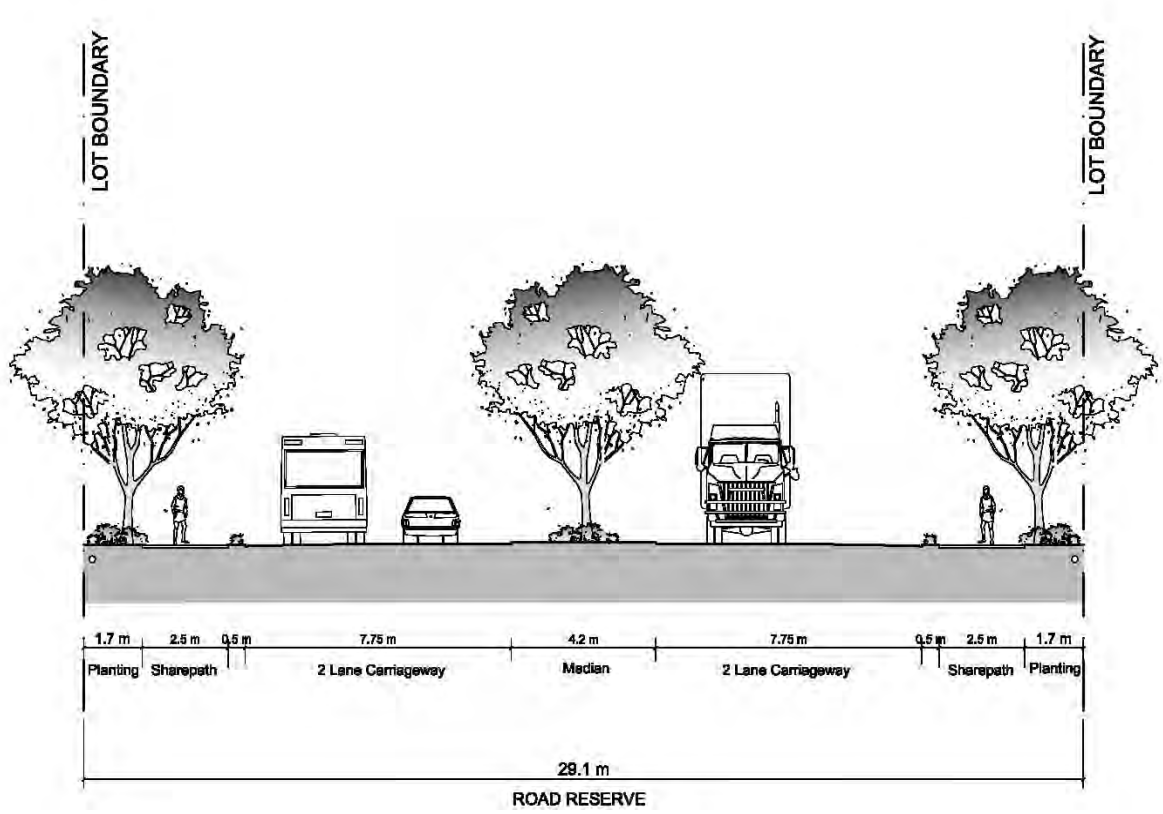


Figure 3-11: Typical sub-arterial road

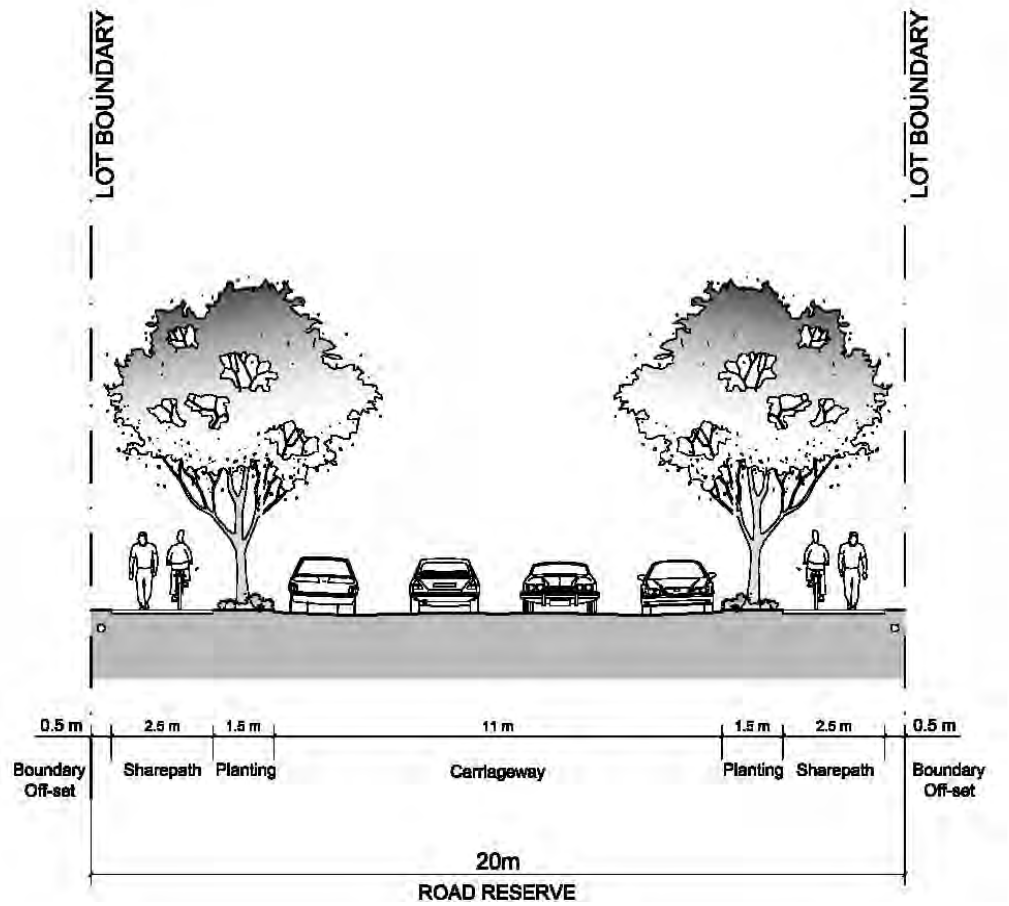


Figure 3-12: Typical collector road

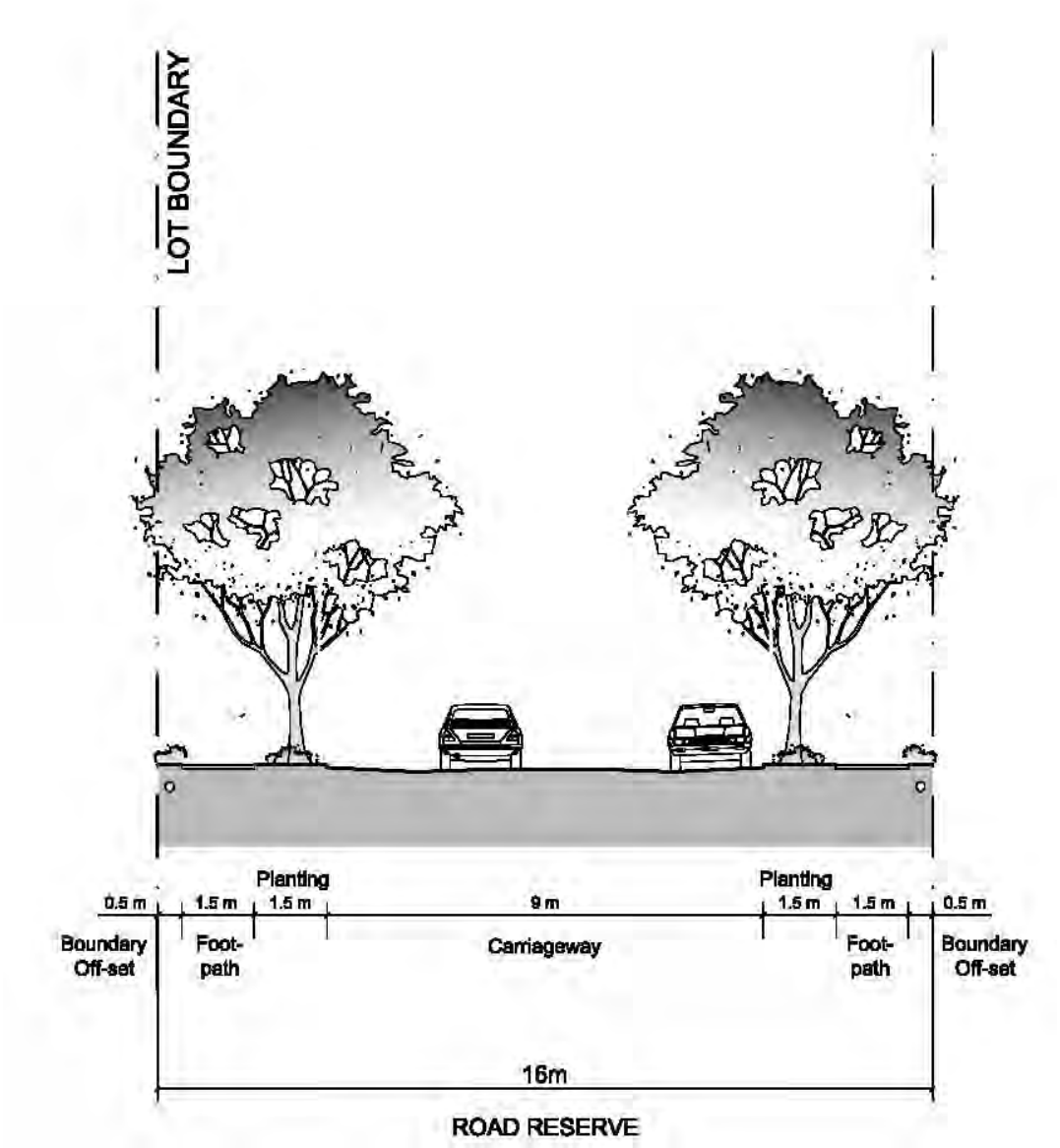


Figure 3-13: Typical local street

8. Variations to the residential street network as permitted under control 7 above will only be approved by Council where the applicant can demonstrate to Council's satisfaction that the proposal:

- will not detrimentally impact on access to adjoining properties,
- provides for the management of stormwater to drain to Council's trunk drainage network, without negative impacts on other properties,
- will not impede the orderly development of adjoining properties in accordance with the relevant Precinct Plan and this Development Control Plan, and
- does not restrict the ability to provide water, sewer, electricity and other essential services to the development or to development on adjoining properties.

9. For changes to the proposed road system which Council considers minor, Council may write to affected property owners and consider any comments of those persons before determining the application. Applicants wishing to amend the proposed road pattern are advised to liaise with affected adjoining owners prior to the submission of the Development Application. By obtaining the prior agreement of adjoining owners to proposed road pattern changes, the time required by Council to determine the application may be reduced.

APPENDIX D

EXTRACT FROM TTPA STUDY

PROPOSED GLENMORE PARK STAGE 2

Transport Management and Accessibility Plan

October 2005

Reference 0338

TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
Transportation, Traffic and Design Consultants
Suite 603, Level 6
282 Victoria Avenue
CHATSWOOD 2067
Telephone (02) 9411 5660
Facsimile (02) 9904 6622
Email: ttpa@ttpa.com.au

5.2 EXISTING GLENMORE PARK

The 2001 Census established that there were some 5,447 occupied dwellings in the existing Glenmore Park development at the time of the survey.

Access to and from the surrounding Arterial Road network (ie The Northern Road and Mulgoa Road) from the existing development is restricted to the Glenmore Parkway and Garswood Road intersection. This circumstance and the circuitous internal road layout provides the relatively unique situation where it is possible to establish the vehicle trip generation rate of the estate without the complication of non-related external through movements. An assessment of the AM and PM peak hour movements at the 3 'access' intersections from the 'June' survey indicate the following IN/OUT movements from the Glenmore Park Estate.

	Total Movements	IN	OUT
AM Peak	3283	915	2368
PM Peak	3706	2666	1040

(NB The earlier survey provided similar results to the June survey being within ± 2% of the total movements)

On the conservative estimate that there were some 200 dwellings built and occupied between the undertaking of the 2001 Census (ie 5,647 dwellings), and the traffic surveys (and that a 6% vacancy rate), the traffic movements indicated above translate to the following external trip generation rates and peak period IN vs OUT ratios for the estate.

	Total (vtph)	IN (%)	OUT (%)
AM Peak	0.62	27	73
PM Peak	0.70	72	28

5.3 ORIOLE STREET CATCHMENT

The street layout within the existing Glenmore Park development provided an opportunity to undertake a 'sensitivity test' of the published RTA generation rate and the rates established in Section 5.2. To ascertain the traffic generation rate of residential only development, a survey was carried out of the vehicle movements in the AM (7.00 –9.00am) and PM (4.00 - 6.30pm) peak period travelling to/from Oriole Street at its intersection with Woodlands Drive. This intersection is the only means of vehicular access to some 340 residences and is an area of the estate which was fully developed and at the time of the survey had no new residential construction activity taking place.

The results of the survey indicate the following movements to/from Oriole Street.

LOCATION: ORIOLE STREET/WOODLANDS DRIVE
VEHICLE MOVEMENTS

		AM Peak (7.45 – 8.45am)	PM Peak (5.15 – 6.15pm)
Oriole Street (OUT)	Left Right	38 128	11 51
Woodlands Drive (IN)	Left Right	8 34	35 132
Total		**206**	**229**

On the assumption that of the 340 residences within the surveyed area, approximately 6% (20 residences) were unoccupied, the traffic movements represent an AM and PM peak generation of 0.64 vehicle trips per hour per residence and 0.72 vehicle trips per hour per residence respectively.

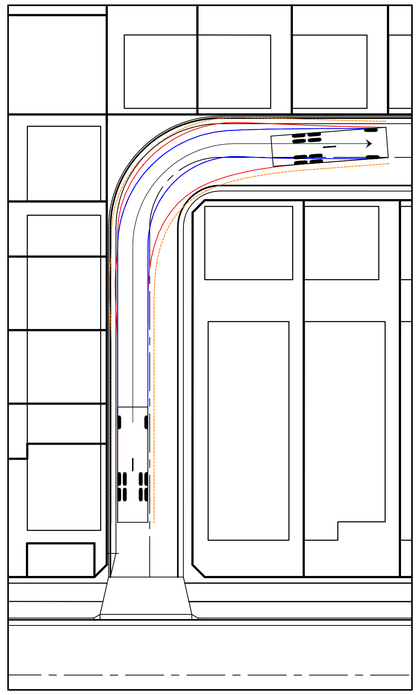
5.4 ASSESSMENT

From the assessment it is apparent that the RTA published trip generation rate for residential development of 0.85 vtph is not a true reflection of the circumstances which prevail at Glenmore Park. On the basis that the trip generation rate attained from the Oriole Street assessment also includes a component of 'internal' trips (say 6%), the data from this analysis and that of the 'whole' of Glenmore Park would suggest that an external trip generation rate of 0.65 vtph per dwelling in the peak periods is more reflective of the existing traffic activity generated by the Glenmore Park Estate.

Application of this rate (0.65 vtph) to the detached dwelling component and a 0.5 vtph rate to the medium density element, indicates the following likely AM and PM peak vehicle movements for the various phases of construction activity:

APPENDIX E

TURNING PATH ASSESSMENT



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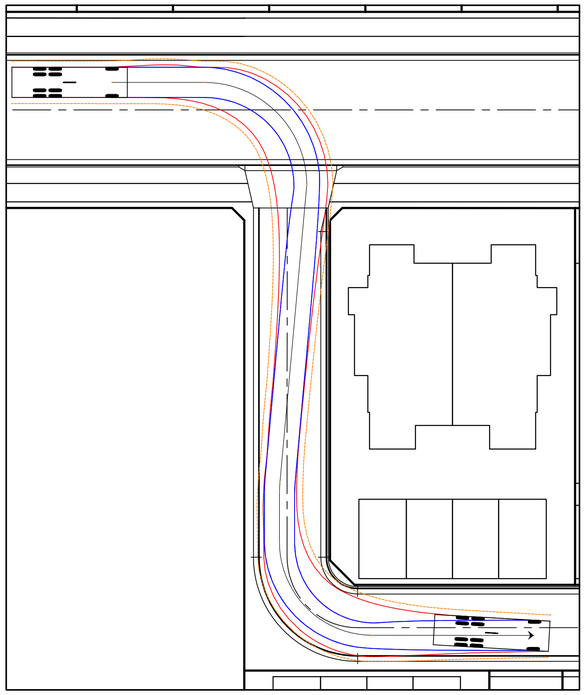

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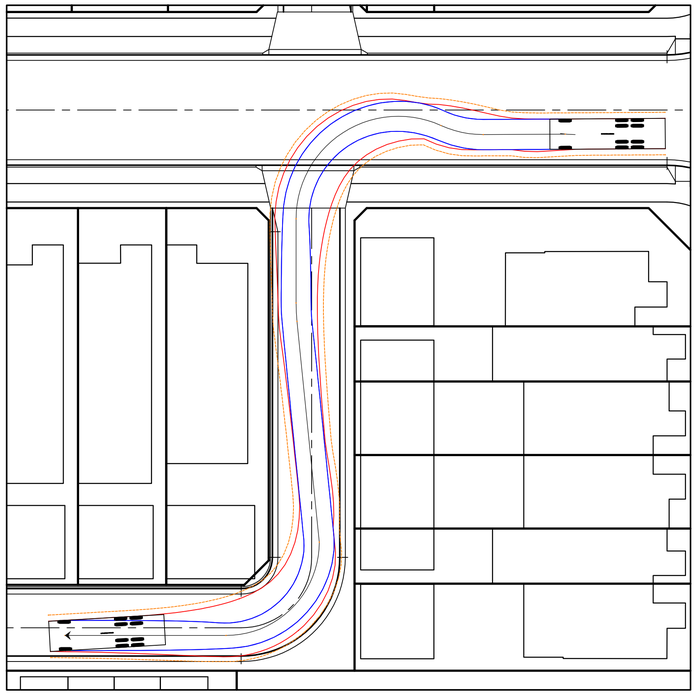

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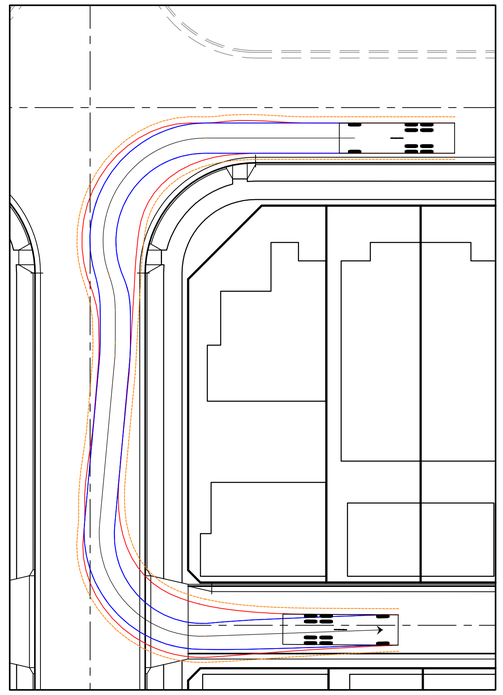

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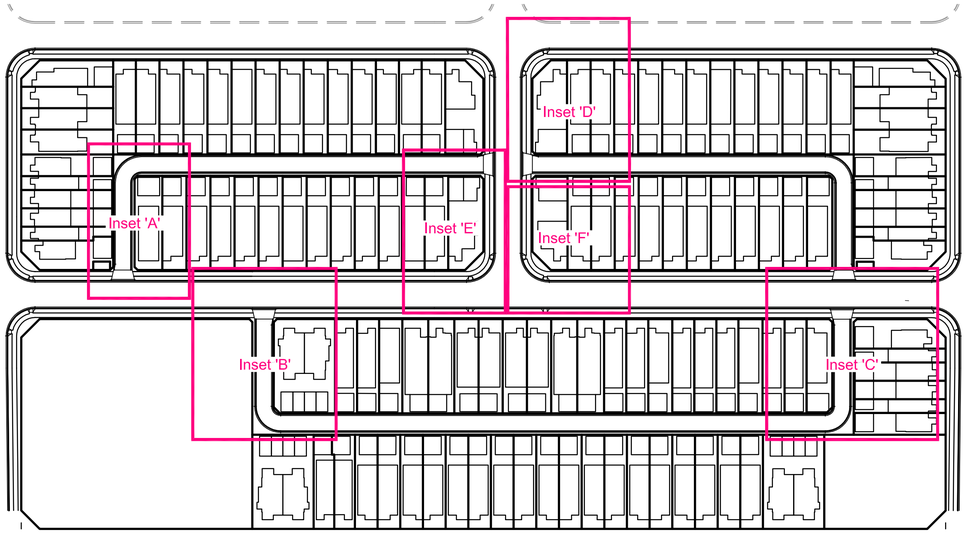
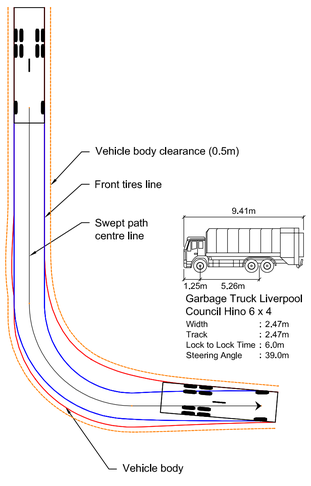


Key Plan
1:1000



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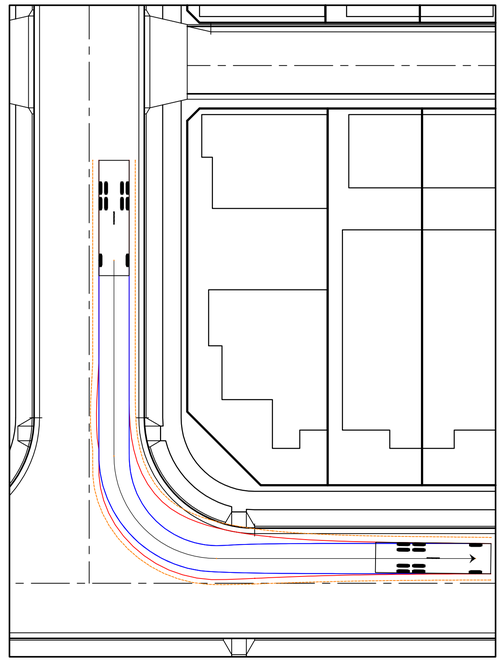

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Preliminary - Not for Construction

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	26.10.16	DRC	Issued for Information	DR	AC

1:250 0 12.5m 25m
1:1000 0 50m 100m

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Client
Vantage Property Group Pty Ltd
Suite 205 12 O'Connell Street
Sydney NSW 2000

Title
230 Sixth Avenue Austral
Development Application
Swept Path Analysis
Waste Collection Vehicle Plan

Designed	P.Cavanagh		Eng check	D.Reilly	
Drawn	D.Chapman		Coordination	J.Taylor	
Dwg check	A.Singh		Approved	A.Cameron	
Scale at A1	Status		Rev		Sec
1:250,1000	PRE		P1		STD

Drawing Number
MMD-369954-C-DR-AB-XX-0120

This plan may be prepared using COLOUR and may be incomplete if copied to black and white.