

**DYLDAM MERRYLANDS
PROPOSED BUILDING C
MIXED USE DEVELOPMENT**

PITT STREET, MERRYLANDS

***Assessment of Traffic and
Parking Implications***

May 2015
(Rev B)

Reference 14285

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1. INTRODUCTION

This report has been prepared to accompany a Development Application to Holroyd City Council for a proposed mixed residential, retail and commercial complex on part of the former "Rositano" bulky goods site on the corner of Pitt Street and Terminal Place at Merrylands (Figure 1).

Numerous established centres in the Metropolitan Area with good transport services are undergoing significant revitalisation with outmoded/under-utilised sites being redeveloped for residential apartments above ground level retail uses.

The Merrylands Centre reflects these evolving circumstances and the subject development site is located with convenient access to the rail and bus services as well as retail, entertainment facilities. The proposed development scheme comprises:

- * Residential apartments
- * Retail floorspace
- * Commercial floorspace
- * Central Plaza area
- * Basement carparking

The purpose of this report is to:

- * describe the site, the planning for the precinct and the proposed development scheme
- * describe the existing road network and traffic conditions in the area and the proposed changes
- * assess the proposed vehicle access arrangements and potential traffic implications

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- * assess the adequacy of the proposed parking provision
- * assess the proposed internal circulation and servicing arrangements



LEGEND



LOCATION

FIG 1

2. PLANNING PROPOSAL

2.1 SITE, CONTEXT AND EXISTING USE

The development site (Figure 2) is an irregular shaped area of some 5,950 m² bounded by Pitt Street, Terminal Place and Gladstone Street on the eastern edge of the Merrylands Centre. The site contains the former Rositano bulky goods building comprising:

Rositano Furniture	4,000 m ²
Bing Lee	1,950 m ²
Total:	5,950 m²

The existing parking area of some 190 spaces with access on Gladstone Street adjoins but is not part of the Building C site.

The site, which is zoned part B4 – Mixed Use and part R4 – High Density Residential, is largely surrounded by retail/commercial uses with the large Stockland Centre being on the opposite side of Pitt Street. Merrylands Railway Station is located just to the south and there is a residential area extending to the east of the railway line.

2.2 PRECINCT PLANNING

The planning provisions for the future development of the Merrylands Centre are contained in Part M of Holroyd DCP 2013. The stated objectives of the Merrylands Centre Controls include:

- renew and revitalise the centre
- provide an active vibrant centre
- promote public transport use, cycling, walking and reduce reliance on private car travel
- improve pedestrian and vehicle traffic movement within the centre



LEGEND



SITE

FIG 2

Details of the planning provisions are contained in the DCP extracts reproduced in Appendix A. These provisions specify the building height and FSR allowances which in turn direct the floorspace and apartment yield for each site. Council commissioned a microsimulation road network traffic model which incorporated the projected future development yield outcomes and the upgraded road system. This analysis confirmed a satisfactory road network operational performance outcome with development under the prescribed planning provisions.

2.3 PROPOSED DEVELOPMENT

It is proposed to demolish to existing building structure and excavate the site to construct a new 14 level building complex over basement carparking.

The proposed development scheme comprises:

<u>Residential</u>	84 x 1 bed apartments
	245 x 2 bed apartments
	26 x 3 bed apartments
Total:	355 apartments
<u>Retail</u>	1,484.43 m ² GLA
<u>Commercial</u>	893.47 m ² GLA
<u>Car parking</u>	461 spaces

The proposed development yield complies entirely with that prescribed in the DCP planning provisions.

Details of the proposed development scheme are provided on the architectural drawings prepared by Tony Caro which accompany the Development Application and are reproduced in part in Appendix B.

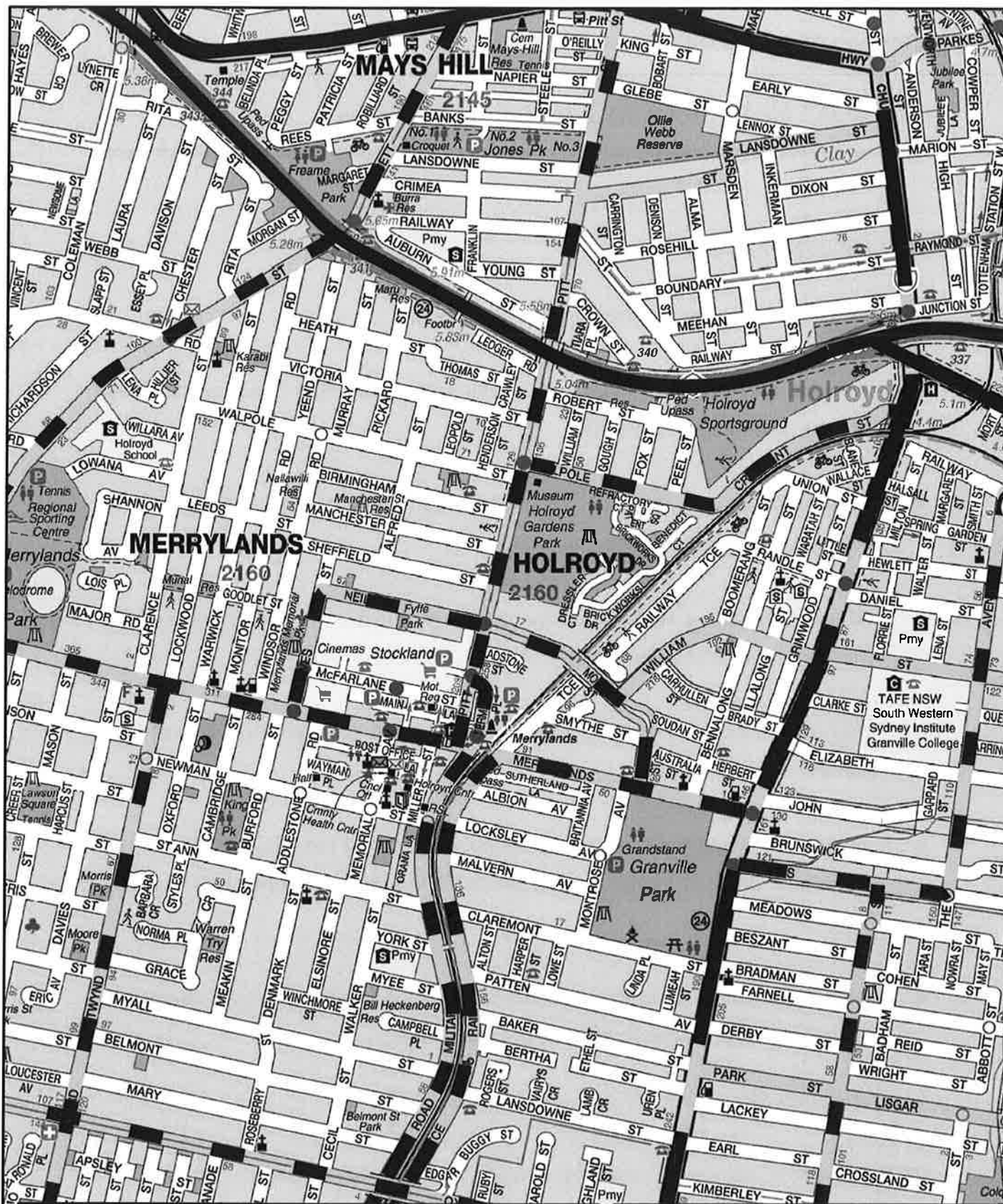
3. ROAD NETWORK AND TRAFFIC CONDITIONS

3.1 ROAD NETWORK

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

- * *M4 Motorway*: a State Road and arterial route connecting between Strathfield and the Blue Mountains crossing
- * *Great Western Highway*: a State Road and arterial route which connects between Sydney, Parramatta and Penrith
- * *Woodville Road*: a State Road and arterial route which connects between the Hume Highway and Great Western Highway/M4
- * *Merrylands Road*: a Regional Road and collector route extending the west from Merrylands to Greystanes
- * *Pitt Street*: a Regional Road and 'collector' route linking between Merrylands and Parramatta which in the southern most part forms a one-way pair with Terminal Place
- * *Neil Street*: part of a Regional Road and 'collector' route linking over the railway line between Merrylands Road and Woodville Road
- * *Gladstone Street* – a short local access cul-de-sac

Pitt Street is relatively straight and level with a 12.8 metre wide roadway.



LEGEND

- ARTERIAL
- - - SUB-ARTERIAL
- COLLECTOR



ROAD NETWORK

FIG 3

3.2 TRAFFIC CONTROLS

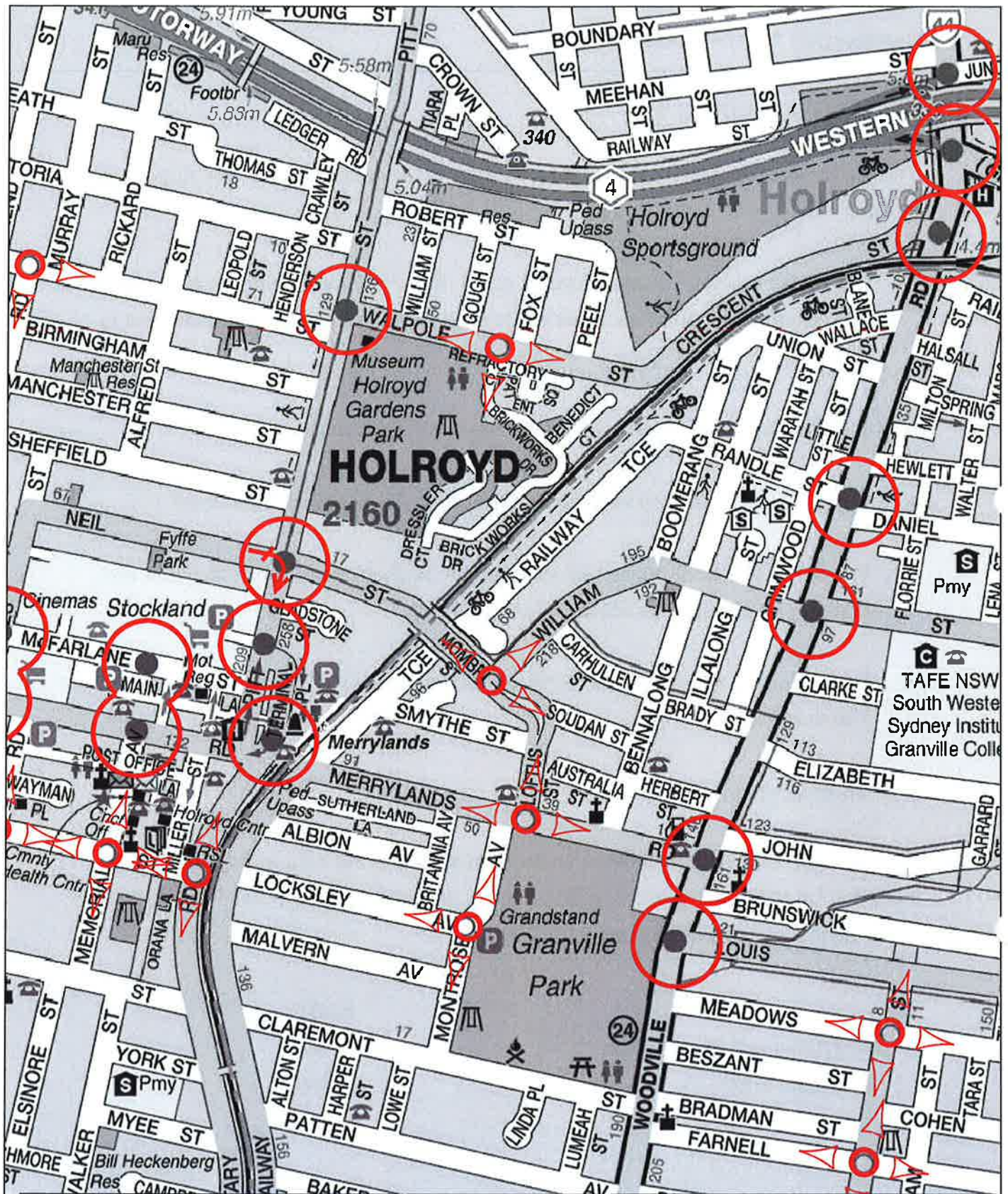
The traffic controls applied to the road system in the vicinity of the site (Figure 4) include:

- * the traffic signals at intersections along the Pitt Street route including the Merrylands Road and Neil Street intersection as well as pedestrian signals just to the north of Terminal Place
- * the 50 kmph urban speed zone on the street system near the site
- * the CLEARWAY restrictions (AM and PM) along Pitt Street and Neil Street
- * the ONE-WAY north traffic restriction in the southern section of Pitt Street and one-way south traffic restriction in Terminal Place
- * the sections of full time NO STOPPING restrictions on Pitt Street, Neil Street and Terminal Place




3.3 TRAFFIC CONDITIONS

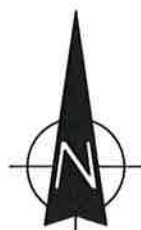
An indication of the traffic conditions on the road system in the area is provided by data published by RMS and surveys undertaken as part of this study. The RMS data is published in terms of AADT for the following:

	AADT
Neil Street at Railway Bridge	31,520
Pitt Street at M4	19,512



LEGEND

-  TRAFFIC SIGNAL CONTROL
-  ROUNDABOUT
-  RESTRICTED TURNING MOVEMENT



TRAFFIC CONTROLS

FIG 4

Surveys undertaken at the Pitt Street and Neil Street intersection during the morning and afternoon peak periods reveal the following:

		AM	PM
Pitt Street	Northbound	201	579
	Right-turn	359	591
	Left-turn	34	51
	Southbound	595	229
	Right-turn	99	85
	Left-turn	358	184
Neil Street	Eastbound	349	351
	Left-turn	135	68
	Westbound	349	351
	Right-turn	310	420
	Left-turn	308	303

The operational performance of the intersection has been assessed using the SIDRA model and the results of that assessment are summarised in the following indicating that the intersection is subject to some congestion during the peak periods. The criteria for interpreting the model output is reproduced overleaf.

	AM	PM
Level of Service	D	E
Degree of Saturation	0.86	0.90
Av Vehicle Delay	48	66.5

3.4 TRANSPORT SERVICES

Merrylands Railway Station on the Main Western Line is located immediately to the south of the site. Bus services focussing on the railway station include Routes 802, 804, 806 which operate along Pitt Street as well Routes 810, 811, 820-822. It is apparent that the site is located with very convenient access to public transport services connecting to the Metropolitan transport network.

Criteria for Interpreting Results of SIDRA Analysis

1. Level of Service (LOS)

LOS	Traffic Signals and Roundabouts	Give Way and Stop Signs
'A'	Good	Good
'B'	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
'C'	Satisfactory	Satisfactory but accident study required
'D'	Operating near capacity	Near capacity and Accident Study required
'E'	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode	At capacity and requires other control mode
'F'	Unsatisfactory and requires additional capacity	Unsatisfactory and requires other control mode

2. Average Vehicle Delay (AVD)

The AVD provides a measure of the operational performance of an intersection as indicated on the table below, which relates AVD to LOS. The AVD's listed in the table should be taken as a guide only as longer delays could be tolerated in some locations (ie inner city conditions) and on some roads (ie minor side street intersecting with a major arterial route).

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabouts	Give Way and Stop Signs
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode	At capacity and requires other control mode

3. Degree of Saturation (DS)

The DS is another measure of the operational performance of individual intersections.

For intersections controlled by **traffic signals**¹ both queue length and delay increase rapidly as DS approaches 1, and it is usual to attempt to keep DS to less than 0.9. Values of DS in the order of 0.7 generally represent satisfactory intersection operation. When DS exceeds 0.9 queues can be anticipated.

For intersections controlled by a **roundabout or GIVE WAY or STOP signs**, satisfactory intersection operation is indicated by a DS of 0.8 or less.

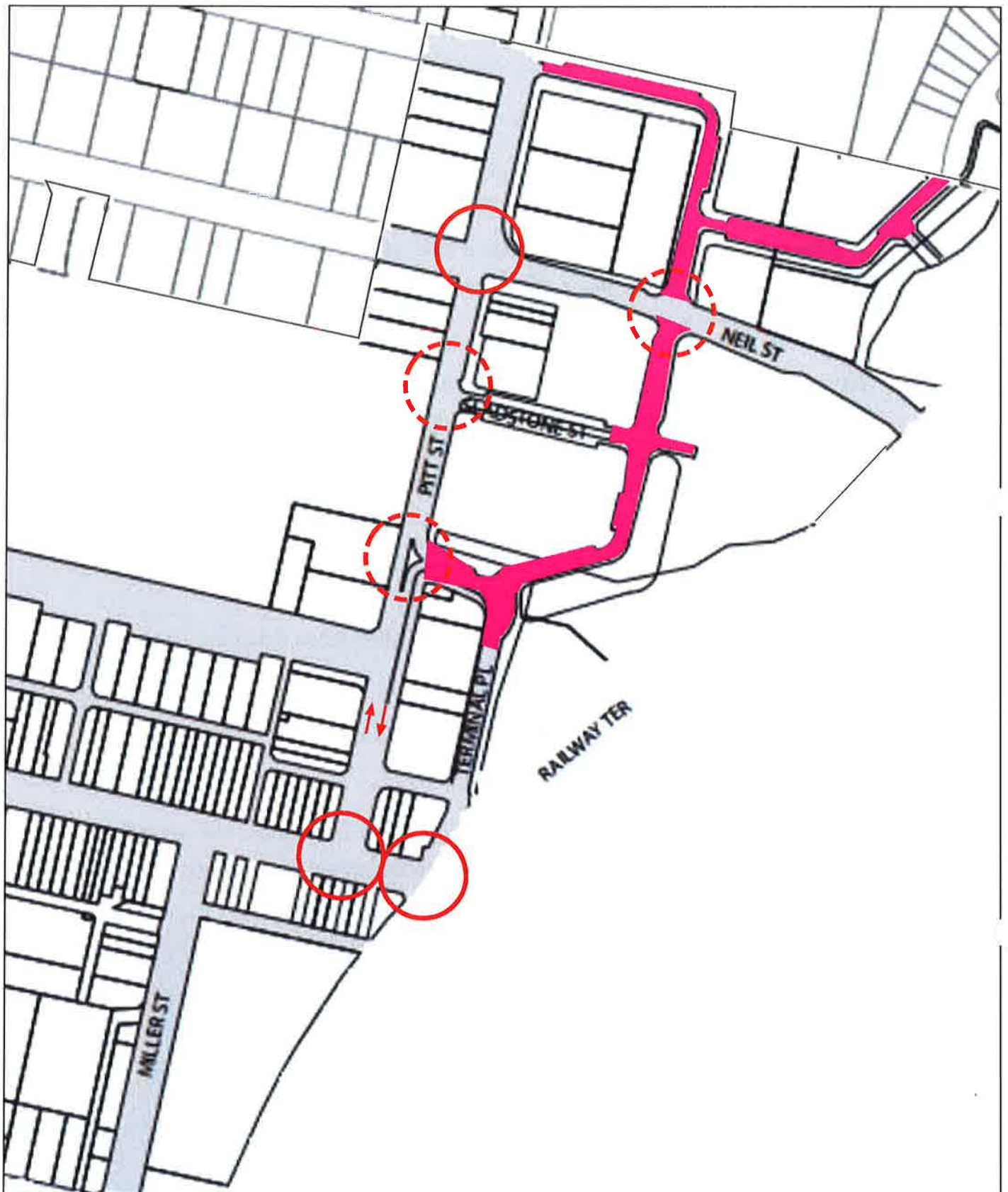
¹ the values of DS for intersections under traffic signal control are only valid for cycle length of 120 secs

3.5 FUTURE CIRCUMSTANCES

Future planning for the road system serving the Merrylands Centre includes:

- * widening of Pitt Street along the eastern side at Neil Street, widening of Neil Street easterly from Pitt Street and provision of a left-turn slip lane from Neil Street westerly to Pitt Street
- * provision of new roadway connecting from Terminal Place, linking with Gladstone Street and extending across Neil Street
- * traffic signals at the Neil Street/New Road intersection
- * realignment of Walpole Street at Pitt Street to create a 4-way signal controlled intersection
- * provision of 2-way traffic in Pitt Street between Merrylands Road and Terminal Place
- * provision of traffic signals at the Pitt Street and Terminal Place intersection

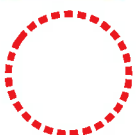
Details of the proposed changed road network and traffic controls are still subject to ongoing assessment, however the current proposals are shown on Figure 5.



LEGEND



NEW ROADS



NEW TRAFFIC SIGNALS



PROPOSED ROAD
SYSTEM

FIG 5

4. TRAFFIC

An indication of the traffic generation of the former bulky goods uses on the site is provided by the RMS Guidelines which specify a generation rate for “Bulky Goods” use during the weekday afternoon peak of 2.7vtph per 100m². This equates to some 160vtph for the total floorspace of 5,950m² and while there is no rate specified for the morning peak this would have been some 40vtph for staff arrival and deliveries etc.

An indication of the potential traffic generation of the proposed residential apartments is provided by the RMS Development Guidelines (TDT 2013-4b) which specifies rates of 0.19 and 0.15 vtph per apartment for the morning and afternoon peak periods respectively for sites which have convenient access to rail services. Application of this criteria to the proposed 355 apartments would indicate some 68vtph in the morning and some 54vtph in the afternoon.

The same RMS TDT specifies traffic generation rates for commercial office floorspace of 1.6vtph per 100m² in the morning peak and 1.2vtph per 100m² for the afternoon peak. Application of this criteria to the proposed 893.5m² of commercial floorspace indicates a generation of some 15vtph in the morning peak and 11vtph in the afternoon peak.

The RMS Development Guideline traffic generation criteria for ‘retail’ is for large shopping centres and is not applicable to the proposed specialty shops etc. There will only be 30 parking spaces provided for retail tenants and customers.

The RMS Development Guidelines provide a guide to the traffic generation rate of “specialty shops” as follows:

Thursday PM

$V(P) = 46 A(ss)$

A = 1,000m² of ss floorspace

On this basis the proposed 1,485m² of retail floorspace will generate some 69vtpH during the Thursday afternoon peak while the morning peak generation will be some 25% or 18vtpH.

The retail elements will have significant elements of dual and complementary use with the residential apartments.

Accordingly, on this basis, the projected traffic generation of the proposed development is as follows:

	AM	PM
Residential Apartments		
355	68 vtpH	54 vtpH
Retail	18 vtpH	69 vtpH
Commercial	15 vtpH	11 vtpH
Total:	101 vtpH	134 vtpH

The projected distribution of these additional trips will be:

	AM		PM	
	IN	OUT	IN	OUT
Residents	14	54	44	10
Retail	12	6	30	39
Commercial	12	3	1	10
Total:	38	63	75	59

The projected directional distribution of these vehicle movements with completion of the proposed road network is as follows:

	New Road (N)		New Road (S)	
	IN	OUT	IN	OUT
AM	30	40	8	23
PM	60	44	15	15

The assessed traffic generation of the former use on the site is 40vtp/h in the morning peak and 160vtp/h in afternoon peak and all of these movements were focused on the Pitt Street and Gladstone Street intersection.

The traffic generation of the proposed development will be somewhat more in the morning peak but somewhat less in the afternoon peak. However:

- * the access movements with the proposed development and changed road system will be spread over a number of approach and departure routes (e.g. New Road, Terminal Place, Pitt Street and Gladstone Street)
- * the projected traffic generation of the proposed development was incorporated into Council's assessment for the development and road network outcome for the centre which indicated an acceptable operational performance outcome

It is apparent that the proposed development will not result in any unsatisfactory traffic circumstances and it is understood that the implementation of the proposed upgraded road system will be facilitated by the development.

5. PARKING

Holroyd City Council's DCP 2013 specifies parking provision criteria in relation to the proposed development as follows:

	Minimum	Maximum
Residential		
One Bedroom	0.8 spaces	1.0 space
Two Bedroom	1.0 space	1.2 spaces
Three Bedroom	1.0 space	1.2 spaces
Visitor	1 space per 5 apartments	
Retail and Commercial		
1 space per:	50m ² GLA	15m ² GLA

Application of this criteria to the proposed development would indicate:

	Minimum
84 x One Bed apartments	67 spaces
245 x Two Bed apartments	245 spaces
26 x Three Bed apartments	26 spaces
Total:	338 spaces
Visitors (355 apartments)	71 spaces
Retail 1,484.43m ²	30 spaces
Commercial 893.47m ²	18 spaces
Total:	457 spaces

It is proposed to provide a total of 461 spaces including 53 accessible spaces in compliance with the DCP minimum requirements.

In relation to the provision of bicycle parking DCP 2013 specifies the following:

Residential Apartments	-	0.5 spaces per apartment for residents 0.1 space per apartment for visitors
Retail/G.L.	-	1 space per 300m ² for staff 1 space per 2,500m ² for visitors
Commercial Level 1	-	1 space per 200m ² for staff 1 space per 750m ² for visitors

Application of these requirements would indicate the following:

Residents	178 spaces
Visitors	36 spaces
Retail	5 spaces for staff 1 space for visitors
Commercial	5 spaces for staff 1 space for visitors

A total of 227 bicycle spaces will be provided in compliance with the DCP requirements.

6. ACCESS, INTERNAL CIRCULATION AND SERVICING

ACCESS

The proposed vehicle access arrangements will comprise:

- a combined ingress/egress driveway for the carpark on the New Road frontage
- a combined ingress/egress driveway for service vehicles on the Gladstone Street frontage

These roads will be straight and level at this location and the design of the proposed driveways will accord with the design requirements of AS2890.1 and 2 and there will be satisfactory sight distances available for drivers and pedestrians. There will be a suitable separation between the driveways and intersections/bends and it is apparent that there will not be any access difficulties.

INTERNAL CIRCULATION

Simple one and two-way internal circulation arrangements would be provided through the basement levels with design criteria compliant with AS 2890.1 and 6. The residential carparking will be secured and segregated from retail/visitor and commercial parking and quite generous manoeuvring and 'turnaround' provisions are a feature of the design. See Appendix D for turning path assessment.

SERVICING

A loading dock would be provided suitable for vans, MRVs and garbage trucks. Tenants vans typically associated with small retail units and other small service vehicles (e.g. service personnel, couriers etc) will also be able to use this loading area or the spaces in the retail/visitor basement level. See Appendix D for turning path assessment.

7. CONCLUSION

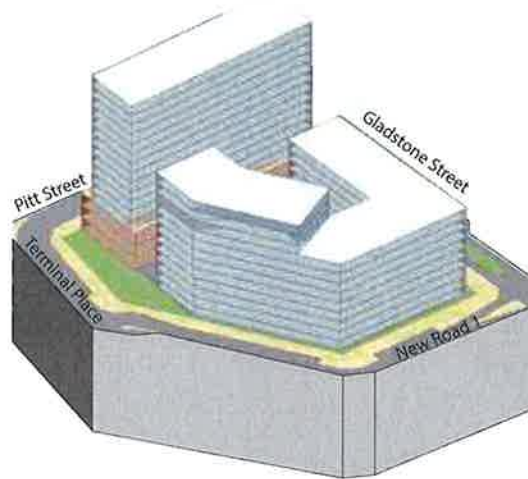
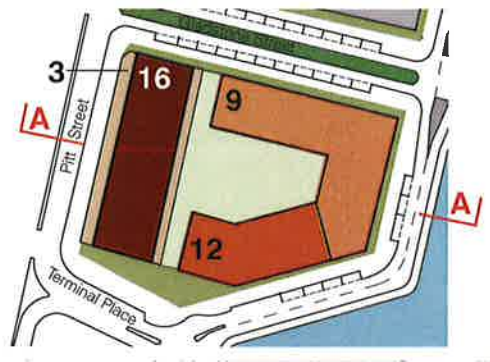
Assessment of the proposed development scheme has concluded that:

- * the proposed parking provision will be adequate and appropriate given the circumstances of Councils DCP criteria and the very convenient public transport services
- * the proposed vehicle access, internal circulation and servicing arrangements will be suitable
- * the projected traffic outcome will be entirely consistent with Council's planning provisions and the assessments which underly that planning
- * there will be no unsatisfactory traffic or traffic related environmental implications
- * the proposed traffic management arrangements will not present any difficulties for the proposed development and its vehicle access requirements

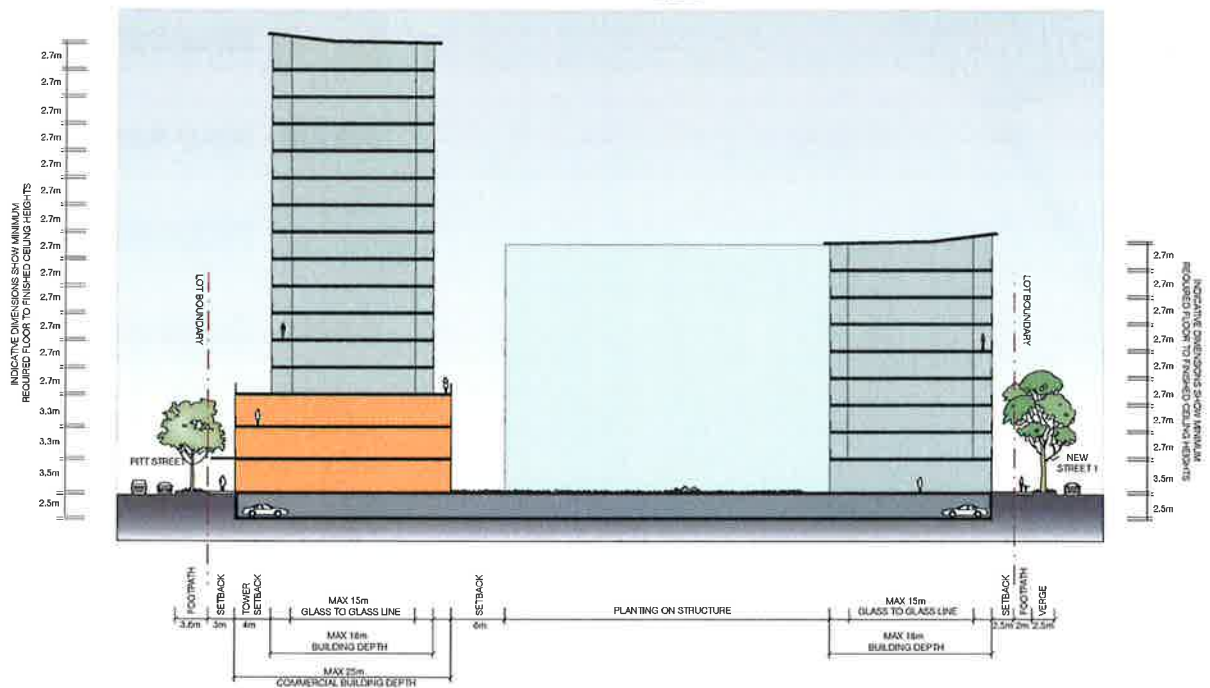
APPENDIX A

EXTRACTS FROM DCP

Merrylands Centre



- 1 storey
- 2 storeys
- 3 storeys
- 4 storeys
- 5 storeys
- 6 storeys
- 7 storeys
- 8 storeys
- 9 storeys
- 12 storeys
- 16 storeys
- envelope of amalgamated roof
- land swap occurs
- possible location of break in building
- can be built over after 2 levels
- residential
- retail/commercial
- parking
- swale
- public open space
- deep soil zone
- planting on structure



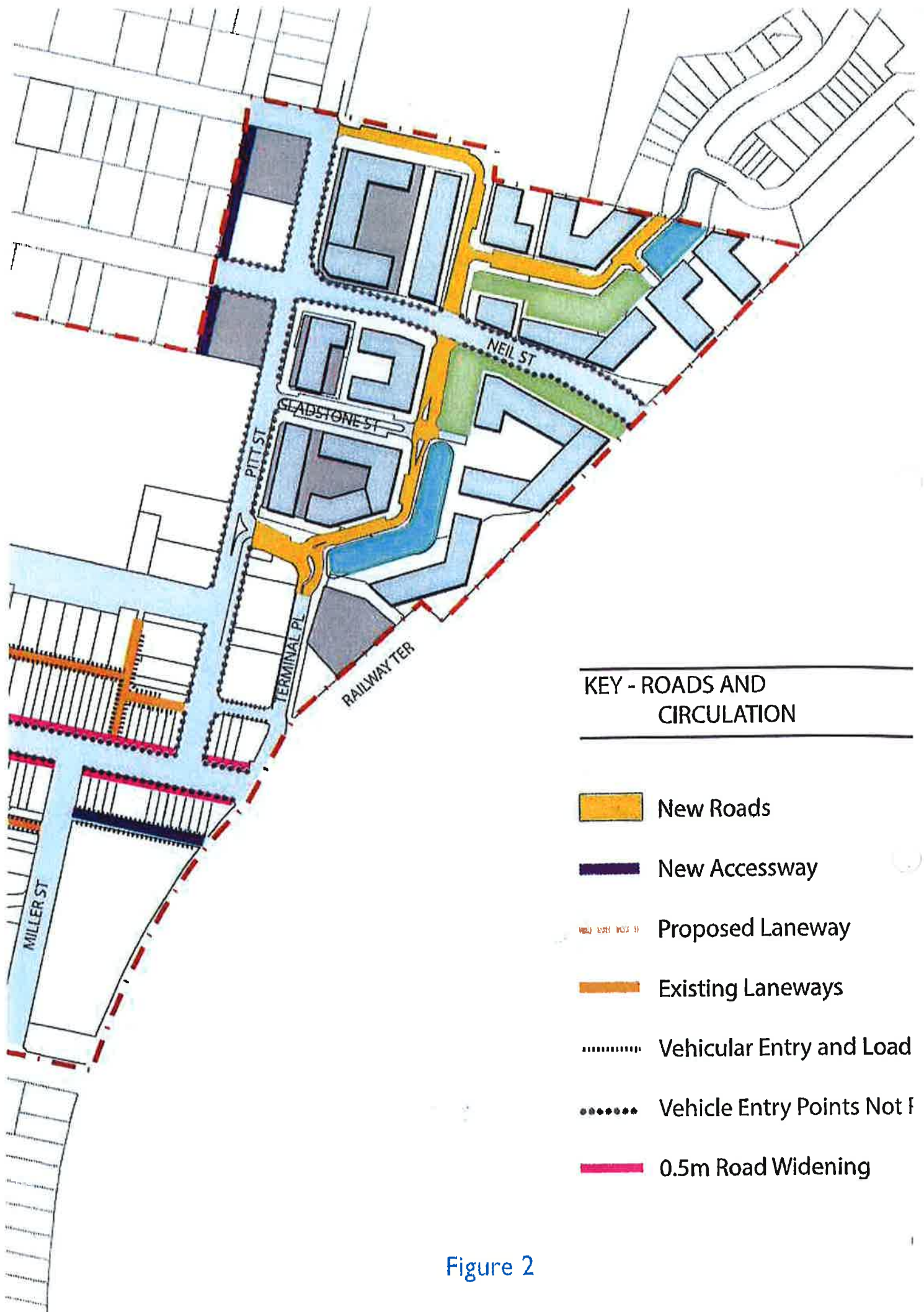
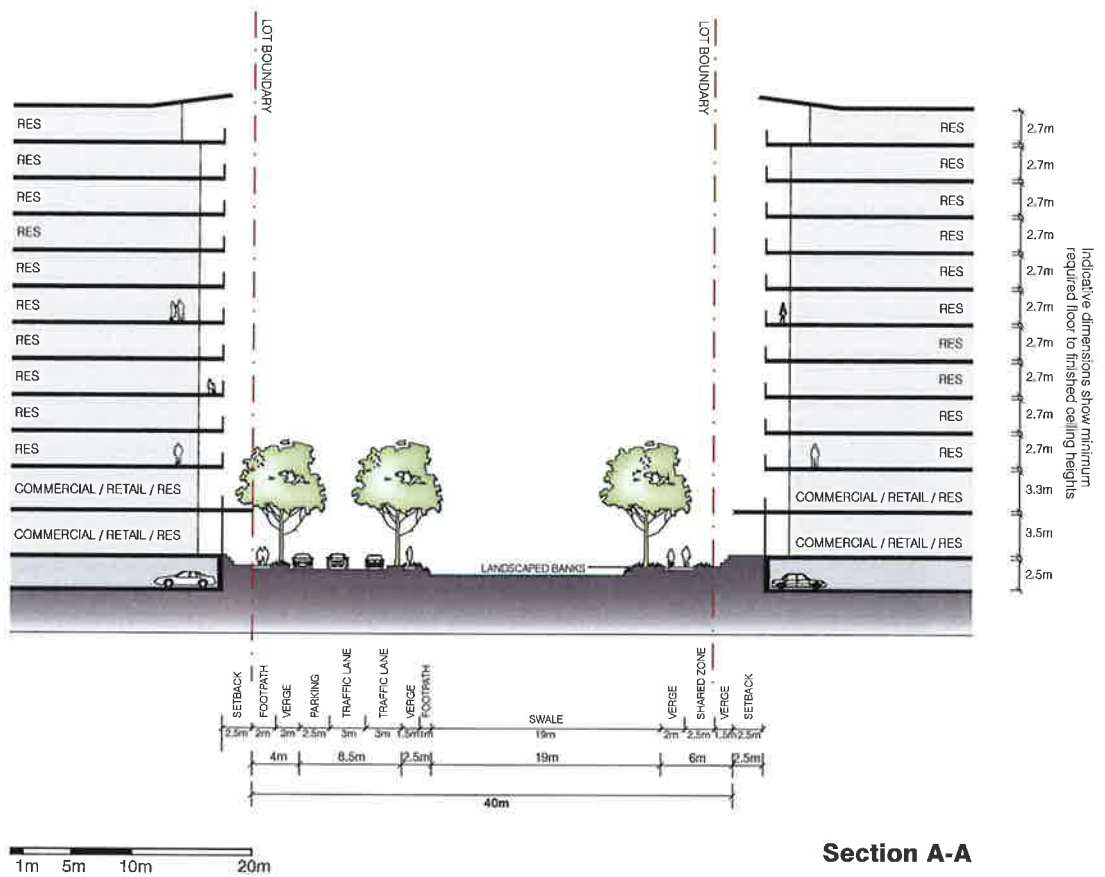
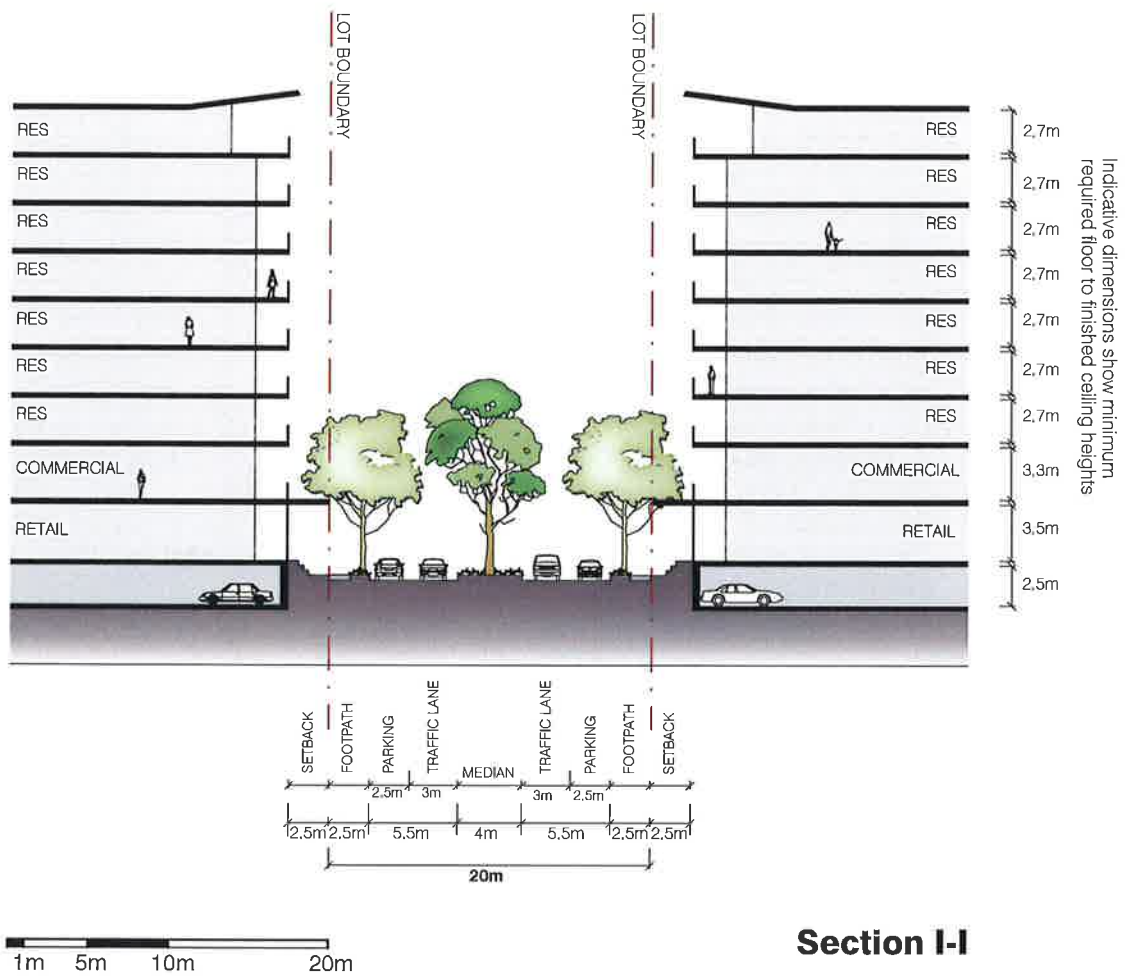


Figure 2

Merrylands Centre



Merrylands Centre



Merrylands Centre

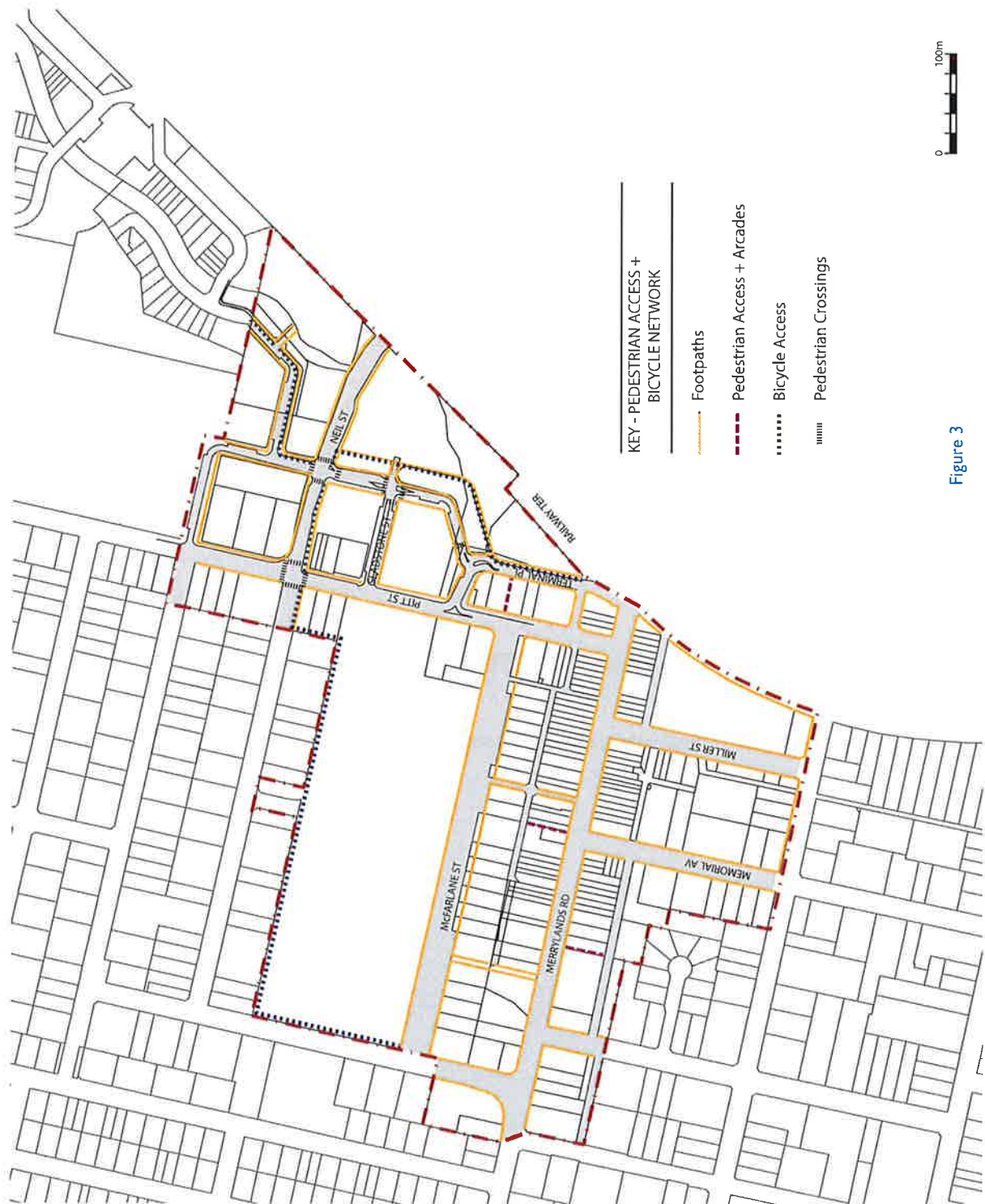
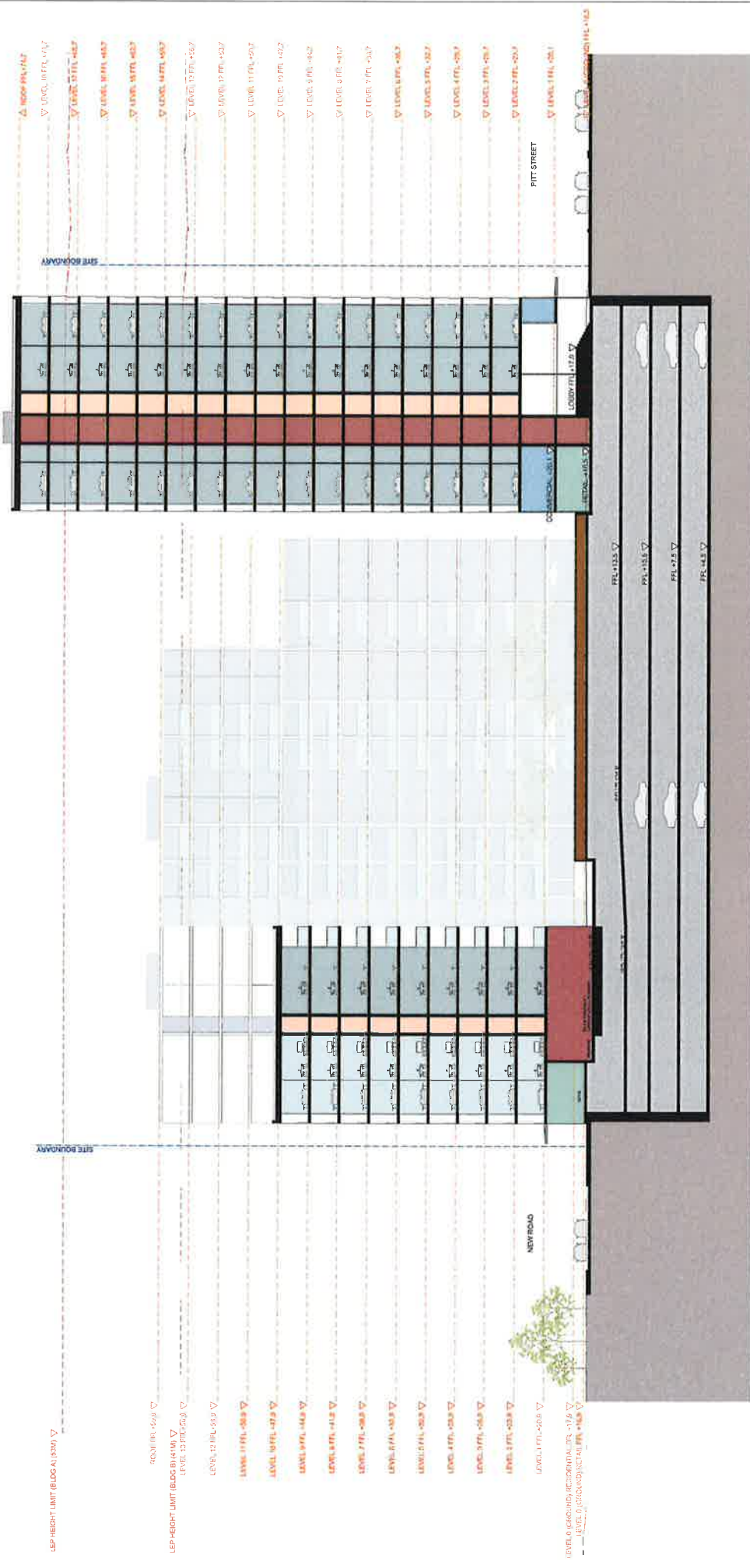


Figure 3

APPENDIX B

DEVELOPMENT PLANS

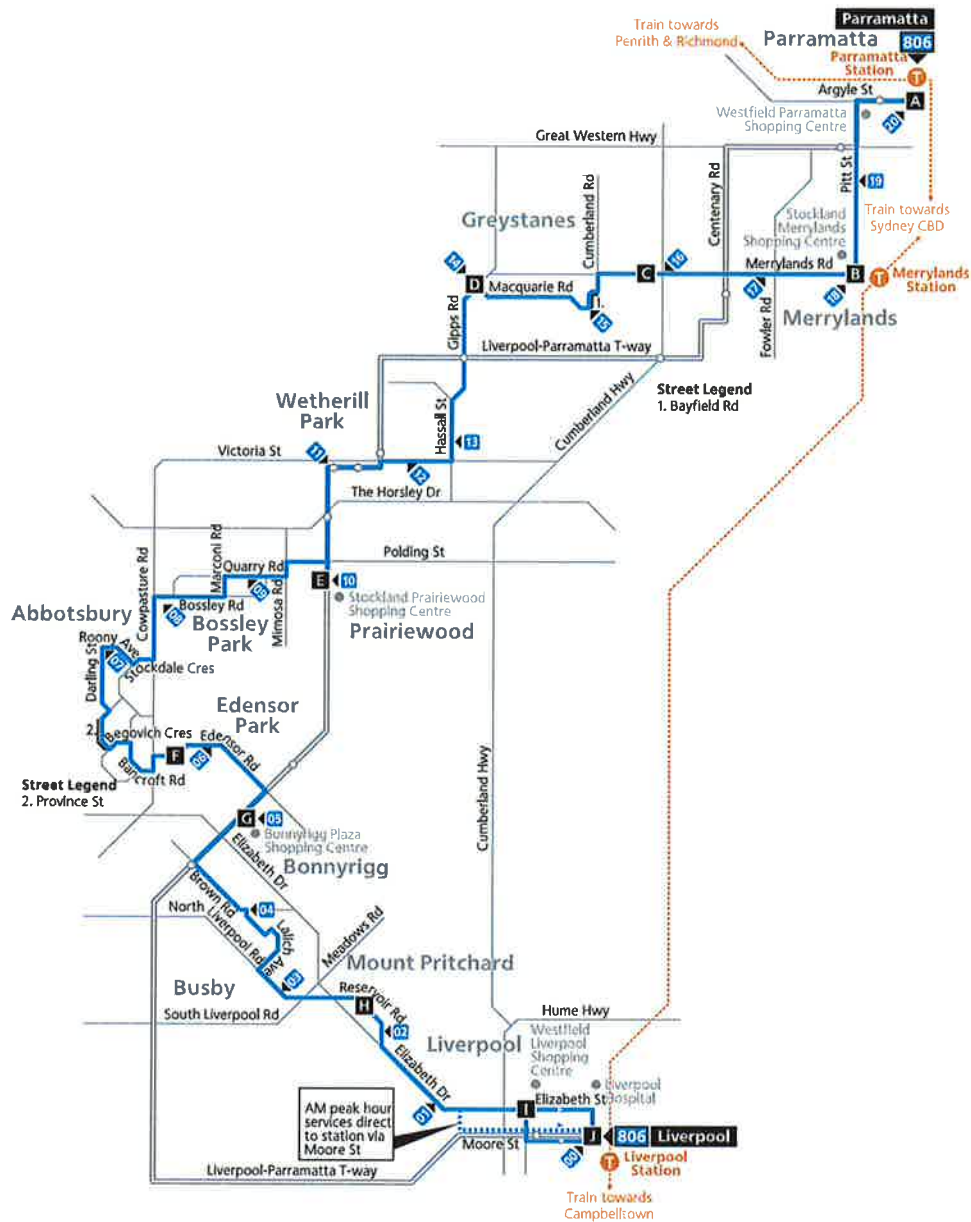


PRELIMINARY

dykan
 14/15, 17/18, 19/20, 21/22, 23/24, 25/26, 27/28, 29/30, 31/32, 33/34, 35/36, 37/38, 39/40, 41/42, 43/44, 45/46, 47/48, 49/50, 51/52, 53/54, 55/56, 57/58, 59/60, 61/62, 63/64, 65/66, 67/68, 69/70, 71/72, 73/74, 75/76, 77/78, 79/80, 81/82, 83/84, 85/86, 87/88, 89/90, 91/92, 93/94, 95/96, 97/98, 99/100, 101/102, 103/104, 105/106, 107/108, 109/110, 111/112, 113/114, 115/116, 117/118, 119/120, 121/122, 123/124, 125/126, 127/128, 129/130, 131/132, 133/134, 135/136, 137/138, 139/140, 141/142, 143/144, 145/146, 147/148, 149/150, 151/152, 153/154, 155/156, 157/158, 159/160, 161/162, 163/164, 165/166, 167/168, 169/170, 171/172, 173/174, 175/176, 177/178, 179/180, 181/182, 183/184, 185/186, 187/188, 189/190, 191/192, 193/194, 195/196, 197/198, 199/200, 201/202, 203/204, 205/206, 207/208, 209/210, 211/212, 213/214, 215/216, 217/218, 219/220, 221/222, 223/224, 225/226, 227/228, 229/230, 231/232, 233/234, 235/236, 237/238, 239/240, 241/242, 243/244, 245/246, 247/248, 249/250, 251/252, 253/254, 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APPENDIX C

BUS SERVICES



Legend

- Bus route
- 806 Bus route number
- A Timing point
- 04 Section point
- T Train line/station

Diagrammatic Map
North
Not to Scale



Getting around by public transport

All over NSW, modes and services have come together as an integrated system to help you get around more easily by public transport.



Sydney Trains

The train services that get you around the city and suburbs of Sydney.



NSW TrainLink

Intercity and Regional services that take you to the Blue Mountains, Central Coast, Newcastle, the Southern Highlands, the South Coast and beyond.



Buses

Hundreds of bus routes in cities, suburbs and beyond connect you with shopping centres, schools, hospitals and more.



Ferries

The Sydney and Newcastle harbours and waterways are navigated by ferry services.

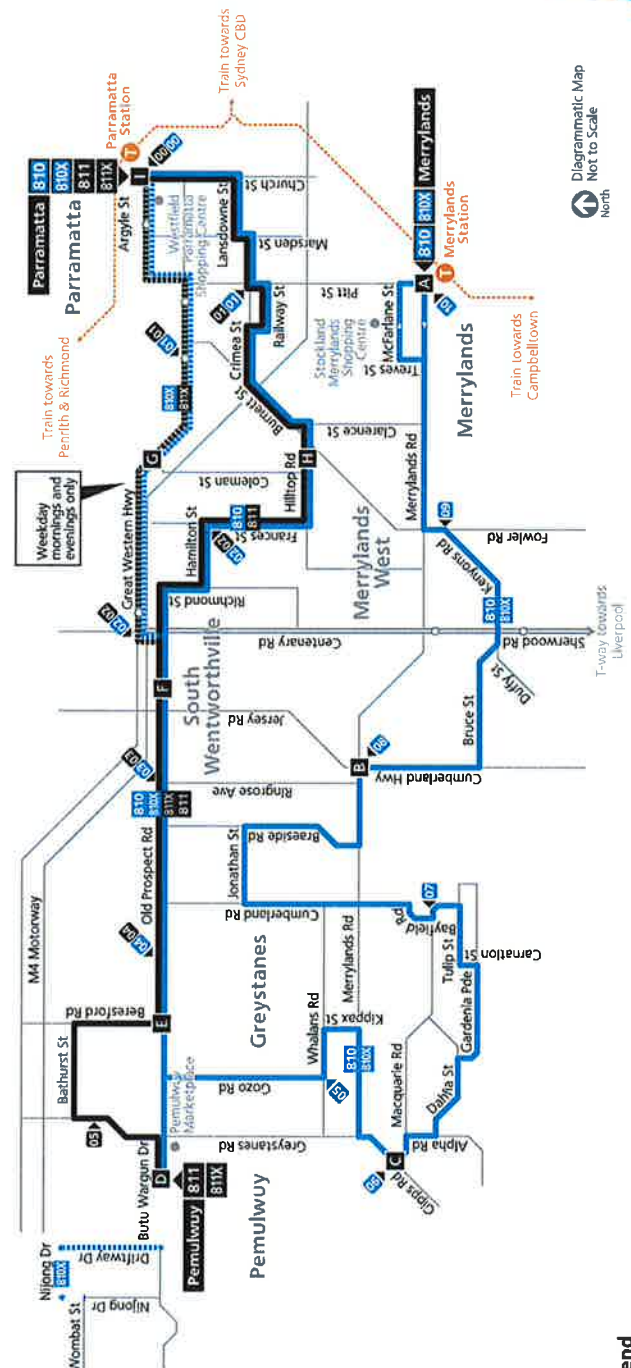


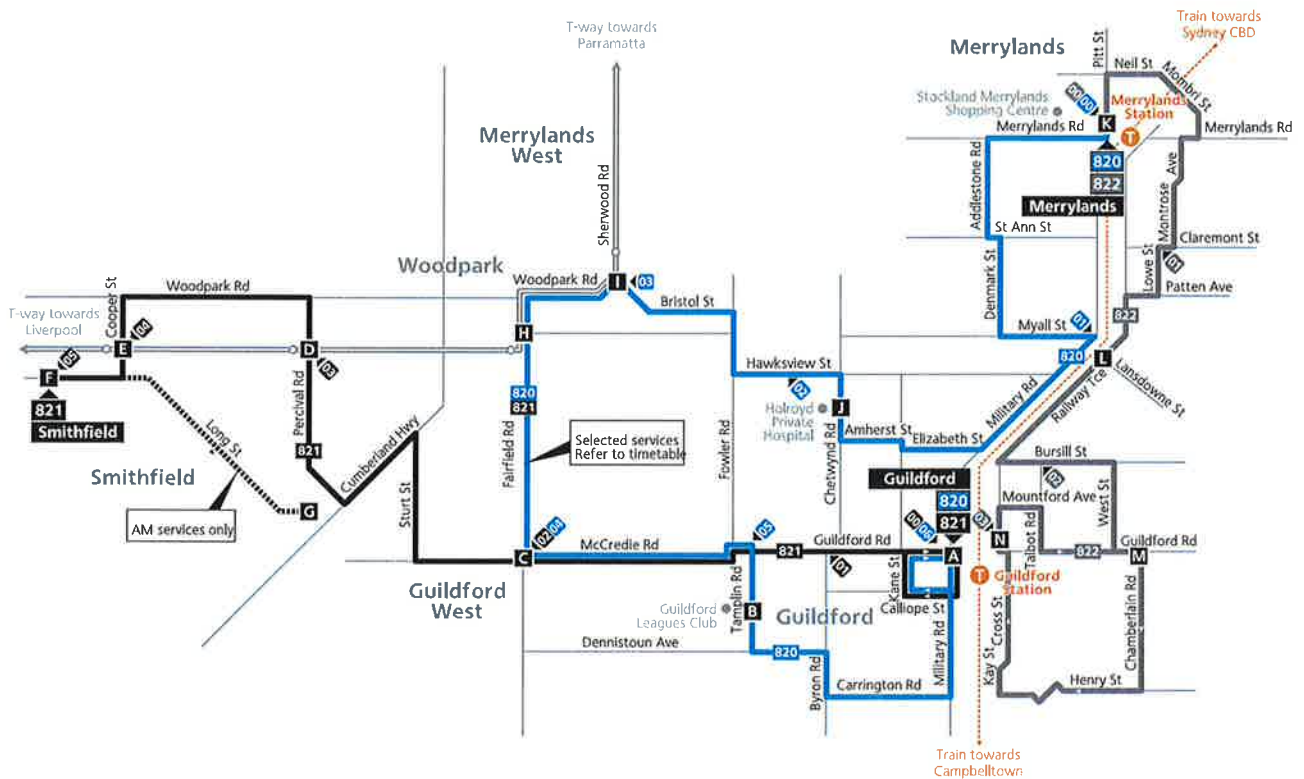
Light Rail

From Central Station to Sydney's Inner West, including Paddy's Markets, Darling Harbour, The Star and the Sydney Fish Market.

Bus route map

810, 811





Legend

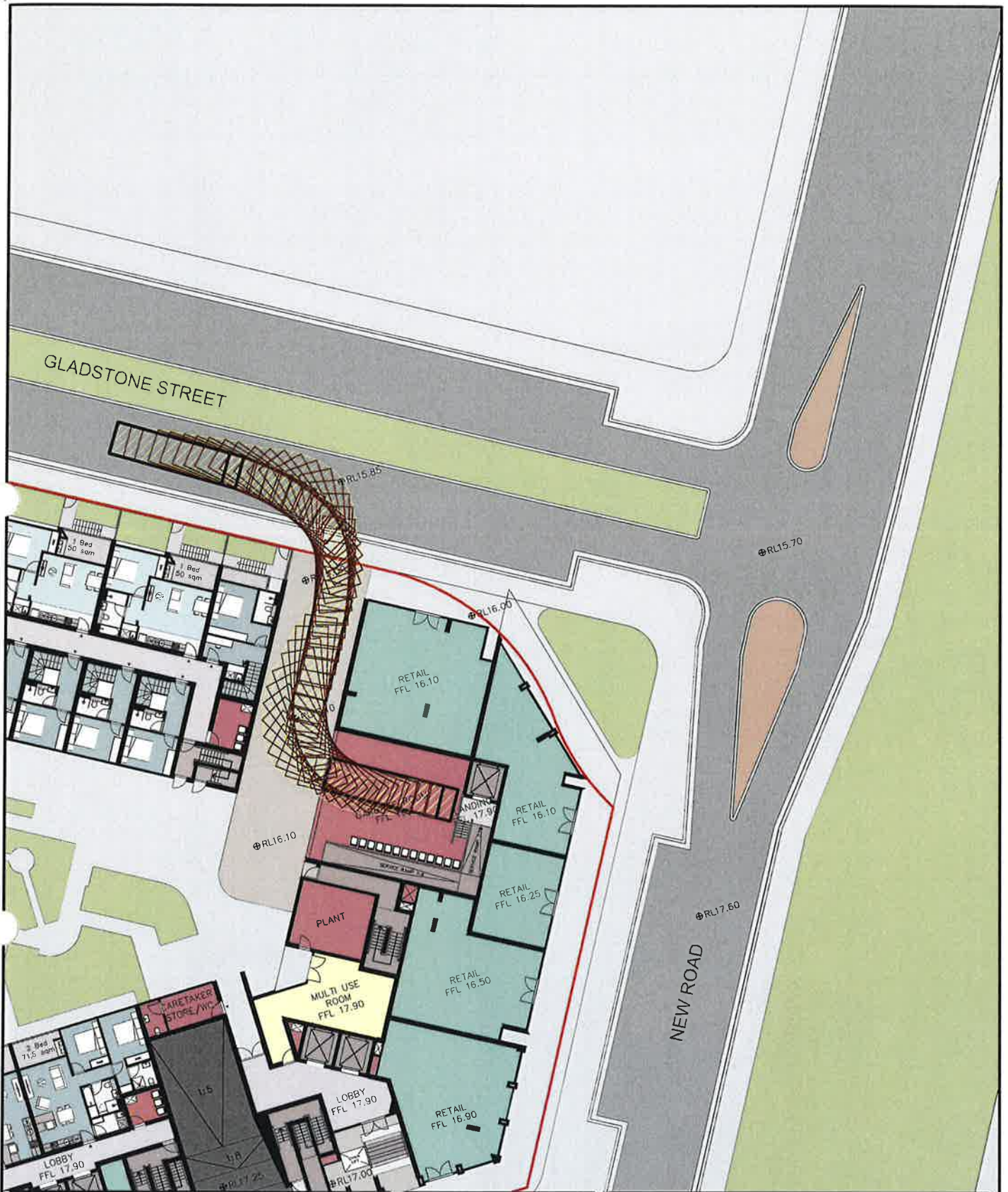
- Bus route
- 820 Bus route number
- A Timing point
- 04 Section point
- T Train line/station

Diagrammatic Map
North
Not to Scale



APPENDIX D

TURNING PATH ASSESSMENT



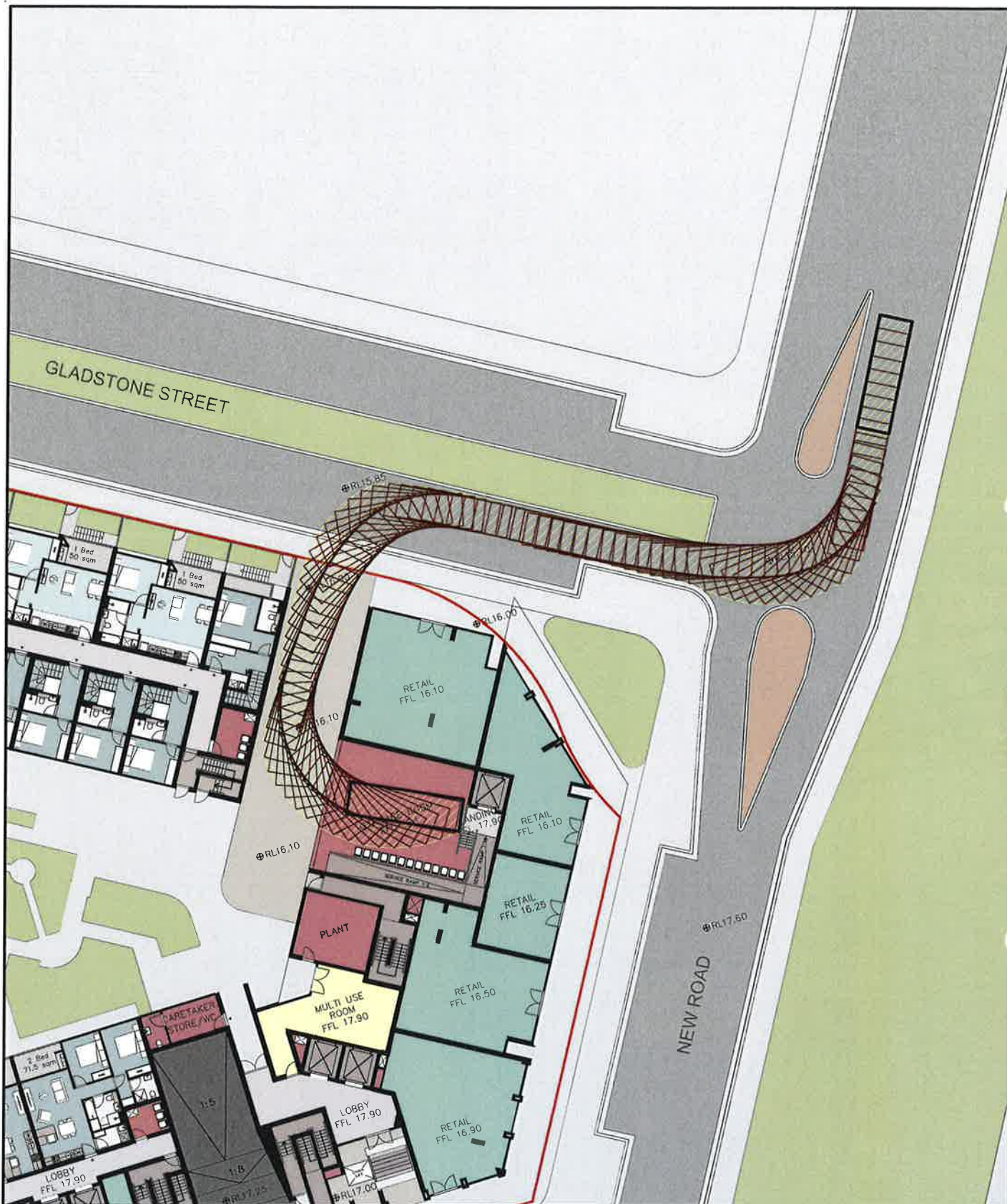
LEGEND

This drawing has been prepared using vehicle modelling computer software AutoTrack V9.21 in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.



**SWEPT PATH ANALYSIS
OF A 10.2m REFUSE
VEHICLE EXITING THE SITE**

SP 2



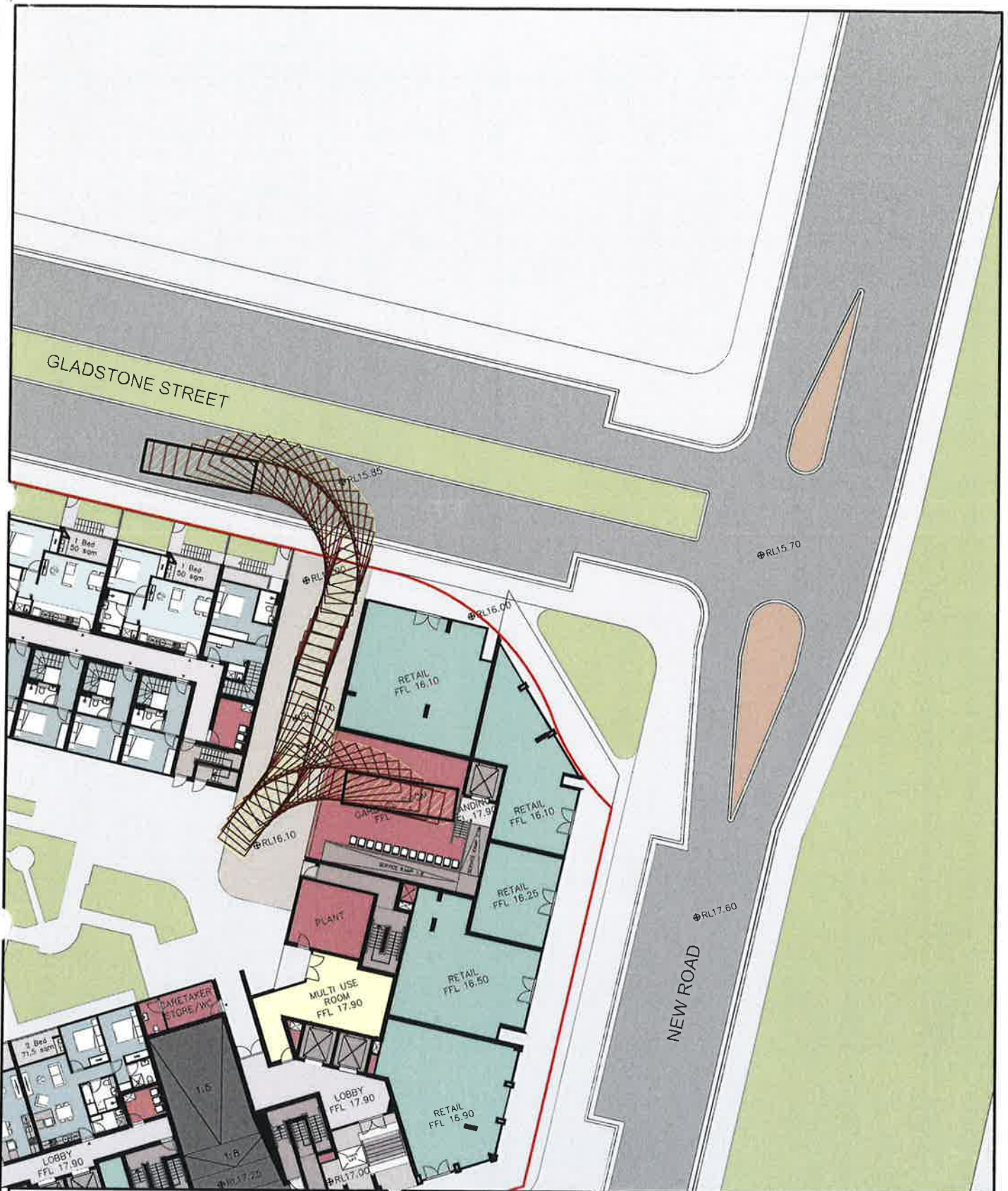
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This drawing has been prepared using vehicle modelling computer software AutoTrack V9.21 in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.



**SWEPT PATH ANALYSIS
OF AN 8.8m RIGID VEHICLE
ENTERING THE SITE**

SP 3



LEGEND

This drawing has been prepared using vehicle modelling computer software AutoTrack V9.21 in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.



**SWEPT PATH ANALYSIS
OF AN 8.8m RIGID
VEHICLE EXITING THE SITE**

SP 4

