'DISCOVERY POINT' PROPOSED CONCEPT PLAN

PRINCES HIGHWAY AND BRODIE SPARK DRIVE, WOLLI CREEK

Assessment of Traffic, Transport and Accessibility Implications

June 2010
Issue B

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1. INTRODUCTION

This report has been prepared to form part of an Environmental Assessment (EA) for a Part 3A Application to the Department of Planning for a Part 3A Concept Plan for the 'Discovery Point' site at Wolli Creek (Figure 1).

The Wolli Creek Redevelopment Area (WCRA) comprises a large precinct of existing and former industrial lands extending to the south of Cooks River and Wolli Creek. The precinct, which spans the Princes Highway and the railway lines, has already been the subject of some significant redevelopment activity for residential apartments and ancillary commercial uses.

Planning for WCRA has been guided by the relevant planning documents and criteria which provided for redevelopment of a mixed use nature including employment, residential and recreational uses taking advantage of the proximity to the Wolli Creek Railway Station, Princes Highway, the M5 Motorway and the Airport. The prominent 'Discovery Point' site is bounded by Princes Highway, Brodie Spark Drive/Magdalene Terrace and the Railway Line and a number of building elements have already been constructed (or commenced) under an existing Masterplan and subsequent individual consents.

The subject application proposes to seek consent under Part 3A for:

* residential floorspace maximum of 123,000m^2 (SIGFA)
* non-residential floorspace minimum of 9,000m^2 (SIGFA)
* parking rates to be adopted in future project applications
* a revised road network throughout the site.

It should be noted that the gross floorarea for the Concept Plan application refers to Standard Instrument Gross Floorarea (SIGFA).

In response to the Preliminary EA the Director General's requirements in relation to Transport and Accessibility Impacts contain the following:

∗ *The EA must address the following key issues:*

Relevant EPI's Policies and Guidelines
- *Metropolitan Transport Plan 2010*
- *Integrating Landuse and Transport*
- *Planning Guidelines for Walking and Cycling*
- *Nature and extent of any non-compliance with relevant planning instruments, plans and guidelines and justification for any non-compliance*
- *Rockdale LEP 2000 and DCP 45*

∗ *The EA shall provide a Traffic and Accessibility Impact Study prepared in accordance with the RTA's Guide to Traffic Generating Developments, considering:*

- *traffic generation and any required road/intersection upgrades (including but not limited to the intersection of Princes Highway/Brodie Spark Drive)*
- *the adequacy of on-site carparking for the proposal having regard to local planning controls, RTA Guidelines and the high public transport accessibility of the site (note: the Department supports reduced carparking rates in areas well served by public transport)*
- *the ability of buses to maintain services during construction and once completed*
- *access, loading dock(s) and service vehicle movements*
- *the potential for implementing a location specific sustainable travel plan (eg 'Travelsmart' or other travel behaviour change initiative)*
- *the implications of the proposed development non-car travel modes (including public transport use, walking and cycling) and the provision of facilities to increase the non-car travel share, including bicycle connections from the site to the surrounding bicycle network and bicycle parking in both residential and commercial/retail portions of the proposed development (including the provision of amenities for cyclists)*

- *how the proposal integrates with the Wolli Creek Railway Station and how the proposal would impact upon the operation of the existing railway lines.*

In addition, the DoP received responses from the RTA, STA and NSW Transport and Infrastructure and copies of this correspondence are provided in Appendix A.

The purpose of this report is to:

* describe the site, the existing development and the proposed Concept Plan development scheme

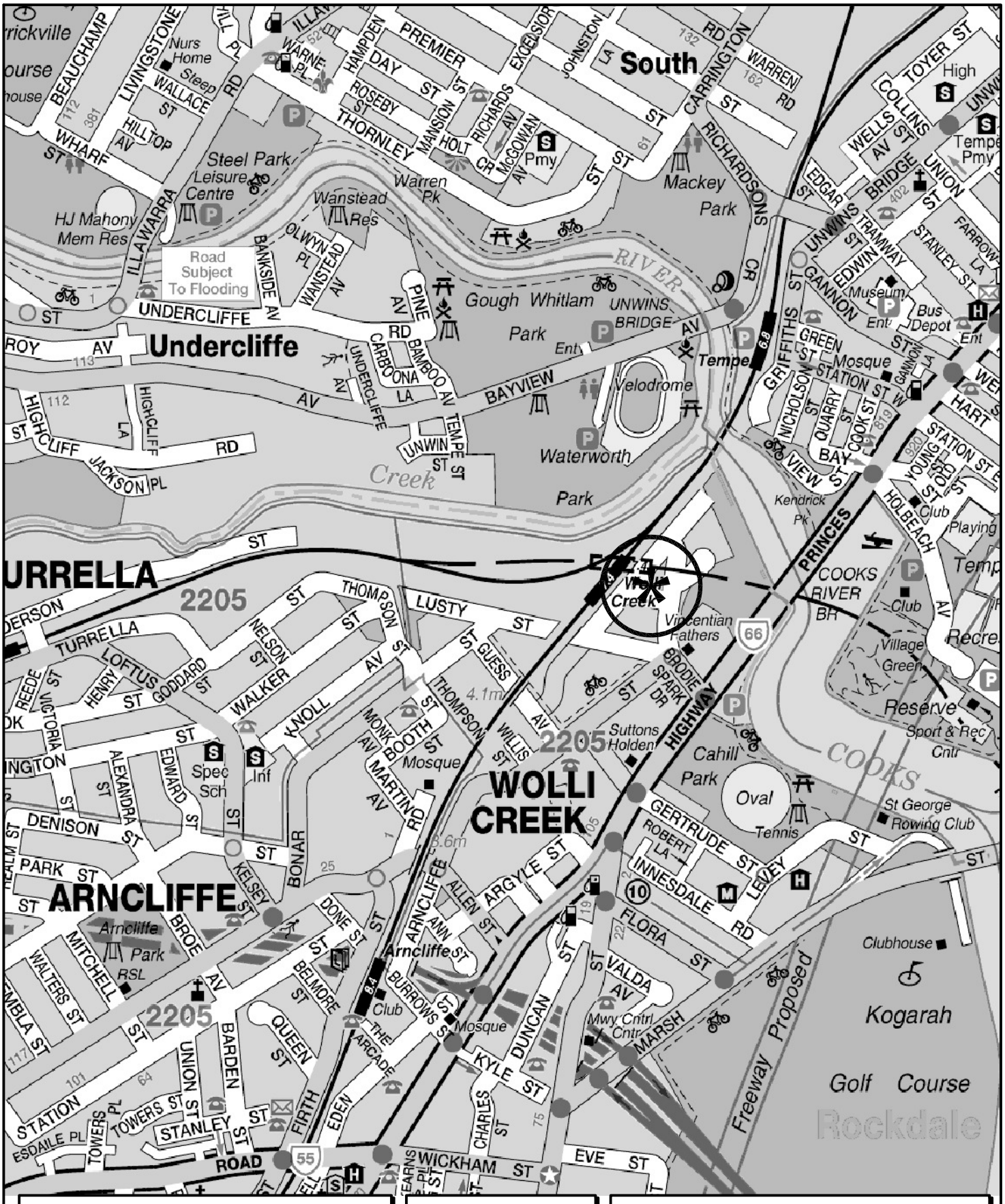
* describe the road network serving the site and the prevailing traffic conditions as well as the planned road network upgrade

* assess the potential traffic implications

* assess the appropriateness of the proposed parking provision

* assess the suitability of the proposed vehicle access, internal circulation and servicing arrangements

* assess the facilitation of bus services and the implications for non-car travel modes including the provisions during the construction process.



LEGEND

LOCATION

FIG 1

2. PROPOSED DEVELOPMENT SCHEME

2.1 SITE AND CONTEXT

The Discovery Point site (Figure 2) is bounded by Cooks River, Princes Highway, Brodie Spark Drive/Magdalene Terrace and the railway line and includes the historic Tempe House, St Magdalen's Chapel and the surrounding open space precinct (Discovery Point Park). The Wolli Creek Railway Station intrudes into the central part of the site as does the temporary access cul-de-sac for buses and emergency vehicles.

The lands to the east and west comprise parkland which extend along the banks of Cooks River and its Wolli Creek tributary while to the south there are some remnant industrial and automotive uses as well as new apartment buildings. The major Sydney Airport Precinct is located further to the east while the Arncliffe and Rockdale Centres are located further to the south.

2.2 EXISTING MASTERPLAN

The Discovery Point precinct is subject to a Masterplan Consent (DA 500/01), which has subsequently been modified under a number of s96 Applications. This Masterplan comprises:

* an envisaged total development outcome of:

Residential	some 1,200 units (subject to final mix)
Retail	14,000m^2 (RGFA)
Commercial	40,000m^2 (RGFA)

RGFA refers to gross floorarea calculated in accordance with Rockdale LEP 2000

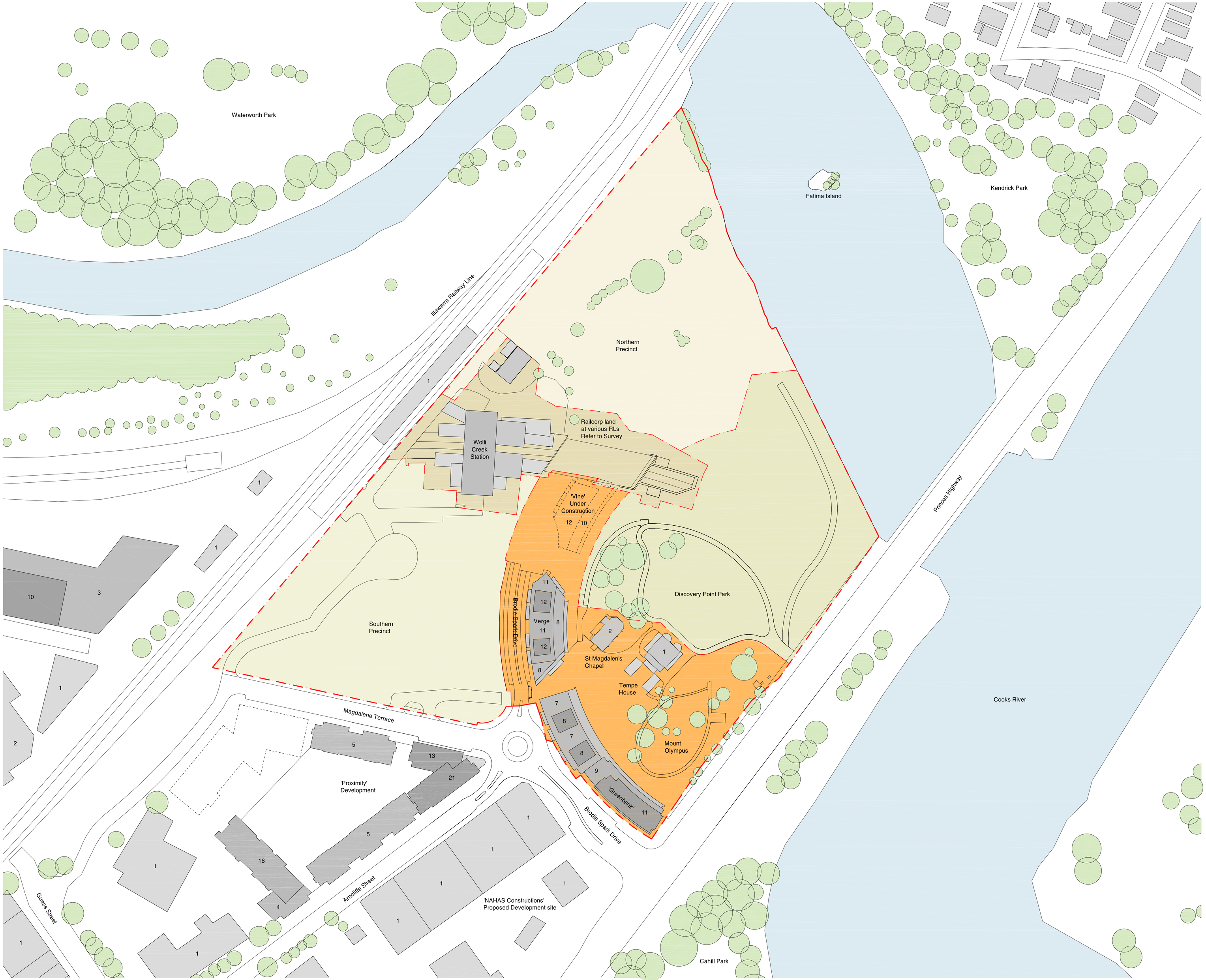
* an indicative parking provision of some 2,210 spaces split into nominated 'southern' and 'northern' carpark areas.

LEGEND

N

SITE

FIG 2



Check all dimensions and site conditions prior to commencement of any work, the purchase or ordering of any materials, fittings, plant, services or equipment and the preparation of shop drawings and/or the fabrication of any components.

Do not scale drawings - refer to figured dimensions only. Any discrepancies shall immediately be referred to the architect for clarification.

FOR APPROVAL

Key

- Developed Part of Discovery Point excluded from concept plan application
- Discovery Point Park
- Rail Corp Land
- Southern Precinct
- Northern Precinct

Revision	Date	Description	Initial	Checked
A	16.06.10	FOR APPROVAL	AV	MA

Discovery Point

Discovery Point, Wolli Creek Concept Plan

Location Plan

Scale	1:1000 @ A1, 1:2000 @ A3
Drawn	APW
Checked	MA
Project No.	S11191
Status	PLANNING
Plot Date	16/6/2010 9:44:33 AM
Plot File	S:\11100-11199\s11191_australand_wollicreek\00_main\cad\plot... ... s\DA\DA1-001.dwg
Drawing No.	DA1-001
[Revision]	A

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BATESSMART

The identified development sites and the envisaged staging for the Masterplan together with the Traffic/Access and Public Transport/On-Street Parking strategies are shown on the diagrams reproduced in Appendix B.

2.3 EXISTING CIRCUMSTANCES

A number of elements of the existing Masterplan have been completed or are currently being constructed. These include Buildings 1, 2 and 4 as well as sections of Brodie Spark Drive, Magdalene Terrace and basement areas as indicated on the plan overleaf.

These 3 buildings comprise:

	Site 1 'Greenbank'	**Site 2 'Verge'**	**Site 4 'Vine'**	**Total**
Apartments	135	88	88	311
Retail/commercial RGFA	1,133m^2	773m^2	-	1,906m^2
Parking spaces	147	92	104	343

The adjacent mixed use 'Proximity' development complex on the south-western corner of the Arncliffe Street/Magdalene Terrace intersection has been completed apart from the commercial office element.

The site (owned and to be developed by NAHAS) on the corner of the Princes Highway and Brodie Spark Drive has been declared a Part 3A project. A project application has been approved with Stage 1 comprising a supermarket and attached bottle shop with a permitted development 'lifetime' of up to 15 years. The Concept Plan application has yet to be lodged but the proposal is for intensified retail development below residential apartments.

2.4 PROPOSED CONCEPT PLAN

The Concept Plan seeks to replace the existing Masterplan for the remaining undeveloped portions of the site. It comprises the staged development of 14 sites

(exclusive of the 3 sites completed or in progress) together with completion of the access road, pedestrian/cyclist and public transport networks.

The Concept Plan includes the provision of above ground parking with a maximum of one level of basement parking to be provided with the exception of the existing excavated area at the southern end of the site. The proposed above ground parking levels are to be framed by active residential and retail uses along major street frontages.

The Concept Plan seeks approval for a total of 132,000m^2 SIGFA (excluding carparking areas) which is to comprise:

* residential floorspace maximum of 123,000m^2 which is anticipated to result in 1,200 to 1,500 residential apartments depending on final mix

* non-residential floorspace minimum of 9,000m^2.

The Concept Plan proposes the following dwelling mix across the whole site:

* maximum 50% studios and one-bedroom units
* minimum 40% two-bedroom units
* minimum 10% three+-bedroom units.

The Concept Plan proposes the following carparking rates:

* Residential
  - maximum 1.0 space per studio/one-bedroom unit
  - maximum 2.0 spaces per two and three+-bedroom unit
  - minimum 1 space per 20 apartments for visitors

* Non-Residential
  - minimum 1 space per 50m^2 commercial floorspace
  - minimum 1 space per 35m^2 retail floorspace.

Indicative floor plans have been prepared by Bates Smart to demonstrate compliance with SEPP 65. The indicative plans are based on one potential development option

for the site which could be accommodated within the proposed envelopes. The total number of dwellings to be developed on the site will depend on future mix and detailed design, however it is envisaged that between 1,200 and 1,500 apartments will be constructed. The indicative development scheme includes the following:

- 73 x studio apartments
- 660 x one-bedroom apartments
- 587 x two-bedroom apartments
- 147 x three-bedroom apartments

  Total 1,467 apartments
- 4,385m^2 retail
- 5,576m^2 commercial.

It is apparent that the total carparking spaces to be provided within the Concept Plan area will be dependent on the final mix and design of subsequent detailed project applications, however assessment of the overall traffic and parking implications for the Concept Plan is based on the indicative mix/number of apartments.

The Concept Plan proposes to rationalise the previously proposed road network as depicted on the existing Masterplan by:

- replacing the two-way north-south street (Mount Olympus Boulevard West) running between Magdalene Terrace and the northern corner of the site with a one-way road

- deleting the east-west street running between Brodie Spark Drive and Spark Lane.

The indicative future development scheme is provided on the architectural plans prepared by Bates Smart Architects (Appendix C).

3. ROAD NETWORK AND TRAFFIC CIRCUMSTANCES

3.1 ROAD NETWORK

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

- the *M5 East* Motorway which passes in tunnel beneath Arncliffe with portals located to the east of West Botany Street and an off-load ramp to the Princes Highway

- the *Princes Highway* arterial route which crosses Cooks River just to the east of Discovery Point

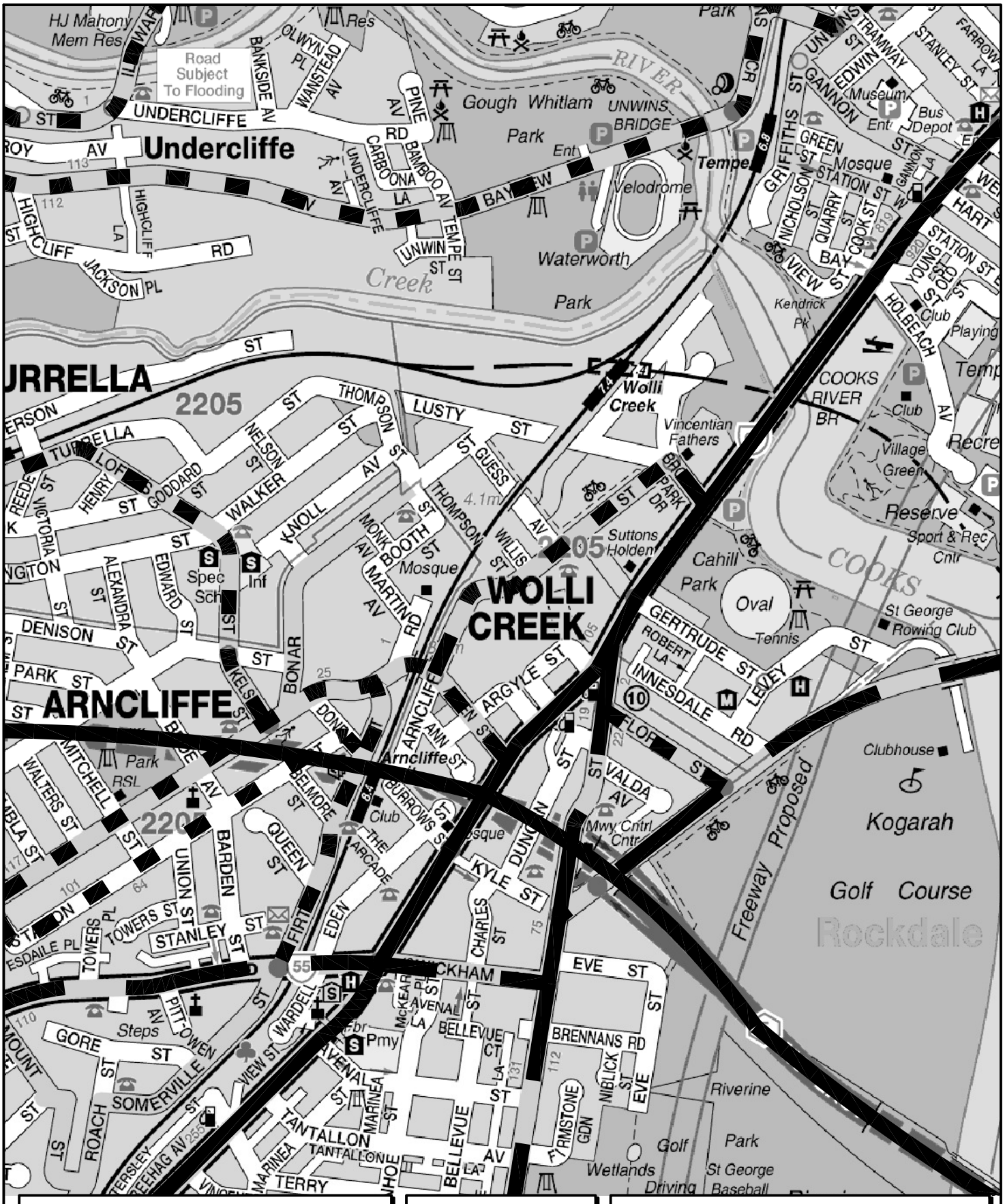
- the State Road and arterial route of *Forest Road, Wickham Street and Marsh Street*

- the Regional Road and sub-arterial route of *West Botany Street*

- the Regional Road and collector route of *Wollongong Road, Arncliffe Street and Brodie Spark Drive* between *Forest Road and Princes Highway*

- the minor collector road route linking through Turrella and connecting to *Wollongong Road via Brodie Spark Drive and Arncliffe Street.*

The access road system is constrained to some extent by the railway lines as well as the Cooks River and Wolli Creek systems.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Road Subject To Flooding
UNDERCLIFFE
Undercliffe
RIVER
Gough Whitlam Park
UNWINS BRIDGE
Tempe
Velodrome
Waterworth Park
Creek
HIGHCLIFF RD
JACKSON PL
BAYVIEW
UNWIN ST
TEMPE ST
BAMBOO AV
CARBOONA
PINE AV
WANSTEAD AV
BANKSIDE AV
OLWYN PL
Park
Ent
Res
Bus Depot
Museum
Mosque
STATION ST
GRIFFITHS ST
GREEN ST
NICHOLSON ST
QUARRY ST
COOK ST
BAY VIEW ST
HOLBEACH
Kendrick Pk
Club
Playing
COOKS RIVER
Club
Village Green
Reserve
Sport & Rec Cntr
Cahill Park
Oval
Tennis
St George Rowing Club
COOKS
Suttons Holden
Wolli Creek
Vincentian Fathers
PARK DR
BR
LUSTY ST
THOMPSON ST
GUESS ST
WILLIS ST
MONK BOOTH ST
MARTIN RD
KNOLL
WALKER
NELSON ST
GODDARD ST
HENRY ST
VICTORIA ST
REEDE ST
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EDWARD ST
DENISON ST
PARK ST
BONAR
KELS
ARGYLE ST
ARNCLIFFE
Arncliffe
GERTRUDE ST
ROBERT LA
INNESDALE RD
LEVEY
FLOR
VALDA AV
Mwy Cntrl Cntr
Clubhouse
Kogarah
Golf Course
Rockdale
Freeway Proposed
Park RSL
WALTERS ST
MITCHELL
BELMORE
BURROWS
Club
THE ARCADE
QUEEN ST
BARDEN
UNION ST
TOWERS ST
TOWERS PL
STANLEY ST
ESDAILE PL
EDEN
FIRT
KYLE ST
DUNC
CHARLES ST
EVE ST
BRENNANS RD
NIBLICK ST
Riverine
Golf Park
Wetlands
St George Baseball
Driving
McKEAR PL
AVENAL
BELLEVUE CT
BELLEVUE AV
MARINEA ST
TANTALLON
TANTALLON
TERRY
ARMSTONE GDN
WARDELL ST
VIEW ST
PITT-OWEN
Steps
GORE ST
SOMERVILLE ST
ROACH ST
MOUNT ST
Pmy
Fbr
LEGEND
ARTERIAL
SUB-ARTERIAL
COLLECTOR
N
ROAD NETWORK
FIG 3

3.2 TRAFFIC CONTROLS

The existing traffic controls which have been applied to the road system in the vicinity of the site (Figure 4) comprise:

* the traffic signals at the Princes Highway and Brodie Spark Drive intersection. Details of this intersection arrangement are provided in Appendix D

* the other traffic signals along the Highway at the Gertrude Street, West Botany Street, M5 Ramp, Burrows Street and Forest Road intersections

* the large roundabout at the Brodie Spark Drive/Arncliffe Street/Magdalene Terrace intersection

* the roundabouts at the Allen Street/Arncliffe Street and Wollongong Road/Firth Street intersections

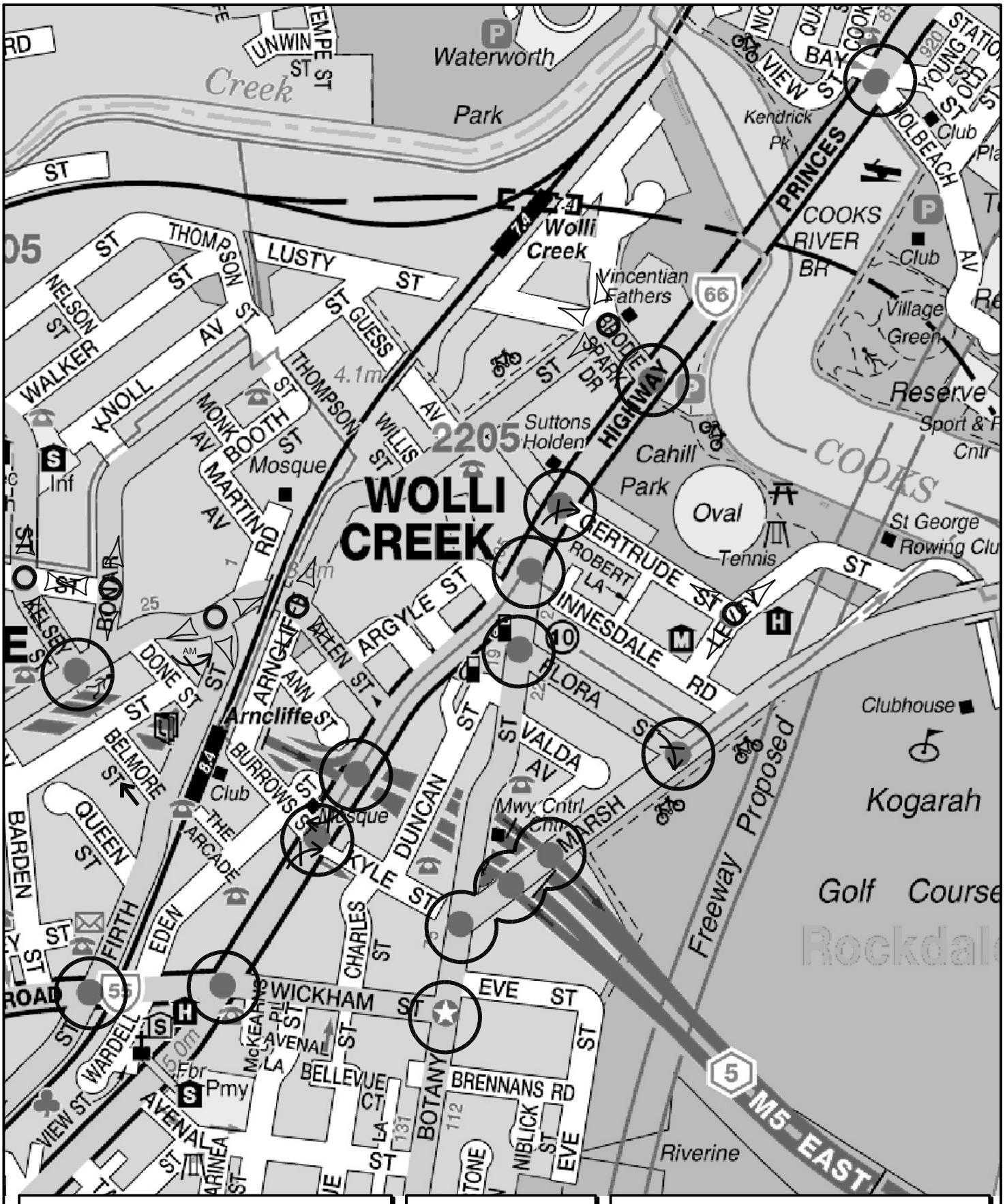
* the traffic signals at the Wollongong Road/Kelsey Street intersection

* the CLEARWAY and NO STOPPING restrictions along the Highway

* the NO STOPPING restrictions along Brodie Spark Drive

* the 60 kmph speed restriction on the Highway and 50 kmph restriction on the local and collector roads

* the central median islands along the Highway and Brodie Spark Drive.



LEGEND

- TRAFFIC SIGNAL CONTROL
- ROUNDABOUT
- RESTRICTED TURNING MOVEMENT

TRAFFIC CONTROLS

FIG 4

3.3 TRAFFIC CONDITIONS

An indication of the existing traffic conditions on the road system in the vicinity of the site is provided by data[1] published by the RTA and traffic surveys undertaken as part of this assessment.

The data provided by the RTA is expressed in terms of Annual Average Daily Traffic (AADT) and the latest recordings in the vicinity of the site are provided in the following:

	AADT
Princes Highway south of Allen Street	37,901
Forest Road west of Princes Highway	20,186
Wollongong Road east of Wolli Creek Road	7,535

Traffic surveys have been undertaken at intersections in the vicinity of the site during retail peak weekday afternoon and Saturday midday periods. The results of those surveys are provided in Appendix A and summarised in the following:

		AM	**PM**
Princes Highway	Northbound	4186	1,315
	Left-turn	56	214
	Southbound	1048	2,935
	Right-turn	89	556
Brodie Spark Drive	Right-turn	146	90
	Left-turn	509	163
Brodie Spark Drive	Westbound	31	208
	Right-turn	2	8
	Left-turn	107	523
	Southbound	-	2
	Right-turn	-	2
	Left-turn	6	2

[1] *Traffic Volumes for Sydney Region*
Roads and Traffic Authority of NSW

		AM	PM
Arncliffe Street	Northbound	4	2
	Right-turn	596	174
	Left-turn	17	19
Magdalene Terrace	Eastbound	205	67
	Right-turn	3	13
	Left-turn	1	1

The operational performance of these intersections under the prevailing peak traffic demands has been assessed using the SIDRA program. The results of that assessment indicating a satisfactory situation are provided in the following while criteria for interpretation of the modelling output is provided overleaf:

	AM			PM		
	LOS	**DS**	**AVD**	**LOS**	**DS**	**AVD**
Princes Highway/Brodie Spark	C	0.86	24.3	C	0.88	27.4
Brodie Spark/Arncliffe	A	0.35	9.2	A	0.20	6.8

3.4 TRANSPORT SERVICES

The area is well served by the public transport services (Appendix E) comprising:

* the Wolli Creek Railway Station which accesses the East Hills, Illawarra and New Southern rail lines

* the Arncliffe Railway Station on the Illawarra Line

* the State Transit Route 348 bus service which runs between Wolli Creek Railway Station and Bondi Junction with a 30 minute frequency between 7.00am and 7.00pm Monday - Friday

* the State Transit Route 471 bus service which runs along Wollongong Road, Bonar Street/Loftus Street and the Princes Highway connecting between Rockdale and Five Dock

* the State Transit Route 425 service which runs along the Highway connecting between Rockdale and Dulwich Hill via Sydenham.

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**[2] 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.

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[2] *the values of DS for intersections under traffic signal control are only valid for cycle length of 120 secs*

3.5 FUTURE CIRCUMSTANCES

The prescribed upgrading of the road network and traffic controls to suitably accommodate the ultimate redevelopment of WCRA are identified in the diagram overleaf and the schedule in Appendix D reproduced from DCP № 62 which applies to the broader Wolli Creek area (excluding Discovery Point).

A number of these elements, particularly the construction of Magdalene Terrace and part of Brodie Spark Drive, have already been completed however major elements which are unlikely to be achieved for many years (due to reliance on redevelopment of sites) include:

- construction of Gertrude Street between Princes Highway and Arncliffe Street
- construction of a new access road parallel to and between the Highway and Arncliffe Street
- widening of the Highway and Arncliffe Street.

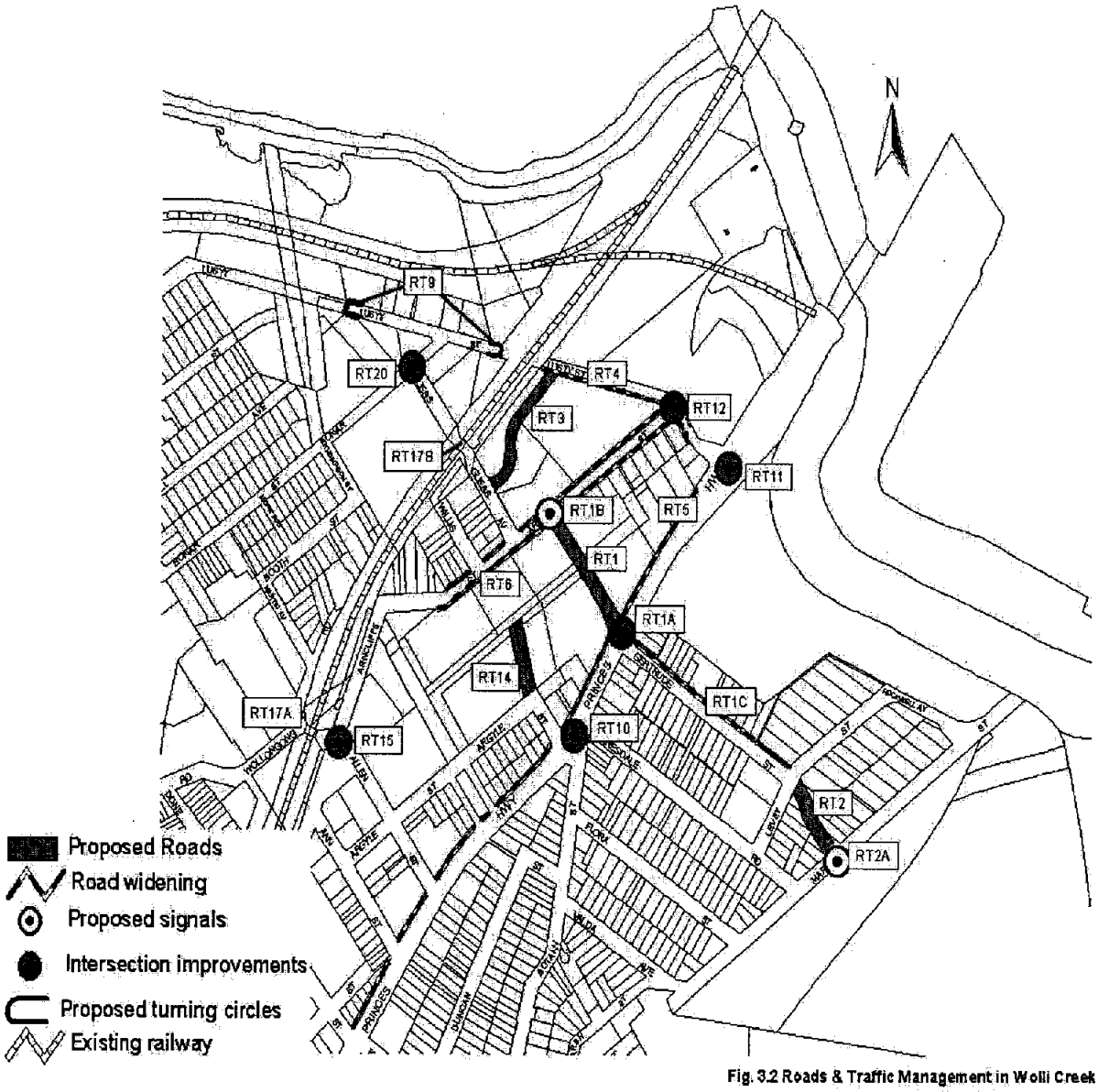


Fig. 3.2 Roads & Traffic Management in Wolli Creek

4. ROAD NETWORK AND VEHICLE ACCESS

Road Network

The proposed road network for the Concept Plan retains the peripheral road circuit of Brodie Spark Drive, Magdalene Terrace, Spark Lane and the two east-west streets (Discovery Point Place and Chisholm Street) connecting between Brodie Spark Drive and Spark Lane. The elements which have been deleted from the existing Masterplan are John Verge Place and the east-west connector (north of the railway) between Brodie Spark Drive and Spark Lane.

Deletion of these minor connector roadways enables an improved provision for 'vehicle free' pedestrian circulation without any detriment to vehicle access, capacity or servicing (including emergency services access).

Brodie Spark Drive retains the same general form although the central median island has been removed to enable the provision of bicycle lanes. The eastern part of Discovery Point Place has been narrowed to facilitate pedestrians crossing to/from the railway station.

Spark Lane will be restricted to a single lane width over the railway crossing but will have directional GIVE WAY control in the manner of a rural one lane bridge circumstance.

Indented kerbside parking will be provided along Brodie Spark Lane, Magdalene Terrace and Chisholm Street at the northern part of the site. Details of the proposed road network are provided in Appendix G.

Vehicle Access

Access for the integrated basement carpark areas will be located on Spark Lane. The accesses, including the use by service vehicles, will therefore avoid any conflict

with significant pedestrian or cyclist movements. The accesses will be located on sections of road which are straight and relatively level and appropriate sight distances will be available.

The proposed accesses will comply with the design criteria of AS 2890.1 and 2 and will accommodate all vehicles requiring access to the sites.

5. TRAFFIC

Previous planning processes incorporating development schemes for the Discovery Point site, including the current approved Masterplan, have been accompanied by various traffic generation assessments as follows:

	AM	PM
1998 (MWT) Medium scenario	2,305 vtph	2,585 vtph
2000 (Stapleton)	1,589 vtph	1,589 vtph
2004 (Project Planning)	1,450 vtph	1,910 vtph
2006 (TTPA)	1,400 vtph	1,680 vtph

The proposed Part 3A Application represents a significant change to the development outcome with:

- reduced retail and commercial floorspace and carparking
- increased residential apartments
- reduced parking provisions consistent with sustainable development outcomes.

The final development outcome for Discovery Point will be determined at the detailed design phase of subsequent Project Applications. For the purpose of providing an assessment of anticipated traffic generation for the Concept Plan the elements of the indicative floor plans have been adopted as follows:

	Existing/Under Construction	Estimated Concept Plan	Total
Apartments	311	1,467	1,778
Carparking	343	1,258	1,601
Commercial	636m^2	5,576m^2	6,876m^2
Carparking	8	112	120
Retail	1,270m^2	4,385m^2	5,655m^2
Carparking	26	125	151
Visitor carparking	4	73	77

The traffic generation of the estimated number of residential apartments can be established by application of the RTA Development Guideline criteria, although the outcome is likely to be less due to the proximity of the Railway Station and the constrained parking provision. The traffic generation of the retail and commercial floorspace will be derived from an assessed parking space turnover due to the constrained parking provision (as compared to the circumstances in the RTA Guidelines).

Thus, the projected total generation will comprise:

1,778 (311 + 1,467) apartments @ 0.29 vtph	516 vtph
NOTE: 233 apartments already occupied = 65 vtph	
120 (8 + 112)commercial parking spaces @ 0.34 vtph[3] per space	41 vtph
157 (26 + 125) retail/visitor spaces @ 2 vtph per space	302 vtph
44 on-street spaces @ 2 vtph per space	88 vtph
Kiss'n'ride, taxis, service etc (say)	50 vtph
Total	**997 vtph**

Actual traffic generation will be dependent on final mix and number of dwellings

Thus, it is apparent that the projected traffic generation under the proposed Concept outcome will be significantly less than that of the previous Masterplan traffic assessments. This projected outcome is only some 58 - 69% of that projected for the current approved Masterplan and therefore the implications for all of the access intersections are significantly better. It follows that the traffic generation outcome of the proposed Concept will not require any facilitating road/intersection upgrade works.

[3] *TTPA Research (see Appendix E)*

6. PARKING

Rockdale Council's Parking and Loading Code specifies the following provision for development in Rockdale LGA:

Residential Apartments	
Small/medium	1 space
Large	2 spaces
Visitor	None if commercial (public parking available)
Retail	1 space per 25m^2 GFA (35m^2 GFA Rockdale Centre)
	1 space per 50m^2 GFA local shops
Offices	1 space per 40m^2 GFA (60m^2 GFA Rockdale Centre)

This criteria relates to the whole LGA and does not have regard to the circumstances of close proximity to public transport services, retail and other facilities (apart from use allowances specified for Rockdale Town Centre).

NSW Government statutory bodies, including the Roads and Traffic Authority, Transport and Infrastructure and the Department of Planning, have contributed to plans to guide the development of cities and towns in NSW and the provision of their transport infrastructure. These publications include, amongst others, Action for Transport 2010, Integrated Transport Plan for Sydney, Shaping Our Cities, Integrating Landuse and Transport Planning Policy and Action for Air. In general, these plans aim to reduce traffic congestion, integrate landuse and transport planning, reduce the use of private cars and improve the efficiency of the public transport system.

Central to the planning mechanisms has been the principles of:

* locating higher density development in close proximity to public transport services, particularly Railway Stations

* constraining parking provision as a means to discourage reliance on travel by private motor vehicle and reduce traffic growth.

The latter principle is now embodied in the parking codes of numerous LGA's and the recommended minimum parking provision for High Density Residential Apartments in Sydney Metropolitan Centres as contained in the RTA Development Guidelines as follows:

	Regional Centres	**Sub-Regional Centres**
One-Bed	0.4 spaces	0.6 spaces
Two-bed	0.7 spaces	0.9 spaces
Three-bed	1.2 spaces	1.4 spaces

The proposed parking provision for residential apartments under the revised Concept Plan, which is considered to reflect a 'balanced' and 'flexible' outcome, is as follows:

	Average Across Completed Development		
		Minimum	**Maximum**
Studio/One-bed	-	0 space	1.0 space
Two-bed	-	1.0 space	2.0 spaces
Three-bed+	-	2.0 spaces	2.0 spaces

The Concept Plan proposes to provide 1 residential visitor space per 20 apartments (having regard to the excellent public transport services available) and these spaces will be available within the retail carpark and on-street provisions. The principle of constrained parking provision will be applied to worker parking (ie commercial floorspace) and the indicative 5,576m^2 GFA of commercial floorspace would have 112 spaces which equates to some 1 space per 50m^2.

The provision for retail parking will follow normal criteria for a town centre as the relatively small floorspace will not be an 'external attractor' providing largely for residents, workers and public transport passengers. The 4,385m^2 GFA of retail floorspace shown in the indicative design scheme would have 125 spaces which equates to some 1 space per 35m^2.

A calculation of parking provision for the Concept Plan indicative floor layout is provided in the following for both the minimum and maximum parking rates:

	Minimum Outcome		**Maximum**	
73 x studio apartments	@ 0	0 spaces	@ 1	73 spaces
660 x one-bedroom apartments	@ 0	0 spaces	@ 1.0	660 spaces
481 x two-bedroom apartments	@ 1.0	587 spaces	@ 2.0	1174 spaces
147 x three-bedroom apartments	@ 2.0	294 spaces	@ 2.0	294 spaces
Total		**881 spaces**		**2,201 spaces**
Commercial 5,576m^2	@ 1 per 50m^2	112 spaces	@ 1 per 50m^2	112 spaces
Retail 4,385m^2	@ 1 per 35m^2	125 spaces	@ 1 per 35m^2	125 spaces
Visitor	@ 1 per 20 apts	73 spaces	@ 1 per 20 apts	73 spaces
Total		**310 spaces**		**310 spaces**
		(including 44 on-street)		
Total		**1,191 spaces**		**2,511 spaces**

The ultimate provision for development will be dependent on detailed design in future Project Applications, however it should be noted that a 'maximum' parking outcome could not be fully realised. Furthermore, it is realistic to assume that greater than a 'minimum' parking outcome will be achieved as some one-bedroom apartments will have a car space and some two-bedroom apartments will have 2 car spaces.

The anticipated provision of parking shown in the indicative design scheme is significantly less than some 2,240 spaces envisaged under the existing Masterplan consent reflecting the reduced commercial/retail floorspace and the application of sustainable development parking principles. Under the indicative outcome scenario there would be a total of 125 parking spaces available for retail patrons as well as visitors to the park and heritable buildings. These parking spaces will be subject to 'period of stay' controls to ensure turnover/availability while the peaks of relevant demands will not coincide (ie residential visitors at night, shoppers and park visitors during daytime).

Should there be an outcome with greater retail floorspace then the number or retail parking spaces will increase accordingly. The circumstance is that the retail floorspace will not incorporate a large supermarket as this will be located nearby on the corner of Arncliffe Street and Brodie Spark Drive. The retail elements will therefore only serve localised demands and will involve very largely 'walk in' trade from residents/workers in the area and bus/train passengers passing through (ie without essentially any external attraction).

The indicative design scheme can be used to illustrate a likely scenario for parking provision on the site. The indicative plans include 1,524 car spaces, in addition to the 381 spaces already constructed/under construction.

7. PEDESTRIANS, CYCLISTS AND PUBLIC TRANSPORT

Pedestrians

The proposed development will make provision for pedestrians with:

- a 'vehicle free' pedestrian corridors connecting north-south to the station and east-west through the site to/from the park
- reduced road crossing widths at intersections and along Station Street adjacent to the bus/rail interchange
- numerous 'vehicle free' plaza areas
- continuous footways along the block frontages with numerous 'set back' widenings
- a high level of surveillance, lighting and urban design/landscaping
- minimal conflicts at vehicle accesses
- access integration with Discovery Point Park and the external pedestrian network.

Cyclists

The proposed development will make provision for cyclists with:

- the bicycle lanes along the riverbank and Brodie Spark Drive allowing for connection to shared footway facilities on the internal network
- basement bike parking for residents
- bicycle stands for staff and shoppers

- ‘end of trip’ facilities for staff

- allowance for connection to the external network including the Regional Cycle Route (Kurnell to Homebush Bay) pending future bridge connections by others.

Public Transport

The proposed development will make provision for public transport services with:

- provision to satisfactorily maintain access, standing and interchange for bus services during the staged construction process as indicated on the diagram overleaf

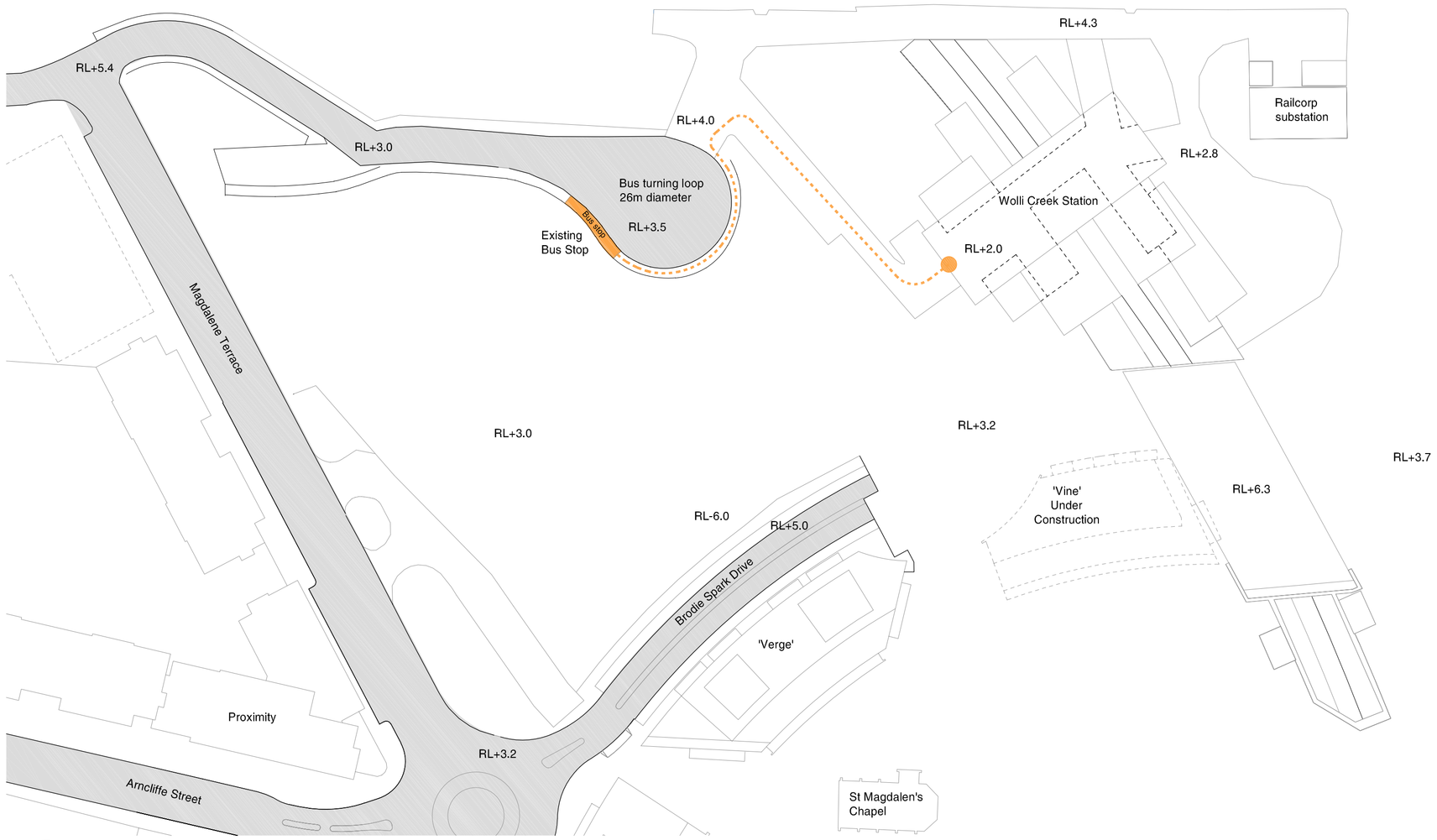
- provision for taxi to stand and for ‘kiss’n’ride’ vehicles to stand

- provision for buses to suitably access via Magdalene Terrace, Spark Lane and Discovery Point Place and depart via Brodie Spark Drive with the completed development as indicated on the turning paths provided in Appendix H

- provision of appropriate segregated standing (2 spaces) on Discovery Point Place adjacent to the Discovery Point Place entrance including appropriate shelter, lighting and other facilities with the completed development

- provision of footways and internal links to facilitate travel to/from the convenient bus and rail services

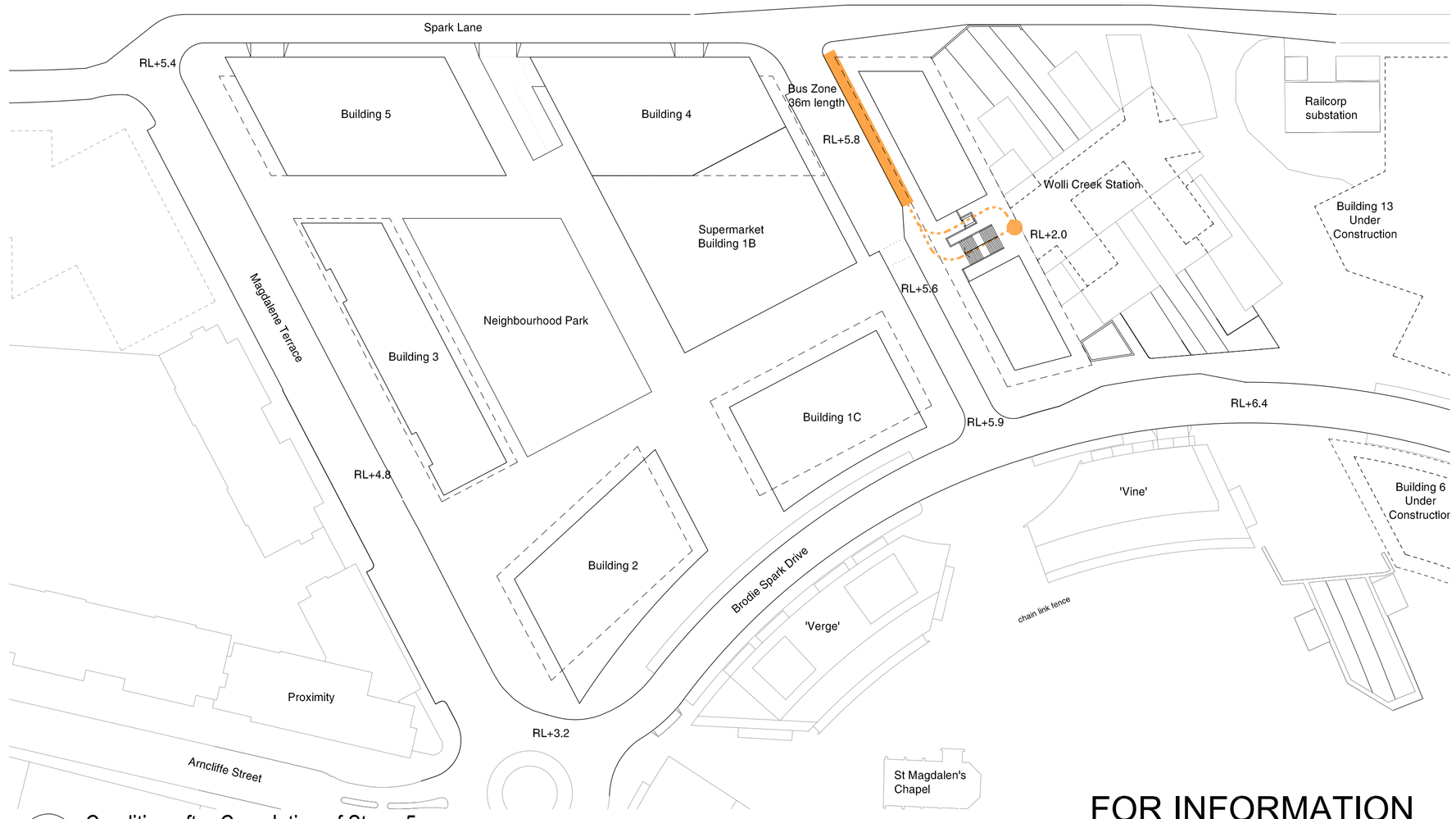
- reducing the need for nearby residents to travel by car in order to shop for essential needs (ie residents will be more inclined to travel to/from work by public transport when they are not reliant on car travel in order to shop as part of the work trips).



1 DA7-003 **Existing Condition**
PLAN 1:750

2 DA7-003 **Stages 1 to 3**
PLAN 1:750

3 DA7-003 **Stages 4 and 5**
PLAN 1:750



4 DA7-003 **Condition after Completion of Stage 5**
PLAN 1:750

FOR INFORMATION
NOT FOR APPROVAL

Discovery Point

Key:
- Road
- New building
- Bus Zone
- Pedestrian Route from Bus Stop to Station
- Station Entry

Revision	Date	Description	Initial	Checked
A	16.06.10	FOR INFORMATION ONLY	APW	MA

Discovery Point, Wolli Creek
Concept Plan
Bus Access Staging Diagrams

Scale	1:750
Drawn	AW
Checked	MA
Project No.	S11191
Status	PLANNING
Plot Date	16/6/2010 9:45:15 AM
Plot File	S:\11100-11199\s11191_australand_wollicreek\00_main\cad\plot ... ...s\DA\DA7-003.dwg
Drawing No.	DA7-003
Revision	A

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BATESSMART

8. SERVICING

The Concept Plan indicative design scheme anticipates loading for the supermarket will occur in a dedicated loading dock to be provided adjacent to the proposed supermarket with access on Spark Lane while on-street LOADING ZONES will be available for speciality retail uses.

Details of the proposed provisions for service vehicles will be provided in subsequent Project Applications while indicative turning path assessments are provided in Appendix H.

Irrespective, the proposed provision for service vehicles has been assessed in preparing the building envelopes and road layouts for the Concept Plan will be quite suitable and appropriate.

9. RELEVANT EPI'S, POLICIES AND GUIDELINES AND AUTHORITY'S ISSUES

This section of the report addresses relevant environmental planning instruments, policies and guidelines and Authority issues in accordance with the DGR's.

We understand that the Minister for Planning is not bound by the provision of an environmental planning instrument, other than a State Environmental Planning Policy in determining an application for a major project (Section 75R(3). In the giving of approval for a Concept Plan the Minister may take into account (but is not required to) the provisions of any environmental planning instrument that would apply but for the application of Section 75R.

∗ **Metropolitan Transport Plan 2010 (February 2010)**

Planning Objectives	Strategies	Compliance
- Effectively link Sydney's landuse planning with its transport network - Create a working, connected sustainable City - Improve quality of life boost the economy and help face future challenges - Integrate with the Metropolitan Strategy providing an effective framework for housing and employment growth and development in Metropolitan Sydney	- Provide 70% of new housing in established areas - Diversity with a variety of renewed neighbourhoods - Ample transport connections - Contain congestion - Concentrate development and supporting transport services in centres - Make better use of existing infrastructure	✓ ✓ ✓ ✓ ✓

∗ Integrating Landuse and Transport Policy Package (August 2001)

Planning Objectives	Strategies	Compliance
- Reducing the growth of VKT	- Concentrate centres	✓
- Improving air quality and reducing green house emissions	- Mix uses in centres	✓
	- Align centres with corridors	✓
- Building more compact cities	- Link public transport with landuse	✓
- Promoting economic development and creating jobs	- Connect streets	✓
- Focus on the movement or people and good rather than vehicles	- Improve pedestrian access	✓
	- Improve cycle access	✓
- Focus on maximising accessibility	- Manage parking supply	✓
	- Improve road management	✓
	- Good urban design	✓

* Planning Guidelines for Walking and Cycling (December 2004)

Planning Objectives	Strategies	Compliance
- The Walking and Cycling City - Accessible centres	- Improve walkability and cycleability across the City	✓
- Walking and cycling catchments - Regional walking and cycling networks	- Emphasise urban redevelopment and renewal over urban expansion	✓
- Mixed use neighbourhoods - Local walking and cycling networks - Security and safety	- Create accessible centres by increasing density and landuse mix	✓
- Parks and open space - Building and site design	- Ensure walking and cycling and use of public transport is more direct and convenient than use of cars	✓
	- Create quality public spaces	✓
	- Provide bicycle parking at public transport stops	✓
	- Locate centres near passenger transport stops	✓
	- Integrate local walking and cycling networks into neighbourhood scale designs	✓
	- Encourage active uses at street level	✓
	- Minimise the number of driveways crossing footpaths	✓
	- Design intersections to be visibly and physically tight to slow traffic and reduce pedestrian crossing distances	

- Nature and extent of any non-compliance with relevant environmental planning instruments, plans and guidelines.

Planning Instrument	Justification
∗ DCP № 45 'Railway Precinct' Street pattern as shown on Fig 4.1 Roads designed as per Fig 4.2 Carparking will comprise 2,210 spaces 12 parking spaces should be provided for tradespeople Bicycle routes Brodie Spark cross section Mount Olympus cross section Spark Lane cross section	The current local planning instruments applicable to the site primarily reflect the intent of the approved Discovery Point Masterplan (D500/01). The proposed Concept Plan will replace the existing Masterplan as it relates to the remaining development area of the site. Consequently the proposal will differ in part from the road network, parking and other traffic aspects of the DCP. The proposal however retains some of the general design principles and objectives contained within these plans such as the hierarchy of streets, bicycle permeability, etc.
∗ Parking and Loading Code Small/medium dwelling 1 space Large dwelling 2 spaces Visitor 1 space per 4 dwellings (no visitor parking required if commercial component of on-site parking available for visitors after hours) Retail 1 space per 25m^2 Offices 1 space per 40m^2	The parking criteria in the Parking and Loading Code applies throughout the LGA while the site is located with exceptional access to public transport services and retail facilities. The proposed 'maximum' limit for parking for apartments is compliant however the minimum outcome is that studio and one-bedroom apartments would have a lower rate of provision commensurate with the locational circumstances. The residential visitor parking provision is compliant as a consequence of the availability of the retail and on-street space 'after hours'. The retail parking provision would be less than the overall LGA criteria but equates to the comparable Rockdale Centre criteria of 1 space per 35m^2 GFA. The commercial parking provision would be less than the overall LGA criteria but is more than the comparable Rockdale Centre criteria (ie 1 space per 50m^2 GFA versus 1 space per 60m^2 GFA)

∗ Authority's Issues

Roads and Traffic Authority (letter of 12.3.10)

- Compliance with Government Strategies

  The Concept Plan is compliant with government strategies as detailed in the foregoing. In particular by co-locating urban development with existing transport services and encouraging walking, cycling and use of public transport.

- Traffic Impact and Need for Road Improvements

  The projected traffic generation of development under the Concept Schemes will be significantly less than development under the existing approved Masterplan and its associated infrastructure works. It is apparent therefore that there is no need for accommodating road upgrade works on the external access road system.

- Design Compliance of Accesses and Parking to Relevant Australian Standards

  Whilst this is a Concept Plan the design of access and parking elements will be compliant with the relevant standards with greater detail provided in the subsequent Project Applications.

- Quantum of Carparking

  The proposed carparking provision will be compliant with the requirement of sustainable development which minimises reliance on private motor vehicle travel and generally compliant with appropriate codes.

- Details of Service Vehicle Movements

  Whilst this is a Concept Plan it is apparent that service vehicle movements will be significantly less than development under the existing approved Masterplan. Any additional requirement for Travel Plans etc would be subject to Consent Conditions in relation to subsequent Project Applications.

- Traffic Management Plan for Construction
  Note as a requirement for subsequent Project Applications.

* Sydney Buses

- Potential Traffic Impact on the Road Network
  The traffic impact will be somewhat less than that of development under the existing approved Masterplan.

- Ability for Buses to Use the Road Network
  Demonstrated in the assessment.

- Improve the Existing Road Network
  The existing arrangements for buses are only temporary. The median island on Brodie Sparks Drive will be removed and the circulation and standing of buses will be facilitated under the Concept Plan.

- Impact of Development Staging
  Addressed in the assessment and will be satisfactory.

- Bus Terminus Location
  There will be one terminus location adjacent to the station entrance with a simple one-way clockwise bus circulation for approach and departure.

- Accommodate Future Growth
  The proposed terminus complies with the DCP requirement for 2 standing spaces.

- Construction Traffic Management Plan
  A matter for subsequent Project Applications.

∗ Transport and Infrastructure

- Policies, Planning Instruments and Development Guidelines
  Addressed in the foregoing.

- Transport and Accessibility Impact
  Addressed in the assessment with a reduced level of traffic generation by the nature/quantum of the uses and the constraint on parking provision.

  More than adequate capacity is available on the existing rail and bus services and the Concept Plan is entirely consistent with the NSW State Plan.

- Access to Bus Services along Princes Highway
  There are no bus services along the highway persé as the bus service enters the site from the highway interchanges at the Railway Station and departs back to the highway. Hence it is entirely accessible.

- Provisions for Bicycles
  Connections are/will be available to the surrounding bicycle network while storage/facilities for cyclists will be the subject of subsequent Project Applications.

- Reduced Parking Provision
  The proposed parking provision reflects contemporary planning principles and the high public transport accessibility.

10. CONCLUSION

The assessment concludes that development under the Concept Scheme will:

- comply with Rockdale Council's objectives of a 50% mode split to other transport modes for work related trips and preclude commuter parking

- comply with the objective to provide a new road link to facilitate access and circulation

- comply with the objective of providing sufficient parking to adequately service the development while at the same time managing the supply of parking to discourage excessive private car usage

- comply with the objective of providing for and facilitating pedestrian and cyclist movements and end of trip facilities

- not have any adverse traffic implications and will in fact have a traffic generation outcome which is significantly less than that with development under the existing Masterplan

- have suitable and appropriate vehicle access, internal circulation and servicing arrangements for the term of the development

- provide vehicle free pedestrian corridors which were not available under the existing Masterplan.