PROPOSED SUBDIVISION & RESIDENTIAL DEVELOPMENT SECTOR 5 (NOS. 4 & 8 FOREST ROAD) WARRIEWOOD VALLEY

Traffic and Parking Impact Assessment

10th March 2005

Reference 5008

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TABLE OF CONTENTS

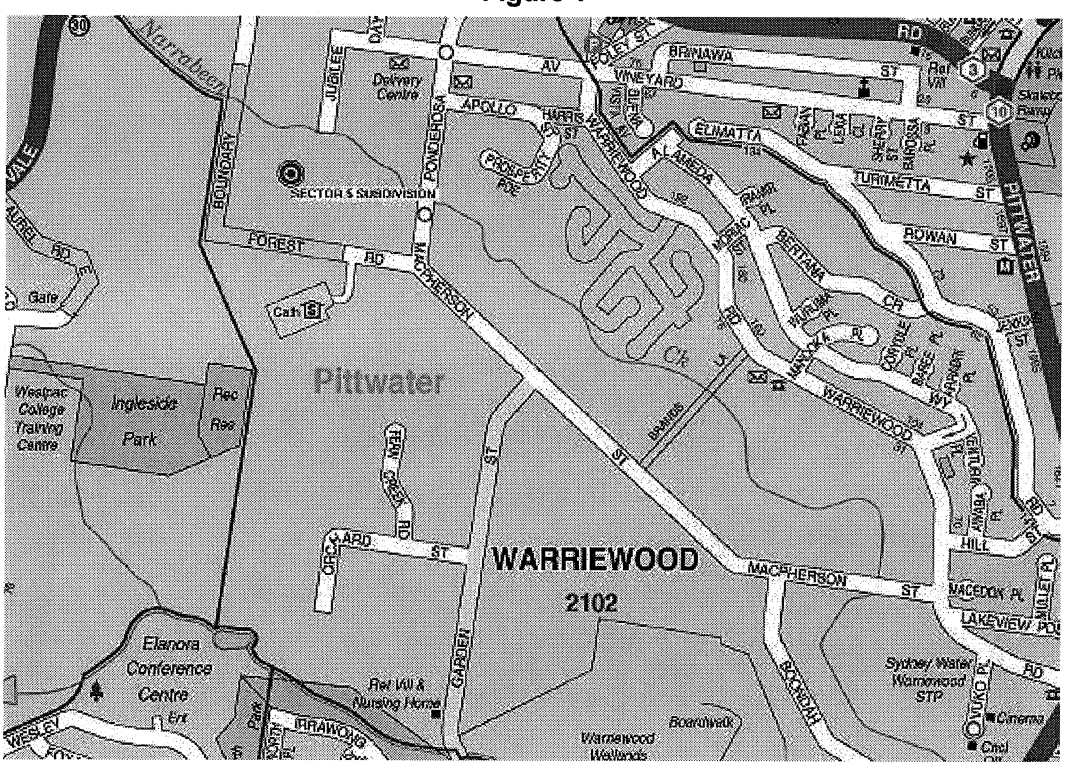
LIST OF ILLUSTRATIONS

1. INTRODUCTION

This Traffic Impact Assessment Report has been prepared, under instruction from Jubilee Developments Pty Ltd for submission to Pittwater Council and assesses the implications of a proposed residential development in Sector 5 of Warriewood Valley. The development site comprises two relatively large parcels of land yielding a total of 74 townhouses. The subdivision is to have primary vehicular access to the western cul de sac end of Forest Road with a minor secondary connection to the southern end of Jubilee Avenue (Figure 1).

Development Site

Figure 1



The format of this report has been structured to provide a concise and fully detailed assessment against relevant heads of consideration and standards. These include *Pittwater 21 DCP*, the Roads and Traffic Authority's *Guide to Traffic Generating Developments* and Australian Standards for *Car parking AS/NZS2890.1-2004 and Commercial Vehicles AS2890.2-2002.*

2. LOCATION AND DESCRIPTION OF DEVELOPMENT

The subdivision is proposed in Sector 5 of Warriewood Valley and is to contain 74 townhouses of various styles with retention of the existing dwelling up graded to contemporary standards. There are to be 54 dwellings on No. 8 Forest Road, Property Number 29823, Lot 1 DP 5055 and 20 dwellings on No. 4 Forest Road, Property Number 29825, Lot B DP 370222. Lot 1 has an area of 5.6ha; Lot B has an area of 0.9638ha, which will yield a combined area of 6.5638ha for residential development.

The subdivision is to have primary vehicular access to the western cul de sac end of Forest Road with a minor secondary connection to the southern end of Jubilee Avenue.

The relationship of Sector 5 with the other Warriewood Valley Release Areas is shown on the map (Figure 2) overleaf.

The proposed development is within easy walking distance to Mater Maria School and a wide range of businesses offering employment opportunities. Warriewood Square Shopping Centre is located about 2.8kms to the south and a variety of recreational facilities are distributed through the locality.

At completion the development will comprise:

Residential:	74 x 3 or 4 bedroom townhouses in addition to the existing dwelling located on No. 8 Forest Road.
Parking provision:	Each dwelling will have either two garage parking spaces or one garage space. Visitor parking will be catered for either on the garage aprons or at the kerb side, which are typical arrangements for low to medium density residential precincts.
TOTAL	**148 parking spaces**

The proposed internal road system involves the rational use of 'one way' and 'two way' traffic flows as detailed below that also satisfy garbage collection requirements:

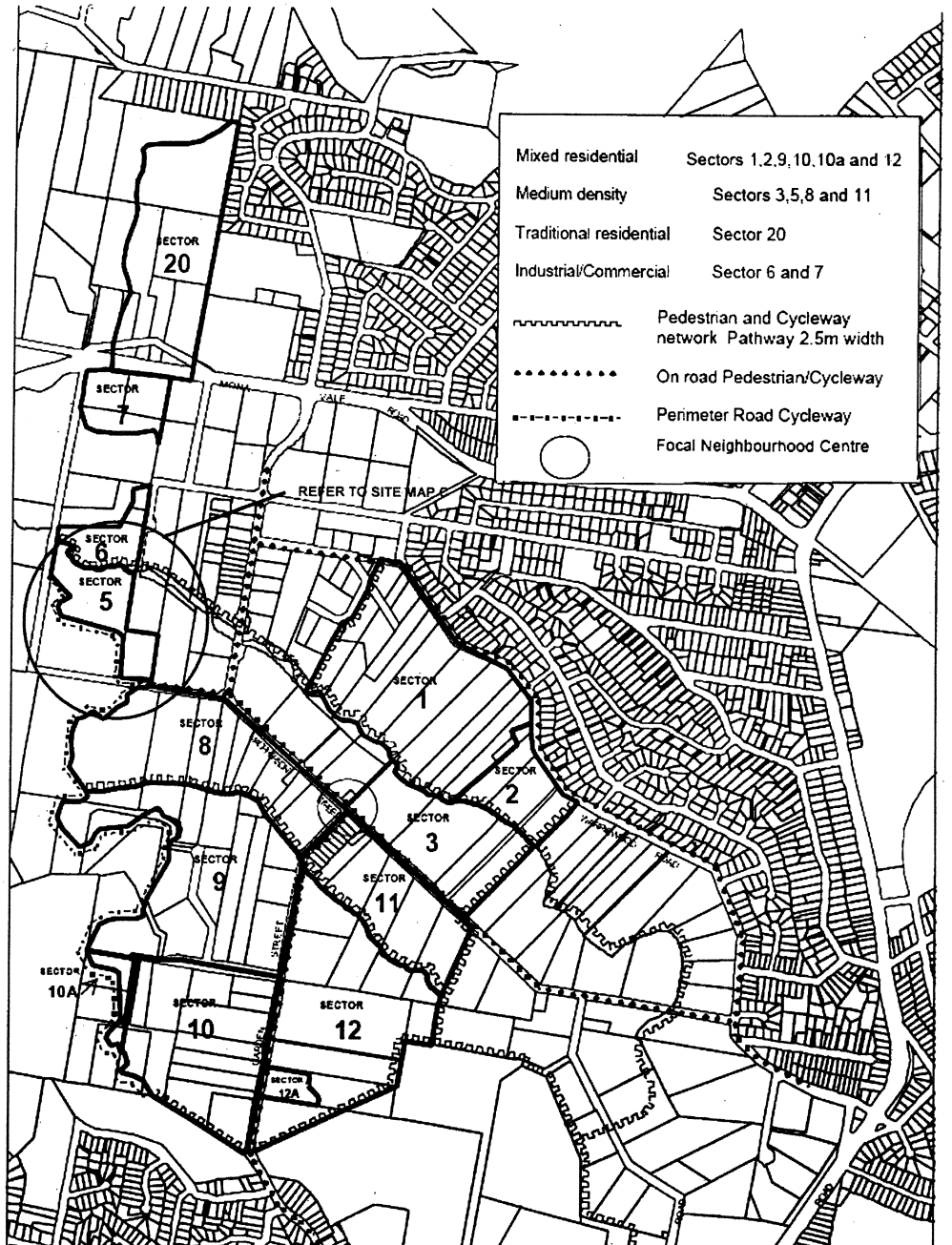
- the 6m wide main spine road linking from Forest Road to Jubilee Avenue will be a two-way road. It should be noted that Jubilee Avenue at this point is constructed as a driveway; this feature with the other LATM treatment will discourage traffic usage.

- the 4m wide road adjacent to the southern and western boundaries will carry traffic in an anti-clockwise one-way direction from the main spine road through the mini roundabout and then linking back to the main spine road near dwelling 1a.

- the 4m and variable width road from the mini roundabout passing 17a – 21b is also to carry one way traffic in a west to east direction

- the 4m and variable width road adjacent to the eastern boundary will carry traffic in a south to north direction passing dwellings 28a to 22b

The proposal is fully detailed in plans prepared by Denis Leech & Associates Pty Ltd Architects, presented with the Development Application.



SITE MAP: LAND RELEASE AREA

18th JANUARY 2005. NOT TO SCALE

SOURCE; PITTWATER COUNCIL

Figure 2

3. REFERRAL REQUIREMENTS

Having regard to the scale and location of the development there is no requirement under Schedule 2 item (a) of SEPP11-Traffic Generating Developments, to consult with the Council Development Committee (Traffic Committee). This assessment is based on the development yield, which falls between below the 75 and 300 dwelling unit thresholds for referral to the Development Committee and the Sydney Regional Development Advisory Committee (RTA) respectively.

It is acknowledged that the number of additional dwellings, being 74, is only marginally below the threshold, however the overall planning and traffic implications of the Warriewood Valley Land Release were thoroughly assessed during the rezoning phase.

Further, the proposal is not 'Integrated Development' in regard to traffic matters as work is not proposed or required on Windsor Road, a 'state' road as a consequence of this development proposal.

4. ROAD AND TRAFFIC CONDITIONS

In common with all infrastructure requirements in the Warriewood Valley Land Release Area, traffic and transport has been thoroughly planned to meet the needs of the future residential population and workforce.

The overarching traffic planning is shown diagrammatically on the 'Traffic & Transport Works Schedule' in the Section 94 Plan for the area, which is reproduced overleaf as Figure 3 of this report. By reference to 'Summaries of Work Items and Land Acquisitions' in the Section 94 Plan the following works are to be undertaken which will improve access and safety for the Sector 5 area:

- Daydream Street / Mona Vale Road – closure and cul de sac (completed)
- Mona Vale Road / Ponderosa Parade – traffic signals to replace roundabout
- Narrabeen Creek- bridge at junction of Ponderosa parade and MacPherson Street
- Various road widening proposals with line marking and traffic facilities
- Local area Traffic Management (LATM) facilities at various locations to calm traffic flows
- Ponderosa Parade – roundabout north of Narrabeen Creek
- MacPherson Street / Forest Road – roundabout
- MacPherson Street / Garden street – roundabout
- Various local and major road and intersection improvements and up grading for efficiency and safety purposes

Funding for the identified infrastructure up grading has and will be contributed to by the respective land releases in an equitable manner as prescribed in the Warriewood Valley Section 94 Plan. Sector 5 will contribute to these works in accordance with these provisions.

Reference has been made to traffic studies prepared for Pittwater Council by Urban Research and Planning, and Jamieson Foley & Associates Pty Ltd. These studies set

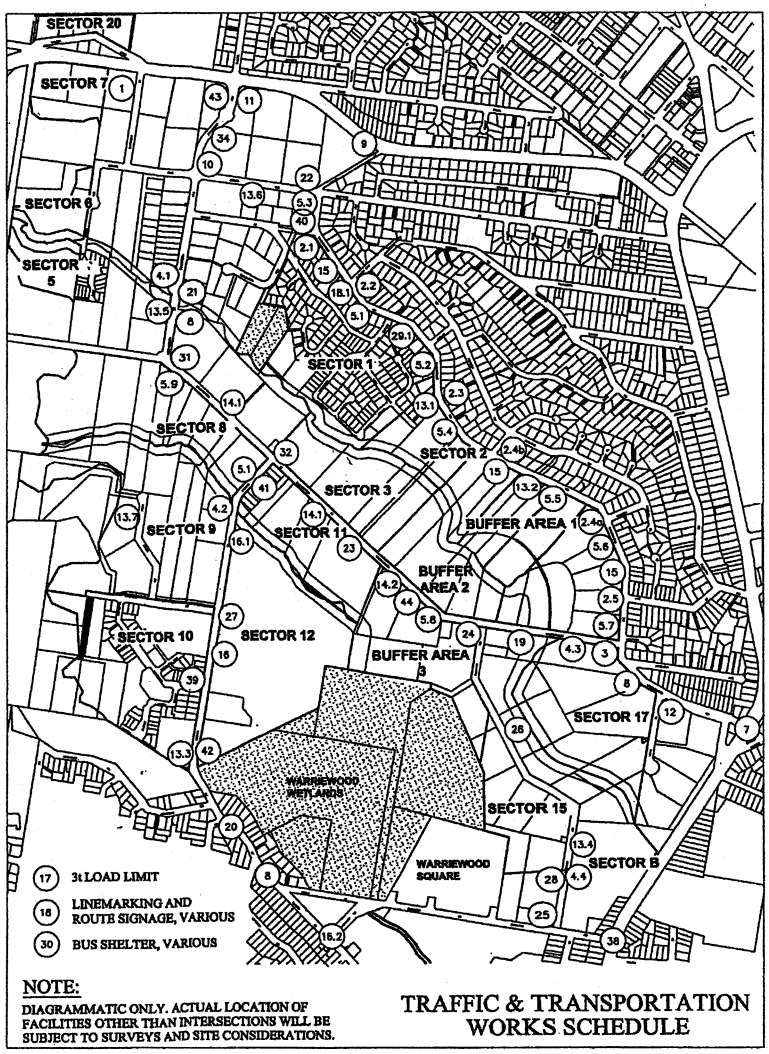

SECTOR 20
SECTOR 7
SECTOR 6
SECTOR 5
SECTOR 1
SECTOR 2
SECTOR 3
SECTOR 8
SECTOR 9
SECTOR 11
SECTOR 10
SECTOR 12
BUFFER AREA 1
BUFFER AREA 2
BUFFER AREA 3
SECTOR 17
SECTOR 15
SECTOR B
WARRIEWOOD WETLANDS
WARRIEWOOD SQUARE
17 3t LOAD LIMIT
18 LINEMARKING AND ROUTE SIGNAGE, VARIOUS
30 BUS SHELTER, VARIOUS
NOTE:
DIAGRAMMATIC ONLY. ACTUAL LOCATION OF FACILITIES OTHER THAN INTERSECTIONS WILL BE SUBJECT TO SURVEYS AND SITE CONSIDERATIONS.
TRAFFIC & TRANSPORTATION WORKS SCHEDULE

FIGURE 5.2

the traffic-planning framework for the road network serving the Warriewood Valley Release Area. Traffic surveys of all major roads were collected and then transport modelling undertaken to predict future traffic loading in terms of average daily traffic. Resulting volumes for roads relevant to this assessment are repeated below. The report also assessed the need for closure of Ponderosa Parade at Narrabeen Creek, and as that option is not to proceed figures relating to that option are not included.

LOCATION	ADT	
	Existing	Future
Daydream Street	3629	2660
Jubilee Avenue between Daydream St & Foley Rd	5000	13480
Ponderosa Parade – Jubilee St and Apollo St	6726	14380
MacPherson Street west of Garden Street	7169	14960
Garden Street south of MacPherson Street	6289	9940

6. AVAILABILITY OF PUBLIC TRANSPORT

The frequency of existing Bus services operated by Sydney Buses and school services provided by private operators i.e. Forest Coach Lines etc are planned to be increased commensurate with the population expansion. Improved facilities for the service providers and passengers have been included in road and transport planning for the release area.

These bus services are operating along Ponderosa Parade and MacPherson Street within a walking distance of approximately 400m, which slightly exceeds the recommended service delivery requirements for regular weekday public transport.

In this regard the site has reasonable access to public transport and generally meets the objectives of Draft State Environmental Planning Policy No. 66 'Integration of Land Use and Transport'. This SEPP seeks to:

- locate development to improve accessibility to housing, employment and services by walking, cycling and public transport,
- to improve the choice of transport and reduce dependence solely on cars for travel purposes,
- moderate growth in the demand for travel and the distances travelled, especially by car,
- support the efficient and viable operation of public transport services and
- provide for the efficient movement of freight.

7. PARKING PROVISION

Pittwater DCP 21 has the following recommended parking provisions for 'Multi Unit Housing' (3 or more dwellings):

1 space per 1 bedroom unit/townhouse/villa
2 spaces per 2 or 3 bedroom dwelling
1-visitor space per 3 dwellings rounded up

The total number of parking spaces required and proposed is tabulated hereunder.

Land Use	Required	Provided
TOWNHOUSE DWELLING UNITS 74 x 3 or 4 bedrooms @ 2 spaces/ dwelling	**148**	**148**
VISITORS 74 Units @ 1 per 3 units	**25**	**Kerb side and garage apron parking exceeds requirements**
TOTAL	**173**	**> 173**

It will be noted that the proposed parking provision satisfies Council's 'un-constrained' parking requirements for both residents and visitors.

8. PARKING LAYOUT

The parking module utilised in the development involves:

- double garages (house types 1 and 2) 5.65 wide x 5.6m long clear of obstructions

  or

- single garages (house type 3) 3.m wide x 5.5m long with the additional space located on the garage apron

All primary access aisles have been examined with the B99 'reverse-in manoeuvre car templates' for the B85 and B99 cars and will be satisfactory for the proposed residential use.

It is concluded that the parking layout meets Council's requirements and exceeds the minimum requirements set out in the Australian Standard for *Off-street Parking AS/NZS2890.1-2004*.

9. TRAFFIC GENERATION AND IMPACTS

The Roads and Traffic Authority development guidelines[1] specify peak hour and daily traffic generation rates for 3 or 4 bedroom townhouses to be in the order of 0.65vph and 6.5vpd respectively. However due to the location of the subdivision traffic generation rates for free standing dwellings of 0.85vtph and 9vtpd have been adopted to achieve a robust assessment of impacts.

Peak hour traffic flows have been assigned to the road system based on 80/20 bias to the peak direction (ie 80% exiting and entering in the morning and evening respectively). Further, having regard to the design of the primary access via Forest Road and secondary access via Jubilee Avenue which is constrained by the current 'private access' design that is to be reinforced by the road design of this development a 90/10 traffic split has been applied. The anticipated directional traffic flows from the development site would be in the order of:

Access via Forest Road

Peak Period	Entry	Exit
Morning peak hour	11	45
Afternoon peak hour	45	11

Access via Jubilee Avenue

Peak Period	Entry	Exit
Morning peak hour	1	5
Afternoon peak hour	5	1

It is concluded that the traffic generation from the proposed development will result in an increase in flows of about 56vph and 6vph to Forest road and Jubilee Avenue

1 *Guide to Traffic Generating Development*
Section 3 Landuse Traffic Generation
Roads and Traffic Authority December 2002

respectively. This equates to an average of about 1 additional vehicle per minute and per 10 minutes during the peak hour to Forest Road and Jubilee Avenue respectively.

Council rezoned the subject land to permit the form of development proposed in this application and was aware that redevelopment would result in a modest increase in traffic levels on the 'local' road system.

Traffic flows in Forest Road were not recorded in the referenced studies conducted for traffic planning as generally traffic loading is very light except during the periods prior to and following school hours due to traffic generated by Mater Maria School. These peak periods are concentrated in 30-minute periods with the afternoon period between 3.00pm and 3.30pm representing the peak period for the day. The 30-minute figures were doubled for modelling purposes as if peak conditions were maintained over an hour.

The operation of the intersection of MacPherson Street and Forest Road was then assessed with the INTANAL program. Set out in the table overleaf is a comparison of existing conditions and intersection controls i.e. as a 'T' junction and then with the additional flows from the Sector 5 area post development controlled by a roundabout. Traffic generated by a residential precinct between 3.00pm and 4.00 is typically 80% of the peak hour flow and this factor has been applied in the modelling.

Details on the INTANAL criteria used for this assessment are provided following the summary table.

Comparison of Operating Conditions
MacPherson Street and Forest Road

Model	Control	Tot /Delay Hrs/hr	Ave /Delay & Max secs	LOS	D/S
Existing conditions PM School Peak Hour	'T' Junction	0.4	5.3 8.0 (4R)	A	0.15
Post Development PM School Peak Hour	Round-about	1.1	4.1 5.7 (4R)	A	0.29

It is concluded that the modest increase in traffic levels in Forest Road post development will not have any road network efficiency or environmental implications for nearby residents or for motorists using the local road or MacPherson Street. As indicated the proposed construction of the roundabout at the junction of MacPherson Street and Forest Road will result in a reduction in overall delays particularly for motorists turning right from Forest Road.

The very minor predicted traffic flow change in Jubilee Avenue will not have any perceptible impacts.

Criteria for Interpreting Results of INTANAL 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 (i.e. inner city conditions) and on some roads (i.e. minor side street intersecting with a major arterial route).

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	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**, a DS of 0.8 or less indicates satisfactory intersection operation.

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

10. CONCLUSION

1. The proposed subdivision and townhouse development will represent a contemporary building project located in an area containing development of a similar scale and type and in an area appropriately zoned for this purpose.

2. The maximum vehicle generation of the development will be about 56vph and 6vph to Forest road and Jubilee Avenue respectively. This equates to an average of about 1 additional vehicle per minute and per 10 minutes during the peak hour to Forest Road and Jubilee Avenue respectively.

3. This modest increases in traffic levels in Forest Road post development will not have any road network efficiency or environmental implications for nearby residents or for motorists using the local road or MacPherson Street. As indicated by INTANAL modelling the proposed construction of the roundabout at the junction of MacPherson Street and Forest Road will result in a reduction in overall delays particularly for motorists turning right from Forest Road during school peak hours.

4. The very minor predicted traffic flow changes in Jubilee Avenue will not have any perceptible impacts.

5. The layout and parking provisions meets or exceeds the relevant design and numerical standards.

6. There will not be any adverse traffic, parking or traffic related environmental implications resulting from the development.

7. This assessment has not identified any requirement for additional traffic facilities or road works as a result of the proposed medium density development beyond those scheduled in the Section 94 Plan for Warriewood Valley.