LIPMAN PROPERTIES PTY LTD

CONCEPT PLAN FOR PROPOSED RESIDENTIAL DEVELOPMENT AND PROJECT APPLICATION FOR PROPOSED "BUILDING A", 128 HERRING ROAD, MACQUARIE PARK: TRANSPORT REPORT (MP 09_0195)

MAY 2010

COLSTON BUDD HUNT & KAFES PTY LTD
ACN 002 334 296
Level 18 Tower A
Zenith Centre
821 Pacific Highway
CHATSWOOD NSW 2067

Telephone: (02) 9411 2411
Facsimile: (02) 9411 2422
Email: cbhk@cbhk.com.au

REF: 7085/2

TABLE OF CONTENTS

1. INTRODUCTION

1.1. Colston Budd Hunt & Kafes Pty Ltd has been commissioned by Lipman Properties Pty Ltd to prepare a report examining the transport implications of a proposed residential development at 128 Herring Road, Macquarie Park. The site location is shown in Figure 1.

1.2. The site is currently part of Morling College (Baptist Theological College). The proposed development is for a subdivision of the site and a Concept Plan for some 557 residential apartments in five buildings, with vehicular access from Herring Road.

1.3. In addition, a Project Application is being made for "Building A" in the development, comprising 123 residential apartments, with vehicular access to basement car parking.

1.4. The Director – General's Environmental Assessment Requirements for the Concept Plan include:

> ***5. Transport & Accessibility Impacts (Construction and Operational)***
> - *The EA shall address the following matters:*
> - *Provide a Transport & Accessibility Impact Study prepared in accordance with the RTA's* Guide to Traffic Generating Developments, *considering traffic generation (including daily and peak traffic movements), any required road / intersection upgrades, access, loading dock(s), car parking arrangements, measures to promote public transport usage and pedestrian and bicycle linkages;*
> - *Provide an assessment of the implications of the proposed development for non-car travel modes (including public transport, walking and cycling), including an*

assessment of existing and proposed pedestrian and cycle movements within the vicinity of the subject site;

- *Demonstrate that a minimalist approach to carparking provision is taken based on the accessibility of the site to public transport;*
- *Demonstrate how users of the development will be able to make travel choices that support the achievement of relevant State Plan targets;*
- *Address the accessibility and traffic/transport principles detailed in the Ryde DCP 2006 and draft LEP 2009, including the "Ryde Bicycle Strategy and Master Plan 2007;*
- *Details of service vehicle movements;*
- *Details of the potential impacts on the local road network and in particular, the three intersections identified in the RTA response (12/01/2010). Consideration should also be given to the* Macquarie Park 2007 Base Paramics Model*, where appropriate; and*
- *Future pedestrian/vehicular/cycle connectivity with adjoining sites.*

7. Car parking

- *The EA must demonstrate the provision of sufficient on-site car parking for the proposal having regard to local planning controls and RTA guidelines. (**Note**: the Department supports reduced car parking rates in areas well-served by public transport).*

1.5. This report has been prepared with reference to the RTA's "Guide to Traffic Generating Developments", and assesses the transport implications of the proposed development through the following chapters:

- Chapter 2 - describing the existing conditions; and
- Chapter 3 - assessing the transport implications of the proposed development.

2. EXISTING CONDITIONS

Site Location and Road Network

2.1 Morling College (Baptist Theological College) is on the western side of Herring Road, north of Epping Road, at Macquarie Park. It has vehicular access from Herring Road at a roundabout. Ivanhoe Place forms a fourth (eastern) approach to the intersection. The site includes three residential dwellings to the north, two of which have vehicular access from Herring Road via separate driveways.

2.2 Surrounding land use includes Macquarie University to the north, a hotel to the south, and Macquarie University Railway Station and Macquarie Shopping Centre to the north-east. There is residential development east of the site on Herring Road.

2.3 Herring Road generally provides two traffic lanes in each direction, clear of intersections, with a central concrete median. It provides access to the site, as well as the university, hotel, medium density residential development and shopping centre. Some on street parking is also provided on the eastern side of the road. There are bus stops and shelters on both sides of the road, north and south of the site. There is a right turn bay on Herring Road, for turns into Windsor Drive, approximately opposite the site.

2.4 Epping Road is south of the site. It provides a major east-west road link between Epping and Lane Cove. It generally provides for three traffic lanes in each direction, clear of intersections. Major intersections are signalised with additional lanes for turning traffic. Clearways operate during peak periods. The intersection of Epping Road with Herring Road is controlled by traffic signals. There are separate right and left turn lanes on Epping Road in both directions at the intersection.

2.5 Waterloo Road is north of the site. It provides one of the major east-west road links through Macquarie Park. The intersection of Waterloo Road with Herring Road is signalised. West of Herring Road, the intersection provides access to and from the university.

2.6 The roundabout on Herring Road which provides access to Morling College provides two approach and circulating lanes on Epping Road and one lane at the College entrance and Ivanhoe Place. Ivanhoe Place provides access to a residential precinct. Windsor Drive, north of the site, also provides access to a residential precinct.

Previous Work

2.7 The Ryde Development Control Plan 2006 identifies a future public road network within Macquarie Park to cater for increased development in the area. This "fine grained road network" includes a new "type 3" street connecting to Herring Road through the subject site, with a 16.1 metre reserve width, including two three metre travel lanes, a 2.5 metre parking lane on one side and a 3.8 metre footpath/verge on both sides.

2.8 Council has had a traffic study[1] prepared to examine road transport infrastructure requirements to accommodate the future development in Macquarie Park. It recommends a series of road and intersection works to accommodate future development, including:

- upgrading the interchange between Herring Road and the M2 Motorway;
- grade separating the Epping Road through movement at the Herring Road intersection; and
- upgrading the Herring Road/Waterloo Road intersection.

[1] "Macquarie Park Traffic Study Final Report" Prepared by Bitzios and Traffix for City of Ryde, 21 July 2008.

2.9 The report also broadly affirms the internal street network identified in DCP 2006. We note that the approved concept plan for Macquarie University (October 2009) does not adopt the new street network identified in DCP 2006. This means that the new roads identified through the subject site would not connect through the university site as identified in the DCP.

Traffic Flows

2.10 Traffic generated by the proposed residential development will have its greatest effects during weekday morning and afternoon peak periods when it combines with commuter traffic. In order to gauge traffic conditions, counts were undertaken during weekday morning and afternoon peak periods at the following intersections:

- Herring Road/Waterloo Road/Macquarie University entrance;
- Herring Road/Morling College access/Ivanhoe Place; and
- Herring Road/Epping Road.

2.11 These intersections are the three identified by the RTA in its correspondence of 13 January 2010 and referred to in the environmental assessment requirements.

2.12 The results of the surveys are shown in Figures 2 and 3, and summarised in Table 2.1. Epping Road carried some 3,200 to 4,200 vehicles per hour two-way during the morning and afternoon peak hours. Flows on Herring Road were lower at some 1,000 to 2,250 vehicles per hour two-way. Waterloo Road carried flows of some 1,500 to 1,550 vehicles per hour two-way during the surveyed peak hours.

2.13 The university access generated some 600 to 650 vehicles per hour two-way during the surveyed peak hours. Ivanhoe Place and the Morling College access carried some 100 vehicles per hour or less two-way during the surveyed peak hours.

Table 2.1: Existing two-way (sum of both directions) peak hour traffic flows			
Road	**Location**	**AM peak hour**	**PM peak hour**
Epping Road	East of Herring Road	4,180	3,660
	West of Herring Road	3,250	3,830
Herring Road	North of Waterloo Road	975	1,325
	South of Waterloo Road	1,745	2,015
	North of Morling College access	2,065	2,075
	North of Epping Road	2,240	2,205
	South of Herring Road	1,220	1,235
Waterloo Road	East of Herring Road	1,535	1,510
University access	West of Herring Road	605	630
Ivanhoe Place	East of Herring Road	75	100
Morling College access	West of Herring Road	30	30

Intersections Operations

2.14 The capacity of the road network is largely determined by the capacity of its intersections to cater for peak period traffic flows. The surveyed intersections shown in Figures 3 and 4 have been analysed using the SIDRA program.

2.15 SIDRA simulates the operations of intersections to provide a number of performance measures. The most useful measure provided is average delay per vehicle expressed in seconds per vehicle. Based on average delay per vehicle, SIDRA estimates the following levels of service (LOS):

- For traffic signals, the average delay per vehicle in seconds is calculated as delay/(all vehicles), for roundabouts the average delay per vehicle in seconds is selected for the movement with the highest average delay per vehicle, equivalent to the following LOS:

0 to 14	=	"A"	Good
15 to 28	=	"B"	Good with minimal delays and spare capacity
29 to 42	=	"C"	Satisfactory with spare capacity
43 to 56	=	"D"	Operating near capacity
57 to 70	=	"E"	At capacity and incidents will cause excessive delays. Roundabouts require other control mode
>70	=	"F"	Unsatisfactory and requires additional capacity

- For give way and stop signs, the average delay per vehicle in seconds is selected from the movement with the highest average delay per vehicle, equivalent to following LOS:

0 to 14	=	"A"	Good
15 to 28	=	"B"	Acceptable delays and spare capacity
29 to 42	=	"C"	Satisfactory but accident study required
43 to 56	=	"D"	Near capacity and accident study required
57 to 70	=	"E"	At capacity and requires other control mode
>70	=	"F"	Unsatisfactory and requires other control mode

2.16 It should be noted that for roundabouts, give way and stop signs, in some circumstances, simply examining the highest individual average delay can be misleading. The size of the movement with the highest average delay per vehicle should also be taken into account. Thus, for example, an intersection where all movements are operating at a level of service A, except one which is at level of service E, may not necessarily define the intersection level of service as E if that movement is very small. That is, longer delays to a small number of vehicles may not justify upgrading an intersection unless a safety issue was also involved.

2.17 The SIDRA analysis found that the signalised intersection of Epping Road with Herring Road is operating with average delays of less than 50 and 55 seconds per vehicle during the morning and afternoon peak hours respectively. This represents level of service D, a satisfactory level of service for a busy intersection during peak periods.

2.18 The signalised intersection of Herring Road with Waterloo Road and the university access is operating with average delays of less than 42 seconds per vehicle during the morning peak period and less than 45 seconds per vehicle during the afternoon peak period. This represents levels of service C and D respectively, which are satisfactory levels of service.

2.19 The roundabout-controlled intersection of Herring Road with Ivanhoe Place and the Morling College access is operating with average delays, for the highest delayed movement, of less than 20 seconds per vehicle during peak periods. This represents level of service B, a good level of service.

Public Transport

2.20 As previously discussed, the site is close to Macquarie University railway station, being within some 250 metres walking distance. Macquarie University is on the Northern Line (Epping to City via Chatswood), which will eventually be extended to Parramatta. Services through Macquarie Park on the Northern Line operate on a 15 minutes in each direction.

2.21 There are a number of bus services which operate along Herring Road and Waterloo Road. Sydney Buses operates the 140, 288, 290, 292, 294, 295, 459, 506, 507, 518, 544 and 545 services. Private buses operate along Waterloo Road and connect surrounding areas with the shopping centre, university and railway station.

2.22 Bus route 140 operates along Herring Road and connects Manly, Fairlight, Balgowlah, The Spit, Spit Junction, Cremorne, Neutral Bay, Crows Nest, St Leonards, Gore Hill, Artarmon, Lane Cove, North Ryde, Macquarie Centre, Macquarie University and Epping. It operates on a limited-stops basis during morning and afternoon peak periods on Mondays to Fridays.

2.23 Routes 288 and 290 operate along Herring Road and between Epping, Macquarie University, Macquarie Centre, North Ryde, Lane Cove, North Sydney and the city. Route 288 operates on a 15 minute headway in each direction. Route 290 operates on a 60 minute headway in each direction. During weekday peak periods, services are more frequent.

2.24 Route 292 operates along Waterloo Road and connects Marsfield, Macquarie University, Macquarie Centre, Macquarie Park, North Ryde, Lane Cove and the city. It operates on a 30 minute headway in each direction on weekdays and a 60 minute headway on weekends, with more frequent services during weekday peak periods.

2.25 Route 294 operates along Waterloo Road between Macquarie Centre, Talavera Road, Lane Cove and the city. It provides a peak period service on weekdays.

2.26 Route 295 operates along Herring Road between North Epping, Epping, Macquarie University and Macquarie Centre. It operates on a 60 minute headway in each direction.

2.27 Route 459 operates along Waterloo Road and connects Strathfield Station, North Strathfield, Concord West, Ryde, Macquarie Centre and Macquarie University. It operates on a 60 minute headway in each direction on weekdays.

2.28 Route 506 operates along Waterloo Road between Macquarie University, Macquarie Centre, North Ryde, East Ryde, Boronia Park, Hunters Hill, Drummoyne, Rozelle, White Bay and the city. It operates on a 30 minute headway in each direction, Monday to Saturday.

2.29 Route 507 operates along Herring Road between Ryde, Meadowbank, Putney, Gladesville, Drummoyne, Rozelle, White Bay and the city, with a number of services existing to Macquarie Centre and Macquarie University on Mondays to Saturdays. Services are every 60 minutes in each direction.

2.30 Route 518 operates along Herring Road between Macquarie University, Macquarie Centre, Denistone East, Ryde, Gladesville, Drummoyne, Rozelle, White bay and the city. It operates a 30 minute headway in each direction, Monday to Saturday and a 60 minute headway in each direction on Sundays.

2.31 Route 544 operates along Herring Road between Auburn, Silverwater, Ermington, Eastwood, Denistone East, Macquarie University and Macquarie Centre. It operates on a 60 minute headway in each direction, Monday to Saturday.

2.32 Route 545 operates along Herring Road and Waterloo Road and connects Parramatta, Telopea, Dundas valley, Eastwood, Macquarie university, Macquarie Centre, Chatswood West and Chatswood. It operates on a 15 minute headway in each direction on weekdays, a 20 minute headway on Saturdays and a 30 minute headway on Sundays.

2.33 Pedestrian crossings are provided across all approaches at the signalised intersections of Herring Road with Waterloo Road and Epping Road. Good pedestrian links are provided along Herring Road and Waterloo Road, as well as through the university.

2.34 The Ryde Bicycle Strategy and Masterplan identifies existing and future regional cycle routes along Waterloo Road and Epping Road, north and south of the site respectively, with a future local route through the university, west of Herring Road.

2.35 Overall, the site has good access to regular public transport services.

3. IMPLICATIONS OF PROPOSED DEVELOPMENT

3.1 The proposed development includes an eight lot staged subdivision (five residential lots, two road lots and the remaining lot for Morling College). The five residential lots would be developed with five residential buildings, containing some 557 apartments in a mix of one, two and three bedroom apartments. A café/building manager office of some 96m^2 would be provided plus a small gym of some 29m^2 for use by residents. Parking would be provided in basement levels. Vehicular access would be provided via a new "type 3" street connection to Herring Road, with provision for future connection to adjoining sites. The new road would be dedicated to Council as identified in DCP 2006.

3.2 Building A would be the first to be constructed. Building A comprises 123 residential dwellings, plus the café, with vehicular access from the new access road to basement car parking. The land subdivision staging is shown in plans prepared by the project architect.

3.3 This chapter examines the implications of the proposed development through the following sections:

- public transport;
- parking provision;
- access and internal layout;
- traffic generation and effects;
- principles of construction traffic management;
- Director – General's requirements; and
- summary.

Public Transport

3.4 As previously discussed in Chapter 2, the site is close to rail services and numerous bus services which operate along Herring Road and Waterloo Road. These services connect the site with surrounding areas.

3.5 The proposed development, with its increase in residential population, will strengthen demand for existing public transport services.

3.6 The location of the development close to other retail, educational and employment areas will reduce the need to travel.

3.7 To support accessibility for cyclists, appropriate parking will be provided for bicycles in accordance with Council requirements, as discussed in the subsequent section on parking provision.

3.8 A pedestrian/cycle path will be provided along the new access road in accordance with the "type 3" street profile in identified in DCP 2006. A pedestrian/cycle path is also proposed along the southern side of Building D, and west of Building D through the riparian zone. This will enable future connection to the pedestrian and bicycle path through the university.

3.9 The proposed development is therefore consistent with government policy and the planning principles of:

(a) improving accessibility to employment and services by walking, cycling, and public transport;

(b) supporting the efficient and viable operation of public transport services.

(c) improving the choice of transport and reducing dependence solely on cars for travel purposes; and

(d) moderating growth in the demand for travel and the distances travelled, especially by car.

Parking Provision

3.10 Section 6.3.8 of Part 4.5 of the Ryde DCP 2006 (Macquarie Park Corridor) indicates that car parking for all development other than commercial and industrial development should be provided in accordance with the Ryde DCP 2006. Section 9 of Part 3.4 of the Ryde DCP 2006 and Part 9.3 of the Ryde DCP 2006 indicate that parking for residential flat buildings within 400 metres of Epping Road or a railway station should provide parking as follows:

- one space per one bedroom dwelling;
- 1.2 spaces per two bedroom dwelling;
- 1.6 spaces per three bedroom dwelling;
- one space per four dwellings for visitors; and
- one space per 25m^2 for the café.

3.11 Building A includes 68 one bedroom apartments, 47 two bedroom apartments, eight apartments with three or more bedrooms and a 96m^2 café/building manager office. On this basis, Council's parking requirement would be 172 spaces, including 137 resident spaces, 31 visitor spaces and four spaces for the café.

3.12 The proposed parking provision for Building A is 174 spaces which satisfies Council's requirements. The parking for Building A is proposed to be allocated as follows:

- one space per one bedroom apartment;
- 1.2 spaces per two bedroom apartment;
- two spaces per apartment with three or more bedrooms;
- one space per four apartments for visitors; and
- four spaces for the café/building manager office.

3.13 Parking provision for the other future buildings in the development is proposed to be provided in accordance with the above rates in paragraph 3.12. Final parking provision for buildings B, C, D and E will be determined at the time that project applications are made for these buildings, following confirmation of the final number and mix of apartments.

3.14 Section 6.3.8 of Part 4.5 of the Ryde DCP 2006 (Macquarie Park Corridor) indicates that bicycle parking is required to be provided at the following rates:

- one space per three dwellings for residents; and
- one space per 12 dwellings for visitors.

3.15 With 123 dwellings proposed in Building A, the bicycle parking requirement would be 41 resident spaces and 10 visitor spaces. Resident bicycle parking is proposed to be provided in caged storage areas. 10 visitor bicycle spaces are proposed for building A on the ground level, adjacent to the new access road. The proposed bicycle parking provision is therefore considered to be appropriate.

3.16 Bicycle parking provision for the other future buildings in the development is proposed to be provided in accordance with Council requirements at the time that applications are made for those buildings.

Access, Servicing and Internal Layout

3.17 Vehicular access is proposed to be provided via a new road connection from Herring Road. The proposed road connection is generally in accordance with the alignment identified in DCP 2006.

3.18 The new road connection would intersect Herring Road at an unsignalised intersection, and would be left in/left out at Herring Road, due to the existing median in Herring Road. This intersection would have appropriate capacity to cater for the traffic volumes from the proposed residential development.

3.19 Traffic approaching the development from the north could use the roundabout at the Morling College access to turn around. Traffic departing the development could travel north to the M2 Motorway or turn right at Waterloo Road to travel east, then connect to Lane Cove Road to travel in any direction.

3.20 The new road would include provision for vehicles to turn around at the western end of the cul-de-sac. The new road would have the ability to extend and connect to adjoining sites to the south-west, if required, in association with the redevelopment of those sites in the future. The road would be dedicated to Council as identified in DCP 2006.

3.21 The new road would have a 16.1 metre reserve width, including two three metre travel lanes, a 2.5 metre parking lane on one side and a 3.8 metre footpath/verge on both sides ("type 3" street in accordance with DCP 2006). The new road is shown in plans prepared by TTW.

3.22 In the early stages of development (Buildings A and B), the road will be provided to the western end of Building A. It will extend to its full length in association with the development of Buildings C and D.

3.23 Vehicular access to the various buildings within the development will be provided in three locations: to Buildings A/B on the northern side of the new road, to Buildings C/D on the northern side of the new road and to Building E on the southern side of the new road. The basements to Buildings A and B, and to Buildings C and D, would be linked internally.

3.24 Garbage collection is proposed to occur from on-street. Ramps to the basement car parks, and the ramps within the car parks, will provide a maximum grade of 1:4 (25 per cent) with appropriate transitions. Resident and visitor parking spaces will be a minimum of 2.5 metres wide by 5.4 metres long, with a 5.8 metre wide access aisle (6.1 metres wide where structure is located on one side of the aisle). Spaces with adjacent obstructions will be 0.3 metres wider. Columns will be set back 750 mm from the front of spaces. Dead end aisles will provide a one metre extension for appropriate access to the end parking spaces. Height clearance will be 2.2 metres generally, with 2.5 metres above disabled spaces. These dimensions are considered appropriate, being in accordance with AS 2890.1:2004.

Traffic Generation and Effects

3.25 Traffic generated by the proposed development will have its greatest effects during the morning and afternoon peak periods when it combines with commuter traffic. Surveys undertaken by the RTA indicate that high density residential developments in sub-regional centres generate 0.29 vehicles per hour per dwelling two-way during weekday morning and afternoon peak hours. On this basis, with some 557 apartments, the proposed development would generate some 160 vehicles per hour two-way during peak hours. The café is small and would primarily serve residents of the development. It would therefore not generate significant external traffic.

3.26 During the morning peak hour, some 70 per cent of traffic would be outbound. The reverse would apply in the afternoon.

3.27 The additional traffic has been assigned to the existing road network. Existing traffic flows plus the additional traffic from the proposed development are shown in Figures 2 and 3, and summarised in Table 3.1.

Table 3.1: Existing two-way (sum of both directions) peak hour traffic flows

Road	Location	AM peak hour		PM peak hour	
		Existing	Plus development	Existing	Plus development
Epping Road	East of Herring Road	4,180	+10	3,660	+30
	West of Herring Road	3,250	+10	3,830	+25
Herring Road	North of Waterloo Road	975	+50	1,325	+20
	South of Waterloo Road	1,745	+130	2,015	+80
	North of college access	2,065	+70	2,075	+140
	North of Epping Road	2,240	+30	2,205	+80
	South of Herring Road	1,220	+10	1,235	+25
Waterloo Road	East of Herring Road	1,535	+80	1,510	+60
University access	West of Herring Road	605	-	630	-
Ivanhoe Place	East of Herring Road	75	-	100	-
College access	West of Herring Road	30	-	30	-
New access road	West of Herring Road	-	+160	-	+160

3.28 Table 3.1 shows that traffic increases on Herring Road would be some 20 to 140 vehicles per hour two-way during peak hours. Increases on Waterloo Road would be some 60 to 80 vehicles per hour two-way. Increases on Epping Road would be some 10 to 30 vehicles per hour two-way. The new access road would carry some 160 vehicles per hour two-way during peak hours.

3.29 The intersections previously analysed in Chapter 2 have been reanalysed with SIDRA for the additional development traffic flows shown in Figures 2 and 3.