Orange Private Hospital Development
Forest Road, Orange

TRAFFIC AND PARKING ASSESSMENT

1 July 2008

Ref: 07007

Prepared by

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1. INTRODUCTION

This report has been prepared to accompany a development application to Orange City Council for the Orange Private Hospital development on the site known as No 3403, Lot 1, DP549856, Forest Road, Orange (Figures 1 and 2).

The site, which has an area of approximately 6 hectares is located on the western side of Forest Road approximately 3 km south of Orange CBD, opposite the existing Bloomfield Hospital. The site was formerly used as an outdoor drive-in cinema, but has been unused for approximately 5 years. It is bounded by two existing road reserves which run off Forest Road, Finneran Rd adjacent to the northern site boundary, and Kemp Rd adjacent to the southern site boundary which provided access to the former drive-in cinema on the site.

The Orange Private Hospital development proposal is illustrated on the "Site Concept Plan" prepared by Cox/Bureau SRH which is reproduced in the following pages. It is a mixed-use development comprising:

1. The private hospital which is located in the north-eastern corner of the site and comprises the main hospital building, a cancer care facility, and an ancillary service precinct.

2. An 80 room hotel (60 rooms + 20 medical suites) with a 100 seat restaurant located on the south-eastern part of the site.

3. A 20 place childcare centre.

4. A 100 bed hostel/short-stay accommodation facility.

5. A cancer drop-in daycentre.

6. A residential precinct located in the north-western corner of the site, which has an indicative development potential of 114 apartments.

A schedule setting out the floorarea of each component of the development proposal with assumed staff numbers is reproduced in the following pages.

ORANGE PRIVATE HOSPITAL DEVELOPMENT PROPOSAL

Building Precinct	Area m2	Assumed Personnel

1. Private Hospital:

1.1 Main Building

Inpatient Unit - 60 Beds and staff/support areas	2,230	20 emp
Administration unit	325	10 emp
General Support (food/linen/waste)	680	20 emp
Operating Unit (4 theatre) + CSSD	1,715	20 emp
Medical Imaging (inc. radiology)	1,000	20 emp
Pathology	1,000	20 emp
Medical Consulting Suites (x 18)	1,750	18 pract
Pharmacy	250	4 staff
Total	**8,950**	

1.2 Cancer Care Facility

Cancer Care	**Total**	**1,400**	20 pract

1.3 Ancillary Service Precinct

Retail (café/florist/gifts/newsagent)	500	4 tenants
Medical Consulting Suites (x 12)	750	12 pract
Rehabilitation Centre (phys/chiro)	750	8 pract
Gym/Health and Fitness	800	6 staff
Total	**2,800**	

2. Hotel:

60 rooms + 20 Medical Suites and Associated areas/staff	2,300	3 staff
100 seat restaurant / Bar	150	6 staff
Total	**2,450**	

3. Childcare Centre:

Assume a 20 place facility	**Total**	**300**	5 staff

4. Hostel/Short-Stay:

100 x 1 Bed Units (Concept Plan) & Common Areas / Admin / Staff	4,000	10 staff
Total	**4,000**	

5. Cancer Resource Centre:

Drop in Day Centre	**Total**	200	4 staff

6. Residential:

Indicative scheme (based on Site Concept Plan) - 114 Apartments	10,800	N/A
Total	**10,800**	

The Orange Private Hospital development proposal is served by a total off-street parking provision of 484 spaces distributed throughout the site as follows:

Private Hospital	180 spaces
Hotel/restaurant	69 spaces
Childcare centre	5 spaces
Hostel/short-stay	25 spaces
Cancer Resource Centre	5 spaces
Residential precinct	200 spaces
Total	**484 spaces**

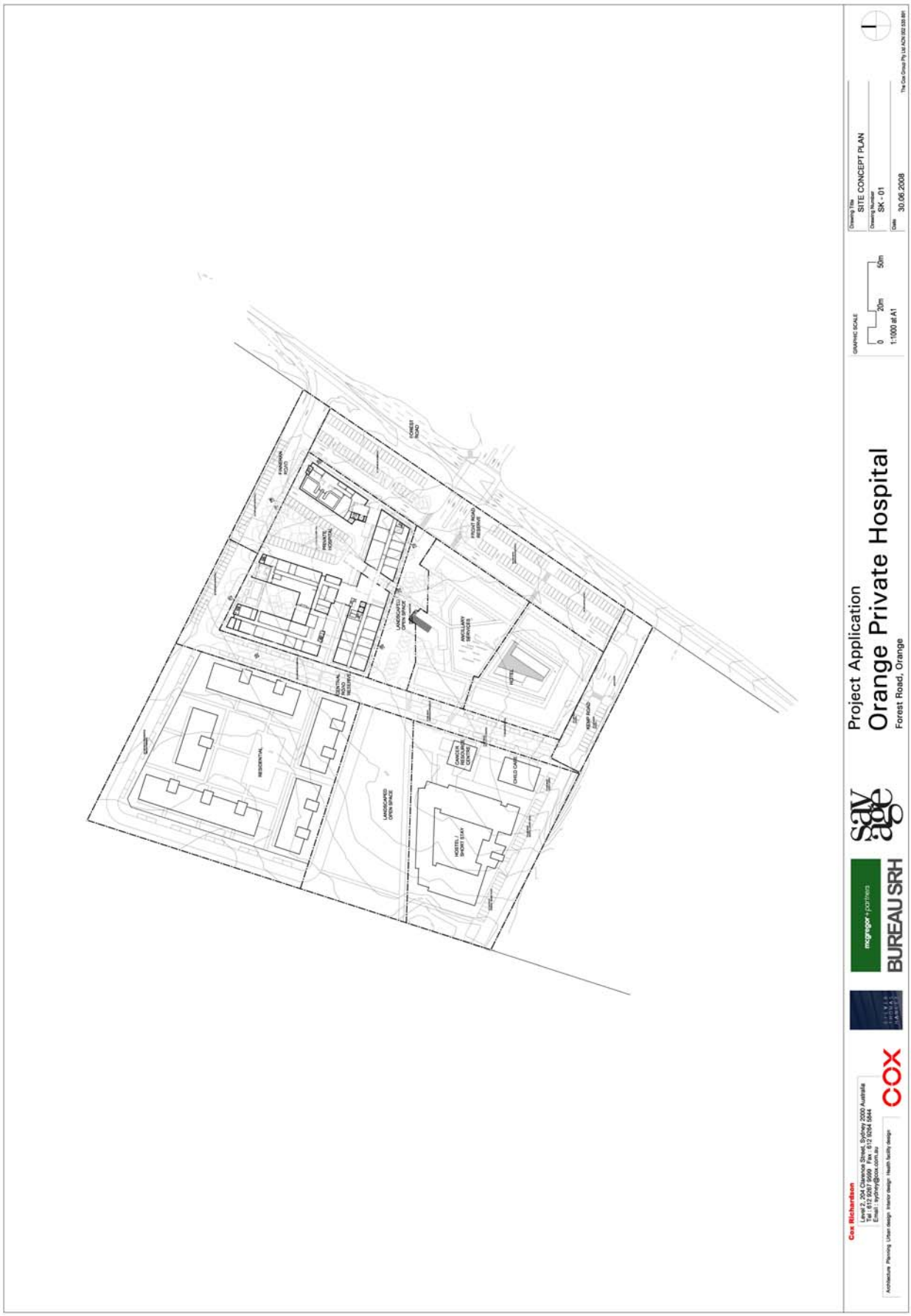
Vehicular access for the proposed development is off Forest Road via the following:

- A new 4-way signalised intersection of the proposed private hospital and public (Bloomfield) hospital on the eastern side of Forest Road. The new signals will include pedestrian crossings on each leg of the intersection to enhance pedestrian safety. A plan of the proposed traffic signals is reproduced in the following pages.

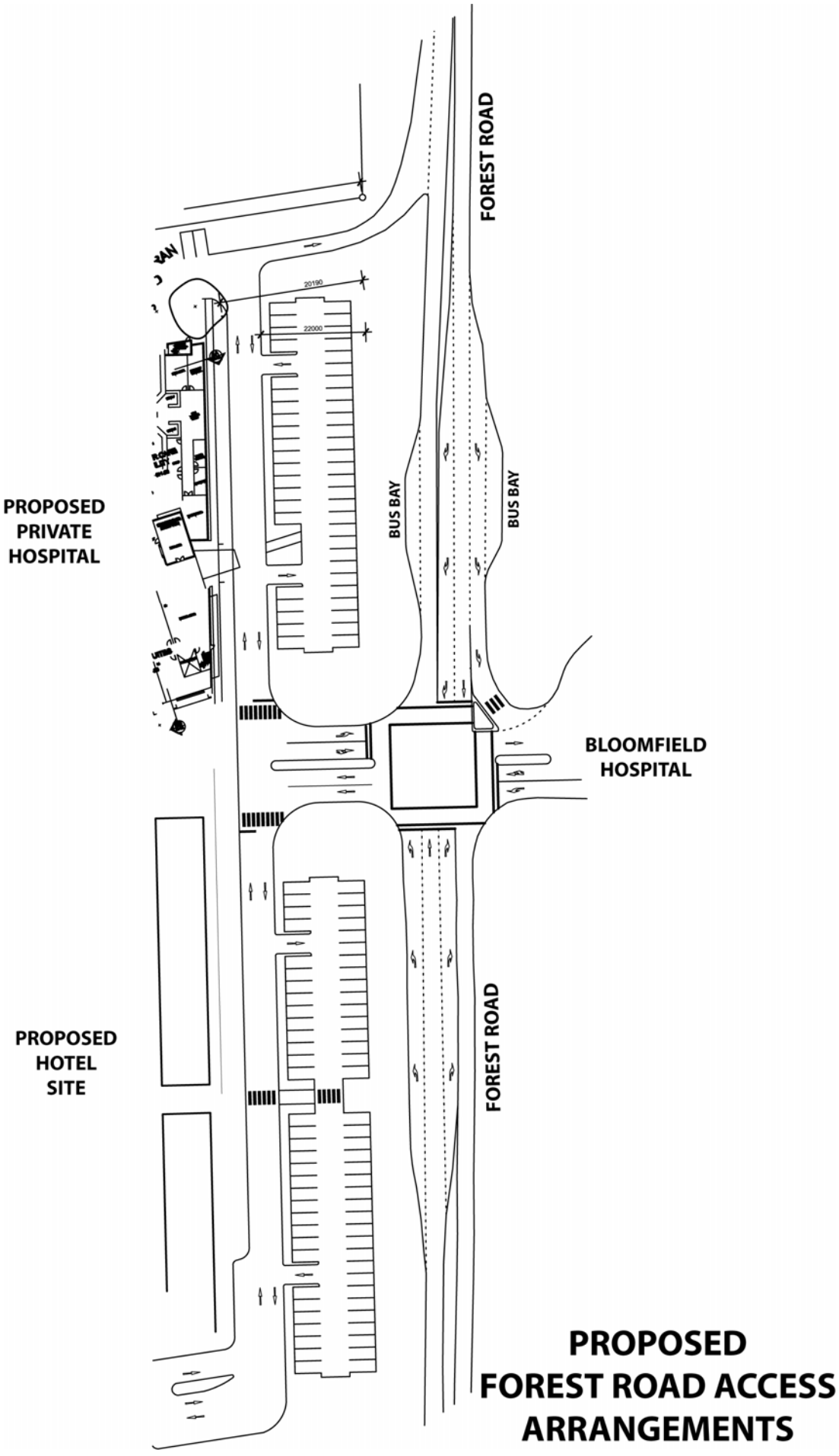
- Left turn exit only movements from the northern access road (Finneran Road)

- Closure of the southern access road (Kemp Road)

The purpose of this report is to assess the traffic and parking implications of the Orange Private Hospital development proposal.



Site Concept Plan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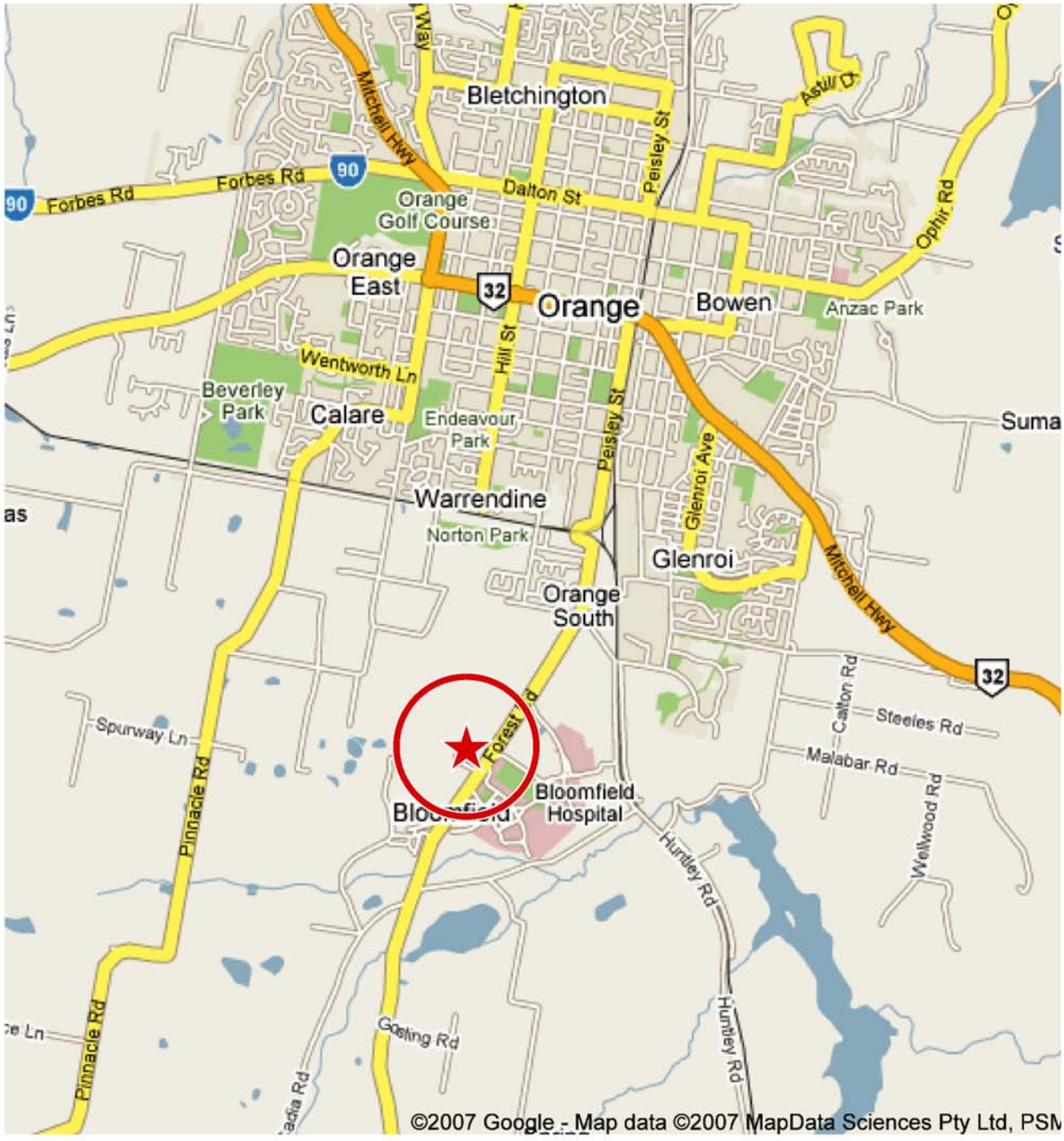
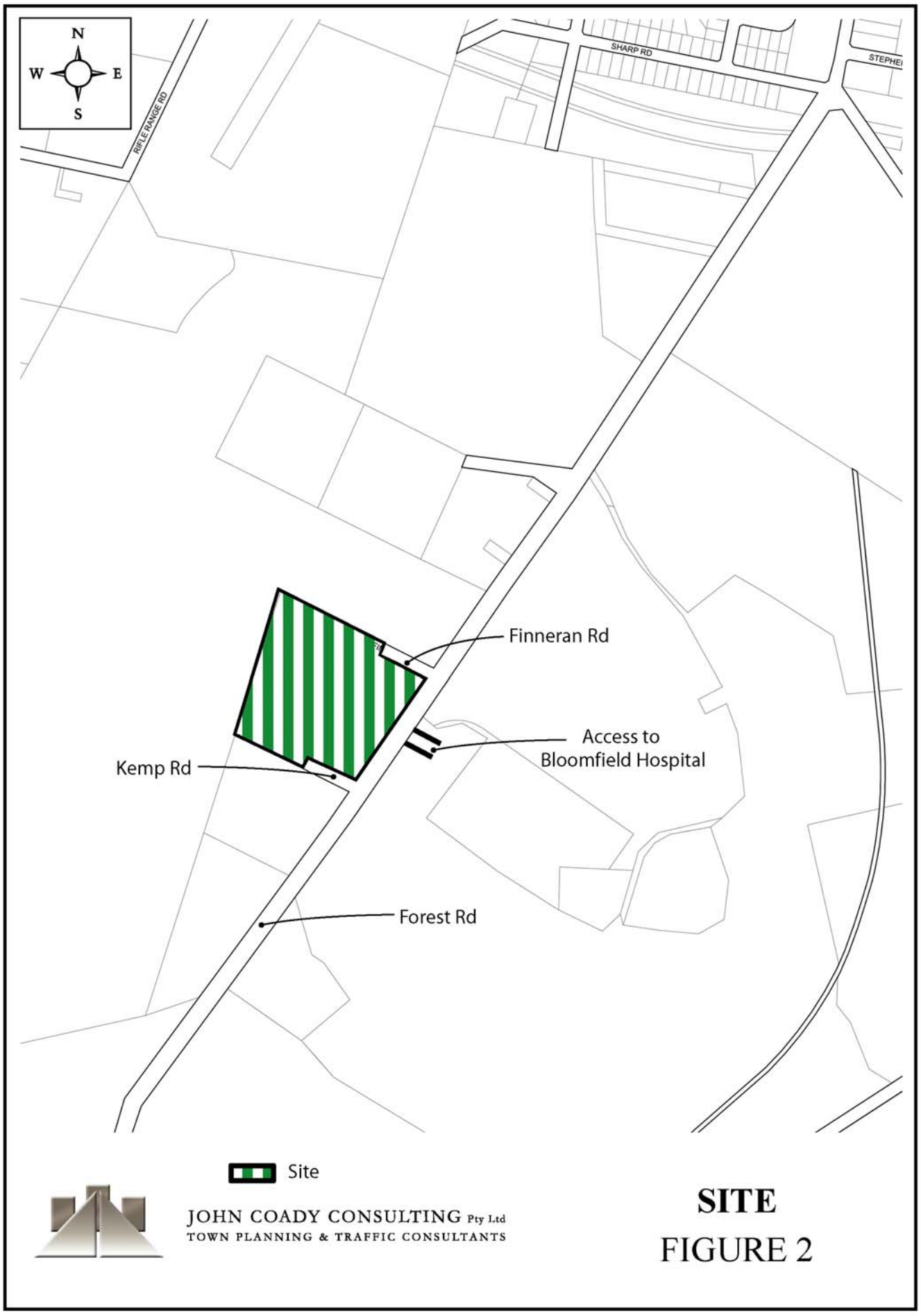
ARRANGEMENTS



JOHN COADY CONSULTING Pty Ltd
TOWN PLANNING & TRAFFIC CONSULTANTS

LOCATION
FIGURE 1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Finneran Rd
Access to
Bloomfield Hospital
Kemp Rd
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Site
JOHN COADY CONSULTING Pty Ltd
TOWN PLANNING & TRAFFIC CONSULTANTS
SITE
FIGURE 2

2. PARKING

Orange Development Control Plan 2004 (30 June 2007) specifies the following parking requirements which are potentially relevant to the proposed development:

Hospital	1 space for every 3 beds Plus 1 space each resident doctor and 1 space for every 2 visiting doctor Plus 1 space for every 2 employees.		
Health Consulting Rooms	1 space for every 2 practitioners with spaces being available for customer and staff use.		
Hotel	1 space per unit Plus 1 space for each resident manager Plus 1 space for every 2 employees.		
Restaurants	1 space per 10m2 GFA or 1 space for every 3 seats, whichever is greater		
Hostel	1 space for every 3 beds Plus 1 space for each resident manager Plus 1 space for every 2 employees.		
Childcare Centre	1 space for every 4 children in attendance		
Gymnasium	4 spaces per 100m2 GFA		
Residential: Apartments & Townhouses	1-bedroom unit 2-bedroom unit 3 (or more) bedroom unit Visitors	- - - -	1.0 space per unit 1.2 spaces per unit 1.5 spaces per unit 0.2 spaces per unit
Housing for Aged & Disabled Persons	As per SEPP 5.		

Those parking requirements, with appropriate modifications, are applied to each component of the proposed development in the schedule reproduced in the following pages indicating a total parking requirement of up to 484 spaces comprising:

Private Hospital (Main building and Cancer Care Facility)	150 spaces
Ancillary Service Precinct	30 spaces
Hotel	69 spaces
Childcare Centre	5 spaces
Hostel	25 spaces
Cancer Resource Centre	5 spaces
Sub total	**280 spaces**
Residential:	200 spaces
Total	**484 Spaces**

ORANGE PRIVATE HOSPITAL – Parking Requirement Calculations (DCP 2004)

Building Precinct	Area (m^2)	Assumed Personnel	Orange City Council Parking Requirements (as modified)	Required Bays	Provided Bays
1. Private Hospital:					
1.1 Main Building:					
Inpatient Unit - 60 Beds			1 space for every 3 inpatient beds.	20	20
and Staff / Support Areas	2,230	20 emp.	1 space per 2 emp. / visiting doctors.	10	10
Administration Unit	325	10 emp.	1 space per 2 employees.	5	5
General Support (food/linen/waste)	680	20 emp.	1 space per 2 employees.	10	10
Operating Unit (4 theatre) + CSSD	1,715	20 emp.	1 space per 2 emp. / visiting doctors.	10	10
Medical Imaging (inc. radiology)	1,000	20 emp.	1 space per 2 employees.	10	10
Pathology	1,000	20 emp.	1 space per 2 employees.	10	10
Medical Consulting Suites (x 18)	1,750	18 pract.	1 space per 2 pract (+ visitor space*).	30	30
Pharmacy	250	4 staff	61. spaces per 100m2	15	15
Total	**8,950**			**120**	**120**
1.2 Cancer Care Facility:					
Cancer Care **Total**	**1,400**	20 pract.	1 space per 2 pract (+ visitor space*)	**30**	**30**
1.3 Ancillary Service Precinct:					
Retail (café/florist/gifts/newsagent)	500	8 staff	1 space per 2 staff	4	4
Medical Consulting Suites (x 12)	750	12 pract.	1 space per 2 pract (+ visitor space*).	10	10
Rehabilitation Centre (phys/chiro)	750	8 pract.	1 space per 2 pract (+ visitor space*).	6	6
Gym/Health & Fitness	800	6 staff	1 space per 2 staff	10	10
Total	**2,800**			**30**	**30**
2. Hotel:					
60 Rooms + 20 Medical Suites			1 space per unit or bedroom.	60	60
& Associated Areas / Staff	2,300	3 staff	1 space per 2 staff; 1 per manager.	2	4
100 Seat Restaurant / Bar	150	6 staff	1 space for every 3 seats x 10%.	3	5
Total	**2,450**			**65**	**69**
3. Child Care Centre:					
Assume a 20 Place Facility **Total**	**300**	5 staff	1 space for every 4 children.	**5**	**5**
4. Hostel/Short Stay:					
100 x 1 Bed Units (Concept Plan)			1 space for every 5 beds.	20	20
& Common Areas / Admin / Staff	4,000	10 staff	1 space for every 2 staff.	5	5
Total	**4,000**			**25**	**25**
5. Cancer Resource Centre:					
Drop-in Day Centre **Total**	**200**	4 staff	1 space per 2 staff (+ visitor space*).	**5**	**5**
6. Residential:					
Indicative Scheme (based on Site			1 bay per 1B; 1.2 per 2B; 1.5 per 3B.	178	178
Concept Plan) – 114 Apartments	10,800	n/a	Visitors: 0.2 bays per apartment.	22	22
Total	**10,800**			**200**	**200**
			* Visitor spaces not specified in DCP.		
Total Parking Spaces:				**480**	**484**

The modifications applied to the parking requirements specified by Orange Development Control Plan 2004 to the various components of the proposed development are as follows:

1. The parking requirement specified by the DCP for "Health consulting rooms" is one space for every 2 practitioners with spaces being available for customer and staff use. While that requirement specifies that parking spaces be available for customers, it does not quantify the number of spaces required. Accordingly, the parking requirement for the medical consulting suites in the Main Building, The Cancer Care Facility, the Medical Consulting Suites and Rehabilitation Centre in the Ancillary Service Precinct, and the Cancer Resource Centre has been calculated by applying the DCP code requirement to the number of staff expected to be employed in those facilities, and then adding in additional parking provision to serve customers/patients.

2. The parking requirement specified by the DCP for the retail floorspace in the Ancillary Service Precinct (6.1 spaces per 100m2) is excessive because it is unlikely that the general public will travel to the site to visit the café/florist/gift/newsagent stores. In these circumstances, the parking requirement for that retail floorspace has been based on the staff expected to be required to operate those businesses at a rate of 1 space per 2 staff.

3. The parking requirement for the Gymnasium/Health and Fitness Centre specified by Council's DCP (4 spaces per 100m2) is excessive because it is expected that a substantial proportion of the patronage of this facility will be drawn from patients, visitors and the workforce of the proposed hospital (and the Bloomfield Hospital on the opposite side of Forest Rd). In these circumstances, the parking requirement for the Gymnasium/Heath and Fitness Centre has been reduced to 30% of the requirement specified by the DCP.

4. The parking requirement specified for the hotel rooms (1 space per room) is excessive because 20 of the rooms will be medical suites occupied by persons who are bedridden. Accordingly, the requirement of 1 space per room has been applied to the remaining 60 rooms only.

5. The parking requirement for the restaurant incorporated in the hotel is excessive because a substantial proportion of restaurant patronage, if not all of it, will be drawn from hotel guests and patients, visitors and the workforce of the proposed hospital (and the Bloomfield Hospital

on the opposite side of Forest Rd). In these circumstances, the parking requirement for the restaurant has been reduced to 10% of the requirement specified by Council's DCP.

6. The parking requirement of 1 space per 3 beds specified by the DCP for hostel accommodation is excessive, and the requirement specified for hostels by SEPP 5 of 1 space for each 10 beds plus 1 space for each 2 persons to be employed on the site at any one time is considered more appropriate. However, as a concession to the requirement specified by Council's DCP, a parking requirement of 1 space for every 5 beds plus 1 space for every 2 staff has been adopted.

7. An indicative parking requirement has been adopted for the residential precinct.

As noted in the foregoing, the proposed development makes provision for a total of 484 parking spaces, satisfying the requirement calculated in the schedule. In the circumstances, it can be concluded that the parking provision incorporated in the Orange Private Hospital development proposal is adequate such that the proposed development has no unacceptable parking implications.

3. COMMERCIAL VEHICLES

AS 2890.2:2002 identifies four categories of trucks:

Small rigid vehicle (SRV)	6.4m long
Medium rigid vehicle (MRV)	8.8m long
Heavy rigid vehicle/bus (HRV)	12.5m long
Articulated vehicle (AV)	19.0m long

1. Private Hospital

The only component of the proposed development expected to generate a level of commercial vehicle activity that requires provision of a loading dock is the Private Hospital, which is expected to generate commercial vehicles transporting food, linen, medical supplies, office equipment and provisions, etc to the hospital, and transporting waste from the hospital. The vehicles used in those activities are expected to comprise predominantly vans and the SRV, with some deliveries via the MRV and the HRV. Articulated vehicles (AV) are not expected to be involved in deliveries to/from the site.

While the number of commercial vehicle trips generated by the Private Hospital will be variable, it is expected that the maximum daily commercial vehicle generation will be in the order of 20 vehicles per day (40 vehicle trips per day) with the majority (75%) of that commercial vehicle activity occurring during the morning (7.00am - 11.00am).

For the purposes of this assessment, the following commercial vehicle activity has been assumed for the Private Hospital:

Daily vehicle trips	40 vehicle trips per day comprising: Vans and SRV - 30 vehicle trips per day MRV and HRV - 10 vehicle trips per day
Peak hour vehicle trips	10 vehicle trips per hour Vans and SRV - 8 vehicle trips per hour MRV and HRV - 2 vehicle trips per hour

Provision has been made for a loading dock capable of accommodating 2 heavy rigid vehicles on the northern side of the Private Hospital building. Vehicular access for those loading docks will be via the proposed traffic signals on Forest Road. The ability of the heavy rigid vehicle to access the

site and manoeuvre to/from the loading dock has been tested using the turning path templates for the HRV contained in *AS 2890.2:2002*, that exercise revealing that the HRV can comfortably access the internal ring road and the loading docks incorporated in the proposed Private Hospital.

2. Hotel

The Hotel component of the proposed development will generate commercial vehicle activity transporting linen, food and liquor to the site and transporting waste from the site. Once again, this commercial vehicle activity will predominantly involve vans and the SRV, with relatively few deliveries made in an MRV.

For the purposes of this assessment, the following commercial vehicle activity has been assumed for the proposed hotel:

Daily vehicle trips	8 vehicle trips per day comprising: Vans and SRV - 6 vehicle trips per day MRV - 2 vehicle trips per day
Peak hour vehicle trips	4 vehicle trips per day Vans and SRV - 2 vehicle trips per day MRV - 2 vehicle trips per day

3. Childcare Centre

The commercial vehicle activity generated by the childcare centre is expected to be only minor, comprising 4 vehicle trips per day in vans or the SRV. Typically, childcare centres avoid deliveries during peak child set-down/pick-up periods which tend to coincide with the AM and PM peak periods. Accordingly, the proposed childcare centre is not expected to generate any commercial vehicle activity during the AM and PM peak periods.

4. Hostel

The Hostel is expected to generate commercial vehicles transporting predominantly food and linen and other provisions to the Hostel, and transporting waste from the Hostel. The vehicles used in those activities are expected to comprise predominantly vans, with some deliveries using the SRV and the MRV.

For the purposes of this assessment, the following commercial vehicle activity has been assumed for the Hostel:

Daily vehicle trips	10 vehicle trips per day Vans and SRV - 8 vehicle trips per day MRV - 2 vehicle trips per day
Peak hour vehicle trips	2 vehicle trips per day by van or SRV

4. Cancer Care Facility

The Maggie Centre is not expected to generate any commercial vehicle activity.

5. Residential

While the residential component of the proposed development will generate commercial vehicle activity associated with residents moving into and out of the precinct, and some service vehicle activity for residents living there, this commercial vehicle activity will not be frequent nor regular, or of a level that is likely to have any significant traffic implications particularly during the AM and PM peak periods.

7. Summary

Accordingly, for the purposes of this assessment the total commercial vehicle activity generated by the proposed development is expected to comprise:

Daily vehicle trips	48 vehicle trips per day Vans and SRV - 36 vehicle trips per day MRV - 12 vehicle trips per day
Peak hour vehicle trips	14 vehicle trips per day Vans and SRV - 10 vehicle trips per hour MRV - 4 vehicle trips per hour

4. TRAFFIC

Existing Road Network

The classifications assigned to the road network serving the site by the RTA (Figure 3) identifies the following classified State and Regional Roads on the road network serving the site:

State Roads	**Regional Roads**
Mitchell Highway	Forest Rd
Forbes Rd - The Escort Way	Pinnicle Rd
	Cargo Rd

As noted in the foregoing, the proposed development site is located on the western side of Forest Rd, a classified Regional Road. The section of Forest Rd in the vicinity of the site is constructed to a two-lane rural road standard with a sealed carriageway approximately 6.5m wide between edge lines with a 500mm bitumen shoulder on each side.

The section of Forest Rd in the vicinity of the proposed development site is subject to a speed limit of 80kph, but is otherwise devoid of traffic and parking controls.

Existing Traffic Conditions

Orange City Council provided automatic traffic count data for Forest Rd south of Huntley Rd for the years 1998 and 2005. A summary of that data is included in Appendix A to this report, revealing that:

- The average daily traffic flows on Forest Rd in the vicinity of the proposed development site are in the order of 6,500 vehicle trips per day, and grew at an average annual rate of 3.9% in the period 1998 to 2005.

- The AM peak hour traffic flows are in the order of 520 vtph and grew at an annual rate of 3.0% per annum between 1998 and 2005, while the PM peak traffic flows are in the order of 600 vtph and grew at an annual rate of 3.7% between 1998 and 2007.

Weekday peak hour traffic counts at the intersections of Forest Rd with Huntley Rd, the access road serving the Country Club and the access road serving the Bloomfield Hospital were conducted on

26 May 2004 as part of a traffic study for the Orange Health Campus redevelopment proposal for the Bloomfield Hospital, and the results of those traffic counts are summarised in a report prepared by Masson/Wilson/Twiney[1]. The weekday peak hour traffic volumes at those intersections recorded by that survey are included as Appendix B to this report.

The Masson/Wilson/Twiney report also contains information on the projected post-development traffic generation potential of the Bloomfield Hospital. That report estimates that the future Bloomfield Hospital development will generate in the order of 375 vehicle trips during the AM peak period and 359 vehicle trips during the PM peak period.

Projected 2007 traffic flows on Forest Rd in the vicinity of the site, which take into account the increased traffic generation potential of the Bloomfield Hospital as a consequence of the redevelopment proposal, are included in Appendix C.

Cadia Mine Expansion Traffic Generation

Cadia Holdings Pty Ltd currently operate the Cadia Hill Gold Mine located approximately 20km south-west of the subject site. This company is currently in the process applying to the State Government to expand the mine to the north and to increase the life of the mine.

Recent discussions with the management of Cadia Holdings indicate that the expansion of the mine will not increase employee levels or traffic generated by the site. To that end, the proposed Cadia Mine expansion will not increase traffic flows along Forest Road past the hospital site.

Projected Traffic Generation Potential

An indication of the traffic generation potential of the various components of the proposed development is provided by the typical traffic generation rates specified by the RTA Guidelines[2] as follows:

Private Hospital

PVT = -14.69 + 0.69 B + 0.31 ASDS

MVT = -10.21 + 0.47 B + 0.06 ASDS

EVT = -2.84 + 0.25 B + 0.40 ASDS

[1] *Masson Wilson Twiney "Proposed Orange Health Campus Redevelopment, Bloomfield - Traffic Report" August 2006*
[2] *RTA "Guide to Traffic Generating Developments. Section 3 - Landuse Traffic Generation" October 2002*

PVT = -22.07 + 1.04 B
MVT = -12.41 + 0.57 B
EVT = -11.96 + 0.69 B

PVT - Peak vehicle trips
MVT - AM Peak vehicle trips
EVT - PM Peak vehicle trips
B - No of beds
ASDS - Average number of staff per weekday shift.

Hotel (Motel)

Daily vehicle trips	= 3 per unit
Evening peak hour vehicle trips	= 0.4 per unit

Childcare centre

AM peak period	= 0.8 vtph per child
PM peak period	= 0.7 vtph per child

Residential

Weekday peak period vehicle trips	
1-2 bedroom apartments	= 0.4 - 0.5 vtph
3-bedroom apartments	= 0.5 - 0.65 vtph

The weekday peak period traffic generation potential of the Private Hospital and Hostel incorporated in the proposed development have been calculated using the formulae incorporated in the RTA Guidelines. In this respect, because the patronage of the retail shops and gymnasium incorporated in the Private Hospital is expected to be drawn predominantly from hotel guests, and patients, visitors and the workforce of the Hospital and Hostel, the traffic generation potential of these ancillary uses is based on the workforce of these facilities only.

The traffic generation potential of the hotel, childcare centre and residential component of the proposed development are based on the typical traffic generation rates specified for those uses by the RTA Guidelines. The traffic generation potential of the Cancer Care Centre is expected to be minimal during the AM and PM peak periods.

The projected traffic generation potential of each component of the proposed development is calculated on the schedule reproduced in the following pages. The total traffic generation potential of the proposed development is:

	AM Peak			PM Peak		
	In	**Out**	**Total**	**In**	**Out**	**Total**
Private Hospital	40	10	50	20	80	100
Hotel/Motel	5	35	40	35	5	40
Childcare centre	10	10	20	10	10	20
Hostel	30	10	40	5	25	30
Maggie Centre	5	5	10	5	5	10
Residential	10	60	70	60	10	70
TOTAL	**100**	**130**	**230**	**135**	**135**	**270**

PROJECTED TRAFFIC GENERATION POTENTIAL OF PROPOSED DEVELOPMENT

Private Hospital (based on a total of 96 beds and an average of 182 staff per weekday shift	
AM Peak vehicle trips	= -10.21 + 0.47B + 0.06 ASDS
	= -10.21 + 0.47 x 96 + 0.06 x 182
	= -10.21 + 45.12 + 10.92
	= 45.83 vtph (say 50 vtph)
PM Peak vehicle trips	= -2.84 + 0.25B + 0.40 ASDS
	= -2.84 + 0.25 x 96 + 0.40 x 182
	= -2.84 + 24.0 + 72.8
	= 93.96 vtph (say 100 vtph)
Hotel/Motel (based on 80 rooms)	
PM Peak vehicle trips	= 0.4 x 80
	= 32 vtph (say 40 vtph)
Childcare centre (based on 20 places)	
AM Peak vehicle trips	= 0.8 x 20
	= 16 vtph (say 20 vtph)
PM Peak vehicle trips	= 0.7 x 20
	= 14 vtph (say 20 vtph)
Hostel (based on a total of 100 beds and an average of 10 staff per weekday shift	
AM Peak vehicle trips	= -10.21 + 0.47B + 0.06 ASDS
	= -10.21 + 0.47 x 100 + 0.06 x 10
	= -10.21 + 47 + 0.6
	= 37.39 vtph (say 40 vtph)
PM Peak vehicle trips	= -2.84 +0.25B + 0.40 ASDS
	= -2.84 + 0.25 x 100 + 0.40 x 10
	= -2.84 + 25 + 4
	= 26.16 vtph (say 30 vtph)
Cancer Care Centre	
AM & PM Peak vehicle trips	= say 10 vtph
Residential (based on a total of 114 apartments - 40 x 1-bed; 40 x 2-bed; 34 x 3-bed).	

AM & PM Peak vehicle trips	= 80 x 0.5 + 34 x 0.65
	= 40 + 26
	= 66 vtph (say 70 vtph)

That traffic projected traffic generation potential has been assigned to the road network serving the site generally reflecting the origin/destination characteristics of the surveyed traffic generation of the existing Bloomfield Hospital as follows:

To/from North 92%
To/from South 8%

Traffic Implications

It will be readily appreciated that the main traffic implications of the proposed development concern the ability of traffic that it generates to access the site via the two access roads off Forest Rd (ie the new traffic signals serving the private and public hospitals and the Finneran Rd *left out only* access). In that regard, Forest Rd is a classified Regional Road, and the function of a Regional Road such as Forest Rd is to provide access to frontage development such as the proposed development. It is unlikely that the additional traffic demand on Forest Rd as a consequence of the proposed development will have any unacceptable traffic implications for key intersections along the route.

The ability of the intersections of Forest Rd with the access roads serving the proposed development to accommodate projected post-development traffic demand can be assessed using the INTANAL traffic model, and criteria for interpreting the results of INTANAL analysis are set out on the schedule reproduced in the following pages.

The intersections of Forest Rd with the two access roads serving the proposed development (ie the new traffic signals serving the private and public hospitals and the Finneran Rd *left out only* access) were assessed using the INTANAL traffic model under projected future (2017) traffic demand, and including the traffic generation potential of the proposed development and the Bloomfield Hospital development proposal.

As noted in the foregoing, the proposed Cadia Mine expansion will not generate any additional traffic flows on Forest Road, however for the purposes of providing a conservative assessment, an additional 200 vehicle trips have been added to the through traffic flows on Forest Road during the AM and PM peak periods.

The results of that INTANAL analysis are set out in Table 4.1 (Traffic Signals) and 4.2 (Finneran Rd) revealing that both intersections operate satisfactorily under projected traffic demand. In the circumstances, it can be concluded that the proposed development has no unacceptable traffic implications.

TABLE 4.1 - RESULTS OF INTANAL ANALYSIS OF FOREST ROAD, PROPOSED PRIVATE HOSPITAL AND BLOOMFIELD HOSPITAL TRAFFIC SIGNAL CONTROLLED INTERSECTION

Key Indicators		2017 Projected Development Traffic Demand	
		AM	**PM**
Level of Service		A	A
Degree of Saturation		0.42	0.69
Average Vehicle Delay (secs/veh)			
Proposed Private Hospital (west)	L	20.5	16.6
	T	21.9	17.1
	R	23.4	22.4
Forest Road (south)	L	8.0	10.3
	T	5.0	8.8
	R	24.0	22.2
Bloomfield Public Hospital (east)	L	20.0	16.1
	T	22.4	19.8
	R	24.3	22.2
Forest Road (north)	L	4.3	4.3
	T	5.0	7.6
	R	21.6	24.5
TOTAL AVERAGE VEHICLE DELAY		**8.9**	**13.1**

SIGNALS

TABLE 4.2 - RESULTS OF INTANAL ANALYSIS OF FOREST ROAD AND NORTHERN *EXIT ONLY* ACCESS ROAD (FINNERAN ROAD)

Key Indicators	**2017 Projected Development Traffic Demand**	
	AM	**PM**
Level of Service	A	A
Degree of Saturation	0.06	0.10
Average Vehicle Delay (secs/veh)		
Proposed Private Hospital (west) L	6.3	10.8
TOTAL AVERAGE VEHICLE DELAY	**6.3**	**10.8**

NTH_2017

Criteria for Interpreting Results of Intanal Analysis

1. Level of Service (LOS)

LOS	Traffic Signals and Roundabouts	Give Way and Stop Signs
'A'	Good operation.	Good operation.
'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, 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.

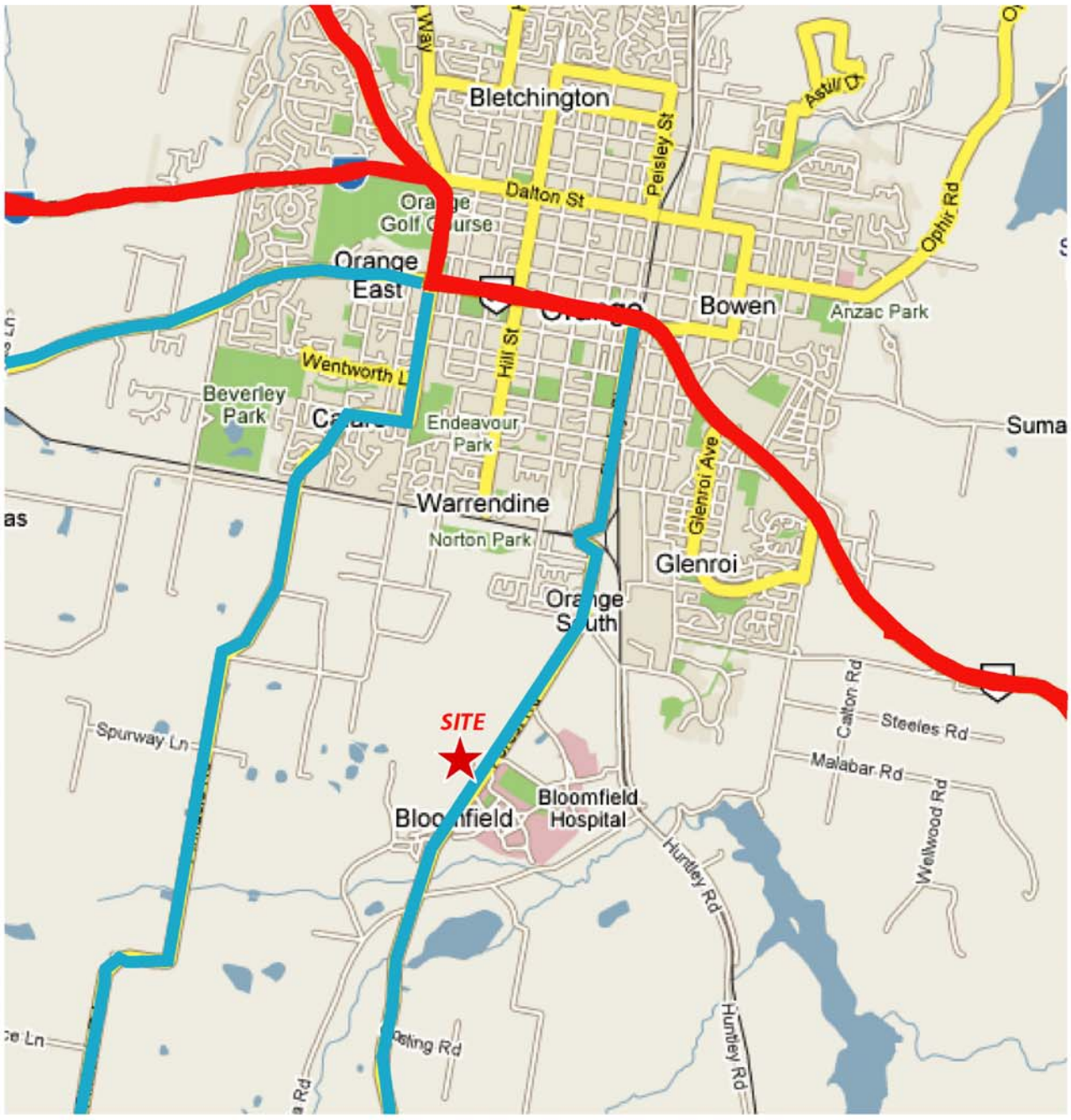
3. Degree of Saturation (DS)

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

For intersections controlled by traffic signals[3] 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.

3 *The values of DS for intersections under traffic signal control are only valid for cycle length of 120 secs.*



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ROAD HIERARCHY
FIGURE 3

APPENDIX A

AUTOMATIC TRAFFIC COUNT DATA

Forest Road, Orange
South of Huntley Road

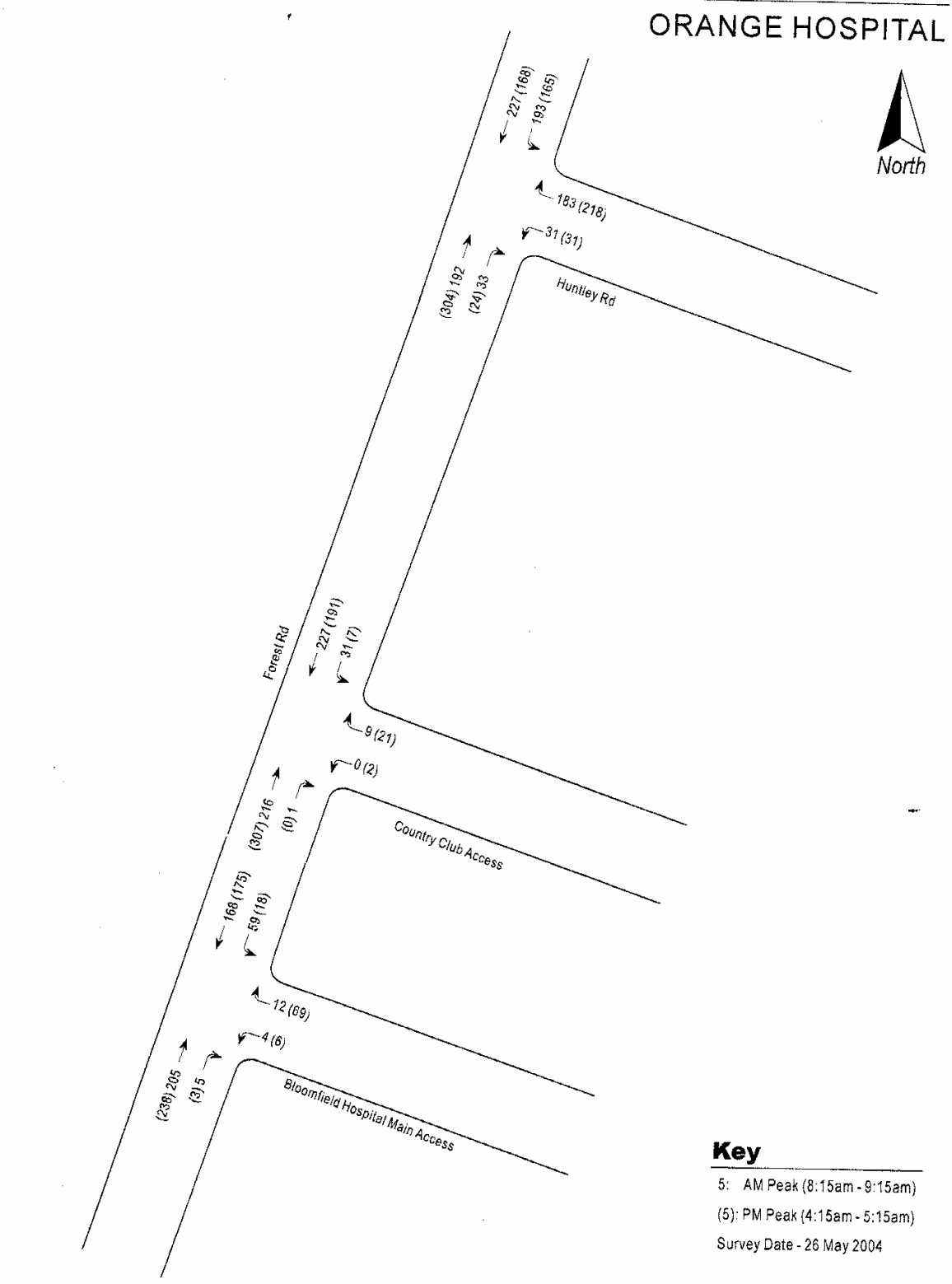
Data provided by Orange Council

	Daily	AM Peak	PM Peak	Sat	Sun
1998 (Recorded)	4601	396	437	3049	2259
1999	4780	408	453	3168	2349
2000	4967	420	470	3291	2443
2001	5161	433	487	3420	2541
2002	5362	446	505	3553	2643
2003	5571	459	524	3692	2748
2004	5788	473	543	3836	2858
2005	6014	487	564	3985	2973
2006	6249	502	584	4141	3092
2007	6492	517	606	4302	3215
2005 (Recorded)	6013	483	569	3985	2966
Annual Growth	***3.9%***	***3.0%***	***3.7%***	***3.9%***	***4.0%***

APPENDIX B

INTERSECTION TRAFFIC COUNT DATA

EXISTING WEEKDAY PEAK HOUR TRAFFIC VOLUMES



Note: Through movements for Forest St past Country club and Hospital Access were estimated from flows at Huntley Rd

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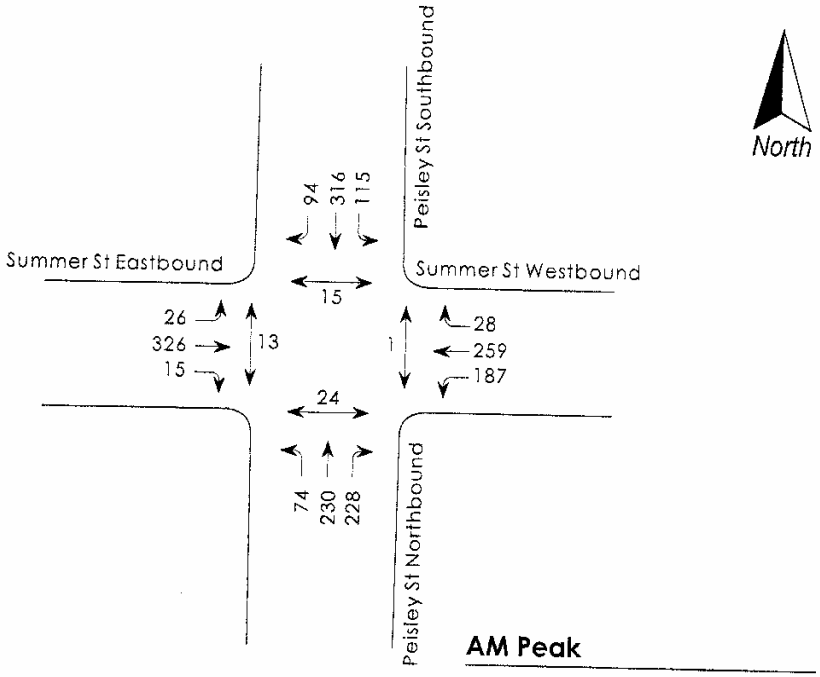
Figure 2

APPENDIX C

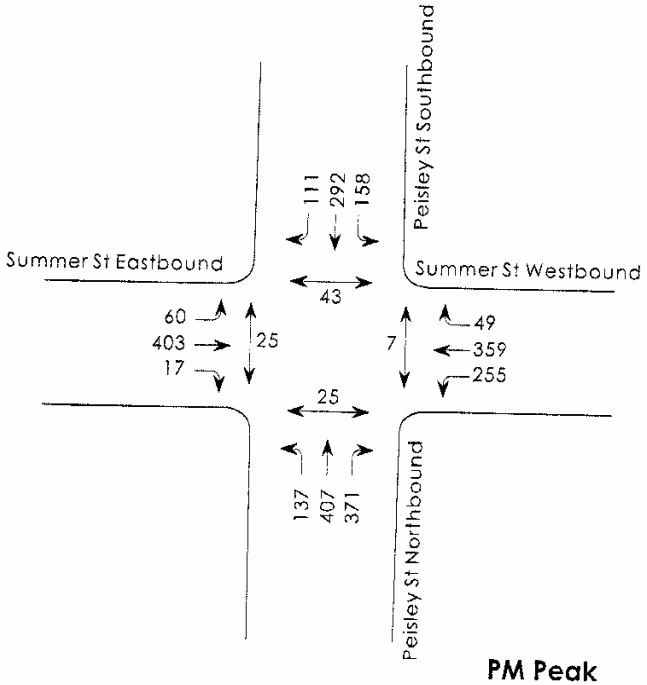
PROJECTED POST-DEVELOPMENT TRAFFIC FLOWS - BLOOMFIELD HOSPITAL REDEVELOPMENT

EXISTING PEAK TRAFFIC FLOWS - SUMMER ST/PEISLEY ST

ORANGE HOSPITAL RELOCATION



AM Peak



PM Peak

Key

5: AM Peak Hour Traffic

(5): PM Peak Hour Traffic

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Figure 3