ST VINCENTS AND MATER HEALTH
SYDNEY

TRAFFIC REPORT FOR PROPOSED REDEVELOPMENT OF JUSTINIAN HOUSE, CROWS NEST

OCTOBER 2007

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1. INTRODUCTION

1.1. Colston Budd Hunt & Kafes Pty Ltd has been engaged by the St Vincents and Mater Health Sydney to prepare a report on traffic aspects of a the proposed redevelopment of Justinian House, Crows Nest, to a medical centre/research facility. The site location is shown on Figure 1.

1.2. This report assesses the implications of the proposed development through the following chapters:-

- Chapter 2 - Describing the existing situation; and
- Chapter 3 - Assessing the implications of the proposed development.

2. EXISTING CONDITIONS

Site Location

2.1. Justinian House is located within the southern part of the block bounded by Sinclair Street, Rocklands Road, Gillies Street and Rocklands Lane. Justinian House includes residential development and medical uses. Vehicular access to the site is provided from Rocklands Road and Gillies Street. Surrounding land use is residential to the east, north and west. South of the site, located on the opposite side of Rocklands Road, is the Mater Hospital. At 3-9 Gillies Street (adjacent to the Mater Hospital) a medical centre has been approved by Council.

Road Network

2.2. The road network in the vicinity of the site includes Pacific Highway, Rocklands Road, Gillies Street and Sinclair Street. Pacific Highway is located north east of the site and provides a north-south link from North Sydney to Hornsby. In the vicinity of the site, Pacific Highway is a four to six lane divided road with additional turn lanes at major intersections. Clearway conditions apply at peak times with limited on-street parking at other times.

2.3. Rocklands Road is south of the site and provides one traffic lane in each direction with kerbside parking clear of intersections. It provides access from Wollstonecraft/Waverton in the west to the Pacific Highway in the east. The intersection of Rocklands Road with the Pacific Highway is traffic signal controlled.

2.4. Gillies Street and Sinclair Street provide one traffic and one parking lane in each direction. The intersections of these streets with Rocklands Road are priority

controlled. The intersection of Sinclair Street and Rocklands Road forms a four way intersection with the access to the Mater Hospital.

Traffic Volumes

2.5. In order to establish existing traffic conditions, counts were undertaken during weekday morning and afternoon peak periods at the following intersections:-

- Pacific Highway/Rocklands Road;
- Rocklands Road/Sinclair Street; and
- Rocklands Road/Gillies Street.

2.6. The results of the counts are set out on Figures 2 and 3 and include estimated traffic from the approved medical development and a residential development at 220 Pacific Highway. These base two-way peak hour flows on the surrounding road network are summarised in Table 2.1.

Table 2.1 :	**Base Two Way (sum of both directions) Peak Hour Traffic Flows (existing flows plus traffic from approved developments)**	
	Vehicles Per Hour (Two-Way)	
Location	**Morning**	**Afternoon**
Pacific Highway		
- north of Rocklands Road	2670	2670
- south of Rocklands Road	2550	2545
Rocklands Road		
- west of Pacific Highway	540	545
- west of Sinclair Street	370	315
- west of Gillies Street	210	190
Sinclair Street	220	140
Gillies Street		
- north of Rocklands Road	235	175
- south of Rocklands Road	170	100

2.7. Table 2.1 shows that with the approved medical centre and other approved developments in the area:-

- Pacific Highway would carry some 2,550 to 2,670 vehicles per hour (two-way) during the morning and afternoon peak period;

- Rocklands Road would carry some 200 to 550 vehicles per hour (two-way) during the morning and afternoon peak periods; traffic flows in both periods would be highest west of Pacific Highway, decreasing to the west;

- Sinclair Street would carry some 140 to 220 vehicles per hour (two-way) during the morning and afternoon peak periods; and

- Gillies Street would carry some 100 to 240 vehicles per hour (two-way) during the peak periods.

Residential Amenity

2.8. The definition of the impact on residential amenity by varying levels of traffic flow is extremely complex. Perceptions of impact vary greatly from person to person. Traffic flows that one person may find perfectly acceptable may be considered excessive by another. Impact is affected by the nature of the street and the area in which it is located, its width, building setbacks, grades, etc. as well as by the speed of traffic and the mix of cars and heavy vehicles.

2.9. The Roads and Traffic Authority has undertaken considerable research into appropriate environmental capacity performance standards on residential streets. Their "Guide to Traffic Generating Developments" defines the following environmental capacity performance standards for local residential streets and collector roads:-

- Local Roads

  - Environmental goal - 200 vehicles per hour in the peak hour;

- Maximum flow - 300 vehicles per hour in the peak hour.

- Collector Roads

  - Environmental goal - 300 vehicles per hour in the peak hour;
  - Maximum flow - 500 vehicles per hour in the peak hour.

2.10. Table 2.1 shows that with the approved medical centre, Rocklands Road (west of Sinclair Street) and Gillies Street (north of Rocklands Road) would carry traffic volumes less than the maximum goal for collector roads. In the short section of Rocklands Road, between Sinclair Street and Pacific Highway, traffic flows would exceed the maximum goal for collector roads. This exceedence is due to the traffic signals on the highway carrying traffic from the area to Rocklands Road, and to the type of land use in the area (high density residential units, hospital and proposed medical centre).

2.11. Traffic flows on Gillies Street (south of Rocklands Road) and Sinclair Street are less than the maximum goal for local streets.

Intersection Operations

2.12. The capacity of the road network is generally determined by the ability of its intersections to cater for peak period traffic flows. The surveyed intersections have been analysed using INTANAL. INTANAL produces a number of measures of intersection operations. The most useful measure provided is average delay per vehicle expressed in seconds per vehicle.

2.13. Based on average delay per vehicle, INTANAL estimate 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"	Satisfactory but 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

2.14. 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.

2.15. The INTANAL analysis found that:-

- the intersection of Pacific Highway with Rocklands Road would operate with average delays per vehicle of less than 20 seconds for both peak periods. This represents level of service B, a good level of intersection operation; and

- the intersections of Rocklands Road with Sinclair Street and Gillies Street would operate with average delays per vehicle of less than 15 seconds for both peak periods. This represents level of service A/B, a good level of intersection operation.

Public Transport

2.16. Public transport services are provided by bus services operating along Pacific Highway. Sydney Buses operates a number of services along the Pacific Highway that connect North Sydney with St Leonards, Chatswood, Lane Cove and Epping/Macquarie Park. In addition, Sydney Buses operates the 265 service along Rocklands Road past the Mater Hospital. Bus stops are located in Rocklands Road adjacent to the hospital. The 265 service connects Lane Cove with McMahons Point via St Leonards, Wollstonecraft and Waverton Stations, Crows Nest and North Sydney.

2.17. The nearest railway stations are Wollstonecraft and Waverton. Each is about one kilometre from the site. Both stations are located on the north shore rail line between Hornsby and the CBD.

2.18. In summary buses provide public transport services to the site. These bus services provide connections to major transport interchanges at North Sydney and St Leonards as well as to Wollstonecraft and Waverton stations.

Parking

2.19. A survey of existing parking demand on surrounding streets (Rocklands Road, Sinclair Street and Gillies Street) found that between 7.00 am and 4.00 pm at least 90% of on street parking was occupied (peak 100%). These results show that there is a high demand for on street parking in the area.

3. IMPLICATIONS OF PROPOSED DEVELOPMENT

The Proposed Development

3.1. It is proposed to redevelop Justinian House to provide a medical centre/research facility comprising some 3,500m^2 GFA. Parking for some 118 cars, 12 motorcycles and 10 bicycles will be provided in basement car parking beneath the new building. Vehicular access to the proposed development will be provided from Rocklands Road (car park) and Gillies Street (service area).

3.2. This chapter examines the implications of the proposed development through the following sections:-

- Public transport;
- Parking provision;
- Access, servicing and internal layout;
- Traffic effects;
- Construction management; and
- Summary.

Public Transport

3.3. As noted in Chapter 2, buses operating along Pacific Highway and Rocklands Road service the site. These provide connections to rail stations at North Sydney, St Leonards, Waverton and Wollstonecraft. The site is therefore well located to provide opportunities for staff and patients with a choice of modes for travel to the site.

3.4. The provision of increased population (staff and patients) in the area will strengthen demand for existing public transport services. This is consistent with government policy of:

(a) improving accessibility to employment and services by walking, cycling, and public transport;
(b) improving the choice of transport and reducing dependence solely on cars for travel purposes;
(c) moderating growth in the demand for travel and the distances travelled, especially by car; and
(d) supporting the efficient and viable operation of public transport services.

3.5. It is also government policy and good transport planning practice to co-locate complementary land uses. By co-locating complementary developments there is a reduction in travel between them and the ability to share facilities. The provision of the proposed medical clinic next to the Mater Hospital is a good example of co-location as patients and staff can share facilities without the need to travel long distances between them. Therefore the location of the proposed development is in accordance with government policy.

Parking Provision

3.6. In approving a medical centre (some 5,500m^2 GFA) on Gillies Street (adjacent to the Mater Hospital) Council required a provision of 167 parking spaces. 60 of these spaces were to be allocated to staff parking. The balance of parking (107 spaces), were for patient/visitor parking. This provision equates to one parking space per 33m^2 GFA with some 36% of spaces allocated for staff parking.

3.7. Based on this rate, the proposed development (with some 3,500m^2 GFA) would require 106 parking spaces with 38 spaces allocated for staff parking. The

proposed development provides 118 parking spaces with 42 spaces allocated for staff parking.

3.8. By way of comparison a review of peak parking demand at a number of medical centres in Sydney has been undertaken. The surveys found an average peak parking demand over the centres of one space per 38m^2 GFA. Application of this rate (with the proposed medical centre having some 3,500m^2 GFA) results in a requirement of some 92 parking spaces.

3.9. Thus the proposed development provides 12 spaces more than required using the same parking rate for an approved medical clinic on Gillies Street and 26 spaces more than required based on surveys of other medical centres. Furthermore the proposed development includes a higher than usual proportion of office space and ancillary facilities (such as the auditorium and meeting rooms) compared to other medical centres. This would further reduce parking requirements. These ancillary facilities would be used by the people within the building and the adjoining hospital/ clinic and thus would generate minimal additional parking. On this basis the proposed parking provision is considered appropriate.

3.10. Appropriate motorcycle (12 spaces), bicycle (10 spaces) and disabled parking will be provided in accordance with the requirements of DCP 2002.

Access, Servicing and Internal Layout

3.11. Parking for the proposed development will be provided in two basement parking levels with access from Rocklands Road. Servicing of the proposed development will occur by reconfiguring the existing service area off Gillies Street.

3.12. The parking layouts on all levels are set out in a simple and clear manner. Parking spaces, aisles, ramps etc. will be provided in accordance with AS2890.1-2004.

Stack parking spaces will be allocated for staff parking. Overall, subject to satisfactory detailed design, it is considered that the access arrangements and layout of parking areas are satisfactory.

3.13. Access to the on site parking will be controlled by boom gates. The entry boom gates will be located some 25 metres within the site providing space to accommodate four cars to queue. This distance is appropriate, being in accordance with the requirements of AS2890.1-2004.

3.14. Servicing of the site will be from Gillies Street with the existing service area to be reconfigured. This will allow service vehicles to enter and depart the site in a forward direction, an improvement on the existing situation. The number of deliveries to the site will be low (less than 10 per day, including waste management vehicles – average two per day) and consist mainly of vans and small trucks. The existing development on the site generated two to three deliveries per day. The service area has been designed to accommodate an 8.8 metre long rigid truck. The service area would be designed in accordance with the requirements of AS2890.2-2002. Overall, subject to satisfactory detailed design, it is considered that the proposed service area is satisfactory.

3.15. Deliveries to the site could be managed by a delivery management plan that would limit the time for deliveries to the site (say between 7am and 7pm) and the routes used to access the site (all deliveries via Pacific Highway, Rocklands Road and Gillies Street) to minimise impacts on the amenity of the area.

Traffic Effects

3.16. Traffic generated by the proposed development will have its largest effects during the weekday morning and afternoon peak periods when it combines with commuter traffic.

3.17. Estimates of traffic generated by the proposed development have been based on surveys of other large medical centres that provide a range of similar services. The RTA "Guide to Traffic Generating Developments" suggests that traffic generation estimates should be based on similar sites.

3.18. Surveys of traffic generation at a number of large medical centres have been reviewed. The surveys found the centres generated 1 trip per 70m^2 GFA in the morning peak period and 1 trip per 25m^2 GFA in the afternoon peak period. Application of these rates to the proposed development (having some 3,500m^2 GFA) would result in a trip generation of some 50 vehicles per hour (two way) in the morning peak period and some 140 vehicles per hour (two way) in the afternoon peak period.

3.19. The additional traffic generated by the proposed development was assigned to the road network. The resulting flows are shown on Figures 2 and 3 and summarised in Table 3.1.

Table 3.1 : Base Plus Development Two Way Peak Hour Traffic Flows

Location	Vehicles Per Hour (Two-Way)			
	Morning		Afternoon	
	Base	With Dev	Base	With Dev
Pacific Highway				
- north of Rocklands Road	2670	+25	2670	+70
- south of Rocklands Road	2550	+15	2545	+40
Rocklands Road				
- west of Pacific Highway	540	+40	545	+110
- west of Sinclair Street	370	+40	315	+110
- west of Gillies Street	210	+0	190	+0
Sinclair Street	220	+0	140	+0
Gillies Street				
- north of Rocklands Road	235	+10	175	+40
- south of Rocklands Road	170	+0	100	+0

3.20. Examination of Table 3.1 reveals that:

- traffic flows on Pacific Highway would increase by some 15 to 25 vehicles per hour (two-way) in the morning peak period. In the afternoon peak period traffic flows would increase by 40 to 70 vehicles per hour (two-way);

- traffic flows would increase by some 40 vehicles per hour (two-way) on Rocklands Road (east of Gillies Street) in the morning peak period. In the afternoon peak period traffic flows would increase by 110 vehicles per hour (two-way; and

- traffic flows would increase by some 10 to 40 vehicles per hour (two-way) on Gillies Street (north of Rocklands Road) in the morning and afternoon peak periods.

3.21. With this additional traffic, traffic flows on Rocklands Road (west of Sinclair Street) and Gillies Street (north of Rocklands Road) would remain below the maximum environmental goal for a collector road. Traffic flows on Gillies Street (south of Rocklands Road) and Sinclair Street would be less than the maximum goal for local streets.

3.22. The intersections analysed in Chapter 2 were re-analysed, with development traffic in place, using INTANAL. The analysis found that:-

- the intersection of Pacific Highway with Rocklands Road would continue to operate with average delays per vehicle of less than 20 seconds for both peak periods. This represents level of service B, a good level of intersection operation; and

- the intersections of Rocklands Road with Sinclair Street and Gillies Street would continue to operate with average delays per vehicle of less than 15 seconds for both peak periods. This represents level of service A/B, a good level of intersection operation.

Construction Management

3.23. At this stage a builder has not been appointed for the construction of the development and hence the construction methodology, process and staging have not been defined. The builder will be responsible for the preparation of the traffic management plan, which will be lodged with Council and other relevant authorities for approval prior to the commencement of construction.

3.24. Construction of the development will commence with the demolition of existing buildings, clearing of the site and excavation of the basement levels. Demolition and clearing of the site has been approved separately by Council. Construction access will be provided to/from Rocklands Road. Construction vehicles, transporting material and unwanted spoil from the site, will be loaded with material via the use of excavators. Trucks will generally enter and exit the site in a forward direction, to/from Rocklands Road. In order to minimise construction traffic on residential streets in the area, trucks will generally be required to approach and depart the site directly to/from the Pacific Highway.

3.25. During construction of the development it would be anticipated that an on-street work zone would be required on Rocklands Road adjacent to the site. The loading and unloading of construction material from trucks, associated with the overall construction activity, will be carried out either on-site or from the on-street work zone. Construction material will be stored on-site within designated material handling areas.

3.26. The pedestrian movements adjacent to the site will be maintained during the construction period. Pedestrian activity will be protected with the provision of a Class A construction fence erected around the perimeter of the site. Scaffolding and overhead protection will be provided, where required.

3.27. Openings in the construction fencing, at the construction access driveway will be managed and controlled by qualified site personnel. Pedestrian warning signs will be erected adjacent to the driveway. The movement of trucks entering and exiting the site will be managed and controlled by flagmen.

3.28. The overall principles for traffic management during construction of the development are:-

- provide a convenient and appropriate environment for pedestrians;
- minimise effects on pedestrian movements and amenity;
- provide appropriate safety fencing around the perimeter of the site;
- manage and control vehicular movements to and from the site;
- maintain traffic capacity at intersections and mid-block in the vicinity of the site;
- manage and control the on-street work zone;
- maintain existing on-street parking in the vicinity of the site;
- restrict construction vehicle activity to designated truck routes through the area (to be identified by the appointed builder);

- construction vehicles will generally enter and exit the site in a forward direction;

- construction vehicles will not be permitted to queue on-street in the vicinity of the site;

- construction activity to be carried out in accordance with the approved hours of construction;

- maintain safety for workers;

- provide convenient and appropriate access to the site for construction traffic;

- manage and control vehicle activity in the vicinity of the site; and

- the preparation of the construction traffic management plan, signage detail, control of pedestrians and control and management of construction vehicles in the vicinity of the site will be the responsibility of the appointed builder.

Summary

3.29. In summary, the main points relating to the proposed development are:-

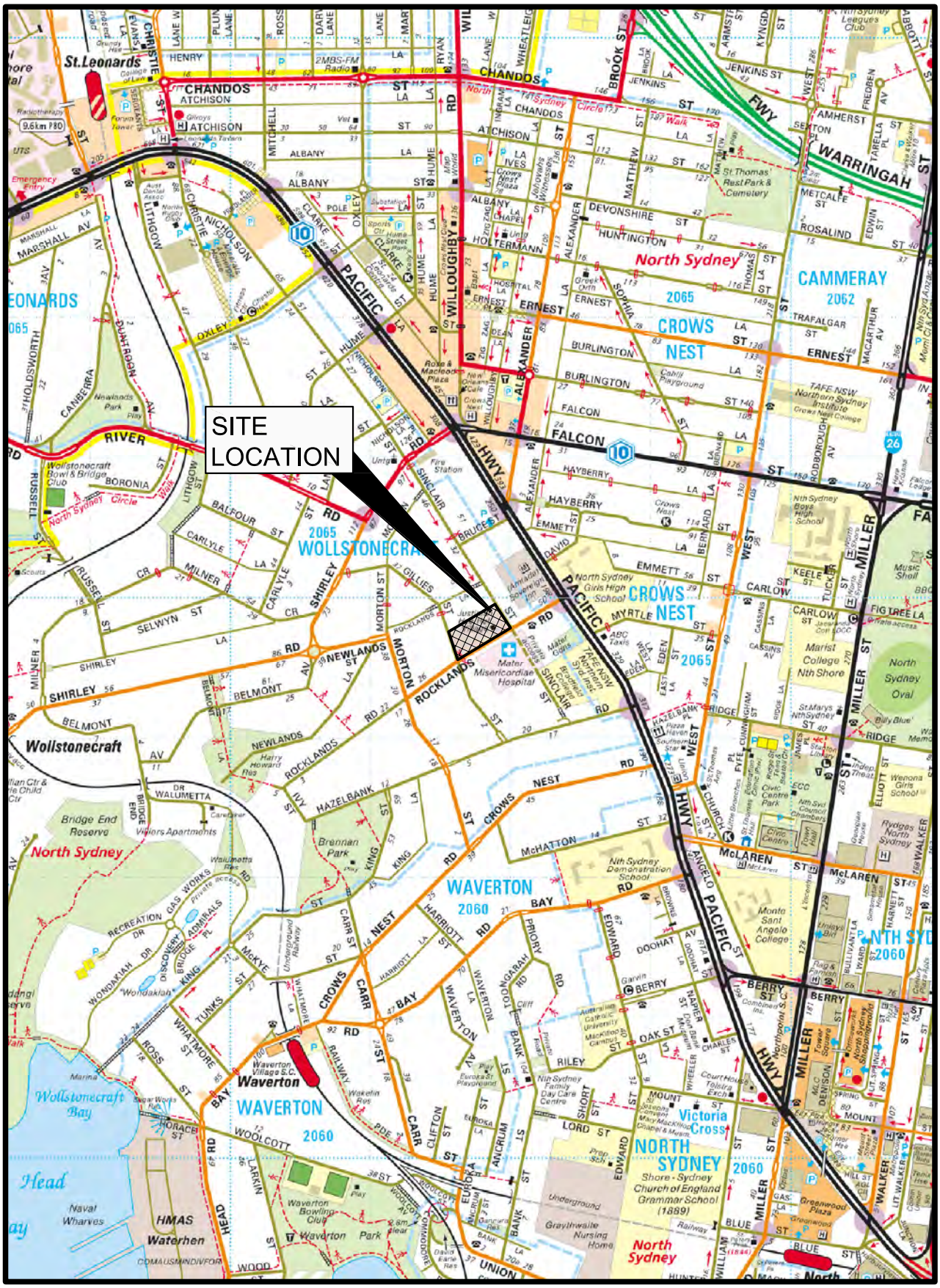
(i) the proposed development will strengthen demand for existing public transport services;

(ii) the proposed development is consistent with the state government policy of co-locating complementary developments;

(iii) the proposed parking provision is considered appropriate;

(iv) access arrangements and parking layout, subject to detailed design, are appropriate; and

(v) the surrounding road network can cater for the traffic generated by the proposed development.



LOCATION PLAN

1

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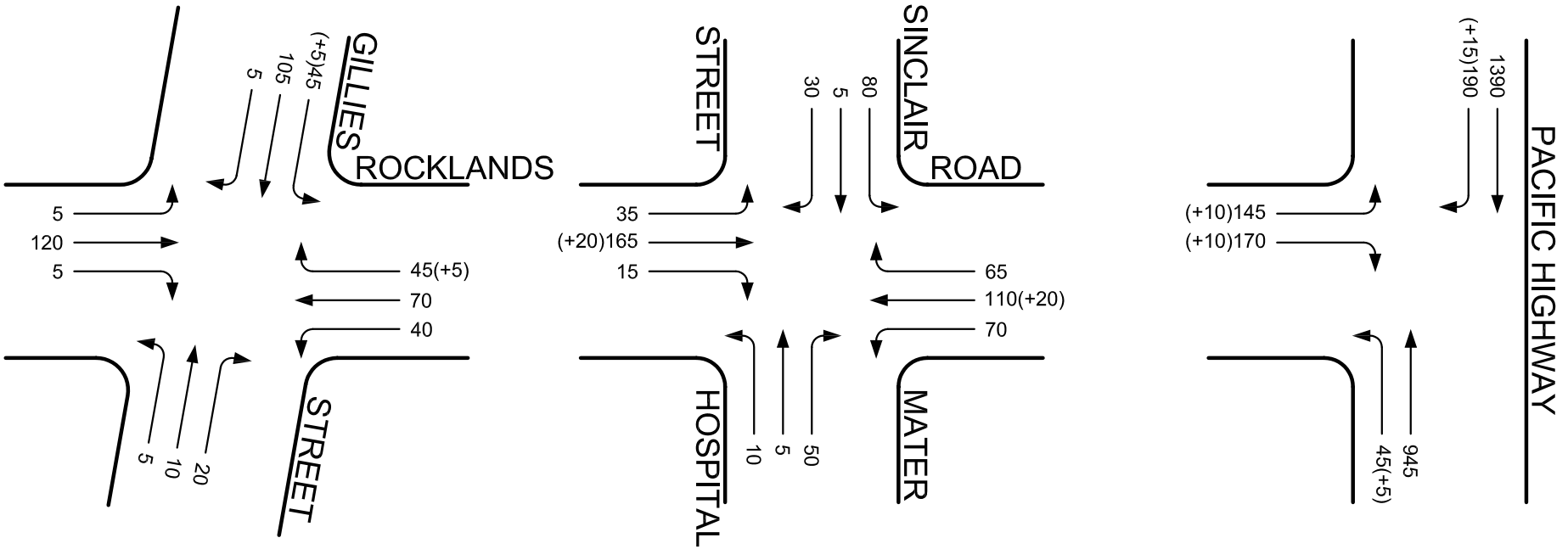

LEGEND

100 - Existing Peak Hour Flows

(+10) - Additional Development Traffic

EXISTING MORNING PEAK HOUR TRAFFIC FLOWS PLUS DEVELOPMENT TRAFFIC

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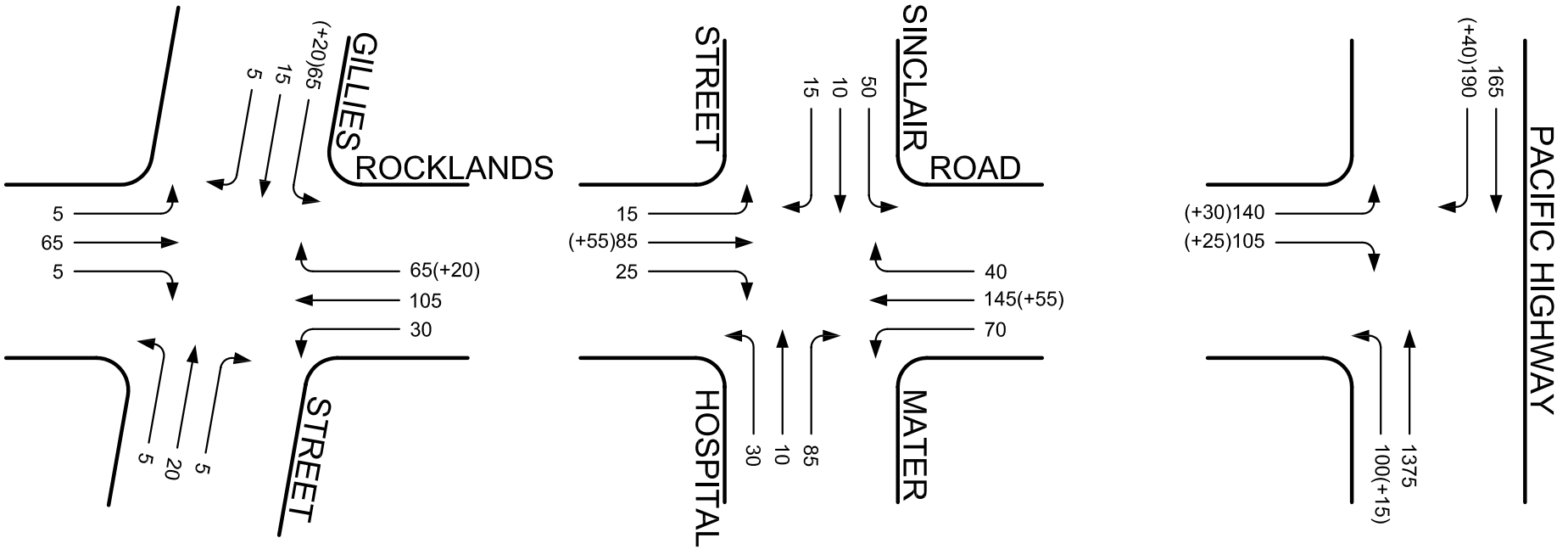
2



LEGEND

100 - Existing Peak Hour Flows

(+10) - Additional Development Traffic

EXISTING AFTERNOON PEAK HOUR TRAFFIC FLOWS PLUS DEVELOPMENT TRAFFIC

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