



- ◆ Energy Australia Conduits
- Water Mains
- ▲ Gas Valve
- Telstra Local Cable
- Connecting Water Mains
- Sewer Mains
- Nextgen Fibre
- Existing Road Access
- Potential Connection Points



**PARSONS  
BRINCKERHOFF**



**HORNSBY  
SHIRE COUNCIL**

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**Infrastructure and Services**

**Project:** Hornsby Quarry Master Plan

**Client:** Hornsby Shire Council

**Proj. No.:** 2116414A Layout Size: **A3**

GIS Proj: O:\A353-Environmental\Nov03-Oct04\Projects\2116414A - Hornsby Quarry Master Plan\GIS\Project\211641A\_2015\_infrastructure.mxd

**Date:** 16 Jun, 04

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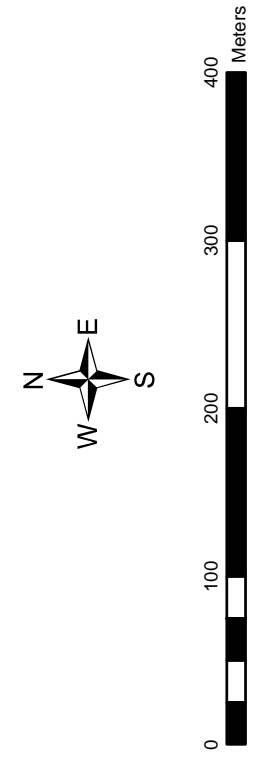
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**DWG. No.:** 2116414A\_2015

**Fig. No.:** 14.1



Study Area Boundary

Cadastre

**Topographic Contour**

— 10 meter interval

— 2 meter interval

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### **14.3.1 Gas**

The Agility plans provided show that there is an existing main that connects to the two valves east of the study area on the Pacific Highway near Coronation Street. This main appears to be an 80 millimetre nylon main with approximately 300 kilo pascals pressure at the valve. Connection of the study area to the Agility system could be done at the main and it is envisaged that at this early stage, the most suitable connection point would be at the valve location (Agility, 21 April 2004).

### **14.3.2 Electricity**

Energy Australia has stated there are no underground cables present within the study area. A connection point exists along Summers Avenue near the corner of Ferntree Close (north of the study area). There is another connection point along Dural Street (south of the study area) and also an existing point of supply into the valley between the Hornsby Leisure Centre and the Hornsby TAFE. The cabling from the point of supply in Dural Street is overhead through the valley and previously provided a supply of electricity to the quarry operation. There is also a transformer that supplies a reserve in the valley. The old substation near the quarry would be recovered during subsequent use of the study area (Energy Australia, 14 May 2004, 20 April 2004).

### **14.3.3 Telstra**

Telstra drawings show there are single round conduits and aerial cables running through the study area. Aerial cables run along Pacific Highway (east), Manor Road (north), Rosemead Road (south), and around the quarry, and numerous cable jointing pits run along these roads and adjoining streets (Telstra letter, 21 April 2004).

### **14.3.4 Fibre Optic/Telecommunication**

Powertel have disclosed that there are no underground fibre optic/telecommunications cables in the study area. If required the fibre optic cable on the Pacific Highway could be used, which would require extending the underground fibre optic telecommunications cable into the quarry (Powertel, 20 April 2004).

Visionstream have stated there is a Nextgen fibre running along Pacific Highway which could be used if required (Visionstream, 22 April 2004).

### **14.3.5 Optus**

Optus drawings show Optus underground assets and cable in other utility ducts on the Pacific Highway could be used. Further advice from Optus would need to be obtained with regards to whether the existing system has capacity (Optus, 20 April 2004).

### **14.3.6 Roads and Traffic Authority**

The RTA have a pedestrian crossing asset located on the Pacific Highway between Hornsby TAFE and Hornsby Public School which may potentially be affected. It is envisaged that the key road network and intersections may also be affected with future potential vehicle movements. Traffic impacts and constraints are discussed further in *Section 15*.

### **14.3.7 Sydney Water**

The drawings from Sydney Water show sewer mains in Ferntree Close (north), alongside the Hornsby TAFE (east) and Manor Road (north) of the study area that could potentially be used. Existing water mains are located on Manor Road and Ferntree Close. A pump station is situated in Ferntree Close.

## **14.4 Access to Study Area**

There have been previous investigations with regard to the Summer Avenue road reserve to use this reserve as a potential access point to the study area. In order to use the road reserve as an access point to the study area, there could be a need to acquire a property located on the corner of Summers Avenue and Ferntree Close.

There are also existing walking tracks along the eastern side of the study area which may be used as potential road access. Potential access points into the study area are further discussed in *Section 15*.

## **14.5 Constraints and Opportunities**

### **14.5.1 Gas**

It is likely that the capacity of the existing gas main will need to be upgraded to suit future land uses.

### **14.5.2 Electricity**

The potential capacity of the existing substation and the mains may require extension and an upgrade to suit the proposed land uses. Consultation with Energy Australia has indicated that it would be necessary to install network infrastructure throughout the study area to provide an electrical supply. This would include a minimum of two, and possibly up to four, kiosk type substations and approximately two kilometres of high voltage cabling. The amount of cabling and number of kiosks would be dependent upon the final nominated land uses and factors such as the intensity of development and how and where these are grouped.

### **14.5.3 Telstra**

All of these existing aerial cables can be used. There is likely to be a need to upgrade and extend the existing system to suit the nominated land use.

### **14.5.4 Fibre Optic Telecommunication**

If required the Nextgen fibre is available for connection the underground fibre optic/telecommunications cable into the quarry would need to be extended.

### **14.5.5 Optus**

Possible constraints include an upgrade of the system to suit the future nominated land use.

### **14.5.6 Sydney Water**

The capacity and pipe size of the existing sewer and water mains will require upgrading and may include extension and amplification of the existing system. Sydney Water recommends that a *Section 73* certificate should be submitted in order for a detailed water and sewer investigation to determine the suitability of these connection points.

The constraints that are envisaged for all of the utilities are that the existing infrastructure may require upgrade and extension to cope with any future land use. In terms of sewer and water mains, there is a possibility that a pump may be required as the sewer main may not be on gravity feed. All authorities will need to be consulted again once the land use has been determined.

## **14.6 Management Measures and Principles**

The final service and utility requirements would depend on the ultimate land use that is proposed in the master plan. An assessment needs to be made to ensure that the level of service (LOS) proposed is sufficient to meet the demands of the proposed land uses.

Any proposed services and utilities would need to meet the requirements of each respective authority.

Other constraints that may affect the upgrade and expansion of the existing services and utilities is the steep slopes, the location of heritage items, the significant Glen Forest, and the uncontrolled fill on the study area.

The design, location, and installation of services and utilities, should also consider preservation of sensitive areas of the study area and be integrated in a manner that minimises impact to the surrounding environment.



## **14.7 Summary**

The study area is surrounded by a range of urban services and utilities. Final service and utility requirements will depend on the outcomes of the master planning process and the level of service required to support the proposed land use. All services and utilities will require extending and/or upgrading to accommodate future land use. All authorities will need to be consulted once the development concept has been identified via the master planning process.

## 15. Traffic and Transport

### 15.1 Introduction

This section outlines the issues and constraints relating to traffic and transport, with an emphasis placed on the local road network and intersections in the Hornsby town centre.

### 15.2 Methodology/Approach

In 2003, PB was commissioned by Hornsby Shire Council to model and calibrate traffic intersections in the Hornsby town centre. This traffic modelling analysis was completed in May 2004. PB used the traffic model and updated it to include the study area. This assisted the core task of traffic assessment and understanding the impacts of the study area on the immediate area, including the Pacific Highway.

The traffic and transport approach and methodology is shown in *Table 15.1*. Existing traffic data was collected and reviewed and traffic and parking patterns surrounding the study area were identified. This provided an outline of the existing traffic and transport opportunities and constraints for the study area. Tasks included:

- identification of capacity constraints at key intersections;
- identification of public transport, pedestrian and cyclist constraints and opportunities; and
- assessment of development potential of the study area.

Once a master plan has been identified, the following tasks will be undertaken to determine the transport impacts that are expected on the immediate area:

- development of intersection model for proposed accesses to the study area;
- update Council's network model to incorporate the study area;
- traffic modelling to include the study area and associated traffic growth;
- assessment of site related and cumulative impacts from other developments within the Hornsby town centre area; and
- development of mitigation and traffic management measures for the study area.

In addition to PB site investigations, the examination of opportunities and constraints considers data from previous traffic and parking surveys and planning data supplied by Council. The investigation of quarry access routes considered information obtained through Council engineering assessments of access roads for previous quarry proposals. During this interim analysis and subsequent stages the following assumptions have been made:

- that 2003 traffic counts data sourced from Council will be adequate and therefore no further counts were conducted;
- the network model will be updated using Tmodel2 consistent with the Hornsby town centre DCP model. SIDRA modelling will be used for intersection analysis;
- only a PM peak hour model will be updated, consistent with the DCP model; and
- only the 2011 future year model will be analysed using the DCP model as the basis for assessing the proposed study area.

**Table 15.1: Traffic and Transport Methodology**

<b>Task</b>	<b>Activities</b>	<b>Outputs/Outcomes</b>
Review existing reports and background traffic information	Review relevant study reports	Finalised study area road network
	Site visits to determine critical intersections in the vicinity of proposed development.	List of critical intersections need to be analysed
	Identify study area network	
Establish existing opportunities and constraints	Assess traffic in the study area and reiterate findings of future scenarios from the existing Hornsby Traffic Model	Existing traffic and parking characteristics in the vicinity of the proposed study area
	Assess parking data in the study area	
	Asses existing public transport opportunities/constraints	Investigation of potential opportunities and constraints with regards to traffic and transport
	Assess existing pedestrian/cyclist access	
	Investigate potential access points to the study area	
	Summarise key traffic, parking, public transport/pedestrian, cyclist opportunities and constraints in relation to the proposed study area.	

## 15.3 Constraints and Opportunities

### 15.3.1 Site Access

A number of locations for possible road access to the study area have been identified. An initial analysis was undertaken to allow a consolidation of options for further analysis. The initial analysis involved investigation into feasible “launch” locations for access to the study area. Previous engineering investigations by Hornsby Shire Council assisted in assessment of the feasibility of access “launch” locations.

It is recommended that two access routes be provided, preferably allowing access to both the south and north. Providing two access routes is important to allow provision of adequate escape routes for emergency events, such as bushfire. In addition the provision of north and south access routes will have an impact on the viability of any bus services to the study area as a loop service focusing solely on the study area is unlikely to be viable.

The main access points to the study area are currently via Quarry Road, which is a sealed private road in reasonable condition that does not have kerb and guttering along much of its length.

Two existing access points are located on Quarry Road. The southeastern portion of the study area is currently accessed from a gated entrance off Quarry Road. This entrance provides vehicular access along an off-road track which is currently a steep bushfire trail. This track continues through the study area until eventually arriving at Bridge Road near the Hornsby TAFE. A second gated access to the south of the study area near the crushing plant is located at the end of Quarry Road.

Hornsby Shire Council has previously undertaken a number of access investigations. These investigations took place in 1984 and 1991 as part of proposals to provide playing fields on the eastern fill area of the study area. Further engineering analysis of alternative access points to the quarry by Council in 1997 configured five access road designs using three different access points.

The 1984 and 1991 proposals for playing fields on the eastern fill area assumed access from Dural Street via Quarry Road. The 1997 investigation analysed three access points located at:

- Bridge Road just north of the existing Hornsby TAFE;
- Pacific Highway, south of the Hornsby Pool opposite Coronation Street; and
- Pacific Highway, between Hornsby Pool and Hornsby TAFE.

These designs showed that it is possible to provide site access at these locations under the following road design assumptions:

- maximum grade of 15 percent (may require further investigation of suitability in the context of site condition characteristics, i.e. this grade may not be suitable for heavy vehicles depending on the severity of turns etc);
- minimum radius curve of 45 metres; and
- design speed of 50 kilometres per hour.

As part of PB's analysis of access locations seven potential access points were investigated. These road access options are shown in *Figure 15.1*. They are described as follows:

- **Option A:** Existing accesses via Quarry Road - traffic from these access points could be either directed to an upgraded Dural Street/Pacific Highway intersection or be encouraged to use Frederick Street and William Street by reducing turning options at the Dural Street/Pacific Highway intersection. These accesses involve an existing right of way over privately owned land which presents a considerable constraint to public access.
- **Option A1:** Access point to the south of the study area, by formalising public access along Quarry Road to access the study area at the location of the former crushing plant. The current right of way does not apply to public access and a publicly dedicated road to replace the current right of way is required.

- **Option A2:** Access point to the southeast of the study area by formalising the existing southern pedestrian access on Quarry Road to the eastern fill area. This access requires acquiring property and formalising a reasonably steep access road onto an existing unsealed road. The current right of way does not apply to public access and a publicly dedicated road to replace the current right of way is required.
- **Option B:** A new link located south of the Hornsby Pool opposite Coronation Street. The topography to the rear of the pool down to the study area is extremely steep at this location, however Hornsby Shire Council Plan No 428.36 sheets 1 and 8 show that by beginning the road descent from the Pacific Highway, the length of the access road can be reduced to around 370 metres before reaching the desired level within the study area, (the access road reaches the desired levels without impinging on developable area). This option may have significant vegetation and heritage impacts.
- **Option C:** A new link located north of Hornsby Pool between the pool and the Hornsby TAFE. Currently this area contains two driveways to the rear of the pool, to the Hornsby TAFE and to a small playground.
- **Option D:** Extending Bridge Road at Hornsby TAFE - the section of existing road loops around behind the Hornsby TAFE is extremely steep at approximately 20 percent grade, is signposted 30 kilometres per hour. Hornsby Shire Council Plan No. 428.36 sheets 4 and 9, does not consider use of the road leading to the Hornsby TAFE, and indicate that significant infrastructure works would be required to allow suitable vehicular access at this location (with some 25 metres of fill required in some sections). This access point would require a steep access road, which could generally follow the contours and run behind the Hornsby TAFE property. However, this access is likely to be inadequate to service the study area due to grade constraints. Property acquisition would also be required.
- **Option E:** Extending Fern Tree Close/Summers Avenue - this may be an option for provision of an access point to the north. This would involve significant infrastructure investment to extend Summers Avenue to create a linkage between the study area, Fern Tree Close, Silvia Street and Summers Avenue. In network terms an access at this point would have the least impact on existing operations. The access would continue south from Silvia Street. Possible access points exist to the north of the study and involve extending Summers Avenue. This would require acquiring property.
- **Option F:** A possible access point to the north of the study area which would use the existing, Summers Avenue road reserve. To use this reserve road, there would be a need to acquire a property located on the corner of Summers Avenue and Ferntree Close.
- **Option G:** A possible access point is by extending Rosemead Road into the Hornsby Quarry. This will require detailed investigation related to traversing an ecological/sensitive area, acquiring property and managing impacts related to directing increased traffic circuitously through a local residential street network.

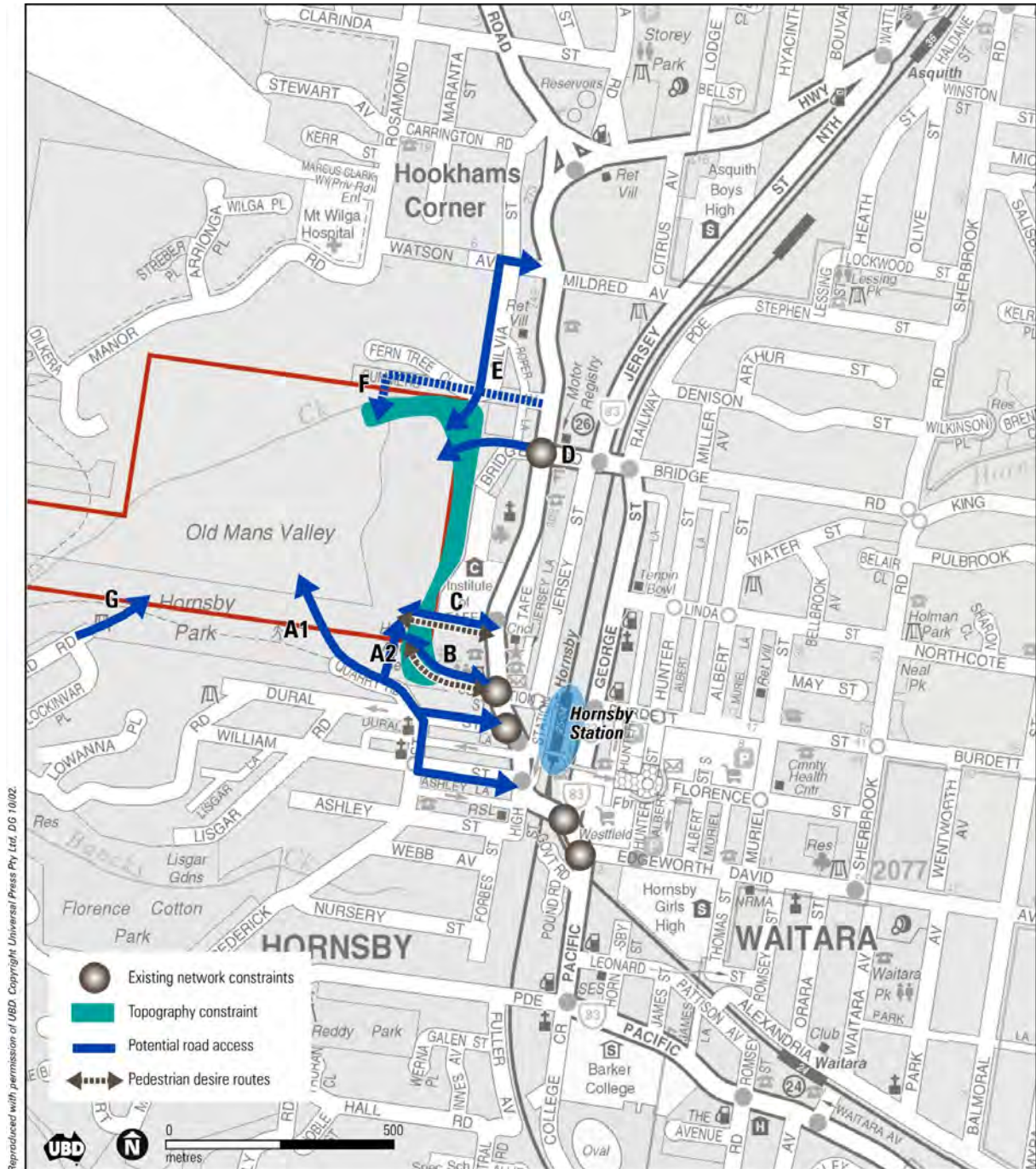
Future land uses and development would require public roads to be constructed inside and outside of the study area. Lands would need to be acquired in order to provide public road access. Topographic and ecological sensitivities restrict opportunities for new public road access. With any of these options, dedication of new public road is required that would require property acquisition.

**Table 15.2: Site Access Assessment**

<b>Access Option</b>	<b>Strengths</b>	<b>Weaknesses</b>
Quarry Road (Option A1 and A2)	<ul style="list-style-type: none"> <li>▪ Existing infrastructure is in place up to study area boundary;</li> <li>▪ There is an existing road alignment within the study area (potential for use has not been investigated);</li> <li>▪ Good exit location in terms of existing network constraints and proximity to activity centres;</li> <li>▪ Favourable topography in comparison to other options;</li> <li>▪ Location in terms of pedestrian and cyclist access to Hornsby railway station and town centre;</li> <li>▪ Southern option for study area access; and</li> <li>▪ Existing network constraints are easily overcome (traffic could be diverted via Frederick Street reducing impacts on Pacific Highway between Coronation and William Street).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Quarry Road is privately owned and crosses right of way land. Requires property acquisition;</li> <li>▪ Dural Street intersection congested. Intersection upgrade required or network changes would be required to force exit via Frederick and William Street; and</li> <li>▪ Quarry Road/Dural Street intersection would require upgrade.</li> </ul>
Link to the south of the Hornsby Pool (Option B)	<ul style="list-style-type: none"> <li>▪ Connection directly to Pacific Highway favoured over Dural Street;</li> <li>▪ Connects to existing intersection with Coronation Street that is due for upgrade in the near future anyway;</li> <li>▪ Provides most direct link between study area and activity centres for vehicles, pedestrians and cyclists;</li> <li>▪ Link could begin a significant distance from the study area boundary allowing descent into the study area earlier thereby reducing steep gradients; and</li> <li>▪ Could be integrated into any redevelopment of the existing Hornsby Pool site.</li> </ul>	<ul style="list-style-type: none"> <li>▪ No existing road infrastructure leading to the study area or within the study area;</li> <li>▪ Requires removal of parkland and women's centre;</li> <li>▪ Significant heritage and vegetation constraints; and</li> <li>▪ Exit point could contribute to traffic problems evident on Pacific Highway between Coronation Street and William Street.</li> </ul>
Link to the north of the Hornsby Pool (Option C)	<ul style="list-style-type: none"> <li>▪ Requires no property acquisition, link past Hornsby Pool is currently a driveway;</li> <li>▪ Link could begin a significant distance from the study area boundary allowing descent into the study area earlier thereby reducing steep gradients; and</li> </ul>	<ul style="list-style-type: none"> <li>▪ No existing road infrastructure leading to the study area or within the study area;</li> <li>▪ Likely to require a large amount of vegetation removal for construction including significant</li> </ul>

Access Option	Strengths	Weaknesses
Bridge Road (Option D)	<ul style="list-style-type: none"> <li>▪ Could be integrated into any redevelopment of the existing Hornsby Pool.</li> <li>▪ Existing road alignment in place (however unlikely to be sufficient);</li> <li>▪ Road infrastructure exists near to study area boundary;</li> <li>▪ Provides direct traffic access to George Street relieving the Pacific Highway to the south of Bridge Road; and</li> <li>▪ Northern option for access.</li> </ul>	<ul style="list-style-type: none"> <li>trees; and</li> <li>▪ Exit point would contribute to traffic problems evident on Pacific Highway between Coronation Street and William Street.</li> <li>▪ Steep topography requiring significant cut and fill during road construction;</li> <li>▪ Existing Bridge Road at Hornsby TAFE is at a dangerous grade, marked 30 kilometres per hour;</li> <li>▪ Existing network constraints at Bridge Road/Pacific Highway intersection with little scope for civil improvements; and</li> <li>▪ Property acquisition required.</li> </ul>
Link Summers Avenue and Fern Tree Close/Silvia Street (Option E)	<ul style="list-style-type: none"> <li>▪ Good location in terms of network capacity impacts; and</li> <li>▪ Northern option for access that avoids the Bridge Road/Pacific Highway intersection.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Extremely steep topography may require construction of elevated structures or property acquisition;</li> <li>▪ Will requiring removal of significant vegetation;</li> <li>▪ Impacts on existing quiet residential streets; and</li> <li>▪ Property acquisition required.</li> </ul>
Summers Avenue (Option F)	<ul style="list-style-type: none"> <li>▪ Good location in terms of network capacity impacts; and</li> <li>▪ Northern option for access that avoids the Bridge Road/Pacific Highway intersection.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Will requiring removal of significant vegetation;</li> <li>▪ Impacts on existing quiet residential streets; and</li> <li>▪ Property acquisition required.</li> </ul>
Rosemead Road (Option G)	<ul style="list-style-type: none"> <li>▪ Good exit location in terms of existing network constraints and proximity to activity centres;</li> <li>▪ Favourable topography in comparison to other options; and</li> <li>▪ Southern option for study area access.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Will requiring removal of significant vegetation;</li> <li>▪ Impacts on existing quiet residential streets; and</li> <li>▪ Property acquisition required.</li> </ul>

The initial assessment and on-site investigation provide seven suggestions for access to be examined as part of the modelling analysis undertaken in conjunction with the master planning process. The modelling analysis will determine the road network suitability and flexibility of the development scenario outlined in the master plan.

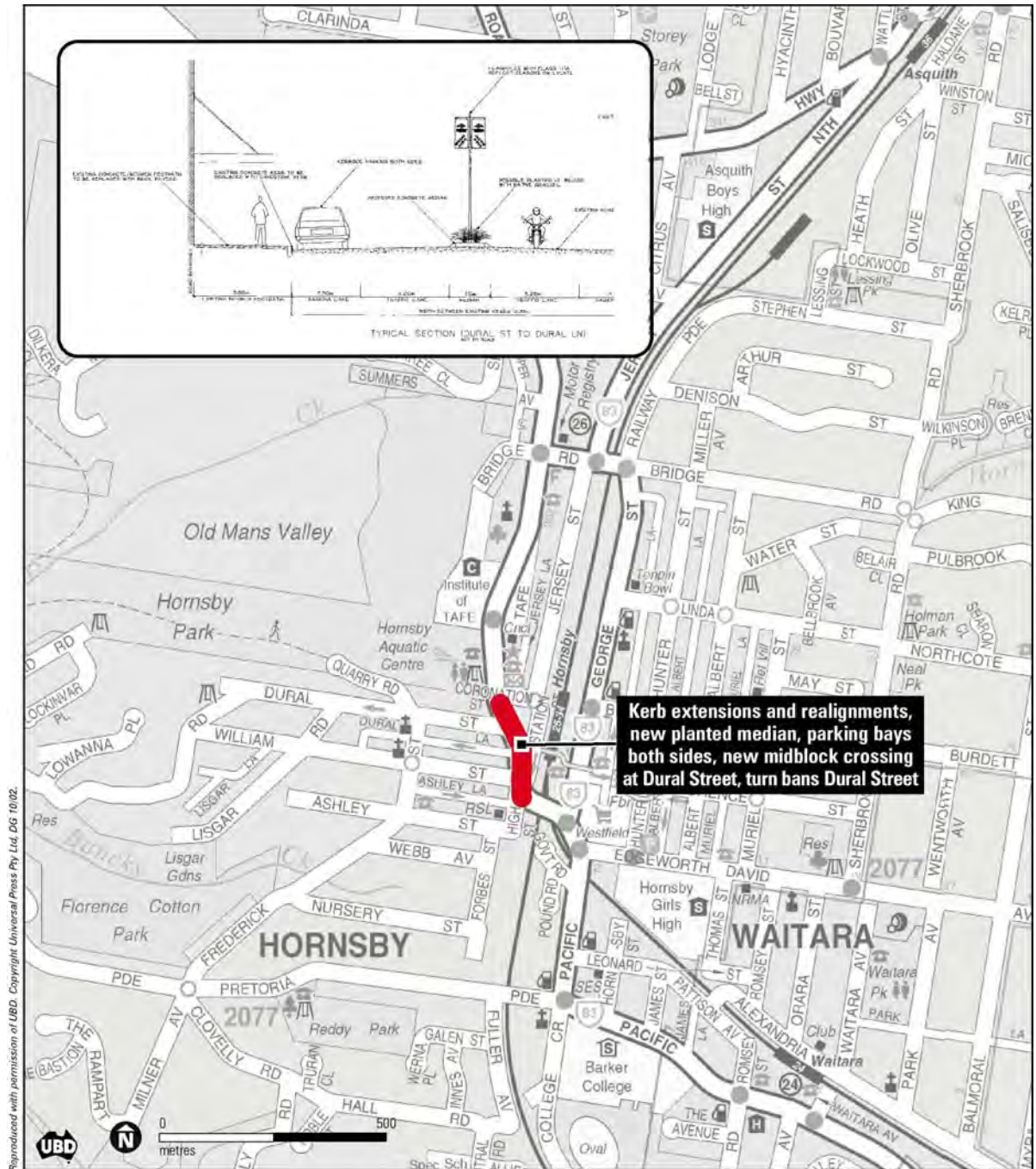


**Figure 15.1: Network Opportunities and Constraints**

### **15.3.2 Traffic Issues**

Hornsby Shire Council is proposing to introduce a number of traffic calming measures along the Pacific Highway north of the rail overbridge, within the area shown in *Figure 15.2*. The calming would comprise one traffic lane and an associated parking lane in each direction, a new concrete median, some kerb realignment, kerb extensions, paving and a new mid-block pedestrian crossing, as well as some additional traffic management treatment. The objective of the proposed works is to make this section of the Pacific Highway (the “old town centre”) more pedestrian friendly. The works are also likely to have the secondary effect of reducing traffic flows on this section of Pacific Highway by diverting through traffic to the bypass route (George Street).

The proposed traffic calming treatments may, however, be contrary to the objective of providing access to the study area. The plan to reduce the capacity of the Pacific Highway from four lanes to two lanes may impact the study area’s capacity for future land uses and development.



**Figure 15.2: Hornsby Shire Council-Proposed Traffic Calming**

## 15.4 Traffic Analysis

### 15.4.1 Hornsby Model

#### *Road Network*

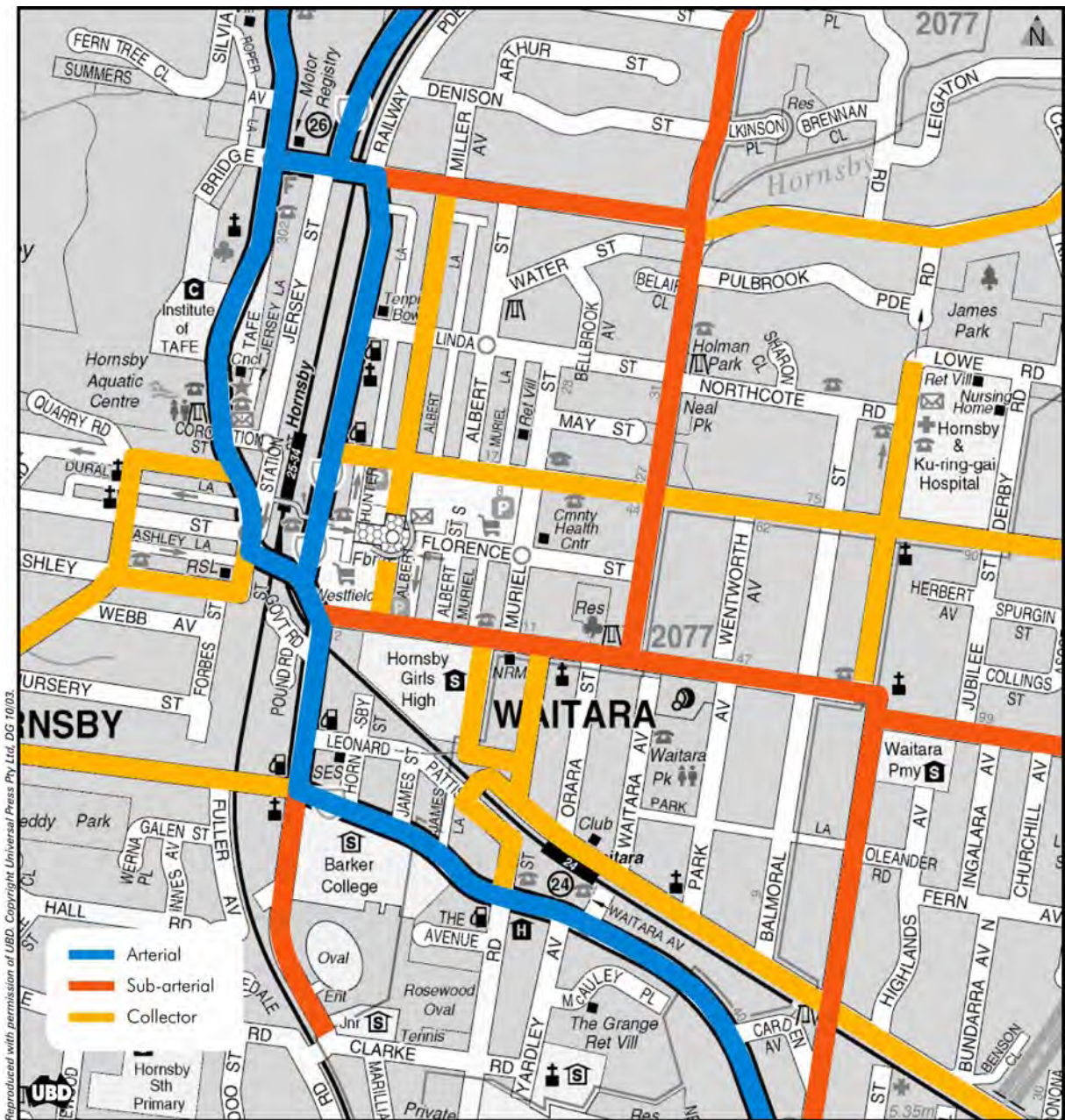
The existing road network surrounding the study area is shown in *Figure 15.3*. For traffic management purposes, the RTA defines a four level road hierarchy according to the function each road performs. The four road types comprise arterial, sub-arterial, collector and local roads, with decreasing order of importance for traffic efficiency and increasing emphasis on local amenity. These roads provide the following functions:

- *arterial roads* - these predominantly carry through traffic from one region to another, forming principal avenues of communication for urban traffic movements;
- *sub-arterial roads* - these typically connect arterial roads to areas of development or carry traffic directly from one part of a region to another; they may also relieve traffic on arterial roads in some circumstances;
- *collector roads* - these connect sub-arterial roads to the local road system in developed areas; and
- *local roads* - these are the sub-divisional roads within a particular developed area, and are used solely for local access.

This classification system was devised to provide a consistent basis for the development of regional and local traffic management strategies to support land use development plans. The current road hierarchy in the vicinity of the study area comprises the following elements:-

- *arterial roads* - Pacific Highway, George Street/Jersey Street North;
- *sub-arterial roads* - Bridge Road, Sherbrook Road, Edgeworth David Avenue, Ingram Road/Myra Street, College Crescent;
- *collector roads* - Alexandria Avenue, Thomas Street, Romsey Street, Burdett Street, Hunter Street, King Road, Palmerston Road, Dural Street, Ashley Street, Frederick Street; and
- *local roads* - all other streets within the study area not listed above.

The current road hierarchy is shown in *Figure 15.3*.



**Figure 15.3: Existing Road Hierarchy**

The Pacific Highway is the main north-south route through the study area, serving as a primary gateway to Sydney. To the south, the Pacific Highway provides direct access to Chatswood and the Sydney central business district. The Pacific Highway is located to the east of the study area and generally follows the alignment of the North Shore Railway Line. It is generally a six-lane divided highway. North of the Hornsby railway station, the Pacific Highway reduces in standard to a four-lane undivided road with parking on either side. It has a sign posted speed limit of 60 kilometres per hour.

North of the Hornsby railway station, George Street functions as an alternative north-south route to the Pacific Highway on the eastern side of the railway line. To the south it intersects with the Pacific Highway near the southwestern corner of the main retail core, to the north it intersects with the Pacific Highway near Asquith railway station. George Street is generally a four-lane undivided road except for a short section adjacent to Westfield Shoppingtown where it has a central median; on-street parking is not permitted along the entire length of George Street except on the eastern side adjacent to Westfield Shoppingtown. It has a sign posted speed of 60 kilometres per hour.

Bridge Road is generally a four-lane undivided sub-arterial road. It is sign posted at 60 kilometres per hour. The section of Bridge Road in the vicinity of the railway line does not permit on-street parking on either side. The sections east of George Street and west of the Pacific Highway are line-marked as a two-lane road and are wide enough to permit on-street parking on both sides.

### *Current Traffic Flows*

In March/April 2003, Council commissioned counts at a number of key intersections within the Hornsby town centre, including the environs of the study area. These counts were then converted into link volumes at a number of locations relevant to the study area. The resulting link volumes are shown in *Table 15.3*.

**Table 15.3: Summary PM Peak Hour Traffic Volumes at Key Locations**

Location	NB/EB <sup>(1)</sup>	SB/WB <sup>(2)</sup>	Total 2-Way
Pacific Highway, North of College Crescent	1,467	1,527	2,994
Pacific Highway, North of Coronation Street	696	567	1,263
Pacific Highway, South of Bridge Road	689	556	1,245
George Street, South of Bridge Road	739	625	1,364
Bridge Road, East of Pacific Highway	315	591	906

*Note: Traffic counts undertaken between 4.00 - 6.30pm for Thursdays over March/April 2003*

<sup>(1)</sup> Traffic movements in northerly or easterly directions

<sup>(2)</sup> Southbound or westbound traffic movements

The above table shows that the Pacific Highway carries approximately 3,000 vehicles per hour during the PM peak hour at its southern end. Further towards the northern end near Bridge Road, traffic on Pacific Highway carries in the order of 1,250 vehicles per hour, a reduction of more than 50 percent. This reduction in traffic can be attributed to the change in role that George Street has on the local road network system with George Street being promoted as the main north-south route rather than the Pacific Highway at this location.

George Street carries approximately 1,350 vehicles per hour during the peak hour while Bridge Road carries less than 1,000 vehicles per hour.

### Traffic Analysis

#### Existing Performance

Intersection analyses were undertaken at a number of key locations. The intersection analyses were undertaken using the aaSIDRA computer program. Summary intersection performance results under existing (2003) traffic conditions are detailed in *Table 15.4*.

**Table 15.4: Existing Intersection Conditions**

Intersection	Control Type	Intersection DOS	Intersection Delays (Sec)	Intersection LOS	Maximum Queue (m)
George Street/Pacific Highway	Signals	0.66	23	B	124
Jersey Street/Bridge Road	Signals	0.54	18	B	139
Pacific Highway/Bridge Road	Signals	0.81	29	C	173
Pacific Highway/Coronation Street	Priority	0.64	>>70	F	29
Pacific Highway/Dural Street	Priority	1.00	>>70	F	75
Pacific Highway/Edgeworth David Avenue	Signals	0.78	20	B	156
Pacific Highway/Pretoria Parade	Signals	1.00	45	D	290
Railway Parade/Bridge Road	Signals	0.54	31	C	147
Romsey Street/Pacific Highway	Signals	0.96	51	D	203
Sherbrook Road/Edgeworth David Avenue	Signals	1.00	28	B	156

The above table presents intersection performance measures commonly used for traffic analysis, and are defined as follows:

- *DOS - the Degree of Saturation*. The ratio of flow to capacity and represents the overall performance of the intersection. Figures above 0.95 represent unstable situations.
- *LOS - the Level of Service*. This ranges from A to F, with F meaning at least one of the legs of the intersection is severely constrained.

Table 15.4 shows that all signalised intersections currently have LOS of D or better. Further examination of the analysis results shows, however, that three of the signalised intersections have capacity constraints on one or more approaches during the evening peak hour period. These intersections are:

- Pacific Highway with Pretoria Parade;
- Pacific Highway with Romsey Street; and
- Sherbrook Road with Edgeworth David Avenue.

The DOS for these three intersections is more than 0.90, indicating capacity constraint for some movements. These intersections operating at or near capacity also have relatively long queues, in the order of 150 metres to 300 metres but on average all movements could pass through the intersections in one cycle (worse movement delay is in the order of 110 seconds which is less than the cycle time of 120 seconds). The intersections in the vicinity of the study area that are currently approaching capacity are displayed in Table 15.5 as existing network constraints.

The two priority controlled intersections are currently operating at LOS F with estimated delays of more than 70 seconds but with queue lengths of less than 100 metres. It should be noted that at priority controlled intersections the worst movement delays are reported as the intersection delays and are generally the movements from the minor stream. Detailed investigation of the analysis results revealed that at these two intersections, the critical movements experiencing the highest delays are the right turn movements from the minor stream where the hourly volumes are in the range of 20 to 60 vehicles per hour. Given that the movements with the longest delays at these two intersections have such a relatively low demand volume, and that the maximum 95 percentile queue length is less than 100 metres at both intersections under existing traffic conditions, it may not be critical if these two intersections are not upgraded.

#### *Future Intersection Performance*

In May 2004, PB completed the Hornsby Traffic Model of the Hornsby town centre for Council. The study included detailed traffic modelling at the local network and intersection level, to assess the impact of potential future developments in the Hornsby town centre.

The model assumed future developments comprising approximately 4,300 residential units and more than 100,000 square metres of commercial development. Traffic expected to be generated by these developments total approximately 3,400 vehicle trips during the evening peak hour. These proposed developments were assumed to be completed by 2011-a one percent per annum growth in regional background traffic to 2011 was included in the model. The model does not, however, include traffic impacts from any development within the study area.

As part of the traffic study, PB undertook analyses for approximately 40 intersections within and around the Hornsby town centre. The intersection analyses showed that five intersections currently operate with LOS E or worse; however, this number would increase to nine intersections under the 2011 anticipated level of development. Traffic generated by development within the study area would potentially access six of these nine intersections:

- George Street with Pacific Highway;
- Pacific Highway with Bridge Road;
- Pacific Highway with Coronation Street;
- Pacific Highway with Dural Street;
- Pacific Highway with Edgeworth David Avenue; and
- Romsey Street with Pacific Highway.

The forecast 2011 performance of these six intersections, plus performance of the other four intersections shown in are summarised in *Table 5.15*.

**Table 15.5: Forecast 2011 Intersection Performance**

<b>Intersection</b>	<b>Control Type</b>	<b>Intersection DOS</b>	<b>Intersection Delays (Sec)</b>	<b>Intersection LOS</b>	<b>Maximum Queue (m)</b>
George Street/Pacific Highway	Signals	1.02	58	E	432
Jersey Street/Bridge Road	Signals	0.81	20	B	290
Pacific Highway/Bridge Road	Signals	1.19	>>70	F	>>500
Pacific Highway/Coronation Street	Priority	1.00	>>70	F	283
Pacific Highway/Dural Street	Priority	2.00	>>70	F	>>500
Pacific Highway/Edgeworth David Avenue	Signals	1.23	60	E	>>500
Pacific Highway/Pretoria Parade	Signals	1.05	51	D	326
Railway Parade/Bridge Road	Signals	0.66	25	B	192
Romsey Street/Pacific Highway	Signals	1.24	>>70	F	>>500
Sherbrook Road/Edgeworth David Avenue	Signals	1.00	26	B	137

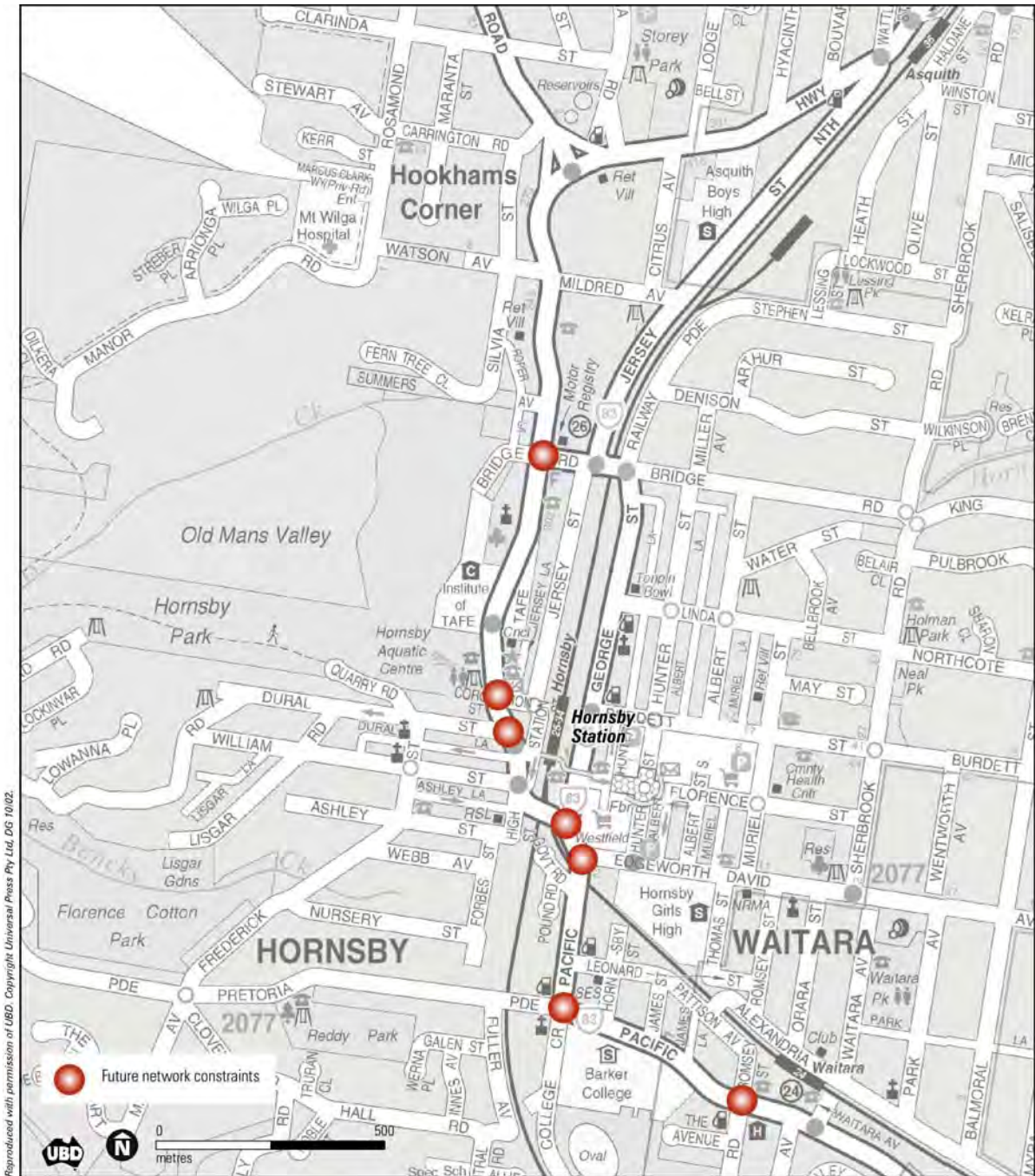
It should be noted that under future traffic conditions, some intersections may have relatively good intersection LOS but they may also have capacity constraints on one or more approaches during the evening peak hour. The intersections that are likely to be a constraint to the network in the future (2011) are displayed in *Table 15.6*. These results exclude any development within the study area.

For those intersections predicted to operate with LOS E or worse under future traffic demand, PB developed intersection improvement options to mitigate the impact of the anticipated growth in future traffic demand. Improvement options range from lane re-line marking to signalisation of priority controlled intersections. If Council approves and implements the recommended improvement options for the intersections that have LOS E or worse, then the performance of these intersections would improve to LOS D or better.

It should also be noted that although the intersection LOS can be improved by implementing PB's recommended improvement options, some of these intersections may still have capacity constraints on one or more approaches. The results are summarised in *Table 15.6*.

**Table 15.6: 2011 Intersection Performance with Recommended Intersection Improvements**

<b>Intersection</b>	<b>Control Type</b>	<b>Intersection DOS</b>	<b>Intersection Delays (Sec)</b>	<b>Intersection LOS</b>	<b>Maximum Queue (m)</b>
George Street/Pacific Highway	Signals	0.86	34	C	245
Pacific Highway/Bridge Road	Signals	0.87	31	C	190
Pacific Highway/Coronation Street	Signals	0.59	18	B	161
Pacific Highway/Dural Street	Signals	0.69	24	B	158
Pacific Highway/Edgeworth David Avenue	Signals	0.95	27	B	285
Romsey Street/Pacific Highway	Signals	0.92	46	D	221



**Figure 15.4: Future Network Constraints (2011)**

### *Parking*

There is a high demand for parking space in the area adjacent to the southeastern corner of the study area on the streets in the vicinity of the rail station and the town centre along the Pacific Highway. This parking demand is due to commuters to Hornsby railway station as well as shoppers to the town centre and users of the Hornsby TAFE and Hornsby Pool. Currently Council parking areas, located at the rear of the Pacific Highway retail area, provide three hour parking for around 190 cars, the Hornsby RSL provides a large parking station for patrons to the establishment. Additional parking areas are provided on Jersey Street (100 unrestricted and 30 by two hour spaces) and within the Hornsby TAFE complex (110 spaces).

A large amount of parking activity in the area is attributable to commuters who park-and-ride at the Hornsby railway station. Two commuter car parks on the east side of the station provide a total of 376 car spaces (232 north of the pedestrian bridge and 53 to the south), plus parking for ten motorcycles. On the west side of the station, a commuter car park for 43 cars is located south of the Pacific Highway rail overbridge.

Both car parks are full before 7.30 am in the morning. Additional commuter parking is accommodated via on-street parking, typically within 400 metres of the railway station. For this reason most of the kerbside space on William, Dural and Coronation streets are currently zoned as restricted areas to deter all-day commuter parking.

## **15.4.2 Public Transport**

### *Bus*

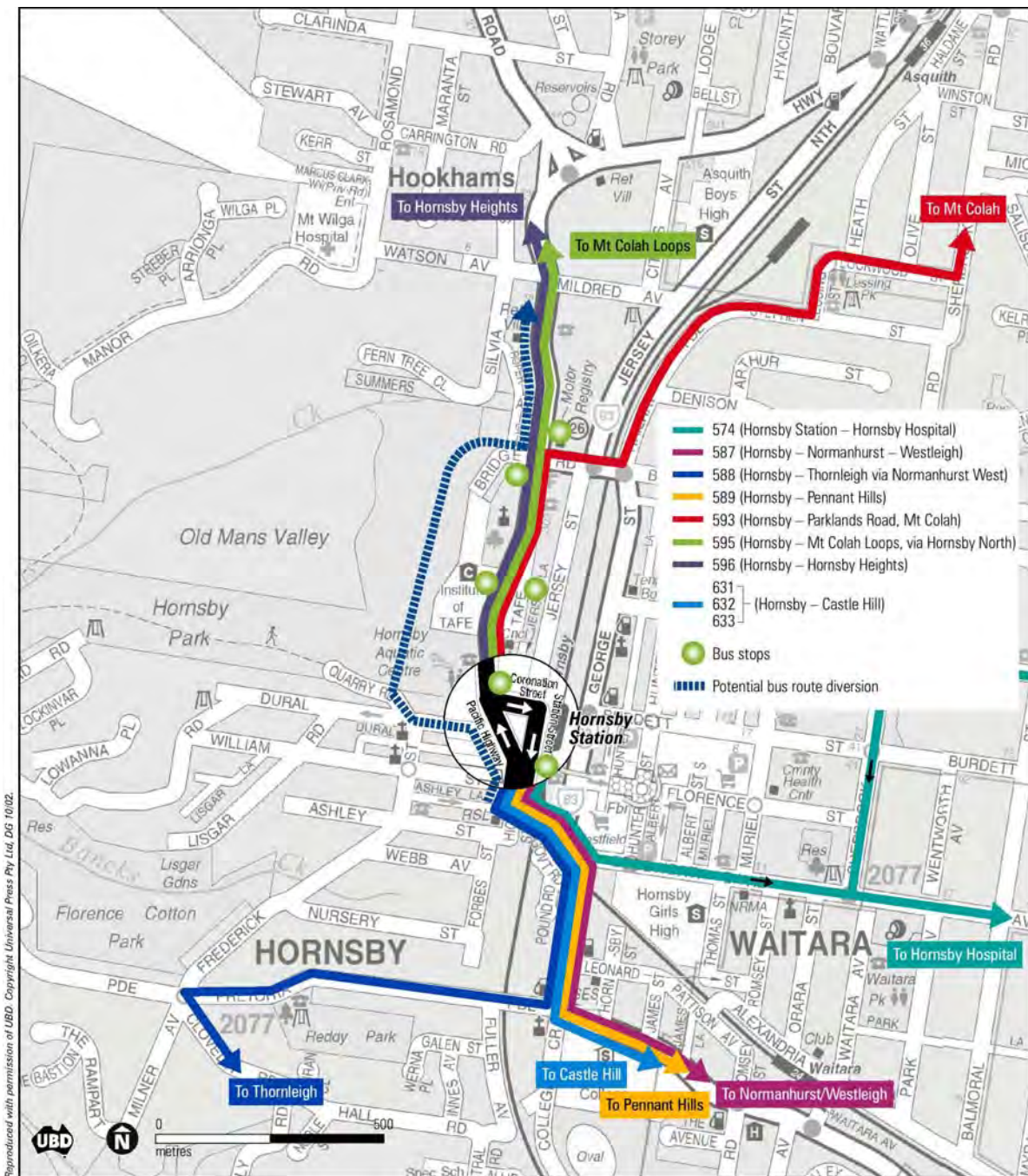
Shorelink and Glenorie Bus Company provide bus services to Hornsby railway station, as illustrated in *Table 15.7* and *Figure 15.5* with Shorelink providing the bulk of the services.

**Table 15.7: Hornsby Bus Routes**

<b>Route Number</b>	<b>Company</b>	<b>Route</b>	<b>Peak Service Level</b>	<b>Scheduled connections</b>
574	Shorelink	Hornsby Hospital	2/hour	No
587	Shorelink	Normanhurst	2/hour	No
588	Shorelink	Normanhurst West	2/hour	No
589	Shorelink	Normanhurst/Thornleigh/Fox Valley	2/hour	No
593	Shorelink	Mt Colah	2-3/hour	No
595	Shorelink	Mt Colah loops	2/hour	No
596	Shorelink	Hornsby Heights	4/hour	No
597	Shorelink	Berowra/Berowra Heights	2/hour	No
631/2/3	Glenorie	Castle Hill	2/hour	No

At present there are a number of bus stops located along the Pacific Highway adjacent to the study area. These could potentially be used by passengers for access to the study area as they pass within 400 metres of the site. The routes that serve these stops are the 593, 595 and 596 to Hornsby Heights and Mt Colah, with a total peak service level of around eight buses per hour (or average headway of around seven minutes).

Most bus routes from Hornsby operate seven days, with the exceptions 631/2/3 (no weekend services), 589 and 593 (no Sunday services). The first bus arrives in the interchange on a weekday at 5.45 am and the last bus leaves at 9.30 pm. Nightride services operate after midnight.



**Figure 15.5: Hornsby Bus Operations**

An additional bus service to the study area is not likely to be viable, though this will depend on the type of land uses, the location and configuration of any development areas, the number of any proposed dwellings and the internal access arrangement. It may be possible to divert one of the existing northbound Pacific Highway bus routes to travel through the study area (as shown in *Figure 15.5*), providing a service between the study area and the railway station, assuming appropriate northern and southern access points are provided. It should be noted that due to the study area being within the walking catchment of the railway station (dependant on pedestrian access links) it is likely that most public transport patrons would walk to the railway station rather than wait for bus services.

The Ministerial Review of Bus Services in NSW undertaken in 2004, known as the Unsworth Review, proposes some significant changes to bus services, with implications for bus services in the Hornsby area. Chief among these are proposals for 43 new strategic bus corridors linking regional centres and providing for fast, frequent bus services, with a high degree of bus priority. Strategic bus corridors would primarily provide connections to regional and sub-regional activity centres for work, shopping etc, but would also be integrated with existing transport nodes to facilitate interchange.

Four proposed strategic bus corridors could operate to Hornsby as follows:

- Hornsby to Castle Hill;
- Hornsby to Macquarie (via Thornleigh);
- Hornsby to Chatswood; and
- Hornsby to Parramatta.

It is possible these services would operate at up to ten minute headways along these corridors providing direct and efficient bus services to residents within the study area. Based on initial patronage projections by Ministry of Transport, the services (in total) could generate an additional 24 to 30 buses per hour operating to and from the Hornsby interchange.

### *Rail*

The nearest railway station to the study area is Hornsby railway station located at the junction of the Northern and North Shore rail lines, within the 800 metre catchment area (equivalent to an eight minute walk) from the study area. These rail lines provide access to the Sydney central business district within around 40 minutes via either Chatswood or Strathfield. Hornsby railway station is ranked as the 18<sup>th</sup> busiest station in terms of morning peak passengers in the CityRail network, with the most recent CityRail passenger counts (February 2002) showing some 11,200 passengers entering, and leaving the station on a weekday.

Hornsby railway station is recognised as an 'easy access' station, with lifts, ramps and stairs providing access to the station and to and from platforms. The overhead station concourse is located at the southern end of the station, approximately 70 metres north of the Pacific Highway overbridge.

There are two main access points to the railway station - on the western side of the station off Station Street (the transport interchange is located here) and on the east side of the station via lift and stairs from the commuter car parking areas; and via a pedestrian overbridge of George Street, with a ramp and stairs landing in the Florence Street pedestrian mall.

State Rail plans to construct an additional track with platform on the western side of Hornsby railway station to cater for northbound trains. The alignment of the proposed track will require reconstruction of the present transport interchange, with the interchange likely to be upgraded. This work is planned to be completed in 2007 and is expected to provide improved reliability and capacity for rail services to and from the railway station.

### **15.4.3 Pedestrians**

There are currently no formal pedestrian links to the study area. There are, however, a number of informal bush tracks. Pedestrians can also access the eastern side of the study area via the off-road vehicular track passing from Quarry Road through the study area to Bridge Road at the Hornsby TAFE.

Pedestrian access from the bounds of the study area to Hornsby railway station is good with the walk from Quarry Road being reasonably flat along existing footpaths. The estimated walking time from the southeastern corner of the study area to the railway station is around five to ten minutes. However, once inside the study area the terrain becomes steep and difficult for pedestrians.

Pedestrian access to the railway station from the study area is via an existing signalised crossing across the Pacific Highway and a zebra crossing across the bus roadway and Station Street.

The focus of walking trips for any potential residents living within the study area will ultimately be to the activity centres located within the Hornsby town centre and Hornsby railway station, both located to the southeast. For this reason it is imperative that efficient and direct pedestrian links are provided between the study area and these activity centres.

Due to the steep topography of the study area, it is recommended that pedestrian links be provided alongside road access infrastructure and also as separate direct links. Pedestrian paths alongside road access infrastructure could be provided to assist people requiring easy access (for wheelchairs, etc) to the study area. Pedestrian paths separate to road access would provide a more direct albeit steeper access, perhaps requiring stairs, to allow more efficient pedestrian links to the Hornsby town centre.

The separate pedestrian paths provided would require formal concrete stair and rail arrangements through bushland areas. For this reason safety issues would need to be addressed through design with sufficient lighting to provide a safe environment.

#### **15.4.4 Cyclists**

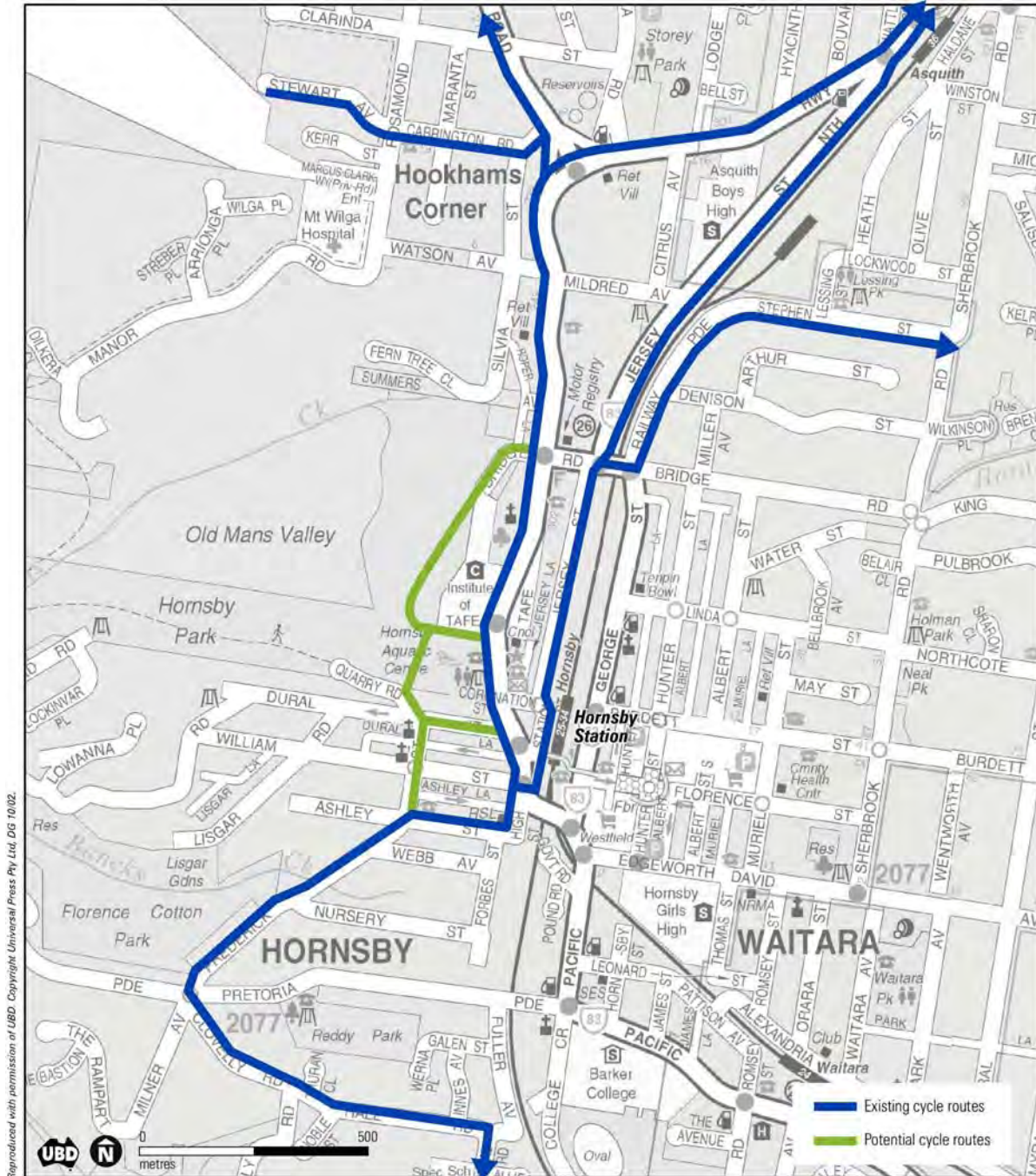
There are currently no off-street cycle tracks located within the vicinity of the study area. Cyclist routes are identified within the Hornsby Bike Plan (SKM, November 1998) with the key routes travelling along the Pacific Highway, Jersey Street and Frederick Street. *Figure 15.6* identifies existing cycle routes.

Journey to work data for the Hornsby local government area shows that in 1996 0.45 percent of trips to work were made by bicycle, in 2001 this figure had marginally increased to 0.47 percent - a low level overall. Planning for cycle facilities should however also take into account both work and recreational trips made by bicycle with the aim to increase the bicycle mode share for all trips. The Hornsby local government area is traditionally an area where the community has a close affiliation with the surrounding natural environment, and people should be encouraged to embrace the natural character of the area by way of recreational walking and cycling.

Bicycle parking racks and lockers are located at the southern end of the Hornsby railway station interchange, and at the northern end of the interchange near the Countrylink offices. There are currently few bicycles parked at the station, demonstrating that cycling is a minor access mode for commuters.

Due to the topography of the study area, it is recommended that provision for cyclists be included within the designs for road access. It is unlikely that any separate or specific cycle links could be feasibly constructed within acceptable grade guidelines.

The cycle paths should be provided as on-road cycle lanes with appropriate delineation and signage. A shared off road pedestrian and cycle facility is not recommended as it is anticipated that the winding nature (reduced sight distances) and steep grades (potentially high cyclist speeds) of any access roads may present conflict problems between cyclists and pedestrians.



**Figure 15.6: Existing and Potential Cycle Routes**

## 15.5 Management Measures and Principles

In general there are a range of broad control principles that should be followed in regard to traffic and transport management for development of the study area. Consideration of the following principles during the master planning phase will ensure effective transport management within the study area.

- provide two access routes to allow adequate escape options for emergency events such as bushfire, and to improve the viability of any bus services through the study area;
- maximise use of existing pedestrian and cycling links through effective connections to and from the study area;
- discourage private vehicle use by maximising links with the existing public transport system.
- provide a pedestrian route through either the northern or southern edge of the Hornsby Pool to the Hornsby town centre and railway station;
- encourage traffic to use William Street rather than Dural Street (should an access be provided via Quarry Road);
- recognise classification of the Pacific Highway and planned traffic calming;
- recognise existing external local area traffic network constraints when considering high traffic generating developments.
- Where possible, design access roads in accordance with Council standards, (limitations of the study area may require some deviation from standards), road access standards are:
  - ▶ maximum grade of 15 percent;
  - ▶ minimum radius curve of 45 metres;
  - ▶ design speed of 50 kilometres per hour;
  - ▶ provide for cyclists within designs for road access; and
  - ▶ provide 3.5 metre traffic lanes and one metre cycle lanes in each direction (approximately nine metre total road width).

## 15.6 Summary

The study area is located in an area of high accessibility being within walking distance of both a high quality public transport node at Hornsby railway station and a significant commercial and retail precinct focused on Florence Street. The study area is also adjacent to the Pacific Highway providing efficient vehicular access to the north and south. However, results of the Hornsby Traffic Model conducted in May 2004 (which does not take into account any future development within the study area) show that a number of intersections are currently approaching capacity and that without significant

improvements many will be operating beyond capacity by 2011. This will present significant delays for motorists. A range of improvements were provided within the Hornsby Traffic Model that would ameliorate these impacts.

For this reason it is essential that good pedestrian and cycling links are provided to encourage public transport use, walking and cycling over the use of private vehicles for access to and from the study area. The possibility of providing public transport within the study area would largely be determined by the nature, size and type of development proposed in the master plan, its potential trip generation and the configuration of internal and external access roads.

Seven access points were identified within the assessment and consist of the following options:

- existing accesses via Quarry Road;
- a new link located south of the Hornsby Pool opposite Coronation Street;
- a new link located north of Hornsby Pool between the pool and the Hornsby TAFE;
- Bridge Road at Hornsby TAFE;
- extension of Summers Avenue to provide access off Fern Tree Close and Silvia Street;
- formalise access via Summers Avenue road reserve; and
- extension of Rosemead Road.

While the modelling analysis will determine the viability of selected access locations in terms of integration within the existing network it may be that topography and cost present the most significant constraint to the study area's accessibility. In general, access points to the north of the study area are more topographically constrained. It is noted that options for access adjacent to the Hornsby Pool may be more viable should redevelopment of the study area be integrated with any redevelopment of the pool site.

## **16. Community Facilities and Services**

### **16.1 Introduction**

This section provides a review of community facilities and services, and identifies issues and constraints for the study area.

### **16.2 Methodology/Approach**

The community facilities and services review was undertaken to identify existing community facilities both in proximity to the study area and in the wider Hornsby region. Key documents reviewed have included Hornsby Shire Council's Recreational Needs Study (Manidis Roberts, 1991), Council's current *Section 94* Contributions Plan, the Hornsby Social Atlas, Hornsby Leisure Strategic Plan (Recreational Planning Associates, 2001) and Hornsby Shire Planning Districts Community Profiles.

Identification of community facilities and services including passive and active recreational, educational, health care and other community facilities was undertaken.

An analysis was then undertaken to determine whether the existing supply of community facilities and services has sufficient capacity to meet new demand or whether new facilities are required.

The process relied on the review of existing Council documentation and did not involve a community facility needs survey.

### **16.3 Community Profile**

The Hornsby Shire has a total population of 146,000 residents.

Hornsby Shire Council has prepared community profiles for planning districts within the Hornsby Shire on the basis of census data. The community profiles provide data on the demographic characteristics of the population living closest to the study area in the *Hornsby, Waitara and Wahroonga* and *Hornsby town centre* planning districts.

Data from the 2001 census indicates that approximately 22,000 people live in these two planning districts. The following statistical observations can be made about this population.

Approximately 83 percent of this population are over 15 years of age with 15 percent being over 65 years of age. About 57 percent were born in Australia and approximately 28 percent speak a language other than English.

Approximately 62 percent are Christian with 20 percent and 23 percent belonging to the Anglican and Catholic faiths respectively. Small numbers of people practice Buddhism, Hinduism and Islam.

Approximately 13 percent are school aged. More than 71 percent of infants and primary school aged children attend government schools and the remaining 28 percent attend Catholic and other private junior schools. Only 59 percent of secondary school aged children attend government schools with 41 percent attending Catholic or private high schools. The high proportion of school children attending private schools is a distinctive characteristic of this area.

Almost 55 percent of the population have completed high school and 32 percent have tertiary qualifications. Approximately 59 percent are in either full or part time employment.

Approximately 24 percent travel to work by train while more than 45 percent travel by car or motorbike. Some 46 percent of households own one car, while a further 22 percent own two cars. Nearly 17 percent of households do not own a car.

More than 60 percent of households are comprised of one or two persons. Approximately 30 percent of households have three or four persons, while about 8 percent of households are made up of 5 or more persons. The average household size is 2.4 persons.

The average weekly household income is \$1,208 which equates to an average annual household income of \$62,840. The median weekly household income is \$980.

**Table 16.1: Demographic Characteristics**

<b>Demographic characteristic</b>	<b>Hornsby Waitara and Wairoonga</b>	<b>Sydney<sup>(1)</sup></b>
% of population over 15 years of age	83.2	79.8
% of population over 65 years of age	15.3	11.9
% of population born in Australia	56.6	62
% of population that speak a language other than English	28	27
% of population that use train only as method of travel to work	23	8
% of population that travel to work by car	46	57.7
% of population with tertiary education (incl. certificates etc)	46	39
% of labour force employed	94	93
% of population employed	59	48
Median household size	2.4	2.7
Median weekly household income	\$980	\$800-\$999

The Hornsby Recreation Needs Study (Manidis Roberts Consulting, 1991) indicates that the most popular recreational activities in the Hornsby area are parklands and

playgrounds, formal gardens particularly for people aged 55 years and over. Outdoor sports facilities were also popular, particularly for persons aged under 25 years of age.

## **16.4 Active Recreational Facilities**

The eastern and southern boundaries of the study area are defined by Hornsby Park, an open space and public recreation area that is owned and managed by Council. To the east, Hornsby Park is landscaped with public toilets, playground, benches and paved pathways. To the south, Hornsby Park comprises a more informal area of parkland providing a direct connection between the Hornsby town centre and Berowra Valley Regional Park to the west.

Berowra Valley Regional Park is a natural bushland area that is protected for its biodiversity values. It is 3,830 hectares and provides a valuable habitat for native plant and animal species. The Park is jointly managed by Hornsby Shire Council and the NPWS and a community based board of trustees. It connects with the Muogamarra Nature Reserve to the north and Ku-ring-gai Chase National Park to the east thereby providing a significant regional green corridor. A series of walking tracks traverse the Berowra Valley Regional Park including Blue Gum Walk and Benowie Walking Track which interconnects with the Great North Walk and extends 250 kilometres from Sydney to Newcastle and the Hunter Valley.

Hornsby Pool, an indoor heated aquatic centre, is located within Hornsby Park. Sports ovals include James Park in Lowe Road in Hornsby which is used for hockey and cricket, Storey Park in Lodge Street in Asquith and Waitara Oval in Waitara Avenue in Waitara both of which are used for rugby and cricket.

Several other parks and pocket parks are located near the study area. Storey Park is approximately one kilometre to the northeast, providing public toilets, playground equipment and a community hall. Lessing Park is located approximately one kilometre to the east, providing public toilets and playground equipment. Florence Cotton Park and Lisgar Gardens are located approximately one kilometre to the south. Ginger Meggs Park is located to the southwest of the study area and has playground facilities.

A number of privately operated active recreational facilities serve the Hornsby area including the AMF Tenpin Bowling Centre on George Street. Several lawn bowling clubs operate in the area including the Asquith Bowling and Recreation Club on Lodge Street and the Hornsby Bowling Sports and Recreation Club on Waitara Avenue. Squash courts are located at the Waitara Squash and Fitness Centre in Waitara, which also has a gym. Other gyms are the Hornsby Power and Fitness Gym in the Westfield Shoppingtown and the Village Fitness Centre on George Street in Hornsby.

A number of active recreation and youth clubs operate including the Hornsby RSL Youth Club, Hornsby District Junior Australian Rules Football Club, Asquith Rugby Club and the Hornsby Ku-ring-gai Police Citizens Youth Club. The Guides have a hall on the Pacific Highway to the east of the study area, while the Scouts have halls in James Park in Asquith, in Reddy Park and on Pound Road in Hornsby. There is also an outdoor rifle range in Hornsby.

## 16.5 Health Care Facilities

The Hornsby and Ku-ring-gai Hospital on Palmerston Road is the nearest public hospital and provides emergency services. The Hornsby Day Surgery Centre is located near the hospital on Northcote Road. Adjoining the study area to the north is the Mount Wilga Hospital, a private health care facility entered off Manor Road.

A Community Health Centre is located in the Westfield Shopping Centre.

Hornsby Child and Family Health Centre is located on Florence Street and the Hornsby Drug, Alcohol and Gambling Service is located in Lowe Road.

## 16.6 Educational Facilities

The Northern Sydney Institute of TAFE adjoins the study area to the east and has campus buildings on both sides of the Pacific Highway. The TAFE offers courses in multimedia, graphic design, fine arts, ceramics, automotive, construction, travel and tourism, computing and business. It also has a specialist Information Technology Centre and Automotive Skills Centre.

The Hornsby region is well served by schools, particularly private and specialist schools. Schools in proximity to the study area include Barker College with a junior campus in Waitara and a senior campus in Hornsby, Abbotsleigh and Knox Grammar both with junior and senior campuses in Wahroonga, Retaval School in Wahroonga, Prouille Primary School in Wahroonga, Our Lady of the Rosary Primary School in Waitara, St Leo's College in Wahroonga, St Patrick's Primary School in Asquith, Wahroonga Adventist Primary School, Wahroonga Preparatory School and the Hornsby Ku-ring-gai Montessori School. Two special schools St Edmunds for the Blind and Visually Impaired and St Lucys for the Visually Handicapped are also located in Wahroonga.

Public schools include Asquith Primary, Asquith Girls High and Asquith Boys High Schools to the north of the study area. Hornsby South Primary School, Hornsby North Primary School, Hornsby Heights Primary School, Hornsby Girls High School, Waitara Primary School and Wahroonga Primary School to the east and Normanhurst Boys High School and Normanhurst Primary School to the south of the study area. Clarke Road Special School is a public facility for children with special learning needs.

Some of the schools have sporting fields, multipurpose courts, tennis courts and indoor halls and gyms which are hired out for community use after school hours.

## 16.7 Community Facilities

A wide range of community facilities operate in the local area.

Hornsby Shire Council's administration offices and the Council Chambers are located on the Pacific Highway immediately to east of the study area. The Hornsby Library is

located on George Street. The closest fire station is on Bridge Road. The nearest police station is located on the Pacific Highway and adjoins Council's administration offices. Post offices are located next to the police station and also in Westfield Shoppingtown. The nearest motor registry is located on the Pacific Highway to the north of the Council building. The local court is located on the Pacific Highway. A womens centre is located in Hornsby Park adjacent to Hornsby Pool.

A number of churches of different faiths exist in the Hornsby area including the St Peters Anglican Church on the Pacific Highway in Hornsby, St Johns Anglican Church in Asquith, and All Saints Anglican Church in Waitara. St Andrews and St Pauls Anglican Churches are in Wahroonga. Sau Faupula Uniting Church is located in Asquith and St Johns Uniting Church is in Wahroonga. Uniting Churches are also located in Waitara and Hornsby. Seventh Day Adventist Churches are located in Waitara and Wahroonga.

The Hornsby City North Christian Church is on Pound Road in Hornsby and Hornsby Baptist Church is on Pretoria Parade. St Patricks Catholic Church is in Asquith, Our Lady of the Rosary Catholic Church and the Holy Name Catholic Church are in Waitara and Wahroonga respectively. A Christian Brethren Assembly is located in Waitara and a Christian Science Church is located in Hornsby along with an Interdenominational Community Church. There is a Church of Christ and a Jehovahs Witness Church in Asquith. While in Wahroonga there is a Presbyterian Church and a Religious Quakers Society Church.

A number of privately operated passive recreation facilities serve the local population. Two movie cinemas operate including Greater Union in the Westfield Shoppingtown and the Hornsby Odeon an independent cinema on the Pacific Highway. The Hornsby RSL Club is located on High Street.

## **16.8 Retail Facilities**

Westfield Shoppingtown on the Pacific Highway provides more than 300 retail and specialty shops including Coles, Woolworths, Target, David Jones and Kmart. Additional retail facilities are located in the Hornsby town centre.

## **16.9 Constraints and Opportunities**

Council provides a number of community facilities and services including public works, flood mitigation, bushfire control, planning, building control and preservation, waste disposal, parks and bushland, weed control, community services, recreation and culture and public health. Council levies developer contributions on all population increasing development within the Hornsby Shire to fund the provision and maintenance of the following facilities and services:

- traffic and transport management facilities;
- open space and recreation facilities;
- library and community facilities;

- bushland and environmental works;
- civic improvements;
- stormwater drainage facilities; and
- bushfire protection facilities.

Future land uses detailed in the master plan for the study area must make allowance for a range of local facilities at a scale commensurate with the demand likely to be generated by the future land use. Alternatively, the study area could provide lands to be developed for community purposes to meet the demand for community facilities that has arisen with the rise of the local population within the Hornsby town centre. If the master plan includes the provision of community facilities or open space, consideration should be given to other forms of development that could fund the provision of facilities that provide a community benefit.

Review of the Hornsby Recreation Needs Study (Manidis Roberts Consulting, 1991) and the Hornsby Leisure Strategic Plan (Recreational Planning Associates, 2001) identifies priorities for the provision of recreational facilities within the Hornsby area. The studies indicate the area needs additional walking tracks and funding for bush regeneration. Bushland areas are in need of regular maintenance particularly walking tracks and weed control. Improved facilities for family picnics and barbeques are also required. Opportunities for pedestrian linkages through the study area via a series of well maintained walking tracks exist. There are also opportunities to develop picnic facilities within the study area to maximise opportunities for the public to experience the industrial and cultural heritage associated with the quarry.

The studies indicate there is a shortage of active recreation facilities with supply not meeting demand, particularly for sporting grounds including soccer fields and cricket ovals, tennis courts and youth orientated facilities like skateboard ramps and multipurpose courts. Accordingly, there is potential to develop the eastern portion of Old Mans Valley for playing fields and passive recreation. The study further suggests that consideration should be given to provision of an indoor sports complex to serve the Hornsby area providing activities such as basketball, aerobics, volleyball, snooker, netball and martial arts. As such, there is an opportunity for part of the study area to be developed for either outdoor sporting grounds or an indoor sports complex.

Discussions with Council staff indicate there is a shortage of community meeting spaces and childcare centres within the Hornsby town centre.

Opportunities exist for the study area to be used to address regional deficiency of active recreation and sporting facilities. Public land in Old Mans Valley could be used and developed for use as a district park or regional reserve. Funding for the provision of community facilities, open space and bushland areas should be addressed in the master plan.

## 16.10 Management Measures and Principles

The following management measures and principles should be considered in the development of the master plan:

- promote the existing linkages between the study area and the parkland within Hornsby Park;
- implement a plan of management for bushland areas in Hornsby Park and within the study area, including the urban fringes of Berowra Valley Regional Park;
- include buffer zones to reduce effects of adjacent land uses on the natural bushland setting and to preserve the recreational experience of bushland areas;
- upgrade walking tracks at Hornsby Park and Benowie Walking Track and provide for their regular maintenance; and
- promote linear links between bushland areas in Hornsby Park and parkland playground areas in Hornsby Park to maximise use of the overall system.

## 16.11 Summary

There are approximately 22,000 people living the planning districts adjacent to the study area. A range of facilities and services provide for this population. Regionally, there is a shortage of active open space facilities. The study area could be partially developed for active recreational use to address the shortage of facilities across the Shire. The study area could also be managed as open space and developed as a district park or regional reserve.

If the master plan includes the provision of community facilities or open space, consideration should be given to other forms of development that could fund the provision of facilities that provide a community benefit.

Conversely if the master plan includes commercial or residential land uses consideration should be given to the impact the development will have on the capacity of existing community facilities so that upgrades and the provision of new facilities can be funded through development contributions.



## 17. Conclusion

The land capability study identifies important issues that need to be considered during the master planning process for Hornsby Quarry and surrounding land in Old Mans Valley. Areas of high and moderate technical constraint impact the development potential of the study area and must be considered when planning for future rehabilitation and management of the study area. The technical investigations undertaken have identified issues, opportunities and constraints that impact the land use potential of the study area.

The technical volume documents the technical investigations undertaken and the issues, opportunities and constraints that impact the land use capacity of the study area. The technical volume and supporting appendices give backing to the land capability study.

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