

Proposed Residential Development
Concept Plan

**23 Bennelong Parkway,
Wentworth Point**

TRAFFIC AND PARKING ASSESSMENT REPORT

2 December 2009

Ref 09115

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1. INTRODUCTION

This report has been prepared to accompany a Concept Plan application for a residential development to be located at 23 Bennelong Road, Wentworth Point (Figures 1 and 2).

The proposed development, to be known as *Bay Park*, comprises three residential buildings on the site with a total of 601 apartments and 829 off-street carparking spaces.

The proposed development is covered by “The Waterfront” *Masterplan* for the residential development of former industrial land in the Bennelong Road area. The *Masterplan* envisages the redevelopment of lands for residential purposes with supporting retail and recreation facilities, and was approved by the Minister of Planning on 18 December 1998.

The cumulative traffic implications of the future developments proposed in this area were assessed in the *Waterfront Precinct Residential Masterplan (May 1998)* and subsequently as part of the *Sydney Olympic Park Draft Post-Olympic Masterplan (June 2001)*. A more recent *Masterplan Traffic Study*¹ was undertaken in mid 2003 and provided a detailed traffic assessment of all potential future residential, retail and commercial developments likely to be undertaken on the peninsula.

The purpose of this report is to assess the traffic and parking implications of the residential development proposal, within the context of the abovementioned *Masterplans*. To that end this report:

- describes the site and provides details of the development proposal
- estimates the traffic generation potential of the development proposal, and assigns that traffic to the road network serving the site
- assesses the traffic implications of the subject development in terms of road network capacity

¹ Project Planning Associates “*Harbourside State Masterplan - Hill Road, Homebush Bay: Traffic Report*” 16 July 2003

- reviews the geometric design features of the proposed vehicular access and car parking arrangements
- assesses the adequacy and suitability of the off-street car parking facilities to be provided on the site.





2. PROPOSED DEVELOPMENT

Site

The subject site is located on the eastern corner of the Hill Road and Bennelong Road intersection, and encompasses land on both sides of the yet to be fully constructed, Amalfi Drive. The site has a street frontage approximately 278m in length to Bennelong Road and occupies an area of approximately 25,570m².

The subject site is currently occupied by *McPhee Transport* and contains a large transport depot with an approximate floor area of 8,500m².

Off-street parking is currently provided for approximately 100 cars in an outdoor carparking area located along the Bennelong Road frontage. There are also approximately 12 loading docks located along the buildings' southern wall. Vehicular access for both cars and trucks (including semi-trailers) is currently provided via a large 20m wide two-way driveway located towards the far eastern end of the Bennelong Road frontage.

Proposed Development

The proposed development will involve the construction of three residential apartment buildings and make provision for a total of 601 apartments as follows:

	Building A	Building B	Building C	Total
1 bedroom apartments:	5	115	64	184
2 bedroom apartments:	27	189	178	394
3 bedroom apartments:	3	7	13	23
TOTAL APARTMENTS:	35	311	255	601

Off-street car parking is to be provided for 829 cars in a basement carparking area with vehicular access to be provided via two-way driveways to be located at either end of the Amalfi Drive frontage of the site.

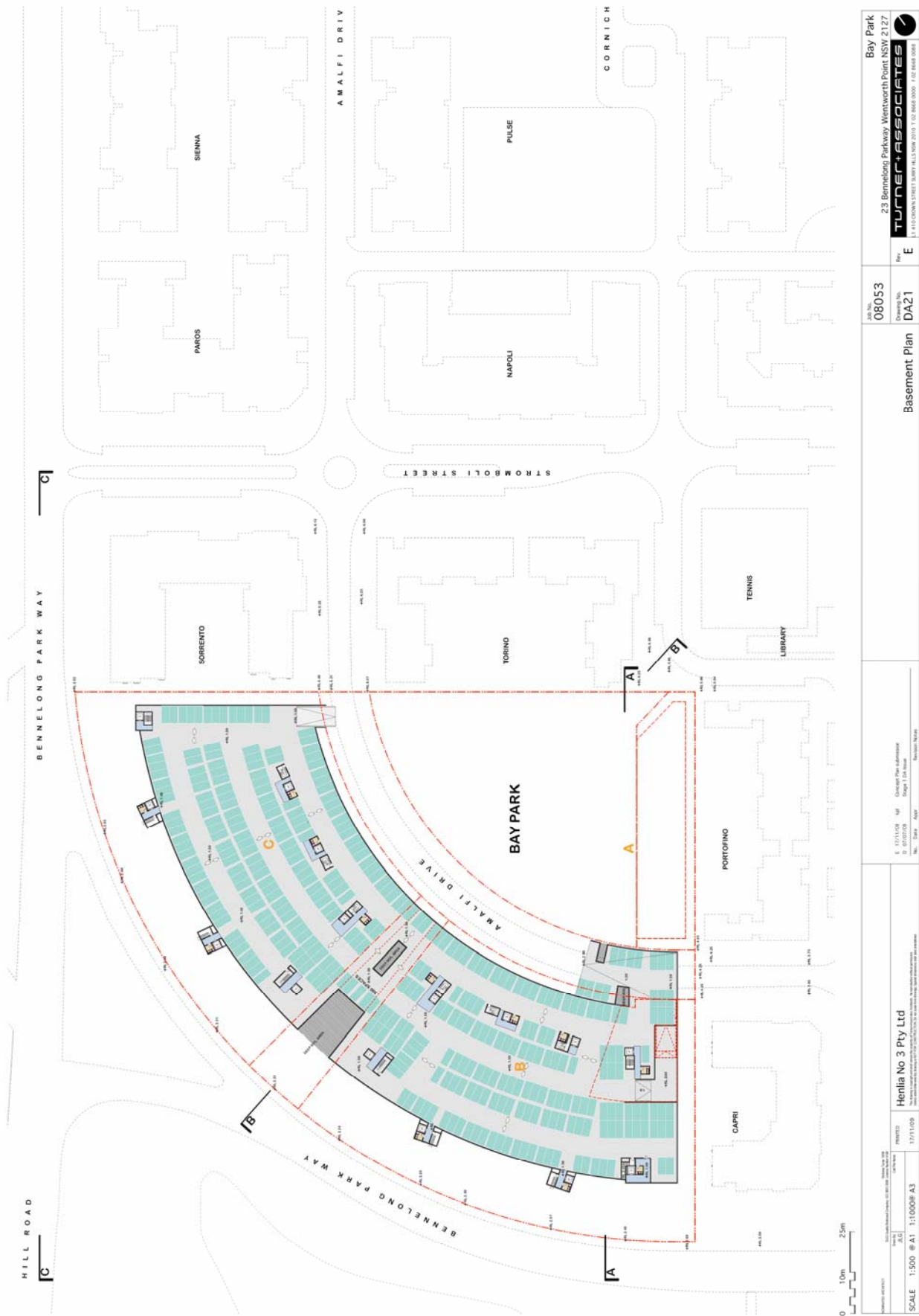
Plans of the proposed development have been prepared by *Turner & Associates* and are reproduced in the following pages.

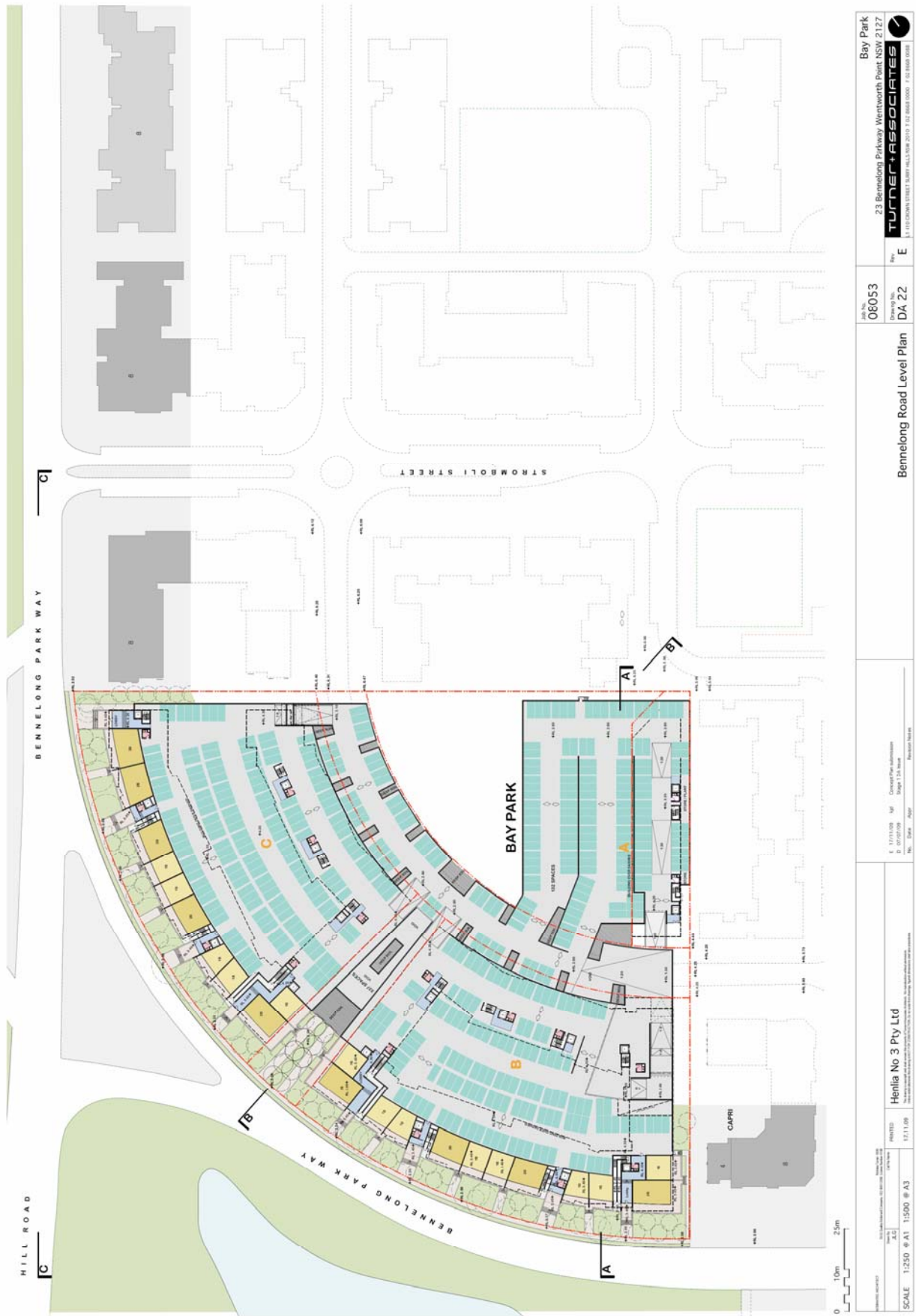
	FLOOR SPACE	NSA (92.5% efficiency)	1 BED 50-55sqm	2 BED 74-86sqm	3 BED 115-125sqm	UNITS (73.8 sqm avg)
BUILDING A			5	27	3	35
BUILDING B			115	189	7	311
BUILDING C			64	178	13	255
TOTALS	48,000 sqm	44,400 sqm	184	394	23	601
SITE AREA	25,570sqm					
FSR	1.9:1 sqm	31%	65%	4%		

	visitors	1 bed	2 bed	3 bed
PARKING RATES				
DCP min:	0	1.0 / unit 184 spaces	1.0 / unit 401 spaces	1.0 / unit 16 spaces
DCP max:	1.0 / 5 units 120 spaces	1.0 / unit 184 spaces	1.5 / unit 601 spaces	2.0 / unit 32 spaces
Provided:	1.07 units 81 spaces	1.0 / unit 184 spaces	1.3 / unit 524 spaces	2.0 / unit 40 spaces
LANDSCAPE AREAS (also see diagrams DA06)	deep soil	park	communal space	total open space
	6,184 sqm	4,910 sqm	3,867 sqm	15,356sqm

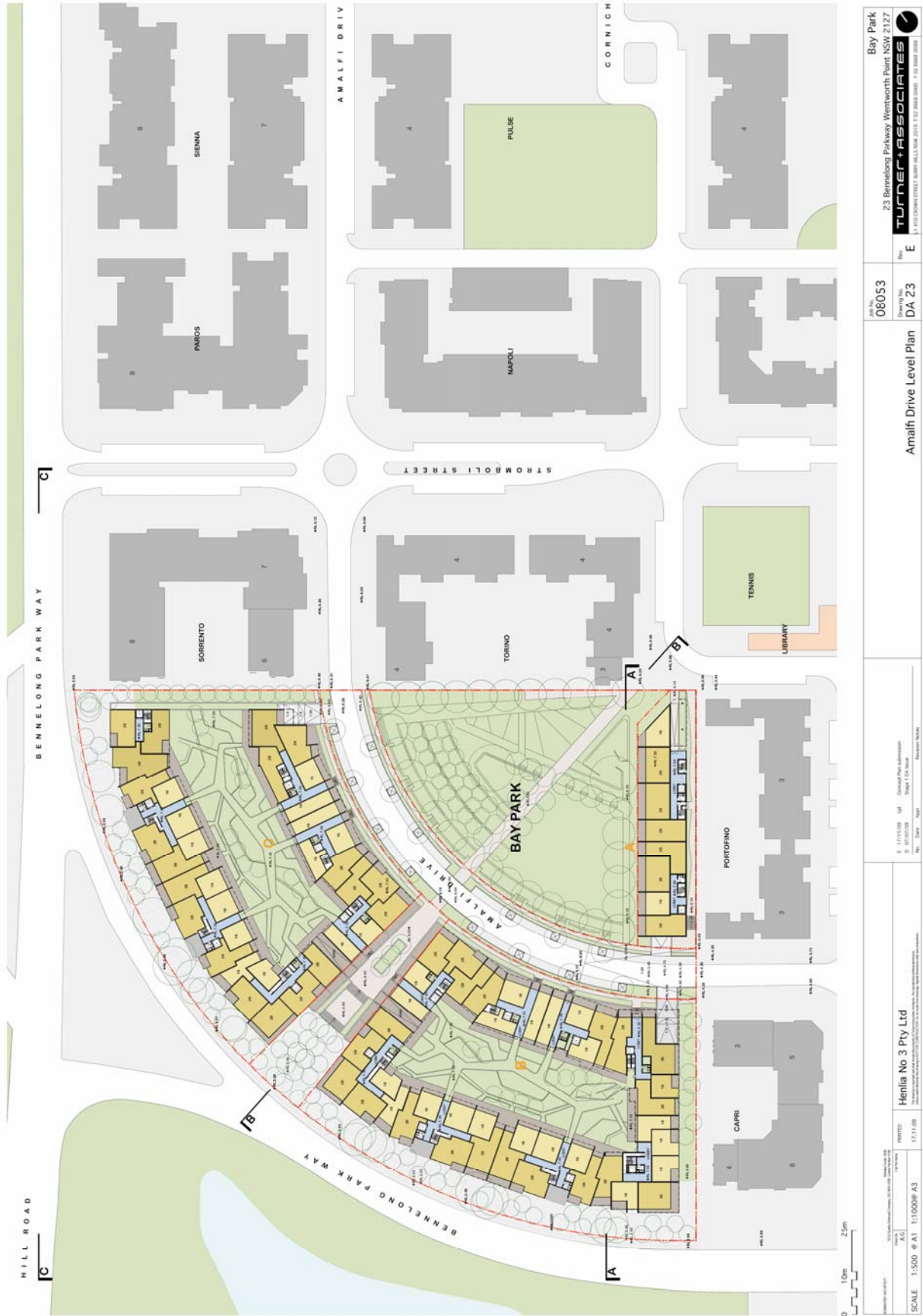


DRAWING NO: DA07 SHEET NO: 08053 SCALE: @ A1 @ A3 DATE: 17.11.09 DRAWN BY: JG CHECKED BY: JG APPROVED BY: JG	PROJECT NO: 08053 PROJECT NAME: Site Statistics_Stage 1 DA CLIENT: Henlia No 3 Pty Ltd ADDRESS: 171/109 CITY: Sydney STATE: NSW COUNTRY: Australia	CONSULTANT: Turner+Associates ADDRESS: 23 Berrimong Parkways, Wentworth Point NSW 2127 PHONE: 02 9550 0000 FAX: 02 9550 0001 WEBSITE: www.turnerassociates.com.au	Job No: 08053 Drawing No: DA07 Revision No: E
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Bay Park 23 Bennelong Parkway Wentworth Point NSW 2127 TURNER+ASSOCIATES E 117/11/08 - MF Concept Plan Submission DA 22 E 117/11/08 - MF Stage 1 & 2 Ref: 2204 - MF		Bay Park 06053 DA 22
Hentia No 3 Pty Ltd 17/11/09 SCALE: 1:250 @ A1, 1:500 @ A3		Bennelong Road Level Plan



Bay Park 23 Benelong Parkway Wentworth Point NSW 2127 TURNER ASSOCIATES E 1/110000@A3		DA 23 06053 Amalfi Drive Level Plan		E 1/110000 @ A3 Concept Plan Submission Stage 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3. TRAFFIC ASSESSMENT

Road Hierarchy

The road hierarchy allocated to the road network in the vicinity of the site by the RTA is illustrated on Figure 3.

The key arterial routes in the area comprise the M4 Motorway and Homebush Bay Drive. Both of these roads are classified by the RTA as *State Roads* and provide major arterial route links in an *east-west* and *north-south* direction respectively.

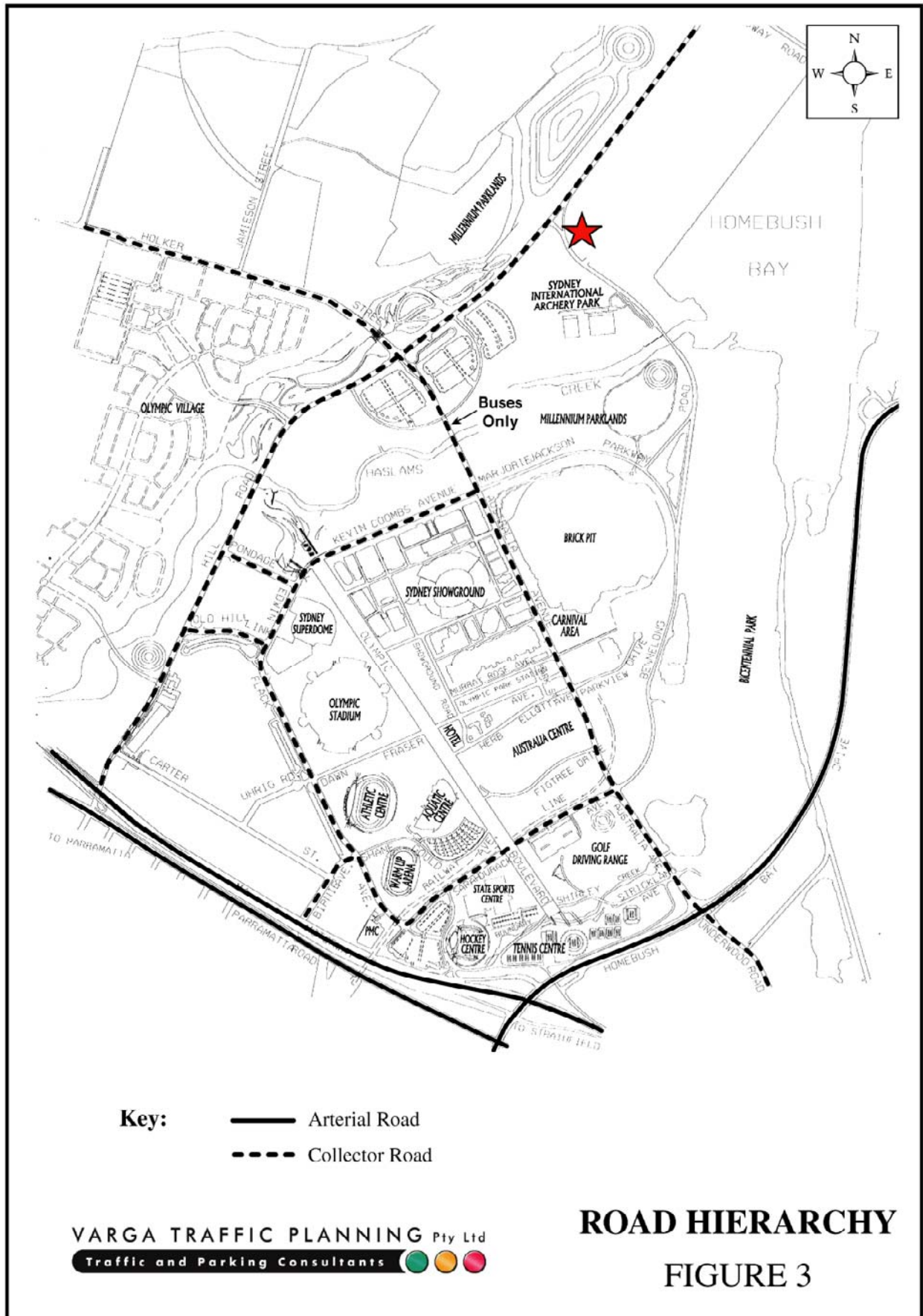
Hill Road performs the function of a *collector road*, providing access from the Wentworth Point peninsula to the *higher order* arterial route network. It is line-marked as a four-lane route (ie two lanes in each direction) with kerbside parking generally prohibited along its length by NO STANDING restrictions. A grade-separated interchange with west-facing ramps is located at the M4 Motorway/Hill Road intersection.

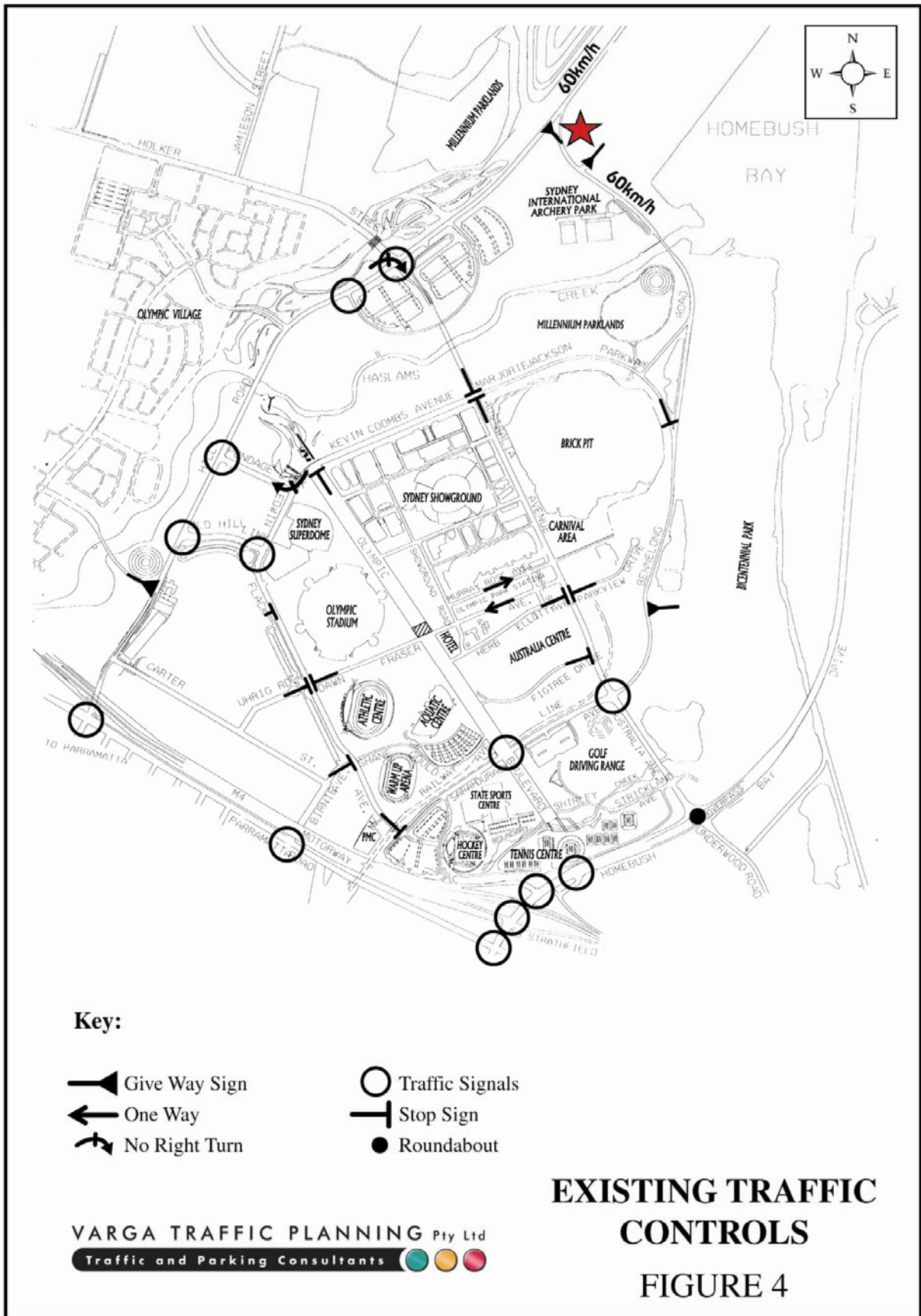
Bennelong Road (ie between Hill Road and Australia Avenue) performs the function of a local *access road* by providing vehicular access to frontage properties. The line-marking on this section of Bennelong Road comprises a centre-line marking only, catering for a single lane (plus bike lane) in each direction. A central turning lane has been provided where necessary to facilitate access to frontage properties.

The road hierarchy serving the Olympic Park precinct is also illustrated on Figure 3 and comprises a loop road encompassing the RAS Showgrounds, Olympic Sporting Facilities and the Australia Centre. Vehicular access within the loop road during “events” is usually restricted to buses and authorised vehicles only.

Existing Traffic Controls

The existing traffic controls on the road network in the vicinity of the site are illustrated on Figure 4 and comprise:





- channelised intersection with a GIVE-WAY sign facing westbound traffic in Bennelong Road, approaching Hill Road
- TRAFFIC SIGNALS at the Parramatta Road/Hill Road intersection
- an OVERPASS at the Homebush Bay Drive/Underwood Road intersection, with a ROUNDABOUT beneath the overpass controlling local traffic.

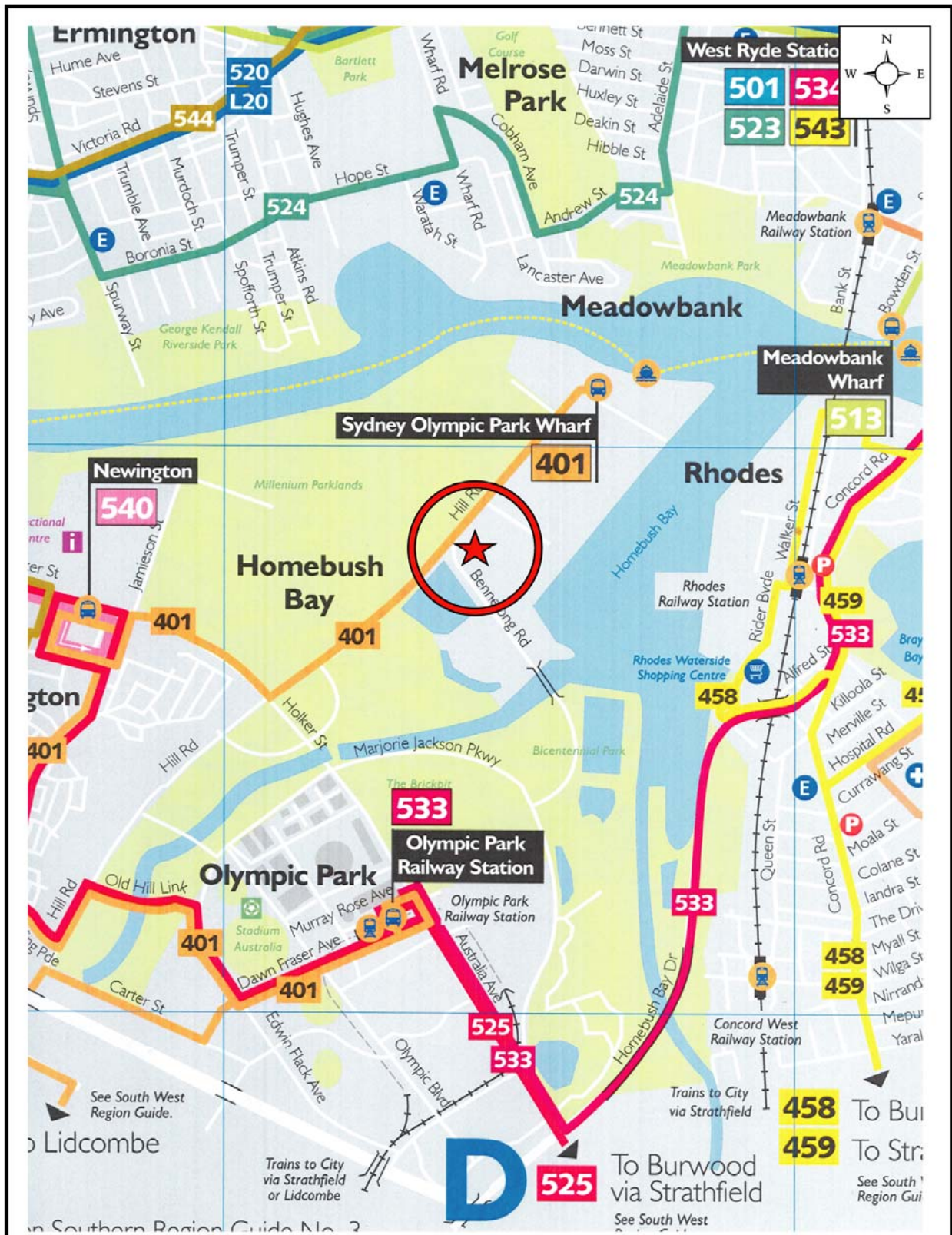
Existing Traffic Conditions

An indication of the existing traffic conditions on the road network in the vicinity of the site is provided by surveys of traffic activity conducted at Bennelong Road/Hill Road, Hill Road/Stromboli Strait, and Bennelong Road/The Piazza. The surveys were conducted during the morning and afternoon commuter peak periods on Thursday 31st July, 2008 and are reproduced in full in Appendix A. These surveys reveal that:

- two-way traffic flows in Hill Road along the site frontage are typically in the order of 700 vehicles per hour (vph) during both the morning and afternoon peak period
- two-way traffic flows in Bennelong Road are typically in the order of 700-800 vph during peak periods
- traffic activity in Stromboli Strait is typically in the order of 110-160 vph during peak periods
- traffic activity in The Piazza is typically in the order of 140-150 vph during peak periods.

Public Transport

Regular public transport services are provided along Hill Road by the 401 bus route which operates between the Sydney Olympic Park Ferry Wharf and Lidcombe Station, via the Olympic Park Railway Station, as indicated on Figure 5. The 533 bus provides a regular service between Chatswood and the Olympic Park Railway Station, allowing for interchange with the 401 bus service. The 525 bus service between Parramatta and Strathfield Railway Stations also operates via Olympic Park Railway Station, thereby allowing for bus passengers to interchange with the 401 bus service.



PUBLIC TRANSPORT

FIGURE 5

VARGA TRAFFIC PLANNING Pty Ltd
 Traffic and Parking Consultants

Residents of the proposed development will therefore have ready access to approximately 160 bus services per day as set out in the table below:

SUMMARY OF DAILY BUS SERVICES						
	Monday-Friday		Saturday		Sunday & Pub Hols	
Bus Route	IN	OUT	IN	OUT	IN	OUT
401	28	26	10	10	10	11
525	44	46	28	26	12	12
533	10	8	0	0	0	0

The ferry service available at the Olympic Park Ferry Wharf operates between Parramatta and Circular Quay. There are a minimum of 26 ferry services per day which will be accessible to residents of the proposed development.

SUMMARY OF DAILY FERRY SERVICES						
	Monday-Friday		Saturday		Sunday & Pub Hols	
Ferry Route	IN	OUT	IN	OUT	IN	OUT
Circular Quay to Parramatta	13	15	19	20	19	19

Extensive intra-urban and inter-urban train services are available at Strathfield Station. In addition, regular train services are also available at the Olympic Park Railway Station, via Lidcombe. There are typically 120 train services per day on weekdays at Olympic Park Railway Station, increasing to 199 train services on weekends and public holidays, as set out in the table below:

SUMMARY OF DAILY TRAIN SERVICES				
	Monday-Friday		Weekends & Public Holidays	
Station	IN	OUT	IN	OUT
Olympic Park	60	60	99	100

Provision has also been made for the introduction of an additional bus service to serve the Wentworth Point peninsula. The bus service would travel via Baywater Drive, a local north-south road link and Burroway Road as suggested by the *Homebush Bay West Structural Design Framework*.

the site, in order to determine the *nett increase (or decrease)* in traffic flows expected to occur as a consequence of the development proposal.

Application of the “road transport terminals” traffic generation rate nominated in the RTA *Guidelines* (1 peak hour vehicle trip per 100m²) to the existing transport depot on the site (~8,500m²) yields a traffic generation potential of approximately 85 peak hour vehicle trips.

Accordingly, it is likely that the proposed development will result in an *increase* in the traffic generation potential the site of approximately 155 vph as set out below:

**Projected Nett Increase in Peak Hour Traffic Activity
as a consequence of the development proposal**

Projected Future Traffic Flows:	240 vehicle trips
Less Existing Traffic Flows:	-85 vehicle trips
NETT INCREASE IN TRAFFIC FLOWS:	155 vehicle trips

That projected increase in traffic activity as a consequence of the development proposal will not have any unacceptable traffic implications in terms of road network capacity, as is demonstrated by the following section of this report.

Traffic Implications - Road Network Capacity

The traffic implications of the proposed development in terms of road network capacity can be assessed using the INTANAL capacity analysis programme. The INTANAL programme is recognised by the Roads and Traffic Authority as the most appropriate programme for this type of intersection analysis.

The results of the analysis of the Bennelong Road/Hill Road intersection are summarised in Table 3.1 below, revealing that:

- the intersection currently operates at *Level of Service “A”* and with an average vehicle delay of approximately 8 seconds/vehicle

- under the projected cumulative traffic demands expected to be generated by the development proposals, the intersection will continue to operate at *Level of Service “A”* with changes in total average vehicle delays of ***less than 1 second per vehicle***.

The results of the analysis of the Bennelong Road/The Piazza intersection are summarised in Table 3.2 below, revealing that:

- the intersection currently operates at *Level of Service “A”* and with an average vehicle delay of approximately 2 seconds/vehicle
- under the projected additional traffic demands expected to be generated by the development proposals, the intersection will continue to operate at *Level of Service “A”* with changes in total average vehicle delays of ***less than 2 seconds per vehicle***.

The results of the analysis of the Hill Road/Stromboli Strait intersection are summarised in Table 3.3 below, revealing that:

- the intersection currently operates at *Level of Service “A”* and with an average vehicle delay of approximately 2-3 seconds/vehicle
- under the projected additional traffic demands expected to be generated by the development proposals, the intersection will continue to operate at *Level of Service “A”* with changes in total average vehicle delays of ***less than 2 seconds per vehicle***.

The analysis confirms that the traffic generation potential of the development is minimal and is consistent with the findings and objectives of the *Masterplan* approved by the Minister.

In the circumstances, it can be concluded that the proposed development will not have any unacceptable traffic implications in terms of road network capacity.

TABLE 3.1 - RESULTS OF INTANAL ANALYSIS OF HILL ROAD/BENNELONG ROAD					
Key Indicators		Existing Traffic Demand		Projected Development Traffic Demand	
		AM	PM	AM	PM
Level of Service		A	A	A	A
Degree of Saturation		0.35	0.40	0.35	0.52
Average Vehicle Delay (secs/veh)					
Hill Road (south)	T	0.0	0.0	0.0	0.0
	R	7.3	7.1	7.5	7.2
Bennelong Road (east)	L	8.4	8.9	8.4	8.9
	R	12.0	12.8	12.1	13.4
Hill Road (north)	L	4.3	4.3	4.3	4.3
	T	0.0	0.0	0.0	0.0
TOTAL AVERAGE VEHICLE DELAY		7.5	8.2	7.4	8.6

HIL-BENX

HIL-BENP

TABLE 3.2 - RESULTS OF INTANAL ANALYSIS OF BENNELONG ROAD/THE PIAZZA					
Key Indicators		Existing Traffic Demand		Projected Development Traffic Demand	
		AM	PM	AM	PM
Level of Service		A	A	A	A
Degree of Saturation		0.22	0.28	0.35	0.38
Average Vehicle Delay (secs/veh)					
Bennelong Road (west)	L	2.2	2.2	2.2	2.2
	T	0.0	0.0	0.0	0.0
Bennelong Road (east)	T	0.5	0.6	0.8	1.3
	R	4.6	4.6	4.8	4.8
The Piazza (north)	L	7.1	5.5	9.6	5.9
	R	10.7	9.2	13.2	10.2
TOTAL AVERAGE VEHICLE DELAY		2.3	1.7	3.7	2.5

BEN-PIAX

BEN-PIAP

TABLE 3.3 - RESULTS OF INTANAL ANALYSIS OF HILL ROAD/STROMBOLI STRAIT					
Key Indicators		Existing Traffic Demand		Projected Development Traffic Demand	
		AM	PM	AM	PM
Level of Service		A	A	A	A
Degree of Saturation		0.30	0.24	0.42	0.30
Average Vehicle Delay (secs/veh)					
Hill Road (south)	T	0.3	0.7	0.4	1.2
	R	6.7	6.7	6.7	6.8
Stromboli Strait (east)	L	9.0	7.8	10.1	8.0
	R	11.8	11.1	12.7	11.4
Hill Road (north)	L	4.3	4.3	4.3	4.3
	T	0.0	0.0	0.0	0.0
TOTAL AVERAGE VEHICLE DELAY		2.7	2.3	3.9	3.4

HIL-STRX

HIL-STRP

Criteria for Interpreting Results of Intanal Analysis

1. *Level of Service (LOS)*

LOS	Traffic Signals and Roundabouts	Give Way and Stop Signs
'A'	Good operation.	Good operation.
'B'	Good with acceptable delays and spare capacity.	Acceptable delays and spare capacity.
'C'	Satisfactory.	Satisfactory but accident study required.
'D'	Operating near capacity.	Near capacity and accident study required.
'E'	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode.	At capacity and requires other control mode.
'F'	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control mode.

2. *Average Vehicle Delay (AVD)*

The AVD provides a measure of the operational performance of an intersection as indicated on the table below which relates AVD to LOS. The AVD's listed in the table should be taken as a guide only as longer delays could be tolerated in some locations (ie inner city conditions) and on some roads (ie minor side street intersecting with a major arterial route).

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	less than 14	Good operation.	Good operation.
B	15 to 28	Good with acceptable delays and spare capacity.	Acceptable delays and spare capacity.
C	29 to 42	Satisfactory.	Satisfactory but accident study required.
D	43 to 56	Operating near capacity.	Near capacity and accident study required.
E	57 to 70	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode.	At capacity and requires other control mode.

3. *Degree of Saturation (DS)*

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

For intersections controlled by traffic signals² both queue length and delay increase rapidly as DS approaches 1, and it is usual to attempt to keep DS to less than 0.9. Values of DS in the order of 0.7 generally represent satisfactory intersection operation. When DS exceeds 0.9 queues can be anticipated.

For intersections controlled by a roundabout or GIVE WAY or STOP signs, satisfactory intersection operation is indicated by a DS of 0.8 or less.

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

4. PARKING IMPLICATIONS

The off-street parking requirements applicable to the development proposal are specified in the *Homebush Bay West Development Control Plan (June 2004)* in the following terms:

vii Provide residential carparking in accordance with the following requirements:

Generally provide a *minimum* of 1 space per dwelling.

<i>Dwelling Type</i>	<i>Maximum Car Spaces per Dwelling</i>
studio	none
1 bedroom	1.0
2 bedroom	1.5
3 bedroom	2.0
visitors	0.2

Application of the above requirements to the development proposal yields a *minimum* parking provision of 601 parking spaces, and a *maximum* parking provision of 941 parking spaces.

The proposed provision of 829 parking spaces incorporated in the development proposal falls within the range of 601 spaces to 941 spaces, thereby satisfying the parking requirements specified in the DCP.

In summary, it is reasonable to conclude that the proposed developments envisaged by the Masterplan will not have any unacceptable parking implications.