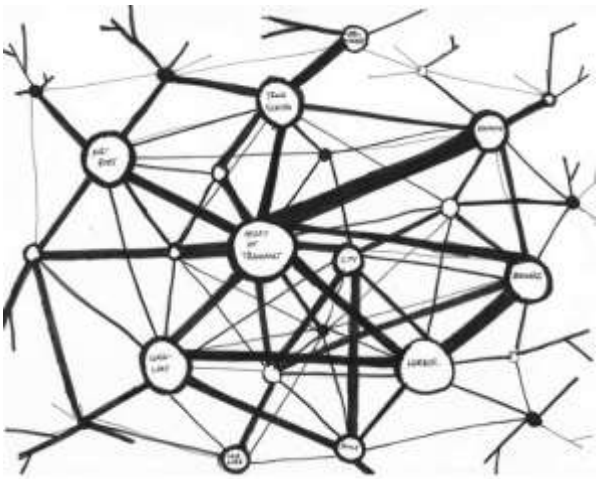
TRAFFIC AND TRANSPORT IMPACT STATEMENT

23 BENNELONG PARKWAY, WENTWORTH POINT (PROPOSED RESIDENTIAL DEVELOPMENT – SECTION 75W MODIFICATION)



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1. INTRODUCTION

The Practice of TSA has been commissioned by Wentworth Point 1 Pty. Ltd. to prepare a traffic and transport impact assessment report to accompany a Section 75W modification to an approved concept plan (MP09_0160) associated with the redevelopment of land at 23 Bennelong Parkway, Wentworth Point (hereafter referred to as 'Subject Site'). The Section 75W (S75W) modification proposal involves the following amendments:

- Two (2) new buildings with 220 apartments; and
- The two (2) new buildings is to be supported by a parking provision of between 268 to 343 spaces in accordance with Parramatta City Council's planning controls.

The purpose of this report is to assess and document the likely traffic and transport impacts resulting from the subject proposal and to recommend, where appropriate, treatments to ameliorate such impacts. To this end, this report undertakes the following:

- Determines the suitability and safety of the access arrangements and internal circulation arrangements as relevant to the site and the local conditions;
- Assesses the adequacy of the proposed parking provision with reference to the development yield, the available public transport facilities in the subject vicinity and the planned implementation of the abovementioned various strategy documents relating to the surrounding area;
- Assesses the existing transport conditions within the vicinity of the site;
- Describes the alterations to existing transport conditions associated with the planned development of the Homebush Bay West peninsula;
- Distinguishes traffic likely to be generated by the proposed development based on the proposed yield and established trip generation rates; and
- Identifies the requirement or otherwise for road upgrades required to accommodate the additional traffic movements associated with the subject development.

This report has been prepared with reference to the following documents:

- The Roads & Maritime Services' *Guide to Traffic Generating Developments*;
- Sydney Regional Environmental Plan No. 24 – *Homebush Bay Area*;
- The Department of Planning & Environment's *Homebush Bay West Development Control Plan 2004* (HBW DCP 2004);

- The Australian Standard for *Parking Facilities Part 1: Off-Street Car Parking* (AS2890.1), *Part 2: Off-Street Commercial Vehicle Facilities* (AS2890.1), *Part 5: On-Street Parking* (AS2890.5) and *Part 6: Off-Street Parking for People with Disabilities* (AS2890.6); and

- State Environmental Planning Policy (*Infrastructure*) 2007.

The report should be read in conjunction with the architectural plans and presentation proposal prepared by Turner.

2. SITE DETAILS

2.1 Site Location

The site is located on the eastern corner of the junction of Hill Road and Bennelong Parkway forming the south-western corner of the Wentworth Point peninsula. This location is shown in the context of the surrounding road network and land use in **Figures 1** and **2** overleaf.

2.2 Site Description

The site provides a legal description of Lot 3 DP 776611 and Lot 22 DP 104874 and a street address of 23 Bennelong Parkway, Wentworth Point. Collectively, the allotments form an irregularly shaped parcel of land providing a combined frontage of approximately 471m to Hill Road and Bennelong Parkway. The site extends to the east away from Hill Road approximately 193m and to the north away from Bennelong Parkway some 171m, resulting in a total site area of 25,570m^2.

2.3 Previous/Existing Use

The development site currently accommodates multi-storey residential development comprising a total of 465 apartments within seven (7) buildings (Buildings A, B, D, E, G, H and J) in accordance with the current consent.

2.4 Surrounding Uses

The development site is situated within the south-western corner of the Wentworth Point peninsula and is adjoined by the following:

- Residential apartment buildings (known as “Sorrento” and “Torino”) adjoin the site to the north fronting Stromboli Strait and Amalfi Drive;

- Mixed use retail / residential buildings (known as “Portofino” and “Capri”) adjoin the site to the east fronting The Piazza and Amalfi Drive; and

- Sydney Olympic Park adjoins to the west and south on the opposite side of Hill Road and Bennelong Parkway respectively.

FIGURE 1
SITE LOCATION – SURROUNDING ROAD NETWORK CONTEXT

Source: Google Maps

FIGURE 2
SITE LOCATION – LOCAL LAND USE CONTEXT

Source: Six Maps

3. PROPOSED DEVELOPMENT

3.1 Proposed S75W Modification

The subject proposal involves the following alterations to approved concept plan (MP09_0160):

- Construction of two 92) new buildings providing a total of 220 apartments; and

- Provision of additional off-street parking in the order of between 268 to 343 spaces.

The abovementioned development is to be serviced by the existing driveway and servicing/loading dock arrangements.

4. EXISTING TRANSPORT CONDITIONS

4.1 Existing Road Network

Hill Road performs a collector function servicing the Homebush Bay West / Wentworth Point peninsula. Hill Road provides direct access to Parramatta Road to the south under traffic signal control with all traffic movements being facilitated. An eastbound off ramp from the M4 Motorway to the Hill Road northbound carriageway is provided whilst a westbound on ramp to the Motorway has also been provided from the southbound Hill Road carriageway.

To the south of Bennelong Parkway, Hill Road forms a dual carriageway providing two through lanes of traffic in each direction separated by a raised central median. To the north of Bennelong Parkway, Hill Road generally forms a 13m wide carriageway providing one through lane of traffic in each direction being separated by a painted central median with parallel parking being provided along the eastern kerb alignment. Traffic flow is governed by a sign posted speed limit of 60km/h.

To the south-west of the subject site, Hill Road forms a T-junction with Bennelong Parkway under major / minor priority control with Hill Road forming the priority route. An exclusive right turn lane is provided within Hill Road servicing those movements accessing Bennelong Parkway. In addition, a long left turn slip lane is provided to assist southbound Hill Road traffic wishing to access Bennelong Parkway.

Bennelong Parkway performs a collector function connecting Hill Road in the north adjacent to the site to the south connecting with Australia Avenue. In the vicinity of the site, Bennelong Parkway provides a 13m wide pavement providing one through lane of traffic in each direction separated by a painted median in conjunction with parallel parking along the northern kerb alignment.

The local road network in the vicinity of the site is defined by a series of primarily north-south and east-west aligned roads. The southern Wentworth Point connection is facilitated via The Piazza, a north-south local access road, connecting with Bennelong Parkway under single lane circulating roundabout control. The Piazza forms a dual carriageway providing one though lane of traffic in each direction, separated by a vegetated median whilst also provided indented parking along both kerb alignments.

The Piazza forms an intersection with the southern existing section of Amalfi Drive, approximately 100m to the north of Bennelong Parkway, operating under single lane circulating roundabout control. Amalfi Drive provides a 6m wide pavement providing one through lane of traffic in each direction in conjunction with indented parking along both alignments.

The southern connection to Wentworth Point connection to Hill Road is facilitated through Stromboli Strait, a local access road which intersects with the collector road under major / minor priority control, with Hill Road forming the priority route. Exclusive right turn deceleration and acceleration lanes are provided within the Hill Road approaches to the junction to assist precinct access / egress movements.

Stromboli Strait forms a dual carriageway providing one though lane of traffic in each direction, separated by a vegetated median whilst also provided indented parking along both kerb alignments. Stromboli Strait forms an intersection with the northern section of Amalfi Drive, approximately 100m to the east of Hill Road, operating under single lane circulating roundabout control. Similarly to the southern section of Amalfi Drive, the northern section provides a 6m wide pavement providing one through lane of traffic in each direction in conjunction with indented parking along both alignments.

4.2 Existing Traffic Volumes

In order to obtain an indication of the existing operation of the local road network adjacent to the site, reference is made to morning and evening peak hour traffic surveys undertaken by staff of this Practice. Traffic surveys were undertaken at the following intersections:

- Hill Road and Bennelong Parkway;
- Bennelong Parkway and The Piazza; and
- Hill Road and Stromboli Strait.

Peak hour traffic surveys at the abovementioned intersections were previously undertaken between 7:00am – 9:00am and 4:00pm – 6:00pm, associated with previous development applications for the subject site.

Updated morning and afternoon peak morning and afternoon hour traffic surveys have been recently undertaken, which have found that peak hour traffic demands within the surveyed local road intersections have not changed to any significant extent. In this regard, the survey results reflected in the traffic studies for the previous development applications remain valid for analysis.

Figure 3 overleaf illustrates the surveyed peak hour traffic volumes.

FIGURE 3
EXISTING PEAK HOUR TRAFFIC VOLUMES
IN THE VICINITY OF THE SITE

LEGEND: AM PEAK / PM PEAK

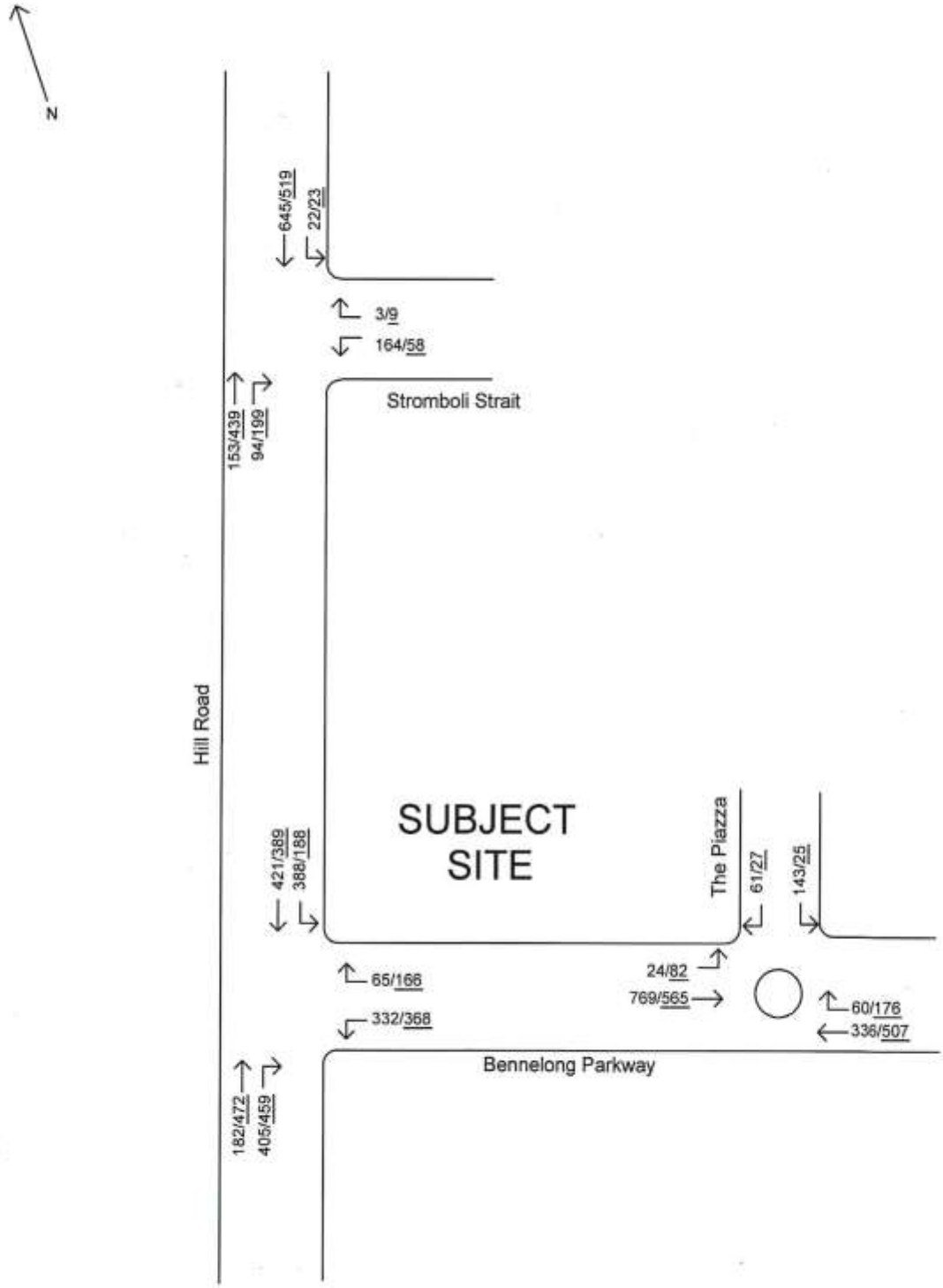


Figure 3 indicates the following:

- Directional traffic demands within Hill Road to the south of Bennelong Parkway are in the order of 600 – 900 vehicles per hour;

- Directional traffic demands within Hill Road to the north of Bennelong Parkway are in the order of 250 – 800 vehicles per hour;

- Directional traffic demands within Bennelong Parkway are approximately 400 – 800 vehicles per hour; and

- Directional traffic demands within The Piazza and Stromboli Strait are approximately 50 – 250 vehicles per hour.

4.3 Existing Intersection Operation

In order to estimate the peak efficiency of the surveyed local intersections, a SIDRA analysis has been undertaken. SIDRA is a computerised traffic arrangement program which, when volume and geometrical configurations of an intersection are imputed, provides an objective assessment of the operation efficiency under varying types of control (i.e. signs, signal and roundabouts). Key indicators of SIDRA include level of service where results are placed on a continuum from A to F, with A providing the greatest intersection efficiency and therefore being the most desirable by the Roads and Maritime Services.

SIDRA uses detailed analytical traffic models coupled with an iterative approximation method to provide estimates of the abovementioned key indicators of capacity and performance statistics. Other key indicators provided by SIDRA are average vehicle delay, the number of stops per hour and the degree of saturation. Degree of saturation is the ratio of the arrival rate of vehicles to the capacity of the approach. Degree of saturation is a useful and professionally accepted measure of intersection performance.

SIDRA provides analysis of the operating conditions that can be compared to the performance criteria set out in **Table 1** overleaf (being the RTA NSW method of calculation of Level of Service).

TABLE 1 LEVELS OF SERVICE CRITERIA FOR INTERSECTION		
Level of Service	**Average Delay per Vehicle (secs/veh)**	**Expected Delay**
SIGNALISED INTERSECTIONS AND ROUNDABOUTS		
A	Less than 14	Little or no delay
B	15 to 28	Minimal delay and spare capacity
C	29 to 42	Satisfactory delays with spare capacity
D	43 to 56	Satisfactory by near capacity
E	57 to 70	At capacity, incidents will cause excessive delays
F	> 70	Extreme delay, unsatisfactory
GIVE WAY & STOP SIGNS		
A	Less than 14	Good
B	15 to 28	Acceptable delays and spare capacity
C	29 to 42	Satisfactory
D	43 to 56	Near capacity
E	57 to 70	At capacity and requires other control mode
F	> 70	Unsatisfactory and requires other control mode

The existing conditions have been modelled utilising the peak hour traffic volumes presented within **Figure 3**. **Table 2** overleaf provides a summary of the SIDRA output data whilst full details are available upon request.

TABLE 2 SIDRA OUTPUT – EXISTING INTERSECTION PERFORMANCE ADJOINING THE SUBJECT SITE		
	AM	**PM**
HILL ROAD & BENNELONG PARKWAY		
Average Delay (secs)	51.4	353.0
Degree of Saturation	0.59	2.15
Level of Service	D	F
HILL ROAD & STROMBOLI STRAIT		
Average Delay (secs)	14.7	14.0
Degree of Saturation	0.34	0.28
Level of Service	B	A
BENNELONG PARKWAY & THE PIAZZA		
Average Delay (secs)	6.5	6.3
Degree of Saturation	0.58	0.57
Level of Service	A	A

Table 2 indicates the following:

- The signage controlled junction of Hill Road and Bennelong Parkway currently operates with an overall level of service ‘D’ and ‘F during the morning and evening peak periods respectively, thereby indicating an alternate intersection control is required (this is discussed in greater detail in subsequent sections of this report);

- The priority controlled junction of Hill Road and Stromboli Strait operates with a level of service 'B' and 'A' during the morning and evening peak hours respectively, representing good operation with spare capacity; and

- The roundabout controlled junction of Bennelong Parkway and The Piazza operates with a level of service 'A' during both peak periods, representing good operation with spare capacity.

4.4 Assessment of Traffic Signal Warrants

Section 2.3 of the Roads & Maritime Services' *Traffic Signal Design* guide specifies the following relevant warrants for the installation of traffic signals:

- The major road flow exceeds 600 vehicles / hour in each direction; and

- The minor road flow exceeds 200 vehicles / hour in one direction.

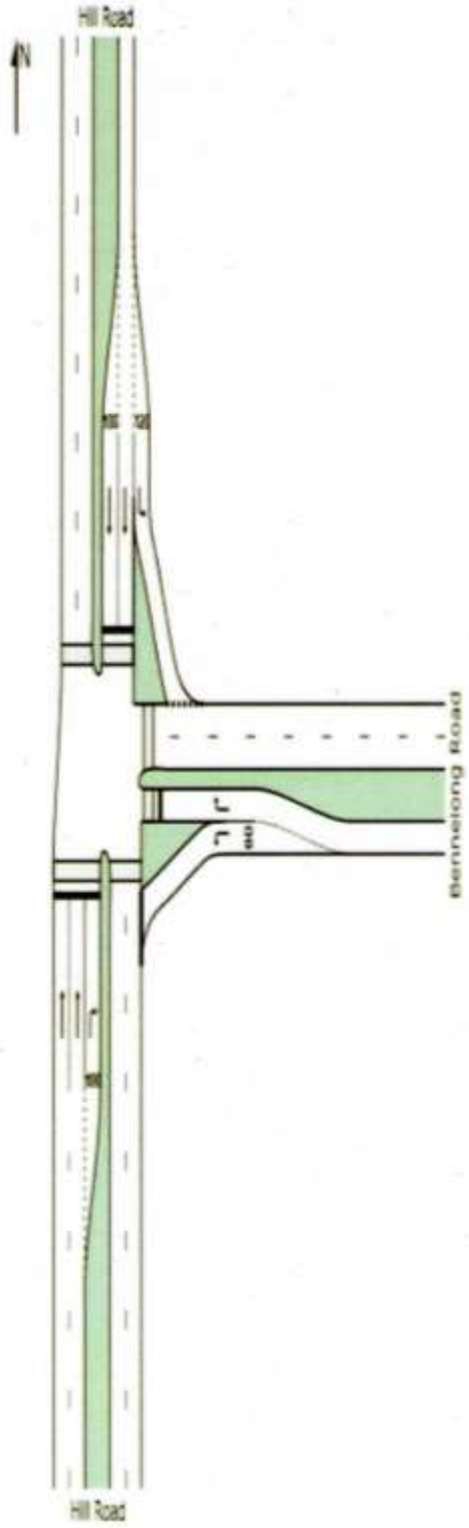
Section 4.3 of this report indicates that the above warrants are largely readily exceeded, during the surveyed peak hours. Further, Section 4.4 indicates that SIDRA modelling of the junction of Hill Road and Bennelong Parkway currently operates with a worst case approach level of service 'D' and 'F' during the morning and evening peaks respectively. This modelling analysis suggests that an operational warrant to provide some form of intersection upgrade currently exists without taking into consideration any additional traffic demand generated by the redevelopment of the subject site.

Accordingly, it is considered that there is currently adequate warrant for the junction to be upgraded to incorporate traffic signals in accordance in accordance with and being funded by Council's Section 94 Contributions Plan.

4.5 Future Intersection Layout / Operation

The future operation of the intersection of Hill Road and Bennelong Parkway is difficult to determine accurately as the future lane configuration and signal operation is subject to detailed design. Notwithstanding this, for the purposes of this assessment, an estimated signalised intersection layout has been prepared and is depicted overleaf by **Figure 4**.

FIGURE 4
PROJECTED SIGNALISED INTERSECTION LAYOUT
JUNCTION OF HILL & BENNELONG PARKWAYS



In order provide an accurate indication of the likely operational performance of the junction of Hill Road and Bennelong Parkway incorporating the planned traffic signal control, a subsequent SIDRA analysis has been undertaken. **Table 3** below provides a summary of the modelling analysis incorporating signalisation, whilst full details are available upon request.

TABLE 3
SIDRA OUTPUT – EXISTING INTERSECTION PERFORMANCE
JUNCTION OF HILL ROAD & BENNELONG PARKWAY

	Existing Intersection Layout		**Upgraded Intersection Layout (Incorporating Signals)**	
	AM	**PM**	**AM**	**PM**
Average Delay (secs)	51.4	353.0	18.1	18.5
Degree of Saturation	0.59	2.15	0.55	0.59
Level of Service	D	F	B	B

Table 3 indicates that the intersection of Hill Road and Bennelong Parkway is projected to operate with a level of service 'B', representing good conditions with spare capacity incorporating the imminent upgrading works to incorporate traffic signal control.

4.6 Public Transport and Non-Car Travel

Following the 2000 Olympics, an emphasis has been placed on improving access to the Homebush Bay area. Much of this infrastructure has been developed in line with sustainable transport principles, providing public transport services and non-car mode infrastructure. The following sub-sections provide a summary of the public transport and non-car travel modes available in the subject vicinity.

4.6.1 Rail

The closest railway stations are as follows:

- **Rhodes Railway Station** via the Bennelong Footbridge connecting the two peninsulas, is located 1.2km to the east of the subject site. Rhodes Railway Station is part of the Northern Railway Line linking the City in the east to Hornsby and the Central Coast in the north. Train service frequency at Rhodes is approximately 15 minutes in the weekday peak direction. This station has been observed to be the main station primarily used by residents of Wentworth Point Precinct; and

- **Sydney Olympic Park Railway Station** is situated approximately 1.6km south of the subject site. There is a frequent service to Strathfield and Redfern Stations on Friday evenings and throughout the weekend from early morning until late evening running at approximately 15 minute intervals. There are also services through to Central but only late mornings on weekdays. Further, there is service every 10 minutes on all days between Olympic Park and Lidcombe Railway Stations. This station has been observed to provide a secondary use function by residents of Wentworth Point Precinct.

4.6.2 Bus

Sydney Buses operates the following services in the vicinity of the subject site:

- Route 526 – Operates between Burwood and Rhodes Shopping Centre via Sydney Olympic Park wharf and Rhodes railway station; and

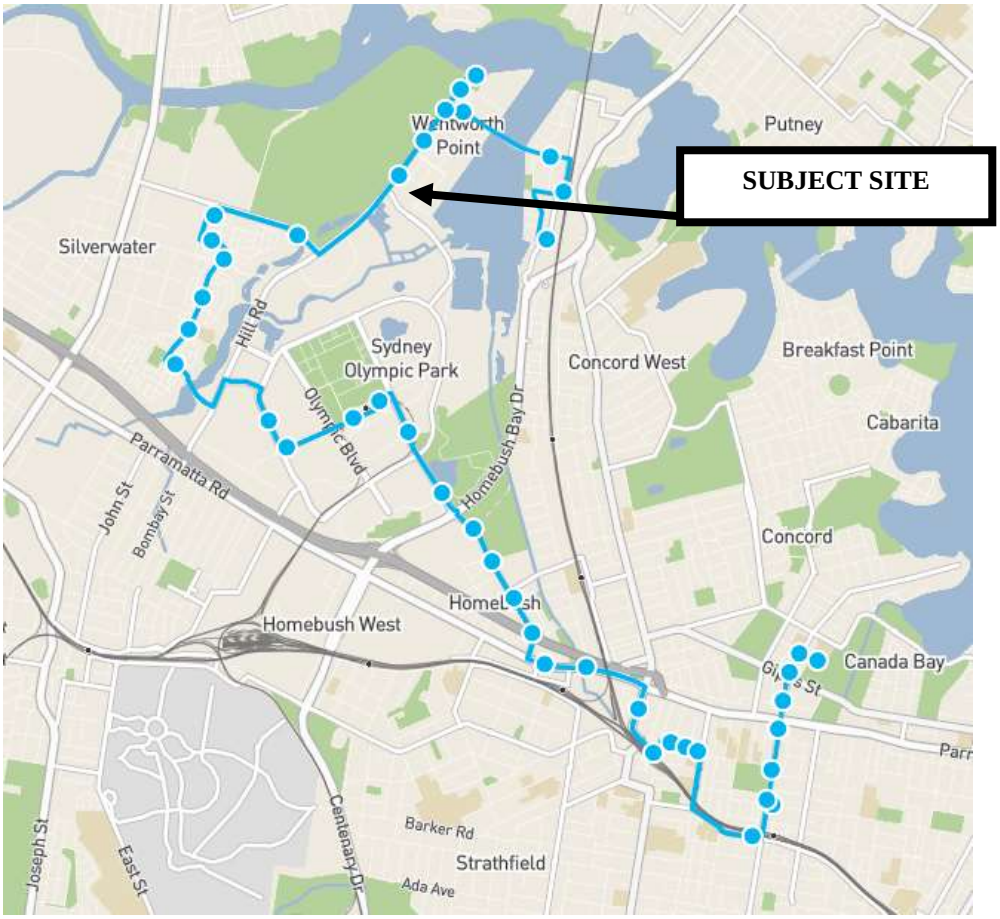
- Route 533 – Operates between Sydney Olympic Park and Chatswood via Sydney Olympic Park railway station and Rhodes railway station.

Route 526 operates from Monday to Sunday with peak frequencies of approximately 15 minutes during weekday commuter periods which extends to approximately 30 minutes during non-peak weekday periods and weekends.

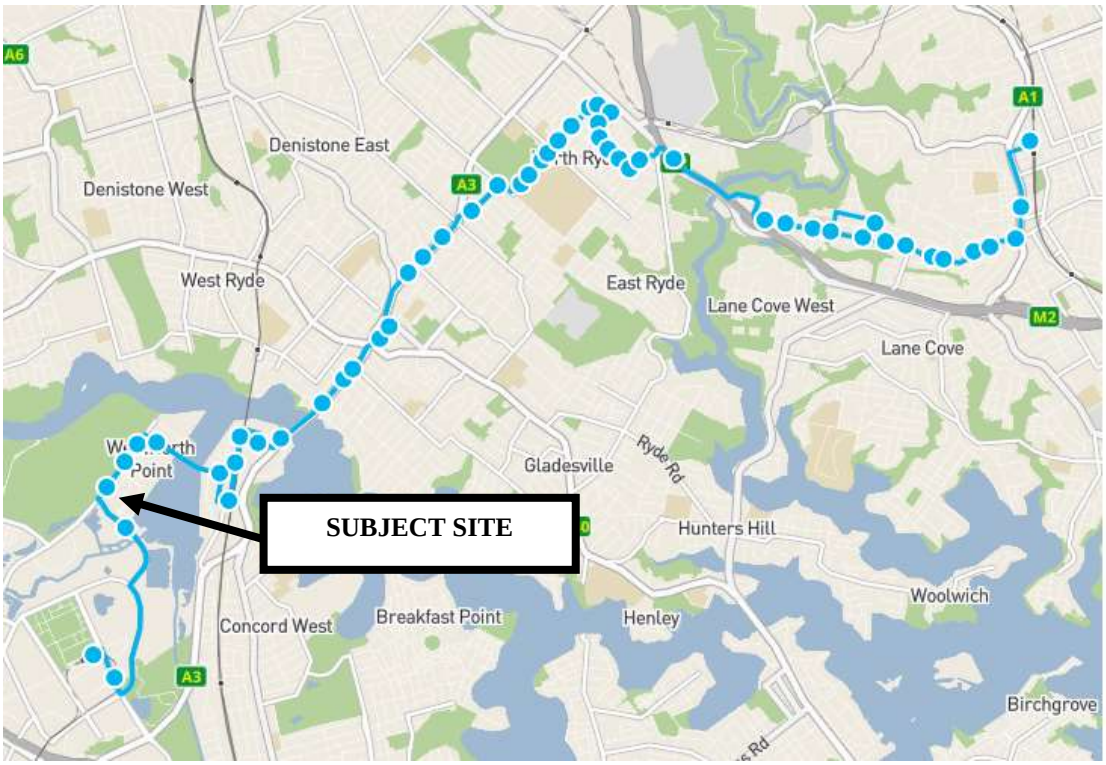
Route 533 operates from Monday to Friday with peak and off peak frequencies of approximately 15 and 30 minutes respectively.

A copy of the Sydney Buses route maps for the services is provided as **Figure 5,** courtesy of Transport for NSW.

FIGURE 5 – SYDNEY BUS ROUTES



Route 526



Route 533

4.6.3 Ferry

Sydney Olympic Park wharf is served by a 30 – 60 minute ferry service (Route F3) operating between Circular Quay and Parramatta. A route map of Route F3 is reproduced in **Figure 6**, courtesy of Transport for NSW.

FIGURE 6 – ROUTE F3 NETWORK MAP

4.6.4 Pedestrian and Cyclists

Pedestrian and cyclist facilities in the general area of Homebush Bay were considerably enhanced to cater for the 2000 Sydney Olympics and therefore most of the present infrastructure is only a few years old. Pedestrian facilities are now fairly extensive through local parks, with plans to extend the network to include a waterfront link around the Homebush Bay peninsula. The level of pedestrian amenity surrounding the site is high with relatively wide, good quality footpaths adjoining the site.

On-road cycle routes are located on the following roads in the vicinity of the subject site:

- Holker Street, between Newington Road and Hill Road;
- Hill Road between Holker Street and Bennelong Parkway;
- Bennelong Parkway between Hill Road and Australia Avenue; and
- Australia Avenue between Bennelong Parkway and Homebush Bay Drive.

In addition, off-road shared use routes are located on the following links nearby:

- Hill Road between Bennelong Parkway and Parramatta Road; and
- Newington Road between Holker Street and Silverwater Road.

Figure 7 overleaf illustrates the location of the cycle routes in the immediate precinct.

FIGURE 7 – HOMEBUSH BAY CYCLE ROUTES

5. PROJECTED TRANSPORT GENERATION & IMPACTS

5.1 Traffic Generation

5.1.1 Approved Concept Plan

MP09-016 (MOD2) approved on 22 July 2013 was supported by a Traffic and Parking Report prepared by Varga Traffic Planning prepared in 2009 and subsequent submissions from the same author in 2010 and 2011. Based on available trip rate information at the time, the Varga submissions adopted a high-density residential trip generation rate of 0.4 peak hour trips during morning and evening peak hours, which is primarily in accordance with that adopted by the Homebush Bay West Precinct Section 94 Development Contributions Plan 2004, when averaged over small and large residential dwellings.

Application of the adopted traffic generation rate of 0.4 trips per hour to the approved concept plan development yield of 641 dwellings results in, an approved site traffic generation of 257 peak hour vehicle trips being established.

5.1.3 Updated Traffic Generation Rates

Travel characteristics of occupants of high density residential developments has changed over recent years as a result of a range of factors including a decreasing performance of the Sydney metropolitan road network, improved public transport infrastructure and improved land-use planning whereby high density residential developments are located within close proximity to public transport infrastructure and areas of employment generating development. Cognisant of this, the Roads & Maritime Services released *Technical Direction TDT 203/04a* in August 2013, which provided revised trip generation advice for a number of land uses, including high-density residential developments, based on recent extensive surveys of similar developments. The Technical Direction specifies an average weekday morning and evening peak hour trip generation of 0.19 and 0.15 trips per unit respectively.

The Roads & Maritime Services however recommend that consultants give consideration to the proximity of a development to public transport infrastructure, employment and other facilities as well as the provision of car parking prior to applying the reduced traffic generation rates. The following provides a discussion on these critical factors influencing traffic generation rates.

- Section 4.6 of this report presents the public transport infrastructure available to the subject site and surrounding precinct. This section notes that whilst the site is currently provided with good accessibility to public transport, with a bus route adjoining the site connecting with Wentworth Point Ferry Wharf and the Sydney Olympic Park Railway Station, the site is not located within walking distance of a railway station.

- Whilst Wentworth Point currently has limited employment opportunities, Sydney Olympic Park (located approximately 1km from the site) provides significant generating development. It is further understood that the vision for Sydney Olympic Park anticipates significant growth thereby providing additional jobs within the precinct, efficient connectivity between which and the site is provided via the abovementioned bus service.

- The redevelopment of the northern portion of Wentworth Point include a regional shopping centre, a school and ancillary community uses. These facilities, which are located within walking and cycling distance of the subject site are likely to reduce the traffic generating potential of the subject site and indeed, the traffic impacts of the development on the surrounding regional road network.

Following consideration of the above factors, it is considered reasonable to adopt traffic generation rates that are 25% higher than the Roads & Maritime Services' Technical Direction rates. This extra 25% loading is due largely to the site not being within walking distance to a train station. Accordingly, appropriate traffic generation rates for redevelopment of the site are considered to be 0.24 and 0.19 trips per unit during the morning and evening peak hours respectively.

5.1.4 Combined Development Yield (S75W Modification) and Impacts

Application of the above estimated traffic generation rates of 0.24 and 0.19 trips per unit during the morning and evening peak hours respectively to the consolidated development yield of 685 dwellings results in a traffic generation of 165 and 131 peak hour traffic movements during the morning and evening peak respectively (of which the 43 additional dwellings forming part of the new DA contributes to 11 morning peak hour trips and 9 evening peak hour trips of this total traffic generation). Such a traffic generation represents 90 and 125 fewer peak hour vehicle trips during the morning and evening peak hours respectively when compared to that approved for the development site associated with MP09-016 (MOD2), being 257 trips. Accordingly, the total development yield proposed as part of the S75W modification application is not projected to result in any impacts over and above that previously assessed and approved.

5.2 External Assessment

Notwithstanding the findings of Section 5.1, the following assessment is provided to investigate the impacts of the proposed S75W modification application on the surrounding road network.

5.2.1 Projected Traffic Volumes

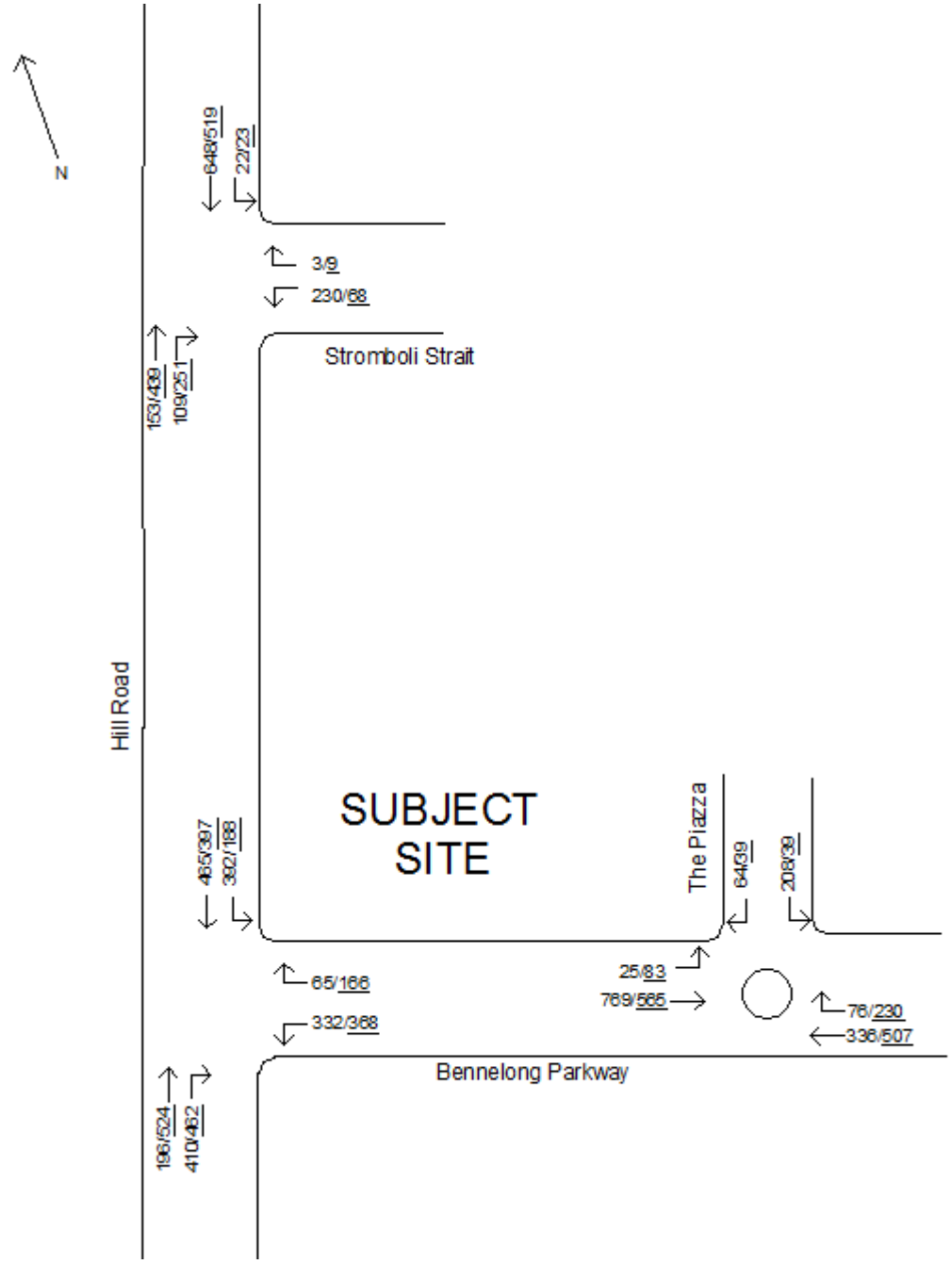
The subject proposal has been projected to generate 167 and 132 morning and evening peak hour vehicles trips to and from the subject site. This additional traffic has been assigned as an 80% outbound / 20% inbound split during the morning peak whilst the reverse condition has been assigned during the evening peak, commensurate with normal residential journey to and from work distributions.

Further, for the purposes of this assessment and approximately in accordance with existing traffic distributions, vehicle movements to and from the site have been evenly distributed to / from the south along Hill Road and to / from the east along Bennelong Parkway. In this regard, those vehicles travelling via Hill Road have been assumed to access / depart the site via Amalfi Drive and thence Stromboli Strait whilst those vehicles travelling via Bennelong Parkway have been assumed to access / depart the site via Amalfi Drive and thence The Piazza.

The projected traffic demands surrounding the subject site incorporating the above methodology are illustrated within **Figure 8** overleaf.

FIGURE 8
PROJECTED PEAK HOUR TRAFFIC VOLUMES
IN THE VICINITY OF THE SITE INCORPORATING 692 DWELLINGS
ASSOCIATED WITH THE S75W MODIFICATION APPLICATION

LEGEND: AM PEAK / PM PEAK



5.2.2 Intersection Performance

Future operational performance of the primary site access intersections have been undertaken by inputting the **Figure 8** traffic volume demands into the SIDRA model. **Table 4** below provides a summary of the post development intersection operation, whilst full details are available upon request. The post development scenario at the junction of Hill Road and Bennelong Parkway incorporates the imminent Section 94 funded upgrading works to incorporate traffic signal control in accordance with **Figure 4**.

TABLE 4
SIDRA OUTPUT –INTERSECTION PERFORMANCE
ADJOINING THE SUBJECT SITE

	Existing Conditions		**Projected Conditions**	
	AM	**PM**	**AM**	**PM**
HILL ROAD & BENNELONG PARKWAY				
Average Delay (secs)	18.1	18.5	18.5	18.4
Degree of Saturation	0.55	0.59	0.57	0.60
Level of Service	B	B	B	B
HILL ROAD & STROMBOLI STRAIT				
Average Delay (secs)	14.7	14.0	19.9	14.7
Degree of Saturation	0.34	0.28	0.35	0.31
Level of Service	B	A	B	B
BENNELONG PARKWAY & THE PIAZZA				
Average Delay (secs)	6.5	6.3	6.9	6.6
Degree of Saturation	0.58	0.57	0.59	0.59
Level of Service	A	A	A	A

Table 4 indicates that the surrounding primary site access intersections are capable of accommodating the modelled worst case scenario post development traffic demands, maintaining a minimum intersection level of service of 'B', representing good operation with spare capacity.

6. SITE ACCESS & INTERNAL CONSIDERATIONS

6.1 Site Access

The subject site is approved to be accessed via the connection of the existing two sections of Amalfi Drive. This new section of road is to be constructed in accordance with a secondary north-south street as specified by HBW DCP 2004, comprising a 6m wide carriageway and 2.5m indented parking along both kerb alignments. The 16m wide road reservations also proposed to provide paved footpaths within 2.5m wide verges.

6.2 Building Access Arrangements

Access to the development is currently accommodated as follows:

- Passenger vehicle access to the parking area servicing the building on the north-eastern side of Amalfi Drive is proposed via a 6m wide combined ingress / egress driveway, connecting with Amalfi Drive approximately adjacent to the eastern site boundary;

- Passenger vehicle ingress access to the parking area servicing the buildings on the south-western side of Amalfi Drive is proposed via a 6m wide ingress only access driveway connecting with Amalfi Drive adjacent to the eastern site boundary;

- Passenger vehicle egress from the abovementioned parking area servicing the buildings on the south-western side of Amalfi Drive is proposed via a 6m wide egress only access driveway connecting with Amalfi Drive approximately adjacent to the northern site boundary; and

- Heavy vehicle access is proposed via a 6m wide combined ingress / egress driveway connecting with the eastbound Bennelong Parkway carriageway approximately in the south-eastern corner of the site.

It has been previously mentioned that no changes are proposed to the abovementioned vehicular access arrangements with respect to the subject proposal, which have been assessed in previous traffic and transport studies associated with the redevelopment of the site to be satisfactory, culminating in approval by Council.

6.3 Internal Circulation

The new off-street passenger vehicle parking areas are proposed to comprise a series of primarily 90 degree parking rows serviced by adjoining parking aisles accommodating two-way traffic.

The parking areas have generally been designed in accordance with the minimum specifications of AS2890.1, providing the following base dimensions:

- Normal 90 degree resident parking space width = 2.4m;
- Residential visitor 90 degree parking space width = 2.5m;
- Additional parking space width adjacent to wall / obstruction = 0.3m;
- Disabled / accessible 90 degree parking space width = 2.4m (adjoining a 2.4m wide shared area);
- Normal 90 degree parking space length = 5.4m;
- Parking aisle width adjoining 90 degree spaces= 5.8m;
- One-way roadway width = 3.0m;
- Two-way roadway width = 5.5m;
- Maximum ramp grade = 1 in 4;
- Maximum change in grade = 1 in 8;
- Maximum ramp grade within 6m of the property boundary = 1 in 20;
- Clearance throughout the parking area = 2.2m; and
- Clearance above disabled parking spaces = 2.5m.

A number of the parking aisles form dead end aisles. The dead end aisles primarily only provide connectivity to resident car parking spaces thereby ensuring that no unreasonable conflicts are envisaged. All dead end parking aisles are proposed to be provided within the aisle extensions of at least 1.0m to ensure that vehicles parked within the end parking bays have adequate manoeuvring room to exit the aisle in a forward direction.

7. PARKING PROVISION

The following parking assessment is undertaken with respect to proposed development yield associated with the S75W modification application comprising 220 dwellings as follows:

- 82 x one bedroom dwellings;
- 118 x two bedroom dwellings; and
- 20 x three bedroom dwellings.

7.1 Vehicular Parking

Parramatta City Council provides locally sensitive minimum and maximum car parking requirements for development within the subject precinct within HBW DCP 2004. The minimum parking requirement is generally one space per dwelling, which equates to 220 spaces based on 220 apartments. Notwithstanding this, **Table 5** below provides a summary of the maximum car parking requirements.

TABLE 5
HOMEBUSH BAY WEST DCP 2004
MAXIMUM CAR PARKING REQUIREMENTS

Dwelling Type	Parking Requirement	Proposed Dwellings	Spaces Required
1 Bedroom	1 space / dwelling	82	82
2 Bedroom	1.5 spaces / dwelling	118	177
3 Bedroom	2 spaces / dwelling	20	40
-	0.2 spaces / dwelling (Visitor)	-	44
	TOTAL	**220**	**343**

Table 5 indicates that the maximum allowable parking provision of 343 car parking spaces comprising 299 resident and 49 visitor spaces.

The proposed development is to be supported by an off-street parking allocation of between 268 and 343 spaces in accordance with HBW DCP 2004.

8. CONCLUSION

This traffic and transport impact assessment report accompanies a Section Application Section 75W modification proposal associated with the redevelopment of land at 23 Bennelong Parkway, Wentworth Point. Having regard to the findings of this report, the following conclusions are provided:

- Section 75W modification proposal involves construction of two new buildings (C & F) with 220 apartments to be supported by an off-street parking allocation of between 268 and 343 spaces;

- The surrounding road network generally operates with a reasonable level of service, although the junction of Hill Road and Bennelong Road is currently approaching capacity. The Wentworth Point peninsular is well serviced by public transport facilities and provides good connectivity to surrounding pedestrian and cycle networks, particularly incorporating the impact of Bennelong Footbridge connecting the Wentworth Point and Rhodes peninsulas;

- The concept approval (MP09-016 (MOD3)) allows for a development yield of 641 dwellings within the subject site. A Traffic and Parking Report prepared by Varga Traffic Planning in association with the concept approval projected a site traffic generation of 257 peak hour vehicle trips being established;

- Utilising up-to-date trip rate guidance, this assessment has demonstrated that the combined development proposed as part of the S75W modification application is capable of generating up to approximately 167 peak hour vehicle movements to and from the site. The subject development is therefore not projected to generate any additional traffic and thus impacts over and above that previously assessed and approved;

- The surrounding local road network is capable of accommodating the additional traffic projected to be generated by the subject proposal incorporating the impending signalisation of Hill Road and Bennelong Parkways, funded by Section 94 Contributions;

- The previously approved access arrangements and internal circulation are anticipated to provide for safe and efficient vehicular and pedestrian movements and servicing during peak times;

- The development site is immediately adjoining bus stops along both sides of Hill Road, which accommodates bus routes providing services to Rhodes railway station, Sydney Olympic Park railway station and Sydney Olympic Park wharf; and

- The proposed car parking provision satisfactorily complies with the requirements of HBW DCP 2004.

In consideration of the conclusions abovementioned, it is considered that the development scheme will not have any unreasonable traffic, transport or parking implications.