



Traffic



TaylorThomsonWhitting



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## Brookvale Community Health Centre

### 612-624 Pittwater Road, Brookvale

### Transport and Accessibility Assessment Report

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for Health Infrastructure

19 October 2015

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## EXECUTIVE SUMMARY

The Northern Beaches Health Service Redevelopment (NBHSR) Project is consolidating health services across the Northern Beaches. As a part of this, the Brookvale Community Health Centre (BCHC) will be one of three hubs bringing together health services, workforce technology and resources. This facility will improve access to primary and community health services for residents of the Northern Beaches.

The key characteristics of the new facility include:

- A four (4) storey building with a gross floor area of 6,166 m<sup>2</sup> located at the front of the site adjoining Pittwater Road and William Street, Brookvale, and incorporating features that complement the functionality of the upgraded bus interchange, including a pedestrian bridge across Pittwater Road that will provide safer crossing conditions for the anticipated increased number of pedestrians.
- A multi-storey (seven levels) car park at the rear of the site, providing 475 car parking spaces, including 250 commuter car parking spaces.
- A main entrance off Pittwater Road, and secondary entrances at the rear of the building.
- Vehicle access from Pittwater Road (left in, left out only) and William Street (all movements).
- Areas for bike cages, rack and motorcycle facilities.

This report responds to the Secretary's Environmental Assessment Requirements (SEARs) related to transport and accessibility (Item 5) for State Significant Development Application SSD 6890 with regard to:

- Transport and accessibility,
- Provision of parking
- Alternative transport options (bus, cycle, motorcycle)
- Vehicle access and egress.
- Developments traffic generation
- Integration with the upgraded bus interchange
- Preliminary construction activity measures.

The transport and accessibility assessment has considered all relevant matters identified in the SEARs associated with construction and operation of the proposed BCHC. All identified impacts can be satisfactorily mitigated or managed, and appropriate measures have been identified and would be implemented as part of design development and/or through targeted management plans.

### Document Revision Register

| Rev | Date     | Prepared By | Approved By | Remarks                |
|-----|----------|-------------|-------------|------------------------|
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## 1.0 INTRODUCTION

### 1.1 Background

This study has been undertaken to evaluate the traffic and accessibility impacts for the new Brookvale Community Health Centre (BCHC), which is part of the Northern Beaches Health Service Redevelopment Project. The report responds to the specific matters listed under *Item 5 Transport and Accessibility* in the Secretary's Environmental Assessment Requirements (SEARs) dated 16 April 2015 (and as summarised in **Section 1.5**).

The main areas of attention of this study relate to:

- Transport and accessibility,
- Provision of parking (vehicle, bicycle etc),
- Vehicle access and egress,
- Developments traffic generation,
- Connection with the Bus Rapid Interchange,
- Preliminary construction activity measures.

The proposed BCHC is State Significant Development (SSD 6890) under Part 4, Division 4.1 of the NSW *Environmental Planning and Assessment Act 1979*, and the Minister for Planning is the approval authority. This notwithstanding, design development has included reference to the Warringah Council's Development Control Plan 2011 (DCP) and has endeavoured to be consistent with the DCP as far as practicable.

### 1.2 Study Area

The site is located in Brookvale approximately 12 kilometres northeast of the Sydney Central Business District and comprises three properties: 612, 620 and 624 Pittwater Road.

A portion of the site (612 Pittwater Road) is currently accessed from William Street and is being used as a civil works materials store. The central part of the site (620 Pittwater Road) currently contains a derelict house and several outbuildings. Access to these parts of the site is restricted by a security fence.

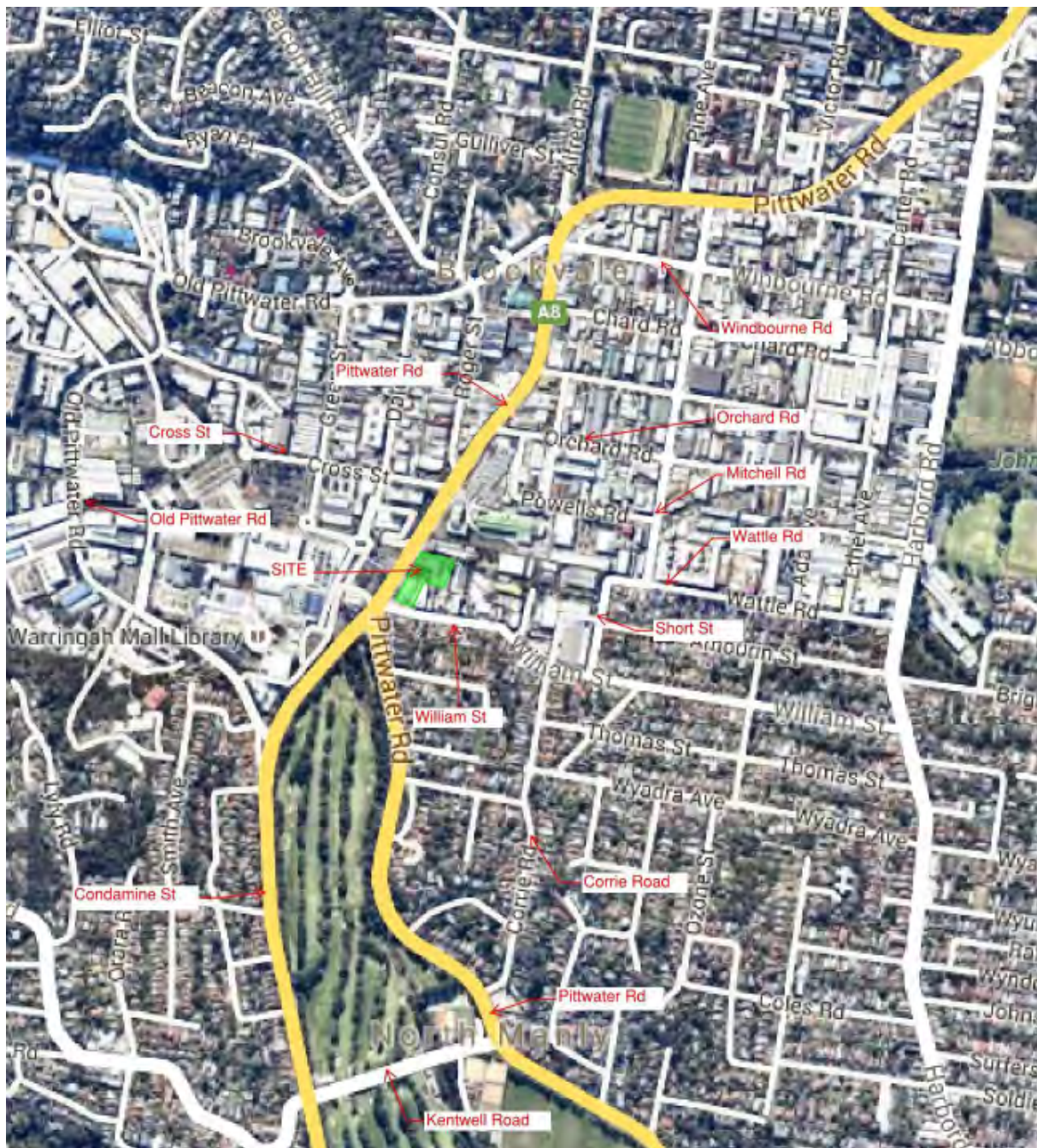
The remainder of the site (624 Pittwater Road) is currently occupied by two commercial enterprises (Barbeques Galore and a door manufacturer) whose tenancies will cease by August 2015. Access to this part of the site is from Pittwater Road.

The study area and BCHC site are shown in **Figure 1**.

The surrounding land use consists of residential, commercial, retail and light industrial uses. Residences are located south of the site at 610 Pittwater Road and along the southern side of William Street. Warringah Golf Course is located south of the intersection of Pittwater Road and Condamine Street.

Warringah Mall is located on the opposite side of Pittwater Road to the west. The northern side of William Street is occupied by commercial premises with light industrial premises located to the north and northeast of the site.





**Figure 1: Study Area**  
(Source: [www.nearmap.com.au](http://www.nearmap.com.au))

### 1.3 Study Approach

The purpose of this report is to provide all relevant information with regard to access, transport and accessibility matters for the BCHC to address the SEARs.

The study has been carried out with reference to relevant guidelines and standards such as the Roads and Maritime Services (RMS) *Guide to Traffic Generating Developments*, AUSTRROADS and state, regional and Warringah Council's planning instruments.

Information from reports related to the study area and from similar studies (based on previous assessments by Taylor Thomson Whitting of some 20 hospitals in NSW and the ACT) has also been utilised.

## 1.4 Literature Review

The following documents and information sources were reviewed in relation to transport and accessibility assessment:

- *Traffic and Transport Assessment of Site Suitability*, GTA Consultants: 23 June 2014
- *Northern Beaches Bus Rapid Transit: Brookvale Interchange*, Transport for NSW (TfNSW): (Version 1.1 – 6/3/2015)
- *Brookvale Pedestrian Bridge Options Analysis*, GHD Consultants: 4 September 2014
- *Brookvale Employment Land Strategy/Brookvale and Dee Why Transport Management Accessibility Study*
- *Guide to Traffic Generating Developments*, Roads and Maritime Services
- *NSW Planning Guidelines for Walking and Cycling*
- *Austroads Guide to Traffic Management Part 12: Traffic Impacts of Development*
- Warringah Development Control Plan 2011
- RMS traffic counter (id 34016): 2012 data
- RMS traffic counter (id 55022): 2009 data
- Travel Demand Survey Questionnaire for existing health facilities for staff and clients (April 2015)

## 1.5 Summary of Response to SEARs Item 5 Transport and Accessibility

| No  | Issue                                                                                                                                                                                             | Comments and References                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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| 5.1 | Existing daily and peak hour vehicle movements, public transport services and parking arrangements on the road network located adjacent to the proposed development                               | <p><b>Section 2.2</b> outlines existing traffic volumes in close proximity to the site. An RMS traffic counter on Condamine Street located south of the site at Manly Creek, Manly Vale recorded 23,000 vehicles per day northbound and 22,300 vehicles per day south bound on a weekday (2012 data). North of the site on Pittwater Road (near the access to Westfield Mall), an RMS traffic counter recorded peak weekday volumes in the order of 24,000 northbound and 21,800 vehicles (2009 data).</p> <p><b>Section 2.6</b> outlines existing public transport options. Sydney Bus services operate adjacent to the site on Pittwater Road.</p> <p><b>Section 2.4</b> outlines the existing parking to the site which contains both unrestricted and period parking on street parking facilities and off street facilities at Westfield Warringah Mall directly opposite.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 5.2 | Existing and proposed pedestrian and cycle movements within the vicinity of the site as well as the provision of bicycle parking and end of trip facilities (showers, change rooms, lockers etc.) | <p>The Northern Beaches BRT Brookvale Interchange report outlines the existing pedestrian movement and the future pedestrian movements as a result of introduction of a BRT service. It is estimated that 830-980 boarding and alighting movements occur during peak periods and are expected to grow by approximately 20% by 2031 as outlined in <b>Section 3.2</b>.</p> <p>The BCHC is expected to cater for 162 staff per shift and 538 clients per day. <b>Section 2.5</b> outlines the existing bicycle facilities and usage in proximity of the site which includes a shared bike path along William Street and 10 bicycle hoops (20 bicycles) located on the corner of William Street and Pittwater Road. <b>Section 4.5</b> outlines how the proposal addresses TfNSW requirements and potential bicycle usage to include:</p> <ul style="list-style-type: none"> <li>• A cage facility under the main building (southern end) for the use of commuters to accommodate up to 16 racks (32 bicycles) securely.</li> <li>• A cage facility on car park level 1 for the use for public, commuters and staff suitable to store 10 racks (20 bicycles) securely.</li> <li>• Located within covered areas of the car park on level 1, a total of 15 racks (30 bicycles) that can be utilised for short term bicycle parking for public, commuters and staff.</li> <li>• Located under the main building (northern end) a total of 8 racks (16 bicycles) that can be utilised for short term bicycle parking for public, commuters and staff.</li> <li>• Located at the southern end of the site a total of 3 racks (6 bicycles) that can be utilised for short term bicycle parking for public, commuters and staff.</li> </ul> |
| 5.3 | Existing safety issues on the pedestrian, bicycle and road networks located adjacent to the                                                                                                       | Pedestrians and cyclists utilise an existing at grade signalised crossing across Pittwater Road north of William Street. This crossing provides access to northbound and                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |



| No  | Issue                                                                                                                                                          | Comments and References                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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|     | site                                                                                                                                                           | <p>southbound bus services. The proposed development includes provision of a pedestrian bridge and removal of the at grade crossing to improve pedestrian safety.</p> <p>While there has been only one recorded pedestrian accident between 2009-2014 in proximity to the site, as noted previously, pedestrian numbers in the area are expected to increase with the introduction of a BRT service.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 5.4 | Estimated total daily and peak hour trips generated by the proposal and commuter parking area, including vehicle, public transport, pedestrian and cycle trips | <p>Peak hour traffic movement is estimated in the order of some 450 vehicle trips per peak hour. Peak hour movements have been distributed with 70% incoming; 30% outgoing in the AM peak period and 30% incoming; 70% outgoing in the PM peak period ratio to allow for tidal movements (refer <b>Section 6.1</b>).</p> <p>A travel demand survey (refer <b>Section 5.1</b>) was utilised to estimate travel demand for the BCHC. From the survey it was estimated that approx 30% of staff (50 staff) would utilise public transport or other options other than car, while 40% of clients (approx. 215) would utilise these facilities.</p> <p>Although it is difficult to accurately estimate future cycle use, based on previous studies, the DCP and TfNSW requirements, the proposal includes the provision of bicycle facilities as outlined in <b>Section 4.5</b> to provide for an alternative sustainable transport option.</p> <p>The Northern Beaches BRT Brookvale Interchange report outlines existing pedestrian movements and future pedestrian movements as a result of the BRT service. It is estimated that 830'980 boarding and alighting currently occurs during peak periods and these are expected to grow by approximately 20% by 2031 as outlined in <b>Section 3.2</b>.</p> |
| 5.5 | The adequacy of public transport to meet the likely future demand of the proposed development                                                                  | <p>Public transport consists of bus services that operate frequently as outlined in <b>Section 2.6</b>. The development will accommodate upgrading of the bus interchange, including possible future introduction of a BRT service).</p> <p>TfNSW intends to implement a BRT service that will service Brookvale interchange at an interval of 2-3 minutes. The increase in services is estimated to readily meet the predicted increase in demand by the BCHC.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 5.6 | Measures to promote travel choices that support the achievement of State targets, such as a location-specific sustainable travel plan                          | <p>The site is located adjacent to the exiting Warringah Mall bus interchange which provides alternative transport options and reduces parking demand.</p> <p>The BCHC is integrating elements of the BRT Brookvale interchange as outlined in <b>Section 3.2</b>. This will provide an opportunity for BCHC staff, clients and visitors to use public transport, and aligns with such plans as the <i>Northern Beaches Transport Action Plan</i>.</p> <p>The development provides for other alternative transport options, including motorcycle parking, small car spaces, bicycle parking and secure locker systems to encourage the use of more sustainable transport options.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

| No   | Issue                                                                                                                                                                                                                                                 | Comments and References                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| 5.7  | Daily and peak vehicle movements impact on nearby intersections, with consideration of the cumulative impacts from other approved developments in the vicinity, and the need/associated funding for upgrading or road improvement works (if required) | <p>Peak hour traffic movement is estimated in order of some 450 vehicle trips (refer <b>Section 6.1</b>).</p> <p>Modelling of the William Street/Pittwater Road intersection (including roadway access to Warringah Mall) has indicated that at post development, the intersection will continue to operate similar to the existing level of service. Based on the modelling of Pittwater Road/William Street intersection continuing to operate at a similar level of service post development, it is anticipated that as vehicles travel further from the site and distribute into the road network other remaining intersections will continue to operate at a similar level of service (refer <b>Section 6.3</b>).</p> <p>The William Street/Pittwater Road/Condamine Street alterations (outlined in <b>Section 5.1 and 5.7</b>) provide an opportunity for vehicles from the site to utilise the arterial road network (Pittwater Road) in lieu of the local road network. With the provision of the pedestrian bridge across Pittwater Road and removal of the at grade pedestrian crossing, there will be increased amenity and safety for pedestrians. These works along with the footpath improvements within the road reserve will be covered within the project provisions.</p> |
| 5.8  | Assessment of safety of proposed access arrangements                                                                                                                                                                                                  | <p>The proposed access arrangement as outlined in <b>Section 5</b> have been developed to provide efficient and safe access to the site and minimising traffic demands on the local road network system by providing access points on William Street and Pittwater Road.</p> <p>The access points have been positioned to closely match the existing situation, with widths reduced as far as practical to minimise pedestrian crossing distances but also allow for necessary vehicle access. The access arrangements allow for peak traffic and pedestrian volumes.</p> <p>Adequate sight lines are available from the site to the road network, bus zone, bus lane and pedestrian footpaths adjacent to the site.</p> <p>There is adequate provision for vehicles to turn into the site as outlined in <b>Section 5</b>.</p> <p>Pedestrian path widths outlined in <b>Section 3.2</b> provide waiting areas for bus services minimising conflicts.</p>                                                                                                                                                                                                                                                                                                                                   |
| 5.9  | Proposed access arrangements during construction and operation                                                                                                                                                                                        | <p>A separate Preliminary Construction Traffic Management Plan has been developed and will be further developed upon engagement of a main contractor of works. Proposed access for construction will be via Pittwater Road with exit via William Street.</p> <p>During operation, site access is proposed to be left in/left out on Pittwater Road and right in left/right out in William Street as outlined in <b>Section 5</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 5.10 | Measures to improve pedestrian, cyclist and vehicle                                                                                                                                                                                                   | <p>Pedestrian paths will be widened to accommodate the increased pedestrian activity associated with the</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| No   | Issue                                                                                                                                                                                                          | Comments and References                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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|      | safety and to mitigate any traffic impacts identified on road, public transport, pedestrian and cycle networks                                                                                                 | <p>introduction of a BRT service as outlined in <b>Section 3.2</b>. CCTV will be in place at the upgraded bus interchange (to be developed during design development).</p> <p>A pedestrian bridge as outlined in <b>Section 5.7</b> will provide improved amenity and safety for pedestrians and cyclists (including lifts and bicycle running rail on the stairs) crossing Pittwater Road.</p> <p>Secure bicycle parking facilities will be provided within the site, supporting alternative transport options, and secure parking area as outlined in <b>Section 4.5</b>.</p> <p>As outlined in <b>Section 5.6</b>, separate drop off areas within the site have been provided to accommodate activities associated with BCHC.</p> <p>An ambulance drop off area is located off William Street and a heavy vehicle drop off area off Pittwater Road. Separating these drop off areas will provide improved safety to pedestrian and drivers by minimising interaction between drop off areas and their associated activities.</p> <p>The widening of driveways allows for turning manoeuvres for all vehicle types likely to need access. Access to/from Pittwater Road will be restricted to left in/left out reducing vehicle conflicts.</p> <p>Provision of segregated areas for car park usage (short term, commuter and staff) as outlined in <b>Section 4.1</b> will improve traffic and parking management within the site, reducing potential traffic conflicts.</p> |
| 5.11 | Proposed car parking provisions for staff, visitors and commuters, including consideration of the availability of public transport and the requirements of the relevant parking codes and Australian Standards | <p>The proposed parking provisions will satisfactorily accommodate staff, clients and visitors to the BCHC as well as commuters. Travel demand surveys undertaken from existing facilities have been used to ascertain anticipated public use for the BCHC for staff and clients. Refer <b>Section 4.1</b>.</p> <p>The parking layout is in accordance with the intent of:</p> <ul style="list-style-type: none"> <li>AS2890.1: Parking Facilities – Off Street Car Parking</li> <li>AS2890.6. : Parking Facilities – Off Street Parking for People with Disabilities</li> </ul> <p>Refer to <b>Section 4.8</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 5.12 | Assessment of emergency vehicle access                                                                                                                                                                         | <p>Turning paths have been developed to accommodate 12.5m fire service vehicles access into and within the site (minor modifications to kerb alignments will be required during design development) and standard bariatric ambulance in the drop off area (refer <b>Section 5.2 and 5.3</b>).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 5.13 | Assessment of any impact of the proposal on the existing bus lanes, bus stops and bus facilities on Pittwater Road                                                                                             | <p>As part of the bus interchange upgrade, the proposal includes the provision of a bus zone on the eastern kerblane outside the subject site. The existing kerbside bus lane remains unchanged (refer <b>Section 3.2</b>).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| No   | Issue                                                                                                                                                                  | Comments and References                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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|      |                                                                                                                                                                        | This will accommodate two 18.5m buses with 5m separation; two 12.5m buses with 5m separation and 15m separation between segments as required by TfNSW.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 5.14 | Demonstrate how the proposal would be integrated with the proposed bus interchange on Pittwater Road                                                                   | <p>As outlined in <b>Section 3.2</b>, the proposal considers the upgraded bus interchange (and introduction of a BRT service) with provision of a bus zone on the eastern kerbline outside the subject site. The existing kerbside bus lane remain unchanged.</p> <p>This length will accommodate two 18.5m buses with 5m separation; two 12.5m buses with 5m separation and 15m separation between segments as required by TfNSW.</p> <p>A wider pedestrian footpath area has been provided. The width ranges from approximately 6.5m to 7.5m to provide a bus waiting/loading area and pedestrian thoroughfare area. Access from the upgraded bus interchange to the commuter car park will be through the BCHC building arcade which ranges in width of approximately 4m to 6m. The BCHC arcade has been designed to safely accommodate pedestrian movements in the area.</p>                                                                                                                                                                       |
| 5.15 | Assessment of any impact of the proposal on the operation of the Brookvale Bus Depot located to the north of the site                                                  | <p>There will be no impact on the bus depot. The current access to the depot is via Pittwater Road and the intersection of Cross Street located north of the site will remain unchanged.</p> <p>The proposed BCHC access location along Pittwater Road is as per the existing location with widening to improve vehicle access to the site.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 5.16 | Parking management measures to provide designated parking areas for users of the health facility and commuters and to prevent these parking areas being used by others | <p>The car park allocation is proposed to be controlled with the following elements (refer <b>Section 5.3</b>):</p> <ul style="list-style-type: none"> <li>Level 1 short term parking (1 hour limit): The parking limit would be policed by approved authorities such as Council officers.</li> <li>Level 2-5 commuter parking: The daily parking limit maybe access controlled and could include being policed by approved authorities such as Council officers and integration of the TfNSW Opal card system.</li> <li>Level 5-7 BCHC Staff/Fleet: Access to this area is proposed to be restricted with the use of boom gates. It is proposed the boom gates could be activated by an approach recognition system with tags or similar (eg RFID cards) issued to approved staff and fleet vehicles, which will activate the boom gate on approach. The approach activation system has the advantage of reducing delays and queuing within the car park at the boom gates as well as reducing infrastructure associated with swipe cards.</li> </ul> |
| 5.17 | Service vehicle access, delivery and loading arrangements and estimated service vehicle movements (including vehicle type and the likely arrival and                   | Service vehicles will enter the site from the north off Pittwater Road (refer <b>Section 5.2</b> ). A designated drop off area within the site, located adjacent to the car park, will provide an area for waste vehicles collection and other                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

| No   | Issue                                                                                                                                                                                                                                                                                                    | Comments and References                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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|      | departure times                                                                                                                                                                                                                                                                                          | <p>deliveries for the BCHC (refer <b>Section 5.6</b>).</p> <p>It is proposed that deliveries or collections that require large vehicles (eg waste collection or stores deliveries) will occur outside peak operational times. This will minimise traffic impact within the site. The site has been designed to accommodate medium rigid vehicles (MRV) as outlined in <b>Section 5.2</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 5.18 | Traffic and transport impacts during construction and how these impacts will be mitigated for any associated traffic, pedestrian, cyclists, parking and public transport, including the preparation of a draft Construction Traffic Management Plan to demonstrate the proposed management of the impact | <p>Access during construction is proposed to be via Pittwater Road with exit via William Street. Vehicles will enter and exit in a forward direction to improve safety for drivers, pedestrians and cyclists.</p> <p>Site works will aim to be completed with minimal disruption to the pedestrian footpath adjacent to the bus interchange. Alternately, during footpath works the bus stop could be relocated north along Pittwater Road, subject to TfNSW and RMS approval. Prior to construction, the Works Contractor will make all necessary arrangements to obtain all required approvals with authorities.</p> <p>During construction, a minimum 1.2 m footpath width will be maintained during footpath works allowing cyclists to dismount safely.</p> <p>A Preliminary Construction Traffic Management Plan has been prepared to provide guidance for the Works Contractor with regard to traffic measures during construction.</p> |



## 2.0 EXISTING CONDITIONS

### 2.1 The Site

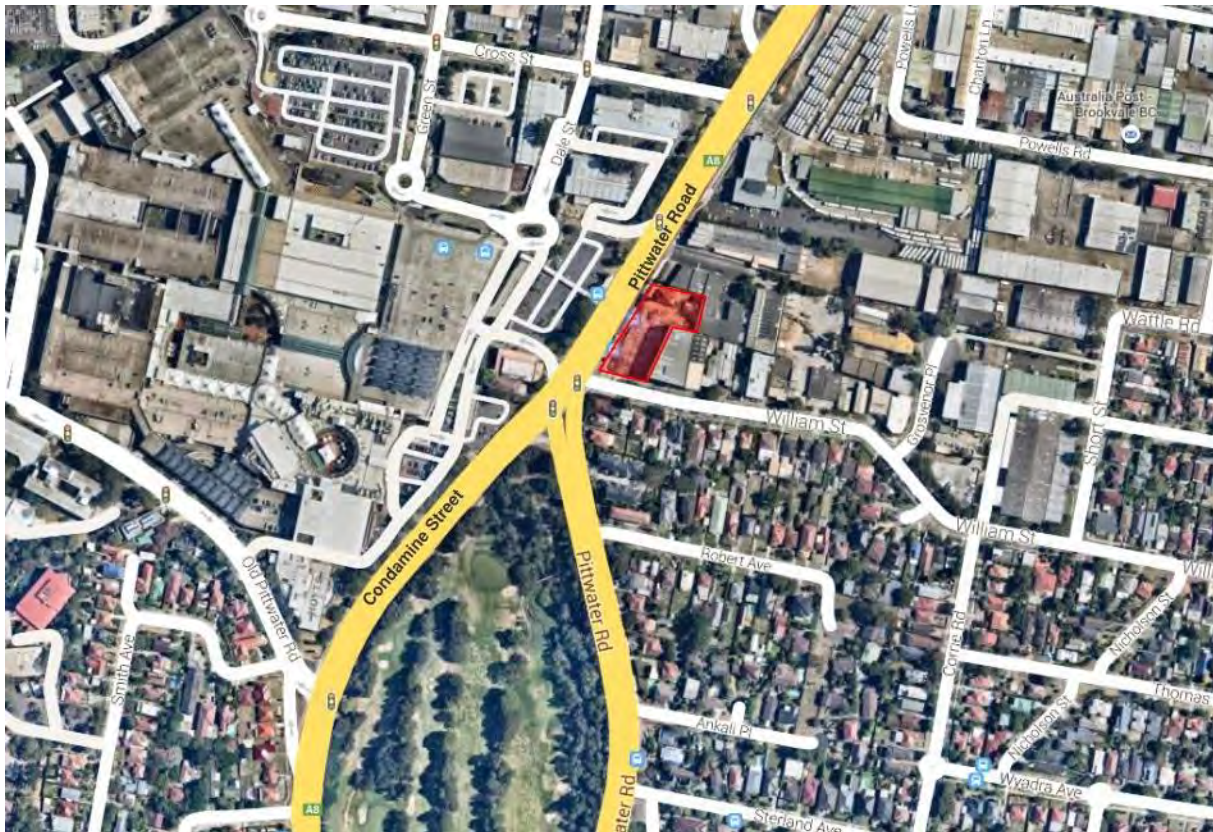
The site is located at 612–624 Pittwater Road, Brookvale at the north-east corner of the intersection of Pittwater Road and William Street (refer **Figure 2**).

Pedestrian footpaths are provided along both sides of Pittwater Road and William Street.

The speed limit along Pittwater Road is 60 km/h while William Street has a posted speed limit of 50km/h.

Kerbside parking is permitted along William Street while parking along Pittwater Road is restricted within the vicinity of the site.

The site is located within the Warringah Local Government Area (LGA).



**Figure 2: Site Locality**  
(Source: [www.nearmap.com.au](http://www.nearmap.com.au))

### 2.2 Approach Routes

The major approach routes to the site are Condamine Street/Pittwater Road from the south and Pittwater Road from the north. Vehicles travelling from the west will likely come from the north via Old Pittwater Road and Pittwater Road or from the south via Condamine Street. Traffic from the east is likely to travel via William Street on the local road network.

There are several alternatives to access the site for vehicles travelling from the south along Condamine Street including:

- Right turn into Kentwell Road, left turn into Pittwater Road, right turn into Corrie Road, left turn into William Street, right turn into the BHC site
- Left turn into Old Pittwater Road, right turn into Cross Street, right turn into Pittwater Road, left turn into the BHC site.

Corrie Road has a 3 tonne load limit (refer **Figure 3**). Accordingly, heavy vehicles travelling from the south will likely use the second route noted above.

RMS has a traffic counter (id 34016) on Condamine Street located south of the site at Manly Creek, Manly Vale. This recorded 23,000 vehicles per day northbound and 22,300 vehicles per day south bound on a weekday (2012 data). There is a second RMS traffic counter (id 55022) to the north of the site on Pittwater Road (near the access to Warringah Mall). This recorded peak weekday volumes in the order of 24,000 northbound and 21,800 vehicles (2009 data).

A turning movement survey was undertaken on 12 October 2011 during the AM and PM peak hours for the intersection of Pittwater Road and William Street. This identified that nominally 3,500 vehicle turning movements occurred at the intersection during each peak hour. Analysis by GTA indicated that the *“intersection operates satisfactory with spare capacity in line with its function as a major road junction on a state road”* (GTA Consultants Traffic and Transport Assessment – 23 June 2014).

The GHD report for the Brookvale Pedestrian Bridge Options Analysis carried out intersection modelling on the William Street/Pittwater Road/Condamine Street intersection based on the October 2011 traffic data and pedestrian counts undertaken in May 2014. The report outlined that the intersection was operating at a satisfactory Level of Service.

## 2.3 Intersections

The major intersections along the approach routes to the site (refer **Figure 3**) include:

- Pittwater Road/Condamine Street/William Street (adjacent to the site)
- Pittwater Road/Sydenham Road and Pittwater Road/Orchard Road and Pittwater Road/Mitchell Road (may be used for access from the south-west)
- Pittwater Road/Corrie Road (likely to be used by vehicles approaching from the south-east)

The intersection of Pittwater Road/Condamine Street/William Street is signalised with at grade pedestrian crossing across William Street and Pittwater Road (northern arm) and a access road to Warringah Mall. William Street is left out only to Pittwater Road for all vehicles. There is no right turn permitted northbound from Condamine Street or Pittwater Road into William Street and no left turn southbound along Pittwater Road into William Street.

The intersection of Pittwater Road and Orchard Road is a non-signalised T intersection. A right turn storage lane is provided from Pittwater Road into to Orchard Road. The right turn from Pittwater Road into Orchard Road requires crossing two lanes of traffic and a bus lane. Pedestrian access across Pittwater Road can be facilitated through the traffic signals at Sydenham Road outlined below

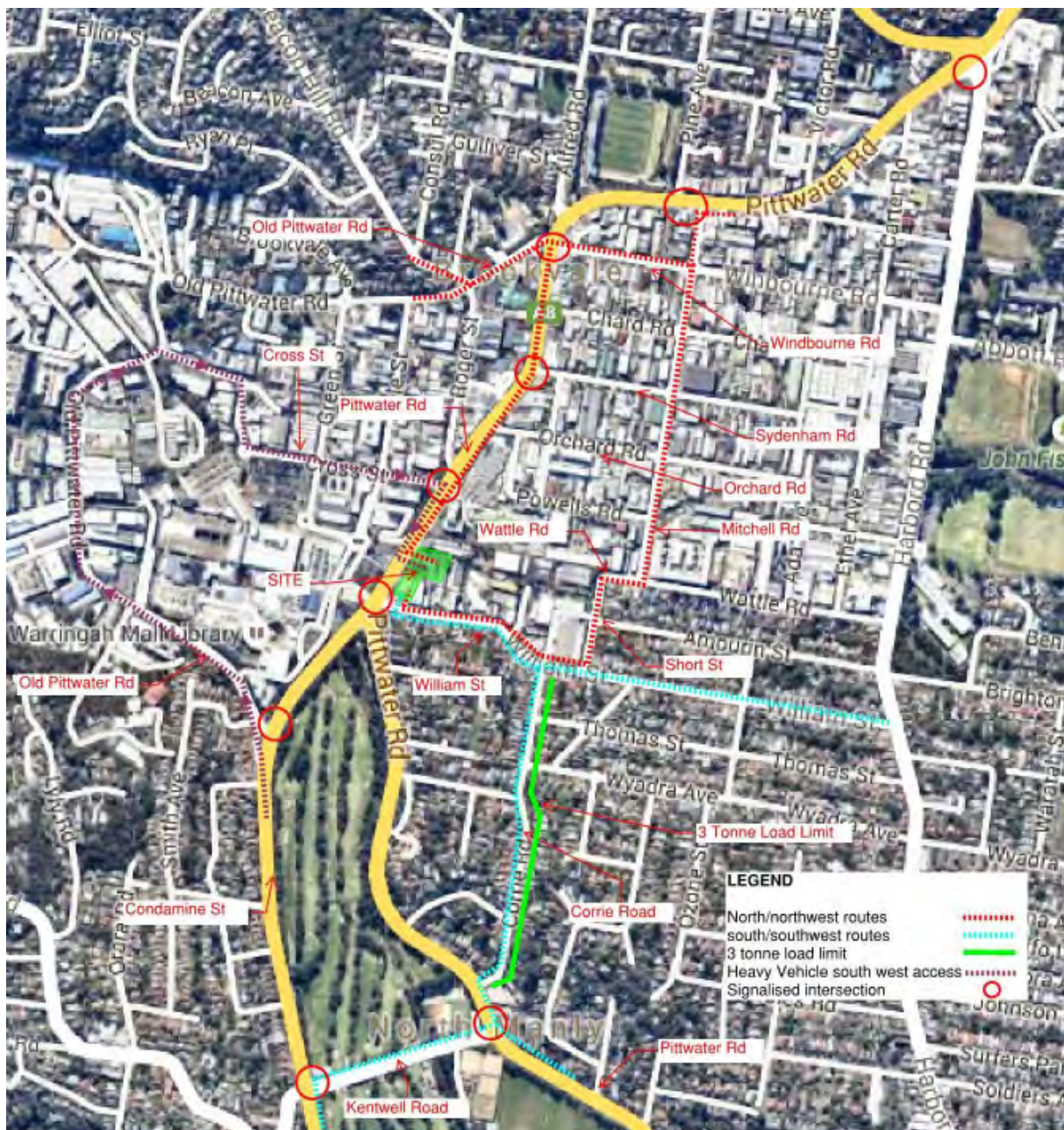
The intersection of Pittwater Road and Sydenham Road is a signalised T intersection located north of the Orchard Road. A right turn lane and signalised arrow is provided from Pittwater



Road into Sydenham Road. Pedestrian signals are provided across Sydenham Road and the southern arm of Pittwater Road. All turning movements are permitted at this intersection.

The intersection of Pittwater Road and Mitchell Road is a signalised T intersection located north of the site. A right turn lane and signalised arrow is provided from Pittwater Road into Mitchell Road. Pedestrian signals are provided across Mitchell Road only. All turning movements are permitted at this intersection.

The intersection of Pittwater Road and Corrie Road is a non-signalised T intersection. Right turn movements are allowed from Pittwater Road, however, no turning lane is provided.



**Figure 3: Approach Routes/Intersections**  
(Source: [www.nearnmap.com.au](http://www.nearnmap.com.au))

## 2.4 Parking

Warringah Mall, located opposite the BCHC site, which contains off street car parking facilities. The first three hours are free parking with fee schedules for parking over three hours.

Pittwater Road has parking restrictions adjacent to the site and clear way in operation during peak periods.

William Street contains unrestricted parking along the southern kerb and 1 hour period parking along the north kerb

Unrestricted kerbside parking typically exist north of the site within the local street network.

There is moderate demand for street parking due to the commercial nature of the district. Westfield Warringah Mall provides a large number of off street parking for the use of patrons reducing the demand of street parking in the surrounding area.

## 2.5 Bicycle Facilities

Existing bicycle routes within Warringah are shown in **Figure 4**. Bicycle paths provide access to the site with shared path/off road access to the site from the south through William Street and Pittwater Road.

There are 10 bicycle hoops (20 bicycles) located on the corner of William Street and Pittwater Road, these racks are heavily used. These will need to be removed for the development but will be replaced within the BCHC site.

The GHD Pedestrian Overbridge Options Analysis report outlined existing bicycle patronage in the area particular across Pittwater Road and bicycle desire routes. Observed cyclist crossings of Pittwater Road were relatively low (AM peak eight cyclists; PM peak 22 cyclists; and Saturday peak 12 cyclists). The bicycle desire line was from the residential areas south east of the site utilising the William Street on road shared facility.



**Figure 4:** Bicycle Routes (source <http://www.warringah.nsw.gov.au/play/walks-trails-and-bike-tracks>)

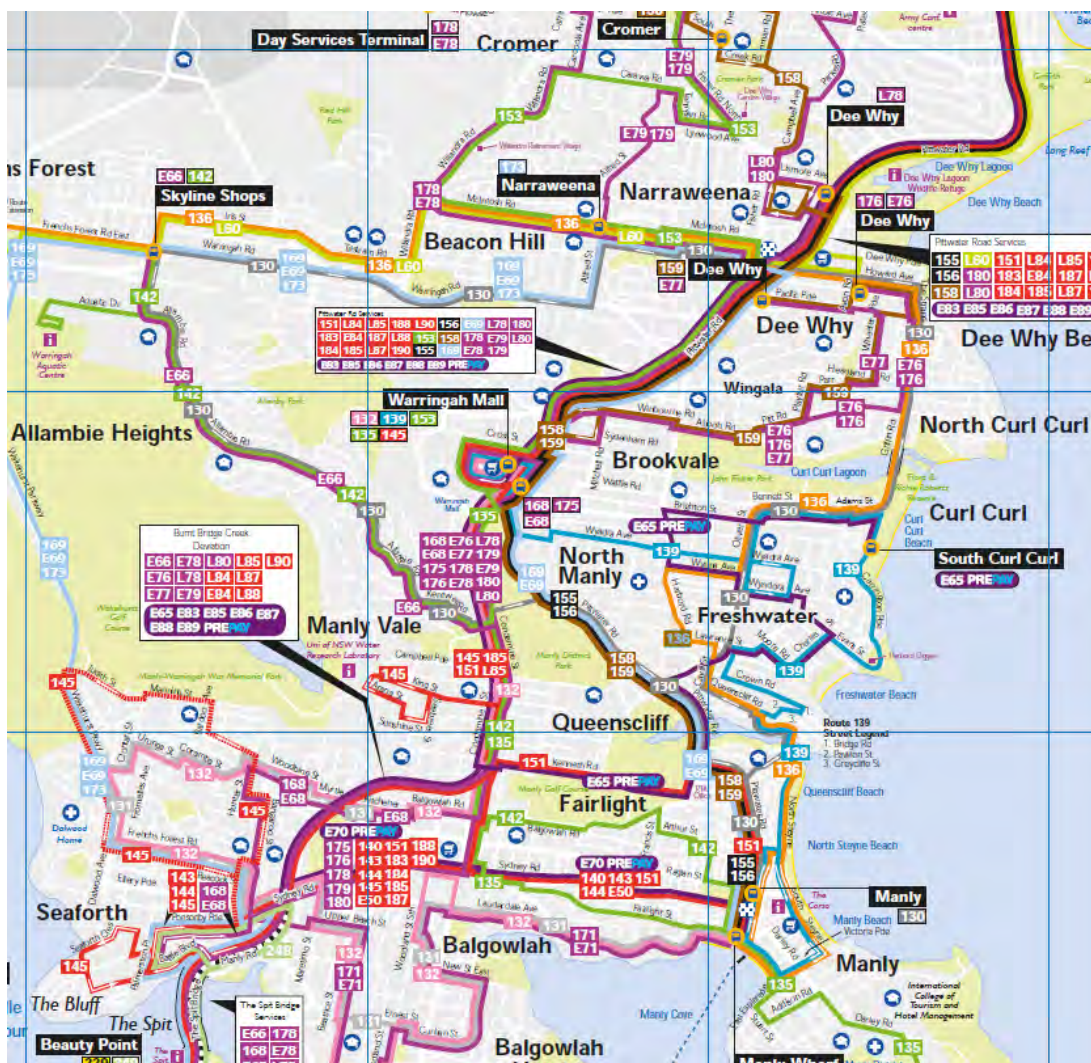


## 2.6 Public Transport

The site is serviced by frequent buses through nearby stops on Pittwater Road and within Warringah Mall. Services run to a range of destinations including Manly, The City, Milsons Point, Chatswood, Collaroy Plateau, Mona Vale, Dee Why, Palm Beach, Cromer Heights, Avalon, Seaforth and McCarrs Creek. Bus Routes from the Pittwater Road bus stop (immediately outside the site) include 132, 135, 145, 151, 168, 176, 179, 180, 183, 184, 185, 188, 190, 276, 280, E76, E77, E78, E79, E83, E84 and E85. A bus route map for the local area can be seen in **Figure 5**.

A bus stop is located directly west of the site frontage along Pittwater Road.

The TfNSW Northern Beach Bus Rapid Transit Report outlines that in 2014, the peak number of bus arrivals was 59 per hour in the southbound direction (directly outside the subject site) in the AM peak and 54 buses per hour in the northbound direction (opposite the subject site) in the PM peak.



**Figure 5:** Bus routes map for the local area, Warringah Mall is marked. (Source: <http://www.sydneybuses.info/routes/region-guides>)

### 3.0 BROOKVALE COMMUNITY HEALTH CENTRE

#### 3.1 Proposed Development

The Northern Beaches Health Service Redevelopment (NBHSR) Project involves consolidating health services across the northern beaches. As part of this the BCHC will be one of three hubs bringing together health services, workforce technology and resources. This facility will improve access to primary and community health services for residents of the northern beaches.

The key characteristics of the new facility will comprise:

- A main building for the provision of health services including staff zones, and consulting rooms.
- A cafe area on the ground floor to service the staff and clients to the BCHC.
- Multi storey car park for use by staff, clients and commuters in association with TfNSW's Bus Rapid Transit (BRT) Interchange Project.
- Areas for bike cages, racks and motorcycle facilities.
- Site access from Pittwater Road and William Street.

#### 3.2 Bus Interchange

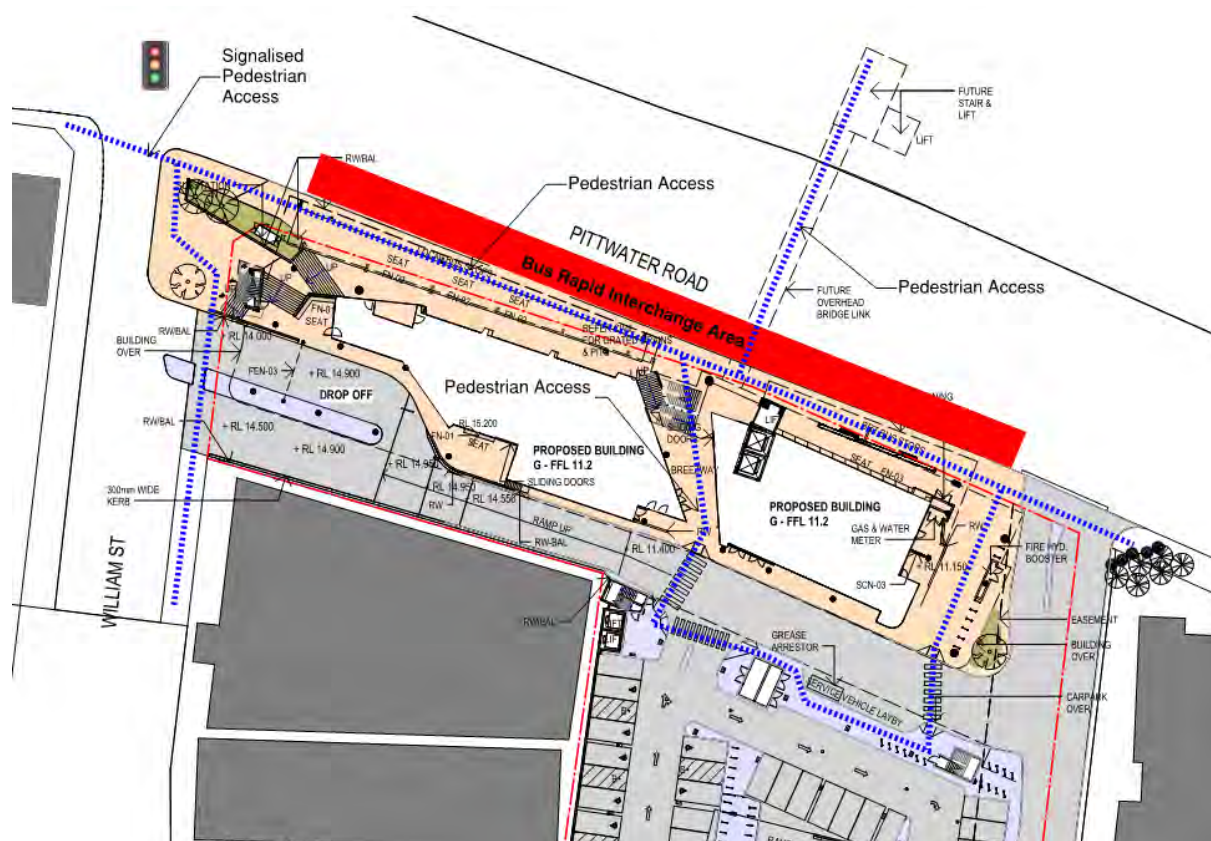
The proposed development accommodates the upgrading of the bus interchange, specifically the southbound stop on Pittwater Road. TfNSW has developed the Northern Beach Bus Interchange Report outlining anticipated bus and patrons numbers. It is estimated that 830-980 boarding and alighting occurs during peak periods and are expected to grow by approximately 20% by 2031. TfNSW has requested the design of the BCHC accommodate a bus interchange capable of accommodating two separate bus segments to work independently if required. These would comprise two buses (12.5m length) for the local/Manly bus route and two buses (18.5m length) for the city express bus service.

The proposed kerb alignment is being maintained with an available kerb length of approximately 100m between the traffic signals at William Street and the access driveway on Pittwater Road. This length will accommodate two 18.5m buses with minimum 5m separation; two 12.5m buses with minimum 5m separation, and 15m separation between segments as outlined by TfNSW.

The pedestrian footpath area adjacent to the interchange varies in width from 6.5m to 7.5m to provide a bus waiting/loading area as well as pedestrian thoroughfare. Access from the interchange to the commuter car park will be through the BCHC building arcade which ranges in width of approximately 4m to 6m.

Integration of the BCHC design with the upgraded interchange provides for facilities including (but not limited to) Opal card readers, bus shelter, covered areas, and real time bus display systems. Development of these will form part of detailed design.

**Figure 6** provides an indicative layout of the upgraded bus interchange and pedestrian connectivity with regard to the BCHC building and commuter car park (at the rear of the BCHC site), and the new pedestrian bridge across Pittwater Road.



**Figure 6:** Bus Interchange Pedestrian Connectivity



## 4.0 PARKING

The BCHC site will provide a multi storey car park for use by staff, clients of the BCHC and commuters. The following summarises how the parking allocation has been developed.

### 4.1 Car Parking Provision

Minimum car parking provision was based on:

- Travel demand survey information received by clients and staff of existing facilities.
- Proposed staff and client numbers provided by Health Infrastructure and Addendum 3 (V3.1; October 2014) Northern Beaches Health Centre (NBHS) Community Health Functional Brief.

A detailed parking estimate specifically for the BCHC facility was developed based on proposed staff and visitor numbers provided by Health Infrastructure and Addendum 3 (V3.1 October 2014) Northern Beaches Health Centre (NBHS) Community Health Functional Brief.

This was supplemented by a travel demand survey undertaken during April 2015 by Taylor Thomson Whitting to gain an understanding of the anticipated vehicle travel demand for staff and visitors to the BCHC. The survey involved a questionnaire to staff and clients of five existing health service faculties that will be transferred to Brookvale. A total of 55 staff and 155 clients were recorded. The survey indicated that nominally 71% of staff and 52% of clients would likely travel by car to the new BCHC facility.

Consideration has also been given to strategic transport policies to encourage alternate modes of transport such as public transport, cycling, walking, etc. To encourage these modes of transport, sites within close proximity to public transport options and/or provide sustainable transport facilities (eg, bicycle lockers/cages, end of trip facilities).

**Table 1** outlines the estimated parking requirements based on proposed staff and client numbers for the development.

**Table 1: Estimated Parking Requirements**

| Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Number                                                                                                                  | Estimated Parking Demand |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Total FTE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 225 Total FTE                                                                                                           | -                        |
| Staff/shift*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 162 staff/ Shift                                                                                                        | 113                      |
| Clients (Daily)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 538 **                                                                                                                  | 33^                      |
| Retail                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Proposed coffee shop to be utilised by staff and clients to the facility therefore included within the parking estimate | 0                        |
| <b>Sub Total</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                         | <b>146</b>               |
| Fleet Cars (CHC)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Number of Fleet vehicles provided by Health Infrastructure (54)                                                         | 54                       |
| <b>Total</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                         | <b>200</b>               |
| <b>Assumptions</b><br>* max staff shift number provided by Health Infrastructure. Travel demand survey indicated about 70% of staff would travel to the Brookvale site by car (based on travel demand survey and allowance for variation of travel demand)<br>** max daily client number provided by Health Infrastructure.<br>^ Based on 60 min length of stay during a day with 60% car use (based on travel demand survey and allowance for variation of travel demand). Spread over typical operating period of 10 hours: 8am-5pm. |                                                                                                                         |                          |

## 4.2 TfNSW Commuter Parking Requirements

The Northern Beaches BRT Interchange Project identifies five proposed interchanges within the Northern Beaches area, one of these being the Brookvale Interchange. These interchanges aim to provide improved commuter parking facilities for cars and bikes and enhanced pedestrian connections.

The Northern Beach Bus Rapid Transit: Brookvale Interchange: TfNSW report outlines that

*“The draft Commuter Parking Feasibility Study for the Northern Beaches BRT project estimates that demand to 2013 for commuter car spaces at Brookvale is between 114 and 193 spaces. However depending on the actual location of car parks, demand may be higher as customers drive further to access the available spaces. Recognising the demand in Brookvale, allowing for overflow from Dee Why, which is capacity-constrained and align with the overall amount of commuter parking required for the whole BRT, the Brookvale commuter is required to have a minimum of 250 spaces”*

The parking provision for commuter parking was discussed between Health Infrastructure and TfNSW. It was agreed that the parking provision be maximised as much as practical with consideration given to the required parking provision for the BCHC facility.

## 4.3 Car Parking – Summary

The following car parking allocation has been developed. It is proposed within the multi-storey car park (**Table 2**). **Appendix A** outlines the proposed car park allocation.

**Table 2:** Proposed Parking Provisions

| Allocation                 | Number     | Location      |
|----------------------------|------------|---------------|
| Visitor/Short term Parking | 44         | Level 1       |
| Accessible Parking         | 10         | Level 1       |
| BCHC Fleet Parking         | 54         | Level 5/6     |
| BCHC Staff Parking         | 117        | Level 6/7     |
| BRT Commuter Parking       | 250        | Level 2/3/4/5 |
| <b>TOTAL</b>               | <b>475</b> |               |

The above breakdown meets the anticipated parking demand for the BCHC and maximises the available parking for commuter parking within the parking facility.

Car park allocation has considered the use for staff, clients, fleet cars for Brookvale CHC and in addition to the commuter car parking. The parking allocation aims to combine parking of similar nature into adjoining areas or on same floor levels with the long term parking such as (commuters and staff) being allocated towards the top of the multi-storey car park, and higher turnover parking areas (such as visitors to the BCHC) being positioned towards the bottom where practical. This aims to reduce the traffic flow within the car parking area and improve circulation within the facility.

Accessible parking has been provided at ground level to provide access from the car park to building and bus interchange and at the upper levels within the staff parking area.

At this stage the fee structure (if any) has not been developed, however the car park allocation is proposed to be controlled through the following elements:

- Level 1 short term parking (1 hour limit): The parking limit would be policed by approved authorities such as Council officers.
- Level 2-5 commuter parking: The daily parking limit maybe access controlled and could include being policed by approved authorities such as Council officers and integration of the TfNSW Opal card system.
- Level 5-7 BCHC Staff/Fleet: Access to this area is proposed to be restricted with the use of boom gates. It is proposed the boom gates could be activated by an approach recognition system with tags or similar (eg RFID cards) issued to approved staff and fleet vehicles, which will activate the boom gate on approach. The approach activation system has the advantage of reducing delays and queuing within the car park at the boom gates as well as reducing infrastructure associated with swipe cards.

#### 4.4 Accessible Parking

The Building Code of Australia (BCA) outlines that for a Class 9a facility (a health care building) that the minimum accessible parking is provided at a rate of one space per 50 car spaces. The TfNSW Transport Access Program “Design of Multi-storey Commuter Car Parks” also outlines the minimum accessible parking is to be provided at one space per 50 car spaces. For Class 7 (a) (Car park building) the BCA outlines the minimum accessible parking is to be provided at one space per 100 car spaces.

Based on the proposed 475 spaces and the minimum parking requirements for the main use (Health Care building of one accessible space per 50 spaces) the development should provide ten (10) accessible parking spaces.

The current proposal includes **ten (10) accessible parking spaces** located on Level 1 of the car park.

#### 4.5 Bicycle Parking

Bicycle parking is proposed on site in conjunction with the objectives of TfNSW. This will incorporate a mix of bike racks (hoops) and bike cages to service the development and the needs to commuters (in conjunction with commuter car parking being provided).

There are currently 10 bike racks located on the corner of William Street and Pittwater Road that accommodate approximately 20 bicycles. The following outlines the considerations given to the proposed bicycle parking provisions for the site.

#### Warringah DCP Requirements

The Warringah DCP stipulates that bike parking is to be provided in conjunction with “Section C3 (A) Bicycle Parking and End of Trip Facilities”. **Table 3** provides an excerpt from the Warringah Council DCP for Bicycle guidelines. Rates are given for more secure bike spaces (locker style or within a secure room) and less secure spaces, eg racks.

**Table 3: Warringah Council DCP Bicycle Parking Requirements**

| Development Type             | Bicycle Spaces Required     |                                       |
|------------------------------|-----------------------------|---------------------------------------|
|                              | Secure Spaces (Locker/Cage) | Less Secure Spaces (Bike Racks)       |
| Business and Retail Premises | 1 per 200m <sup>2</sup> GFA | Visitors: 1 per 600m <sup>2</sup> GFA |

Based on a total GFA of= 6,166 square metres, the minimum required bicycle facilities are:

- 30 secure spaces (lockers/cage).
- 11 less secure spaces (racks).

The proposal includes a cage facility located on Level 1 of the car park. This will provide ten (10) bicycle racks to accommodate up to 20 bicycles securely. Additionally there will be another 15 racks (30 bicycles) located undercover within the car park Level 1, a further 8 racks (16 bicycles) undercover at the northern building perimeter and 3 racks (6 bicycles) at the southern end of the site. These racks can be utilised for staff, visitors and commuters to the area.

The Warringah DCP also addresses end of trip facilities. This stipulates that bathroom change areas needs to provide at least one toilet, wash basin, mirror, clothing hooks and power points (including shaving plugs). A minimum of one shower cubicle per seven bicycle spaces needs to be provided. Based on 30 bike spaces (staff secure spaces) the BCHC would need a minimum of four shower cubicles.

The DCP also outlines requirements for clothes lockers and suggests minimum locker dimensions. Lockers are to be provided at the rate of one per bicycle space.

It is proposed these facilities could be accommodated within the proposed building area.

### **TfNSW Bus Rapid Transit Requirements**

The Northern Beaches Bus Rapid Transit: Brookvale Interchange: TfNSW report outlines that secure parking for bicycles is required for commuters in the form of bike sheds/lockers in addition to short term bicycle facilities such as bike racks.

The report outlines that secure bicycle facilities for 50 bicycles be provided in addition to short term parking racks in accordance with development application requirements. Further discussions with TfNSW have agreed that a caged area be provided to accommodate 30 bicycles and a separate undercover area for 20 bicycles.

A cage facility will be provided under the building adjacent to the bus interchange that contains a minimum of 16 racks (32 bicycles). As noted above there are a further 26 racks (52 bicycles) located around the site.

### **Bicycle Parking Provision Summary**

Based on previous studies, DCP guidelines and TfNSW requirements, the proposal includes the following bicycle provision to encourage alternative sustainable transport options:



- A cage facility under the main building (southern end) for the use of commuters to accommodate up to 16 racks (32 bicycles) securely.
- A cage facility on car park level 1 for the use for public, commuters and staff suitable to store 10 racks (20 bicycles) securely.
- Located within covered areas of the car park on level 1, a total of 15 racks (30 bicycles) that can be utilised for short term bicycle parking for public, commuters and staff.
- Located under the main building (northern end) a total of 8 racks (16 bicycles) that can be utilised for short term bicycle parking for public, commuters and staff.
- Located at the southern end of the site a total of 3 racks (6 bicycles) that can be utilised for short term bicycle parking for public, commuters and staff.

#### **4.6 Motorcycle Parking**

The Warringah DCP does not outline motorcycle parking requirements, however to encourage alternate transport options it is proposed to provide allocated motorcycle parking within the car park. A total of 3 designated spaces have been allocated on the plans. The proposed motorcycle parking is located within Level 2 of the car park facility and can be utilised by both BCHC staff/clients and by commuters. The parking layout also provides for additional allocated motorcycle parking spaces if required.

#### **4.7 Electric Car Spaces**

Under the TfNSW Transport Access Program Design for Multi-Storey Car Parks, provision is to be made for future electric car spaces in the order of 15% of the total new car spaces being provided. Based on the 250 commuter car parking spaces provided, consideration could be given to 37 spaces having future facilities for electric car spaces. There are opportunities within the car parking facility to provide suitable infrastructure for electric car use.

#### **4.8 Car Park Layout**

The car park layout is designed in accordance with AS2890.1. The car park has generally been designed as a Class 3 facility (short term/high turnover parking) with the parking layout consisting of 2.6m x 5.4m spaces and 6m wide aisles.

Small car spaces (2.3m x 5.0m) are proposed throughout the car park (25 spaces in total) to maximise parking provision and encourage small car usage. It is considered that increasing the use of small cars assists in improved environmental aspects of car usage.

The proposed layout provides for one way traffic flow as preferred by TfNSW Design of Multi-storey Car Park, promoting more efficient circulation and improved parking facility.

Accessible parking spaces are to be in accordance with AS2890.6 and consists of a shared area adjacent to the accessible space to assist in vehicular access.

## 5.0 PROPOSED ACCESS ARRANGEMENTS

### 5.1 Site Access

Currently, site access is provided off Pittwater Road and off William Street. The driveway on Pittwater Road is nominally 21m in length and provides access to the site in addition to adjoining property north of the site (626 Pittwater Road). The driveway on William Street is nominally 7m wide and provides access to the site.

Consideration has been given to several options to provide suitable access to the site from the north and south. It was necessary to account for potential vehicular movements on local and arterial road network, current road restrictions (load limits, turning restrictions etc), vehicle/bus interactions and general site access to the car park.

Site access locations would closely resemble the existing site access positions. It is also proposed to implement a right turn facility from William Street onto Pittwater Road. This would be facilitated through the removal of the at grade pedestrian crossing with alternative (and safer) crossing provided by the new pedestrian bridge.

#### **Pittwater Road Site Access/Egress**

The Pittwater Road driveway is proposed to be amended to allow access from Pittwater Road into the subject site and the adjoining eastern property (626 Pittwater Road). The driveway is to be extended to allow vehicles to enter and exit the site with the existing central median on Pittwater Road restricting movements to left in/left out only. This minimises disruption to traffic flow and movement in and out of the site and along Pittwater Road.

#### **William Street Site Access/Egress**

A second site access/egress is proposed off William Street, closely positioned to the existing driveway location. This access will allow a single lane entry/exit each way. Vehicles would be able to turn left or right out of the site. Due to the existing no access from Pittwater Road into William Street, access to the site along William Street will be from the east only.

#### **William Street/Pittwater Road/Condamine Street Intersection Alteration**

As noted above, the development includes the provision of a right turn from William Street to Pittwater Road. This would reduce the amount of vehicle traffic on William Street (and other local streets) by providing direct access for northbound traffic onto an arterial route (ie Pittwater Road).

Modification of the William Street/Pittwater Road intersection would generally comprise:

- Widening of William Street to accommodate two lanes (right/left out).
- Removal of the island and traffic signals within the intersection and relocated lanterns/signage to alternative locations.
- Removal of the at grade pedestrian crossing facility along the northern arm of Pittwater Road.
- Northward extension of the existing pedestrian fencing to discourage pedestrian movement across Pittwater Road.
- Implementation of a pedestrian overbridge (refer to **Section 5.5**)

Refer to **Figure 7** for site access arrangements.

The above access arrangements allow vehicles travelling to/from the site from the north or south to utilise the arterial road network (Pittwater Road) in preference to the local street network.

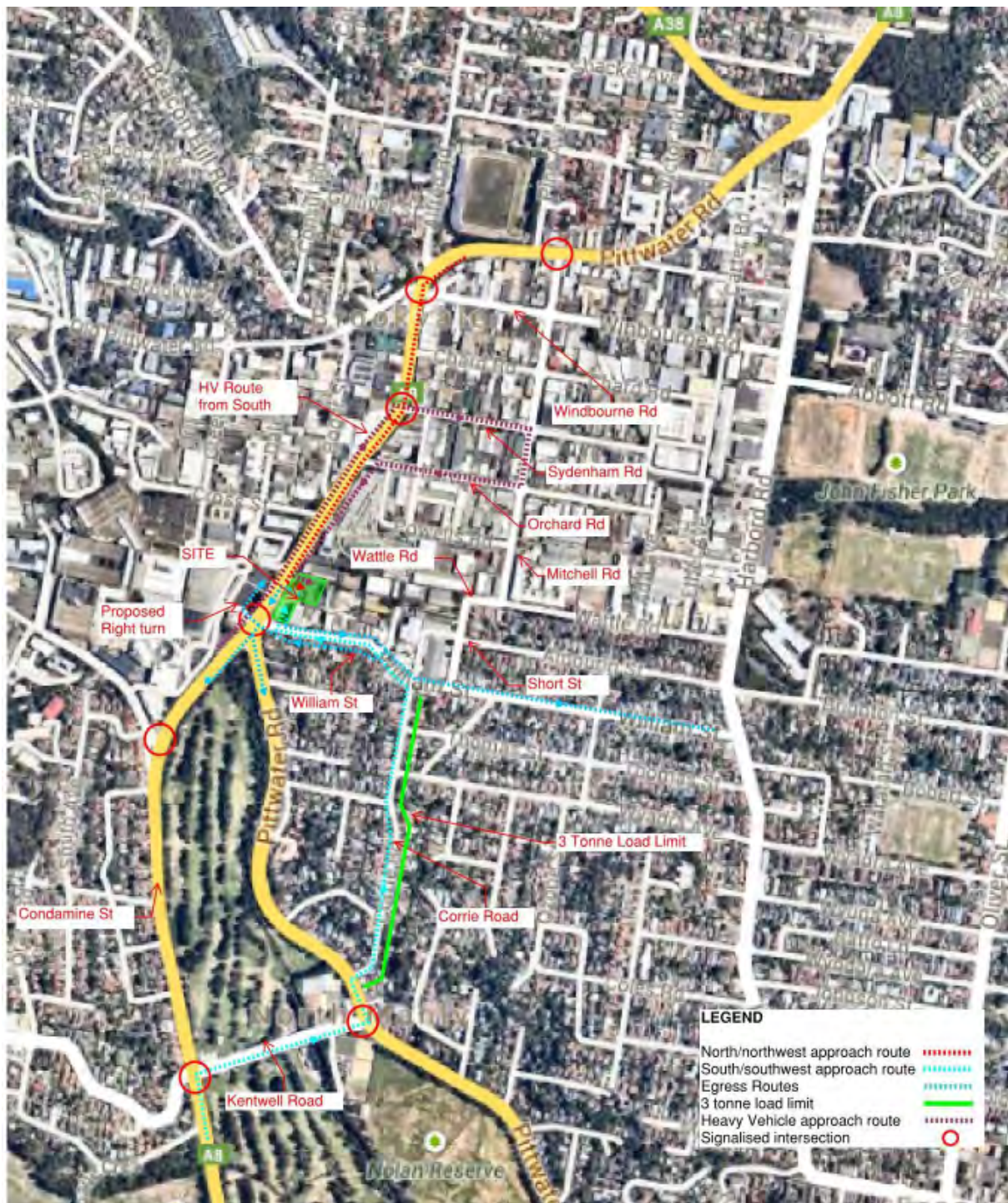


**Figure 7:** Proposed Site Access

Access routes to the BCHC site from the wider area are as described in **Section 2.2**.

Heavy vehicles leaving the site will exit to William Street and utilise the traffic signals at Pittwater Road to travel north or south (refer **Figure 8**). This route benefits the site operation of heavy vehicles and limits traffic movements along local street network.





**Figure 8:** Proposed Site Access Routes

## 5.2 Service Vehicle Access

Service vehicles will enter the site from the north off Pittwater Road, utilise the loading area facilities located within the site, and then exit the site via William Street in a forward direction.

Turning path plans have been developed for the site access off Pittwater Road and to William Street. With minor kerb modification the access driveway off Pittwater Road can accommodate vehicles up to 12.4m in length (suitable for emergency vehicle movement eg



fire services). It is anticipated that the site would typically have to accommodate vehicles up to 8.8m Medium Rigid vehicle (MRV) for waste services. It is anticipated that these movements will occur outside peak hours, however turning path plans indicate that sufficient width is available within the site for a MRV to pass a B99 car with appropriate clearances.

Refer to **Appendix B** for vehicle turning path plans of the site.

### 5.3 Ambulance Access

Ambulance access to the site is proposed from the drop off area accessed via William Street. The drop off facility access is separate from the general access to the multi-storey car park. Adequate turning path plans have been provided for a general bariatric ambulance to enter and exit the site in a forward direction. Refer to **Appendix B**.

### 5.4 Car Park Access

Access to the multi-storey car park access will be available from both Pittwater Road and William Street. Access will be uncontrolled but with policing enforcing any period parking restrictions as outlined in **Section 4.3**. The proposed access to the car park facility will be positioned to the eastern property line to maximise available queuing length within the property. A length of approximately 60m has been provided from Pittwater Road along the internal access roadway within the property (suitable to accommodate up to 10 vehicles). Additionally, queue length is available within the car park structure as boom gates are only proposed in the upper levels of the car park. The internal access road from William Street to the car park access is approximately 60m (suitable for up to 10 vehicles).

### 5.5 Pedestrian Access

There are existing footpaths along both the eastern and western sides of Pittwater Road with at grade pedestrian crossings across Pittwater Road and William Street via the signalised intersection at William Street/Pittwater Road.

The pedestrian footpath area adjacent to the upgraded bus interchange will have a width of 6.5–7.5m with the widest areas being in the express bus designated area. Access from the bus interchange to the commuter car park will be through the BCHC building arcade.

Pedestrian access will also be provided along the southern building line of the site providing access from the drop off area to the main building entrance.

The development includes a pedestrian bridge across Pittwater Road from the BCHC building. This will be available for use by both staff and clients accessing the BCJC on foot, and by commuters. With the anticipated increased number of pedestrians using the bus interchange, this will provide for safer crossing of Pittwater Road.

Key features of the pedestrian bridge include:

- Lifts for the use by pedestrians (and cyclists) on each side of the roadway with a capacity of 17 persons.
- Public stair access (with bicycle running rail)
- Bridge and stair width of 2.5m to accommodate both pedestrians and cyclists.

In the event that a lift is temporarily inoperative, alternative disabled access across Pittwater Road will be available via the at grade pedestrian crossing at Cross Street.

Pedestrian amenity will be improved by decreased waiting times from implementation of the bridge as noted below (GHD Brookvale Pedestrian Overbridge Options Analysis):

- Average time to cross the road when using the stairs and pedestrian bridge decreases from 83 seconds to 68 seconds and is half of the maximum at-grade crossing time.
- Average time to cross the road using lifts decreases by 11 seconds and the maximum time decreases by 26 seconds when compared to the at grade crossing.
- Increased safety for pedestrians, cyclists and road users with grade separation provided (one pedestrian injury was recorded between 2009 and 2013 where a vehicle collided with a pedestrian).

## **5.6 Drop Off Facilities**

A drop off area for clients and ambulances from William Street will be provided under the building structure. A second drop off area will be provided adjacent to the car park with access from Pittwater Road. This drop off area is approximately 20m in length and will generally be utilised for loading and unloading for light and heavy service vehicles for the BCHC.

Consideration could be given to implement a drop off area along the southern kerbline in William Street to accommodate a kiss and ride facility for BRT. This could be implemented with "No Parking" restriction during peak hours (7am-9am and 4pm-6.30pm Monday to Friday). Further consultation would be required with Council, should this be a requirement for TfNSW.

## 6.0 TRAFFIC IMPACT OF THE DEVELOPMENT

### 6.1 Traffic Generation

A traffic generation estimate has been developed based upon the proposed parking of 475 spaces and an estimate turnover rate per space (excluding accessible spaces). This consisted of:

- Staff Parking: 117 spaces (turnover rate = 1 trip in any peak hour)
- Client/Visitor Parking: 44 spaces (turnover rate = 1.3 trip in any peak hour)
- Fleet Parking: 54 spaces (turnover rate = 0.5 trip in any peak hour)
- Commuter Parking: 250 spaces (turnover rate = 1 trip in any peak hour)

The peak arrival times of clients, staff and commuters may not all coincide within the peak hour period. The BCHC is proposed to operate between 8am-5pm daily. Although staff arrival in the AM period may correspond somewhat with commuter parking arrival, the majority of client arrival times will be slightly later. In the PM period staff and client departure will likely be prior to commuter departure. As a conservative estimate, utilising the above rates for all usage within any typical peak hour period, the site could potential generate some 450 vehicle trips per hour.

- Assuming an AM Peak arrival/departure of 70%/30% (315 trips in + 135 trips out).
- Assuming an PM Peak arrival/departure of 30%/70% (135 trips in + 315 trips out).

Based upon an assumed arrival distribution of 50% from the north and 50% from the south, it is anticipated that the peak arrival/departure from each entrance of Pittwater Road and William Street will be in the order of some 160 vehicles/hr.

### 6.2 Road Network

*The term “level of service” for **road capacity** has been defined by AUSTROADS as: A qualitative measure describing operational conditions within a traffic stream and their perception by motorists and or passengers. A level of service definition generally describes these conditions in terms of factors such as speed and travel time, freedom to manoeuvre, traffic interruptions, comfort, convenience and safety. In general there are six levels of service designated from A to F, with level of service A representing the best operating conditions (i.e. free flow) and level of service F the worst (i.e. forced or breakdown flow).*

One-way hourly volumes for urban roads during peak hours and recommended level of service are shown in **Table 4**.

**Table 4:** Urban Road Peak Hour Flows per Direction

| Level of Service       | One Lane (veh/hr) | Two Lanes (veh/hr) |
|------------------------|-------------------|--------------------|
| A: good operation      | 200               | 900                |
| B: good operation      | 380               | 1400               |
| C: satisfactory        | 600               | 1800               |
| D: poor but manageable | 900               | 2200               |
| E: at capacity         | 1400              | 2800               |

Source: RTA (now RMS) Guidelines 2002

As noted in **Section 2.2**, RMS has a traffic counter (id 34016) on Condamine Street located south of the site at Manly Creek, Manly Vale. This recorded 23,000 vehicles per day northbound and 22,300 vehicles per day south bound on a weekday (2012 data).

There is a second RMS traffic counter (id 55022) to the north of the site on Pittwater Road (near the access to Warringah Mall). This recorded peak weekday volumes in the order of 24,000 northbound and 21,800 vehicles (2009 data). This site also provided weekday peak hourly follows which is in the order of 1800-1900 vehicles northbound in the PM peak and 1600-1700 southbound in the AM peak indicating that the Pittwater Road operates at of satisfactory level of service.

Considering the above existing peak hour traffic information and potential traffic generation as from the development, it is anticipated the road network work continue to operate to a satisfactory level.

### 6.3 Intersection Operation

The adequacy of the capacity of an intersection is judged by whether it can physically an operationally cater for the traffic using it. This considers parameters such as the performance of an intersection including the degree of saturation (DoS) and the average delay per vehicle.

Satisfactory operation of an intersection would normally continue up to 42 seconds average delay per vehicle. At this Level of Service (LoS), operating speeds are still reasonable and acceptable delays are experienced. The recommended criteria for evaluating capacity of intersections are shown in **Table 5**.

**Table 5:** Criteria for Evaluating Capacity of Intersection

| Level of Service                           | Degree of Saturation (DoS) | Ave. Delay/ Veh. (Secs) |
|--------------------------------------------|----------------------------|-------------------------|
| A/B: good operation                        | less than 0.80             | Less than 28            |
| C: satisfactory                            | 0.80 to 0.85               | 29-42                   |
| D: poor but manageable                     | 0.85 to 0.90               | 43-56                   |
| E: at capacity                             | 0.90 to 1.0                | 57-70                   |
| F: unsatisfactory, extra capacity required | Over 1.0                   | Over 70                 |

As noted in Section 2.2, an investigation by GTA in 2013 indicated that the “*intersection operates satisfactory with spare capacity in line with its function its function as a major road junction on a state road*” (GTA Traffic and Transport Assessment – 23 June 2014).

The GHD report for the Brookvale Pedestrian Bridge Options Analysis carried out intersections modelling on William Street/Pittwater Road/Condamine Street intersection based on the October 2011 traffic data and pedestrian counts undertaken in May 2014. The report outlined that the intersection currently operates at a satisfactory Level of Service.

**Table 6:** Pittwater Road/William Street Intersection Existing Analysis (GHD Consultants)

| Criteria                | AM Peak Hour | PM Peak Hour |
|-------------------------|--------------|--------------|
| Level of Service        | C            | C            |
| Average Delay (sec/veh) | 34.0         | 29.2         |
| Degree of Saturation    | 0.665        | 0.668        |

Post development SIDRA modelling was undertaken incorporating the proposed intersection amendment outlined in **Section 5.1** including right turn from William Street onto Pittwater Road and removal of the at grade pedestrian crossing across in the northern arm of Pittwater Road (with new pedestrian bridge).



**Table 7** and **Table 8** outline the summary of results based on the following assumptions

- The site could potential generate some 450 vehicle trips per hour in total.
- AM Peak Period:
  - o 70% incoming (315 vph): 50% from North (158); 50% from South (158)
  - o 30% incoming (135 vph): 50% from North (68); 50% from South (68)
- PM Peak Period: visa versa
- All vehicles from north enter via Pittwater Road
- All vehicles from south enter via William Street
- Exiting vehicles from the site southbound distributed 50% to utilise the Pittwater Road exit directly, while the remaining 50% will utilise the William Street exit to access southbound along Pittwater Road.

As a sensitivity review on the intersection performance, an additional 200 vph (over the development traffic generation) was implemented into the right turn from William Street into Pittwater Road as a factor of potential additional traffic that may utilise the proposed right turn from William Street that currently does not exist. This is estimated as a worst case scenario based on traffic data provide at other intersections north of William Street. Mitchell Road onto Pittwater Road traffic volume was in the order of some 150-160 vpj during peak periods.

**Table 7:** Pittwater Road/William Street Intersection Analysis Post Development (Existing Layout)

| Criteria                | AM Peak Hour | PM Peak Hour |
|-------------------------|--------------|--------------|
| Level of Service        | C            | C            |
| Average Delay (sec/veh) | 36.0         | 28.8         |
| Degree of Saturation    | 0.705        | 0.649        |

**Table 8:** Pittwater Road/William Street Intersection Post Development + 200 additional vehicles

| Criteria                | AM Peak Hour | PM Peak Hour |
|-------------------------|--------------|--------------|
| Level of Service        | C            | C            |
| Average Delay (sec/veh) | 38.4         | 37.3         |
| Degree of Saturation    | 0.706        | 0.770        |

Based on the above assumptions and traffic generation of the BHCH, the intersection with the proposed right turn facility from William Street onto Pittwater Road, in conjunction with the removal of the at grade pedestrian crossing across the northern arm of Pittwater Road, would continue to operate at a similar Level of Service as the existing situation.

An allowance of up to 200 vehicles turning right as a result of the additional turn facility provided has been modelled. This indicated the intersection will to continue to operate at a similar Levels of Service as the existing situation. It is anticipated as vehicles travel further from the site and distribute into the road network other remaining intersections will continue to operate at a similar level of service. Refer to **Appendix C** for detailed SIDRA analysis results.

## 7.0 CONCLUSION

The BCHC development provides 475 parking spaces (including 10 accessible spaces). This is separated into 44 short term (1 hour) parking spaces; 171 staff/fleet spaces; and 250 commuter parking spaces. Based on travel demand surveys and the estimate parking demand, the proposed provisions address the parking demands for the BCHC and maximises the parking for Commuter parking provisions.

To encourage alternate transport options the proposal includes separate bicycle facilities. These include:

- A cage facility under the main building (southern end) for the use of commuters to accommodate up to 16 racks (32 bicycles) securely.
- A cage facility on car park level 1 for the use for public, commuters and staff suitable to store 10 racks (20 bicycles) securely.
- Located within covered areas of the car park on level 1, 15 racks (30 bicycles) that can be utilised for short term bicycle parking for public, commuters and staff.
- Located under the main building (northern end) a total of 8 racks (16 bicycles) that can be utilised for short term bicycle parking for public, commuters and staff.
- Located at the southern end of the site a total of 3 racks (6 bicycles)

Provision has been made to accommodate a minimum of 3 motorcycle parking bays with provision for future bays throughout the car park if required.

TfNSW Transport Access Design for Multi-Storey Car Park requires the provision for future electric car spaces. Should future electrical car spaces be required, the infrastructure could be installed within the car park facility. During design development, suitable allowance (ie PVC conduits) should be incorporated within the design.

The car park layout is generally in accordance with the intent of AS2890.1 and AS2890.6. The access and internal roadways are generally in accordance with the intent of AS2890.1 and AS2890.2. The design allows for access for vehicles up to 12.5m in length during emergency situations and 8.8m for general operation. The dual access driveway provides access to the rear property (626 Pittwater Road) for vehicles up to 12.5m in length.

Site access will be similar to the existing situation with left in/left out on Pittwater Road and right in and left/right out on William Street. Heavy vehicles will enter the site from the north from Pittwater Road and exit the site to William Street.

The proposal includes modification of the Pittwater Road/William Street intersection to allow a right turn out from William Street to Pittwater Road providing access to the north from the site using the major road network in lieu of the local road network.

Pedestrian access to the site will be available by footpaths along Pittwater Road with internal access provided from the car park to the building and bus interchange on Pittwater Road. A new pedestrian bridge will provide for greater amenity and safer crossing across Pittwater Road for both pedestrians and cyclists.

Traffic generation has been estimated at 450 vehicle movement per peak hour period with the proposed car park access arrangement providing sufficient queuing area within the site. It is estimated that the existing road and intersections will operate at a similar level of service as existing.