UNSW Health Translation Hub

Transport Impact Assessment

JMT Consulting

Prepared for:

University of New South Wales

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UNSW SYDNEY

PROJECT INFORMATION

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1 Introduction

1.1 Introduction

This report supports a State Significant Development Application (SSDA) for the proposed UNSW Health Translation Hub (UNSW HTH) at the Randwick Hospitals Campus (RHC), which is submitted to the Department of Planning, Industry and Environment (DPIE) pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (the Act). Health Infrastructure on behalf of Health Administration Corporation (HAC) is the applicant for the UNSW HTH, which will be delivered with the University of New South Wales (UNSW).

The UNSW HTH forms an extension of the existing and proposed hospital facilities at the RHC, providing a specialist health-related research and education facility on the Campus.

JMT Consulting has prepared this transport impact assessment to support the development of the UNSW HTH.

1.2 Background

A partnership agreement has been established between HAC and the UNSW to develop the UNSW HTH. This partnership will also allow UNSW to operate the building as well as manage its design and delivery.

The university has for many years worked with industry partners. UNSW currently has over 3,000 collaborative research projects with industry, government and community organisations, with approximately 10,000 industry experts collaborating with UNSW. The UNSW HTH continues to emphasise the importance of collaboration between staff, students and industry.

The partnership will bring together educational and medical researchers, industry clinicians, educators and public health officials to drive excellence, and support the rapid translation of research, innovation and education into improved patient care. It will strengthen the symbiotic relationship between UNSW and the RHC and its research institutes and broader health partners which form part of the Randwick Health and Innovation Precinct (RHIP).

The UNSW HTH will build on the existing affiliation between UNSW and the Sydney Children's Hospital Network (SCHN); Health Infrastructure; and the South Eastern Sydney Local Health District, including Prince of Wales Hospital, The Royal Hospital for Women and Eastern Suburbs Mental Health Services.

1.3 Site location

The site is located approximately 6 kilometres (km) from the Sydney Central Business District (CBD), within the Randwick Local Government Area (LGA). It is located approximately 4km from Sydney Airport. Figure 1 provides a regional context map of the site showing its location in relation to the Sydney CBD and surrounding centres.

This block sits in between the existing Randwick Hospitals Campus and the UNSW Kensington Campus, and directly adjacent to the CBD and South East Light Rail service which runs along High Street (Figure 2). The site of the proposed UNSW HTH has an area of 8,897square metres (sqm).

The site has been subject to some site preparation and early works associated with the broader development of the block. Adjacent to the site, along the High Street and Botany Road frontages, runs a 6-metre (m) wide stormwater and sewage easement.

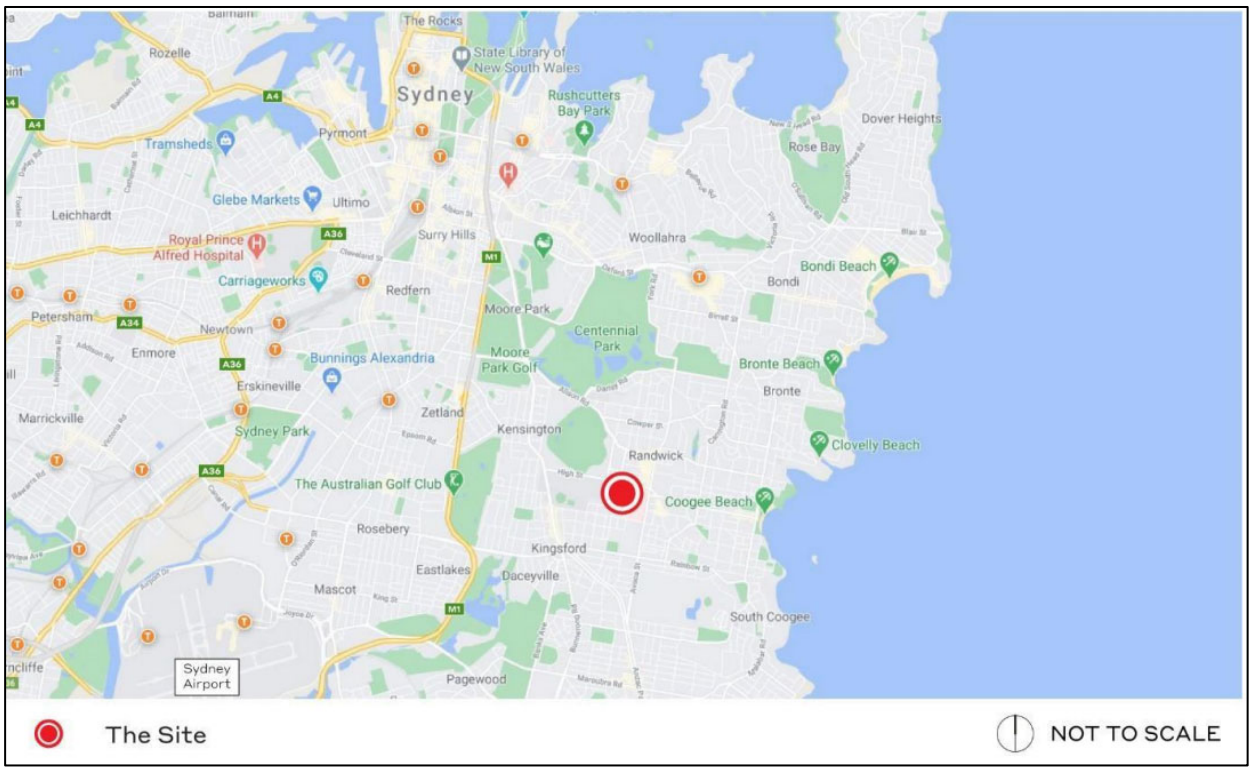


Figure 1 Site context

Source: Google maps and Ethos Urban

Figure 2 Site location

1.4 Report scope

This transport assessment report supports the State Significant Development Application for the proposed UNSW HTH development project, and outlines the following:

- Existing transport conditions;
- Justification for proposed parking provision;
- Vehicle access arrangements;
- Public transport availability;
- Road network impacts;
- Construction pedestrian traffic management plan; and
- Pedestrian and cycle linkages.

1.5 Reference documents

The following documents have been considered in the development of this transport strategy for the UNSW HTH project:

- RMS Guide to Traffic Generating Developments

  Used to inform the traffic assessment undertaken for the project.

- EIS Guidelines – Road and Related Facilities

  Used to inform the preparation of the transport strategy, in particular the assessment of transport impacts.

- NSW Planning Guidelines for Walking and Cycling & Cycling Aspects of Austroads Guides

  This document has been used to inform the development of the walking and cycling measures proposed in this strategy.

- Guide to Traffic Management Part 12: Integrated Transport Assessments for Developments (Austroads, 2020)

  This guide has been referenced for the appropriate methodology to be used for transport impact assessment of the development.

- Healthy Urban Development Checklist 2010

  This guide has been referenced to inform the active transport assessment for the project

- Australian Standard 2890.3 Parking facilities, Part 3: Bicycle parking (AS 2890.3) and Australian Standard 2890.2 Parking facilities, Part 2: Off-street commercial vehicle facilities (AS 2890.2).

  Australian Standards have been used to inform the design of the loading dock and end of trip facility area to be provided as part of the UNSW HTH project.

1.6 Secretary's Environmental Assessment Requirements (SEARs)

The Department of Planning, Industry and Environment (DPIE) issued a list of the Secretary's Environmental Assessment Requirements (SEARs) which inform the Environmental Impact Statement (EIS). The SEARs for the development were issued on 2 December 2020 setting out the documentary and reporting requirements for the preparation of the EIS. Table 1 lists the SEARs that are specific to transport and accessibility.

Table 1 Response to SEARs

SEARs – Transport and Accessibility	Section Discussed
The EIS must include a transport and accessibility impact assessment, which details, but not limited to the following	
• analysis of the existing transport network, including: ○ road hierarchy ○ pedestrian, cycle and public transport infrastructure ○ details of current daily and peak hour vehicle movements based on traffic surveys and / or existing traffic studies relevant to the locality ○ existing performance levels of nearby intersections utilising appropriate traffic modelling methods (such as SIDRA network modelling).	3
• details of the proposed development, including: ○ a map of the proposed access which identifies public roads, bus routes, footpaths and cycleways ○ vehicular access arrangements, including for service and emergency vehicles and loading/unloading, including swept path analysis demonstrating the largest design vehicle entering and leaving the site and moving in each direction through intersections along the proposed transport routes ○ car parking, bicycle parking and end-of-trip facilities ○ drop-off / pick-up zone(s)/arrangements ○ pedestrian or road infrastructure improvements or safety measures loading and service facilities.	5
• analysis of the impacts due to the operation of the proposed development, including: ○ proposed modal split for all users of the development including vehicle, pedestrian, cyclist, public transport and other sustainable travel modes ○ estimated total daily and peak hour vehicle, public transport, freight, service vehicle, cyclist and pedestrian trip generation for staff and visitors ○ a clear explanation and justification of the: ▪ assumed growth rate applied ▪ volume and distribution of proposed trips to be generated ▪ type and frequency of vehicles accessing the site.	6

SEARs – Transport and Accessibility	Section Discussed
• details of performance of nearby key intersections with the additional traffic generated by the development both at the commencement of operation and in a 10-year time period (using SIDRA network modelling or similar traffic model as required by TfNSW)	0
• cumulative traffic impacts from any surrounding planned and approved development(s).	0
• traffic and safety impacts of the proposed development on public transport (light rail and buses), pedestrian and cyclists, including at the proposed access and drop off / drop off zone(s)	5.1, 5.2, 5.6, 6.7
• adequacy of pedestrian, bicycle and public transport infrastructure (including bus network and Sydney light rail) to meet forecast demand of the development	6.7
• adequacy of car parking and bicycle parking provisions for staff and visitors when assessed against the relevant car / bicycle parking codes and standards	5.2, 5.5
• adequacy of the drop-off / pick-up zone(s), including any related queuing	5.6
• adequacy of the existing / proposed pedestrian infrastructure to enable convenient and safe access to and from the site for all users	5.1
• adequacy and loading and servicing provisions to meet estimated daily and peak hour freight and servicing demand.	6.8
• measures to ameliorate any adverse traffic and transport impacts due to the development based on the above analysis, including: ○ travel demand management measures to encourage sustainable transport (such as a Green Travel Plan and / or specific Workplace Travel Plan) ○ infrastructure improvements, including details of timing and method of delivery ○ freight and servicing management measures to minimise transport network impacts (such as a preliminary Delivery and Servicing Management Plan).	6.5, 6.8
• a preliminary operational traffic and access management plan	5

SEARs – Transport and Accessibility	Section Discussed
• analysis of the impacts of the traffic generated during construction of the proposed development, including: ○ construction vehicle routes, types, volumes and swept path ○ construction program (duration and milestones) ○ on-site car parking and access arrangements for construction, emergency and construction worker vehicles ○ cumulative impacts associated with other construction activities in the locality ○ road safety at identified intersections near the site due to conflicts between construction vehicles and existing traffic, public transport (light rail and buses), pedestrians and cyclists in the locality ○ measures to mitigate impacts, including to ensure the safety of pedestrian and cyclists during construction.	7
• Identify the impacts of existing transport infrastructure (Sydney light rail) adjacent to the site on the proposed development, in particular on medical and laboratory equipment / apparatus, and any necessary mitigation measures.	6.9

2 Stakeholder Consultation

In accordance with project SEARs consultation was undertaken with the Sydney Coordination Office within Transport for NSW to discuss the proposal. This included representatives from their public transport team who were able to provide feedback in relation to the operation of the nearby light rail service. The meeting was held on 8 October 2020 via MS Teams between 3.15pm to 4.15pm. Key items discussed at the meeting, and associated UNSW responses, are provided in Table 2 below.

Table 2 Outcomes of TfNSW consultation

Question / Comment	UNSW response
Has the rise in student accommodation being provided on campus contributed to an increase in the walking mode share?	Partially yes, however the rise in walking as a mode of transport to the campus is more a result of students and staff living in surrounding suburbs compared to previous years.
What is the basis for determining the number of service vehicle bays within the basement?	Surveys of similar sized buildings were used to forecast the number of service vehicle movements to the UNSW HTH building. Based on these expected movements, the number of service vehicle bays provided was deemed to be suitable.
Strongly support the proposal for access for cyclists to bicycle parking and end of trip facilities to be separated from vehicle access	Noted – this is a core element of the building design
What is the overlap in construction between the SCH Stage 1 and the CCCC buildings and the UNSW HTH building?	Unclear at this stage as programmes are still under development. UNSW and HI continue to work closely to discuss issues around staging.
What does the number of heavy vehicles generated by the UNSW HTH building represent as a percentage increase when compared to existing traffic movements on Botany Street?	Up to 10 heavy vehicle movements are forecast during peak hours by the UNSW HTH building. This low figure is not expected to impact the operation of the road network, and represents an increase of less than 1% relative to existing traffic flows on Botany Street
How many drop off bays will be provided on Botany Street?	Current planning envisages space for approximately three vehicles within the drop off / pick up bay on Botany Street

Question / Comment	UNSW response
Given the single traffic lane on High Street there may be a tendency for truck drivers to drift onto the tram tracks when entering or exiting the construction site. An over-sized vehicle driveway should be provided to minimise the risk of this occurring	Noted and agreed – this will be considered as part of our construction pedestrian traffic management plan to be submitted as part of the SSD application (see section 7.6 of this document)
Travel demand (including parking demand) will have reduced due to online learning provided at UNSW, partly triggered by COVID	Noted and agreed.
Pedestrian bridge across Botany Street should have a clearance height sufficient to accommodate buses and over-size vehicles	Noted, the current design makes provision for this by including the bridge link at Level 2 with a clearance height of approximately 9m which is more than sufficient to accommodate large vehicles.

3 Existing Transport Conditions

3.1 Travel patterns

Although the UNSW HTH will be an extension of the Randwick Hospital Campus, the building will be operated by UNSW and therefore from a traffic and transport perspective the development has been considered as part of the broader UNSW Kensington Campus. Existing travel patterns from UNSW Kensington campus staff and students are therefore considered suitable to analyse to understand potential travel behaviours from staff and students using the UNSW HTH building.

UNSW's recent travel surveys indicate a continuing trend to more sustainable methods of travel, particularly public transport. Despite the growth in student and staff numbers over the last 10 years, private vehicle usage has decreased from 32% in 2007 to 15% in 2019 – an average reduction of approximately 1.5% per year.

Significant numbers of people continue to use public transport to access the UNSW Kensington campus, despite the ongoing light rail construction works.

The trends in travel to the UNSW Kensington Campus, based on the recently completed 2019 travel survey (conducted prior to the opening of the CBD and South East Light Rail), are illustrated in Figure 3 below. The existing staff and student mode share is presented in Figure 4.

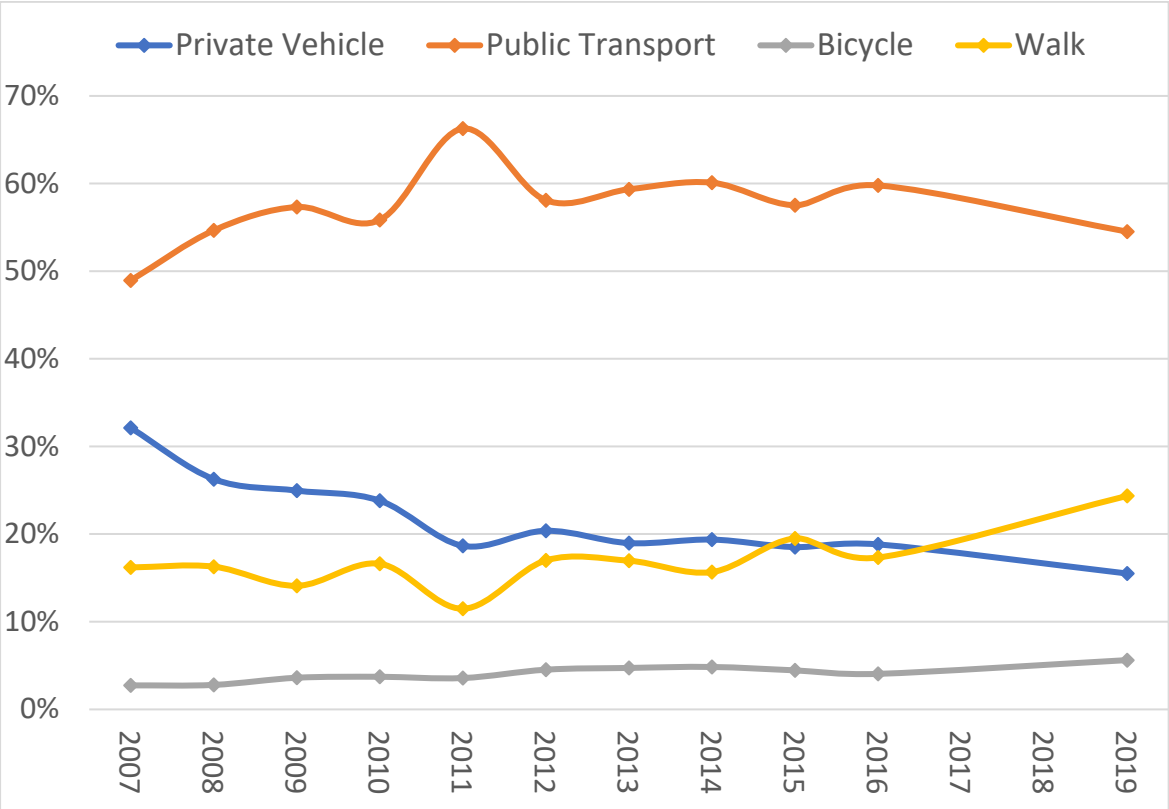


Figure 3 Travel trends to the UNSW Kensington Campus by mode, 2007-2019

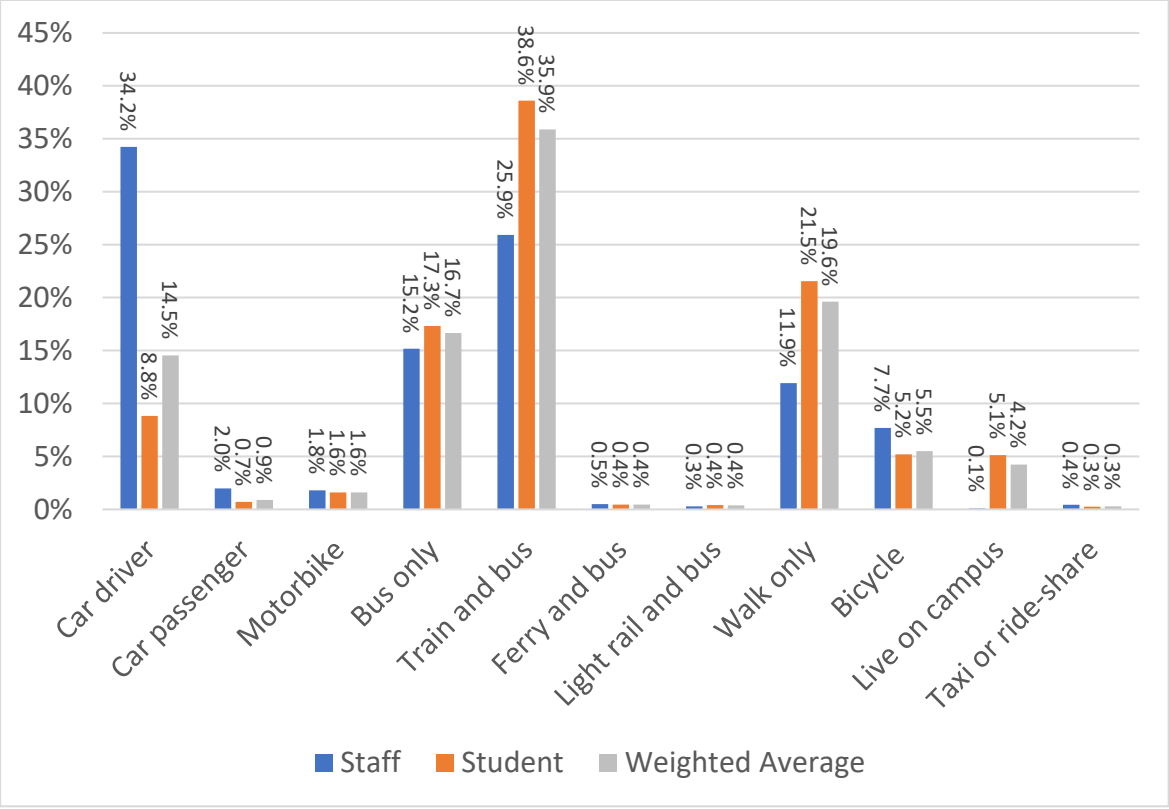


Figure 4 Existing mode share

Generally students and staff arrive to the campus between 8am and 10am, with the travel survey noting that this period typically accounts for approximately 60% of total daily arrivals. Staff arrivals were even more concentrated during this period at nearly 80%, while students arrival was more dispersed throughout the day. The peak departure period is less concentrated, with the peak hour (5pm-6pm) only accounting for 28% of total daily departures.

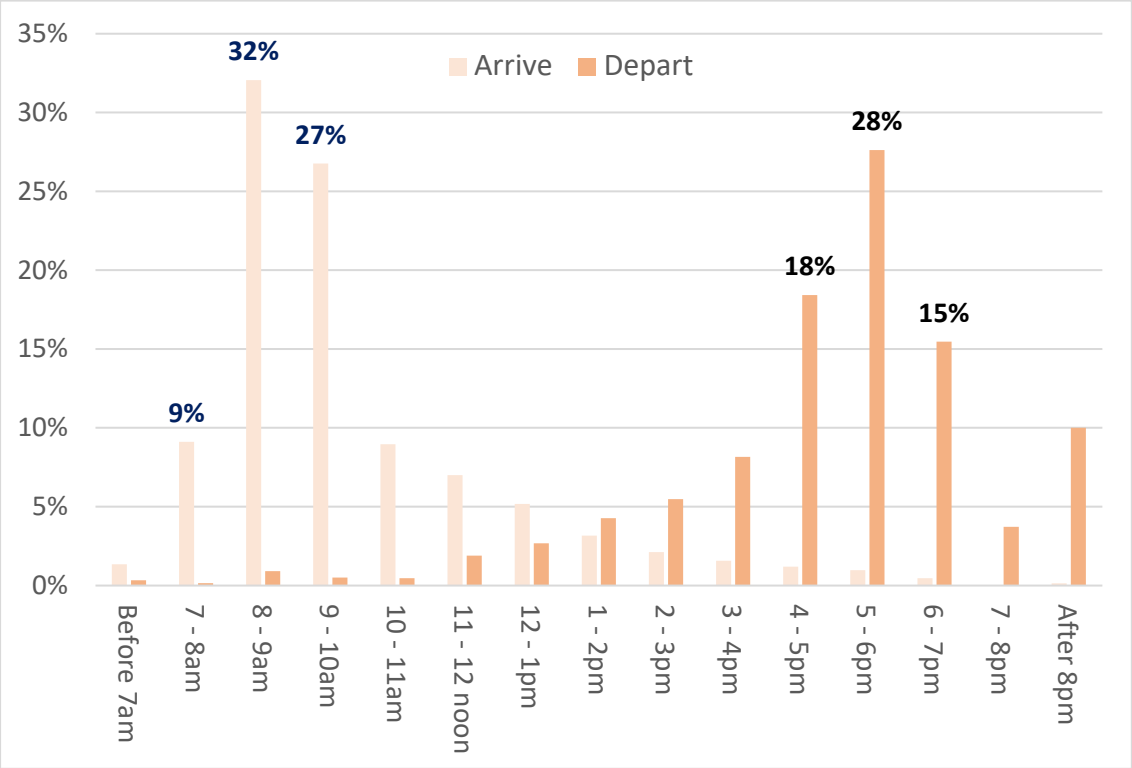


Figure 5 Arrival and departure time of staff/students

3.2 Public transport

The majority of students and staff use public transport to access the Kensington campus. In a recent travel survey undertaken by the University, almost 60% of respondents of the UNSW Travel Survey travelled to the campus by public transport, which is up from 49% in 2007. This was prior to the opening of the CBD and South East Light Rail service, which has further enhanced accessibility to the campus.

The UNSW HTH site will be afforded high quality public transport access through the provision of nearby bus and light rail stops on High Street and Botany Street as shown in Figure 6 below. This includes:

- UNSW High Street and Randwick light rail stops. The site is located within 200m of the UNSW High Street light rail stop.
- Bus routes 348, 357, 370, 400 buses

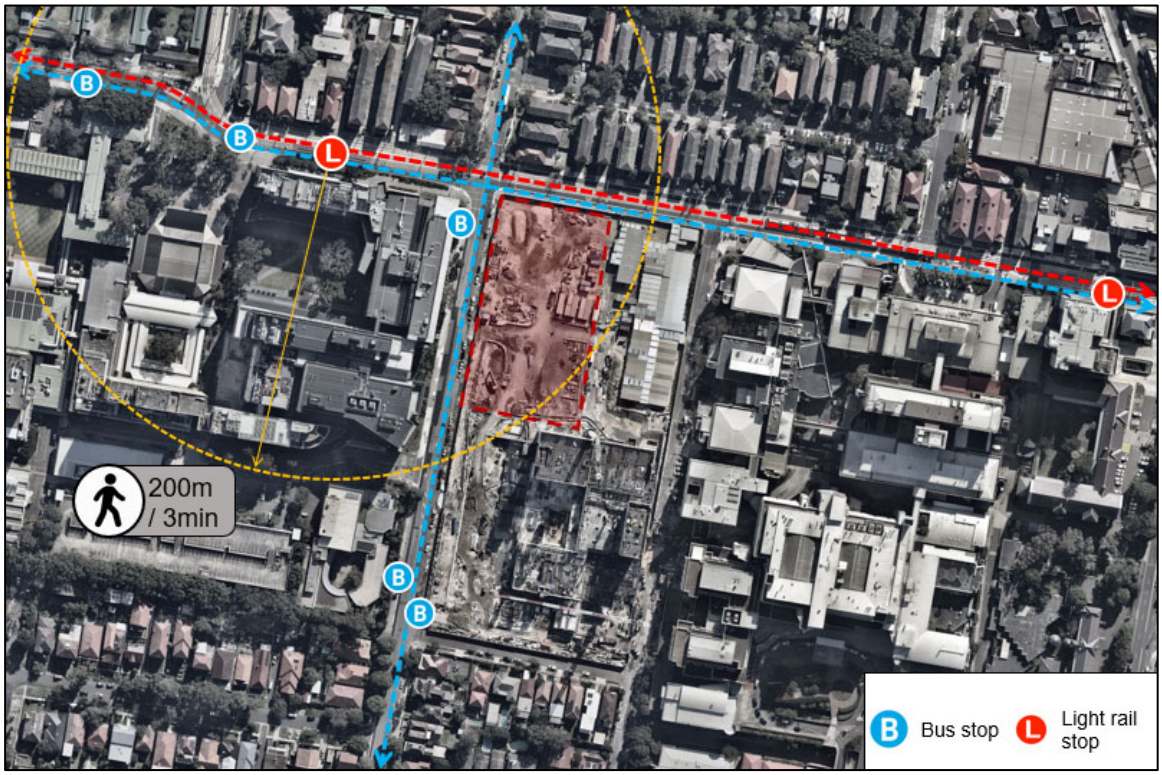


Figure 6 Public transport access

The opening of the CBD and South East Light Rail in late 2019 (L2 line) and early 2020 (L3 line) has improved public transport accessibility and further increase the attractiveness of public transport as a means of access to the campus. Light rail services travel from the campus towards the Sydney CBD approximately every eight minutes from both the UNSW High Street and UNSW Anzac Parade stops.

3.3 Cycling

The existing bicycle network surrounding the UNSW Kensington campus is shown in Figure 7. The on-road bicycle lane on Doncaster Avenue and Houston Road provides a north-south bicycle route that connects Kingsford and Kensington to the Anzac Parade bicycle route at Centennial Park, continuing on to the Sydney CBD. A shared path (shared by pedestrians and cyclists) on Alison Road and Wansey Road provides a connection between the campus, Randwick Racecourse and Centennial Park. High Street, Botany Street and Arthur Street are also typically used by cyclists however no formal bicycle facility exists on these streets.

Transport for NSW, in conjunction with Randwick City Council, recently announced that a 'pop up' cycleway will be introduced along High Street. This will further enhance connectivity for cyclists travelling to the UNSW HTH building.

Approximately 800 publicly-available bicycle parking spaces are provided on the UNSW Kensington campus. The vast majority of these are provided adjacent to buildings, with varying degrees of lighting, shelter and passive surveillance.

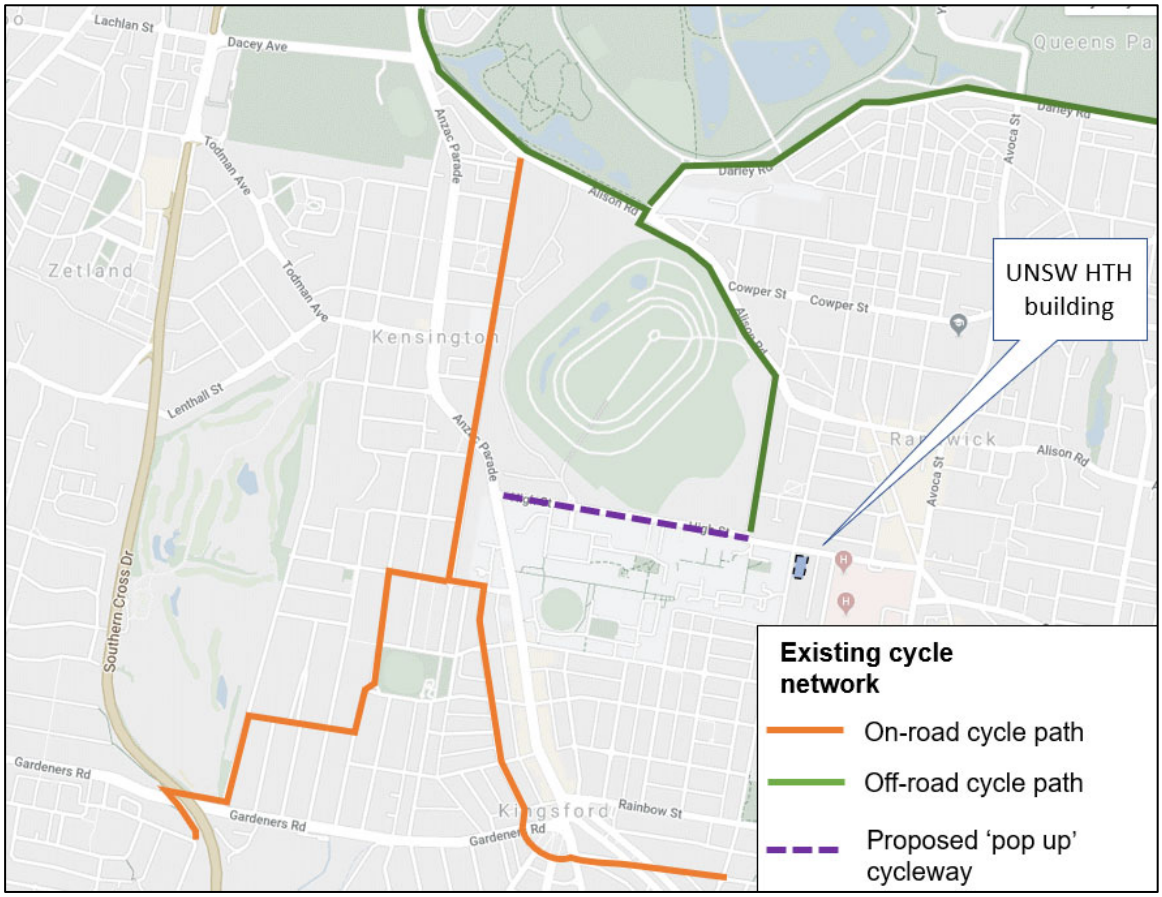


Figure 7 Existing bicycle network

3.4 Pedestrian access and movement

There are multiple existing pedestrian access points to the UNSW Kensington campus. The University Mall entrance on Anzac Parade and Gates 2, 8 and 9 on High Street are currently the major arrival points on a typical semester day which is a consequence of the morning drop-off / pick up locations for the express buses to the campus. Pedestrian surveys conducted by UNSW of 20 different access points revealed the following:

- In the morning, the peak is between 8:30am and 9:30am, where 90% of pedestrians are entering the campus and 10% exiting.
- Around lunchtime, the peak is between 1:15pm and 2:15pm, where 53% of pedestrians are entering the campus and 47% exiting.
- In the afternoon, the peak is between 5pm and 6pm, where 27% of pedestrians are entering the campus and 73% exiting.

This profile of pedestrian activity through the campus is shown in Figure 8.

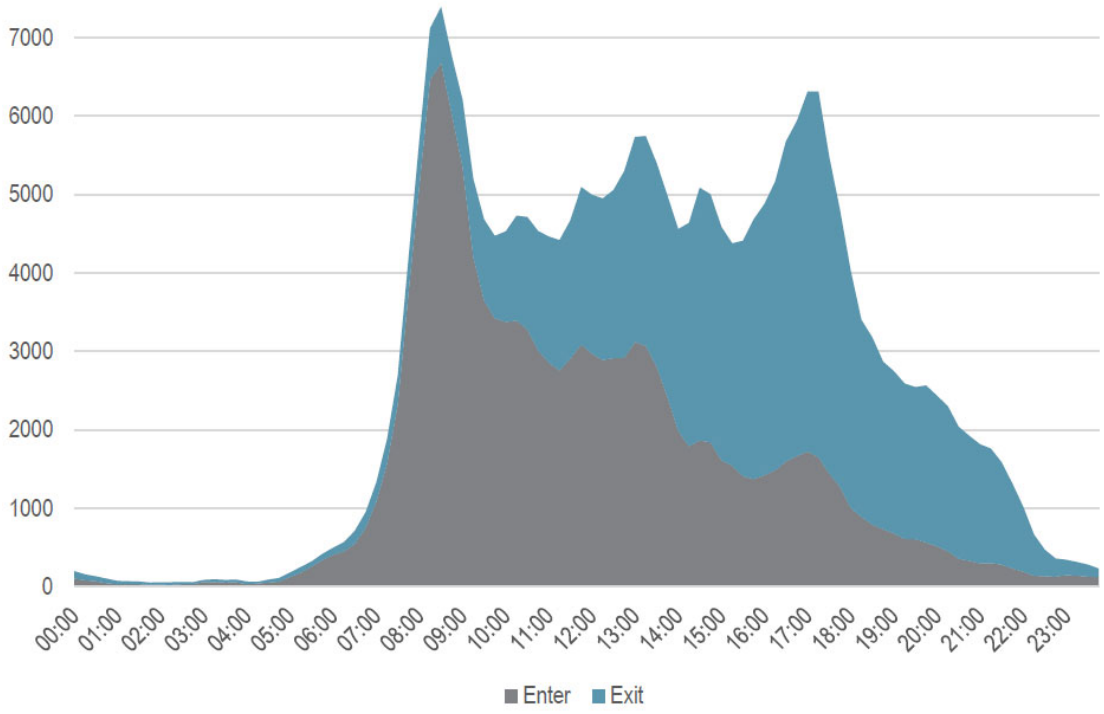


Figure 8 Daily profile of pedestrian activity at UNSW Kensington campus

Source: UNSW Kensington Campus Transport and Accessibility Plan, 2019

3.5 Car parking

The UNSW Kensington campus benefits from having the main parking structures located at the periphery of the campus. This has the benefit of minimising interactions between pedestrians and vehicles and generally makes for a more pleasant campus environment. There are over 2,700 parking spaces across the campus, of which over 1,200 are available within the Botany Street car park which is close to the UNSW HTH site.

A number of small, at grade car parks are provided in other areas of the campus, however similar to the parking structures these are generally located adjacent to the road network. The existing location and capacity of the on-site car parking areas are shown in Figure 9 below.

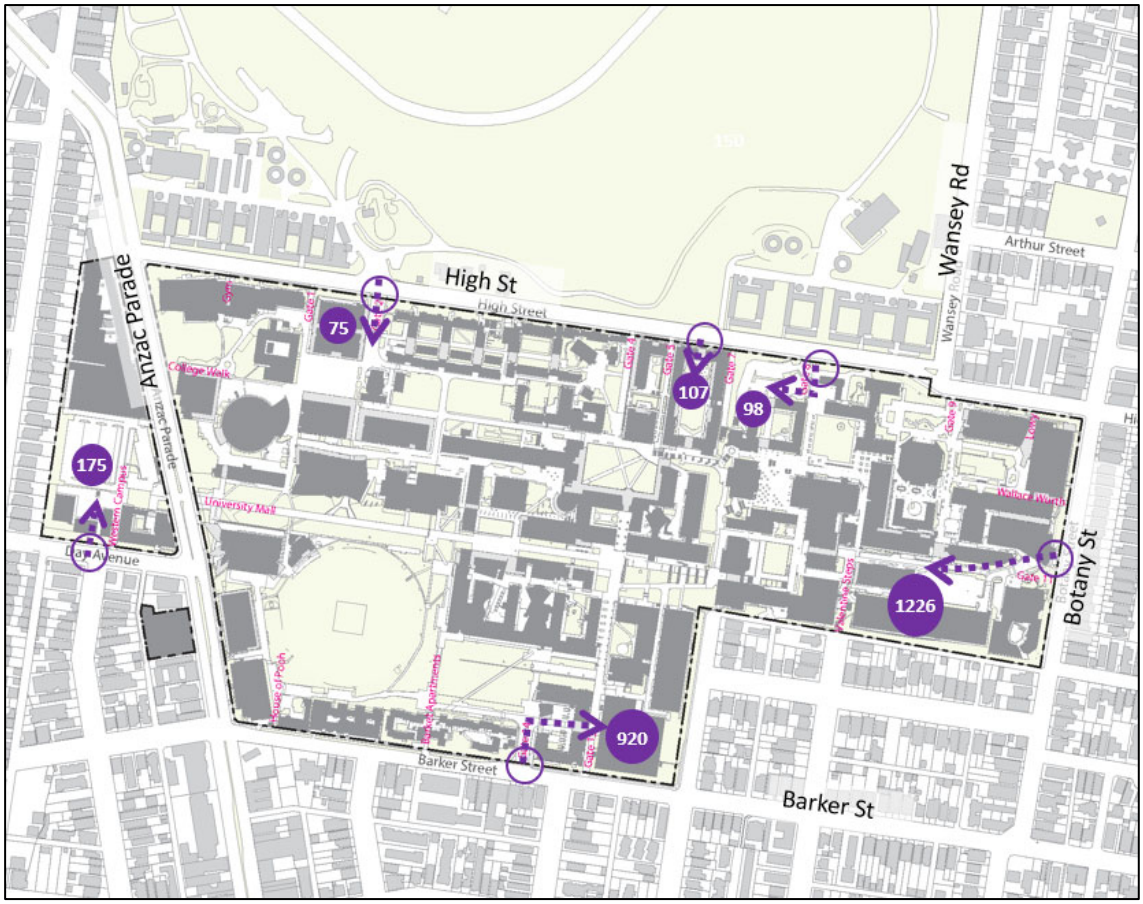


Figure 9 Car parking locations and capacity

3.6 Road network performance

As part of the Integrated Acute Services Building (IASB) proposal traffic modelling was undertaken by Arup to understand the performance of the existing road network in the vicinity of the Randwick Health & Innovation Precinct. The intersection modelling, summarised in Figure 10 and Figure 11, indicates that the majority of intersections in the area operate satisfactorily during peak hours.

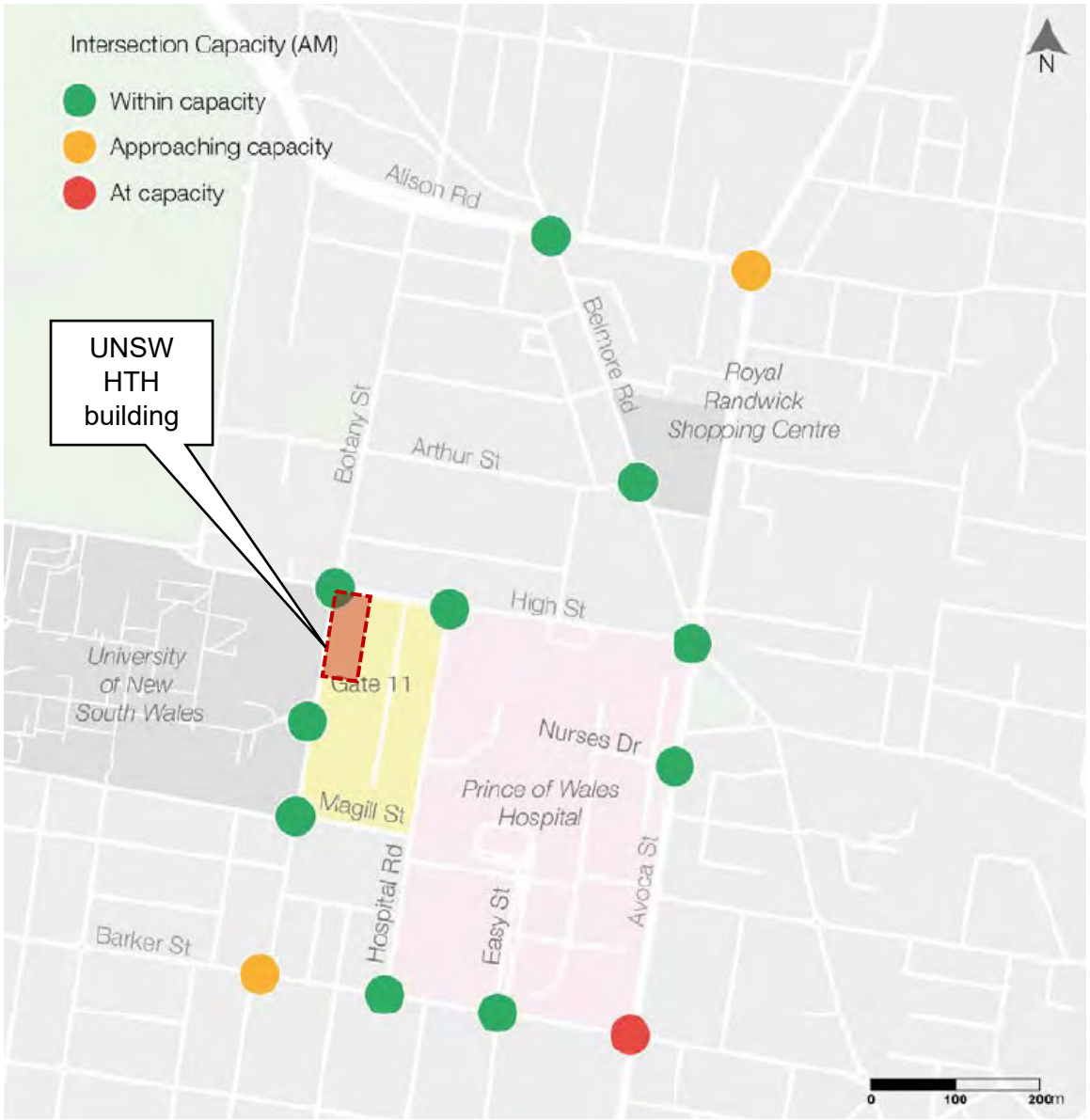


Figure 10 Existing intersection performance (AM peak hour)

Source: Arup, 2018

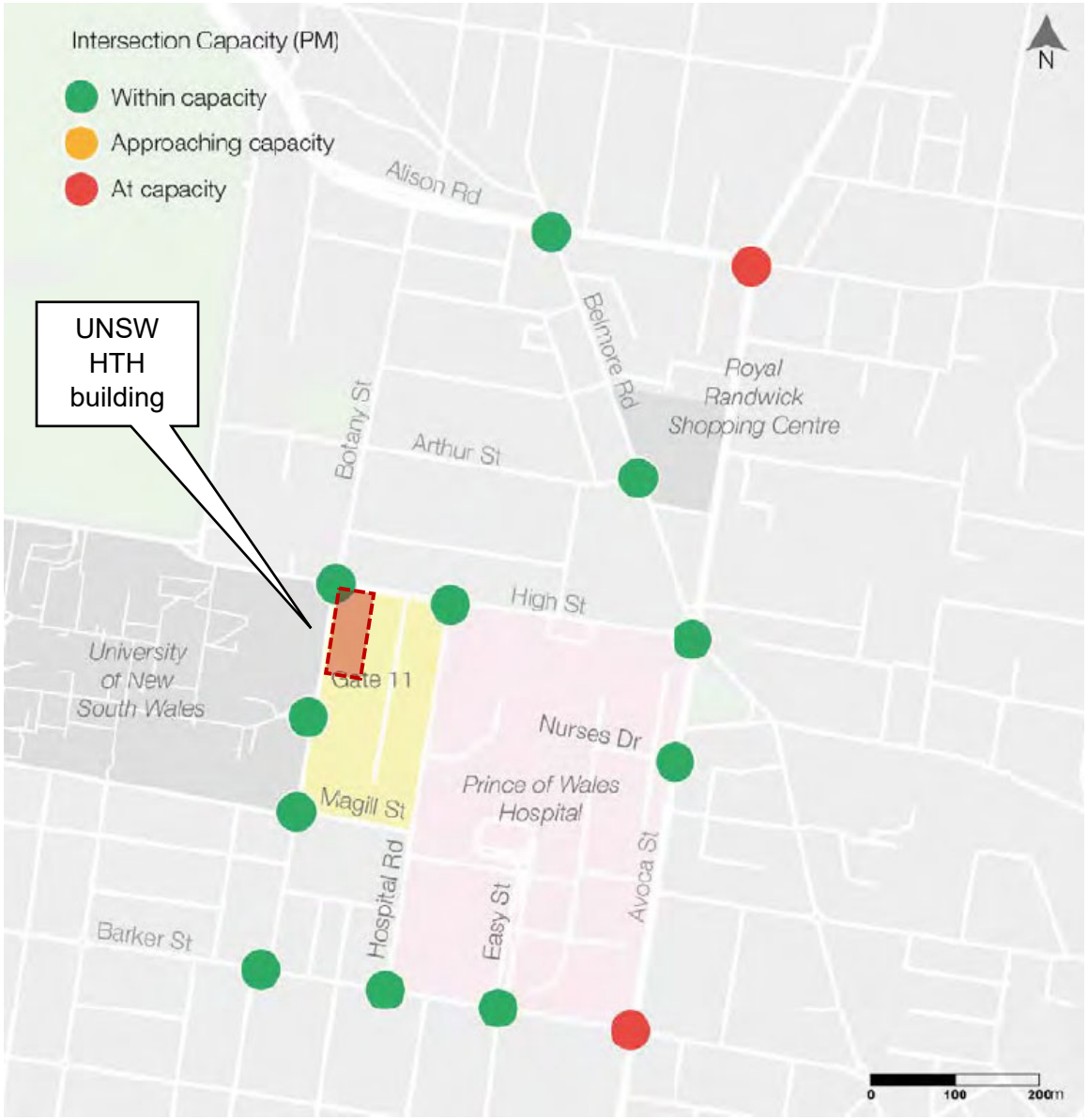


Figure 11 Existing intersection performance (PM peak hour)

Source: Arup, 2018

4 Description of Proposal

The proposal involves the expansion of the existing and proposed hospital facilities at the RHC to provide ancillary health research and education uses. This will be in the form of a single building which will be physically connected (at podium level) to the neighbouring Sydney Children's Hospital Stage 1 and Children's Comprehensive Cancer Centre (SCH Stage 1 and the CCCC) redevelopment. Specifically, the SSDA seeks approval for:

- Relevant site preparation, excavation and enabling works.
- Construction and use of a new, 15-storey building accommodating research and health education uses, comprising:
    - One basement level; and
    - A total GFA of approximately 35,600sqm, including health-related research, education and administrative floor space.
- Pedestrian link bridges connecting the UNSW Kensington Campus to the RHC, via the Wallace Wurth Building to the UNSW HTH and through to the SCH Stage 1 and the CCCC.
- Landscaping and public domain works, including the creation of over 2,500 sqm of new publicly accessible open space within the eastern portion of the site, sitting between the UNSW HTH and the SCH Stage 1 and the CCCC redevelopment.
- Building signage.
- Stratum subdivision.
- Services and utilities augmentation as required.

The UNSW HTH will be an expansion of the RHC to accommodate new health related education, research, and administrative facilities. It will include:

- Purpose-built spaces for health educators and researchers to work alongside clinicians.
- Floor plates for health translation research focused work with physical connections to the SCH Stage1 and the CCCC and wider Randwick Hospitals Campus.
- Dedicated facilities for the CCCC directly linking the UNSW HTH with the SCH Stage 1 and the CCCC.
- An education hub, including education and training rooms allowing hospital staff to educate and train UNSW medical students.
- Facilities for education, training, research, seminars and industry events.

- Clinical schools for the Women's and Children's Health, Psychiatry and Prince of Wales Hospital.
- Ambulatory care clinics including in neurosciences, public and population health.
- Supporting facilities including retail premises.

5 Transport Access Strategy

5.1 Pedestrian access

Pedestrian access to the UNSW HTH building will be provided from a number of directions and dependent on the transport mode of arrival to the campus. The site is positioned at the end of the UNSW pedestrian network and has a high exposure to the north that can be easily accessed from the High Street light rail stop to the north-west and the Botany Street car park within UNSW to the south west. A number of users may also access the site from the north-west via the Gate 8 car park within the main UNSW Kensington campus.

Pedestrian access to the site will further improve following the installation of traffic lights (with associated pedestrian crossings) at the intersection of Botany Street and Gate 11, to be delivered as part of the Integrated Acute Services Building (IASB) project. These traffic lights will allow for the safe and efficient movement of pedestrians between the main UNSW Kensington campus and the future UNSW HTH building. Universal access for those with mobility impairments is also included as part of the design and described in further detail in the Access report prepared by Morris Goding Access Consulting.

The proposal also includes a pedestrian bridge spanning across Botany Street, linking the UNSW HTH building with the existing Wallace Worth building. The bridge connection is at Level 2 of the building and will be approximately 9m above the level of Botany Street, ensuring no impacts to passing traffic.

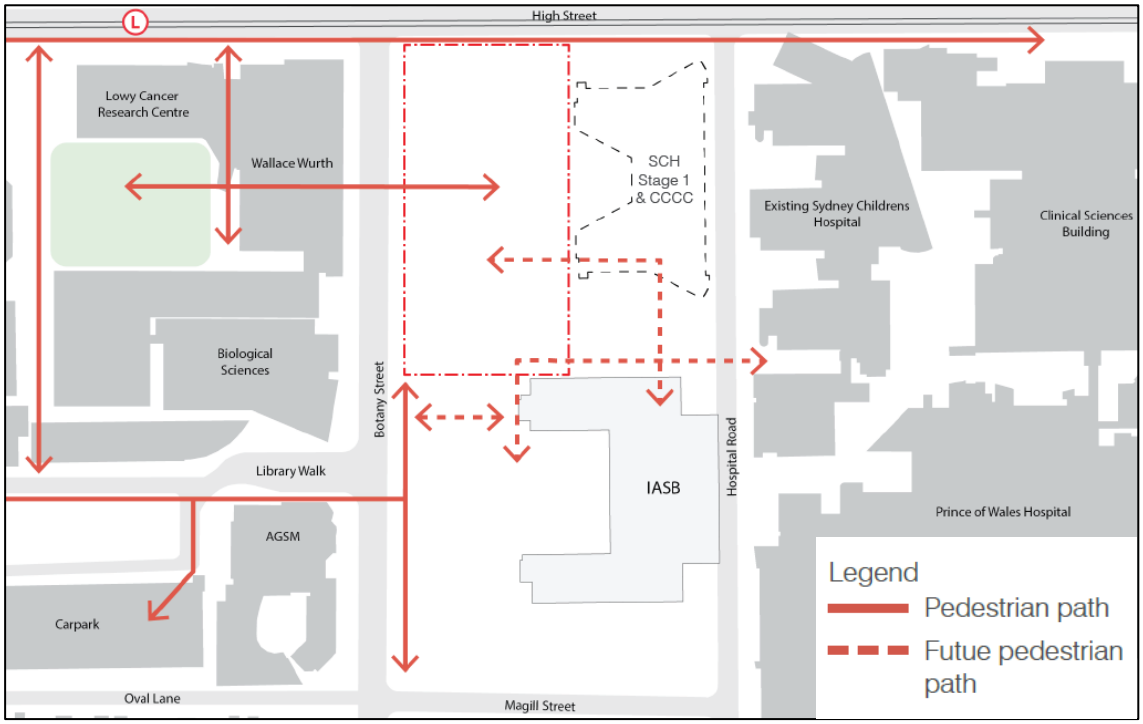


Figure 12 Pedestrian access
Image Source: Architectus

Clear pedestrian access has been considered throughout the site to maintain a safe and accessible journey for pedestrians. Connections to and from the wider context are clear and intuitive.

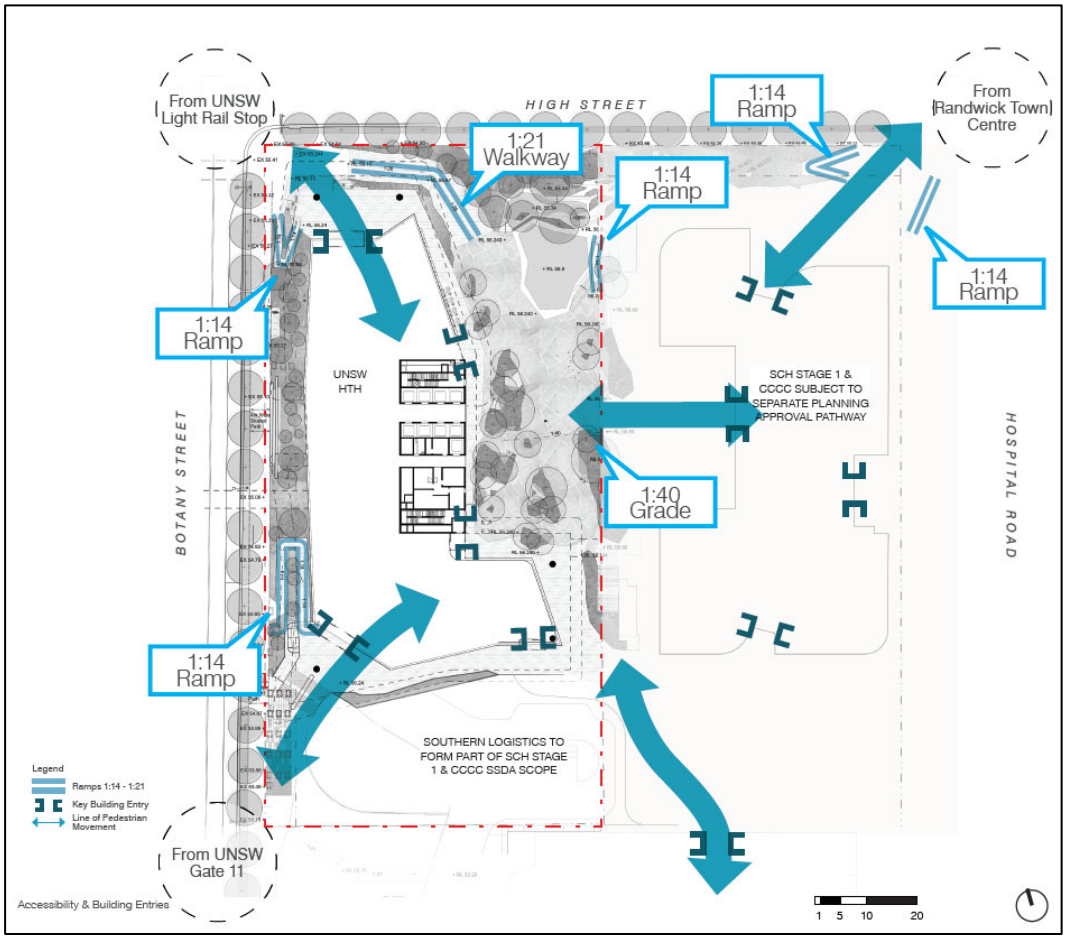


Figure 13 Internal pedestrian circulation

Source: ASPECT Studios

The forecast pedestrian flows are indicated in Figure 14 and are based on the outcomes of recent travel surveys of UNSW students and staff undertaken in October 2019. The likely paths of travel are shown from the following directions:

- Light rail (UNSW High Street stop)
- Bus stops on High Street, Anzac Parade and Belmore Road in Randwick Junction
- Parking stations within the main UNSW Kensington campus
- Proposed vehicle drop off on Botany Street

In addition to these key pedestrian routes a pedestrian bridge is to be provided which spans across Botany Street that connects the main UNSW Kensington campus with the UNSW HTH building. This bridge connection will provide easy and direct access for students, staff and visitors travelling between the UNSW HTH building and the UNSW Kensington campus.

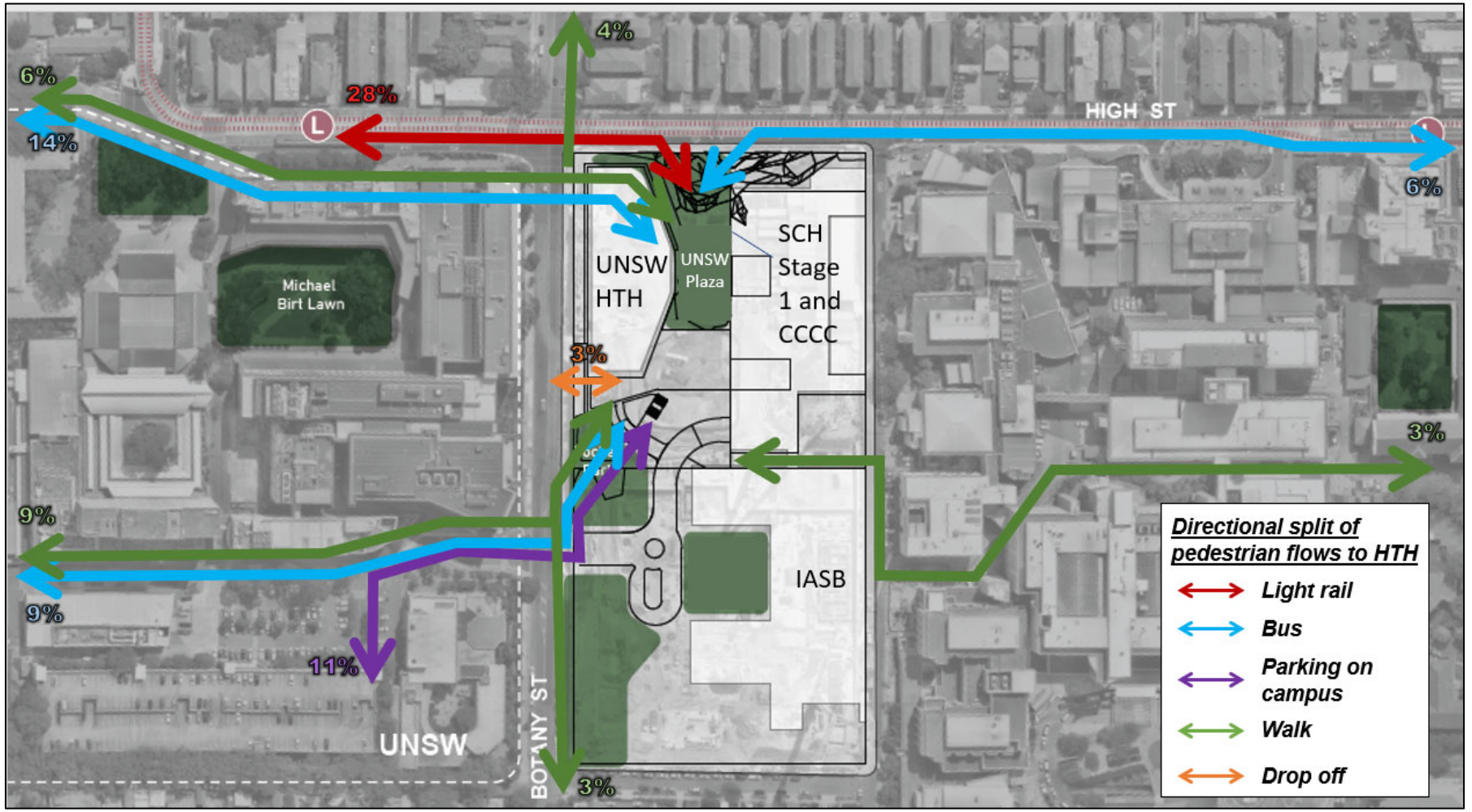


Figure 14 Forecast pedestrian flows to the UNSW HTH building

5.2 Bicycle access and parking

Secure bicycle parking is available across the UNSW Kensington campus with access to end of trip (EOT) facilities such as lockers and showers in many locations. The UNSW HTH project will provide an enhancement to these existing facilities by making provision for additional bicycle parking and EOT within the building by providing for 125 bicycle parking spaces, which is consistent with Green Star bicycle parking rates. In addition lockers and showers will be provided for cyclists using the building.

In terms of access from the adjacent public domain, includes a dedicated entry for cyclists to a secure bicycle parking area via south-west corner of the building adjacent to Botany Street (see Figure 15). A 1:14 ramp would be provided that provides a connection between Botany Street and the end of trip area located on Level -01 of the building. This area would be available to staff and students within the UNSW HTH building community. The facility will include the following amenities:

- 125 bicycle storage spaces
- Male and female facilities each with 10 showers and approximately 125 lockers in each facility.
- 3 x gender neutral facilities including 13 gender neutral / ambulant lockers
- 2 DDA cubicles each with toilet and shower

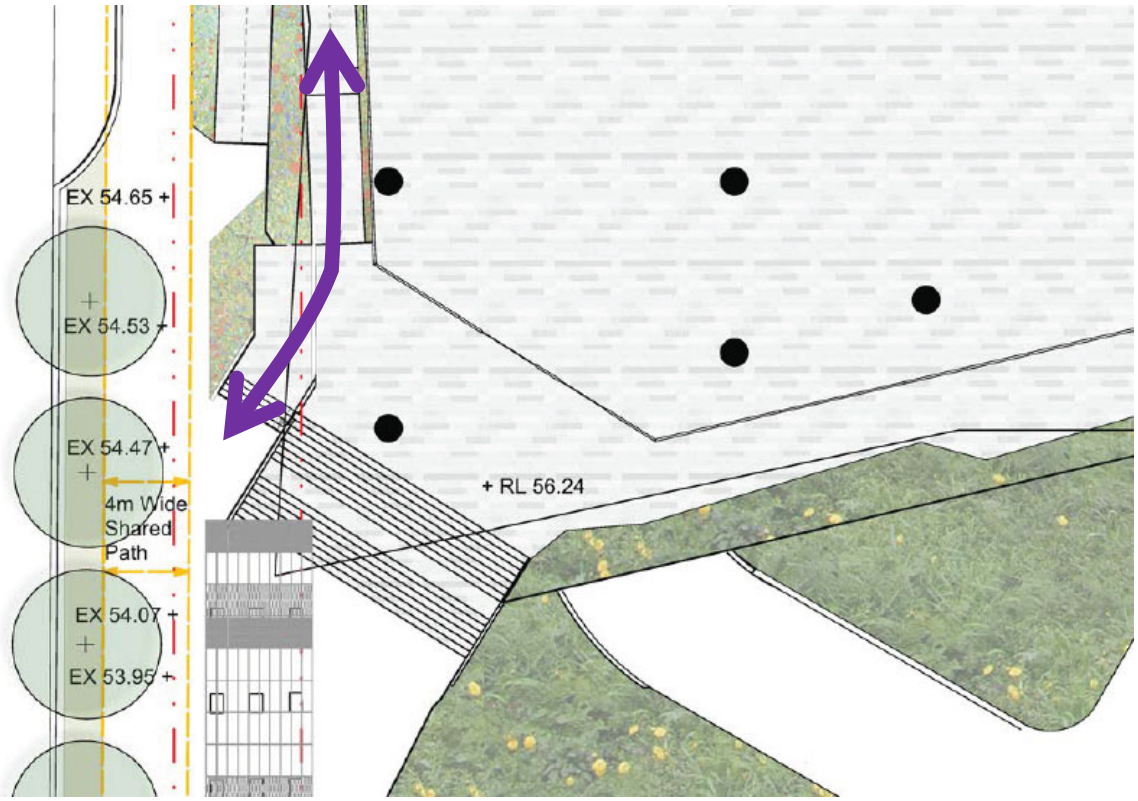


Figure 15 Bicycle entry to the UNSW HTH building

Visitor bicycle parking is to also be provided in the public domain, with space for 20 bicycles to be available. These visitor bicycle parking spaces will be provided in highly visible locations with strong levels of passive surveillance.

Cyclists will arrive to the site via a number of dedicated bicycle routes as previously outlined in Section 3.3 of this document, including:

- Future High Street 'pop up' cycleway
- Wansey Road shared pathway
- Doncaster Avenue / Houston Road cycleway

In addition to the above, the project makes allowance for a 4m wide shared path on Botany Street immediately adjacent to the UNSW HTH site. This will facilitate a direct connection for cyclists between these key regional cycle routes and the end of trip facility access point. The shared path will complement Randwick City Council's future bicycle network strategy.

5.3 Vehicle access

Vehicle access to the UNSW HTH building will be via the future signalised intersection on Botany Street opposite UNSW Gate 11 (also known as Library Walk). These new traffic lights are to be delivered by others as part of the Integrated Acute Services Building (IASB) project. The traffic lights are expected to be operational in 2022 which is prior to the opening of the UNSW HTH building. This intersection will facilitate access into the new health precinct including the IASB, SCH Stage 1 and CCCC. The internal roads within the site have been set out to accommodate the following:

- Access to the SCH Emergency Department on L-01;
- Access for the UNSW HTH loading dock to be provided on L-01;
- Access to the IASB located on L00
- Access to a basement car parking area for the SCH proposed via a ramp from L-01 to L-02.

These access arrangements are shown illustratively in Figure 16.

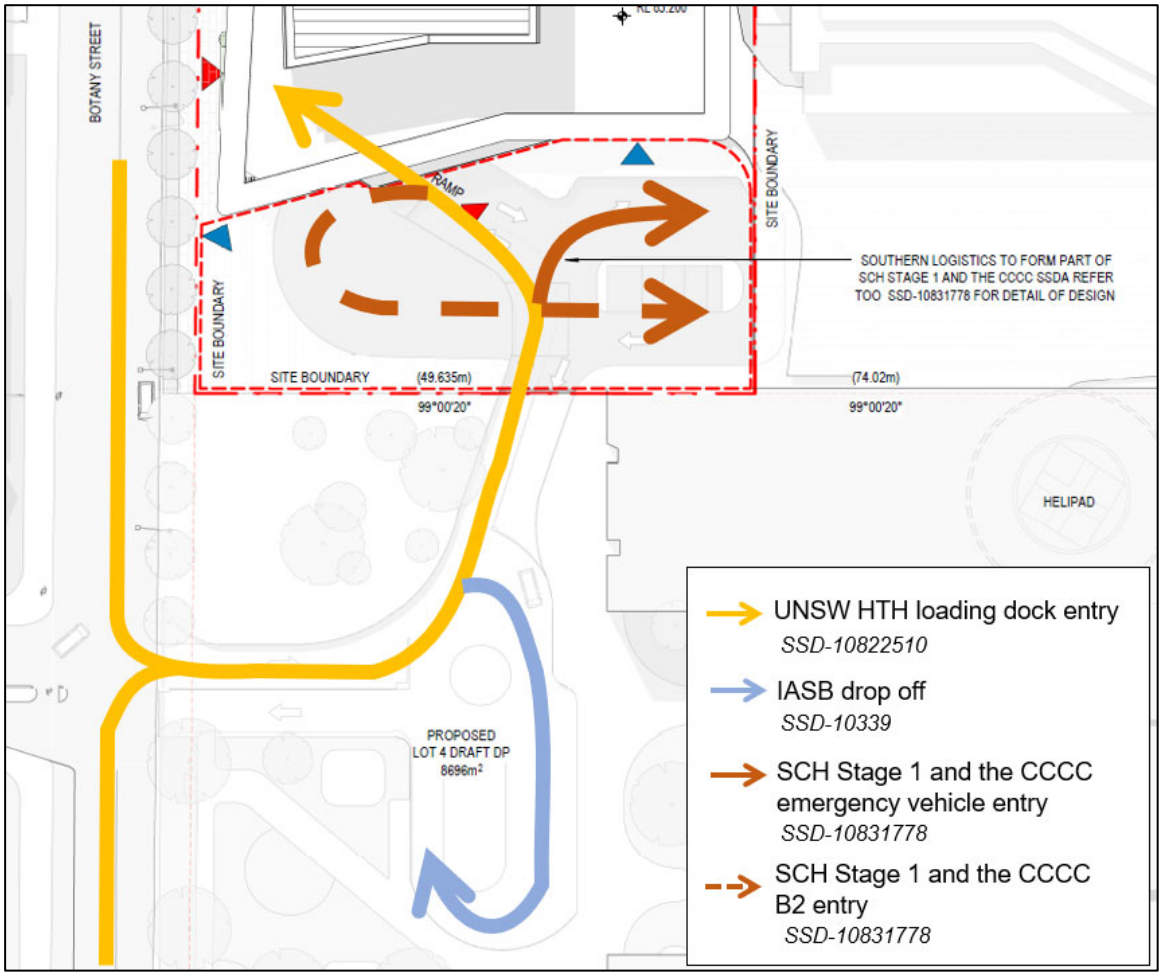


Figure 16 Vehicle access arrangements summary

The overall site access plan, indicating the party responsible for the delivery of the internal road network, is presented in Figure 17 below.

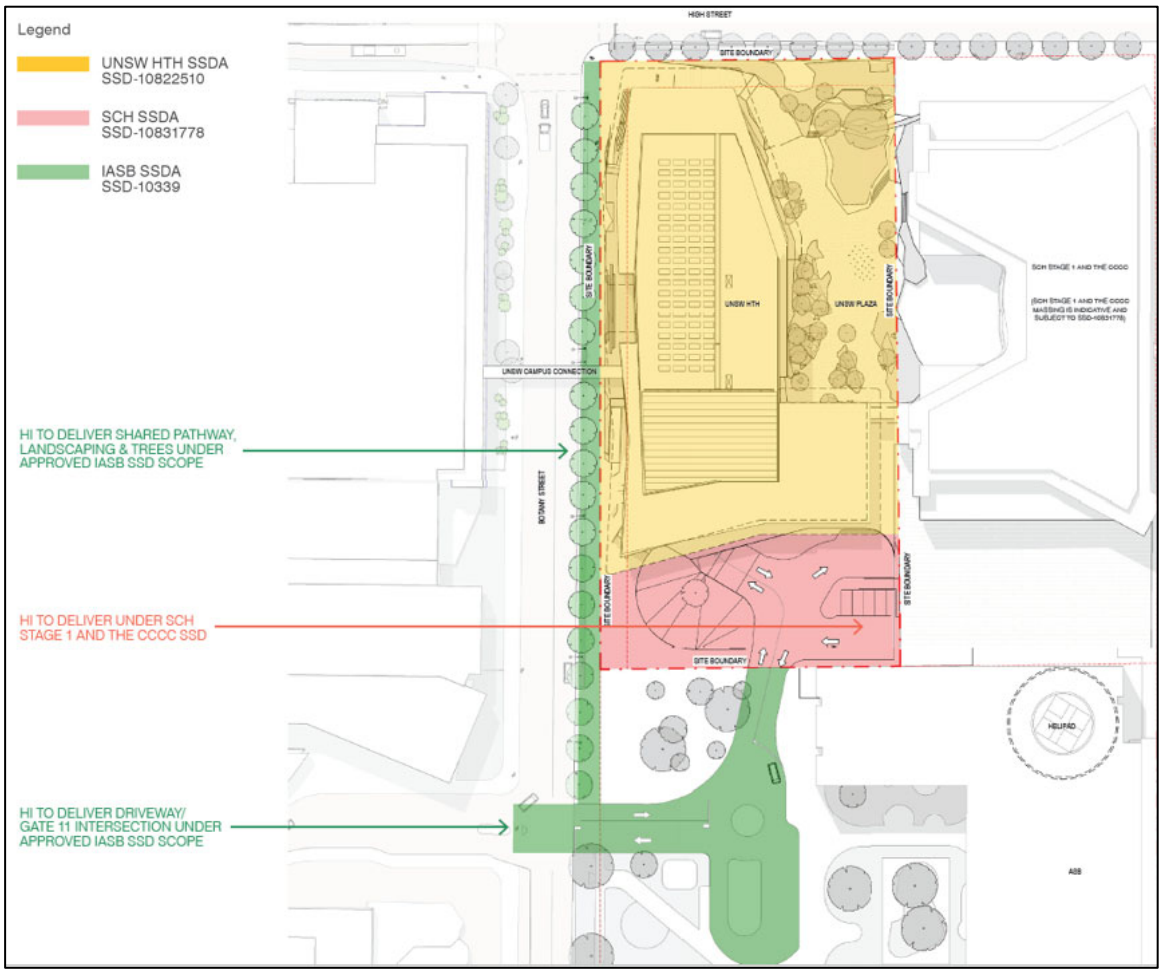


Figure 17 Overall site access plan

Image Source: Architectus

5.4 Loading dock

The current loading dock design makes provision for the following:

- 1 space for a 12.5m Heavy Rigid Vehicle (HRV)
- 1 space for an 8.8m Medium Rigid Vehicle (MRV)
- 5 spaces for vans/utes

The loading dock layout is illustrated in Figure 18 below.

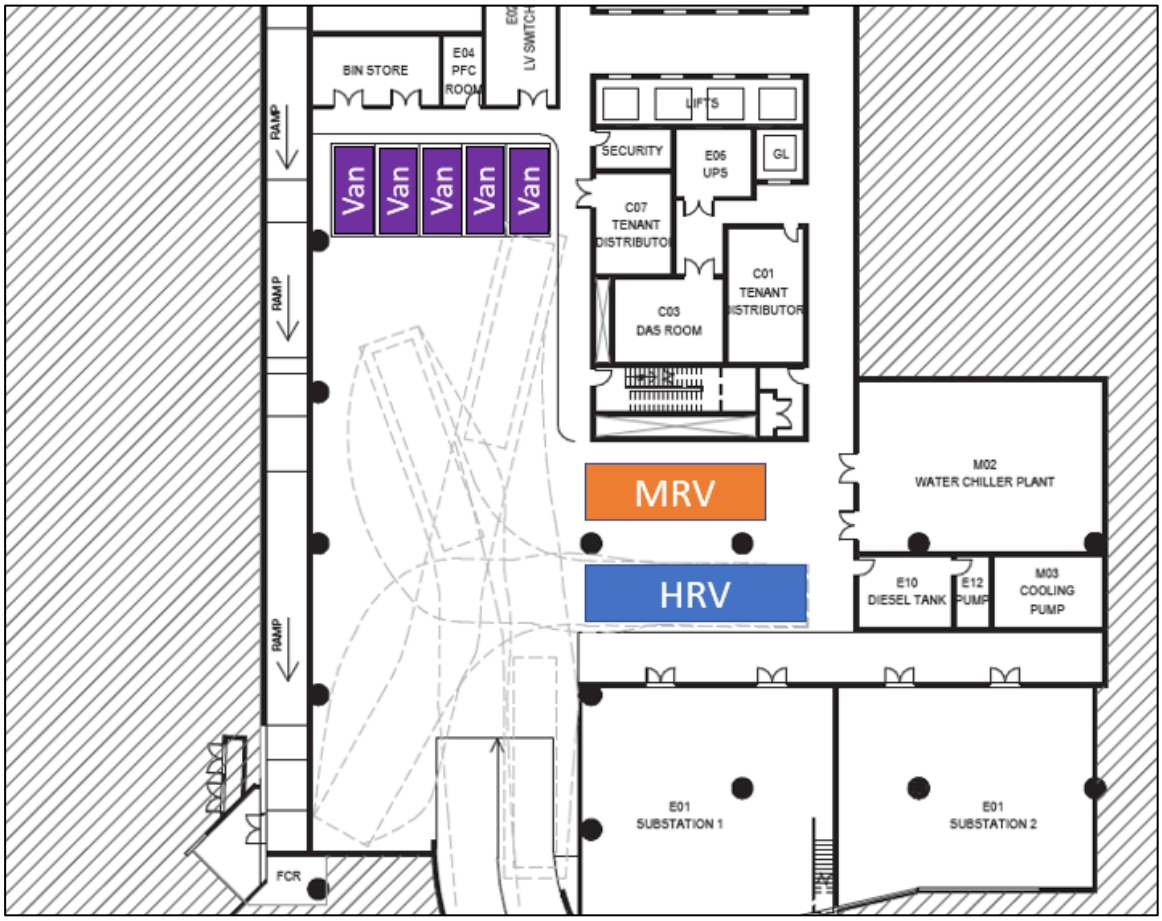


Figure 18 Loading dock configuration

Vehicle swept paths are provided in Appendix A of this document which confirm the suitability of the loading dock design.

5.5 Car parking

Consistent with the approach adopted as part of the broader UNSW transport master plan, the UNSW HTH project does not propose any on-site parking for staff or visitors. Justification for this approach noted below:

- The transport strategy developed for UNSW has noted that the future growth of the campus be serviced by public transport, walking and cycling, with no increases in on-site parking. This is consistent with the approach noted in the 2007 UNSW Kensington Campus Development Control Plan (DCP) which recommends no additional parking to be provided on the campus.
- Car parking is currently provided across a number of areas in the UNSW Kensington campus. Recent observations of existing parking areas (undertaken prior to the COVID-19 pandemic) indicated that parking demand, even at the busiest time of day, is not at capacity and would have the ability to accommodate future parking demands.
- The future strategy in relation to car parking maintains the current approach of holistically considering car parking across the campus by more efficiently utilising existing parking areas, rather than providing significant amounts of additional parking within new developments.
- This approach, which is consistent with that adopted for a number of other recent developments, has resulted in a significant modal shift away from private vehicle towards public transport, walking and cycling – benefiting the wider transport network. This trend away from private vehicles over the last 13 years, based on results from the UNSW travel survey, was previously illustrated in Figure 3 of this document.
- The provision of light rail to the campus has significantly improved public transport accessibility and further reduce reliance on private vehicle / car parking as a mode of transport
- Providing additional car parking as part of new developments would contribute to more traffic within the RHIP.

5.6 Drop off / pick up

A short term vehicle drop off / pick up area is proposed on the eastern side of Botany Street. This zone (shown in Figure 19) could accommodate three vehicles at any one time and will facilitate arrivals via taxi or ride-share vehicles.

Currently this section kerb is signposted as 'works zone' to facilitate the construction of the IASB. Following the completion of construction works in the RHIP it has been identified that a section of kerb along the eastern side of Botany Street, approximately 55m in length, would be designated as '1 hour parking' at all times of the day. It is proposed that approximately 20m of this 1 hour parking zone is redesignated as 5 minute parking (or similar) to facilitate pick up and drop off movements.

The drop off zone is more than 50m away from the future Botany Street / Gate 11 traffic lights (to be delivered by others as part of the IASB project) so as not to impact their operation. The drop off / pick up area will be indented from the kerb so as to maintain two lanes of traffic along Botany Street at all times.

The drop off zone will provide capacity for up to three vehicles at any one time. Given the average length of stay is expected to be less than two minutes, the zone would be able to accommodate 60 to 90 vehicles per hour depending on the arrival profile. This capacity is significantly greater than the expected demand of approximately 10 vehicles per hour during peak periods, which will ensure queueing will not occur back onto Botany Street and pedestrian / vehicle safety will not be impacted.

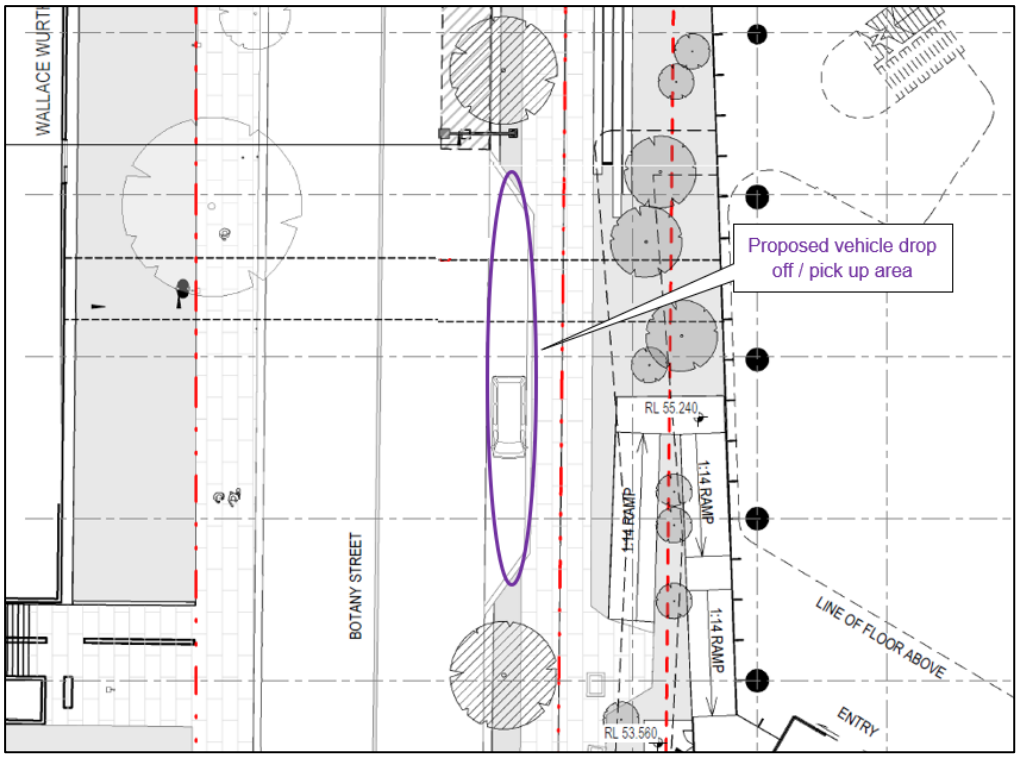


Figure 19 Proposed Botany Street drop off / pick up area

6 Transport Assessment

6.1 Forecast mode share

The transport assessment undertaken has considered the likely travel patterns of UNSW HTH users staff which includes staff, students and industry partners accessing the UNSW HTH building. These travel patterns are based on recent surveys taken from the users of the UNSW Kensington campus. It is important to recognise that the existing campus users contains of mix of staff, students and industry partners in the fields of administration, health, research, academia as well as others. For example staff users in the existing Lowy Building perform a mix of academic, health and research functions which are complementary to one another. The travel behaviours are influenced not by the field of work but by the transport environment supporting the campus, particularly public transport provision and parking availability. For this reason travel patterns of future UNSW HTH staff, students and industry partners are likely to reflect that of the existing users on the UNSW Kensington campus.

A future transport mode share has been developed to inform the likely travel demand generated by people travelling to the UNSW HTH building. This modal split has considered the following factors:

- The findings of recent October 2019 travel surveys undertaken at the UNSW Kensington campus;
- Existing travel demand management policies in place by UNSW (see Section 6.5)
- The recent opening of the CBD and South East Light Rail service; and
- The policy not to provide on-site car parking as part of the UNSW HTH project.

This forecast future modal share is provided in Figure 20 on the following page.

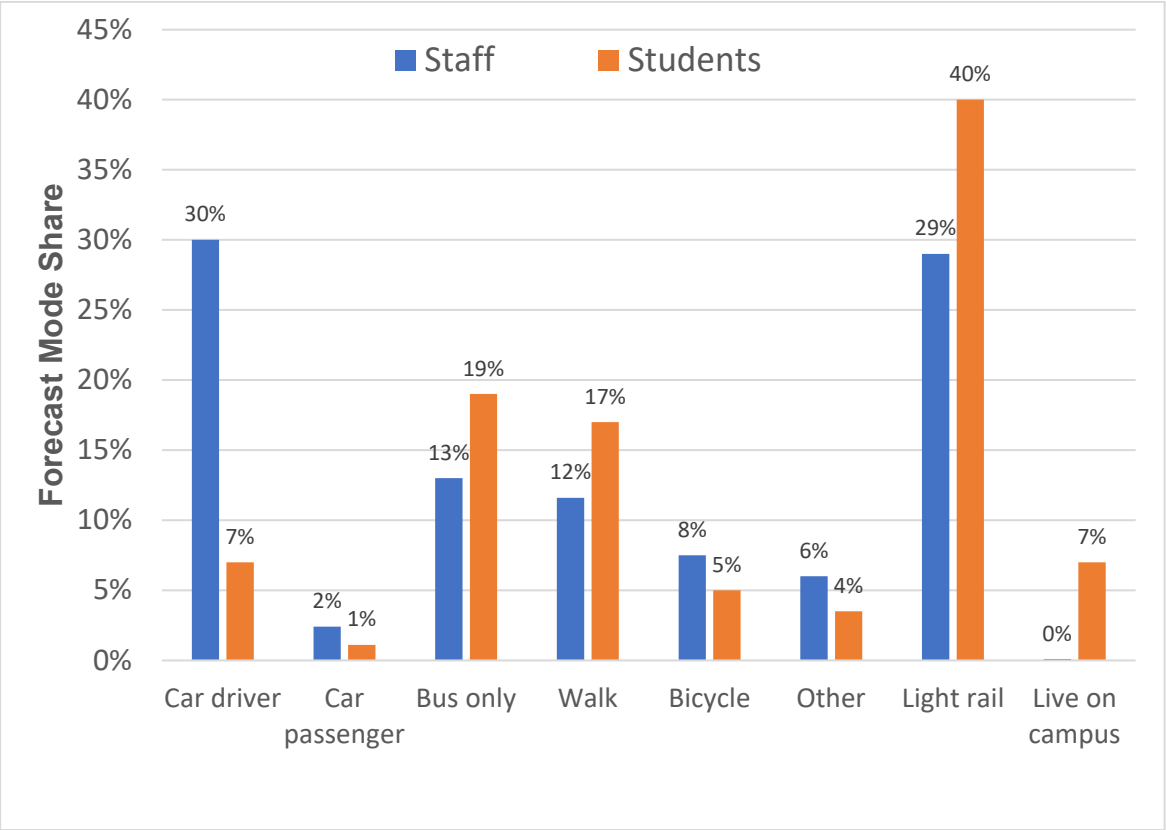


Figure 20 Forecast future mode share

6.2 Travel demand

During operation, the UNSW HTH will accommodate a range of users, including UNSW staff and staff from research institutions, as well as external health and research institutes.

However, job creation associated with the UNSW HTH will be limited, with the majority of occupants being relocated from the UNSW campus or, in the case of research institutions and industry partners, from other locations around Sydney. It is anticipated that the UNSW HTH will generate approximately 495 new full-time operational jobs.

The additional travel demand arising from these additional 495 staff members has been determined based on travel characteristics of existing UNSW staff members, as recorded in recent travel survey undertaken in October 2019. This survey concluded that approximately 50% of staff arrive in the morning peak hour of 8am – 9am, with 43% departing between 5pm – 6pm. The additional travel demand generated by the additional staff can be summarised as follows:

- 251 additional trips during the morning peak hour (8am – 9am)
- 217 additional trips during the evening peak hour (5pm – 6pm)

Based on the forecast staff mode share outlined in the previous section of this report, the forecast additional travel demand by mode is summarised in Table 3 on the following page. The analysis indicates that the additional staff generated by the project would generate no more than 75 additional car trips per hour which will be distributed across the broader road network. Parking surveys undertaken on the UNSW Kensington Campus in October 2019 indicated parking is not at capacity at the busiest times of day, and therefore these additional car movements can be accommodated within existing parking areas on the campus.

The additional travel demand on the public transport network is also minor – with an additional 72 light rail trips and 33 bus trips forecast in a single hour.

Table 3 Forecast additional travel demand

Mode	Mode Share	Additional Staff Trips	
		AM peak hour (8am - 9am)	*PM peak hour (5pm - 6pm)*
Car driver	30%	75	64
Car passenger	2%	6	6
Bus only	13%	33	28
Walk	12%	30	26
Bicycle	8%	20	18
Other	6%	15	13
Light rail	29%	72	62
Total	***100%***	***251***	***217***

6.3 Road network impacts

The only vehicle movements generated will be associated with the on-site loading dock given no on-site parking is to be provided. Based on a total building size of approximately 35,000m^2, the following number of vehicles are expected on a typical day:

- 12 vehicles during the peak hour of the day (9am – 10am)
- 65 vehicles over the course of the day

This number of vehicles is low in the context of traffic volumes in the RHIP and would not materially impact the operation of the surrounding road network.

Looking holistically across the precinct, the forecast number of cumulative traffic movements (through the future Botany Street / Gate 11 traffic lights) is summarised in Table 4 below. These numbers assume that the SCH site will only generate traffic relating to Emergency Department pick up and drop off as well as a future basement car park, and have not yet considered public drop off in the future as the campus expands.

Table 4 Forecast traffic movements to the RHIP

Use	AM peak hour (8am - 9am)			PM peak hour (5pm - 6pm)			Daily		
	General traffic	***Logistics vehicles***	***Total vehicles***	***General traffic***	***Logistics vehicles***	***Total vehicles***	***General traffic***	***Logistics vehicles***	***Total vehicles***
Acute Services Building	98	0	98	68	0	68	1580	0	1580
SCH Stage 1 and CCCC buildings (ED)	14	0	14	22	0	22	360	0	360
SCH Stage 1 and CCCC buildings (Basement parking)	63	0	63	63	0	63	645	0	645
UNSW Health Translation Hub	0	10	10	0	7	7	0	65	65
Total	***175***	***10***	***185***	***153***	***7***	***160***	***2585***	***65***	***2650***

6.4 Traffic modelling

As part of the approved IASB development (SSD 10339) traffic modelling was undertaken to consider the operation of the Botany Street / Gate 11 traffic lights. The traffic modelling accounted for both the IASB development as well as a future expansion of the health precinct to the north of the IASB, on the site of the UNSW HTH building and the SCH Stage 1 and the CCCC buildings. The traffic modelling made allowance for the following additional traffic movements associated with the UNSW HTH and the SCH Stage 1 and the CCCC buildings:

- AM peak hour – 361 vehicles (231 in, 130 out)
- PM peak hour – 361 vehicles (130 in, 231 out)

The traffic modelling undertaken to support the SSD submission noted that, even with these additional 361 vehicles during peak hours, the Botany Street / Gate 11 intersection would continue to operate at 'Level of Service B' with acceptable queue lengths, as summarised in Table 5 below.

Table 5 Traffic modelling results – Botany Street / Gate 11 intersection

Peak Hour	Degree of Saturation	Level of Service	Max. Queue Length
AM peak hour	0.58	B	98m
PM peak hour	0.67	B	78m

Source: Arup, 2018

Given the allowance made for additional traffic movements in the SSD submission is significantly greater than current forecasts for the UNSW HTH and the SCH Stage 1 and the CCCC buildings (as per Table 4 on the previous page), the modelling is considered to remain valid and appropriate for use in this assessment.

As previously noted in Section 3.6 the majority of intersections in the area surrounding the UNSW HTH building operate satisfactorily during peak hours. The UNSW HTH proposal is forecast to generate up to an additional 10 vehicles during peak hours of the day which is considered negligible in the context of existing and future traffic flows on surrounding streets. In this context no additional traffic modelling is considered required to support the UNSW HTH project.

6.5 Car parking

The additional 495 job associated with the UNSW HTH building may generate additional demands of approximately 120 parking spaces based on the forecast mode share and typical occupancy rate of the building. The Botany Street car park provides for over 1,200 parking spaces in close proximity to the site which UNSW HTH users could utilise, with a number of additional parking areas available across the UNSW Kensington campus. Monitoring of these existing parking areas was undertaken throughout 2019 (during typical operations) to inform the broader UNSW Transport Strategy. This monitoring indicated available capacity across these existing parking areas as demonstrated in Figure 21, with the photos taken at approximately 1pm on typical weekdays during semester periods in 2019.

Figure 21 Parking availability within existing UNSW Kensington campus car parks

Since this time parking demand on the UNSW Kensington campus has further reduced due to the acceleration of online learning capabilities provided at UNSW and the recent delivery of the UNSW light rails stops at High Street and Anzac Parade. Consistent with the recommendations of the UNSW Transport Strategy, the proposed car parking strategy maintains the approach of holistically considering car parking across the campus by more efficiently utilising existing parking areas, rather than providing significant amounts of additional parking within new developments. This approach, which is consistent with that adopted for a number of other recent developments on the UNSW Kensington campus, has resulted in a significant modal shift away from private vehicle towards public transport, walking and cycling – benefiting the wider transport network. Therefore there is sufficient parking supply on the campus to accommodate future demands generated by the UNSW HTH building.

6.6 Travel demand management

Travel demand management measures, e.g. Travel Plans and carpooling, are currently well established at UNSW. The UNSW Environmental Sustainability Plan 2019-21 (ESP) outlines a roadmap towards best practice in environmental sustainability in the higher education sector. The ESP makes a commitment to the following:

'Ensure our campuses are easily accessible by multiple transport modes and our community is supported to make active and sustainable transport choices'

The plans sets a target of increasing the percentage of staff and students commuting by active travel modes to 20% by 2022, as well as reducing air travel emissions by 1% by 2022. It is important to note that travel surveys undertaken in October 2019 indicated an active travel mode share of approximately 22% - exceeding the target set out in the ESP.

The plan outlines the following relevant strategies and programs:

- Develop a Campus Transport and Access Plan.
- Provide secure bicycle storage and end-of-trip facilities in key campus locations.
- Establish processes to measure and offset business travel carbon emissions.
- Identify and evaluate opportunities to expand telephone and video-conferencing facilities and promote these as an alternative to travel.

The implementation of these strategies will contribute to reducing parking demand, particularly for staff, and encourage other forms of transport to the site. Travel demand management measures that have contributed to a change in the travel mode share on campus include:

- No additional car parking on-campus provided as part of new developments (including the proposed UNSW HTH building);
- Restricted on-street parking availability in the vicinity of the UNSW campus;
- Additional student accommodation on campus;
- Improved pedestrian connections to public transport nodes – in particular future light rail stops on High Street and Anzac Parade
- Preparation of a Campus Bicycle Master Plan to guide ongoing implementation of end of trip facilities and promotion of cycling as a viable access mode;
- Adding 104 new bicycle parking spaces and 6 repair stations in 2018, bringing the total to around 800 bicycle parking spaces available on the Kensington campus.
- Adding a secure bicycle parking facility on lower campus adjacent to the Barker Street car park (see Figure 22)
- Improved pedestrian crossing facilities for access to the campus;

- Allowing staff to work from home to reduce travel demand to the campus;
- Increasing trend to on-line learning where students attend the campus less frequently; and
- Promotion of alternative travel modes to private vehicle use for new students and staff through induction processes.

Figure 22 UNSW secure bicycle parking facility

6.7 Public transport assessment

As demonstrated in Section 3.2, the future UNSW HTH building is well located with respect to nearby public transport, being within walking distance of a number of bus stops as well as two light rail stops. Strong pedestrian connections are proposed as part of the development to connect the UNSW HTH development with the light rail stop on High Street, as well as existing bus stops. The pedestrian bridge across Botany Street will strengthen connectivity to the main UNSW Kensington campus including the Anzac Parade bus corridor. Internal pedestrian connections will also be available within the site to provide good levels of permeability and allow connections through to public transport stops on High Street.

Therefore it can be concluded that, following the development of the UNSW HTH site including improved pedestrian connections, adequate provisions will be in place for people travelling by public transport to the UNSW HTH building. No additional upgrades beyond those already described are considered necessary to support the development.

6.8 Loading and servicing management

To determine the appropriate number of vehicles to accommodate within the loading dock, research undertaken by Arup in 2018 has been referenced. This Arup research led to the development of relationship between GFA and loading dock peak hour vehicle movements (shown in Figure 23). While the level of loading activity is dependent on a number of factors and not simply the GFA of the building, this does provide a useful forecasting tool when assessing the loading and servicing requirements for planned office buildings.

Given the UNSW HTH building is expected to have approximately 35,000m^2 GFA, approximately 12 loading dock movements are anticipated during the peak hour. The design proposes to provide a total of seven service vehicle bays within the loading dock. This provision is therefore more than sufficient to accommodate the loading and servicing demands during peak hours, given vehicles typically have a length of stay of between 15 to 30 minutes.

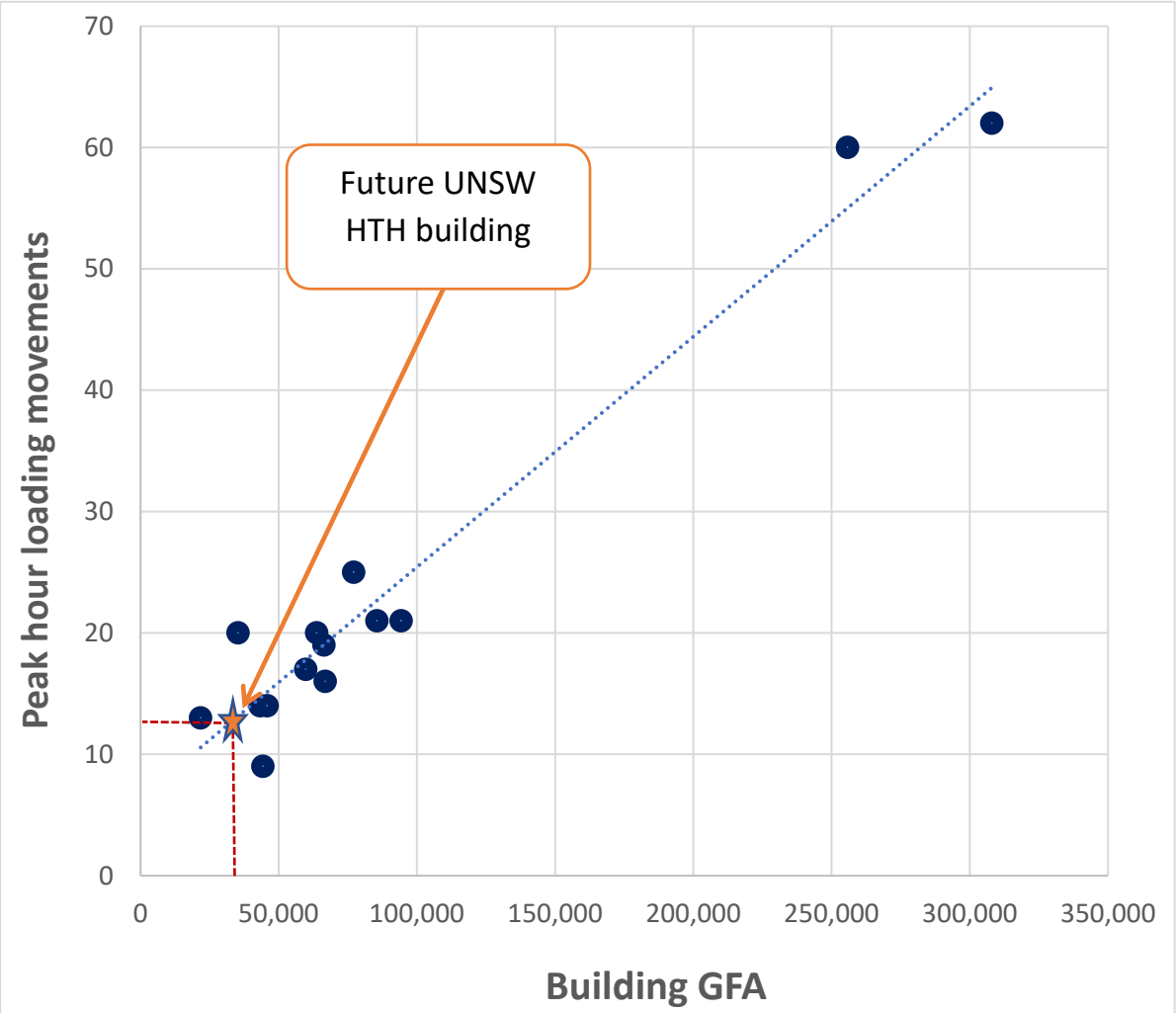


Figure 23 Relationship between building GFA and peak hour service vehicle activity

Source: Arup, 2018

6.9 Light rail impacts

The proposal will not impact the operation of the CBD and South East Light Rail service given:

- No operational vehicle access is proposed along the High Street frontage which would impact the light rail service;
- The development is forecast to generate a minor number of additional traffic movements which would have a negligible impact on the operation of surrounding intersections;
- Construction vehicle approach and departure routes have been selected to avoid the light rail corridor; and
- The proposed construction access driveway on High Street an over-sized vehicle driveway would be provided to minimise the risk of construction vehicles veering onto the light rail tracks.

7 Draft Construction Pedestrian Traffic Management Plan

7.1 Preliminary CPTMP overview

This section details a preliminary Construction Pedestrian and Traffic Management Plan (CPTMP) for the construction of the UNSW Health Translation Hub (HTH). The purpose of the preliminary CPTMP is to assess the proposed access and operation of construction traffic associated with the proposed development with respect to safety and capacity.

The contractor (once appointed) will prepare a more detailed CPTMP prior to the commencement of works which will include the following:

- Traffic Control Plans;
- Specific methods of safely managing construction vehicle and pedestrian traffic within the surrounding area;
- Crane locations;
- Vehicle turning paths;
- Site compound layout and access;
- Driver facility areas; and
- Additional work zones / road closures.

7.2 Construction timing

In accordance with the timeframes noted in the construction management plan prepared for the project, at this indicative stage it is forecast that construction may commence from the start of 2024 with completion by late 2026. As the project is in its preliminary stages, the following timeframes are approximate and may vary once further details are known.

7.3 Construction hours

To mitigate impacts on surrounding neighbours the proposed work hours provide the greatest opportunity for the most efficient construction program as well as mitigating traffic impacts. The preferred working hours of the site are as follows:

- 7am – 6pm Monday to Friday
- 7am – 6pm Saturday
- No work Sundays or public holidays

Outside these hours, works, such as special delivery of materials / machinery / specific site works may be required to be undertaken outside the approved hours of operation for the site, in line with the type of work, authority's requirements, or for safety reasons. For example, wide delivery loads that are required to meet Transport for NSW restrictions on public roads may need to be delivered outside the approved site hours, or large concrete pours that require time to pour and cure the concrete before it can be finished may extend beyond the approved hours on limited occasions.

Communication with relevant authorities and neighbours will be issued prior to these events occurring to all impacted stakeholders

7.4 Construction vehicle volumes and road network impacts

Based on the scale of the development and the proposed construction programme, the following number of vehicles are expected as summarised in Table 6 below. These construction vehicle volumes are indicative only and would be confirmed following the appointment of a contractor.

Table 6 Forecast construction vehicle movements

Description	Stage			
	Bulk Excavation	***Structure***	***Fitout and finishes***	***Landscaping / external works***
Deliveries per day	30-40 per day	25-30 per day	30 per day	20 per day
Deliveries per hour	6 - 8 per hour	5 per hour	6 per hour	4 per hour

Workers may generate additional traffic to the site in the form of vans and utes. Typically construction workers have a high vehicle occupancy of between 2-3 people per vehicle, particularly for sites with constrained parking environments. Given the availability of public transport, particularly a light rail stop adjacent to the construction site, the likely number of light vehicles generated by the project would be in the order of 50 vehicles per day. Construction workers generally start earlier and finish earlier than the commuter peak periods, and would likely not coincide with the commuter and UNSW peak periods.

Furthermore, road network impacts may be mitigated by the fact that construction workers generally start earlier and finish earlier than the commuter peak periods, and would likely not coincide with the peak traffic period of the Kensington/Randwick road network.

Traffic generation of this magnitude is anticipated to have a minimal impact on the surrounding road network.

7.5 Expected vehicle types

The following vehicle types as outlined in Australian Standards AS2890.2 are expected to be used during the project:

- 19m Single Articulated Vehicles (AVs) or truck and dogs;
- 12.5m Heavy Rigid Vehicles (HRVs)
- 8.8m Medium Rigid Vehicles (MRVs)
- 6.5m Small Rigid Vehicles (SRVs);
- Utes/vans

The maximum truck size that will likely access the site is a 19m Articulated Vehicle which will carry large construction material. There is provision on-site for these vehicles to turn around and so they will be able to access the site directly, and will not require a Works Zone on the adjacent public road system.

All heavy goods such as machinery plant will need to be delivered outside of peak traffic hours.

Mobile crane days may be required during the construction stage of the program, with limited lifting operations on weekends. If required, these operations would be subject to a separate application for partial road closure with Transport for NSW and Randwick City Council. These would be timed to avoid busy traffic periods and not to impact key public transport services.

7.6 Construction vehicle access and works zones

The proposed access arrangements for construction vehicles is illustrated in Figure 24 below, which considers access points along Botany Street and High Street. All vehicles would enter and exit the site in a forwards direction. Given the vehicle access restrictions in place in the vicinity of the site associated with the light rail, right turns into the site from Botany Street would be proposed so as to not impact light rail operations.

For the High Street access point an over-sized vehicle driveway would be provided to mitigate the risk of construction vehicles veering onto the light rail tracks – in line with the feedback provided by Transport for NSW.

To facilitate lifting from the tower cranes positioned on site a works zone is proposed on the eastern side of Botany Street. This kerbside space is currently designated as a works zone as part of the Randwick Campus Redevelopment project.

The access locations are indicative only and would be updated as part of the detailed CPTMP to be issued prior to the commencement of construction.

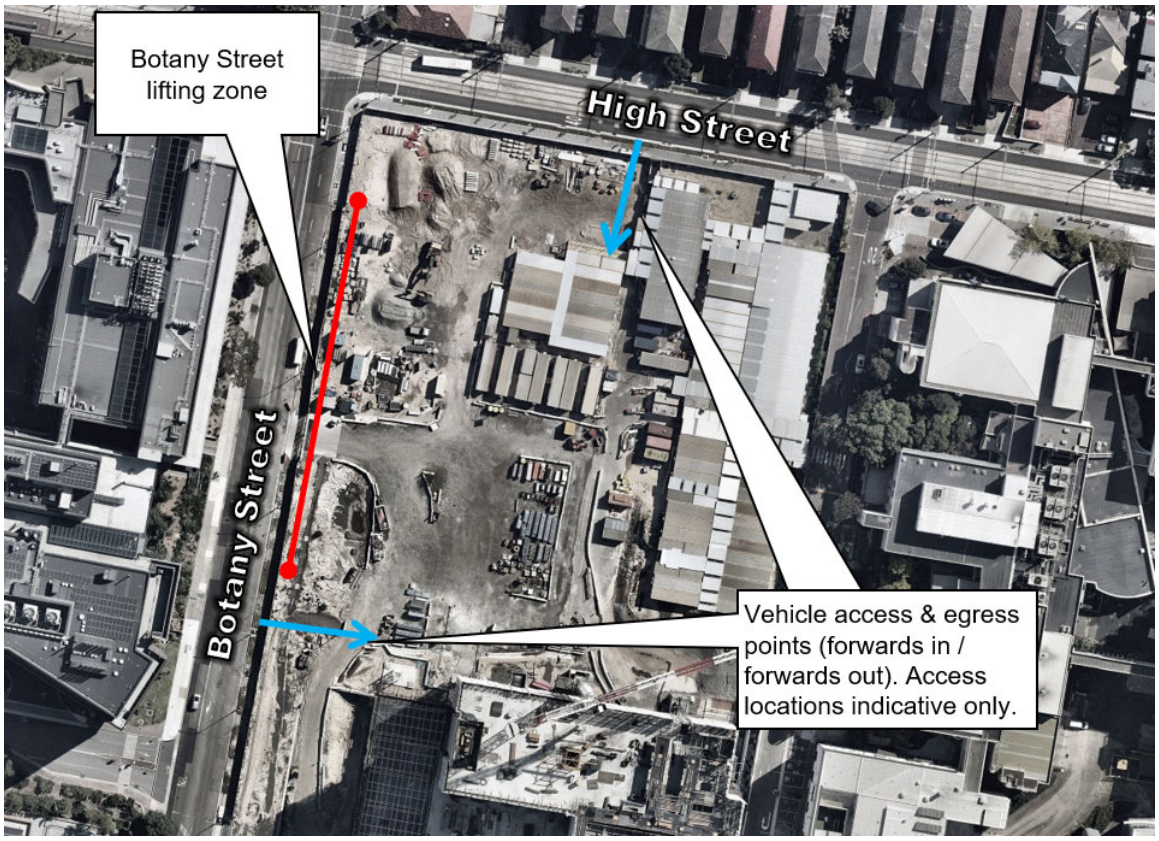


Figure 24 Proposed construction vehicle access

7.7 Construction vehicle routes

To keep construction related traffic to a minimum on the surrounding roads, it is necessary to define routes for construction traffic to and from the construction site. These access routes are to predominantly utilise arterial roads and minimise the use of local roads where possible. Construction traffic through the Randwick Junction Town Centre (i.e. Belmore Road) is to also be avoided. The key arterial roads surrounding the site are Avoca Street, Anzac Parade and Alison Road.

Specifically trucks will be directed to approach the site to avoid conflicts with the light rail line, particularly the High Street / Wansey Road intersection to ensure the light rail service operates efficiently through this location.

Due to recent directional changes to the road network as a result of the light rail line, use of Arthur Street and Clara Street will be required for vehicles accessing the High Street construction site access point.

Figure 25 describes the inbound routes to the construction site, with outbound vehicles to follow the same routes.

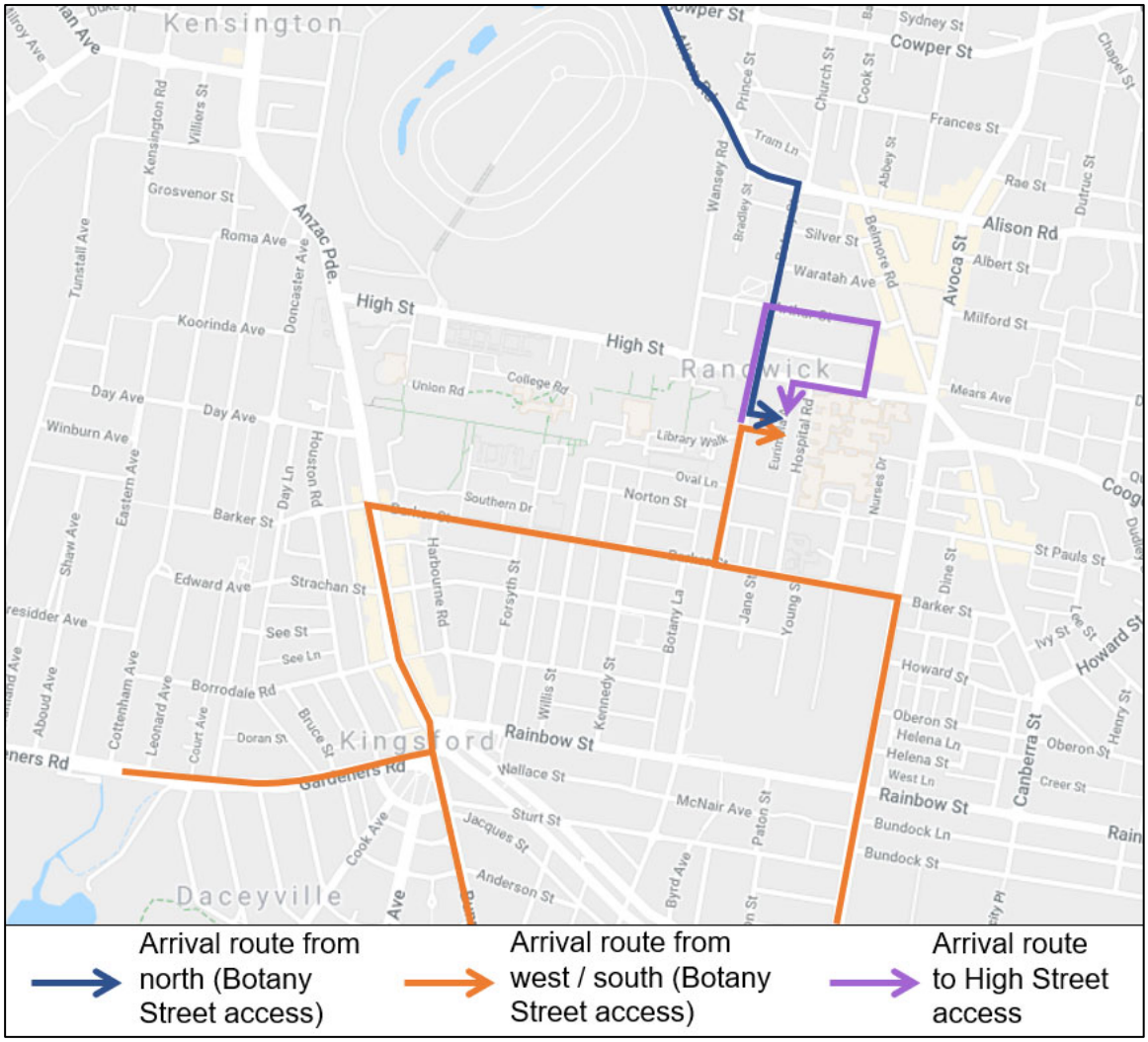


Figure 25 Construction vehicle routes

7.8 Car parking

No car parking is proposed to be provided for construction staff. As part of site induction employees will be advised of the public transport options and encouraged to use these facilities or carpooling arrangements to decrease the number of employee vehicles. There are publicly available car parking spaces located on the rooftop of the nearby Botany Street multi-storey car park which could be utilised by construction workers if needed.

7.9 Pedestrians impacts during construction

Transport for NSW accredited traffic controllers will manage the interaction of construction vehicles with pedestrians at the site access points on High Street and Botany Street to allow pedestrians to cross these works area. Construction vehicles entering, exiting and driving around the site will be required to give way to pedestrians at all times, as required under the NSW Road Rules.

Footpaths will remain open at all times during the construction project. The appointed contractor will install B-Class hoardings along Botany Street (adjacent to the works zone) to ensure the safety of pedestrians walking within the lifting zone.

7.10 Cumulative construction impacts

The key construction project that will may ongoing at the time of the UNSW HTH project is the Sydney Children's Hospital (Stage 1) expansion. UNSW is in close consultation with Health Infrastructure in relation to this project and hold weekly coordination sessions to coordinate works to minimise the impacts of the projects on the adjacent road network.

7.11 Mitigation measures

Mitigation measures will be adopted during the project to ensure traffic movements have minimal impact on surrounding land uses and the community in general, and would include the following:

- Manage and control construction traffic movements on the adjacent road network and vehicle movements to and from the site;
- Trucks to enter and exit the site in a forward direction;
- No provision of vehicle parking for construction workers;
- Restrict construction vehicle activity to designated truck routes;
- Construction access from the external road network to mainly occur at signalised intersection;
- Pedestrian movements adjacent to demolition activity will be managed and controlled by site personnel where required;

- Pedestrian warning signs and construction safety signs/devices to be utilised in the vicinity of the site and to be provided in accordance with WorkCover requirements;
- Construction activity to be carried out in accordance with the approved hours of work;
- Truck loads would be covered during transportation off-site;
- Establishment and enforcement of appropriate on-site vehicle speed limits which would be reviewed depending on weather conditions or safety requirements;
- Activities related to the construction works would not impede traffic flow along local roads;
- Materials would be delivered and spoil removed during standard construction hours;
- Construction vehicles not to queue on adjacent roads and be wholly accommodated within the site or the nominated Botany Street works zone;
- Minimal construction traffic movements to/from the site will be made during peak hours where practical to minimise the impact on the wider road network.

To manage driver conduct, the following measures are to be considered for implementation:

- All deliveries are to be pre-booked;
- All deliveries are to check-in at the site office; and
- Drivers are to give way to pedestrians.

Traffic controllers will be used to stop traffic on the public streets to allow trucks to enter or leave the site. Vehicles must enter and exit the site in a forward direction. They must wait until a suitable gap in traffic allows them to assist trucks to enter or exit the site. Vehicles entering, exiting and driving around the site will be required to give way to pedestrians.

8 Summary

This transport impact assessment has been prepared to support the planning application (SSD 10822510) for the proposed UNSW HTH at the RHC.

The UNSW HTH site benefits from being located adjacent to nearby public transport, being within walking distance of a number of bus stops as well as two light rail stops. Strong pedestrian connections are proposed as part of the development to connect the UNSW HTH development with the light rail stop on High Street, as well as existing bus stops.

In this context transport strategy developed for the proposal has focused on providing access via sustainable modes of transport. The proposal provides for improved pedestrian connectivity through a pedestrian bridge across Botany Street which will enhance the connection between the UNSW HTH and the main UNSW

Bicycle parking is to be provided for staff and visitors so as to encourage this form of transport to the site, with a dedicated entry for cyclists via south-west corner of the building adjacent to Botany Street. No car parking will be provided on the site for staff or visitors – thereby minimising traffic impacts and promoting other forms of transport.

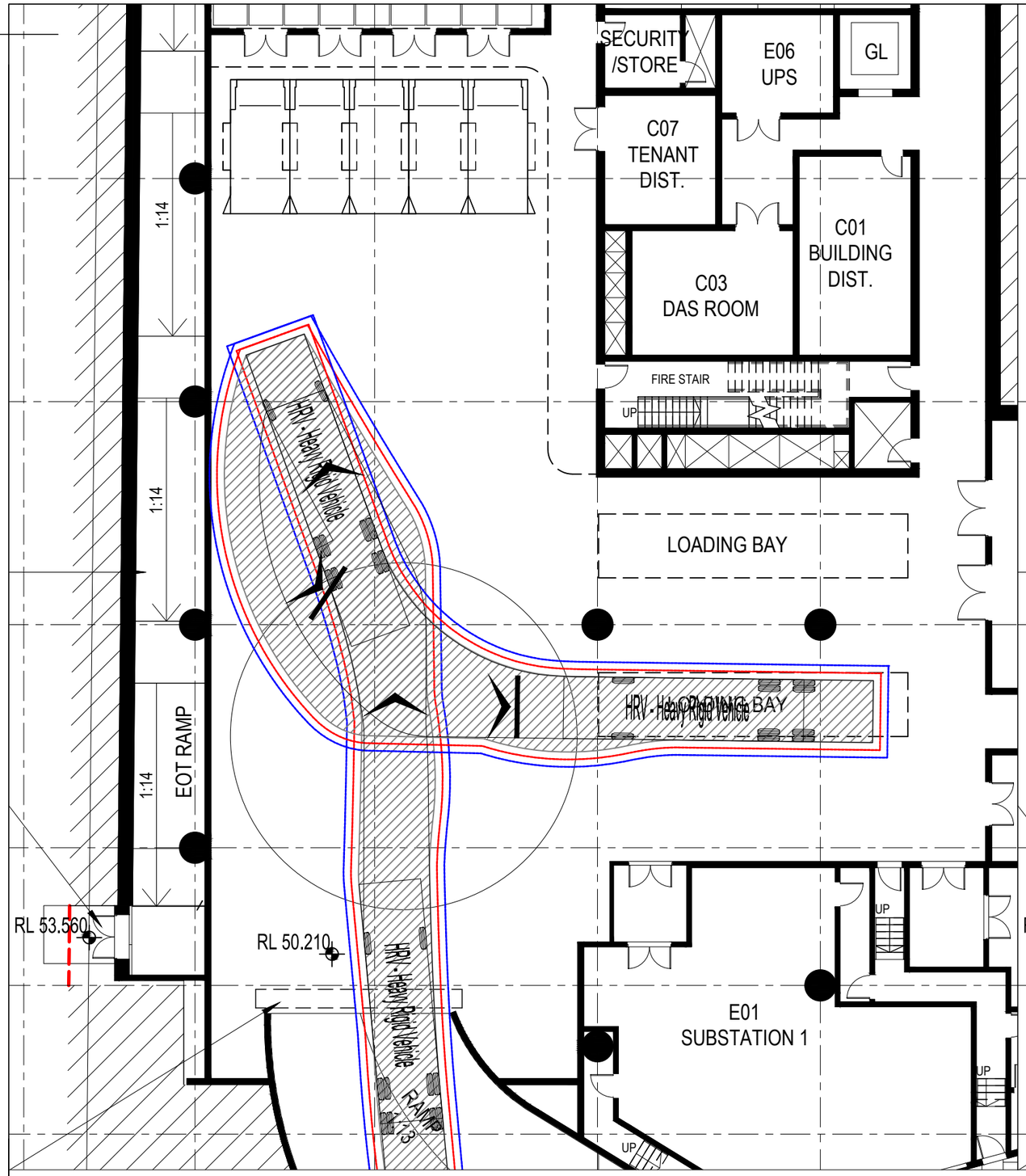
The potential impacts of the project, and associated mitigation measures, are summarised in Table 7 below.

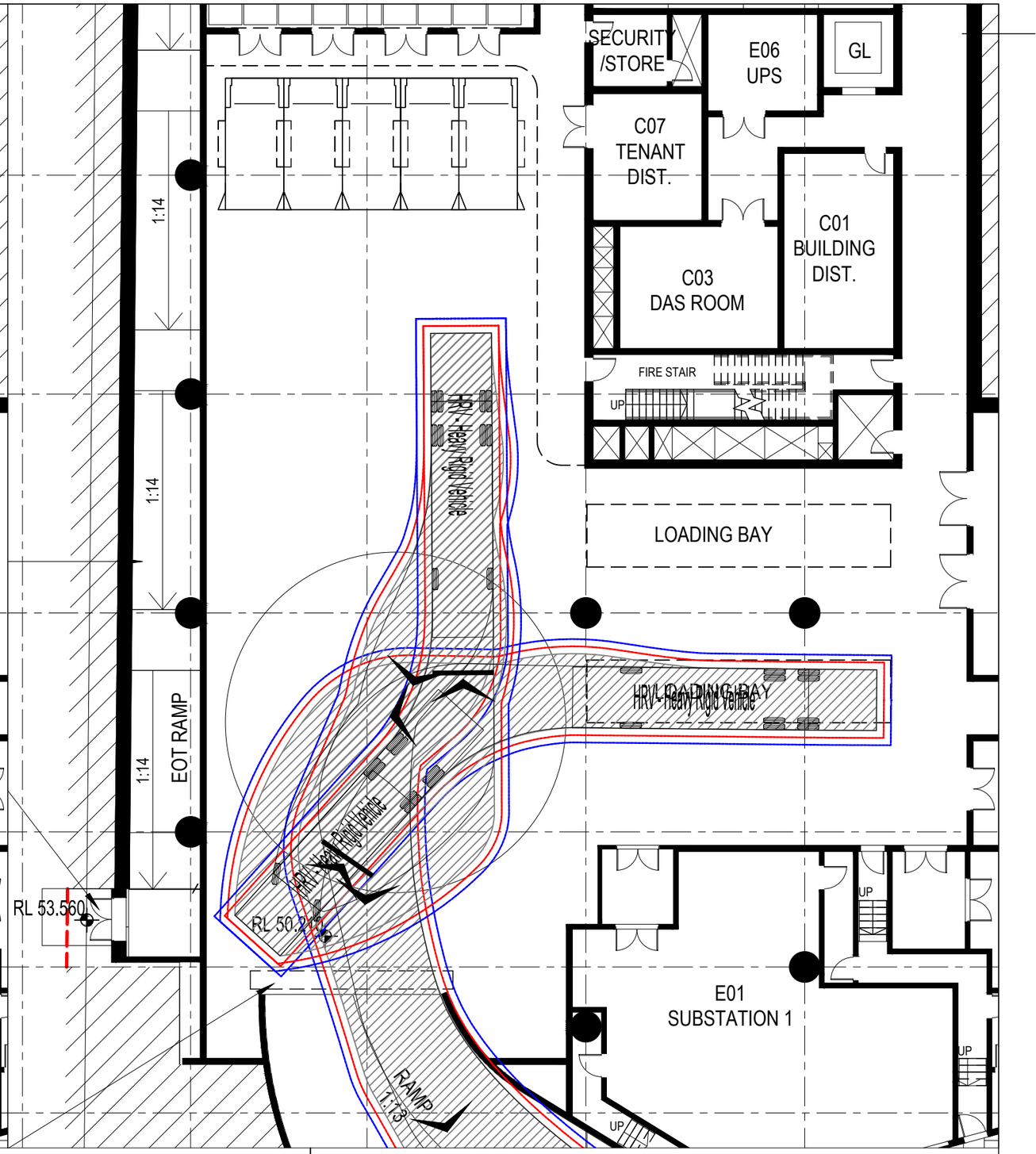
Table 7 Potential projects impacts and associated mitigation measures

Potential impacts of proposal	Mitigation Measure
The proposal will result in increased pressure on on-street loading zones in the vicinity of the Site.	The design proposes to provide a total of seven service vehicle bays within the loading dock. Based on surveys of similar sites, this provision is sufficient to accommodate the loading and servicing demands entirely within the Site and not on surrounding streets.
The proposal will impact the operation of the nearby light rail network	So as to not impact the light rail service operational vehicle access is not proposed along the High Street frontage of the site, while an over-sized vehicle driveway will be provided during the construction phase to minimise the risk of construction vehicles veering onto the light rail tracks
The proposal will result in increased traffic congestion on the surrounding road network	No car parking is being provided as part of the development and therefore the traffic impact will be negligible, with the main traffic generation related to servicing and deliveries

Potential impacts of proposal	Mitigation Measure
The proposal will impact pedestrians, cyclists and general traffic during construction	A preliminary Construction Pedestrian and Traffic Management Plan (CPTMP) has been prepared, describing how it is proposed to manage the impacts to traffic, pedestrians, cyclists and public transport users during the construction stage. A more detailed CPTMP will be prepared prior to the commencement of construction.
The proposal will inhibit future vehicle access to adjacent buildings	The proposed access arrangements have been coordinated in order to provide appropriate access to the IASB as well as a future SCH Stage 1 and the CCCC buildings (subject to a separate approval)
The proposal will generate additional demand for bicycle parking facilities	The proposal will include a large bicycle parking and end of trip area to provide 135 bicycle parking spaces as well as supporting lockers and showers.

Appendix A: Vehicle Swept Path Analysis





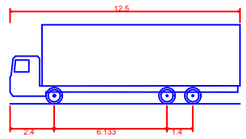
Client
University of New South Wales

Job Title
UNSW Health Translation Hub

Drawing Title
Turning Paths
HRV - Loading Dock

Legend
- Body Envelope
- 300mm Envelope
- 600mm Envelope
- Wheel Envelope

Vehicle type(s)



HRV - Heavy Rigid Vehicle

Overall Length	12.500m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.417m
Track Width	2.500m
Lock to Lock Time	6.00 sec
Curb to Curb Turning Radius	12.500m

Date
08.03.21

Job No
2009

Drawing No
SKT01

Drawing Status
Draft

Scale at A3
1:200

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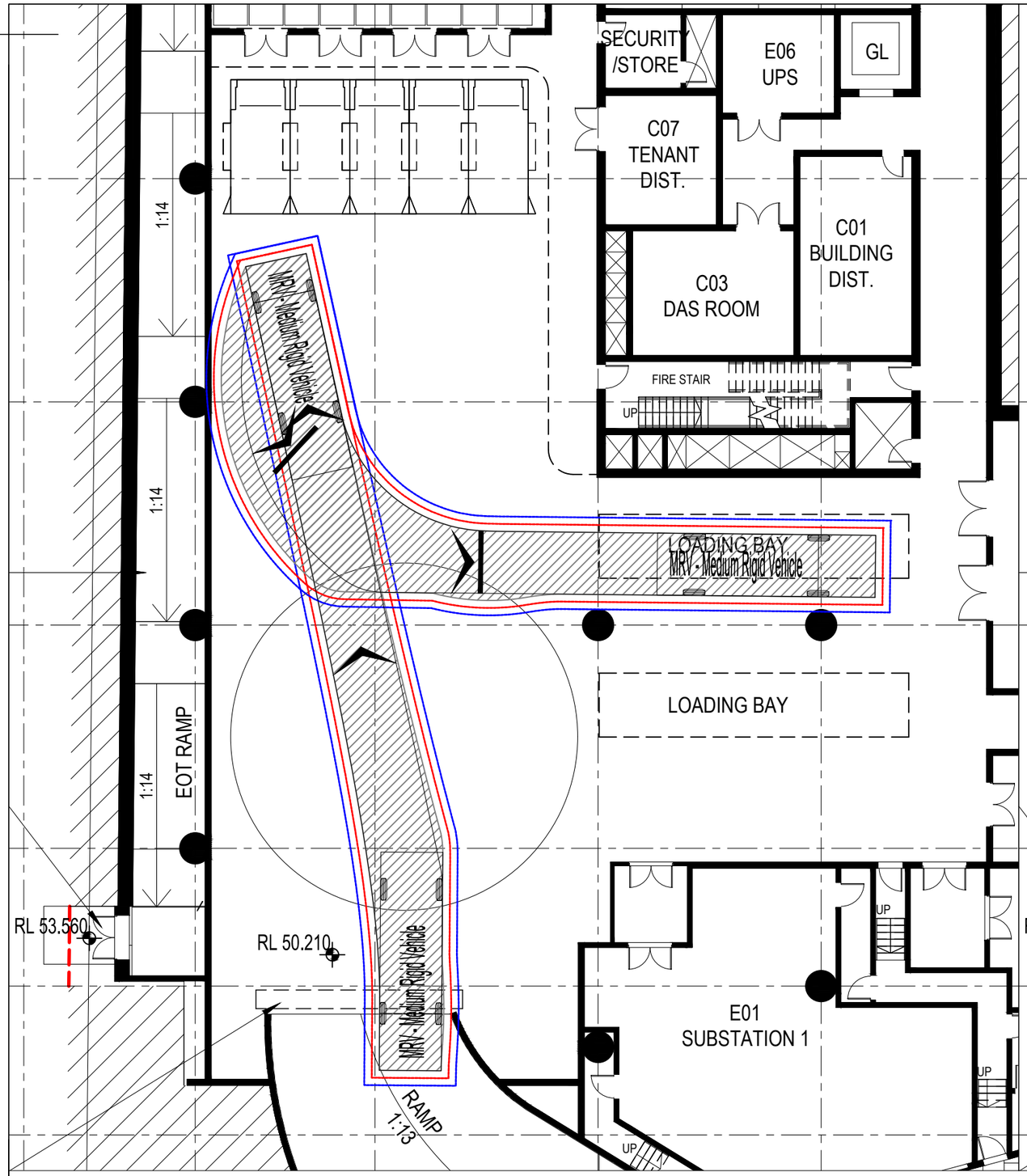
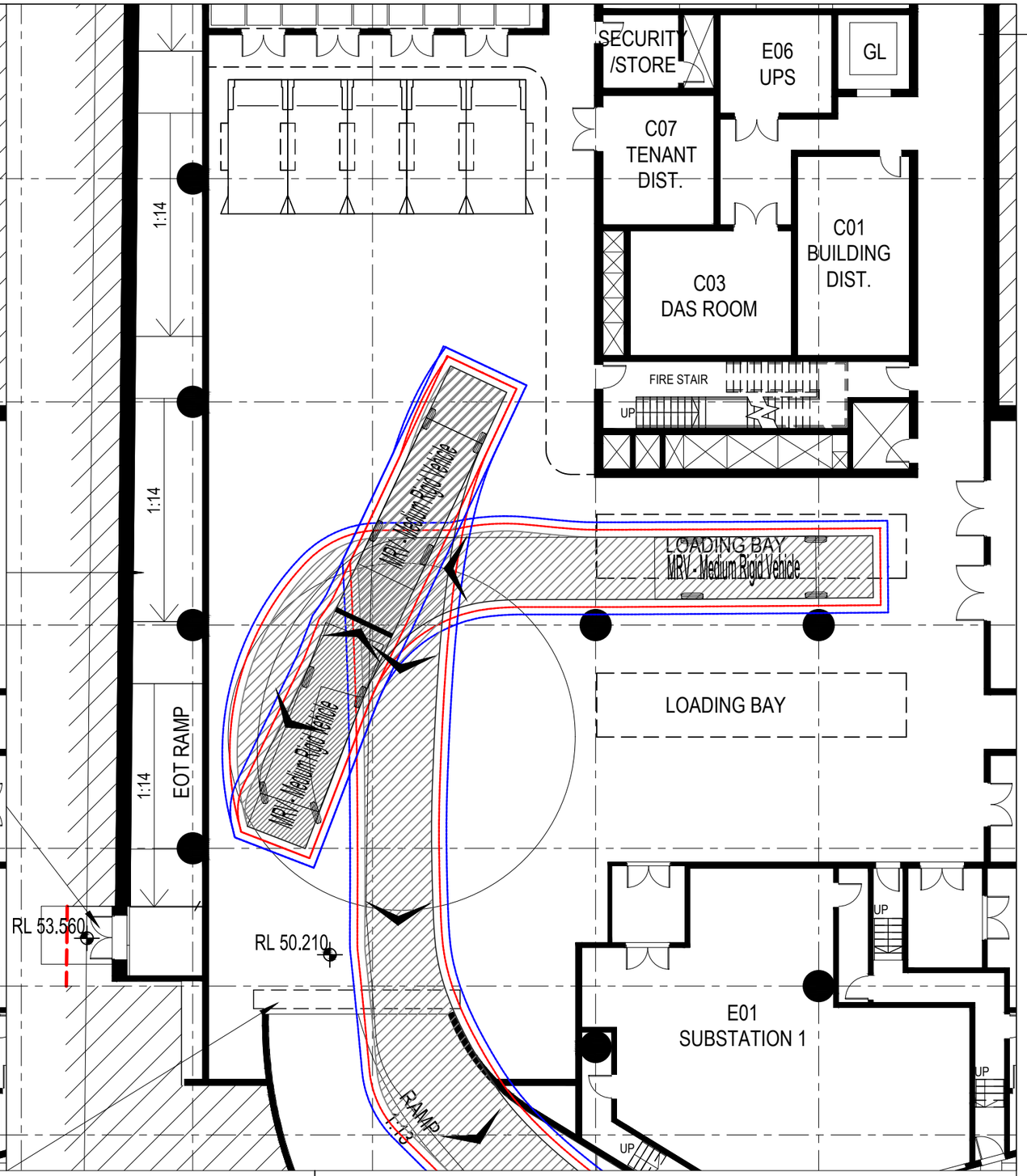




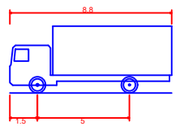
Client
University of New South Wales

Job Title
UNSW Health Translation Hub

Drawing Title
Turning Paths
MRV - Loading Dock

Legend
- Body Envelope
- 300mm Envelope
- 600mm Envelope
- Wheel Envelope

Vehicle type(s)



MRV - Medium Rigid Vehicle

Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	10.000m

Date
08.03.21

Job No
2009

Drawing No
SKT02

Drawing Status
Draft

Scale at A3
1:200

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