

# transport impact assessment;

Nepean Hospital  
CAMHS and TAM Facilities

For Health Infrastructure

28 February 2023

parking;  
traffic;  
civil design;  
wayfinding;  
**ptc.**

## Document Control

Nepean Hospital  
CAMHS and TAM Facilities, Transport impact assessment

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## Contact

### Andrew Morse

+61 2 8920 0800

+61 414 618 002

[andrew.morse@ptcconsultants.co](mailto:andrew.morse@ptcconsultants.co)

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**ptc.**  
Suite 502, 1 James Place  
North Sydney NSW 2060  
[info@ptcconsultants.co](mailto:info@ptcconsultants.co)  
t + 61 2 8920 0800  
[ptcconsultants.co](http://ptcconsultants.co)

## Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
<b>2</b>	<b>Background</b>	<b>2</b>
2.1	Site Context	2
2.1.1	Existing Surrounding Land Use	2
2.2	Development Proposal	3
<b>3</b>	<b>Existing Conditions</b>	<b>4</b>
3.1	Road hierarchy	4
3.2	Public Transport	7
3.2.1	Bus Facilities	7
3.2.2	Train Facilities	8
3.3	Active Transport	9
3.3.1	Pedestrian Facilities	9
3.3.2	Cycling Facilities	9
<b>4</b>	<b>Traffic Activity</b>	<b>10</b>
4.1	Traffic Assumptions - CAMHS	10
4.2	Traffic Generation - CAMHS	10
4.3	Traffic Generation – TAM	11
<b>5</b>	<b>Car Parking Supply &amp; Demand</b>	<b>12</b>
5.1	Parking Supply	12
5.2	Parking Demand	12
<b>6</b>	<b>Site Access and Service Vehicle Arrangement</b>	<b>14</b>
6.1	Site Access	14
6.2	Loading Dock Access	15
6.3	Waste Collection	15
<b>7</b>	<b>Construction Traffic Management</b>	<b>16</b>
<b>8</b>	<b>Conclusion</b>	<b>18</b>
Attachment 1	Swept Path Assessment	19
Figure 1	- Proposed Location	1
Figure 2	- Existing Site Plan (Source: STH – Existing Site Investigations)	2
Figure 3	- Surrounding Land Use (Source: NSW Planning Portal)	3
Figure 4	- Road Hierarchy (Source: RMS Road Hierarchy Review)	4
Figure 5	- Streetview of Great Western Highway, Eastbound (Source: Google)	5
Figure 6	- Streetview of Parker Street, Northbound (Source: Google)	5
Figure 7	- Derby Street, westbound (Source: Google maps)	6
Figure 8	- Somerset Street, westbound (Source: Google maps)	6
Figure 9	- Public Transport Map	7
Figure 10	- Bus Operator Map for Outer-western Sydney Services	8
Figure 11	- Cycleway Network (source: <a href="https://www.rms.nsw.gov.au/maps/cycleway_finder">https://www.rms.nsw.gov.au/maps/cycleway_finder</a> )	9
Figure 12	- Existing Driveway Accesses	14
Figure 13	- Existing Site Frontage Parking Controls	15
Figure 14	- Proposed Driveways	15
Figure 15	- CAMHS and TAM Construction Area	16
Figure 16	- Truck Routes	17
Table 1	- Existing road network – Great Western Highway	5
Table 2	- Existing road network – Parker Street	5

Table 3 - Existing road network – Derby Street	6
Table 4 - Existing road network – Somerset Street	6
Table 5 - Bus Service Summary	7
Table 6 - Existing parking demand generated by staff that are to be relocated off campus	12
Table 7 - Estimated CAMHS parking demand	13

Response to Council letter dated 2<sup>nd</sup> March 2021

Comment	Response and Report Reference
<p>The proposal represents an increase in gross floor area and additional or expanded services within the hospital that may require a proportionate increase in onsite car parking.</p>	<p>The floor area is not a reliable reference with regard to hospital parking demand, with the staff population, number of beds and the provided health services resulting in a more accurate basis. In this regard, the staff population will decrease as a result of this proposal according to the current services plan for the hospital, thereby parking demand will reduce accordingly. Refer to section 5 where we present both the parking demand and provision outcomes to conclude a net reduction in demand.</p>
<p>There is already a numerical deficiency in on-site car parking resulting from recent state significant development approvals for the redevelopment of the Nepean Hospital campus. It will need to be demonstrated that the proposed development works will not further increase patronage and parking demands if there is no additional car parking proposed.</p>	<p>Section 5 presents the parking assessment that underpins this application, which is presented in the context of the overall campus parking supply.</p> <p>In specific regard for the CAMHS and TAM project, the clinical services plan proposes a reduction in staff through the removal of the existing buildings within the site, which reduces the parking demand more than the impacts on the parking provision, resulting in a net positive parking provision to demand ratio (i.e. a reduction in the use of on-street parking).</p>
<p>A review of the plans suggest reconfiguration of some car parking however there doesn't appear to be a specific increase in parking to cater for the increased gross floor area associated with the proposed development.</p>	<p>As above, the project does involve some parking reconfiguration including the relocation of the fleet parking to the West Block car park, however the parking demand reduces by more than the reduction in parking (refer Section 5). The parking demand associated with the proposed staffing with CAMHS is presented as this provides a more accurate assessment that the gross floor area.</p>
<p>It is therefore requested that a traffic and parking assessment report be prepared and submitted to Council for review that addresses the traffic and parking demands of the existing / approved hospital campus with analysis to confirm what impacts the proposed works will have on parking availability. The report should ensure or demonstrate that further</p>	<p>This report has been prepared with reference to the overall campus parking study that established the parking demand and travel mode characteristics of the hospital. By applying the results of that study to the existing buildings to be removed from the subject site, and the proposed uses, it is demonstrated that the project in combination with the reduction in staff</p>

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overflow parking is projected to occur in the local road network as a consequence of this development.

demand will improve the parking supply situation (Section 5).

The traffic assessment component has confirmed that the project will involve an overall decrease in the traffic activity associated with the campus, but particularly on Derby Street through the removal of the fleet car park from the site (Section 4).

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## 1 Introduction

ptc. has been engaged by Health Infrastructure (HI) to provide traffic advice in relation to the design development of a new Child and Adolescent Mental Health Service (CAMHS) unit and the Total Asset management facility (TAM) at Nepean Hospital, which will replace the existing Nepean 1 and Nepean 2 buildings.

It is understood that the State Wide Mental Health Infrastructure Program requires a net addition of 10 beds to the existing beds available at the Nepean Hospital campus. As such, a new CAMHS unit is proposed in the south-eastern corner of the Nepean Hospital campus to supplement the existing facilities.

In conjunction with the redevelopment of the site for CAMHS, the TAM facility is to be relocated from the current compound adjacent to Barber Avenue to make way for the Stage 2 expansion project. The location of the CAMHS and TAM site is indicated in Figure 1.

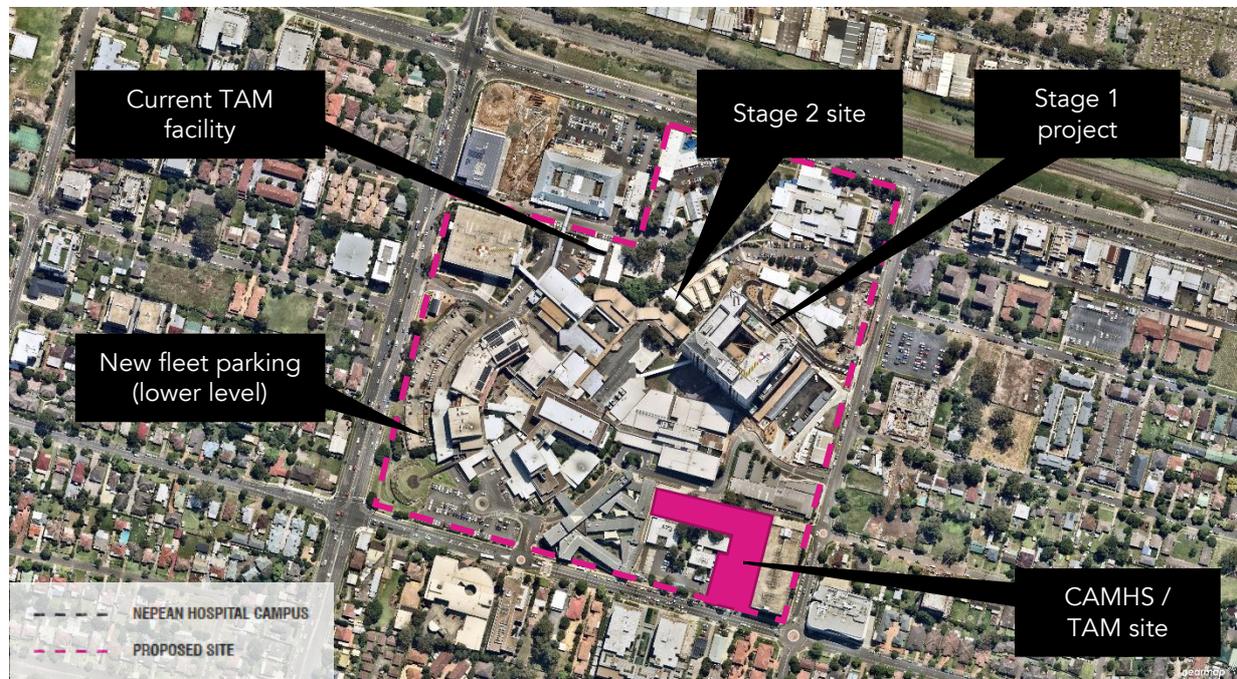


Figure 1 - Proposed Location

It should be noted that the assessment presented in this report is separate to, but has regard for, the Stage 1 and Stage 2 projects with regard to traffic movements and the overall campus parking provisions.

## 2 Background

### 2.1 Site Context

There are currently five buildings within the proposed site location, comprising Nepean 1, Nepean 2, NBMLHD Executive, Sexual Health and Court Building.

There are two car parks for fleet and staff parking maintained and operated by Wilson Parking, controlled by secure boom gates having access from Derby Street (see Figure 2).



Figure 2 - Existing Site Plan (Source: STH – Existing Site Investigations)

#### 2.1.1 Existing Surrounding Land Use

In the context of the surrounding land use, the Hospital campus is classified as an Infrastructure Zone (SP2) and is surrounded by a variety of different land uses as shown in Figure 3:

- The west of the hospital is characterised by Medium (R3) and High (R4) Density Residential housings;
- Immediately to the east and south of the hospital is a Mixed Use (B4) area, followed by Medium (R3) and High (R4) Density Residential housings and the Chapman Gardens Oval, zoned as Public Recreation (R1);

- To the north-east of the Hospital lies a General Industrial (IN1) area, accommodating railway tracks, the Kingswood Railway station and several automotive outlets along the Great Western Highway. Behind these is the Kingswood Cemetery, zoned as Special Activities (SP1).

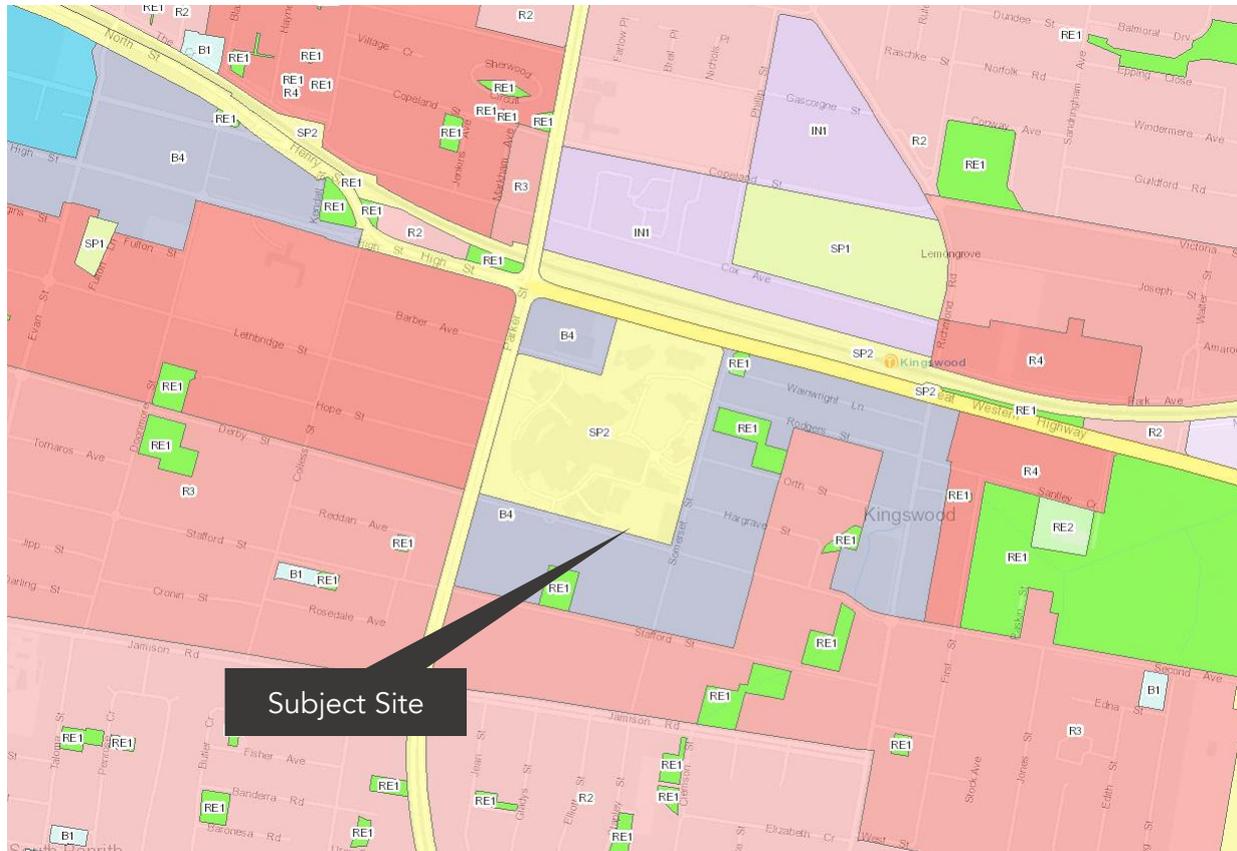


Figure 3 - Surrounding Land Use (Source: NSW Planning Portal)

## 2.2 Development Proposal

The proposal is for the development of two facilities within the site comprising:

- a new CAMHS unit and will comprise one building in lieu of the existing Nepean 1 and Nepean 2 buildings,
- the relocated TAM facility within the southern-eastern part of the site.

The main pedestrian entry is proposed on the northern frontage of the CAMHS building and an additional pedestrian link is proposed to the west, providing a connection to the existing Adult Mental Health building.

A pedestrian entrance will also be provided in the south-eastern corner of the CAMHS unit, with public parking in the adjacent multideck car park. The CAMHS project will also likely involve integration and amendment of the existing Secure Port to improve the connection with the Adult Mental Health unit.

The arrangement of the TAM buildings will involve adjustments to the existing driveway serving the court building car park and the requirement for a new driveway to provide for entry movements into the TAM compound. These do not impact in the on-street parking provision as the frontage is current subject to a No Stopping control.

### 3 Existing Conditions

#### 3.1 Road hierarchy

The Hospital is served by a regional and local road network providing ready access to the City Centre and the surrounding region, while the Great Western Highway and Parker Street provide the primary connection to the Sydney CBD. The road network shown in Figure 4 is also comprised of State and Regional roads, as well as local roads providing access to the surrounding land uses.

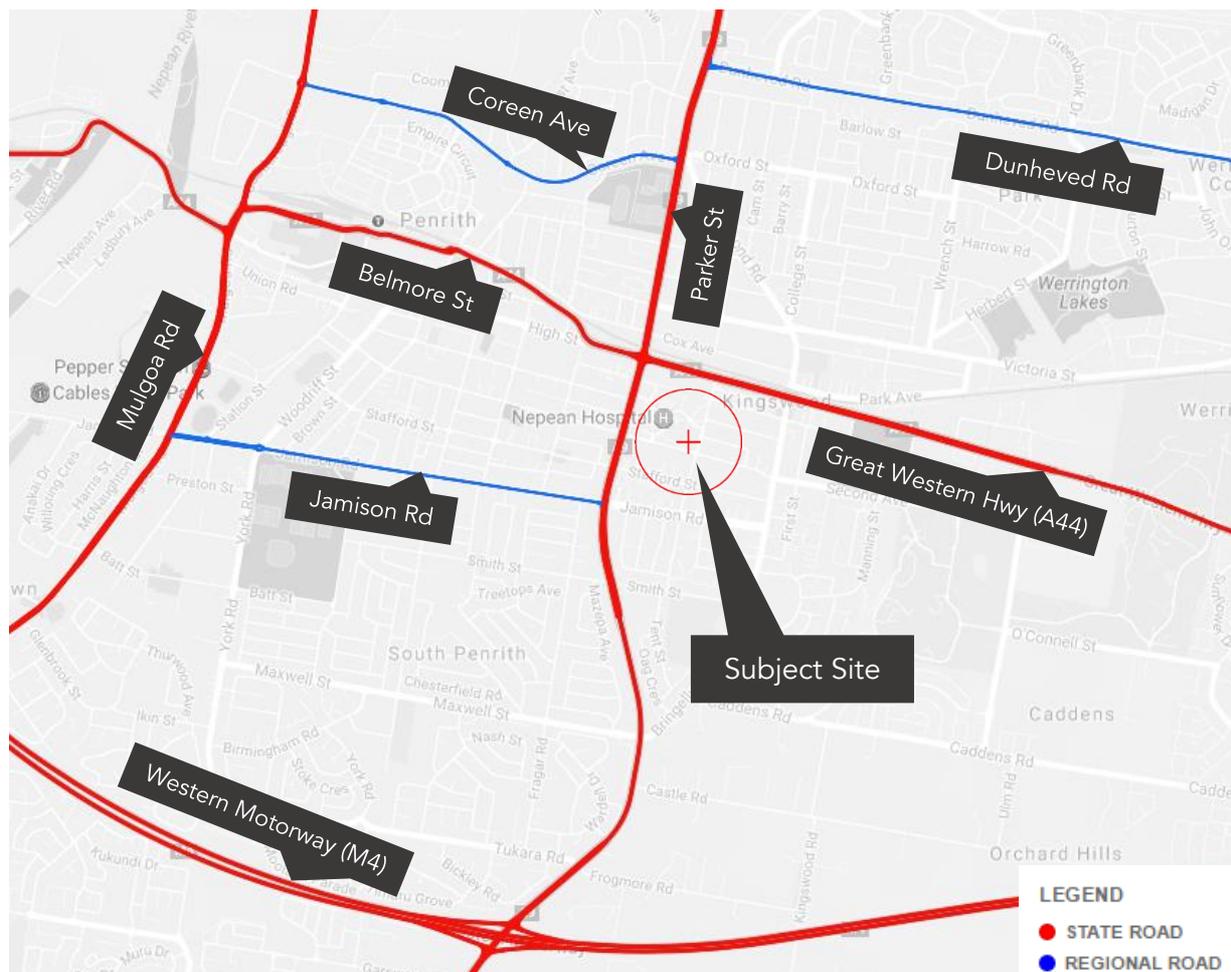


Figure 4 - Road Hierarchy (Source: RMS Road Hierarchy Review)

The NSW administrative road hierarchy comprises the following road classifications, which align with the generic road hierarchy as follows:

State Roads: Freeways and Primary Arterials (RMS Managed)

Regional Roads: Secondary or sub arterials (Council Managed, partly funded by the State)

Local Roads: Collector and local access roads (Council Managed)

A summary of the characteristics of the roads on the network surrounding the site is provided in Table 1.

Table 1 - Existing road network – Great Western Highway

<b>Great Western Highway</b>	
<b>Road Classification</b>	State Road
<b>Alignment</b>	East – West
<b>Number of Lanes</b>	3 lanes in each direction
<b>Carriageway Type</b>	Divided
<b>Carriageway Width</b>	22.5 metres
<b>Speed Limit</b>	60kph
<b>Parking Controls</b>	Unrestricted parking on the north side of carriageway and partially unrestricted and partially 'No Stopping' on the south side of carriageway
<b>Forms Site Frontage</b>	No



Figure 5 - Streetview of Great Western Highway, Eastbound (Source: Google)

Table 2 - Existing road network – Parker Street

<b>Parker Street</b>	
<b>Road Classification</b>	State Road
<b>Alignment</b>	North – South
<b>Number of Lanes</b>	3 lanes in each direction
<b>Carriageway Type</b>	Divided
<b>Carriageway Width</b>	22.5 metres
<b>Speed Limit</b>	70kph
<b>Parking Controls</b>	Unrestricted on east side of carriageway and partially unrestricted and partially 'No Stopping' on the west side of carriageway
<b>Forms Site Frontage</b>	No



Figure 6 - Streetview of Parker Street, Northbound (Source: Google)

Table 3 - Existing road network – Derby Street

Talavera road	
Road Classification	Local Road
Alignment	East - West
Number of Lanes	1 lane in each direction with parking lane on either side of the carriageway
Carriageway Type	Undivided
Carriageway Width	Approximately 12m
Speed Limit	50 km/h
Parking Controls	4P on south side of carriageway and 2P on north side of carriageway
Forms Site Frontage	Yes



Figure 7 - Derby Street, westbound (Source: Google maps)

Table 4 - Existing road network – Somerset Street

Talavera road	
Road Classification	Local Road
Alignment	North - South
Number of Lanes	1 lane in each direction with parking lane on either side of the carriageway
Carriageway Type	Undivided
Carriageway Width	Approximately 13m
Speed Limit	50 km/h
Parking Controls	2P on west side of carriageway and 4P on east side of carriageway
Forms Site Frontage	No



Figure 8 - Somerset Street, westbound (Source: Google maps)

### 3.2 Public Transport

The locality has been assessed in the context of available public transport that may be utilised by staff and visitors. When defining accessibility, the NSW Guidelines to Walking & Cycling (2004) suggests that 400-800m is a comfortable walking distance. The 400m and 800m catchments are shown in Figure 9.



Figure 9 - Public Transport Map

#### 3.2.1 Bus Facilities

The Hospital is relatively well serviced by bus, with a number of routes and regular services (every 30 mins on weekdays), and therefore provides an alternative mode share option for hospital staff and visitors, subject to the availability of convenient bus stops close to their home location. The Hospital Precinct is serviced by the bus routes presented in Table 5.

Table 5 - Bus Service Summary

Route No.	Coverage	Frequency
774	Mount Druitt to Penrith	Weekdays: Services every 30 minutes, between 6:25am and 11:36pm Weekends: Services every 1 hour, between 7:33am and 10:20pm
775	Mount Druitt to Penrith	Weekdays: Services every 30 minutes, between 5:21am and 10:56pm Weekends: Services every 1 hour, between 7:33am and 10:20pm
776	Mount Druitt to Penrith	Weekdays: Services every 30 minutes, between 5:36am and 10:20pm Weekends: Services every 1 hour, between 8:14am and 11:03pm
789	Luddenham to Penrith	Weekdays: 2 services every weekday, at 7:54am and 4:30pm Weekends: No services

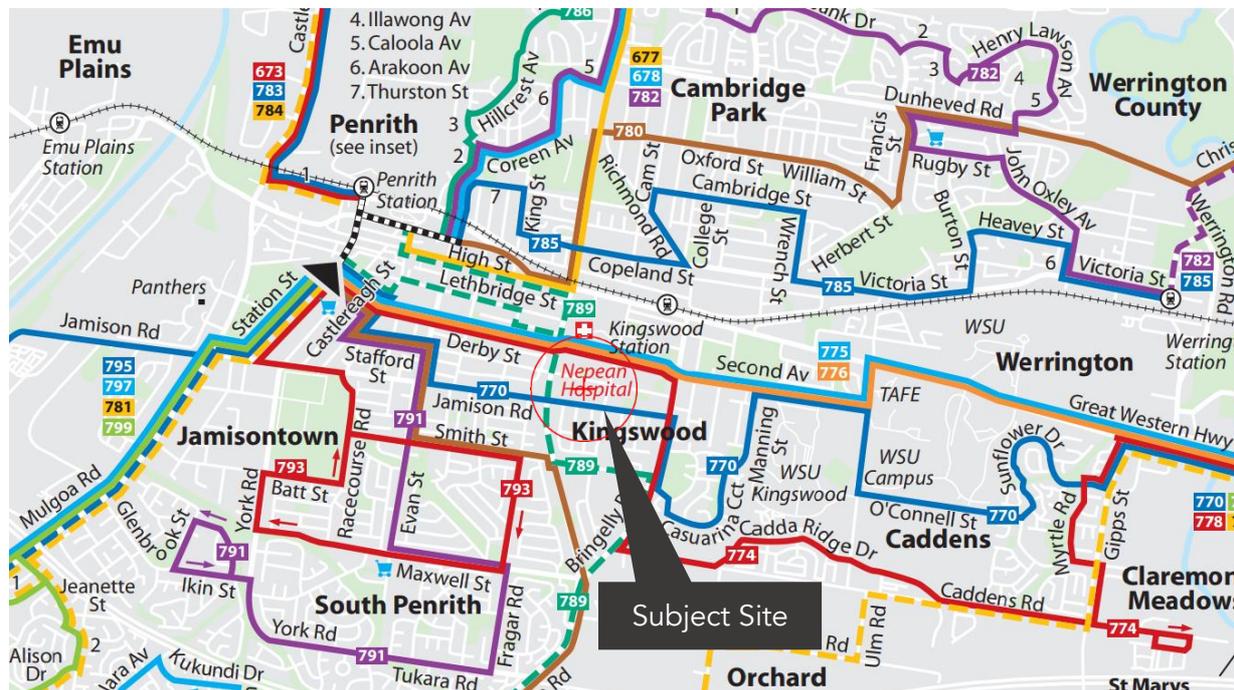


Figure 10 - Bus Operator Map for Outer-western Sydney Services  
 (Source: Transport for New South Wales Bus Operator Maps)

### 3.2.2 Train Facilities

The closest station, Kingswood Railway Station, is located approximately 800m (walking distance) from CAMHS, which is considered to be within the reasonable walking distance.

The station is on the T1 Western Line, from Emu Plains and Richmond to the City. Services operate every 5 – 15 minutes during peak hours, with services operating from 3.16am to 11.36pm.

The distance from CAMHS, the availability of taxi links as well as the relative frequency of services could make heavy rail a reasonably attractive mode share option for hospital staff and visitors, subject to the availability of a convenient railway station close to their home location.

### 3.3 Active Transport

In addition to public transport, the locality has also been assessed for its active transport potential.

#### 3.3.1 Pedestrian Facilities

The pedestrian infrastructure is well developed in the vicinity of the site, with footpaths on both sides of the surrounding roads, signalised pedestrian crossings, zebra crossings, appropriate signage and markings. In addition to this, the topography of the area is relatively flat. However, as with cycling, walking is only likely to be an attractive option for staff who live relatively close to the site.

#### 3.3.2 Cycling Facilities

It is noted that the cycling infrastructure in the Penrith region is relatively underdeveloped, with no dedicated bicycle paths in the vicinity of the Hospital. However, the surrounding road network makes cycling a viable method of travel. As shown in Figure 11, there are a number of surrounding roads which are considered "low difficulty".

Despite the relatively level topography surrounding the site, cycling is only likely to be an attractive mode share for staff that live within a relatively close distance.

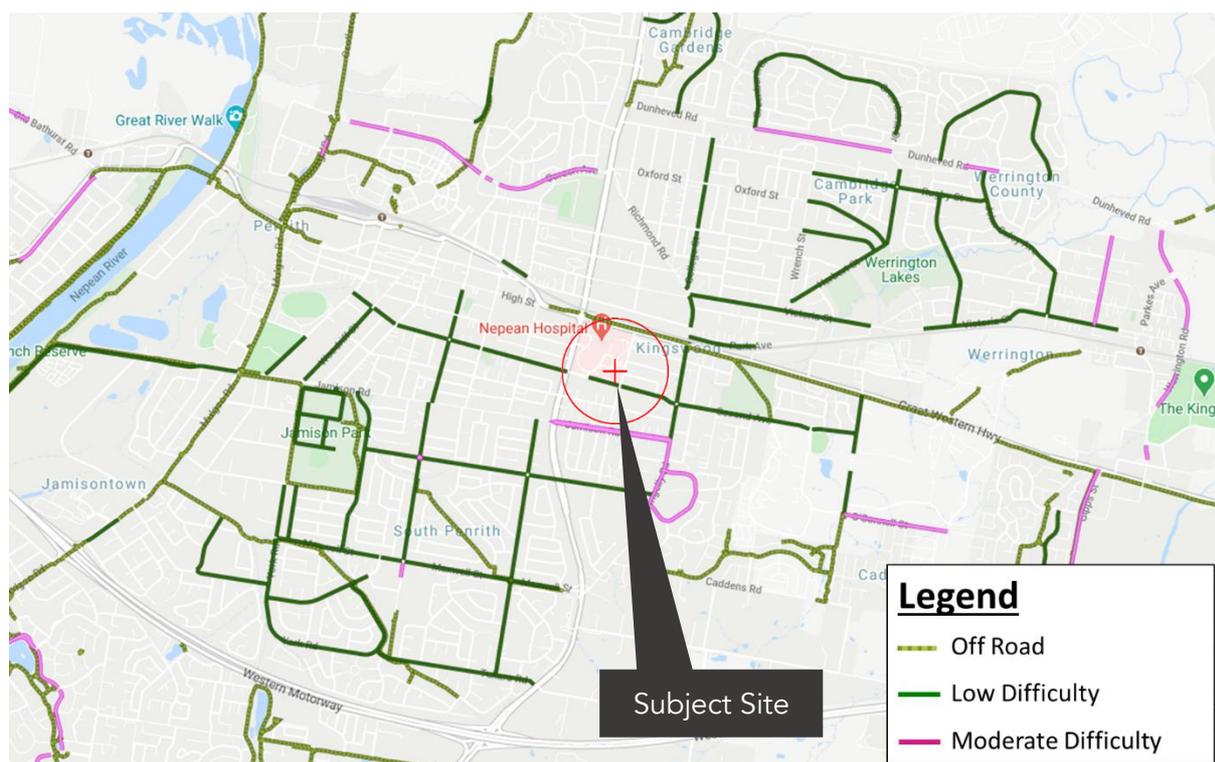


Figure 11 - Cycleway Network (source: [https://www.rms.nsw.gov.au/maps/cycleway\\_finder](https://www.rms.nsw.gov.au/maps/cycleway_finder))

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## 4 Traffic Activity

### 4.1 Traffic Assumptions - CAMHS

The following information has been provided by Nepean Blue Mountains Local Health District:

- It is anticipated that approximately 30-40 visitors will visit the CAMHS unit per day
- There will be a number of staff on duty on site, namely, nursing, allied health, medical, managers, peer workers, admin, teachers and support workers. The number of staff on duty is summarised as following:
  - There will be 29 staff on duty during the day shift
  - There will be 10 staff on duty during the afternoon shift
  - There will be 5 staff on duty during the night shift
- Outside of staff and visitors, there is a potential for the following to visit the site:
  - Police/Ambulance/PTS drop offs
  - Carers
  - Community CYMHS staff
  - Education staff
  - People coming for network meetings
  - Legal representatives
  - Researchers and research participants
- The largest vehicle to access the site will be a fire truck or COS delivery truck.

The development of CAMHS will involve the decommissioning and demolishing of the existing services on within the Nepean 1 and Nepean 2 buildings. It is assumed that all the existing services that are provided within Nepean 1 and Nepean 2 will be moved off the hospital campus and hence reduce the traffic and parking demand of the site.

### 4.2 Traffic Generation - CAMHS

The traffic generated by the site is assessed based on the staff population. Others who visit the site will typically arrive and depart outside of the AM and PM peak periods and will therefore not impact the road network during these peak times. Hence, the traffic generation of the site will be assessed based on the difference between the current and proposed staff populations, noting that 131 staff are proposed to be relocated to the Health Hub of which 125 will be relocated from the campus.

The decrease in the staff population, even with the addition of 44 new staff of the proposed CAMHS development, indicates that the development of the CAMHS project will have an overall decrease the traffic activity associated with the site, hence the development will improve the overall road network performance and therefore, no further traffic assessment is required.

It should be noted that this is true only because the services on the existing site are to be removed from the hospital campus. If the services that are being removed are to be brought back onto the hospital campus, a traffic assessment will need to be undertaken to ensure the traffic generated by those services are adequately absorbed into the road network.

### **4.3 Traffic Generation – TAM**

The TAM facility is being relocated from the Barber Avenue area of the campus to the subject site and as such will not generate any new traffic activity to the road network, i.e. employees will arrive and depart, and inter-department vehicle trips will still occur.

The key difference will be the location of the activity, which will be removed from Barber Avenue and placed on Somerset Street.

In order to assess whether any impacts will arise from the relocation, the activity at the existing TAM facility has been recorded as being:

- Up to a maximum of five contractor vehicles using the driveway to enter TAMS,
- One small delivery van/truck per day (noting larger deliveries will be via the north block loading dock).

This is an insignificant traffic volume, particularly in the context that the fleet car park is to be relocated from the site and associated driveways to make way for the CAMHS and TAM projects.

## 5 Car Parking Supply & Demand

### 5.1 Parking Supply

The parking provision within the campus is subject to change as projects are commenced or reach completion. Each project is focused on minimising impacts on parking on a site-by-site basis, albeit the target is to maintain a provision of spaces that aligns with the changes in demand, making net improvements where possible.

In June 2022 a campus parking inventory was undertaken by ptc. and CBRE and recorded a total parking provision of 1,836 spaces, which excluded parking associated with Stage 1, as the contractor’s compound was still in place in lieu of parking. The total spaces associated with Stage 1 were added and resulted in a total provision of 2,015 spaces following the completion of Stage 1. This satisfied a Stage 1 SSDA condition requiring the provision of 2,009 spaces. At the time of writing, this provision remains within the campus as no other parking has been displaced pending the commencement of Stage 2 (which has a minor impact on parking) and the CAMHS and TAM project.

It is important to consider the parking provision in the context of the demand (refer Section 5.2 below).

The CAMHS and TAM developments will displace 26 existing staff parking spaces and 46 fleet parking spaces. The CAMHS building will include 5 new parking spaces for staff, while 2 new spaces are to be provided for the TAM facility. The 46 fleet parking spaces are to be relocated to the West Block car park displacing 46 staff parking spaces (refer to the Provision Equation in Section 5.2 below).

There is a separate proposal being developed to provide staff parking within the former ambulance bay area (south of West Block) to offset some of the displaced parking.

In total, the CAMHS/TAM project and the related displacements results in the loss of 65 spaces within the campus (not including the additional parking to be provided within the ambulance area), however this is offset by a reduction in the demand as discussed in Section 5.2 below.

### 5.2 Parking Demand

There are currently 256 staff working in the buildings that will be demolished to make way for the CAMHS and TAM development. 125 of these staff will be relocated to the Health Hub, leaving 131 staff based within the campus.

Based on a parking demand study and parking surveys (undertaken by ptc. for the entire Hospital campus), we estimate that the existing parking demand generated by the staff that are to be relocated is approximately 111 spaces (see Table 6 below).

Table 6 - Existing parking demand generated by staff that are to be relocated off campus

Staff (A)	125
Percentage driving and requiring a parking space (B)	93%
People per car (C)	1.05
<b>Existing Parking Demand by staff that are to be relocated off campus – spaces (A*B/C)</b>	<b>111</b>

The new staff population within the CAMHS development will be 44 and we estimate that the peak parking demand for CAMHS will be as follows:

Table 7 - Estimated CAMHS parking demand

User Group	Information from Hospital	People	Driving, require space	People per car	Cars per day	Parking space turnover	Peak Spaces Required
Staff	Peak shift (day) - 29 staff	29	93%	1.05	26	1	26
Visitors to inpatients	Between 30-40 people per day, say average 35	35	71%	1.7	15	2.61	6
ANO	Discreet drop off, police, ambulance etc - allow say four						4
<b>Total spaces required (assuming all demand is met by supply i.e. unrestrained demand)</b>							<b>36</b>

**Notes:**

% driving & requiring a parking space per **ptc.** surveys at Nepean Hospital

People per car per **ptc.** surveys at Nepean Hospital

Parking space turnover per **ptc.** Nepean Hospital parking demand study

From the above analysis it can be seen that by combining the displacement of parking, and the reduction in demand for 75 staff parking spaces, there will be a net reduction in the parking demand at the Campus as a result of this development, as summarised below:

Demand Equation

- Existing Parking Demand by staff that are to be relocated off campus = 111 spaces.
- New parking demand associated with CAMHS = 36 spaces.
- Reduction in demand of 75 spaces.

Supply Equation

- Existing parking within the site = 26 staff spaces and 46 fleet spaces (total = 72).
- Development proposes 7 spaces (65 spaces displaced).
- Relocation of fleet parking displaces 46 spaces in West Block car park.

The overall outcome is that the project will result in the loss of 19 staff spaces within the site and 46 spaces from West Block totalling a displacement of 65 spaces, however, the demand for parking will reduce by 75 spaces, providing a net decrease in demand of 10 spaces across the campus, which effectively removes this number of vehicles from the surrounding off-street parking.

## 6 Site Access and Service Vehicle Arrangement

### 6.1 Site Access

Access to the subject area of the campus is provided via two driveways, both accommodating two-way traffic flow.

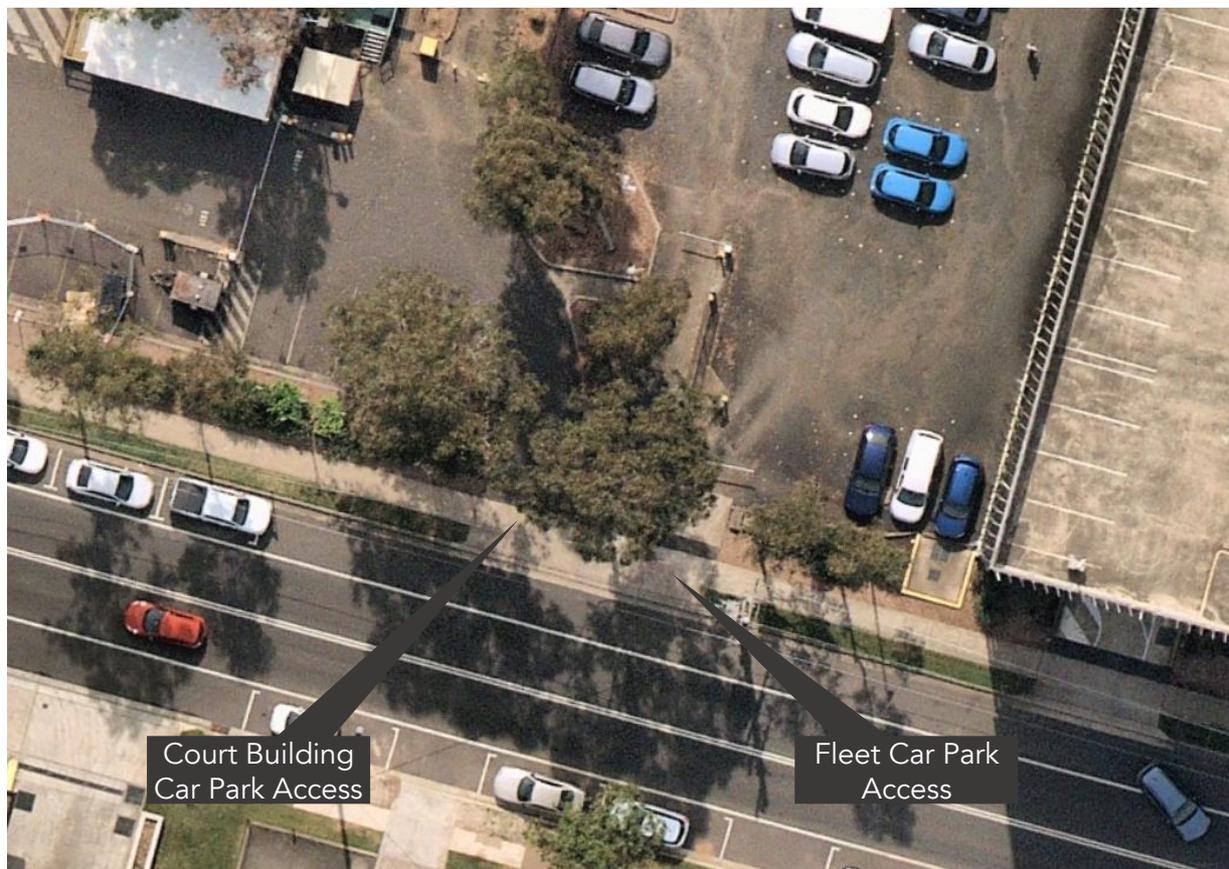


Figure 12 - Existing Driveway Accesses

The layout of the TAM buildings will require the relocation of the Court Building driveway to the west, the existing fleet car park driveway will be removed, while a new two-way driveway will be constructed to the west and adjacent to the multi-storey car park to provide access to the CAMHS building and egress from TAM.

The proposed driveway layout is illustrated overleaf. The following image is captured from Streetview to confirm that the driveways are located within an existing No Stopping control zone and therefore the proposal will have no impact on the provision of on-street parking spaces.

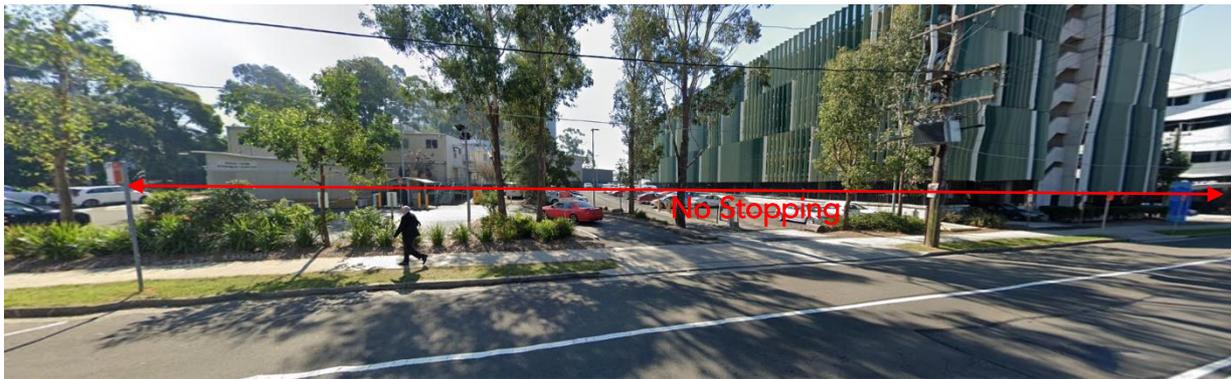


Figure 13 - Existing Site Frontage Parking Controls

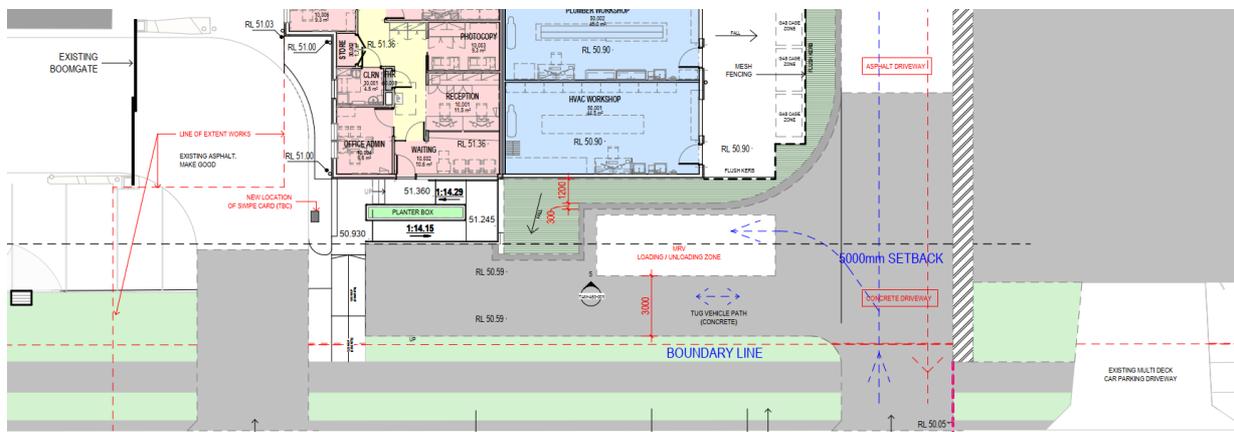


Figure 14 - Proposed Driveways

## 6.2 Loading Dock Access

A loading dock will be provided in the eastern corner of the CAMHS unit. The largest vehicle required to access the loading dock will be a Medium Rigid Vehicle. Access to the loading dock will be via a new access driveway on Derby Street, adjacent to the MSCP. A swept path assessment shows that the loading dock can accommodate an SRV. The swept path is provided in Attachment 1.

## 6.3 Waste Collection

Refuse collection will occur along the existing Nepean Hospital Ring Road at the northern frontage of the site as per the existing arrangements. Bins will be wheeled out to the Ring Road from the storage location by staff and returned after collection.

## 7 Construction Traffic Management

The CAMHS and TAM projects will be constructed as a single contract therefore the construction activity will occur concurrently to minimise the impacts of traffic activity on Derby Street.

Access to both sites will be provided via a single driveway on Derby Street, adjacent to the multi-storey car park. Access through to the CAMHS site will be maintained along a roadway between the TAM site and the MSCP.

The projects will involve the demolition of the buildings and car parking identified by the red shading in the following figure.



Figure 15 - CAMHS and TAM Construction Area

The projects are likely to occur over a 12-month period, comprising demolition, construction of the main structures and fit out. The peak traffic activity is likely to be associated with the removal of material during the demolition stage, and concrete pours associated with the footings and structures. Following these stages, smaller and less frequent vehicles are used for the fit out stage.

The site is well served by the arterial road network, providing proximate access to the M4 motorway to the south of Kingswood. The following truck routes have been identified as provided the most direct routes while minimising the impact on residential areas/roads.

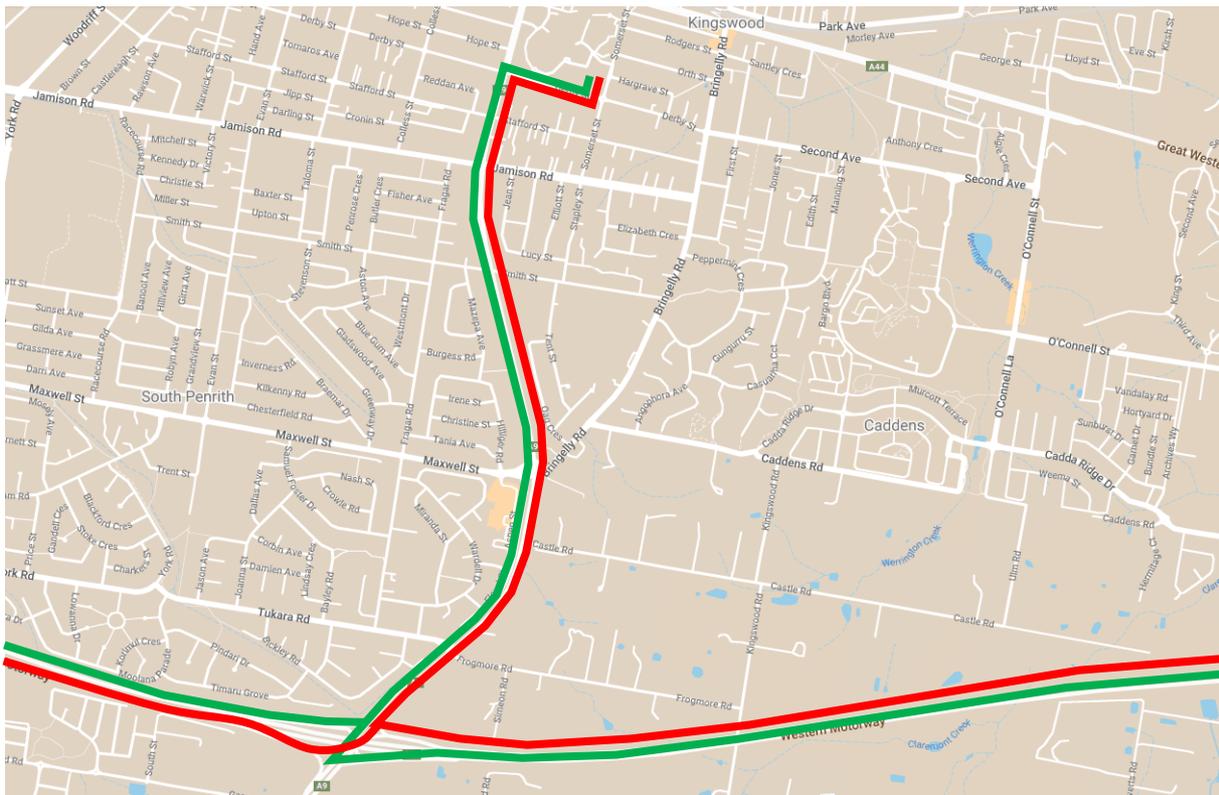


Figure 16 - Truck Routes

The proposed driveway access will be designed to accommodate the left turn movement into the site and the right turn exit movement. There is no intention for vehicle to use the roads to the west of the campus.

The movement of vehicles will be restricted to the hours of operation of the site and all standard requirements (covered loads etc.) will apply.

## 8 Conclusion

**ptc.** has been engaged by HI to provide traffic advice to support the design development of a new CAMHS unit and TAM facility at Nepean Hospital.

The State Wide Mental Health Infrastructure Program requires a net addition of 10 beds to the existing beds available at the Nepean Hospital campus.

The development of CAMHS will involve the decommissioning and demolishing of the existing services in the Nepean 1 and Nepean 2 buildings. It is assumed that all the existing services in these buildings will be moved off the hospital campus and hence reduce the traffic and parking demand of the site.

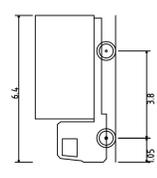
The number of staff will decrease causing the traffic generation of the site to also decrease. The development will improve the overall road network performance.

The CAMHS site will have a parking demand of 36 spaces, however, it is noted that the development will cause a net decrease in staff numbers and therefore the overall parking demand throughout the campus will be lower.

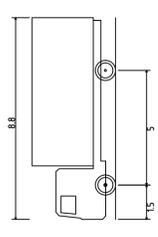
The TAM facility is being relocated from the Barber Avenue area of the campus to the subject site and therefore there is no increase in the traffic activity on the road network, and an insignificant redirection of activity to Somerset Street rather than Barber Avenue.

## Attachment 1 Swept Path Assessment

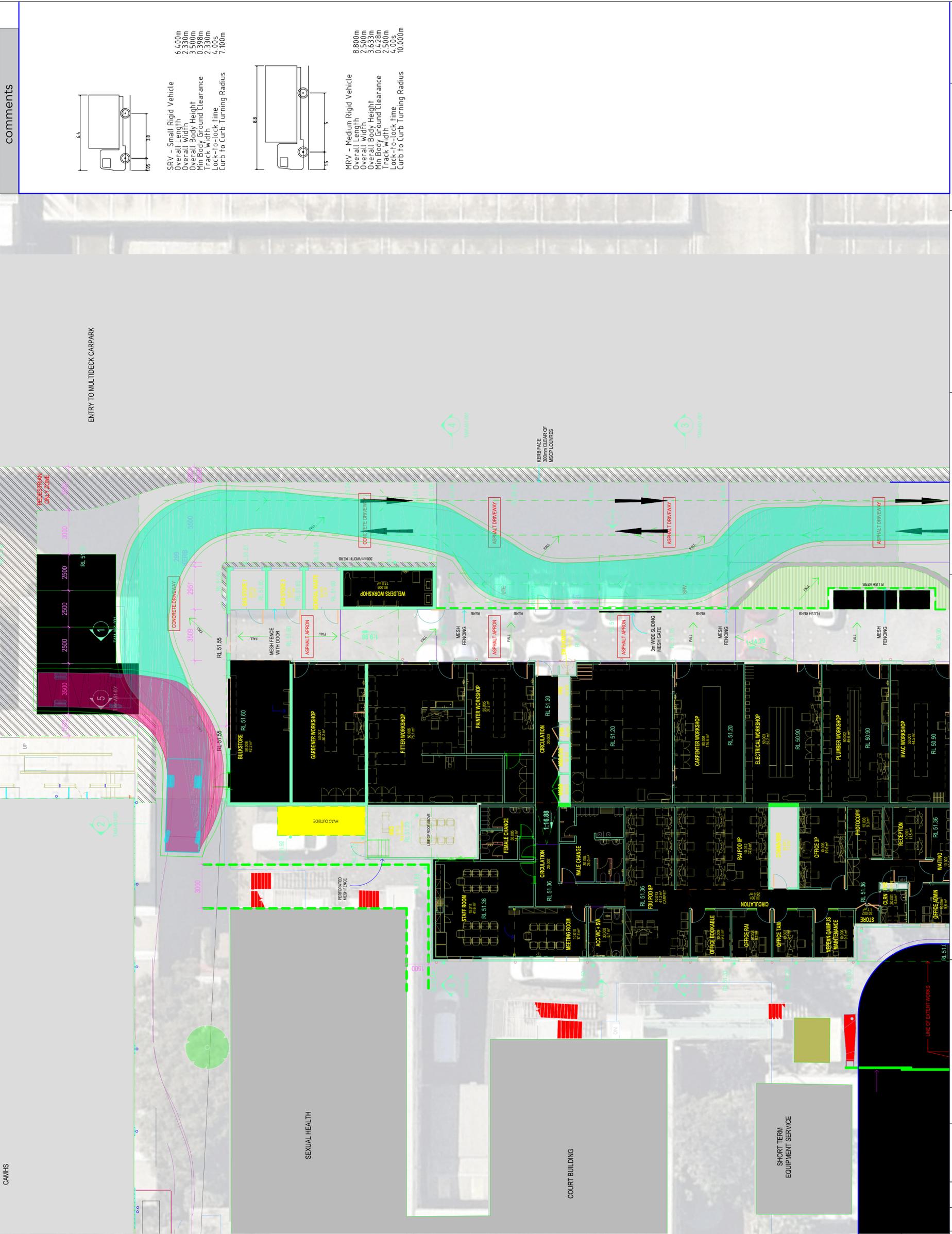




SRV - Small Rigid Vehicle  
 Overall Length 6.400m  
 Overall Width 2.300m  
 Overall Body Height 3.500m  
 Min Body Ground Clearance 2.336m  
 Track Width 2.336m  
 Lock-to-lock time 4.00s  
 Curb to Curb Turning Radius 7.100m



MRV - Medium Rigid Vehicle  
 Overall Length 8.800m  
 Overall Width 2.500m  
 Overall Body Height 3.533m  
 Overall Body Ground Clearance 0.428m  
 Min Body Width 2.500m  
 Track Width 2.500m  
 Lock-to-lock time 4.00s  
 Curb to Curb Turning Radius 10.000m



ENTRY TO MULTIDECK CARPARK

CLIENT	CBRE	PRELIMINARY
DRAWING #	ptc-002	
PROJECT #	22-0159	
SCALE	1:125 @ A3	

DRAWING TITLE  
 DESIGN REVIEW  
 SWEEP PATH ANALYSIS  
 6.4m SMALL RIGID VEHICLE ENTERING  
 THE SITE

PROJECT  
 CAMHS / TAM, DERBY STREET,  
 KINGSWOOD (NEPHAN  
 HOSPITAL)

REV	DATE	DESCRIPTION	DRAWN	REVIEWED
P2	25/11/2022	FOR INFORMATION	PD	AM
P1	07/02/22	FOR INFORMATION	KY	AM



Site 502, 1 James Place North Sydney NSW 2060 t +61 2 8920 0800 ptcconsultants.co
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