



# TRAFFIC IMPACT ASSESSMENT

31 Santley Crescent & 2A Bringelly Road, Kingswood

**PREPARED FOR:**

Danabina P/L & Midpoint Investments P/L

**REFERENCE:**

0444r01v01

**DATE:**

14/10/2021



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Prepared for: Danabina P/L & Midpoint Investments P/L  
ABN: 52 760 603 505  
ABN: 87 629 413 529

Reference: 0444r01v01  
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### Revision History

VERSION	DATE	PREPARED	REVIEWED	APPROVED	SIGNED
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# 1. Introduction

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## 1.1. Overview

PDC Consultants has been commissioned by Danabina P/L & Midpoint Investments P/L to undertake a traffic impact assessment of a Development Application (DA) relating to the proposed mixed-use development for the site at 31 Santley Crescent & 2A Bringelly Road, Kingswood. Specifically, the DA proposes the demolition of the existing buildings and construction of a seven-storey mixed-use development consisting of:

- 95 boarding rooms, a manager's room and a communal room
- 342m<sup>2</sup> of retail gross floor area (GFA);
- Two (2) basement levels accommodating a total of 43 car parking spaces, including two (2) carshare spaces
- One mechanical car lift for travel between Basement Level 1 & 2.
- 5.5 metre wide entry / exit driveway onto Santley Crescent

Having regard for the above, it is evident that development is not of a scale that requires referral of the DA to Transport for New South Wales (TfNSW), under the provisions of the State Environmental Planning Policy (Infrastructure) 2007.

The site is located in the Penrith City Council local government area and therefore, the proposed development has been assessed in accordance with the Penrith Development Control Plan 2014 and Local Environmental Plan 2010.

## 1.2. Structure of this Report

This report documents the findings of our investigations in relation to the anticipated traffic and parking impacts of the proposed development and should be read in the context of the Statement of Environmental Effects (SEE), prepared separately by Minto Planning Services. The remainder of this report is structured as follows:

- Section 2: Describes the site and existing traffic and parking conditions in the locality;
- Section 3: Describes the proposed development;
- Section 4: Assesses the parking requirements of the development;
- Section 5: Describes the components of a Green Travel Plan;
- Section 6: Assesses the traffic impacts of the development;
- Section 7: Discusses the proposed access and internal design arrangements;
- Section 8: Presents the overall study conclusions.

### 1.3. References

In preparing this report, reference has been made to the following guidelines / standards:

- Penrith Local Environmental Plan 2010 (Penrith LEP 2010);
- Penrith Development Control Plan 2014 (Penrith DCP 2014);
- State Environmental Planning Policy (Infrastructure) 2007 (SEPP Infrastructure 2007);
- Disability (Access to Premises -Buildings) Standards 2010 (Disability Standard 2010);
- Australian Standard AS 2890.1-2004, Part 1: Off-Street Car Parking (AS 2890.1);
- Australian Standard AS 2890.2-2018, Part 2: Off-Street Commercial Vehicle Facilities (AS 2890.2);
- Australian Standard AS 2890.3-2015, Part 3: Bicycle Parking Facilities (AS 2890.3);
- Australian Standard AS 2890.6-2009, Part 6: Off-Street Parking for People with Disabilities (AS 2890.6);
- RMS<sup>1</sup> Guide to Traffic Generating Development 2002 (RMS Guide);
- RMS<sup>1</sup> Technical Direction TDT 2013/04a - Guide to Traffic Generating Developments, Updated Traffic Surveys (RMS Guide Update).

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<sup>1</sup> Roads and Maritime Services (RMS) has joined with TfNSW, with reference to Roads and Maritime now taken legally to automatically mean TfNSW

## 2. Existing Conditions

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### 2.1. Location and Site

The site is located at 31 Santley Crescent & 2A Bringelly Road, Kingswood, being approximately 68 kilometres north-west of the Sydney CBD and 160 metres southeast of Kingswood Railway Station. More specifically, the site is bound between Santley Crescent to the south and Bringelly Road to the west.

The site is comprised of two (2) separate lots, formally identified as Lot 3, DP 215200 and Lot 5, DP 215200. The site is irregular in configuration with a total area of approximately 1,393m<sup>2</sup>. It has two (2) street frontages, being Santley Crescent to the south having a length of 21 metres and Bringelly Road to the west, having a length of 16 metres. Given the configuration of the site the western boundary also borders a medical facility, having a length of 3 metres. The northern boundary borders both a residential flat building and vacant land with lengths of 19 metres and 26 metres respectively. The eastern boundary borders a residential flat building with a length of 51 metres.

The site currently accommodates two (2) residential dwellings (i.e. one dwelling per lot) with two (2) 3.0 metre vehicle access onto Santley Crescent and 2A Bringelly Road. **Figures 1 and 2** overleaf provide an appreciation of the site's location in both a local and broad context respectively.

### 2.2. Road Network

The road hierarchy in the vicinity of the site is shown by **Figure 2**, with the following roads considered noteworthy:

- **Great Western Highway:** a major TfNSW arterial road (HW 5), that runs in an east-west direction forming part of the link between the Sydney CBD in the east and Bathurst in the west. In the vicinity of the site, Great Western Highway runs adjacent to the T1 and Blue Mountains Railway Line and is subject to 60km/h speed zoning restrictions. It accommodates three (3) lanes of traffic in each direction within a 26 metre divided carriageway. No stopping parking restrictions are also enforced along both kerbsides in close proximity to the site.
- **Santley Crescent:** a local road that runs in a west to north-east direction between Bringelly Road in the west and connects with Great Western Highway in the north-east. It is subject to 50km/hr speed zoning and carries a single lane of traffic in either direction within an undivided carriageway of width 11.0 metres. Santley Crescent also permits unrestricted parallel parking along both kerbsides within the vicinity of the site.
- **Bringelly Road:** a local road that runs in both a north-south direction, intersecting Great Western Highway in the north and Parker Street to the south. Near the site, it is subject to 50km/hr speed zoning and carries a single lane of traffic in either direction within an undivided carriageway of width 16.0 metres. Bringelly Road permits ½ P parking between 8:30am-6:00pm Monday to Friday and 8:30am-12:20pm on Saturdays along both kerbsides.

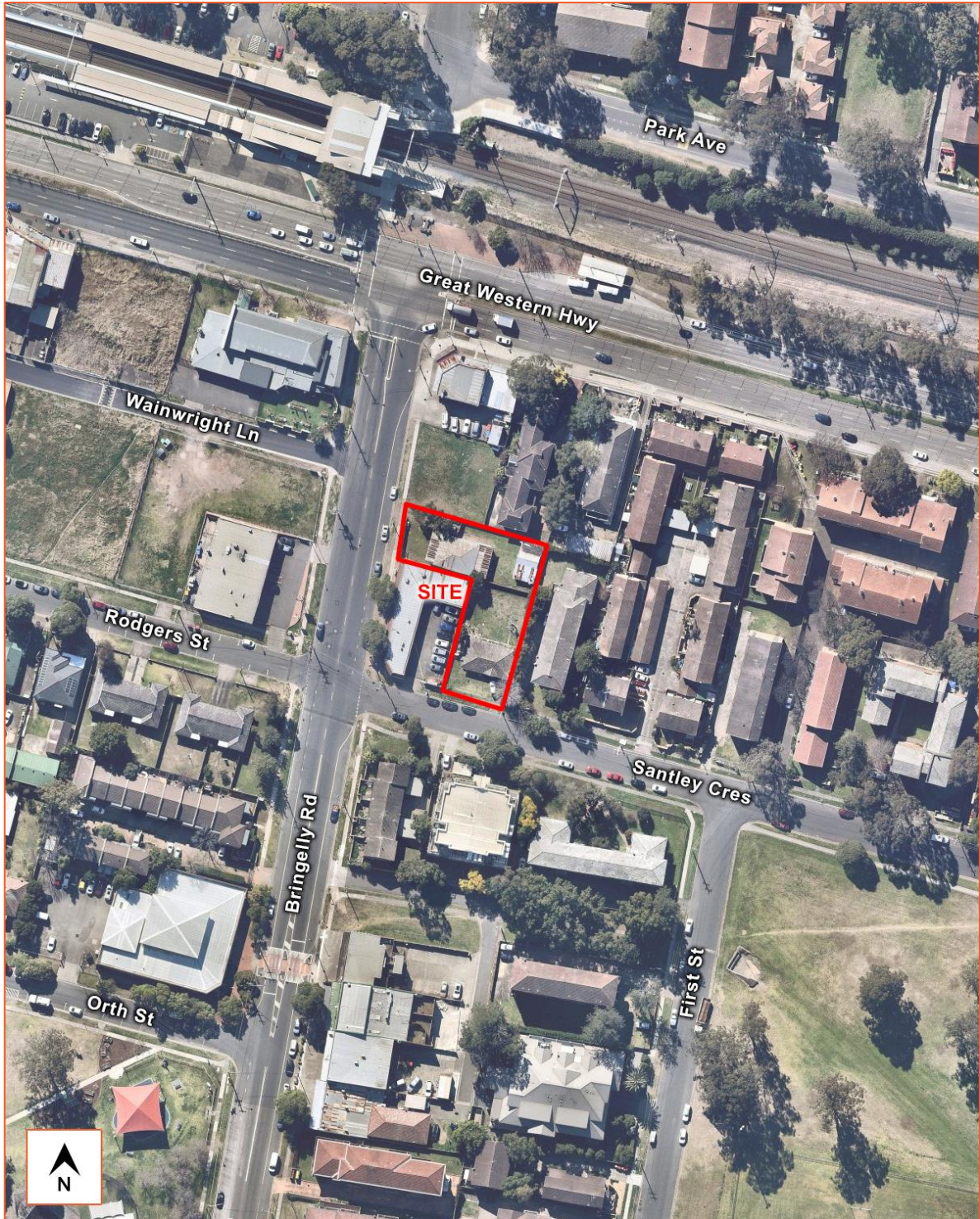


Figure 1: Site Plan



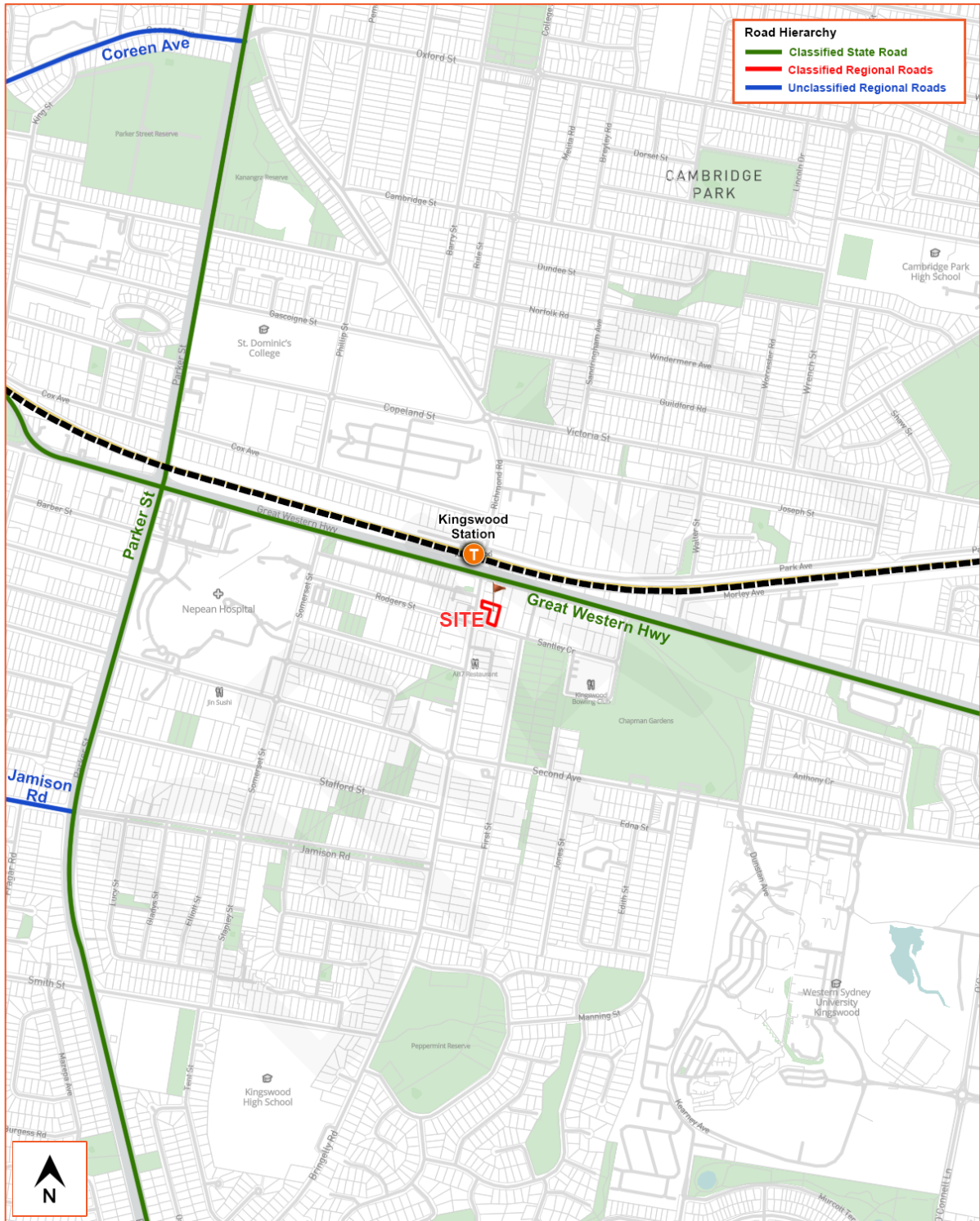


Figure 2: Location & Road Hierarchy Plan

## 2.3. Public & Active Transport

### 2.3.1. Bus Services

The Integrated Public Transport Service Planning Guidelines, Sydney Metropolitan Area, states that the walking catchment for metropolitan bus services includes all areas within a 400-metre radius of a bus stop. As can be seen from **Figure 3**, the site is situated within 50 metres of bus stops operating along Great Western Highway and 400 metres of bus stops operating along Second Avenue and accordingly, staff, residents and visitors of the proposed development would also have convenient access to the public bus services. **Table 1** below shows the notable town centres that are accessible via these bus services and the average service headways during peak and off-peak periods.

**Table 1: Bus Services**

ROUTE NO.	ROUTE (TO / FROM)	ROUTE DESCRIPTION	AVERAGE HEADWAY
677	Richmond to Penrith via Londonderry	Via Londonderry, Cambridge Gardens	Weekdays: 1 hour AM and PM school services <b>Weekends: 2 hours</b>
770	Mount Druitt to Penrith via St Marys	Via Colyton, St Marys, Claremont Meadows, Kingswood	Weekdays: 30 minutes all day Weekends: 1 hour
774	Mount Druitt to Penrith via Nepean Hospital	Via Oxley Park, St Marys, Claremont Meadows, Caddens, Kingswood	Weekdays: 20 minutes all day <b>Weekends: 1 hour</b>
775	Mount Druitt to Penrith via Erskine Park	Via Erskine Park, St Marys, Kingswood	Weekdays: 10-15 minutes all day <b>Weekends: 30 minutes</b>
776	Mount Druitt to Penrith via St Clair	Via St Clair, St Marys, Kingswood	Weekdays: 15 minutes all day <b>Weekends: 30 minutes</b>
780	Mount Druitt to Penrith via Ropes Crossing	Via Whalan, Emerton, Lethbridge Park, Ropes Crossing, Werrington Country, Cambridge Park	Weekdays: 30 minutes all day <b>Weekends: 1 hour</b>
785	Werrington to Penrith via Cambridge Park	Via Cambridge Park	Weekdays: 1 hour all day <b>Weekends: 1 hour</b>
N70	Penrith to City Town Hall (Night Service)	Via Kingswood, Claremonth Meadows, St Marys, Oxley Park, Rooty Hill, Doonside, Marayong, Blacktown, Seven Hills, Pedle Hill, Wentworthville	Weekdays: 4 services Weekends: 4 services

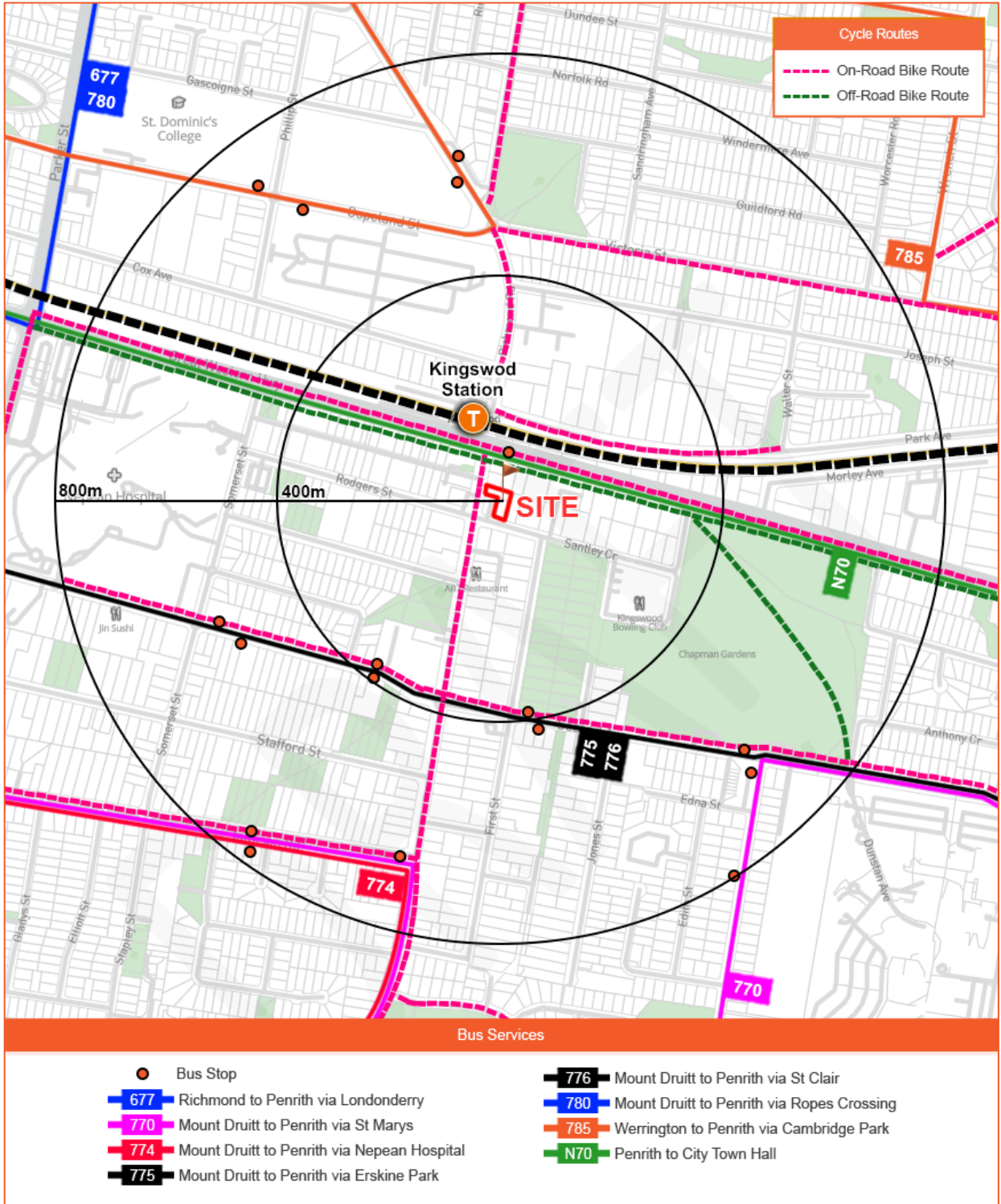


Figure 3: Public & Active Transport Services

### 2.3.2. Rail Services

The Integrated Public Transport Service Planning Guidelines, Sydney Metropolitan Area, states that the walking catchment for metropolitan railway stations includes all areas within an 800-metre radius of a station. It can be seen from **Figure 3** that Kingswood Railway Station is located 160 metres north of the site and hence, falls well within the typical walking catchment area. Accordingly, staff, residents and visitors of the proposed development would have convenient access the Sydney rail network, as shown by **Figure 4**.

Kingswood Railway Station is serviced by two (2) railway lines, being the T1 Western Line and Blue Mountains Line. **Table 2** below shows the notable town centres that are accessible along the both the T1 Western Line and Blue Mountains Line and the average service headways during peak and off-peak periods.

**Table 2: Rail Services**

RAILWAY LINE	NOTABLE TOWN CENTRES ALONG LINE	AVERAGE HEADWAY
T1 Western Line	Penrith, St Marys, Blacktown, Seven Hills, Parramatta, Strathfield, Redfern & Sydney CBD	Weekdays: 15 minutes all day Weekends: 15 minutes all day
Blue Mountains Line	Bathurst, Lithgow, Mt Victoria, Katoomba, Springwood, Penrith, Blacktown, Parramatta, Strathfield & Sydney CBD	Weekdays: 15-30 minutes peak / 1 hour off peak Weekends: 40 minutes to 1 hour all day

### 2.3.3. Cycle Network

**Figure 3** shows that the site has excellent access to the local bicycle network with on-road and off-road cycle paths provided along the western kerbside of Great Western Highway that connects to Chapman Gardens, west of the site. Additionally, on-road cycle paths are also provided along Bringelly Road and Second Avenue to the west and south of the site respectively, which provide connections to the wider bicycle network.

## 2.4. Existing Traffic Generation

As discussed in Section 2.1 of this report, the site currently accommodates two (2) residential dwellings. The RMS Guide Update recommends application of a peak period traffic generation rate of 0.95 trips per dwelling during the 7-9am (AM) peak period and 0.99 trips per dwelling during the 4-6pm (PM) peak period. Application of these rates to the two (2) existing dwellings results in the following traffic generation:

- 2 vehicle trips / hour (0 in, 2 out), during the AM peak period;
- 2 vehicle trips / hour (2 in, 0 out), during the PM peak period.

The above assumes a 20% inbound and 80% outbound distribution during the AM peak period noting that residents would typically depart the site for work in the morning, and vice versa for the weekday PM peak period. Notwithstanding, it is considered that the most relevant use of the above is to determine the net change in traffic generation as a result of the proposed development, as is discussed in Section 6.1 of this report.

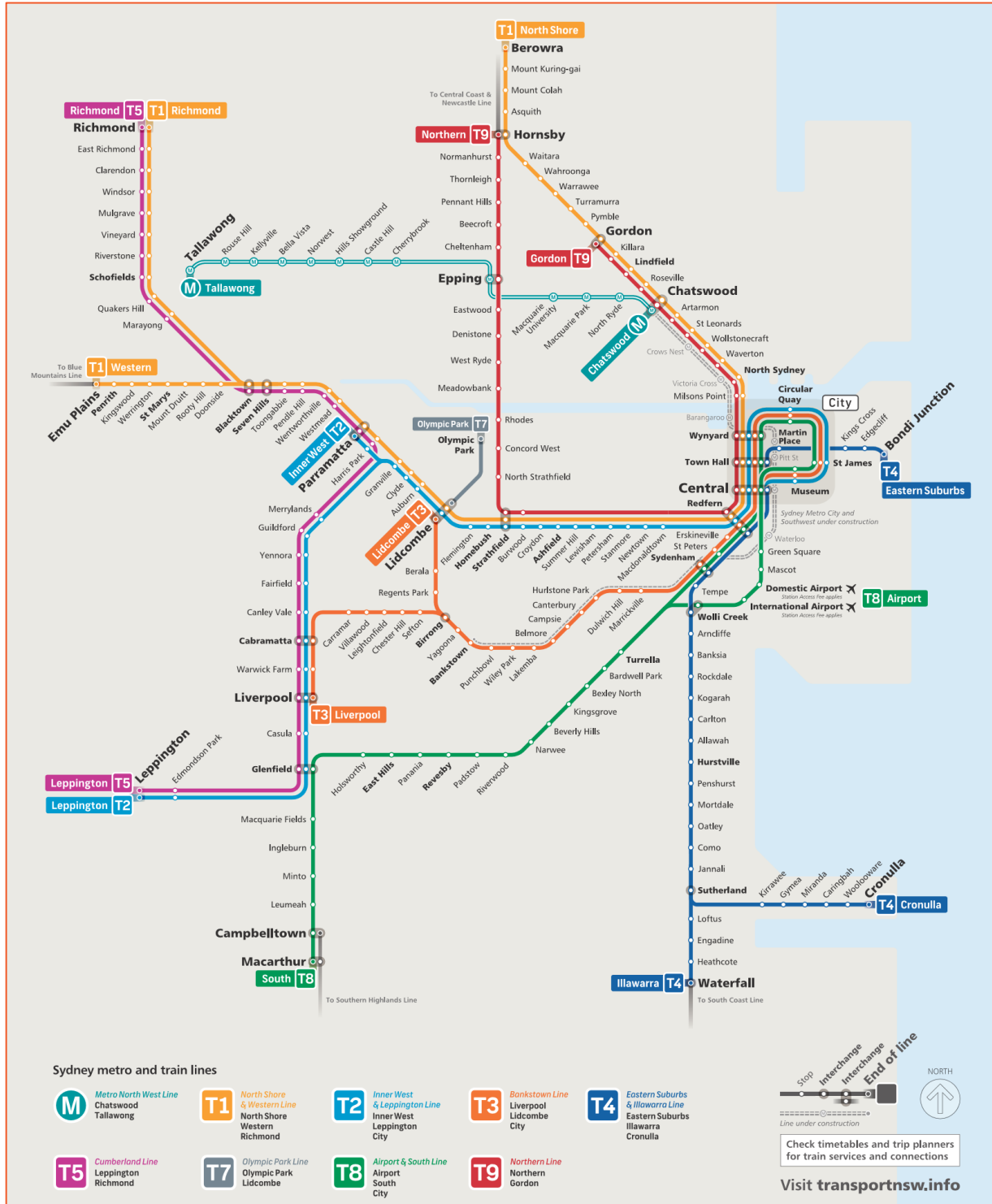


Figure 4: Sydney Trains Rail Network – Suburban

### 3. Proposed Development

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A detailed description of the proposed development for which approval is now sought, is outlined in the Statement of Environmental Effects prepared separately by Minto Planning Services. In summary, the subject application relates to the demolition of all existing buildings and construction of a 6-storey mixed-use development consisting of:

- 95 boarding rooms;
- One (1) manager's room;
- One (1) communal room;
- 342m<sup>2</sup> of commercial GFA including:
  - 119m<sup>2</sup> on the ground floor;
  - 223m<sup>2</sup> on the first floor;
- Two (2) basement levels accommodating a total of 43 car parking spaces, with the following arrangements:
  - Nine (9) commercial car spaces;
  - Two (2) car share spaces;
  - 32 boarding house car spaces;
- A single service bay suitable for a 6.4m Small Rigid Vehicle (SRV) design vehicle located on Basement Level 1;
- One mechanical car lift for travel between Basement Level 1 & 2;
- 5.5-metre-wide entry / exit driveway onto Santley Crescent.

The parking and traffic implications arising from the proposed development are discussed in Sections 4 and 5, respectively. A copy of the relevant architectural drawings, prepared by Gus Fares Architects, are also included in **Appendix A**.

## 4. Parking Requirements

### 4.1. Car Parking

#### 4.1.1. Commercial

The car parking requirement for the commercial component of the development has been assessed in accordance with the Penrith DCP 2014. **Table 3** below shows the minimum car parking requirement under the applicable 'business and office premises' car parking rate, and the proposed provision in response.

**Table 3: Commercial Car Parking Requirement & Provision**

TYPE	GFA.	DCP PARKING RATE	DCP REQUIREMENT	PARKING PROVISION
Commercial	342m <sup>2</sup>	1.0 space / 40m <sup>2</sup> GFA	9	9
<b>TOTAL</b>			<b>9</b>	<b>9</b>

It is evident from **Table 3** that the commercial component of the development requires a minimum of nine (9) car parking spaces under application of the Penrith DCP 2014. In response, nine (9) car spaces are provided for the commercial component of the development on Basement Level 1 which complies with the Penrith DCP 2014 and is considered an acceptable level of provision. **Please indicate 9 commercial car spaces on the plans.**

#### 4.1.2. Boarding House

Clause 29(2)(e) of the SEPP ARH 2009 outlines the following car parking rates for boarding house developments:

*(2) A consent authority must not refuse consent to development to which this Division applies on any of the following grounds:*

**(e) parking**

*if:*

*(i) in the case of development carried out by or on behalf of a social housing provider in an accessible area—at least 0.2 parking spaces are provided for each boarding room, and*

*(ii) in the case of development carried out by or on behalf of a social housing provider not in an accessible area—at least 0.4 parking spaces are provided for each boarding room, and*

*(iia) in the case of development not carried out by or on behalf of a social housing provider—at least 0.5 parking spaces are provided for each boarding room, and*

*(iii) in the case of any development—not more than 1 parking space is provided for each person employed in connection with the development and who is resident on site.*

The application is not being carried out by or on behalf of a social housing provider and accordingly, the parking rates under Clause 29(2)(e)(iia) and Clause 29(2)(e)(iii) of the SEPP ARH 2009 are required to be adopted for the development.

Additionally, the Penrith DCP 2014 does not provide a car parking rate for boarding house developments. This development is therefore assessed solely under the relevant requirements of SEPP ARH 2009. **Table 4** below shows the car parking requirement for the boarding house component of the development based on the applicable car parking rates under the SEPP ARH 2009.

**Table 4: Boarding House Car Parking Requirement & Provision**

TYPE	NO.	SEPP PARKING RATE	SEPP REQUIREMENT	PARKING PROVISION
Resident	95	0.5 spaces / room	48	31
Manager	1	Max. 1.0 space / manager	0	0
<b>TOTAL</b>			<b>48</b>	<b>31</b>

It is evident from **Table 4** that the SEPP ARH 2009 requires the development to provide 48 car parking spaces, for the proposed boarding house component of the development. In response, the development provides a total of 31 car parking spaces, resulting in a theoretical shortfall of 17 car parking spaces against the SEPP ARH 2009. Whilst this level of provision does not satisfy the SEPP ARH 2009, it is considered that the provision is acceptable and adequate to accommodate the parking demands of the development in the circumstances for the following reasons:

**Please allocate 32 car spaces to the boarding house component.**

Carshare

- As identified within **Appendix A**, the development will allocate two (2) car spaces for car share vehicles. Research obtained by a car share provider suggests that each car share vehicle can replace up to 12 private cars, which would result in an effective parking provision of some 55 car parking spaces for the boarding house component of the development. The parking provision would ensure that compliance is effectively achieved with the SEPP ARH 2009.

Penrith DCP 2014 Parking Objectives & SEPP ARH 2009 Provisions

- The Penrith DCP 2014 outlines the following justification for developments with reduced levels of car parking:

**C 10.5.1 Parking**

**4) Waiver or Reduction of Parking Spaces**

- a) Council has the discretion to waive or reduce the number of car spaces required for a particular site if the reduced provision can be justified in a Traffic Impact Statement, in terms of:
  - i) Proximity to public transport nodes;
  - ii) Opportunity to share parking with another use; or
  - iii) An empirical assessment of car parking.



With regard for the above, the proposed development satisfies one (1) of the items from the Penrith DCP 2014 as the site is excellently serviced by public transport, with bus stops located within 50 metres of along Great Western Highway and Kingswood Railway Station located within 160 metres of the site. It is therefore considered acceptable that the proposed development should be considered for a reduction in parking spaces.

- It is reiterated that the SEPP ARH 2009 does not stipulate a development standard for car parking but rather a “cannot be refused if complied with” requirement. Accordingly, Council may grant consent for the development on a merit-based assessment and taking into consideration the accessibility of the site to public transport services and amenities as is further discussed below.

#### Public and Active Transport

- The resident parking rate specified under Clause 29(2)(e)(ia) of the SEPP ARH 2009 is a generic rate that is required to be adopted for all boarding house developments proposed throughout NSW, and does not include any discounts for sites that are well served by public transport services and / or are expected to generate reduced parking demands such as the proposed development.
- As discussed in Section 2.3 of this report, the site benefits from excellent access to public transport services, Staff, residents and visitors of the proposed development would have access to convenient and frequent public transport services.

#### Proximity to Amenities

- The site is favourably sited on the fringe of Kingswood town centre which is well within walking distance from the site. Being within close proximity provides residents with access to a range of social, civic, retail, medical and educational services within Kingswood.
- Specifically, as indicated on **Figure 5** the site is located within walking distance to Nepean Hospital, Western Sydney University, and Nepean TAFE. **Figure 5** overleaf details the walking locations of these developments in relation to the proposed development site, and the estimated walking distance and time to the amenities.
- Accordingly, being in walking distance to these amenities and services reduces the requirement for car journeys and removes incentive for residents of the site to own a car.

#### Green Travel Plan

- As is discussed in further detail in Section 5 of this report, it is recommended that a Green Travel Plan (GTP) be prepared for the development. The GTP shall influence the travel behaviour of residents away from the use of private vehicles towards more efficient modes of transport including active transport such as walking and cycling; public transport such as metro, rail and bus services, and car share services.

#### Bicycle & Motorcycle Parking

- As is discussed in further detail in Sections 4.3 and 4.4 of this report, the development will provide on-site bicycle and motorcycle parking facilities in accordance with the SEPP ARH 2009. These facilities will complement the on-site car parking to provide a sustainable transport outcome for the site that encourages the use of alternative transport modes and a reduction in the use of private vehicles.

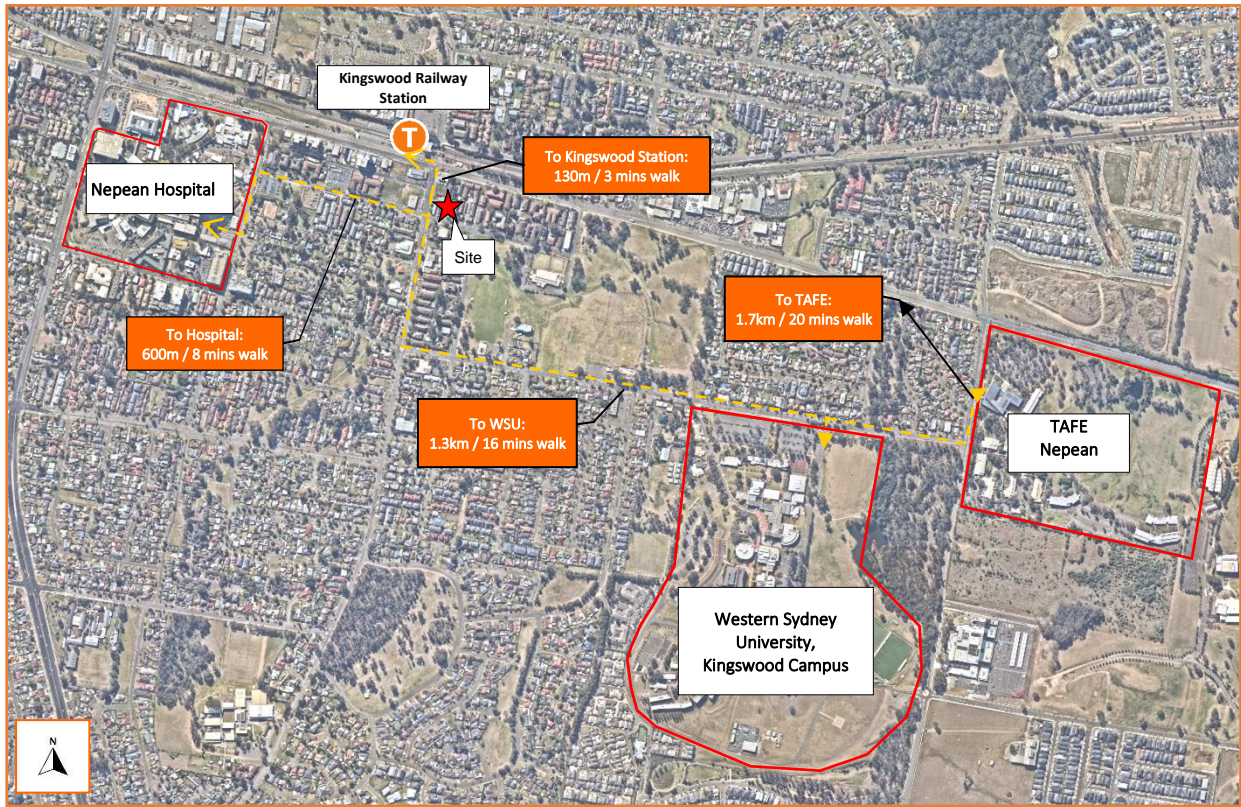


Figure 5: Location and Distance from Amenities

#### 4.2. Accessible Car Parking

Consultation with the Applicant's access consultant has confirmed that the development is required to provide a minimum of three (3) accessible car parking spaces. In response, the development provides three (3) accessible car parking spaces in accordance with the access consultants requirements, and this is considered an acceptable level of provision.

### 4.3. Motorcycle Parking

It is noteworthy to mention the Penrith DCP 2014 does not provide motorcycle parking requirements for commercial or boarding house developments. Therefore, the proposed development has not provided any motorcycle parking spaces for the proposed commercial component of the development and has assessed the boarding house motorcycle provisions against the requirements of SEPP ARH 2009.

Clause 30(1)(h) of the SEPP ARH 2009 stipulate minimum motorcycle parking rates. **Table 5** below shows the minimum motorcycle parking requirement for the development and the proposed parking provision in response.

**Table 5: Motorcycle Parking Requirement & Provision**

TYPE	NO.	SEPP PARKING RATE	SEPP REQUIREMENT	PARKING PROVISION
Boarding House	95	0.2 space / room	19	19
<b>TOTAL</b>			<b>19</b>	<b>19</b>

It is evident from **Table 5** that the proposed development requires a minimum of 19 motorcycle spaces under the SEPP ARH 2009. In response, the development provides a total of 19 motorcycle spaces within Basement Level 1 & 2. This complies with the requirements the SEPP ARH 2009 and is therefore considered acceptable. **Indicate 19 motorcycles on the plans.**

### 4.4. Bicycle Parking

Both the Penrith DCP 2014 and Clause 30(1)(h) of the SEPP ARH 2009 stipulate minimum bicycle parking rates. **Table 6** shows the minimum bicycle parking requirement for the development and the proposed parking provision in response.

**Table 6: Bicycle Parking Requirement & Provision**

TYPE	NO.	SEPP PARKING RATE	DCP PARKING RATE <sup>1</sup>	SEPP REQUIREMENT	DCP REQUIREMENT	PARKING PROVISION
Boarding House	95 rooms	0.2 space / room	5-10% / room for residents and 3-5% / room for visitors	19	8-14	19
Commercial	10 Staff	-	5-10% / staff for residents and 3-5% / staff for visitors	-	2	2
<b>TOTAL</b>				<b>19</b>	<b>10-14</b>	<b>21</b>

<sup>1</sup> Assessed in accordance with the rates within the 'Planning Guidelines for Walking and Cycling' (NSW Government 2004) as stipulated within the Penrith DCP 2004.

It is evident from **Table 6** that the proposed development requires a minimum of 19 bicycle spaces under the SEPP ARH 2009 and 10-14 bicycle spaces under the Penrith DCP 2014. In response, the development provides a total of 21 bicycle spaces, comprising of 19 residential bicycle spaces and two (2) commercial bicycle spaces and therefore complies with the requirements of the SEPP ARH 2009 and the Penrith DCP 2014. **Indicate 21 bikes on the plans.**

## 4.5. Service Vehicle Parking

The service vehicle parking requirement for the proposed development has been assessed in accordance with Table C10.3 of the Penrith DCP 2014. **Table 7** below shows the minimum service vehicle parking rates applicable to the proposed development.

**Table 7: Service Vehicle Parking Requirement & Provision**

TYPE	NO. / AREA	DCP PARKING RATE	MINIMUM REQUIREMENT	PARKING PROVISION
Commercial	342m <sup>2</sup> GFA	MRV for Site Area up to 1,500m <sup>2</sup>	1	1
<b>TOTAL</b>			<b>1</b>	<b>1</b>

*\*The Penrith DCP 2014 does not stipulate a service vehicle rate for boarding house developments.*

It is evident from **Table 7** that the proposed development is required to provide an on-site service vehicle space suitable for a Medium Rigid Vehicle (MRV). In response, the proposed development provides a single on-site service bay which will accommodate a 6.4 metre long SRV, with a head height of 3.5 metres. Whilst the provision does not satisfy the dimensions of a MRV vehicle a SRV vehicle is considered acceptable given that the development will generate a moderate demand for service vehicle parking and the scale of a SRV vehicle will be sufficient. It is noteworthy to mention, the RMS Guide stipulates 1 truck space / 4000m<sup>2</sup> commercial GFA. It is therefore anticipated that the commercial component of the development will generate negligible servicing demands and if so, they will be no greater than a SRV.

Waste collection of the development will occur within the provided service vehicle bay and will be collected by a private contractor using a 6.4 metre Small Rigid Vehicle (SRV). To facilitate waste collection, a caretaker will be responsible for transferring bins from the holding room in Basement 1 to the waste collection area prior to collection being undertaken, and for promptly returning the bins to the holding room following collection. This arrangement is considered acceptable and will ensure that the waste can be collected safely and efficiently, whilst also being consistent with the existing development and numerous other comparable developments in the area.

The proposed service vehicle parking and waste collection arrangements are therefore considered acceptable and will not result in any change to the existing reliance on on-street parking.

## 5. Green Travel Plan

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A GTP is a travel demand management tool to promote the use of active and public transport to / from developments. The primary purpose of the GTP is to coordinate a site-wide approach to influence the travel behaviour of residents and visitors away from the use of private vehicles towards more efficient modes of transport including active transport such as walking and cycling; public transport such as metro, train and bus services; and car-pooling and car sharing.

A GTP generally includes a Transport Access Guide, in the form of a map / brochure, illustrating the available modes of transport available including, but not limited to, the following:

- Bus routes, stops and a table of services;
- Rail / Metro stations and a table of services;
- Bicycle network and the location of any on-site bicycle parking facilities;
- Location of on-site car share vehicles/pods and other car share vehicles/pods within the vicinity of the site;
- Relevant transport related mobile phone applications and websites such as TripView, Opal Travel, Uber and OLA.

With regard to the above, the GTP will ensure that staff, residents and visitors are aware of the public transport services and infrastructure within the site's locality and encourage the use of these services for journeys to / from the development.

## 6. Traffic Impacts

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### 6.1. Trip Generation

#### 6.1.1. Boarding House

Neither of the RMS Guide or RMS Guide Update policies include traffic generation rates for boarding house developments. Reference was therefore made to the medium-density residential trip rates outlined in the RMS Guide, noting that the traffic generation of such developments would be somewhat comparable to a boarding house development. In this regard, it is noted that the RMS Guide recommends application of a peak period traffic generation rate of 0.4 trips / dwelling for a studio apartment, which attract a car parking rate of 1.0 car space / dwelling during AM and PM peak periods.

Conversely, the SEPP ARH 2009 requires car parking to be provided at a rate of only 0.5 car spaces / boarding room, or 50% of that required under the RMS Guide for a studio apartment. Accordingly, a peak period traffic generation rate of 0.2 trips / boarding room can be derived for boarding house developments. Application of this rate to the 95 boarding rooms proposed results in the following peak period traffic generation:

- 19 vehicle trips / hour (3 in, 16 out), during the AM peak period;
- 19 vehicle trips / hour (16 in, 3 out), during the PM peak period.

#### 6.1.2. Commercial

The RMS<sup>1</sup> Guide Update recommends application of a peak period traffic generation rate of 1.6 trips / 100m<sup>2</sup> GFA during the AM peak period and 1.2 trips / 100m<sup>2</sup> GFA during the PM peak period, for commercial developments. Application of these rates to the 342m<sup>2</sup> GFA proposed, results in the following peak period traffic generation:

- 5 vehicle trips / hour (3 in, 2 out), during the AM peak period;
- 4 vehicle trips / hour (1 in, 3 out), during the PM peak period.

#### 6.1.3. Combined

The total traffic generation of the proposed development is therefore expected to be in the order of:

- 24 vehicle trips / hour (6 in, 18 out), during the AM peak period;
- 23 vehicle trips / hour (17 in, 6 out), during the PM peak period.

The above is not a net increase in traffic generation, as it does not take into consideration the generation of the existing development. In this regard, the net increase in traffic generation as a result of the proposed development is expected to be as follows:

- 22 vehicle trips / hour (6 in, 16 out), during the AM peak period;
- 21 vehicle trips / hour (15 in, 6 out), during the PM peak period.

## 6.2. Traffic Impacts

The proposed development will result in a net increase in traffic generation of 22 vehicle trips / hour during the weekday AM and 21 vehicle trips / hour during PM peak period. This equates to a maximum of one additional vehicle trip every three (3) minutes in both peak periods, which is expected to have minimum impact on the performance of the external road network, and accordingly no external improvements will be required to facilitate the development.

Furthermore, computer modelling techniques available to analyse intersection performances are not sensitive to such small changes in traffic volumes and hence, such an assessment is not considered to be required. The traffic impacts of the proposed development are therefore considered acceptable.

The traffic impacts of the proposed development are therefore considered acceptable and no external improvements will be required to facilitate the development

## 7. Design Aspects

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### 7.1. Access

With 42 car parking spaces of User Class 1A, the proposed development requires a Category 1 Driveway under Table 3.1 of AS 2890.1, being a combined entry / exit driveway of width 3.0 metres to 5.5 metres. In response, the development proposes a 5.5 metre combined entry / exit driveway onto Stanley Crescent with 300mm kerbs on both sides and therefore complies with the requirements of AS 2890.1.

The proposed arrangements have also been assessed using swept path analysis which confirms compliance with AS 2890.1, and that the proposed access arrangements will operate safely and efficiently. The results of this analysis are included in **Appendix B** for reference.

In summary, the proposed access arrangements are considered acceptable and comply with the relevant requirements of AS 2890.1.

### 7.2. Internal Design

The proposed internal parking arrangements comply with the relevant requirements of AS 2890.1, AS 2890.2, AS 2890.3 and AS 2890.6, with the following design aspects considered noteworthy:

#### 7.2.1. Roadway / Ramp

- The driveway has a maximum grade of 5% (1 in 20) for the first 6 metres inside the property boundary and this generally complies with the requirements of Clause 3.3 of AS 2890.1.
- The vehicular ramps have a maximum grade of 20% (1 in 5) with 2.0 metre transitions of 12.5% (1 in 8) provided at both ends, thereby satisfying Clause 2.5.3 of AS 2890.1, and are acceptable for access by the proposed waste collection vehicle.
- The vehicular ramp from Ground Floor to Basement 1 has a width of 5.5 metres between kerbs at the property boundary. This arrangement will accommodate two-lane, two-way traffic flow as demonstrated by the swept path analysis results included in **Appendix B**, complies with AS 2890.1 and is considered acceptable.

#### 7.2.2. Car Lift

- The car lift will accommodate vehicle travel between the Basement Level 1 and Basement Level 2 and will have internal dimensions of 3.7 metres in width and 6 metres in length, which is sufficient to accommodate all vehicles up to and including a B99 Design Vehicle.



- Vehicle movements in / out of the car lift on each parking level has been assessed using swept path analysis. The results included as **Appendix B** confirm compliance is achieved with AS 2890.1, and that the proposed car lift arrangement will operate safely and efficiently.
- The car lift is provided in lieu of a conventional ramp due to the irregular configuration and narrow width of the site. These constraints limit the ability to achieve a feasible parking layout using a conventional ramp between the levels and accordingly it is considered that a car lift is the most appropriate solution for the site.

### 7.2.3. Parking Modules

- All commercial car parking spaces are provided in accordance with the User Class 2 requirements of AS 2890.1, having a minimum space width of 2.5 metres and length of 5.4 metres, with a minimum aisle width of 6.1 metres.
- All boarding house car parking spaces are provided in accordance with the User Class 1A requirements of AS 2890.1, having a minimum space width of 2.4 metres and length of 5.4 metres, with a minimum aisle width of 6.1 metres.
- The parallel parking spaces have minimum space width of 2.5 metres and length of 6.5 metres, with a minimum aisle width of 6.45 metres
- All accessible car parking spaces are provided with a minimum space width of 2.4 metres and length of 5.4 metres, with a minimum aisle width of 6.1 metres. Additionally, these spaces are located immediately adjacent to a 2.4 metre wide and 5.4 metre long shared area, thereby satisfying the requirements of AS 2890.6.
- All walls / columns are located outside of the space design envelope, as required under Figure 5.2 of AS 2890.1.
- A 1.0 metre blind aisle extension has been provided beyond the last parking spaces, in accordance with Figure 2.3 of AS 2890.1.

### 7.2.4. Service/Loading Area

- The loading bay has a width of 4.0 metres and length of 7.0 metres. This exceeds the requirements stated within Table 4.1 of AS2890.2. The proposed service/waste collection area is considered to be acceptable.
- Given the constraints of the site the proposed loading bay is located within the most suitable and efficient location within Basement Level 1 ensuring that vehicles up to a SRV vehicle can enter / exit the site in a forward direction with minimal turning manoeuvres. Swept path analysis results included in **Appendix B**, ensure the loading bay complies with AS 2890.2 and is considered acceptable.
- Given the low trip generations of the site it is incredibly unlikely a vehicle will enter the site at the same time a SRV vehicle is reversing into the loading bay. Nevertheless, it is noted that waste collection and deliveries will be completed outside peak traffic times i.e. AM & PM peaks when residents are leaving and returning to / from work to ensure there are no vehicle conflicts.

- In the unlikely event a vehicle enters the site at the same time a truck is reversing there is sufficient sight distance along the ramp for an entering vehicle to see a SRV vehicle reversing into the loading bay. It is therefore anticipated they will wait at the top of the ramp until the truck is parked. Further traffic management and safety measures can also be implemented prior to the DA Approval if required by Council.

#### 7.2.5. Head Heights

- A clear head height of 3.5 metres is provided above all traffic circulation and car parking areas within Basement Level 1 in accordance with Table 2.1 of AS2890.2.
- A minimum clear head height of 2.5 metres is required above the accessible car parking space and shared areas, in accordance with Clause 2.4 of AS 2890.6.
- A clear head height of 2.2 metres is provided above all traffic circulation and car parking areas within Basement Level 2 accordance with Clause 5.3.1 of AS 2890.1.

#### 7.2.6. Other Design Aspects

- A 2.5 metre by 2.0 metre visual splay is provided on the egress side of the car park driveway, at the property boundary, in accordance with Figure 3.3 of AS 2890.1. This area is to be kept clear of all vertical obstructions with a height greater than 0.6 metres.
- All commercial car parking spaces are provided on Basement Level 1 ensuring the staff and visitors are not required to use the mechanical car lift.
- All bicycle parking spaces are provided as Security Level B facilities, in accordance with AS 2890.3.
- All motorcycle spaces are provided in accordance with Clause 2.4.7 of AS 2890.1.

In summary, the internal parking arrangements have been designed in accordance with AS 2890.1, AS 2890.2, AS 2890.3 and AS 2890.6. Any minor amendments considered necessary (if any) can be dealt with prior to the release of a Construction Certificate.

## 8. Conclusions

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In summary:

- PDC Consultants has been commissioned by Danabina P/L & Midpoint Investments P/L to undertake a traffic impact assessment of a Development Application (DA) relating to the proposed mixed-use development for the site at 31 Santley Crescent & 2A Bringelly Road, Kingswood. Specifically, the DA proposes the demolition of the existing buildings and construction of a seven-storey mixed-use development consisting of:
  - 95 boarding rooms, a manager's room and a communal room
  - 342m<sup>2</sup> of retail gross floor area (GFA);
  - Two (2) basement levels accommodating a total of 42 car parking spaces including two (2) car share spaces;
  - One mechanical car lift for travel between Basement Level 1 & 2;
  - 5.5 metre wide entry / exit driveway onto Santley Crescent;
- The traffic generation assessment confirms that the development will generate a total of 24 vehicle trips / hour during the weekday AM peak period and 23 vehicle trips / hour during the weekday PM peak period. However, once the traffic generation of the existing development is taken into consideration, it is evident that the proposed development would result in a net increase in traffic generation of 22 vehicle trips / hour during the weekday AM peak period and 21 vehicle trips / hour during the weekday PM peak periods. This equates to a maximum of one additional vehicle trip every three minutes and will have minimal material impact on the performance of the external road network or on key intersections in the locality and accordingly, no external improvements will be required to facilitate the development. The traffic impacts of the proposed development are therefore considered acceptable.
- The proposed boarding house component of the development requires 48 car spaces under the SEPP ARH 2009. In response, the development provides a total of 31 car parking spaces including two (2) spaces for car share vehicles. Research obtained by car share provider suggests that each car share vehicle can replace up to 12 private cars, which would result in an effective parking provision of some 55 car parking spaces for the boarding house component of the development. The parking provision would ensure that compliance is effectively achieved with the SEPP ARH 2009. Additionally, several justifications are provided within Section 4.1.2.
- The proposed commercial floor space generates a requirement for nine (9) car parking spaces under the Penrith DCP 2014. The development provides nine (9) commercial car spaces and therefore complies with Penrith DCP 2014.
- The proposed development requires a minimum of 19 bicycle spaces under the SEPP ARH 2009 and 10-14 bicycle spaces under the Penrith DCP 2014. In response, the development provides a total of 21 bicycle spaces within the basement levels comprising of 19 residential bicycle spaces and two (2) commercial bicycle spaces and therefore complies with the requirements of the SEPP ARH 2009 and the Penrith DCP 2014.
- The proposed access and internal parking arrangements comply with the relevant requirements of AS 2890.1, AS2890.2, AS 2890.3 and AS 2890.6.



## Appendix A

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## Appendix B

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