WAGGA WAGGA HEALTH SERVICE REDEVELOPMENT

Changing more than the buildings

GTAconsultants

Wagga Wagga Base Hospital (WWBH) Redevelopment Stage 3 State Significant Development Transport Impact Assessment

Client / /	Health Infrastructure
Office / /	NSW
Reference / /	N138820
Date / /	12/06/18

NSW GOVERNMENT Health Infrastructure

Wagga Wagga Base Hospital (WWBH) Redevelopment Stage 3

State Significant Development

Transport Impact Assessment

Issue: F 12/06/18

Client: Health Infrastructure
Reference: N138820
GTA Consultants Office: NSW

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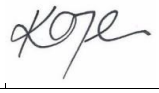
F	12/06/18	Updated with new cover page	Ghizlane Chergaoui, Siew Hwee Kong	Nicole Vukic / Karen McNatty	Karen McNatty	

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Executive Summary

Summary of Existing Assets

Wagga Wagga Base Hospital (WWBH) is a 393-bed hospital located within the Murrumbidgee Local Health District (MLHD). WWBH currently has a total of 1,338 staff working across three shifts on a typical day. Adopting a factor of 0.6 of the total staff, the average staff per weekday shift (ASDS) is calculated to be 803.

Wagga Wagga is around 460 kilometres south west of Sydney and 245 kilometres west of Canberra along Edward Street (Sturt Highway), which connects to the Olympic Highway to the north and south. WWBH is located in the Wagga Wagga City Council Local Government Area (LGA) and provides public health services to the Riverina and Murray regions of NSW.

WWBH is located around one kilometre south west from the Wagga Wagga Town Centre. The surrounding properties predominantly include low to medium density residential uses, infrastructure, public and private recreation uses.

The existing WWBH is located at 260-280 Edward Street, Wagga Wagga, NSW 2650. The site occupies the block bounded by Edward Street, Docker Street, Lewis Drive, Peck Street, Yabtree Street, Yathong Street and Rawson Lane, with approximately 200-metre frontages to Edward Street and 260-metre frontages to Docker Street and Lewis Drive.

The WWBH Main Entrance is currently serviced by at least seven bus services operated by Busabout Wagga and Junee Buses. Two bus services operated by Busabout Wagga stop on the western side of Docker Street south of Hardy Avenue, the eastern side of Docker Street south of Darlow Street and the northern side of Edward Street east of Docker Street. These bus services provide local connections to Bourkelands, Glenfield Park, Springvale and Wagga Wagga. Each service generally provides services every 40 minutes during the peak hours and hourly services outside of peak hours on weekdays with only a limited number of services on weekends.

Access to WWBH is currently provided from all four surrounding roads of Edward Street, Docker Street, Brookong Avenue (emergency vehicle access only) and Murray Street. The main visitor access is from Edward Street via Lewis Drive while the ambulance access is directly from Docker Street, Rawson Lane and Lewis Drive.

The main staff parking access is from Lewis Drive via Edward Street and Doris Roy Lane via Murray Street. An additional parking area to the south of the site is accessible via Rawson Lane from Docker Street (left in/ left out only), with on-street parking along Yabtree Street and Yathong Avenue accessible via Lewis Drive and Murray Street.

The hospital has 398 car parking spaces at the time of survey in December 2017. The surveyed peak demand is equal to an occupancy of 340 spaces at 1:30pm with 58 vacant spaces (86 per cent occupancy). Based on the parking survey, 53 out of the 58 vacant spaces consist of parking spaces associated with UNSW (16 per cent), permit only (22 per cent) and authorised vehicles only (53 per cent), which are not accessible to the general public and all WWBH staff. This results in up to five spaces which are available to the general public.

A total of 489 on-street parking spaces is available near the hospital, with 428 spaces occupied and 61 spaces vacant (86 per cent occupancy).

The opening of the recently completed car parking facility near the new set-down/ pick-up zone provides 42 parking spaces. This results in the hospital now having a total of 440 off-street parking spaces.

The intersection of Edward Street/ Lewis Drive currently operates satisfactorily, with spare capacity on all approaches. The intersection of Edward Street/ Docker Street currently operates at capacity with level of service E during the PM peak hour while the intersection of Edward Street/ Murray Street operates at level of service F during both AM and PM peak hours.

Schematic Design Assessment

The scope of the schematic design project is to potentially address the WWBH Stage 3 redevelopment and improvements for a six-storey ambulatory care building, including a rooftop plant room, all above an undercroft parking level. The ambulatory care building provides 28 flexible aged care beds, 24 rehabilitation beds, 24 older person's mental health inpatient unit beds, 20 renal dialysis unit chairs plus four training chairs collocated with other extended hours services, ambulatory clinics, rehabilitation and allied health, comprising 60 bookable rooms and treatment spaces. The Stage 3 redevelopment also includes an education area including library, conference rooms (60 seats) and a lecture theatre (100 seats), workforce and office accommodation and provides extended hours services including hospital in the home, integrated care, rapid assessment clinic, after hours General Practitioners and infusions. The Stage 3 work is expected to be completed in November 2020.

Following several workshops with Health infrastructure (HI), MLHD and WWBH personnel, a schematic design has been confirmed for the WWBH Stage 3 development within the north-western corner of the site. This layout enables a smoother integration with the existing acute services, support services and education facilities while providing convenient access to the Stage 1 Mental Health facility. The layout also includes improved pedestrian facilities and accesses to accommodate future development.

The existing vehicle accesses to the WWBH are to be maintained via Edward Street (from Lewis Drive), Docker Street, Brookong Avenue (emergency vehicle access only) and Murray Street (from Yabtree Street and Yathong Street). The access via Doris Roy Lane is proposed to be converted from a two-way lane to an eastbound only lane for exiting vehicles. It is also proposed to convert the existing eastbound lane on Yabtree Street between Lewis Drive and Peck Street to a two-way road.

Access to the proposed undercroft car park is proposed via the existing driveway to the west of Lewis Drive from the circulation aisle of CP1. It is proposed that the existing driveway width be widened from 5.6-metres to 6.5-metres to CP1 with minor reconfigurations of the car parking spaces on the eastern end of CP1. Entry/exit to/ from the undercroft car park is to be located around 50 metres west of Lewis Drive to ensure that no entering vehicles associated with the undercroft car park will queue into Lewis Drive.

As part of the new on-grade car parking spaces to the northwest corner of Harvey House, it is proposed that the existing left-out only driveway be removed, and the left-in entry only be widened to accommodate two-way movements.

The proposed Stage 3 redevelopment of WWBH includes:

- An increase of 115 additional staff. This represents an additional average staff per weekday shift (ASDS) of 69
- An increase of 94 beds/ chairs/ rooms.

However, it is noted that 20 per cent of the 144 FTE (29 FTE) work off-site. As such, the net increase in FTE staff will be 115 which is equivalent to an ASDS of 69. Based on the increase of 115 FTE and 69 ASDS, there would be a total of 1,453 FTE and 872 ASDS when Stage 3 is fully operational in 2027.

The proposed site is expected to generate an additional 76 and 92 vehicle trips during the AM and PM peak hours respectively. The intersections of Edward Street/ Docker Street and Edward Street/ Murray Street would operate beyond its capacity under 2027 traffic conditions even without the additional traffic generated by the project. The Edward Street/ Docker Street intersection would operate at levels of service D and E during the AM and PM peak hours, respectively, which are similar to the existing operating conditions with the lengthening of the turn lanes, reconfigurations of the full lanes and signal optimisation.

Based on the safety concerns as well as the additional vehicle delays and queues at this intersection, it is recommended that the intersection of Edward Street/ Murray Street, be signalised with two-phase operation to minimise impact on through traffic along Edward Street. This proposal is in accordance with the Integrated Movement Study for City of Wagga Wagga (2008). With the signalisation of Edward Street/ Murray Street intersection, it would operate at levels of service A during the peak hours when including the proposed development traffic.

The WWBH would maintain the existing loading arrangements on-site with access via Docker Street.

It also noted that a 19-metre articulated vehicle is used in delivering and decanting bulk oxygen to the WWBH with deliveries. Vehicle approach is currently via Yathong Street with vehicle departure to Docker Street via Rawson Lane.

Analysis of parking requirements was assessed based on staff numbers and bed/ chair/ room numbers. The proposed development would provide 95 additional spaces including 85 spaces for the hospital and 10 spaces for the Education Area. The additional parking demand of 95 spaces to be generated by the additional staff and bed numbers could not be accommodated by the existing off-street and on-street parking facilities.

As part of the SSD application, a total of 107 additional spaces will be provided on site via:

- The reinstatement of the car parking spaces under the existing demountable facilities located on the northeast corner of Lewis Drive and Yabtree Street after the building removal: 36 spaces
- The reconfigured CP1: nine spaces
- The proposed Stage 3 parking: 44 spaces
- The reconfigured ground level parking area north of Harvey House: 18.

The total additional car parking provision of 107 spaces exceeds the required 95 spaces by 12 spaces. It is noted that the overprovision of 12 spaces is considered appropriate and provides future provision for the likely loss of parking spaces (a minimum of 10 spaces) along Docker Street due to the recommended reconfiguration of the Edward Street/ Docker Street intersection.

In addition, the new parking facilities also exceed HI's commitment to provide 100 car spaces in addition to the existing 440 spaces available at the end of the Stage 2 Redevelopment work, as presented in the Final Business Case.

As part of the SSD application for the WWBH Stage 3 redevelopment, right turn restrictions are proposed out of Murray Street and Brookong Avenue onto Edward Street with a raised median preventing right turns, instead of signalising the intersection of Murray Street/ Edward Street.

The assessment of the right-turn restrictions will be completed in response to the Request for Information (RFI), to be submitted to Roads and Maritime and Council for approval.

Table E1 provides a summary of the traffic and transport requirements for Stage 3 only, Stage 3 and multi-storey car park and the full masterplan, with the requirements for Stage 3 and multi-storey car park and the full masterplan to be investigated at a later stage.

Table E1: Traffic and transport requirements summary

Traffic and Transport Requirements	Stage 3 (only)	Stage 3 and Carpark	Full Masterplan
Parking	95 spaces	To be confirmed	
Traffic Impact	○ Northbound right-turn restriction at the intersections Murray Street/ Edward Street and Brookong Avenue/ Edward Street. ○ Southbound right-turn restriction at the intersection Murray Street/ Edward Street. ○ Reconfiguration of the intersection of Docker Street/ Edward Street ○ Loss of a **minimum** of 10 on-street parking spaces on Docker Street south of Sturt Highway. *Note: A review of the right-turn restrictions will be completed in response to the RFI for the SSD application. These recommendations will be subject to the analysis outcomes.*	Signalised intersection of Murray Street/ Edward Street	

While it is recognised that the site's location somewhat limits the practicality of using sustainable transport modes, there remains potential for improved utilisation of public transport and associated provision of sustainable transport infrastructure.

Several opportunities exist to provide WWBH staff with incentives to consider alternative modes of travel to and from work. The following recommendations are high level strategies that would need to be developed in greater detail and through consultation with relevant stakeholders closer to the opening of the Stage 3 building:

- Staff accommodation
- Shuttle bus service
- Public transport
- Active travel
- Promote car-pooling.

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1. Introduction

1.1 Background

The objective of the Wagga Wagga Base Hospital (WWBH), Stage 3 Development Masterplan project, which forms part of the Murrumbidgee Local Health District (MLHD), is to undertake planning for the redevelopment of the hospital with the primary aim of responding to previously identified clinical priorities. This forms part of the strategic plan for the potential development of the remaining campus.

The WWBH Stage 3 consists of a six storey Ambulatory Care Building, including a rooftop Plant Room, all above an undercroft parking level. The Ambulatory Care Building will provide the following Units:

- 28 flexible Aged Care Beds, including four dedicated beds for Acute Delirium
- 24 Rehabilitation beds, including inpatient therapy and ADL facilities shared with the Aged Care and Older Persons Health inpatient units
- A 24 bed Older Person's Mental Health Inpatient Unit, including eight T-BASIS beds
- A 20 chair Renal Dialysis Unit plus four training chairs (two x HD and two x peritoneal) collocated with other Extended Hours Services
- Ambulatory Clinics, Rehabilitation and Allied Health, comprising 60 bookable (electronic patient flow management system) Interview / Consult rooms and Gym / Allied Health treatment spaces. Services accessing this area will include Primary and Community Health, Outpatients, Prosthetics and Orthotics, Mental Health, Drug and Alcohol, and Oral Health services (eight Dental Chairs)
- An education area including library, conference rooms (60 seats total) and a lecture theatre (100 seats)
- Extended Hours Services including Hospital in the Home, Integrated Care, Rapid Assessment Clinic, After Hours GP, and Infusions using 10 treatment spaces and six consultation rooms and shared support areas with renal dialysis
- Workforce and office accommodation will be provided for staff associated with Stage 3, refined through New Ways of Working (NWW)
- The NWW assessment will be also extended to Support Services staff, including Patient Flow, IT, Health Share, Health Information Services, Pastoral Care and Volunteer Services.

Following several workshops with Health infrastructure (HI), MLHD and WWBH personnel, the positioning of the Stage 3 development in the north-western corner of the site was selected as the preferred layout. This layout enables a smoother integration with the existing acute services, support services and education facilities while providing convenient access to the Stage 1 Mental Health facility. The layout also includes improved pedestrian facilities and accesses to accommodate future development.

Savills Australia, on behalf of Health Infrastructure (HI) engaged GTA Consultants (GTA) to provide traffic and transport input into the masterplan stage for the Stage 3 redevelopment of WWBH and to complete a transport impact assessment considering the masterplan and development schedule as part of the state significant development (SSD) application.

1.2 Purpose of this Report

This report sets out an assessment of the anticipated transport (traffic, parking, accessibility, pedestrian, constraints and opportunities) conditions/ situations near WWBH and provides strategic

design advice to ensure an appropriate transport network. This report also includes a detailed review of the Stage 3 development project and overall master planning requirements in terms of:

- Provision of parking supply to meet any such future demands
- Traffic generation of future demands
- Site accessibility
- Service vehicle requirements
- Pedestrian and mobility scooter considerations.

This report addresses all Department of Planning and Environment - NSW Government (DPE) transport and accessibility impacts (construction and operational) included in Secretary's Environmental Assessment Requirements (SEARs) – Schedule 2 of the Environmental Planning and Assessment Regulation 2000, as referenced by Table 1.1.

Table 1.1: Secretary's Environmental Assessment Requirements

Key traffic/ transport issue	Requirement	Relevant report Section
Policies, Guidelines and Planning Agreements		
Address the relevant planning provisions, goals and strategic planning objectives in the following:		
	○ Draft Future Transport Strategy 2056 and supporting plans	Section 1.4
	○ Planning Guidelines for Walking and Cycling	Section 6.2
	○ Better Placed – An Integrated design policy for the build environment of NSW 2007	Section 6.1
Transport and Accessibility Impacts (Construction and Operational)		
Include a transport and accessibility impact assessment, which details, but not limited to the following:		
	○ accurate details of the current daily and peak hour vehicle, public transport, pedestrian and cycle movement and existing traffic and transport facilities provided on the road network located adjacent to the proposed development	Sections 0, 2.2, 2.3, 2.4, 2.5, 2.8 and 2.9, Figure 2.22
	○ An assessment of the operation of existing and future transport networks including the bus network and their ability to accommodate the forecast number of trips to and from the development	Sections 2.4, 2.8 and 6.5
	○ Details of estimated total daily and peak hour trips generated by the proposal, including vehicle, public transport, pedestrian and bicycle trips	Section 7.1.4
	○ the adequacy of public transport, pedestrian and bicycle networks and infrastructure to meet the likely future demand of the proposed development	Sections 6.3, 6.4.2 and 6.5
	○ The impact of the proposed development on existing and future public transport infrastructure within the vicinity of the site in consultation with Roads and Maritime Services and Transport for NSW (TfNSW) and identify measures to integrate the development with the transport network	Sections 6.5 and 8.3
	○ Details of any upgrading or road improvement works required to accommodate the proposed development	Section 7
	○ Details of travel demand management measures to encourage sustainable travel choices and details of programs for implementation	Section 8
	○ The impact of trips generated by the development on nearby intersections, with consideration of the cumulative impacts from other approved developments in the vicinity, and the need/ associated funding for upgrading or road improvement works, if required (note: traffic modelling is to be undertaken with scope to be agreed by Roads and Maritime Services, TfNSW and Council	Section 7
	○ The proposed active transport access arrangements and connections to public transport services	Section 6
	○ The proposed access arrangements, including car and bus pick-up/drop-off facilities, and measures to mitigate any associated traffic impacts and impacts on public transport, pedestrian and bicycle networks, including pedestrian crossings and refuges and speed control devices and zones	Sections 5.2.1 and 6

Key traffic/ transport issue	Requirement	Relevant report Section
	○ Measures to maintain road and personal safety in line with Crime prevention through environmental design (CPTED) principles	Section 6.7
	○ The proposed car and bicycle parking provision, including end-of-trip facilities, which must be taken into consideration of the availability of public transport and the requirement of Council's relevant parking codes and Australian Standards	Section 3.5 and 4
	○ Proposed bicycle parking facilities in secure, convenient, accessible areas close to main entries incorporating lighting and passive surveillance	Section 3.5 and 4
	○ Details of the proposed number of car parking spaces and compliance with appropriate parking codes and justification for the level of car parking provided on-site (including the provision of an updated parking study)	Section 4
	○ Details of emergency vehicle access arrangements	Section 5.2.2
	○ An assessment of road and pedestrian safety adjacent to the proposed development and the details of required road safety measures	Section 6.3
	○ Service vehicle access, delivery and loading arrangements and estimated service vehicle movements (including vehicle type)	Section 3.7
Construction Traffic Management Plan		
	○ Assessment of cumulative impacts associated with other construction activities	Appendix C
	○ An assessment of road safety at key intersection and location subject to heavy vehicle construction traffic movements and high pedestrian activity	
	○ Details of construction program detailing the anticipated construction duration and highlighting significant and milestone stages and events during the construction process	
	○ Details of anticipated peak hour and daily construction vehicle movements to and from the site	
	○ Details of access arrangements of construction vehicles, construction workers to and from the site, emergency vehicles and service vehicle	
	○ Details of temporary cycling and pedestrian access during construction	
	○ Details of the proposed construction vehicle access arrangements at all stages of construction	
	○ Traffic and transport impacts during construction, including cumulative impacts associated with other construction activities, and how these impacts will be mitigated for any associated traffic, pedestrian, cyclists, parking and public transport, including the preparation of a draft Construction Traffic Management Plan to demonstrate the proposed management of the impact (which must include vehicle routes, number of trucks, hours of operation, access arrangements and traffic control measures for all demolition/ construction activities)	
Plans and Documents		
	○ Preliminary Construction Management Plan, inclusive of a preliminary Construction Traffic Management Plan detailing vehicle routes, number of trucks, hours of operation, access arrangements and traffic control measures.	Appendix C

1.3 References

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

- An assessment of the site and its surrounds on Tuesday, 5 December 2017.
- Historical understanding of Wagga Wagga and its surrounds.
- Wagga Wagga Council Local Environmental Plan (LEP) 2010.
- Wagga Wagga Development Control Plan (DCP) 2010.
- Australian Standard, Parking Facilities, Part 1: Off-Street Car Parking AS 2890.1:2004.
- Australian Standard, Parking Facilities, Part 2: Off-Street Commercial Vehicle Facilities AS 2890.2:2002.

- Australian Standard, Parking Facilities, Part 6: Off-Street Parking for People with Disabilities AS 2890.6:2009.
- Roads and Maritime Services (Roads and Maritime) Guide to Traffic Generating Developments, 2002.
- Traffic surveys undertaken by Data Audit Systems on Tuesday, 5 December 2017 as referenced in the context of this report.
- Car parking surveys undertaken by GTA Consultants (GTA) on Tuesday, 5 December 2017 as referenced in the context of this report.
- Wagga Wagga Base Hospital Stage 3 Development Masterplan Report for Health Infrastructure, by Martin & Ollmann, V4 - 17 December 2017.
- Wagga Wagga Base Hospital Stage 3 Development Schematic Design Report for Health Infrastructure, by Martin & Ollmann, V2 - 28 March 2018.
- Stage 3 Development plans, Docker Street, Wagga Wagga NSW 2650, Wagga Wagga Health Service Redevelopment, by Martin & Ollmann, issued 1 May 2018 and 7 June 2018
- Building Code of Australia, 2014.
- Integrated Movement Study for City of Wagga Wagga December 2018, by URaP – TTW Pty Ltd.
- Other documents and data as referenced in this report.

1.4 Draft Future Transport Strategy 2056 and Supporting Plans

Reviews have been completed for the following supporting plans:

- Draft Future Transport Strategy 2056
- Draft Greater Sydney Services and Infrastructure Plan
- Draft Regional NSW Services and Infrastructure Plan
- Draft Greater Newcastle Future Transport Plan.

The reviews have shown that no transport projects would be delivered or currently underway near the site. Therefore, the projects identified within Wagga Wagga include:

- Kapooka Bridge Replacement and Olympic Highway Realignment - Bridges to the Bush - Program 1 with a new four lane road-over-rail bridge on the Olympic Highway at Kapooka includes realigning about 2.7 kilometres of the Olympic Highway and upgrading the Olympic Highway / Camp Access Road intersection.
- Fixing Country Road Round 2 - Eunony Bridge - Wagga Wagga High Productivity Freight Route Upgrade by upgrading existing road networks, encompassing the Eunony Bridge and the adjoining road network linking the Sturt Highway with the Bomen Business Park (north of the city) and the Olympic Highway.
- Shared Path cycleway alongside Kooringal Road between Plumpton Road and Hammond Avenue.

2. Existing Conditions

The existing WWBH is located at 260-280 Edward Street, Wagga Wagga, NSW 2650. The site occupies the block bounded by Edward Street, Docker Street, Lewis Drive, Peck Street, Yabtree Street, Yathong Street and Rawson Lane, with approximately 200-metre frontages to Edward Street and 260-metre frontages to Docker Street and Lewis Drive.

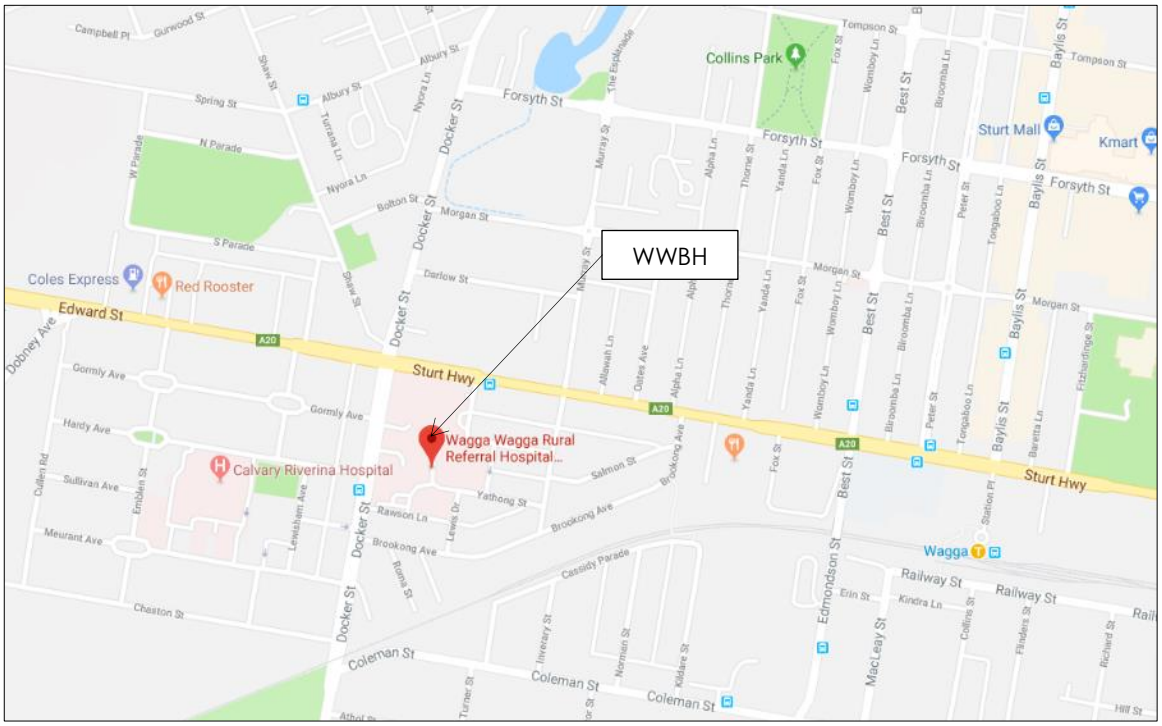
The site currently has a land use classification as SP2 – Infrastructure under the Wagga Wagga Local Environment Plan (LEP) 2010 and is labelled in the LEP as a "NSW Government" property type.

Wagga Wagga is around 460 kilometres south west of Sydney and 245 kilometres west of Canberra along Edward Street (Sturt Highway), which connects to the Olympic Highway in the north and south. WWBH is located in the Wagga Wagga City Council Local Government Area (LGA) and provides public health services to the Riverina and Murray regions of NSW.

WWBH is located around one kilometre south west from the Wagga Wagga Town Centre. The surrounding properties predominantly include low to medium density residential uses, infrastructure, public and private recreation uses.

The location of the subject site and its surrounding environs is shown in Figure 2.1.

Figure 2.1: Subject site and its environs



Basemap source: Google Maps (accessed 12/ 21/ 17)

WWBH is currently a 393 bed/ chair/ consulting room (room) facility and provides a wide range of services, including medical, surgical, critical care, maternity, paediatrics, rehabilitation, aged care, geriatric evaluation and management (GEM), mental health, procedural centre, angiography, emergency, renal unit and transit unit services.

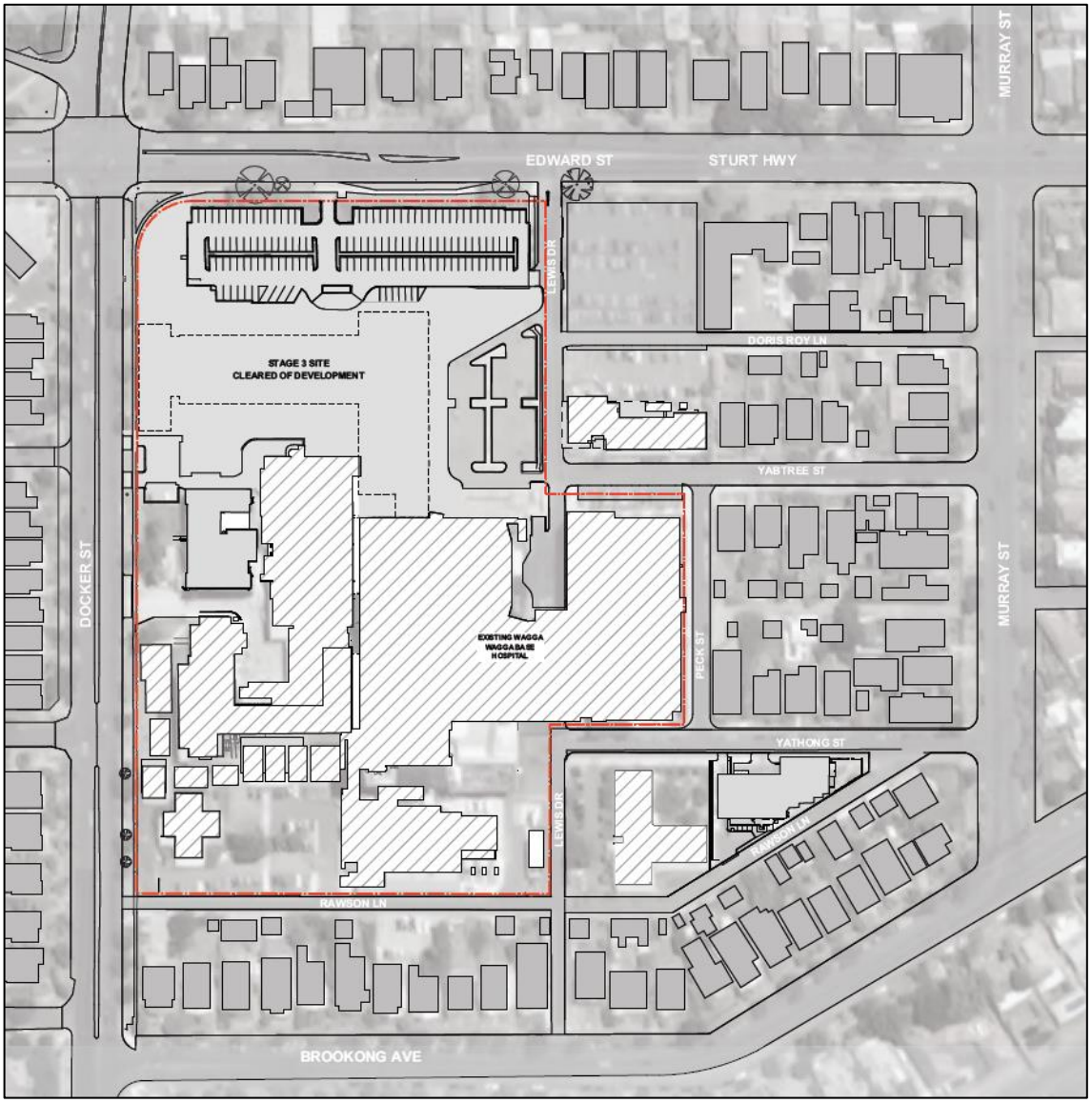
WWBH currently has a total of 1,338[1] staff working across three shifts on a typical day, as follows:

- Day: 8.00am to 4.30pm
- Evening: 4:30pm to 10:30pm
- Night: 10:30pm to 8.00am.

Adopting a factor of 0.6 of the total staff, the average staff per weekday shift (ASDS) is calculated to be 803.

The existing and proposed site plans of the WWBH site are provided in Figure 2.2 and Figure 2.3, respectively.

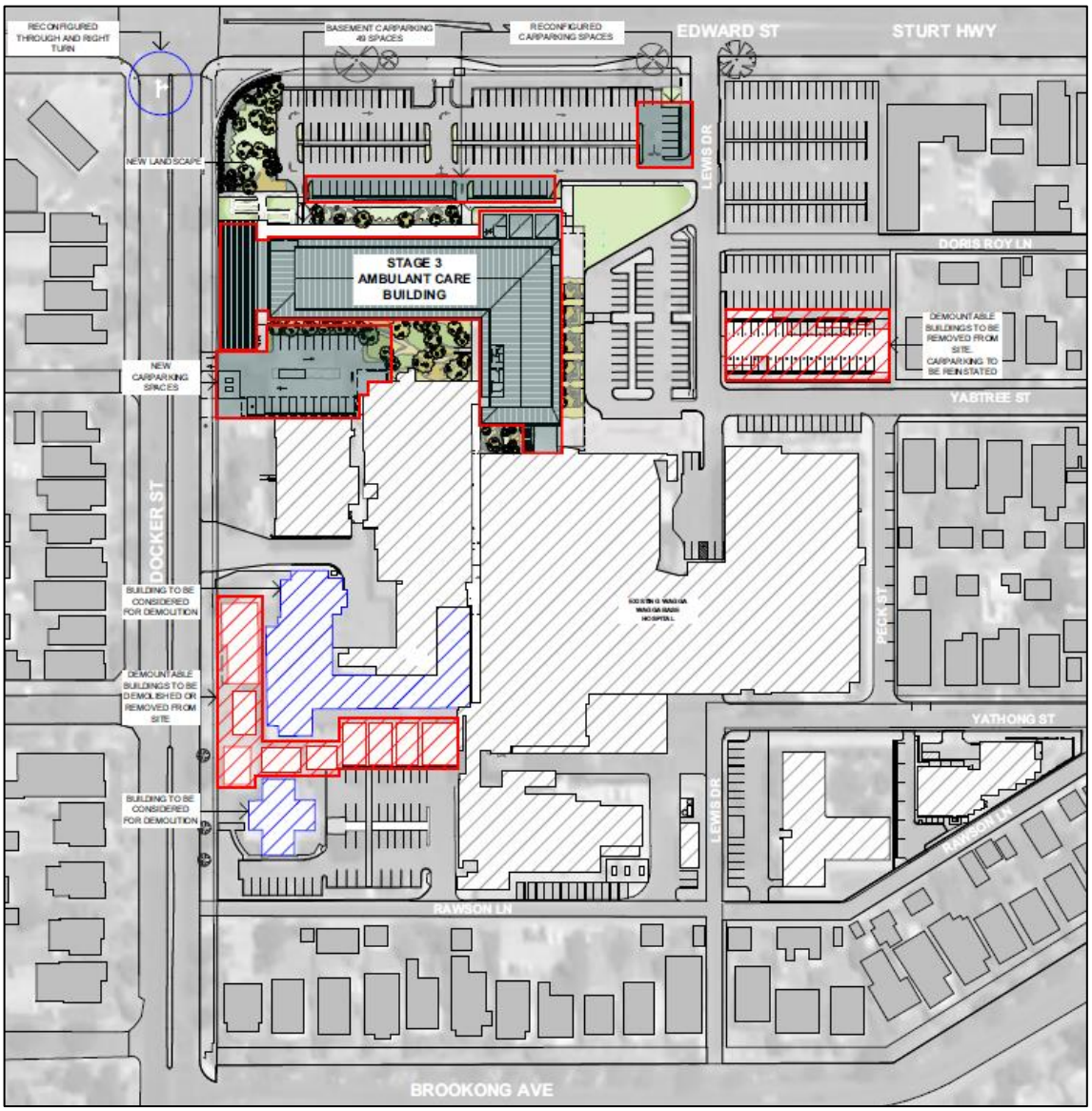
Figure 2.2: Existing WWBH site plan



Source: Wagga Wagga Health Service Redevelopment, Stage 3 Development, Site Plan, Drawing No. SSD-ACB-0400, Issue 01, Martin & Ollmann, 1 May 2018.

[1] Murrumbidgee Local Health District, Financial Impact Statement for Wagga Wagga Base Hospital Stage 3 Redevelopment – Section 5: Staffing Implications, received 17 January 2018.

Figure 2.3: Proposed WWBH layout



Source: Wagga Wagga Health Service Redevelopment, Stage 3 Development, Site Plan, Drawing No. SSD-ACB-0401, Issue 05, Martin & Ollmann, 1 May 2018.

2.1 Road Network

2.1.1 Adjoining Roads

Edward Street

Edward Street, shown in Figure 2.4 and Figure 2.5, functions as an arterial road in an east-west direction on the northern boundary of the site. Edward Street is a two-way road with two lanes in each direction, set within a 15-metre wide carriageway (approximately), with footpaths provided on both sides of the road. Kerbside parking is permitted on both sides of the road near the intersection with Murray Street under both unrestricted and two-hour (2P) time restrictions.

Edward Street carries approximately 10,200 vehicles per day in the westbound direction and 9,200 vehicles per day in the eastbound direction[2].

Figure 2.4: Edward Street (looking east)

Figure 2.5: Edward Street (looking west)

Docker Street

Docker Street, shown in Figure 2.6 and Figure 2.7, functions as a collector road in a north-south direction on the western boundary of the site. Adjacent to the hospital, Docker Street is a two-way road with two traffic lanes and one parking lane in each direction, set within an approximately 15-metre wide carriageway, with footpaths provided on both sides of the road and a posted speed limit of 50 km/ h. Kerbside parking is permitted on both sides of the road under 2P time restrictions.

Docker Street carries approximately 9,800 vehicles per day in the northbound direction and 8,400 vehicles per day in the southbound direction[3].

Figure 2.6: Docker Street (looking north)

Figure 2.7: Docker Street (looking south)

Murray Street

Murray Street, shown in Figure 2.8 and Figure 2.9, functions as a local street in a north south-direction to the east of the site. Murray Street is a two-way street with one traffic lane in each direction, set within an approximately 15-metre wide carriageway, with footpaths provided on both sides of the road. Unrestricted kerbside parking is permitted on both sides of the road.

2 Based on the peak hour traffic counts undertaken by Data Audit Systems on Tuesday on 5 December 2017 and assuming a peak-to-daily ratio of 8% for arterial roads and 10% for local roads.

3 Based on the peak hour traffic counts undertaken by Data Audit Systems on Tuesday on 5 December 2017 and assuming a peak-to-daily ratio of 8% for arterial roads and 10% for local roads.

Murray Street carries approximately 1,500 vehicles per day in the northbound direction and 760 vehicles per day in the southbound direction[4].

Figure 2.8: Murray Street (looking north)

Figure 2.9: Murray Street (looking south)

Brookong Avenue

Brookong Avenue, shown in Figure 2.10 and Figure 2.11, functions as a collector road in an east-west direction to the south of the site. Brookong Avenue is two-way street with one lane in each direction, set within an approximately 16-metre wide carriageway. A mixture of parallel and angled kerbside parking is permitted on both sides of the road, which is generally unrestricted.

Brookong Avenue carries approximately 3,500 vehicles per day in both directions[5].

Figure 2.10: Brookong Avenue (looking east)

Figure 2.11: Brookong Avenue (looking west)

Lewis Drive

Lewis Drive, shown in Figure 2.12 and Figure 2.13, functions as a local street in a north-south direction on the eastern boundary of the site. Lewis Drive is a one-way southbound travel only street with one lane, set within a carriageway width of about five metres and allows access to the existing car parking zone.

Lewis Drive carries approximately 1,300 vehicles per day in the southbound direction[6] during the survey period in December 2017. It is noted that Lewis Drive was converted to two-way street in

4 Based on the peak hour traffic counts undertaken by Data Audit Systems on Tuesday on 5 December 2017 and assuming a peak-to-daily ratio of 8% for arterial roads and 10% for local roads.
5 Based on the peak hour traffic counts undertaken by Council and assuming a peak-to-daily ratio of 8% for arterial roads and 10% for local roads.
6 Based on the peak hour traffic counts undertaken by Data Audit Systems on Tuesday on 5 December 2017 and assuming a peak-to-daily ratio of 8% for arterial roads and 10% for local roads.

January 2018. A new traffic survey will be completed at the intersection of Lewis Drive/ Edward Street to understand the two-way traffic flow along Lewis Drive.

Figure 2.12: Lewis Drive (looking north)

Figure 2.13: Lewis Drive (looking south)

Yabtree Street

Yabtree Street, shown in Figure 2.14 and Figure 2.15, functions as a local road and is aligned in an east-west direction to the east of the hospital. Yabtree Street is a two-way road with one lane in each direction, set within a carriageway of approximately eight metres wide. Parallel kerbside parking is permitted on the south side of the road, east of the connection road to Yathong Street.

Yabtreet Street carries approximately 120 vehicles per day in the westbound direction and 750 vehicles per day in the eastbound direction[7].

Figure 2.14: Yabtree Street (looking east)

Figure 2.15: Yabtree Street (looking west)

Yathong Street

Yathong Street, shown in Figure 2.16 and Figure 2.17 functions as a local road and is aligned in an east-west direction to the east of the hospital. Yathong Street is a two-way road with one lane in each direction, set within a carriageway of approximately seven metres wide. Unrestricted parallel kerbside parking is permitted on the north side of the road.

Yathong Street carries approximately 500 vehicles per day in the westbound direction and 400 vehicles per day in the eastbound direction[8].

7 Based on the peak hour traffic counts undertaken by Data Audit Systems on Tuesday on 5 December 2017 and assuming a peak-to-daily ratio of 8% for arterial roads and 10% for local roads.

8 Based on the peak hour traffic counts undertaken by Data Audit Systems on Tuesday on 5 December 2017 and assuming a peak-to-daily ratio of 8% for arterial roads and 10% for local roads.

Figure 2.16: Yathong Street (looking east)

Figure 2.17: Yathong Street (looking west)

2.1.2 Surrounding Intersections

The following intersections currently exist near the site:

- Edward Street/ Docker Street (signalised)
- Edward Street/ Lewis Drive (unsignalised)
- Edward Street/ Murray Street (priority controlled)
- Docker Street/ Brookong Avenue (signalised)
- Murray Street/ Brookong Avenue (unsignalised).

2.2 Site Access and Traffic Generation

Access to WWBH is currently provided from all four surrounding roads of Edward Street, Docker Street, Brookong Avenue (emergency vehicle access only) and Murray Street. The main visitor access is from Edward Street via Lewis Drive while the ambulance access is directly from Docker Street, Rawson Lane and Lewis Drive.

The main staff parking access is from Lewis Drive via Edward Street and Doris Roy Lane via Murray Street. An additional parking area to the south of the site is accessible via Rawson Lane from Docker Street (left in/ left out only), with on-street parking along Yabtree Street and Yathong Avenue accessible via Lewis Drive and Murray Street.

The existing vehicle access to the main car parking area on the northwest corner of the site is 5.6 metres wide. The width of this access is not able to accommodate both entering and exiting vehicles from and to Lewis Drive, simultaneously, as shown in Figure 2.18 and Figure 2.19. The current arrangement creates delays and conflicts at times when two opposing vehicles approach the access, presenting a potential conflict for WWBH staff and visitors.

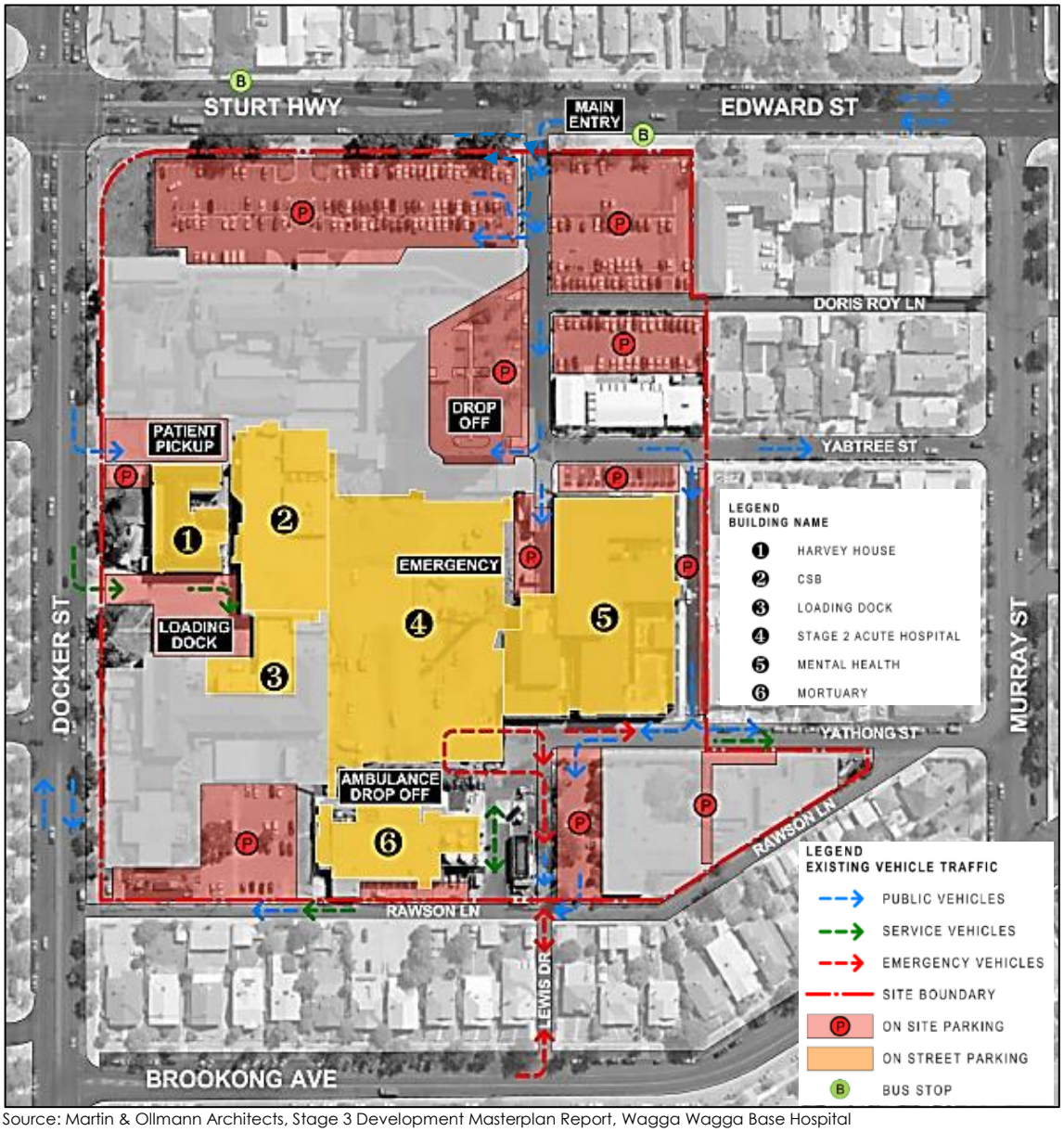
GTA undertook traffic surveys at the site access driveways during typical weekday AM and PM peak periods. Based on these results, the hospital's AM and PM peak hours occur between 8:15am and 9:15am and between 3:15pm and 4:15pm, respectively.

The existing site access driveways are shown in Figure 2.20.

Figure 2.18: Entering vehicle from Lewis Drive

Figure 2.19: Exiting vehicle to Lewis Drive

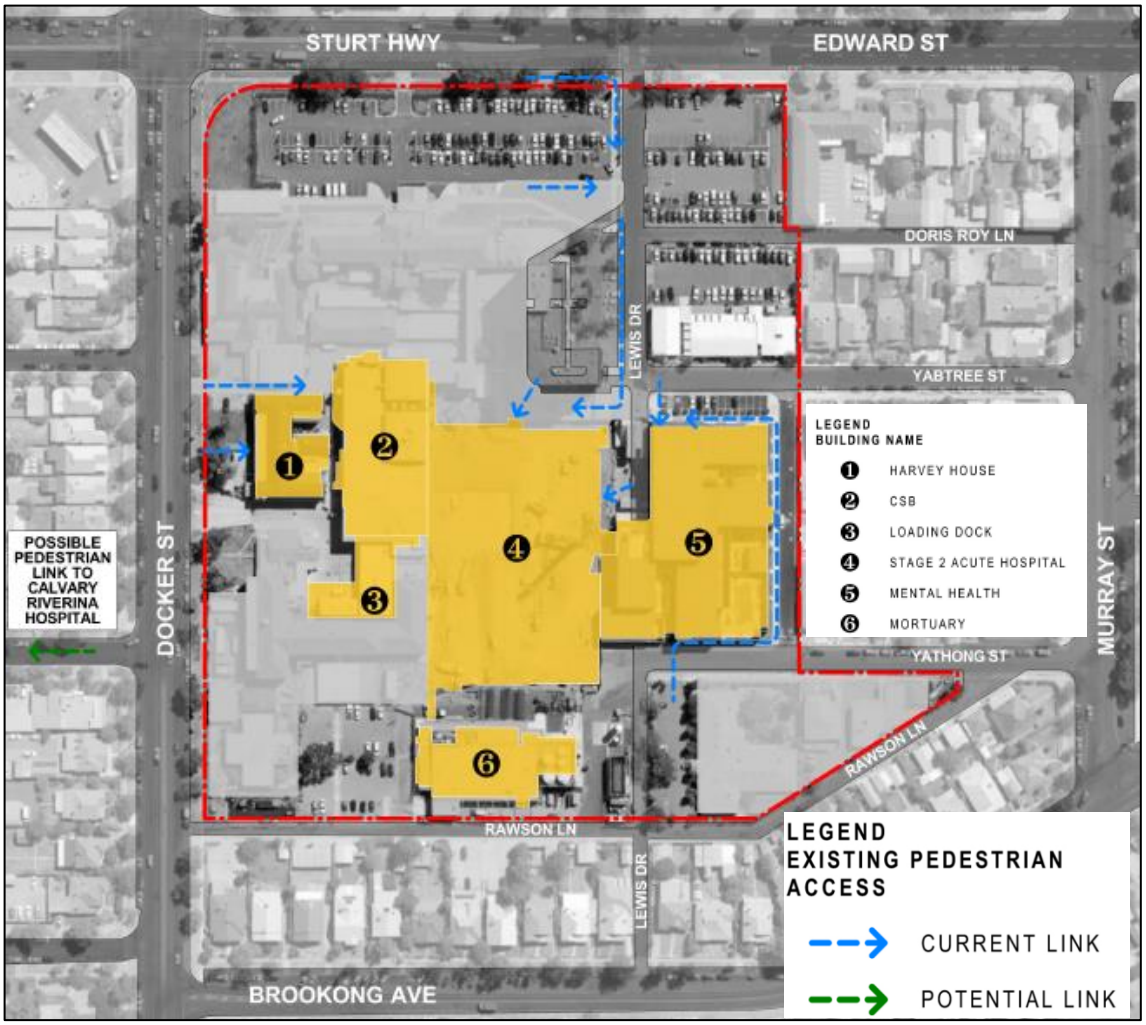
Figure 2.20: Existing traffic access



Source: Martin & Ollmann Architects, Stage 3 Development Masterplan Report, Wagga Wagga Base Hospital

The existing pedestrian accesses are shown in Figure 2.21.

Figure 2.21: Existing pedestrian access



Source: Martin & Ollmann Architects, Stage 3 Development Masterplan Report, Wagga Wagga Base Hospital

2.3 Traffic Volumes

Traffic movement counts where undertaken on Tuesday 5 December 2017, during the following peak periods:

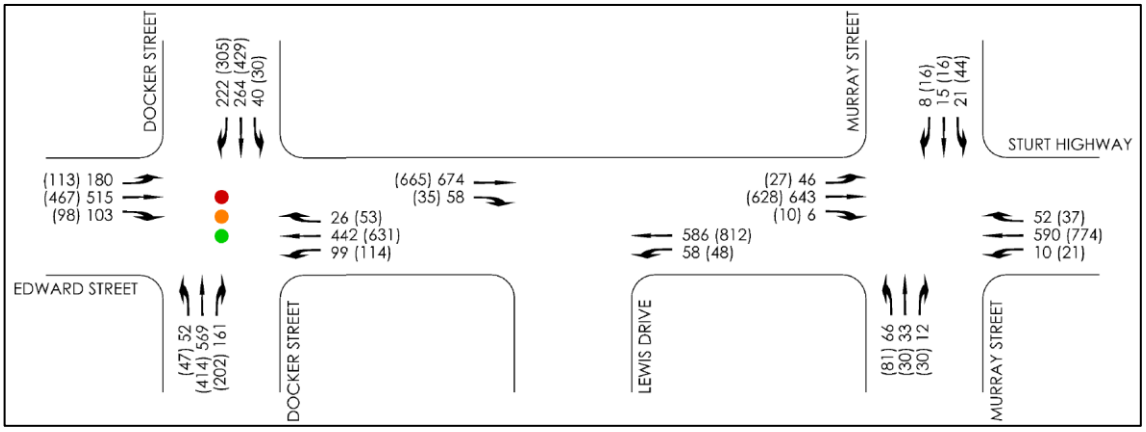
- AM peak: 6:30am to 9:30am
- PM peak: 2:30am to 6:30pm.

The following intersections were included in the traffic survey:

- Edward Street/ Docker Street
- Edward Street/ Lewis Drive
- Edward Street/ Murray Street
- Doris Roy Lane/ Lewis Drive
- Yabtree Street/ Peck Street
- Yathong Street/ Peck Street
- Murray Street/ Brookong Avenue
- Docker Street/ Brookong Avenue.

The AM and PM peak hour traffic volumes for the three key intersections along Edward Street are summarised in Figure 2.22.

Figure 2.22: Existing weekday AM peak hour traffic volumes



2.4 Intersection Operation

The operation of the key intersections within the study area have been assessed using SIDRA Intersection[9], a computer-based modelling package which calculates intersection performance.

The commonly used measure of intersection performance, as defined by Roads and Maritime Services (Roads and Maritime), is vehicle delay. SIDRA Intersection determines the average delay that vehicles encounter and provides a measure of the level of service. A level of service of D or better is generally considered acceptable operation.

Table 2.1 shows the criteria that SIDRA Intersection adopts in assessing the level of service.

Table 2.1: SIDRA Intersection level of service criteria

Level of service	Average delay per vehicle (secs/ veh)	Traffic signals, roundabout	Give way and stop sign
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Near capacity	Near capacity, accident study required
E	57 to 70	At capacity, at signals incidents will cause excessive delays	At capacity, requires other control mode
F	Greater than 70	Extra capacity required	Extreme delay, major treatment required

Table 2.2 presents a summary of the existing operation of the key intersections.

[9] Program used under license from Akcelik & Associates Pty Ltd.

Table 2.2: Existing operating conditions

Intersection	Peak	Leg	Degree of saturation (DOS)	Average delay (sec)	95th percentile queue (m)	Level of service (LOS)
Edward Street/ Docker Street (Signalised)	AM	South	0.76	42	141	C
		East	0.59	40	104	C
		North	0.74	40	141	C
		West	0.75	46	145	D
		Overall	**0.76**	**42**	**145**	**C**
	PM	South	0.96	78	176	F
		East	0.96	75	218	F
		North	0.98	68	183	E
		West	0.73	48	130	D
		Overall	**0.98**	**68**	**183**	**E**
Edward Street/ Lewis Drive[1]	AM	East	0.19	6	0	A
		West	0.24	11	7	A
	PM	East	0.39	6	0	A
		West	0.24	14	9	A
Edward Street/ Murray Street[1]	AM	South	0.54	83	14	F
		East	0.22	12	9	A
		North	0.29	69	7	E
		West	0.21	12	2	A
	PM	South	0.62	72	18	F
		East	0.26	11	6	A
		North	0.38	66	10	E
		West	0.20	13	3	A

[1] Worst movement reported for unsignalised intersection.

Based on analysis and site observations, there is traffic congestion through Docker Street and Sturt Highway/ Edward Street, with the major signalised intersection of Edward Street/ Docker Street experiencing peak period queuing and delays during the PM peak hour.

The worst delay occurs on the northbound movement on Docker Street with an average delay of 78 seconds while the maximum vehicle queue of 183 metres occurs on the southbound movement on Docker Street during the PM peak hour. The vehicle queue along Sturt Highway/ Edward Street for the westbound movement extends past Lewis Drive in the PM peak.

Most of the congestion at the intersection of Edward Street/ Lewis Drive is influenced by the intersection of Edward Street/ Docker Street with the westbound Edward Street traffic affected by the intersection of Edward Street/ Docker Street. Notwithstanding that, the southbound right-turn is not affected by the westbound traffic due to the "KEEP CLEAR" pavement marking on the westbound Edward Street lanes.

The eastern and western legs of this intersection currently experience negligible queuing and delays during both the AM and PM peak periods. As such, there is remaining capacity at the intersection of Edward Street/ Lewis Drive, to cater for the traffic generated by the proposed development during the both AM and PM peak hours, with the improvements on the intersection of Edward Street/ Docker Street.

The northern and southern legs of the intersection of Edward Street/ Docker Street currently operates at capacity with level of service E and F during the AM and PM peak hours. The northern and southern legs experience up to 69-second and 83-second average delays respectively during

the AM peak hour and up to up to 72-second and 66-second average delays respectively during the PM peak hour.

2.5 Car Parking

2.5.1 Supply

WWBH currently has 11 car parking facilities with the location illustrated in Figure 2.23.

Figure 2.23: Car parking facilities

Source: Martin & Ollmann Architects, Stage 3 Development Masterplan Report, Wagga Wagga Base Hospital

The number of parking spaces for each car parking facility is as follows:

- CP1 138 spaces
- CP2 96 spaces
- CP3 35 spaces
- CP4 42 spaces (was not yet open for access during survey period in December 2017)
- CP5 14 spaces
- CP6 6 spaces
- CP7 15 spaces
- CP8 15 spaces
- CP9 13 spaces
- CP10 45 spaces
- CP11 8 spaces
- CP12 13 spaces.

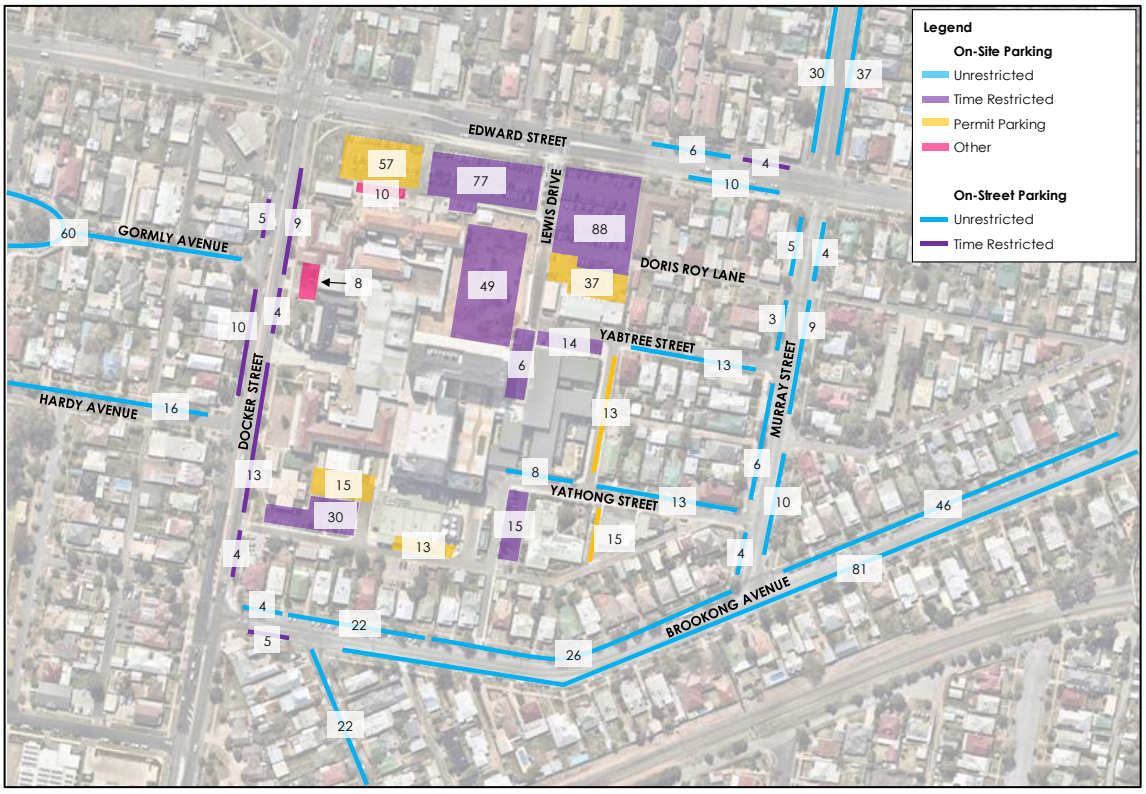
The parking spaces total to 398 spaces during the survey period in December 2017.

A total of 440 spaces are provided on-site (plus the recently completed CP4) with 489 on-street parking spaces available near the hospital, which are within an acceptable walking distance of 400 metres. This equates to a total of 929 car parking spaces.

Currently a combination of on-site and on-street parking is used by hospital staff and patients/ visitors for WWBH as shown in Figure 2.24.

The surveyed on-street parking locations were determined in consultation with WWBH staff.

Figure 2.24: Surveyed car parking study area



Basemap source: Nearmap

It is noted that although the following streets have on-street parking facilities and are within 400 metres from WWBH, they are not included in the survey as they were observed to be highly utilised by surrounding residential and commercial uses:

- Salmon Street (both sides)
- Western side of Docker Street (between Meurant Avenue and Brookong Avenue)
- Dwyer Avenue (both sides)
- Lewisham Avenue (eastern side)
- Shaw Street (both sides)
- Docker Street (both sides between Edward Street and Darlow Street).

Based on the minor availability of on-street spaces, the exclusion of these roads would present a conservative approach in assessing the car parking requirement for the proposed development.

2.5.2 Demand

The hospital currently has 398 car parking spaces prior to the opening of the 42-space car park adjacent to the new set-down/ pick-up zone. The observed peak demand at 1:30pm has been used for the basis of the following parking demand assessment.

The peak demand was observed to be an occupancy of 340 spaces at 1:30pm with 58 vacant spaces (86 per cent occupancy). Based on the parking survey, 53 out of the 58 vacant spaces consist of parking spaces associated with UNSW (16 per cent), permit only (22 per cent) and authorised vehicles only (53 per cent), which are not accessible to the general public and all WWBH staff. This results in up to five spaces which are available to general public.

A total of 489 on-street parking spaces is available near the hospital, with 428 spaces occupied and 61 spaces vacant (86 per cent occupancy) during the peak hour of 1:30pm.

It is noted that a car parking occupancy of around 85 per cent is typically considered to represent theoretical capacity. This occupancy level represents the equilibrium and a good utilisation of car parking, and further given the dynamic nature of parking, provides the ability for drivers arriving to an area to find a car parking without excessive circulation.

The above is supported by the site observations indicating that off-street car parking for the hospital is approaching capacity and overflows to the adjacent streets.

With the opening of the recently completed car parking facility with 42 spaces near the new set-down/ pick-up zone, the hospital will have a total of 440 off-street parking spaces. With the surveyed peak demand at 1:30pm of 340 spaces, there is likely be 100 vacant off-street spaces (77 per cent occupancy).

Overall, there were observed to be a total of 768 occupied spaces and 161 vacant spaces during the peak hour. This represents an 83 per cent occupancy for on- and off-street parking for the hospital of 929 spaces.

Noting the above theoretical capacity, an 85 per cent occupancy of 929 on-site and on-street parking spaces represents 790 occupied spaces. With the peak demand at 768 spaces, there would be a theoretical supply (surplus) of 22 vacant spaces before the drivers have to circulate to find parking spaces, leading to increased congestion near WWBH.

As discussed, it is noted that there is minor availability of on-street spaces along Salmon Street, Dwyer Avenue, Lewisham Avenue and Shaw Street.

2.6 Bicycle Parking

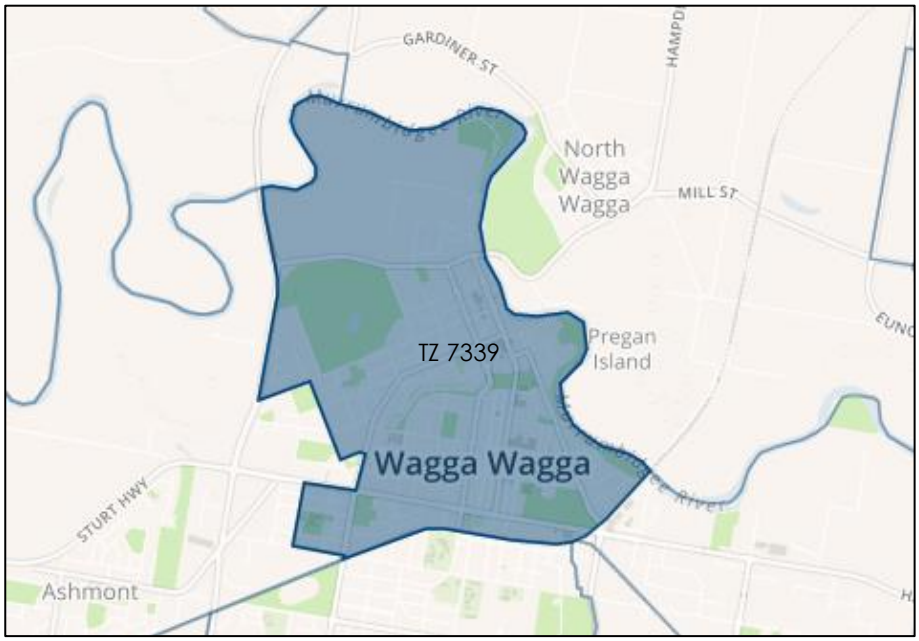
There is currently a bicycle storage area adjacent to the Support Services Building with 11 bicycle racks that can accommodate up to 16 bicycles for the use by staff.

Figure 2.25: Existing Bicycle Parking

2.7 Staff Travel Mode

2011 Census data from Bureau of Transport Statistics, shows the existing Journey to Work (JTW) patterns in the area. WWBH is contained in travel zone 7339 as shown in Figure 2.26.

Figure 2.26: Location and extents of travel zone 7339



Source: JTW Explorer, Bureau of Transport Statistics, 21/ 12/ 2017

JTW data as summarised in Table 2.3 indicates that the main mode of travel in the area is by car, with 82 per cent driving to work and eight per cent travelling as passengers in a vehicle.

Table 2.3: JTW, place of work at travel zone 7339

Mode	Mode share
Vehicle driver	82%
Vehicle passenger	8%
Walked only	6%
Train	0%
Bus	1%
Mode not stated	2%
Other (Bicycle)	1%
Total	**100%**

Data source: JTW Explorer, Bureau of Transport Statistics, 21/12/2017

2.8 Public Transport

The WWBH Main Entrance is currently serviced by at least seven bus services (1W, 3W, 22, 24, 961, 962 and 963) operated by Busabout Wagga and Junee Buses. Two bus services operated by Busabout Wagga stop on the western side of Docker Street south of Hardy Avenue, the eastern side of Docker Street south of Darlow Street and the northern side of Edward Street east of Docker Street. These bus services provide local connections to Bourkelands, Glenfield Park, Springvale and Wagga Wagga. Each service generally provides services every 40 minutes during the peak hours and hourly services outside of peak hours on weekdays with only a limited number of services on weekends.

The average bus capacity has a combined seating and standing capacity of 80 passengers. On the basis of the site observations during the peak periods, there is abundantly spare capacity on existing bus services (more than 80% capacity). The capacity is equivalent to approximately 60 passengers on each bus. Based on seven bus services, the overall remaining capacity is approximately 420 passengers.

The low usage of the existing bus services is also reflected in the JTW data as summarised in Table 2.3 which indicates only one per cent staff travel by bus.

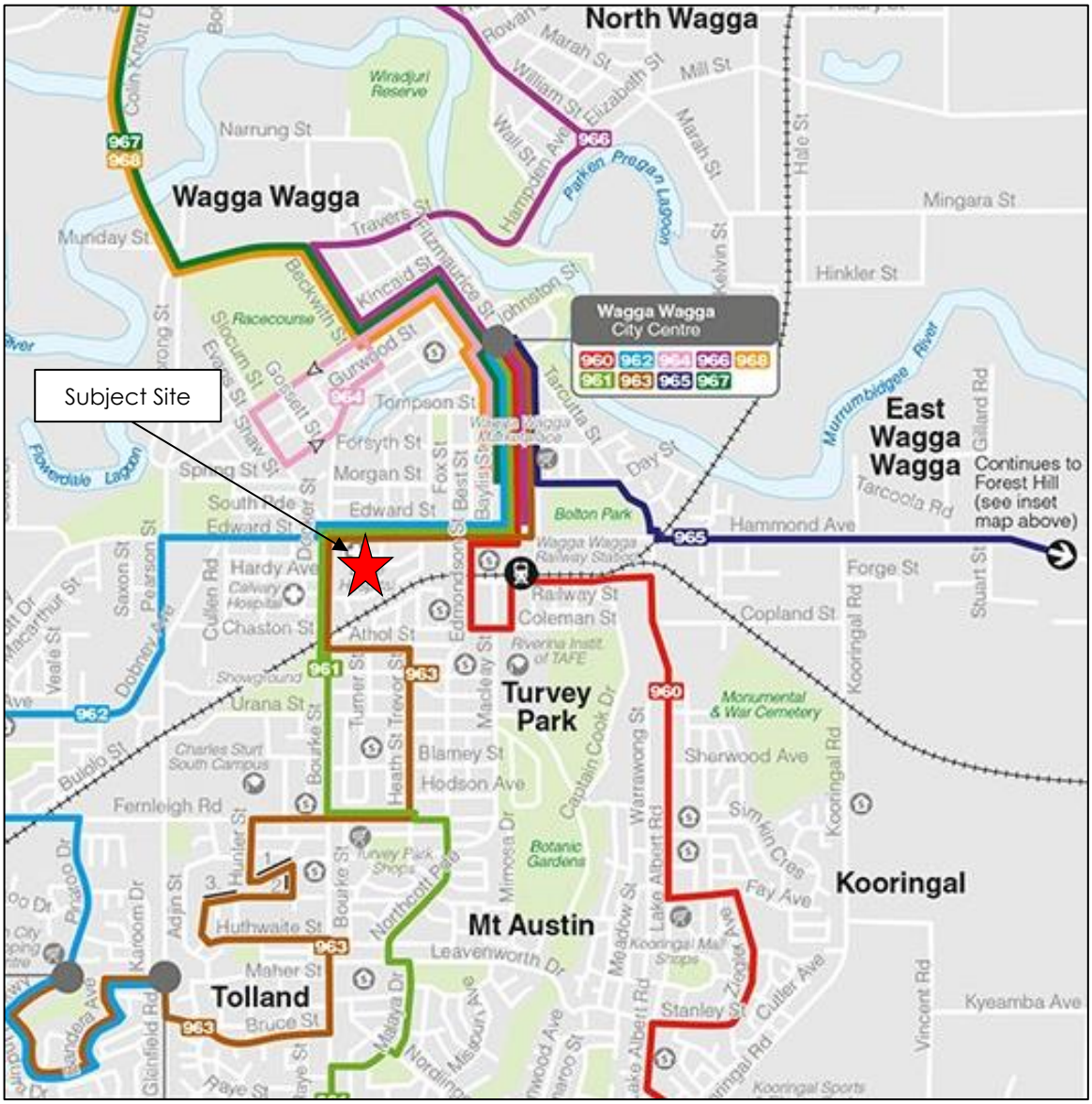
During the Integrated Movement Study for City of Wagga Wagga (2008), several issues were identified from a number of discussions and consultations with representatives from Ministry of Transport, Roads and Maritime, Fearnes Coaches, community transport and various departments within Council. These issues which are not related to capacity include:

- Very low levels of active and public transport in Wagga Wagga
- Lack of public transport availability during after-hours and at weekends
- Isolated suburbs within the Local Government Area (LGA) with minimal access to transport services
- Bus services with long travel time
- Lack of personal safety along certain bike routes within the LGA
- Lack of appropriate transport services for elderly, people with disability and those economically disadvantaged.

Wagga Wagga Railway Station is located within one kilometre from the site on railway street and is serviced by the 622 and 624 service lines running from Wagga Wagga to Sydney Central and Melbourne twice a day for each line.

A review of the public transport available near the site is shown in Figure 2.27.

Figure 2.27: Surrounding bus network



Source: https:/ / busaboutwagga.com.au/ pdf/ wagga_wagga_network_map.pdf, accessed 28 November 2017

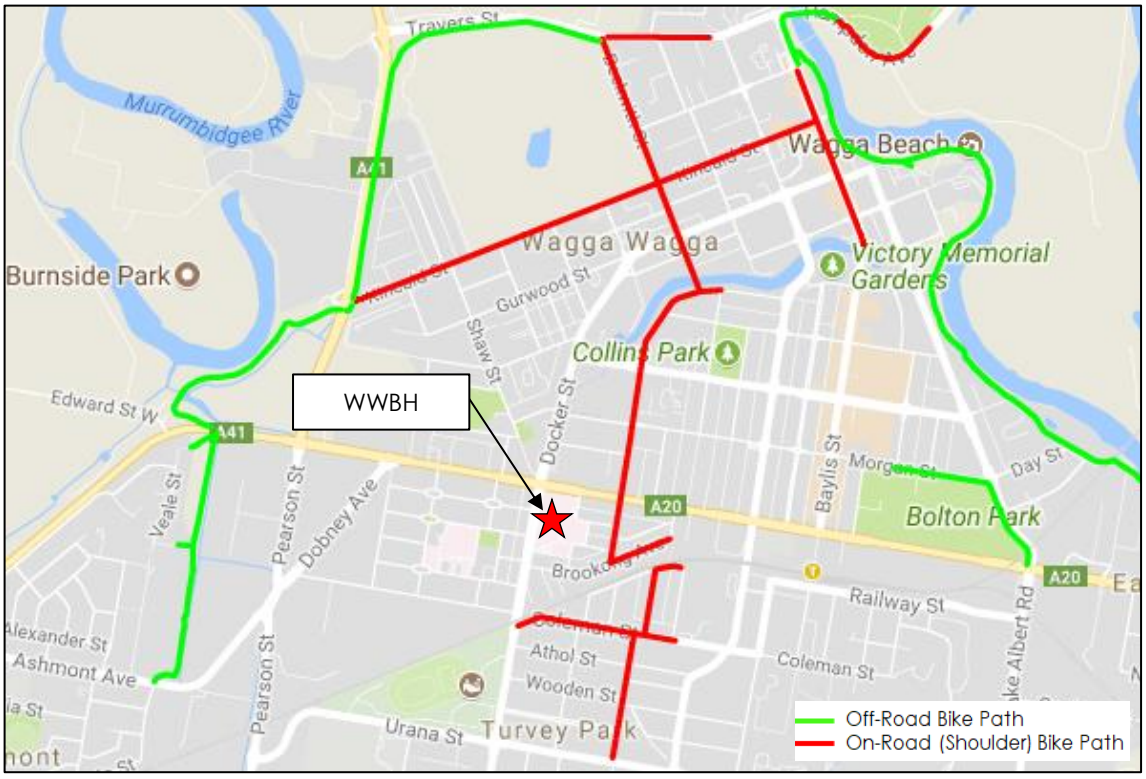
2.9 Pedestrian, Cycle and Scooter Infrastructure

Located on the fringe of the town centre and in close proximity to bus services and the railway station, WWBH is well-serviced by footpaths on all streets surrounding the site. Signalised pedestrian crossings and refuge islands provide good connectivity within the pedestrian network.

Employees and patrons are able to access the hospital by active transport and accordingly, the surrounding cycling network is shown in Figure 2.28. Key routes near the site include Murray Street with an on-road shoulder lane and Brookong Avenue having a dedicated cycling lane.

Wagga Wagga City Council is introducing the RECHARGE Scheme in partnership with RECHARGE Scheme Australia Limited. This scheme aims to facilitate mobility through providing designated electric scooters and wheelchair recharge outlets for people with restricted mobility and people with disabilities. Within the LGA, Wagga Wagga City Library, Wagga Civic Theatre and Seniors Community Centre are currently participating in the RECHARGE Scheme.

Figure 2.28: Surrounding cycling network



Source: Wagga Wagga City Council, accessed 28 November 2017

2.10 Crash Data

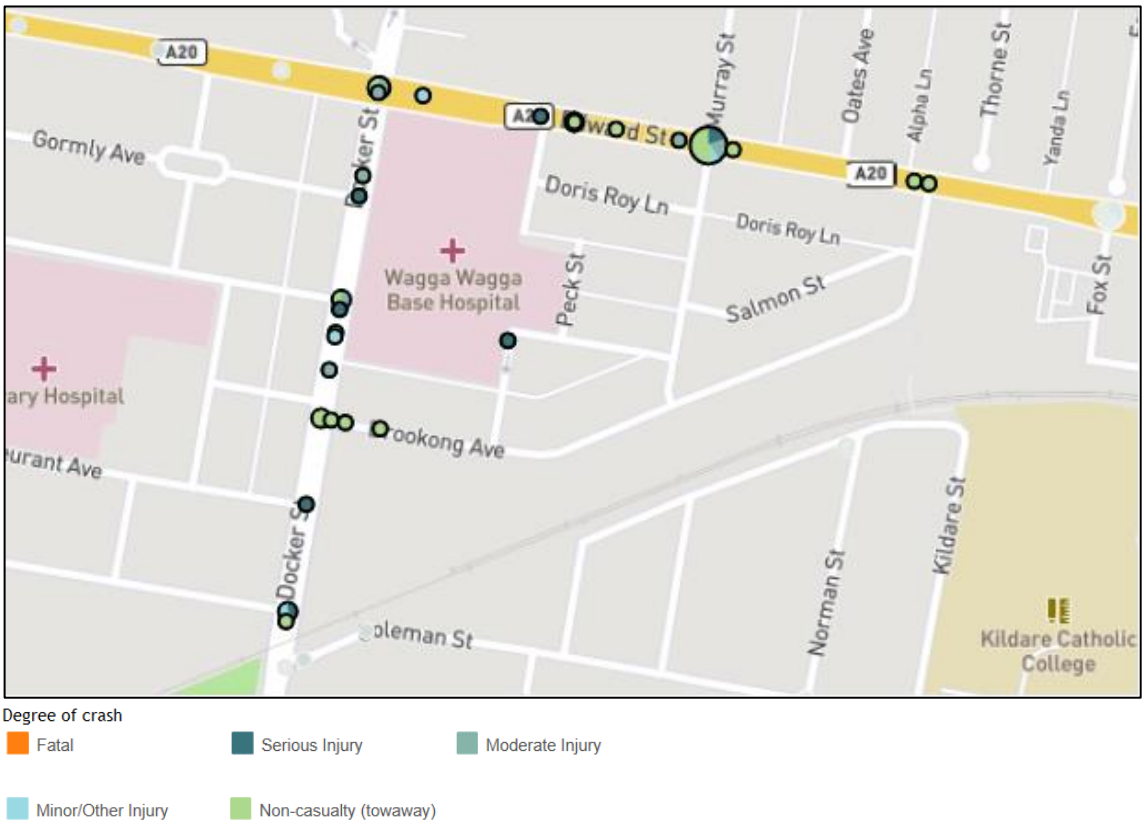
Crash data for the roads around WWBH has been obtained from TfNSW Centre for Road Safety – Crash and Casualty statistics LGA view. The crash data relates to the latest five-year period to December 2016.

Within this period, 42 crashes occurred in vicinity of the hospital. The reported crashes do not include any fatalities. A summary of crash history is provided in the following and shown in Figure 2.29:

- 12 crashes occurred at the Edward Street/ Murray Street intersection with the following characteristics:
  - Five crashes involved vehicles crossing through traffic at intersections and resulting in serious injury.
  - Three crashes involved vehicles turning right at intersections and colliding with through traffic and resulting in serious injury.
  - Four crashes involved vehicles leaving the travel lane towards the left and hitting an object and vehicles turning left at an intersection and hitting an opposing vehicle within the side street crashes.
- Four crashes occurred at the Edward Street/ Lewis Drive intersection, resulting in serious injury and involved rear end, vehicles travelling through the intersection and hitting the rear of turning vehicles, vehicles changing lanes and hitting the rear end of vehicles turning right travelling in the same direction.
- One pedestrian injury occurred within the hospital site along Lewis Drive south of Yathong Street.

- Four crashes occurred on Docker Street/ Brookong Avenue intersection and involved vehicles leaving parking, vehicles parking, vehicles leaving the travel lane towards the left and hitting an object and vehicles hitting the rear of left turning vehicles travelling in the same direction, resulting in non-casualty.
- Five crashes occurred on Docker Street/ Brookong Avenue intersection with four rear end crashes and one left rear crash. One pedestrian injury occurred in this intersection.
- Four crashes occurred on Docker Street between Brookong Avenue and Chaston Street with three typical intersection crashes and one off carriageway crash.
- Two crashes occurred on Sturt Highway/ Brookong Avenue intersection with one rear end crash and one crash involving a car leaving parking.

Figure 2.29: Crash history (2011-2016)



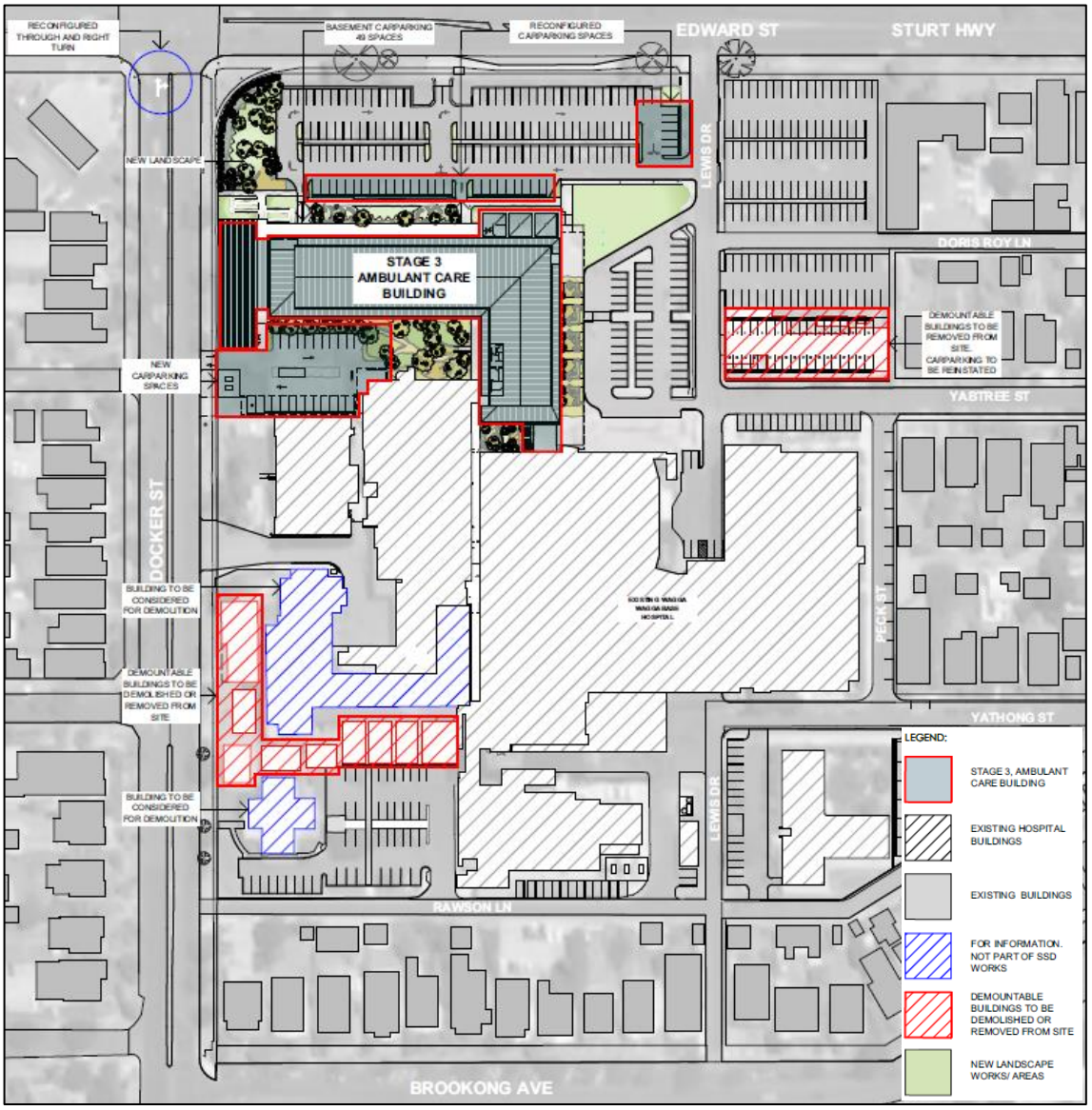
Source: TfNSW, accessed 21/ 12/ 2017

3. Development Proposal

3.1 Land Uses

Figure 3.1 provides an understanding of the proposed footprint for the preferred masterplan, with the expected uses and numbers of beds/ chairs/ rooms for Stage 3, summarised in Table 3.1.

Figure 3.1: Preferred Masterplan Layout



Source: Wagga Wagga Health Service Redevelopment, Stage 3 Development, Site Plan, Drawing No. SSD-ACB-0401, Issue 04, Martin & Ollmann, 20 April 2018.

Table 3.1: Proposed Stage 3 development schedule

Use	Unit	Size (beds/ chair/ rooms/m²)
Hospital	Aged care rehabilitation	8
	Aged care/ GEM	20
	Mental health	8
	Extended ambulatory care	10
	Renal unit	8
	Subtotal – beds/ chairs	**54**
	Consulting rooms	40
Subtotal		**94**
Education Area	Lecture theatre	379.2m²

The proposed Stage 3 development will result in an increase of 54 beds/ chairs and 40 rooms, which totals to 94 beds/ chairs/ rooms. At the completion of Stage 3 development, WWBH will have a total of 487 beds/ chairs/ rooms.

The projected additional fulltime equivalent (FTE) staff when Stage 3 is fully operational in 2027 is 1,482[10]. This equates to an ASDS of 890. The proposed Stage 3 development will result in an increase of 144 FTE staff. However, it is noted that 20 per cent of the 144 FTE (29 FTE) work off-site. As such, the net increase in FTE staff will be 115 which is equivalent to an ASDS of 69.

Based on the increase of 115 FTE and 69 ASDS, there would be a total of 1,453 FTE and 872 ASDS when Stage 3 is fully operational in 2027.

In addition to the above uses, the proposed Stage 3 development will include a 379.2 square metre lecture theatre.

3.2 Vehicle Access

It is proposed that the existing vehicle accesses to the WWBH to be maintained via Edward Street (from Lewis Drive), Docker Street, Brookong Avenue (emergency vehicle access only) and Murray Street (from Yabtree Street and Yathong Street). The access via Doris Roy Lane is proposed to be converted from two-way lane to eastbound only lane for exiting vehicles. It is also proposed to convert existing eastbound lane on Yabtree Street between Lewis Drive and Peck Street to a two-way road.

Access to the proposed undercroft car park is proposed via the existing driveway to the west of Lewis Drive from the circulation aisle of CP1.

As part of the new on-grade car parking spaces on the northwest corner of Harvey House, it is proposed that the existing left-out only driveway be removed, and the left-in entry only be widened to accommodate two-way movements.

The proposed reconfiguration of the internal road network is further discussed in Section 5 of this report.

[10] Murrumbidgee Local Health District, Financial Impact Statement for Wagga Wagga Base Hospital Stage 3 Redevelopment – Section 5: Staffing Implications, received 17 January 2018.

3.3 Car Parking

3.3.1 Existing Car Parking Facilities

The existing at-grade car park car park facilities (CP1, CP2, CP3, CP4, CP5 and CP6) are currently accessed from Lewis Drive. To access the external road network vehicles do so via Lewis Drive, Doris Roy Lane and Yabtree Street.

3.3.2 New Car Parking Facilities (as part of SSD Application)

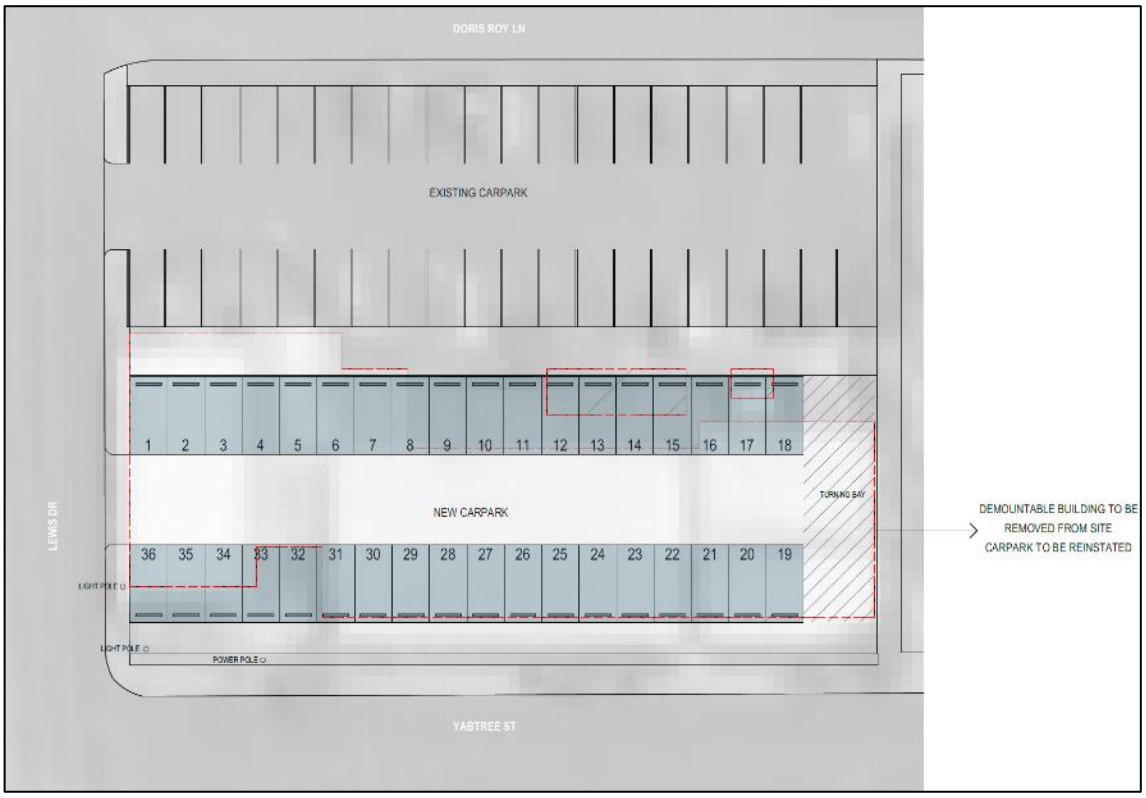
As part of the SSD application, a total of 107 additional spaces will be provided on site via:

- The reinstatement of the car parking spaces under the existing demountable facilities located on the northeast corner of Lewis Drive and Yabtree Street after the building removal: 36 spaces
- The reconfigured CP1: nine spaces
- The proposed Stage 3 parking: 44 spaces
- The reconfigured ground level parking area north of Harvey House: 18.

Reinstatement of Car Parking Spaces under Existing Demountable Facilities

The car parking spaces under the existing demountable facilities located south of CP3 would be reinstated after the building removal. With the reinstatement, the proposed car park on the northeast corner of Lewis Drive and Yabtree Street could provide a minimum of 36 additional spaces on site. The reinstated car spaces are shown in Figure 3.2.

Figure 3.2: Proposed reinstated car parking spaces under existing demountable building (south of CP3)

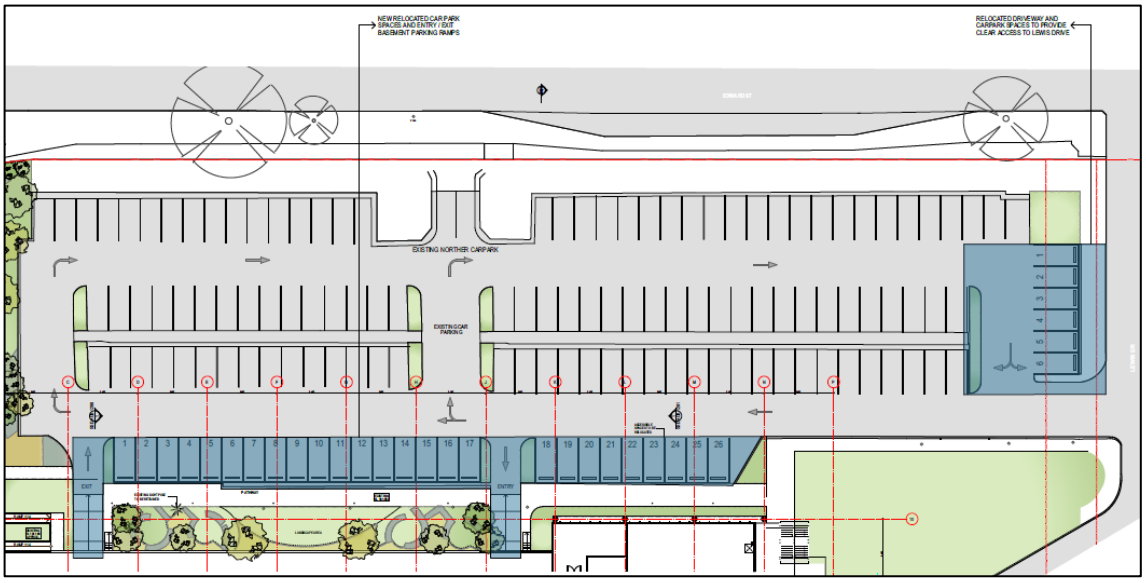


Source: Wagga Wagga Health Service Redevelopment, Stage 3 Development, General Arrangement – Corner of Lewis and Yabtree Carpark, Drawing No. SSD-ACB-1192, Issue 01, Martin & Ollmann, 20 April 2018.

Reconfigured CP1

The reconfiguration of CP1 upon the completion of Stage 3 works will result in a net increase of nine car spaces, as shown in Figure 3.3. This is based on the provision of 147 spaces upon completion of Stage 3 works in comparison to 138 spaces before the enabling works.

Figure 3.3: Proposed CP1 layout redesign and Stage 3 building car park accesses

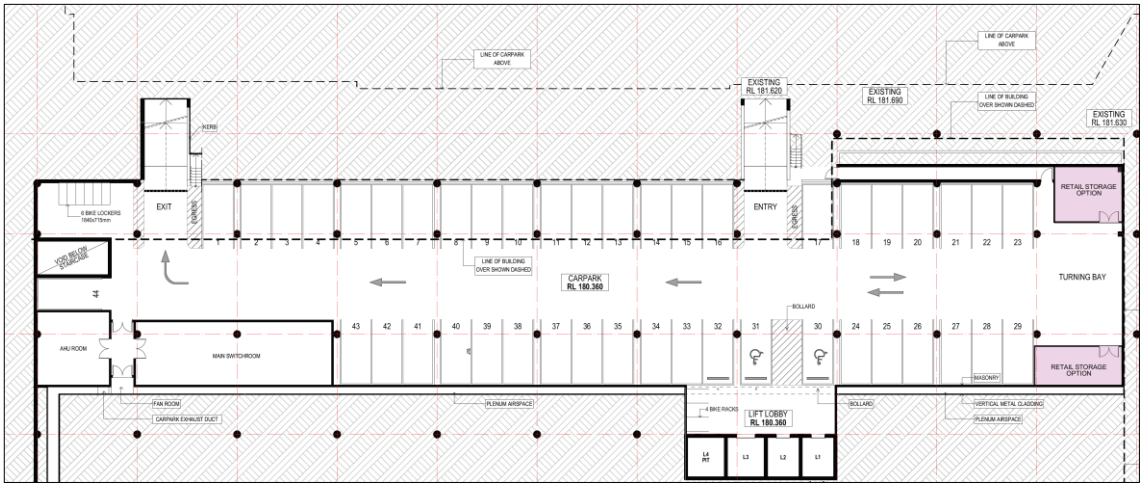


Source: Wagga Wagga Health Service Redevelopment, Stage 3 Development, General Arrangement – Northern Car Park, Drawing No. SSD-ACB-1190, Issue 03, Martin & Ollmann, 20 April 2018.

Proposed Undercroft Car Park

The preferred masterplan also proposes to provide an undercroft car park for the Stage 3 Ambulatory Care Zone and Research and Education Zone buildings. It is proposed to have an undercroft parking facility with 44 car parking spaces for the new Ambulatory Care building, as shown in Figure 3.4.

Figure 3.4: Proposed undercroft carpark



Source: Wagga Wagga Health Service Redevelopment, Stage 3 Development, General Arrangement – Basement Carpark, Drawing No. SSD-ACB-1110, Issue 04, Martin & Ollmann, 7 June 2018.

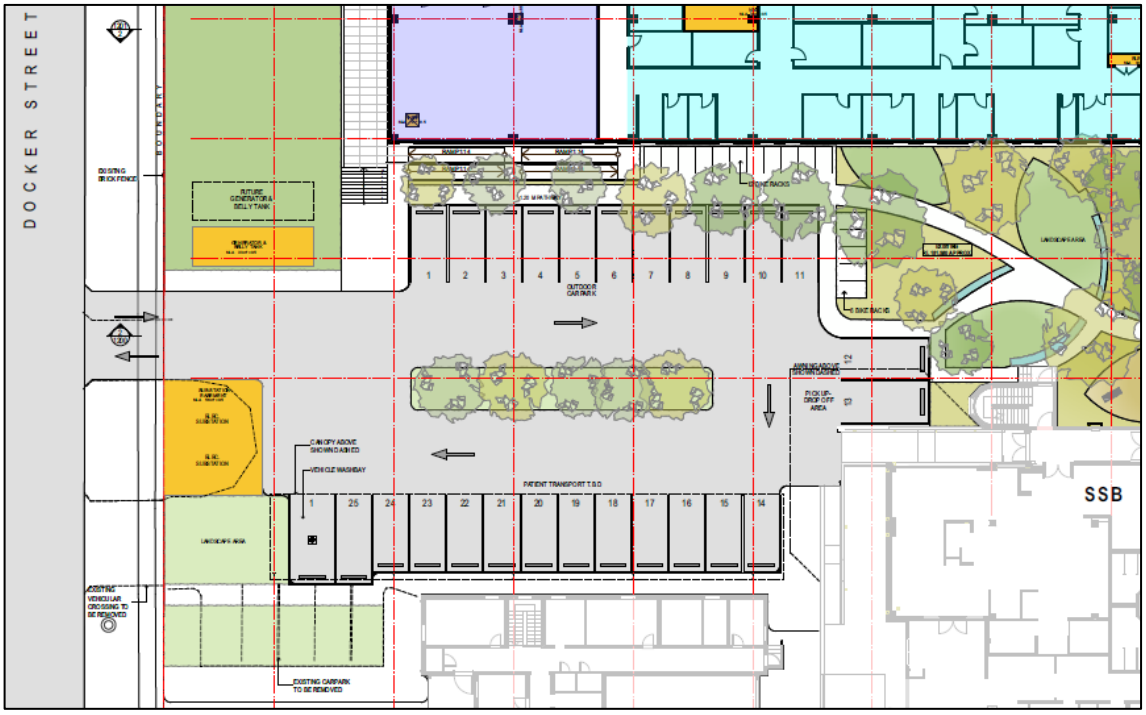
It is noted that the three disabled spaces will be displaced by the three disabled spaces within the recently completed CP4.

Reconfigured On-Grade Parking north of Harvey House

A total of 26 additional on-grade car parking spaces (for transfer vehicle, patient transport and wash bay) are proposed to the north of Harvey House, as shown in Figure 3.5.

The provision of the on-grade car parking spaces would result in the loss of eight existing spaces located to the northwest corner of Harvey House. This equates to a net increase of 18 spaces.

Figure 3.5: Proposed on-grade car parking facility



Source: Wagga Wagga Health Service Redevelopment, Stage 3 Development, General Arrangement – Ground Floor, Drawing No. SSD-ACB-1120, Issue 04, Martin & Ollmann, 7 June 2018.

Summary

In total, the new car parking facilities would provide a total of 107 car parking spaces. The new parking facilities exceeds HI's commitment to provide 100 car spaces in addition the existing 440 spaces available at the end of the Stage 2 Redevelopment work, as presented in the Final Business Case.

The car parking provision requirement is further discussed in Section 4 of this report.

The vehicle access arrangements for the proposed undercroft and on-grade car park is further discussed in Section 5 of this report.

3.4 Pedestrian Facilities

The existing pedestrian infrastructure and connections on-site will generally be maintained. The Rural Clinical School's administrative headquarters and Wagga Wagga teaching campus are located in Harvey House, within the grounds of the WWBH. The Notre Dame University is located 500 metres (seven-minute walk) to the west of the WWBH, on Hardy Avenue while the TAFE NSW Wagga Wagga is located about 1.5 kilometres (18-minute walk) to the southeast on Coleman Street.

At the location of the proposed new buildings, existing infrastructure will be replaced with new pedestrian links, including a path from the new development to the existing buildings. There is an opportunity to provide a pedestrian link to Calvary Riverina Hospital.

3.5 Bicycle Facilities

The development proposes 28 bicycle spaces to be located in the landscaped area between the proposed ambulatory care building and the new on-grade parking north of Harvey House as well as the proposed basement carpark adjacent to the lifts.

The bicycle parking would be designed in accordance with AS 2890.3 Parking facilities - Bicycle Parking Facilities. Bicycle parking and access would ensure that potential conflicts with vehicles are minimised. In addition, the bicycle parking is to be secure, convenient and located undercover with easy access from the street and building entries and to be located in accordance with Safer by Design and Crime Prevention Through Environmental Design (CPTED) principles (detailed in Section 6.7). Bicycle parking safety may be addressed by ensuring the facility is located to ensure passive surveillance (e.g. highly visible areas such as near building entries) and adequate lighting is provided.

The suitability of the bicycle provision is discussed in Section 4 of this report.

3.6 Scooter Facilities

It is proposed that WWBH participates in the RECHARGE Scheme and includes provision of charging station for electric mobility scooter or wheelchair.

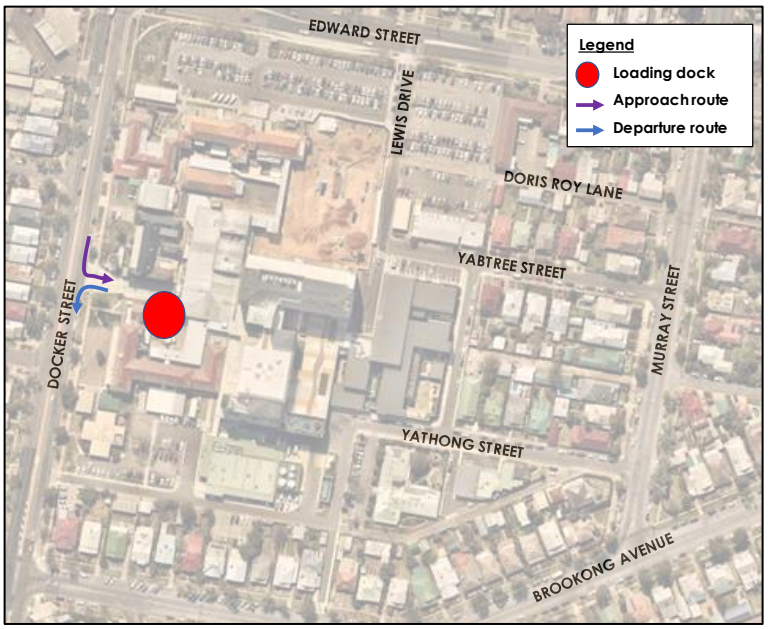
3.7 Loading Areas

The proposed development will maintain the existing loading arrangements on-site, towards the south of the clinical services building, with access to the loading dock via Docker Street.

It is understood that the existing loading area provides for four formal loading docks which can accommodate up to 12.5-metre long heavy rigid vehicles (HRV). Larger vehicles up to 14 metre HRVs can be accommodated within the loading area however would be required to park within the hard stand area to the west of the formal loading docks, with loading/ unloading occurring via use of fork lift. An informal loading area is provided adjacent to the bin room and recycling/ medical gas bottle store which can accommodate rigid trucks/ vans up to 8.8-metres long (medium rigid vehicle [MRV]) and standard 10-12 metre long contractor garbage trucks.

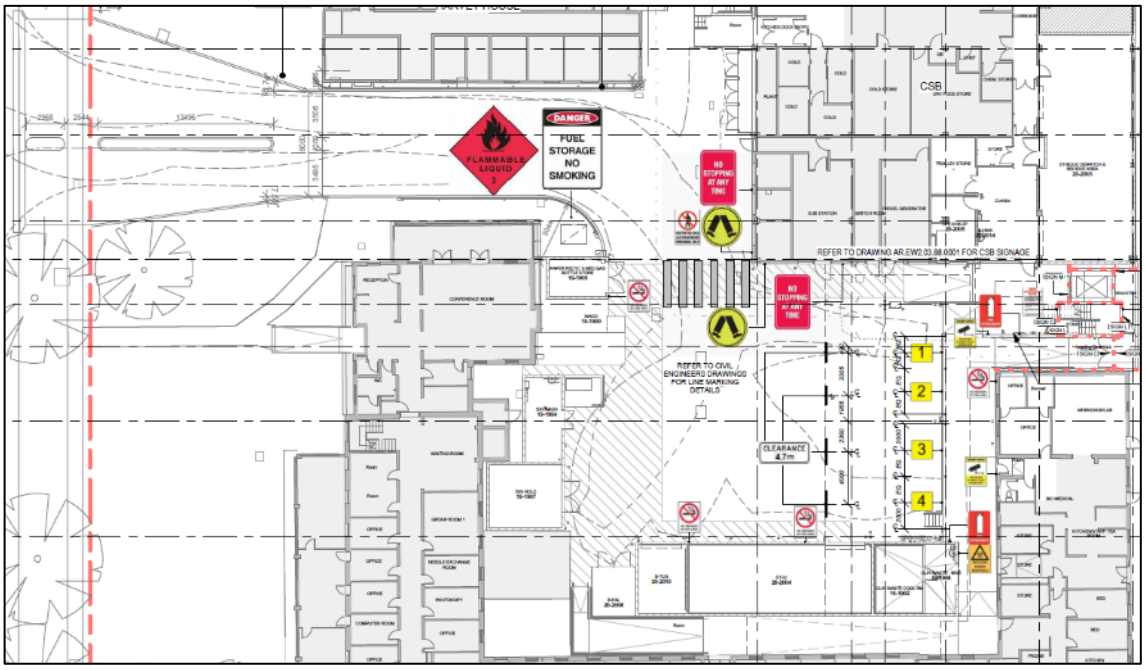
It is noted that the loading area accommodates 60 vehicles per day (120 vehicle movements per day), with 70 to 80 per cent being small vehicles; that is, couriers, vans, maintenance vehicles etc. This is equivalent to 16 vehicle trips per hour. This delivery activity predominantly occurs on weekdays between 7am and 5pm. The location of the existing loading area and layout are shown in Figure 3.6 and Figure 3.7.

Figure 3.6: Existing loading area



Basemap source: Nearmap

Figure 3.7: Existing loading area layout



Source: Wagga Wagga Health Services Redevelopment, Edward Street – Plan – Ground Floor Signage – Loading Dock, Drawing No. AR. EW2.03.88.0002[D], by Billard Leece Partnership Pty Ltd, 6 June 2014.

The future loading requirements for the Stage 3 development in terms of loading/ servicing activity is not available at this stage. However, it is noted that the activity would be accommodated by the existing loading dock. A detailed loading dock management plan may be necessary to ensure that the increased loading activity is able to be appropriately managed and that loading activity occurs at the appropriate location within the existing loading area.

The provision of a left-in and left-out manoeuvre at the access via Docker Street assists in minimising delays to through vehicles on Docker Street. As such, it is expected that the anticipated vehicle movements will not have a significant impact on the existing traffic flows.

It also noted that 19-metre articulated vehicles are used in delivering and decanting bulk oxygen to the WWBH with deliveries outside the peak hours to minimise disruption to the local road network. There are currently only two vehicles per week (four vehicle movements per week) and is expected to remain the same with the proposed development. Vehicle approach is currently via Yathong Street with vehicle departure to Docker Street via Rawson Lane.

4. Car Parking

4.1 Car Parking Requirements for Hospital

4.1.1 Wagga Wagga City Council's DCP 2010

The car parking requirements for hospitals are set out in the Wagga Wagga City Council's DCP 2010 based on staffing levels and number of beds. The DCP 2010 states the following parking requirements for a hospital use:

- One space for every four beds (including chairs and consulting rooms)
- One space for every two employees.

Application of the above DCP car parking rates against the development schedule for the proposed redevelopment, is provided in Table 4.1.

Table 4.1: DCP car parking requirements

Use	Size	DCP parking rate	DCP parking requirement
Hospital	94 beds/ chair/ rooms	1 space/ 4 beds/ chair/ rooms	24
	115 staff	1 space/ 2 employees	58
		Total	**82**

Table 4.1 indicates that the proposed development has a requirement to provide 82 spaces based on the rates provided for within the DCP.

4.1.2 Car Parking Demand Based on Bed/ Chair/ Consulting Room Numbers

The existing site currently contains a total of 393 beds/ chairs/ consulting rooms. Based on the provision of 440 car parking spaces on-site, the car parking rate per bed/ chair/ room equals to 0.90 car space per every bed/ chair/ room.

The proposed development would include an overall increase of 54 beds and 40 consulting rooms, therefore providing an additional 94 beds/ chairs/ rooms.

Application of the rate of 0.90 to the proposed additional 94 beds/ chairs/ consulting rooms will generate an additional requirement of 85 car parking spaces.

4.1.3 Summary

A summary of the parking requirements for the proposed hospital development is shown in Table 4.2.

Table 4.2: Car parking requirement summary

Use	Additional size	DCP 2010 parking rate	Number of Beds/ Chairs/ Rooms (based on on-site car parking supply of 440)
Hospital	94 beds/ chair/ rooms	82	85
	115 staff		

It is recommended that to accommodate the Stage 3 development that an additional 85 spaces be provided.

4.2 Car Parking Requirements for Education Area

A review of the DCP 2010, Roads and Maritime Guide to Traffic Generating Development (2002) and neighbouring Councils' DCPs indicates that no specific car parking rate is nominated for Education Area use.

The intended use for the Education Area is predominately for those who will already on site for other purposes, such as staff. On the occasion that the centre would be used for external uses a commercial rate of one space per 40 square metres has been applied. Based on the proposed area of 379.2 square metres this would equate to a requirement of ten parking spaces.

4.3 Cumulative Parking Requirements

A summary of the cumulative parking requirements for the proposed hospital (including the Education Area) development is shown in Table 4.3.

Table 4.3: Car parking cumulative requirement summary

Use	Parking requirement
Hospital	85
Education Area	10
Total	**95**

Table 4.3 indicates that the proposed Stage 3 development would require 95 additional spaces including 85 spaces for the hospital and 10 spaces for the Education Area.

4.4 Adequacy of Parking Supply

The additional parking demand of 95 to be generated by the additional staff and bed numbers could not be accommodated by the existing off-street and on-street parking facilities.

With the additional 36 spaces to be restored south of CP3, the proposal would need to provide a minimum of 59 additional spaces on site.

With the proposed parking facilities proposed as part of the SSD Application as discussed in Section 3.3, a total of 107 additional car parking spaces would be provided, exceeding the minimum requirement for Stage 3.

It is noted that the overprovision of 12 spaces is appropriate to displace the loss of parking spaces (a minimum of 10 spaces) along Docker Street due to the reconfiguration of the Edward Street/ Docker Street intersection.

4.5 Accessible Parking

The accessible car parking requirements for different development types are set out in the Building Code of Australia (BCA), 2014. The relevant disabled parking requirements are:

- Hospital (non-outpatient area): One space per 100 parking spaces
- Hospital (outpatient area): One space per 50 parking spaces up to 1,000 parking spaces and one space per 100 parking in excess of 1,000 parking spaces.

Based on the additional 95 spaces, the proposal will be required to provide up to a total of two accessible spaces, to be compliant with the BCA. The proposed development provides two disabled spaces in the undercroft parking facility, in accordance with the BCA.

4.6 Motorcycle Parking

Council's DCP does not provide specific guidance on motorcycle parking. It is however recommended that up to five motorcycle spaces be provided where possible and within the hospital car parking areas to encourage motorcycle travel to the hospital (especially for staff).

4.7 Bicycle Parking

DCP 2010 and LEP 2010 do not provide a bicycle parking requirement. However, in acknowledgement of the objective of the proposed Bike Plan to encourage more active transport (walking and cycling), the potential to incorporate these facilities has been reviewed referencing to the Planning Guidelines for Walking and Cycling (Department of Planning, 2004). The guidelines suggest the following bicycle parking provisions for a hospital:

- Staff (long-term use) – rate of five to 10 per cent of staff
- Visitor (short-term use) – rate of five to 10 per cent of staff.

Given the location of the hospital and the existing/ proposed surrounding cycling infrastructure, it is recommended that a bicycle parking rate of five per cent of staff and visitors is adopted.

Applying this to an ASDS of 872, the proposed development should provide a total of 88 bicycle spaces (44 bicycle spaces for staff and 44 bicycle spaces for visitors).

Observations on-site indicate that around 40 per cent of the existing 28 bicycle spaces are currently being utilised. Based on this the provision of 88 bicycle spaces is considered an over supply. A more conservative provision of 50 per cent of the overall 88 bicycle requirement is considered appropriate to encourage staff and visitors to cycle to and from the hospital. The proposed bicycle parking provisions are considered adequate for the likely active transport requirements of future staff and visitors, recognising the existing and changing nature of the area and surrounding environment considering the Wagga Wagga Bicycle Plan.

Applying the utilisation rate of 50 per cent to the above bicycle requirements for staff and visitors will result in 44 bicycle spaces for staff and visitors.

As discussed, the existing hospital currently provides a total of 16 spaces for staff. Therefore, an additional 28 spaces (six spaces for staff and 22 spaces for visitors) would be required as part of the proposed Stage 3 redevelopment.

The bicycle parking facilities are proposed to be located in the landscaped area between the proposed ambulatory care building and the new on-grade parking north of Harvey House as well as the proposed basement carpark adjacent to the lifts.

5. Proposed Transport Improvements

5.1 SSD Application Improvements

5.1.1 Proposed Right-Turn Restrictions at Murray Street and Brookong Avenue along Edward Street

A review of right turn restrictions out of Murray Street (as shown in Figure 5.1) and Brookong Avenue (as shown in Figure 5.2) onto Edward Street, instead of signalising the intersection of Murray Street/ Edward Street will be completed in response to the RFI for the SSD application for the WWBH Stage 3 redevelopment. This would require a review of the reconfiguration of the Edward Street/ Docker Street intersection.

Figure 5.1: Proposed right-turn restriction from Murray Street onto Edward Street

Basemap source: Nearmap

Figure 5.2: Proposed right-turn restriction from Brookong Avenue onto Edward Street

Basemap source: Nearmap

Any proposed improvements at the intersection of Edward Street/ Murray Street would be prepared in consultation with Council and Roads and Maritime.

5.1.2 Proposed Access Locations to Undercroft Car Park of Stage 3 Building via CP1

As part of the SSD application for the WWBH Stage 3 redevelopment, it is proposed that a new undercroft car park facility be provided for the new buildings constructed as part of Stage 3.

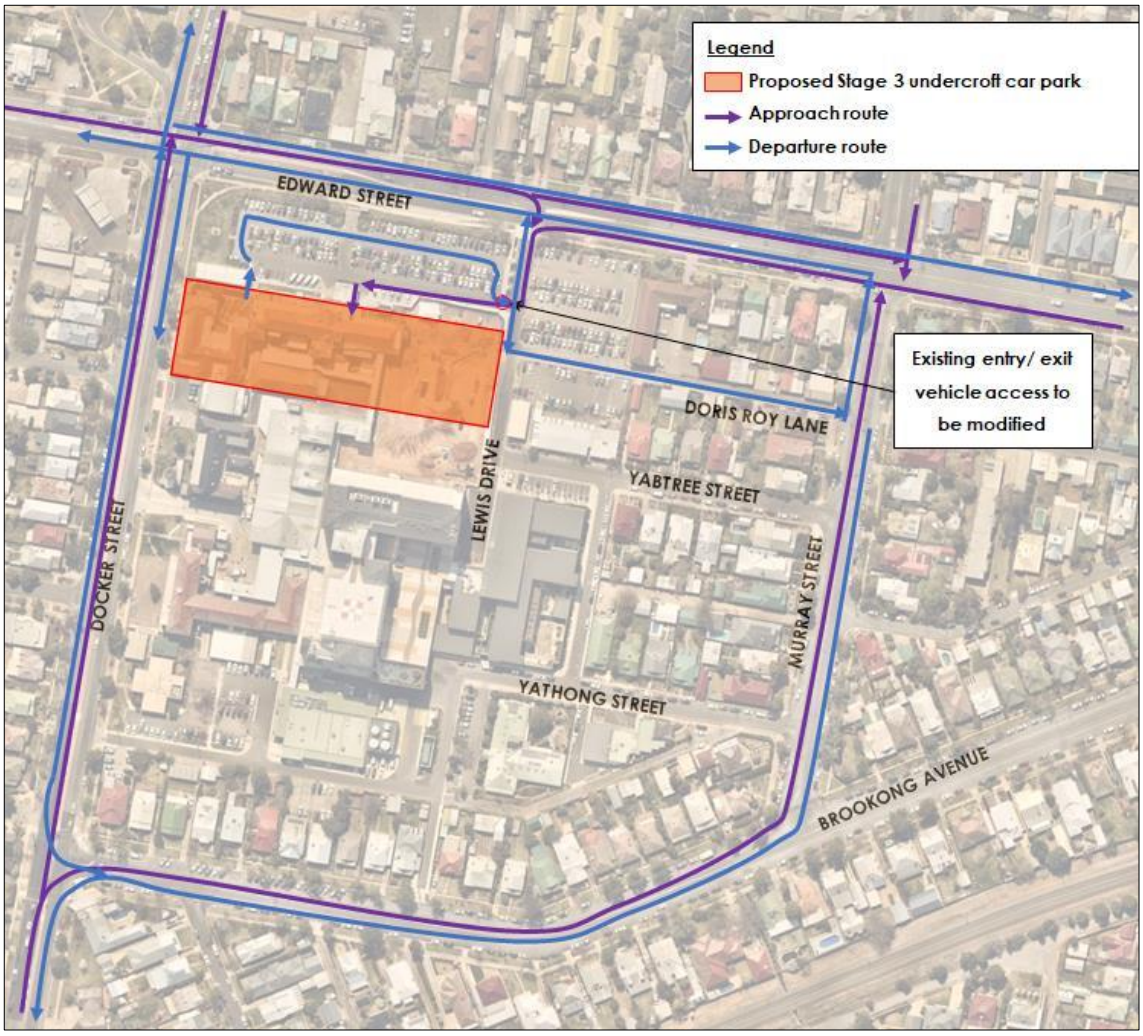
As discussed, the existing 5.6-metre driveway cannot accommodate for two-way movements for vehicles entering and exiting CP1. Such conflict results in vehicles queuing on Lewis Drive to allow for vehicles to exit CP1. With the proposed undercroft car park, parking demand at the existing driveway will increase.

As such, the following road designs are proposed to enhance pedestrian safety and to optimise existing operation of CP1 and future operation of the proposed undercroft car park, as shown in Figure 3.3:

- Widen existing driveway width (from 5.6-metre to 6.5-metre) to CP1 with minor reconfiguration of the car parking spaces on the eastern end of CP1.
- Entry to and exit from the undercroft car park would be located 70 metres and 120 metres west of Lewis Drive respectively to ensure that entering and exiting vehicles associated with the undercroft car park would not impact the vehicles circulating within CP1 and result in vehicle queuing onto Lewis Drive.

The above proposals, as well as the approach and departure routes due to the proposed changes are shown in Figure 5.3.

Figure 5.3: Approach and departure routes for CP1 and Stage 3 building car park



Basemap source: Nearmap

5.2 Other Improvements (Part of Future Approvals)

Several transport improvements are proposed to accommodate the specific needs of pedestrians, not only to improve their safety, but also to increase pedestrian access to the buildings within WWBH. These improvements do not form part of the SSD application and would form part of future approvals.

These improvements include measures to:

- control vehicle speed
- implement traffic-calming measures
- restrict vehicle traffic in residential areas
- construct additional footpaths
- create a pedestrian zone for the connection between the existing and proposed car parks and the existing acute care zone and proposed Stage 3 Ambulatory Care Zone and Research and Education Zone.

The following road design strategies to improve pedestrian safety are proposed and will be addressed during the detailed design stage:

- reconfiguration of the existing set-down/ pick-up zone and CP4
- proposed access locations to the undercroft car park of Stage 3 building via CP1
- public access to the Emergency Department via Murray Street and exit via Yabtree Street and Doris Roy Lane.

5.2.1 Reconfiguration of Existing Set-Down/ Pick-Up Zone and CP4

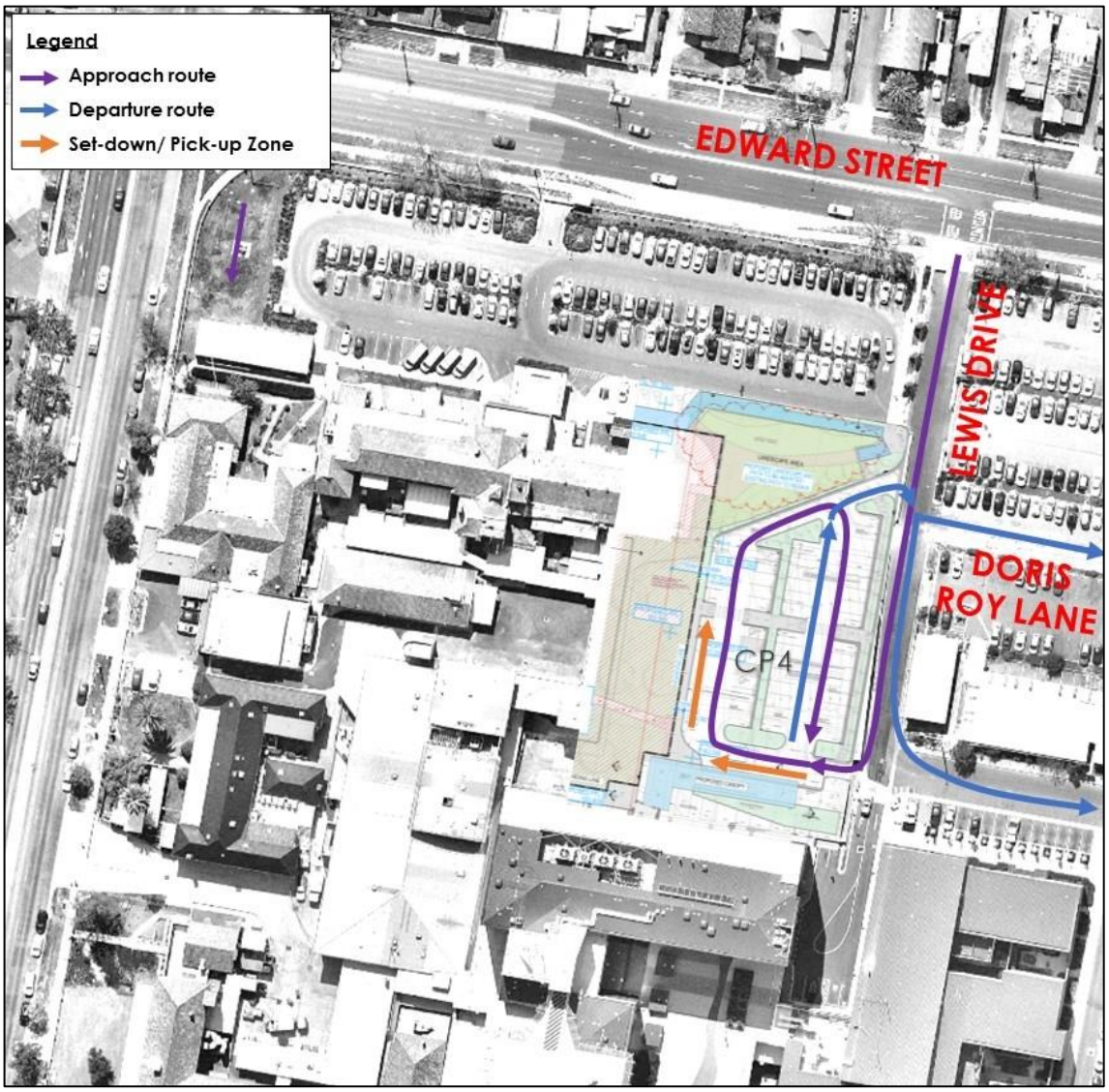
The functional layout of the existing set-down/ pick-up zone and CP4 of is critical to its efficiency while providing a pleasant and safe user experience. Some of the key concerns with the existing functional designs include:

- Set-down/ pick-up layout:
  - The current layout will require vehicle to reverse into the easternmost, westernmost and northernmost set-down/ pick-up spaces.
  - Given the one-way circulating lane width is only 3.6 metres and two-way circulating lane is only six metres wide, any reversing into the set-down/ pick-up spaces will interrupt the through traffic flows.
  - With the easternmost set-down/ pick-up space located only five metres from Lewis Drive, there is only sufficient storage for one vehicle to queue behind the reversing vehicle before impacting Lewis Drive. This vehicle may potentially reverse and encroach on pedestrian access across the existing north-south crossing, as shown in Figure 5.4.
- Entrance/ exit locations and traffic circulation:
  - The existing exit driveway layout, as shown in Figure 5.5 does not physically restrict left-turning vehicles with Lewis Drive being only one-way southbound. This will create potential conflicts if drivers make erroneous manoeuvres from CP4 northbound onto Lewis Drive.
  - The vehicle entry is located close to (less than 5 metres) the adjacent set-down/ pick-up space and does not provide sufficient queueing storage.
  - The existing approach and departure routes as shown in Figure 5.6 results in five potential vehicle conflict points as shown in Figure 5.7.

Figure 5.4: Existing north-south pedestrian crossing

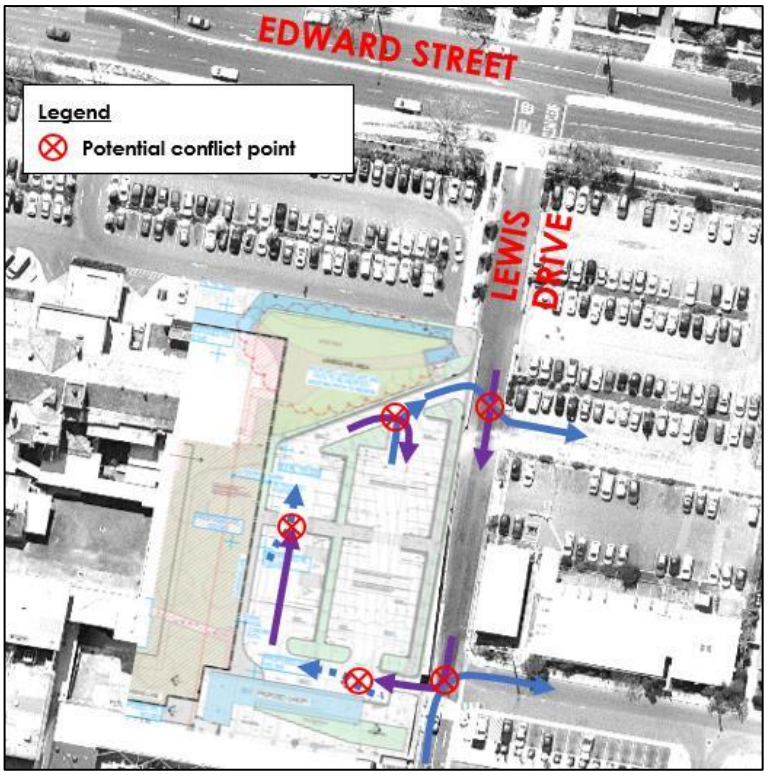
Figure 5.5: Existing exit only driveway onto Lewis Drive

Figure 5.6: Existing approach and departure routes for set-down/pick-up zone and CP4



Basemap source: Nearmap

Figure 5.7: Existing potential vehicle conflicts between approach and departure routes for set-down/pick-up zone and CP4



Basemap source: Nearmap

Based on the above concerns, the following layout reconfigurations are proposed to satisfy a safe and more efficient car park layout, as illustrated in Figure 5.8:

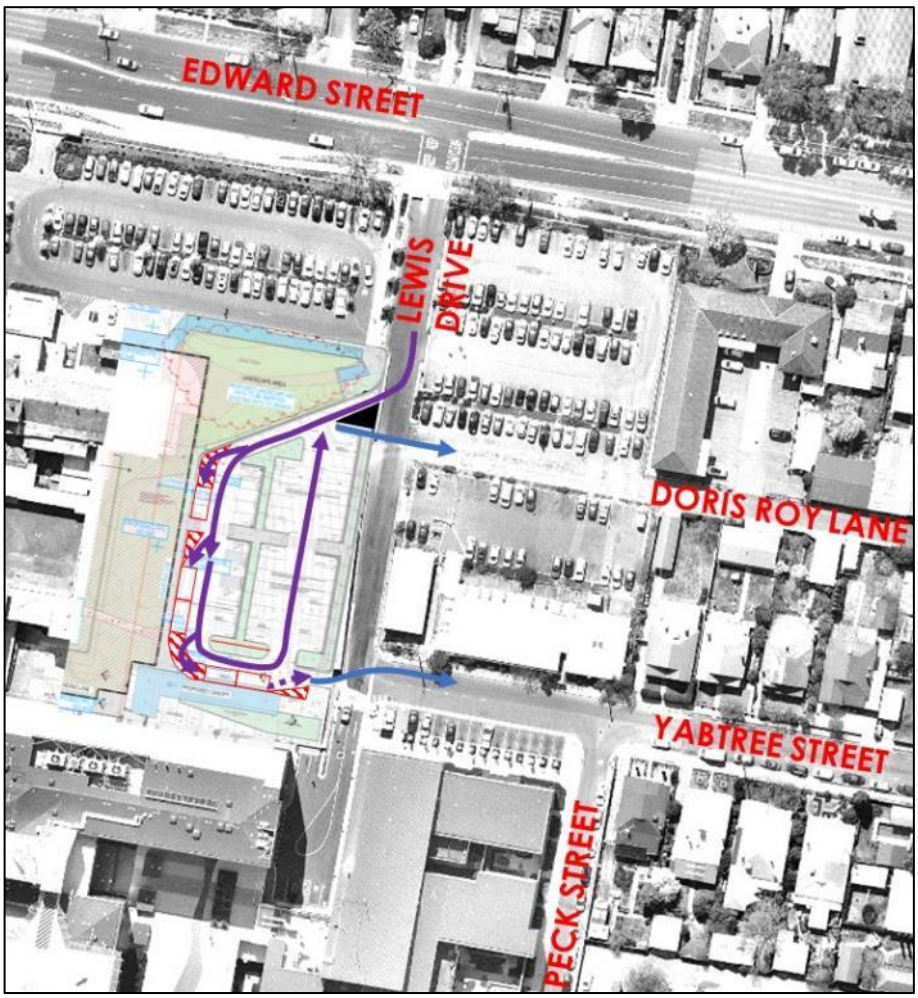
- existing entry driveway to be converted to exit driveway
- entry and exit driveway to and from the set-down/ pick-up spaces to be revised to the north-eastern end of CP4
- internal vehicle circulation to be revised from clock-wise to counter clock-wise movements
- set-down/ pick-up spaces to be widened from 2.1 metres to 3.6 metres to provide an additional 1.5 metres for the safety of passenger set-down and pick-up activities
- appropriate pavement marking to be provided before and after set-down/ pick-up spaces to guide vehicles in and out of these spaces
- replace the existing flat pedestrian crossings within CP4 to new coloured thresholds
- reduce existing landscaped areas to accommodate wider set-down/ pick-up spaces and circulating aisles
- install pavement marking and signage indicating 10 km/h posted speed limit within CP4.

The proposed approach and departure routes based on the above layout reconfigurations are shown in Figure 5.9. The proposed layout provides the following safety benefits:

- no reversing of vehicles, in areas of high pedestrian activity
- on-site traffic congestion is unlikely to impact on the external transport network
- design for a progressive reduction in speed environment in moving between the road and a parking space
- design for efficient and simple space search patterns
- avoid cross-aisle intersections

- design for aisles to intersect with Lewis Drive as near to right angles as possible
- provide a clearly defined pedestrian network which closely follows desire lines and minimises the potential for vehicular and pedestrian conflict
- minimises likely vehicle operating speeds and congestion levels at conflict points
- provides for pedestrian and vehicular queues at conflict points
- provides adequate queuing areas for set-down/ pick-up spaces that will not block the primary circulation road or site access driveways.

Figure 5.8: Proposed reconfiguration of existing set-down/pick-up zone and CP4



Basemap source: Nearmap