7th June 2023

Small Hospitals Initiative

Gunnedah Hospital Redevelopment

Transport Impact Assessment

For: **Ranbury on behalf of Health Infrastructure NSW**

Document Control

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1. Executive Summary

ptc. has been engaged by Health Infrastructure NSW to prepare a Transport Impact Assessment to accompany a Review of Environmental Factors (REF) for the redevelopment of the Gunnedah Hospital.

It is important to note that there is minimal, if any, additional hospital facilities proposed in this development. This development focusses predominantly on the updating and refurbishment, and in some instances relocation, of existing site facilities to create a more functional and up to date hospital.

The site has limited access to public transport, and as a result many staff and patients use private vehicles to access the site. Surrounding pedestrian and dedicated cycling facilities are limited, however the nature of the local roads and lower traffic volumes does enable some short distance active travel.

Based on parking occupancy surveys of the existing site, as well as anticipated traffic generation of the proposed development, adequate parking capacity exists to accommodate the future site needs. As such, the provision of at near the same number of spaces as existing is deemed to be adequate for the proposed development, supplemented by the improved drop off and pick up facilities. Accessible parking spaces are provided in excess of the minimum requirement and is therefore compliant.

Construction vehicle activity including parking during construction work and any temporary reduction in on-site parking is expected to be supplemented by the available on-street and nearby public carparking amenity.

All access and egress points across the site, for the various anticipated vehicle types, are suitable based on swept path assessments. All on-site parking spaces are to be compliant with Class 3 parking dimensions.

Based on the assumptions detailed above, the existing site provides adequate parking supply for the expected traffic generation. Furthermore, the surrounding road network operates with a good Level of Service, with ample spare capacity to handle any minor increases in traffic due to the proposed development or construction activity.

The implementation of a Green Travel Plan is expected to promote the uptake of active cycling and pedestrian travel to the site, particularly for staff, and lessen any carparking or traffic impacts that may arise in the future. A GTP is an operation programme, that actively evolves and progresses into the future of the site, through planned implementation and ongoing evaluation.

2. Introduction

2.1. Project Summary

ptc. has been engaged by Health Infrastructure NSW to prepare a Transport Impact Assessment to accompany a Review of Environmental Factors for the redevelopment of the Gunnedah Hospital.

The proposed development is set within the context of Gunnedah Hospital Redevelopment (GHR). The new building will provide a built environment to support contemporary models of care that are integrated and person-centred. A focus on providing spaces that are culturally safe, welcoming and that meet health care needs across the life span is a priority to ensure access closer to people's home.

The location of the site within the local context is shown in Figure 1.

Figure 1: Subject Site (Source: Nearmap)

2.2. Reference Document

Relevant Policies and Guidelines:

- Guide to Traffic Generating Developments (Roads and Maritime Services, 2002).
- NSW Planning Guidelines for Walking and Cycling (Department of Infrastructure, Planning and Natural Resources (DIPNR), 2004).
- Guide to Traffic Management Part 12: Integrated Transport Assessments for Developments (Austroads, 2020).
- Australian Standard 2890 Parking facilities.

3. Background Information

3.1. Site Context

The site is located within a low density residential zone (R2), situated to the south of the railway line, and just to the east of the Gunnedah Showground and High School. The local land use surrounding the subject site is shown in Figure 2. Key features surrounding the site include:

- The site is within a large residential zoning area (R2 and R3), with smaller pockets of public recreation areas (RE1).
- To the north, along key streets, is commercial and local retail zoning (B2 and B6).

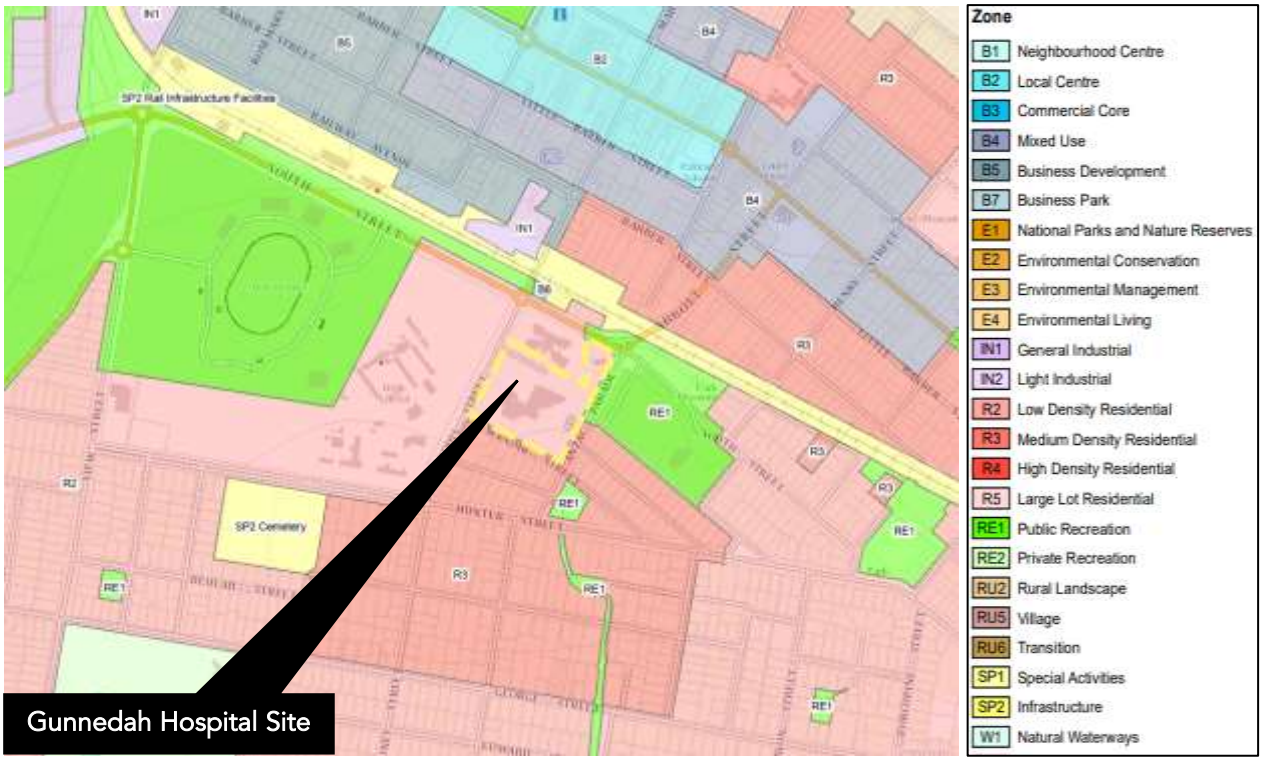


Figure 2: Local land use map (Source: NSW ePlanning Spatial Viewer)

3.2. Development Proposal

The development proposal seeks to provide the following:

- new single storey redevelopment including inpatient, maternity, birthing & emergency department
- landscaped central courtyard with stair & ramp access to lower level
- private landscaped birthing courtyard
- landscaped gathering courtyard
- new single storey plant room & enclosed rainwater harvesting plant yard
- refurbished and separated back of house loading zone
- new substation, bulk oxygen tank, fire protection thanks & pumpset
- new emergency parking, drop off zone & 24/7 entry
- new accessible ramp to helipad
- improved signage & wayfinding strategy

It is important to note that there is minimal, if any, additional facilities proposed in this development. This development focusses predominantly on the updating and refurbishment, and in some instances relocation, of existing site facilities to create a more functional and up to date hospital site.

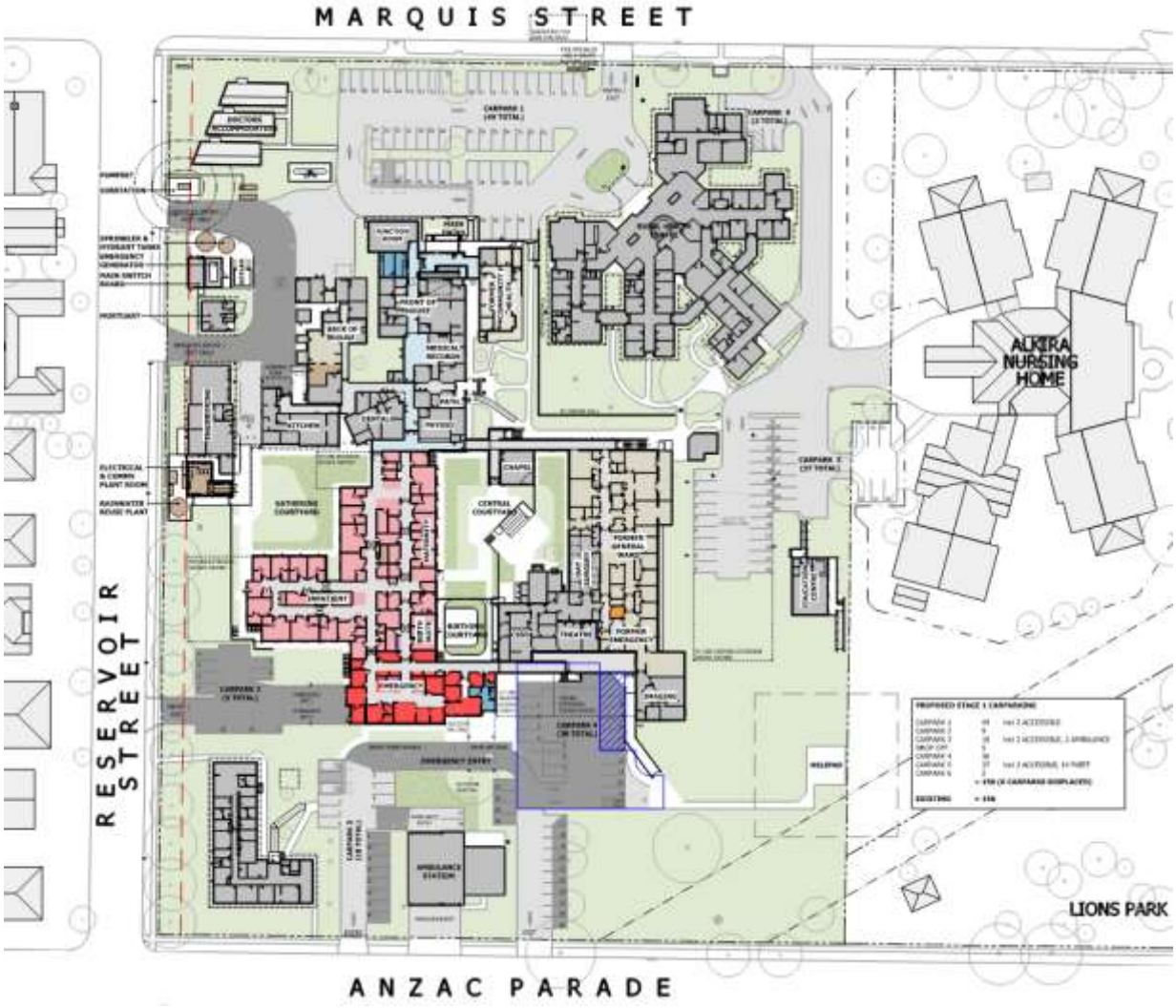


Figure 3: Proposed Site Floor Plan (dwp)

4. Existing Transport Facilities

4.1. Road Hierarchy

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

State Roads: Freeways and Primary Arterials (RMS Managed)

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

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

The subject site is located on Anzac Parade (local road) in the town of Gunnedah. The town is primarily serviced by State roads including Kamilaroi Highway (Conadilly Street) and Oxley Highway (South Street), as well as Regional roads including Bloomfield Street. The site is serviced by local roads managed by Gunnedah Shire Council.

Figure 4 shows the classification of the surrounding roads.

Figure 4: Road Heirarchy (Source: TfNSW State and Regional Roads)

Table 1: Existing road network – Anzac Parade

Anzac Parade	
Road Classification	Local Road
Alignment	North – South
Number of Lanes	1 lane each direction
Carriageway Type	Undivided
Carriageway Width	14m
Speed Limit	50 km/h
School Zone	No
Parking Controls	Unrestricted parking
Forms Site Frontage	Yes

Figure 5: Anzac Parade, Southbound (Source: Google maps)

Table 2: Existing road network – Reservoir Street

Reservoir Street	
Road Classification	Local Road
Alignment	East – West
Number of Lanes	1 lane in each direction
Carriageway Type	Undivided
Carriageway Width	12m
Speed Limit	50 km/h
School Zone	No
Parking Controls	No parking
Forms Site Frontage	Yes

Figure 6: Reservoir Street, Westbound (Source: Google maps)

Table 3: Existing road network – Marquis Street

Marquis Street	
Road Classification	Local Road
Alignment	North – South
Number of Lanes	1 lane in each direction
Carriageway Type	Undivided
Carriageway Width	16m
Speed Limit	50 km/h
School Zone	No
Parking Controls	Unrestricted parking
Forms Site Frontage	Yes

Figure 7: Marquis Street, Southbound (Source: Google maps)

Table 4: Existing road network – South Street

South Street	
Road Classification	State Road
Alignment	East – West
Number of Lanes	1 lane each direction
Carriageway Type	Undivided
Carriageway Width	15m
Speed Limit	50km/hr
School Zone	No
Parking Controls	Unrestricted
Forms Site Frontage	Yes

Figure 8: South Street, Westbound (Source: Google maps)

4.2. Public Transport

The locality has been assessed in the context of available forms of public transport that may be utilised by prospective staff and visitors. When defining accessibility, the NSW Guidelines to Walking & Cycling (2004) suggests that 400m-800m is a comfortable walking distance. Furthermore, the Guidelines also suggest 1500m is suitable for cycling accessibility to public transport facilities and local amenities.

The 400m and 800m catchments are shown in Figure 9.

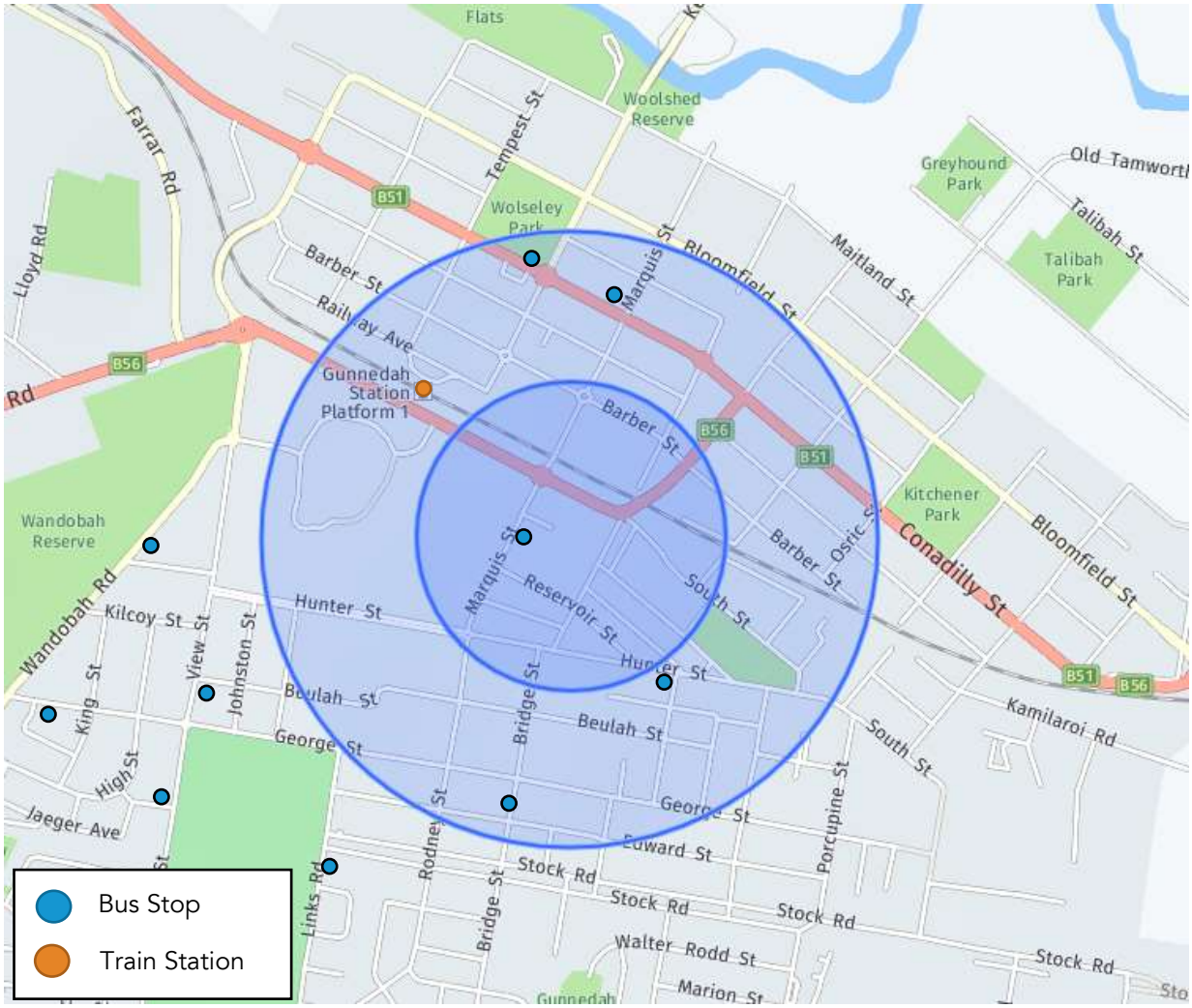


Figure 9: Public transport services and the 400m and 800m walking catchments

4.2.1. Bus Services

Several private bus routes operate within Gunnedah and provide transit about the town. These services do not accept opal cards. The services departing from the closest stop to Gunnedah Hospital are summarised in Table 5.

Table 5: Bus Services

Bus Service Number	Route Description	Service Times
451	Gunnedah CBD to South Gunnedah (Loop Service)	Mon-Fri: Hourly Weekend: no services
452	Gunnedah CBD to South East Gunnedah (Loop Service)	Mon-Fri: Hourly Weekend: no services

4.2.2. Rail Services

Gunnedah station connects the town to the larger NSW regional train network. Adjacent town stations include Boggabri and Werris Creek. The New South Wales Train Link Map for the North Western Region is shown in Figure 10. Coaches are used to supplement the rail network in regional NSW.

Figure 10: NSW North Western Train Lines

4.3. Active Transport

4.3.1. Pedestrian Facilities

Walking is a viable transport option for distances under 800m and is often quicker for short trips door to door. Walking is also the most space efficient mode of transport for short trips and presents the highest benefits. Co-benefits where walking replaces a motorised trip include improved health for the individual, reduced congestion on the road network and reduced noise and emission pollution. Site observations show that the existing footpath networks and crossing points between the adjoining residential precincts and the hospital are generally adequate.

4.3.2. Cyclist Facilities

Like walking, cycling is only likely to be an attractive mode share for staff members who live within relatively close distance to the campus.

The site is surrounded by local roads, particularly in the residential areas to the south. Whilst there are no dedicated cycleways or shared paths, these roads are wide with sizeable shoulders. Additionally, the traffic volumes of these smaller local roads would likely be low, thus making on road cycling more suitable as a short distance mode of travel.

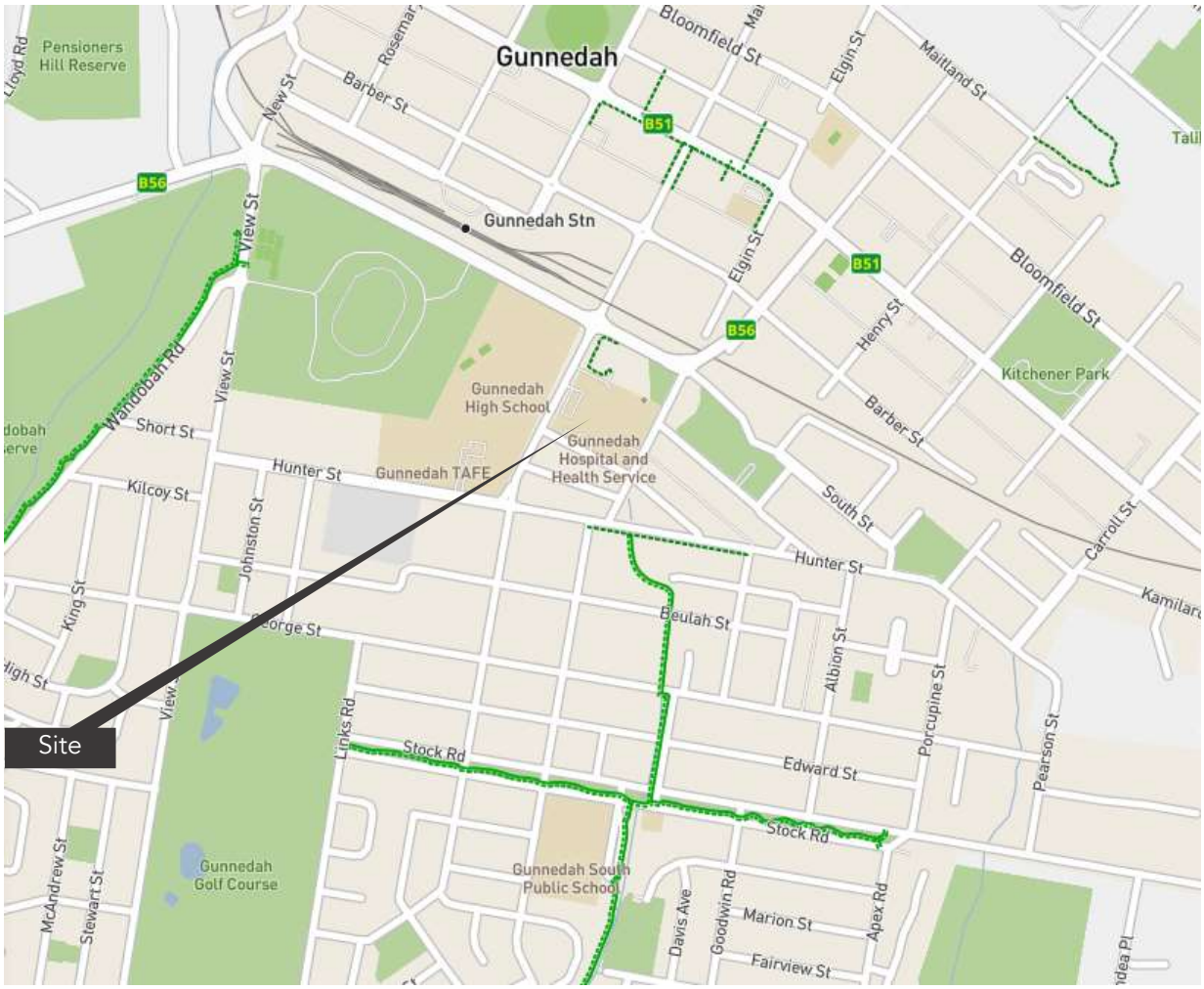


Figure 11: Cycling Paths (Source: Transport for New South Wales)

The site has limited access to public transport, and as a result many staff and patients use private vehicles to access the site. Surrounding pedestrian and dedicated cycling facilities are limited, however the nature of the local roads and lower traffic volumes does enable some short distance active travel.

5. Parking Provision

5.1. Assessment of Existing Parking

An on-site assessment of the existing parking provision, including an occupancy and length of stay survey, was undertaken to determine any underlying issues with the carparking available and the general trends of the hospital users. Vehicle turnover in the main carpark was typically high as a result of quick patient visits. It was observed on-site that staff members utilise the main car parking area to park, and this is verified by the Length of Stay Survey.

Overall, the existing car parking provided on site is adequate for the various staff uses, as well as patient and visitor demand. Given that there is no new hospital infrastructure or facilities being provided in the development, nor any notable increase in staffing numbers, it is expected that the existing on-site parking provision will be suitable.

During our Length of Stay Occupancy Survey, peak car park occupancy of 65.4% was observed, indicating that the existing parking provision is more than adequate for the hospital.

Furthermore, the surrounding streets have additional parking capacity for the use of staff or longer stay visitors to the hospital. The RMS Guide to Traffic Generating Developments (2002) states (for private hospitals) that consideration should be given to reducing onsite parking if convenient and safe on street parking is available, provided that the use of such parking does not adversely affect the amenity of the surrounding area. As such, the use of the on street parking, if required, is suitable.

The following sections are an assessment of the requirements and provisions for the development site:

5.2. Surveys

A site visit was carried out on Monday 25th July 2022 to assess the potential supply and demand for parking in the vicinity of the Hospital and the availability of alternative parking supply for hospital-related users (e.g. staff, patients and visitors). In addition, we undertook surveys at the Hospital to assist in building the demand model for parking at the campus.

The parking occupancy and length of stay surveys for on-campus car parks were conducted on Wednesday 27th July 2022 between 8am-6pm at hourly intervals. We also undertook an occupancy survey for on-street spaces within RPZ at 10am, 12pm and 2pm. The intercept survey was also undertaken on 27th July 2022. The staff survey was run over a period of 14 days from 25th July 2022 to 7th August 2022.

5.2.1. Current Parking Capacity

The following map shows all on-campus car parks:

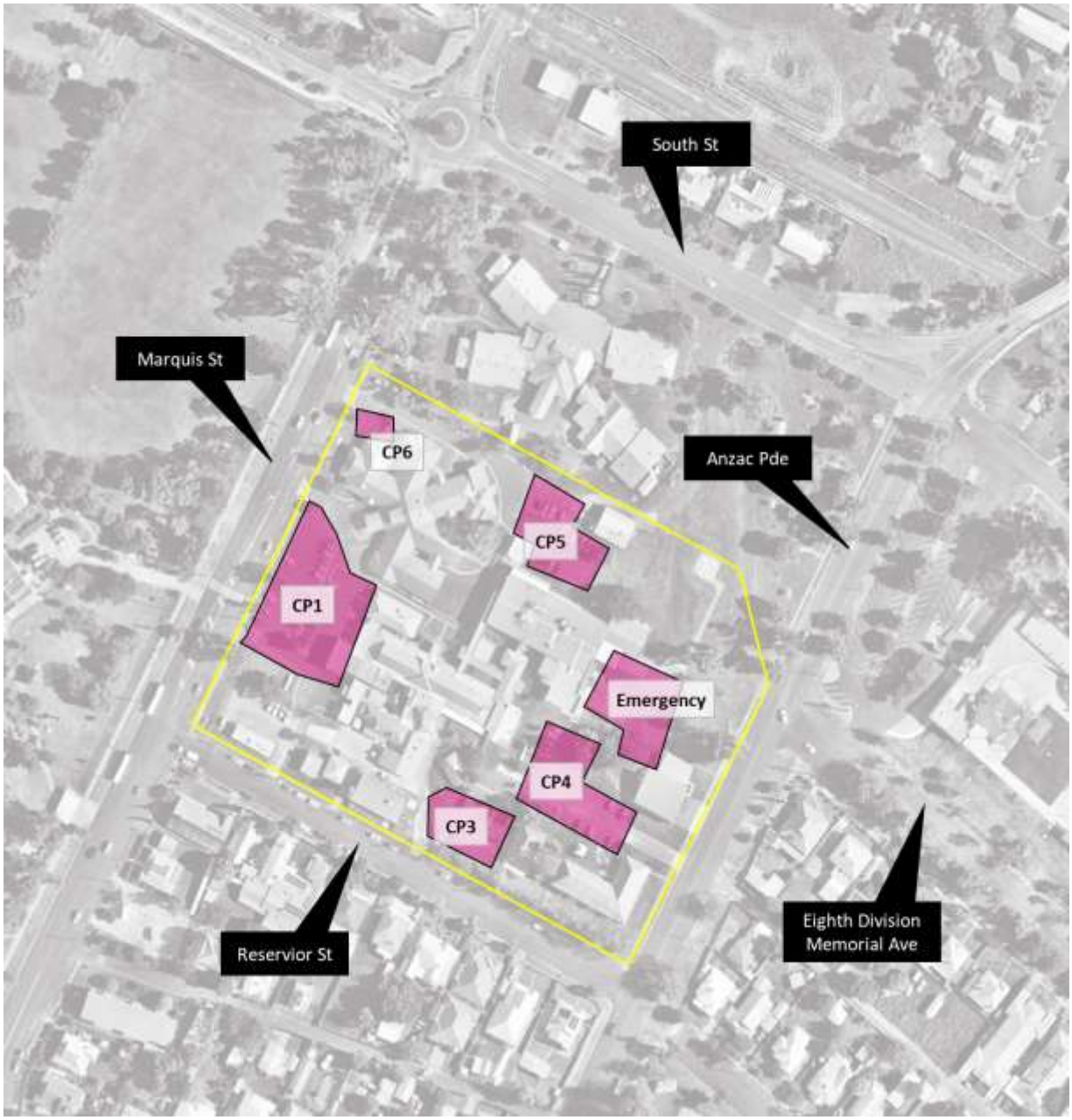


Figure 12: On-Campus Car Parks

Current parking supply in the Hospital comprises a total of 156 formal spaces. A breakdown of the parking supply is as follows:

Table 6: Breakdown of Parking Supply by Car Park

Car Park	Formal Spaces
Car Park 1	50
Car Park 3	18
Car Park 4	41
Car Park 5	37
Car Park 6	2

Car Park	Formal Spaces
Emergency car park	8
Total – On Campus Car Parks	**156**

5.2.2. Parking Occupancy

The main objective of the occupancy surveys was to observe peak parking demand on weekday as a cross check of the estimated peak parking demand resulting from our demand model and ensure the reliability of the model for future forecasting.

The summary of the results is shown in Figure 13 and Figure 14, whereas the full results and the analysis are shown in Appendix C. The peak occupancy of the car parks is illustrated in the heatmap in Figure 15.

The key findings are as follows:

- Peak occupancy of on-campus car parks (102 spaces, 65.4% of total capacity) occurred between 1pm-2pm on Wednesday;
- Car Park 3 & 5 had the highest peak occupancy (77.8% and 75.7% respectively) during peak hours;
- At peak hour, the occupancy of Car Park 1 was 60%, even though it provided the most convenient parking just outside the main entrance;
- The peak occupancy of on-street parking spaces was 78 spaces (19.6% of capacity) between 10am-11am; whilst the community car park was always empty (less than 5% occupancy at peak);
- It is not possible to accurately identify how many observed on-street vehicles belong to Hospital-related users, as some may belong to residents or other local workers (e.g. high school staff) and/or visitors.

	Capacity	8:00-9:00		9:00-10:00		10:00-11:00		11:00-12:00		12:00-13:00		13:00-14:00		14:00-15:00		15:00-16:00		16:00-17:00		17:00-18:00	
On-Campus Car Park		Occ. #	Occ. %	Occ. #	Occ. %	Occ. #	Occ. %	Occ. #	Occ. %	Occ. #	Occ. %	Occ. #	Occ. %	Occ. #	Occ. %	Occ. #	Occ. %	Occ. #	Occ. %	Occ. #	Occ. %
Car Park 1	50	16	32.0%	26	52.0%	28	56.0%	28	56.0%	28	56.0%	30	60.0%	22	44.0%	29	58.0%	14	28.0%	8	16.0%
Car Park 3	18	10	55.6%	12	66.7%	13	72.2%	14	77.8%	12	66.7%	14	77.8%	12	66.7%	11	61.1%	6	33.3%	6	33.3%
Car Park 4	41	19	46.3%	20	48.8%	22	53.7%	21	51.2%	26	63.4%	27	65.9%	25	61.0%	24	58.5%	13	31.7%	12	29.3%
Car Park 5	37	30	81.1%	31	83.8%	29	78.4%	28	75.7%	27	73.0%	28	75.7%	30	81.1%	25	67.6%	21	56.8%	20	54.1%
Car Park 6	2	1	50.0%	2	100.0%	2	100.0%	2	100.0%	2	100.0%	1	50.0%	2	100.0%	2	100.0%	2	100.0%	2	100.0%
Emergency Car Park	8	6	75.0%	4	50.0%	2	25.0%	2	25.0%	3	37.5%	2	25.0%	2	25.0%	2	25.0%	1	12.5%	1	12.5%
Total	156	82	52.6%	95	60.9%	96	61.5%	95	60.9%	98	62.8%	102	65.4%	93	59.6%	93	59.6%	57	36.5%	49	31.4%

	Capacity	10:00-11:00		12:00-13:00		14:00-15:00	
Off Campus Parking		Occ. #	Occ. %	Occ. #	Occ. %	Occ. #	Occ. %
Marquis St	96	36	37.5%	33	34.4%	21	21.9%
Hunter St	65	8	12.3%	6	9.2%	5	7.7%
Reservoir St	73	24	32.9%	22	30.1%	20	27.4%
South St	55	6	10.9%	5	9.1%	16	29.1%
Eighth Division Memorial Ave	46	4	8.7%	4	8.7%	3	6.5%
Anzac Pde	63	0	0.0%	0	0.0%	0	0.0%
Subtotal - On Street	398	78	19.6%	70	17.6%	65	16.3%
Community Car Park	82	1	1.2%	0	0.0%	4	4.9%
Total Off Campus Parking	480	79	16.5%	70	14.6%	69	14.4%

Figure 13: Summary of Occupied Spaces and Occupancy3

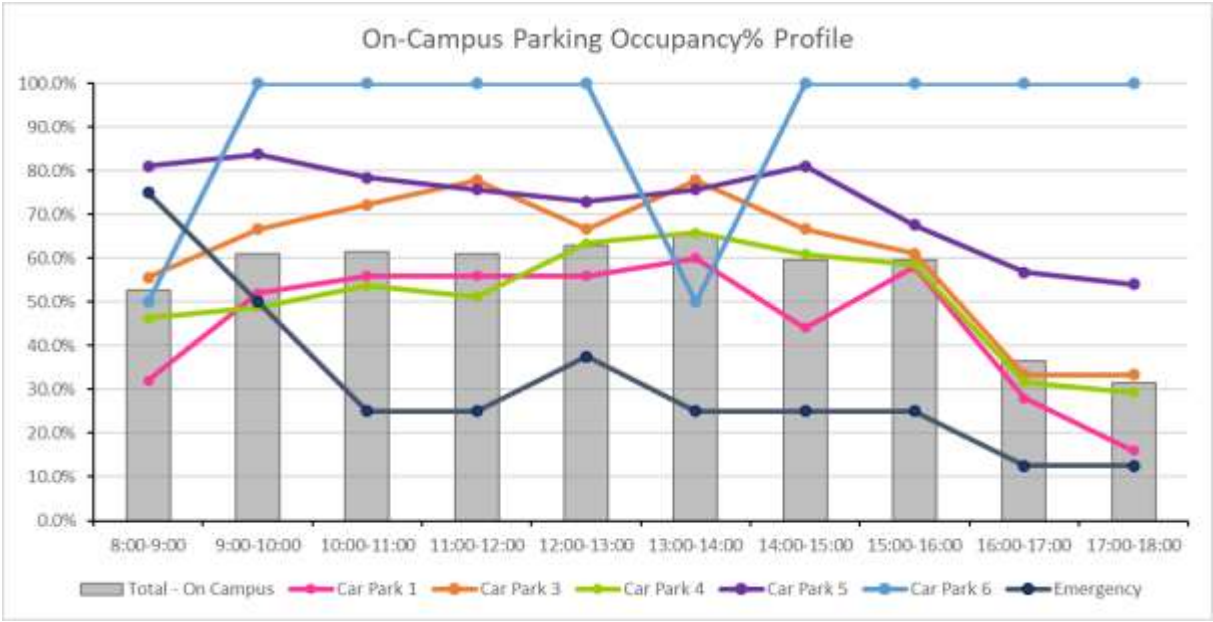


Figure 14: On-Campus Parking Occupancy Profile

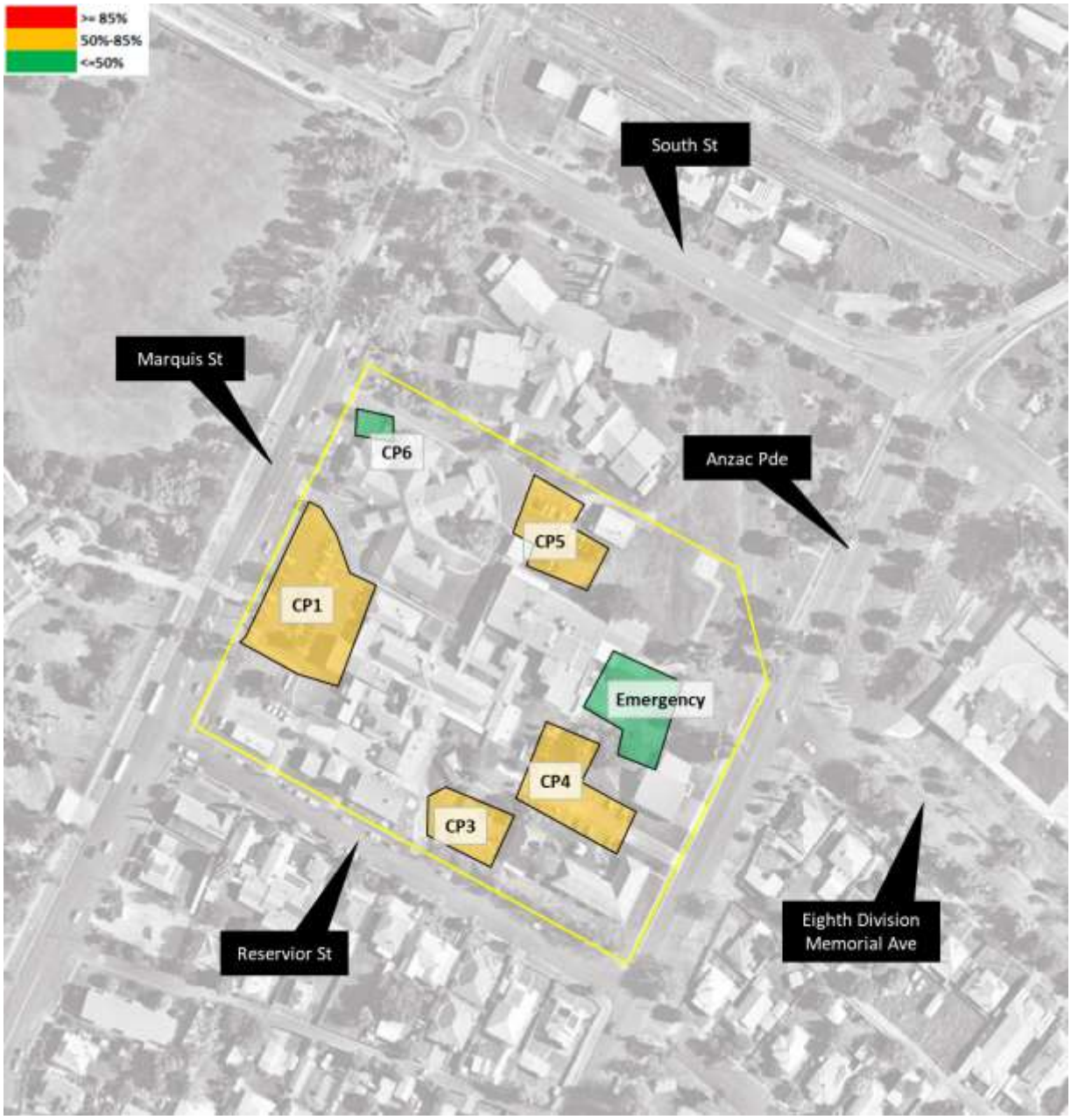


Figure 15: Peak Occupancy Heatmap

5.2.3. Length of Stay

The objective of this survey was to understand the average length of stay of outpatient and visitor vehicles and the average number of times the bays turn over each day.

The results of our analysis are contained in Appendix C.

A summary of the average length of stay and turnover for outpatient and visitor vehicles, based on the assumption that vehicles parked <5 hours in public spaces belong to patients & visitors, is as follows:

Table 7: Patient & Visitor Average Length of Stay and Turnover

Patient & Visitor Parking	ptc. Survey
Average Length of Stay	2.29 hours / car
Turnover	2.11 times / space

The modal average length of stay is 0-3 hours, as shown in the chart below:

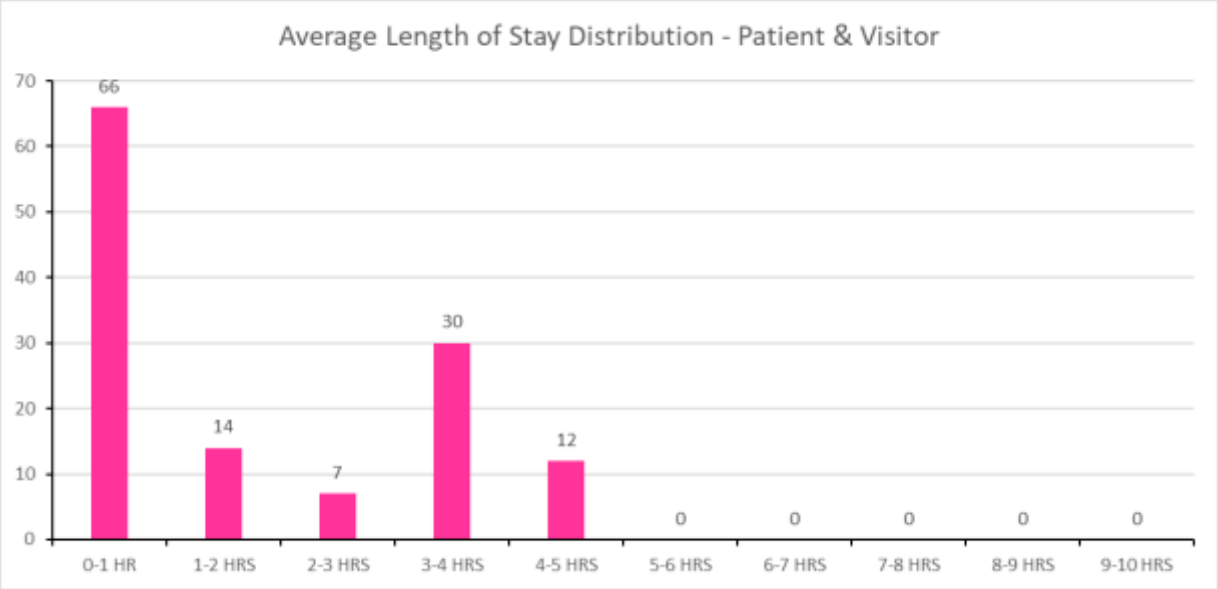


Figure 16: Patient/Visitor Length of Stay Distribution

Based on our experience from other hospital sites, although most patients / visitors would stay for up to 3 hours, there are a certain number staying considerably longer (up to 5 hours) which is usual for a site which services a large regional area.

The length of stay of an outpatient is impacted by how quickly the Hospital is able to service those patients.

5.2.4. Travel Mode Survey

We undertook online surveys of staff at the Hospital to understand:

- How they travel to the Hospital
- If they drive:
    - Where do they park
    - Why don't park on campus
    - How far do they walk from parking space to the Hospital
    - How many people are in the vehicle
    - Why they do not use public transport
    - Would they be interested in car pooling / car sharing

- Would they be interested in cycling if appropriate end of trip facilities were provided

We also conducted intercept surveys of outpatients and visitors to understand:

- How they travel to the Hospital
- If they drive:
  - Where do they park
  - How many people are in the vehicle
  - Why they do not use public transport
  - Their expected length of stay

The above data was used to construct our parking demand estimates.

During our surveys we obtained 38 responses from staff and 55 responses from outpatients and visitors.

A summary of key results for responses by staff is shown below:

Table 8: Staff Online Survey Key Results Comparison

Key Result	ptc. Survey
% Car	100%
Avg. Staff per car	1
% Drop off	0%
% Park on Campus	90% of which: 38% in Car Park 4 31% in Car Park 1 10% in Car Park 3 8% in Car Park 5
How far do you walk from parking space to the Hospital	Within 200m – 100%
Why travel by car	* Lack of alternatives 44% * Driving is more convenient 44% * Insufficient services 31% * Multiple destinations 31% * Long travel distance 21%
Are you interested in car pooling / car sharing	Yes – 10%
Are you interested in cycling	Yes – 5%
How far do you travel to work	* 0-5 km - 59% * 5-20km – 26% * 20-50km – 13% * More than 50km - 3%

Some of ideas provided by staff include:

- *"There needs to be secure staff parking that doesn't allow access to the general public. In the CP1 carpark outside the Rural Health Centre, car spaces are taken up by high school teachers and students throughout the day. And during drop off and school pick up parents park waiting for their children. This is a massive safety risk and they should not be allowed to utilise this car park."*
- *"Covered car park areas to protect vehicles from the elements including heat of summer. Staff only area so that staff can be assured of carpark close to the building and security cameras when working shift work."*
- *"driveway to carpark 3 is too narrow and can cause issues when 2 cars meet"*

The following table shows the key results from outpatient & visitor intercept surveys:

Table 9: Outpatient/Visitor Intercept Survey Key Results Comparison

Key Result	ptc. Survey
% Car	98.2%
% Drop off	5.6%
% Park on campus	89% of which: 65% in Car Park 1 24% in Car Park 3
% Park on street	6% - Reservoir Street & Marquis Street
Why don't park on campus	Easy access to the Hospital
Why travel by car	* Driving is more convenient 94% * Lack of convenient alternatives 35% * Take longer by other mode 19% * Insufficient services 14% * Long travel distance 12%
Avg. expected length of stay (Hr)	0.81 Hours
How far do you travel to the Hospital	* 0-5 km - 65% * 5-20km – 21% * 20-50km – 4% * More than 50km - 10%

5.3. Parking Demand

ptc.'s approach to estimating parking demand is outlined in Figure 17. We acknowledge that no two sites are identical; therefore our general methodology is tailored to the requirements of each specific site.

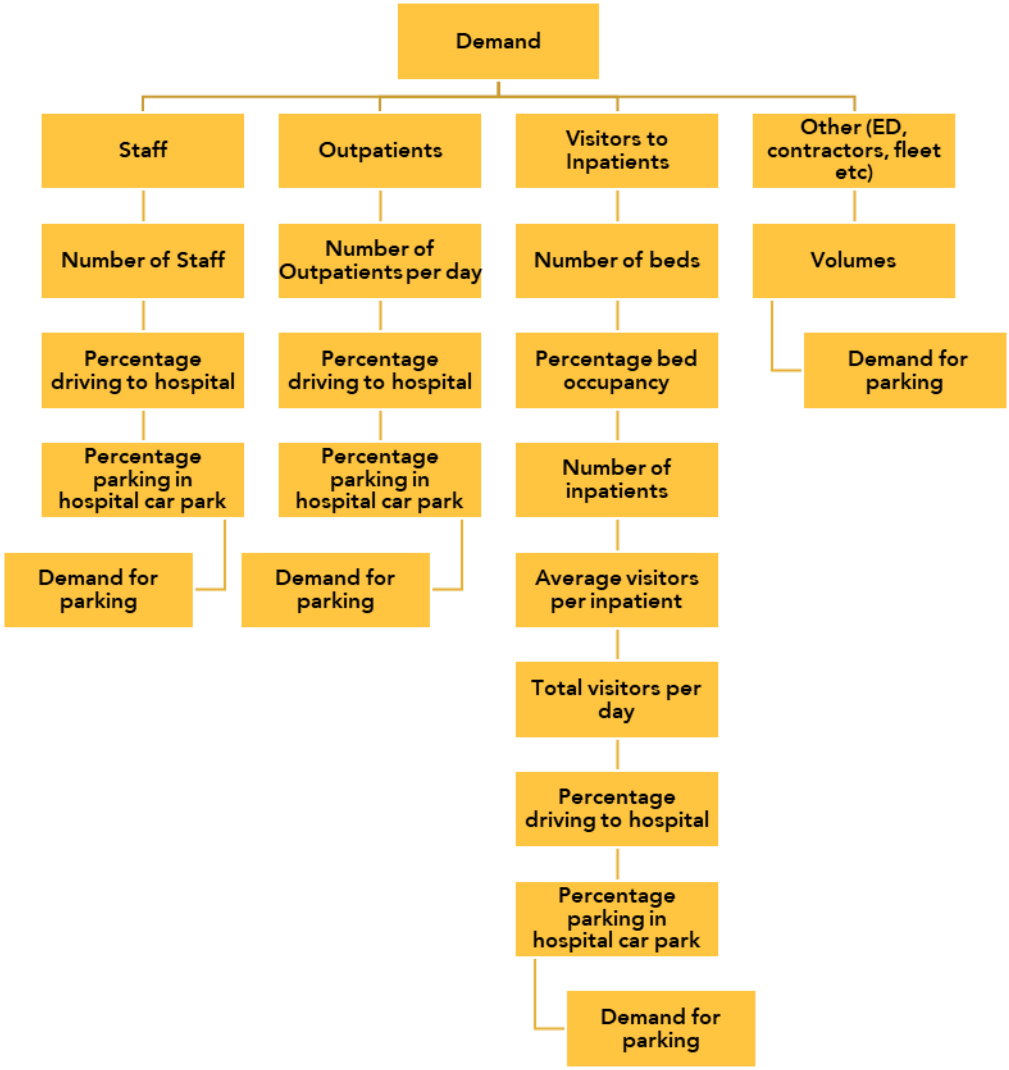


Figure 17: Parking Demand Estimate Methodology Overview

The raw demand data is converted into detailed demand estimates, subdivided by the appropriate user and time categories, expected turnover per space, etc. The results are then incorporated into individual spreadsheets representing the current and future situations.

5.3.1. Key Assumptions and Inputs

General assumptions applied in the preparation of the current base case demand estimates are summarised in below:

Table 10 - Key Assumptions and Inputs - Current Base Case Estimates

Key Assumption / Input	Data Source
Staff FTE	Hospital data
Outpatient Occasions of Service per annum	Hospital data
Emergency daily presentations	Hospital data
No. of Visitors per weekday	Hospital data

Key Assumption / Input	Data Source
% driving and requiring parking	Online staff and intercept surveys
People per car	Intercept survey & ptc. assumptions
Staff/VMO/Fleet turnover	ptc. assumption
Outpatient/visitor turnover	ptc. Length of Stay survey

Where hard data has not been provided to us, or is not available, we have adopted assumptions based on our experience of other comparable hospitals and from observations during our site visit.

Appendix D summarises the current base case demand drivers and assumptions.

Below is a summary of our analysis, assumptions and conclusions regarding current base case demand for parking from the Hospital-related users. The data has been used to build our demand models (Appendix D).

5.3.2. Calculation Methodology

We set out below the rationale for interpreting our demand estimates:

a) Total cars per day = people x % driving and requiring a car space / people per car

b) **Peak parking spaces required = (a) / parking space turnover**

We adopted "Outpatients" as a worked example:

21 Outpatients per weekday x 93% driving and requiring a car space / 1 person per car = approx. 19 cars / space turnover of 2.11 = approx. 10 parking spaces required at peak.

5.3.3. Summary of Weekday Peak Base Case Parking Demand

A summary of the estimated current peak weekday parking demand is shown in Table 9 below. More details are included in Appendix D.

Table 11 - Summary of Base Case Weekday Peak Parking Demand – Current Base Case

Weekday Peak Parking Demand – Base Case Estimate	Current
Staff (incl. VMO)	**42**
Public:	
Outpatients	10
Visitors	14
ED Presentation	12
Total Public	**36**
Fleet Vehicles	**12**
Other:	
Education & Training	1

Weekday Peak Parking Demand – Base Case Estimate	Current
Volunteers	3
Total Other	**4**
Grand Total	**94**

5.3.4. Parking Surplus / (Shortfall)

Our analysis of parking surplus / (Shortfall) at Gunnedah Hospital is shown as follows:

Table 12: Summary of Weekday Peak Parking Demand – Current Weekday Peak Current

Weekday Peak	Current
Total Parking Demand	94
Total On-campus parking supply	156
Total Surplus	62

Conclusions:

- Currently there is a surplus of 62 spaces overall at the Hospital campus; and
- Any future growth or fluctuation in the parking demands of the site are able to be absorbed by the surplus of on-campus parking and on street parking surrounding the hospital.

Assumptions:

- No changes to the parking behaviour of staff, outpatients and visitors (e.g. same %'s continue to drive, use same parking locations, etc.)
- No changes to the % staff, outpatients and visitors who are dropped off and do not park
- No significant price change in the hospital car parks
- No changes by Council to on-street and off-street parking regimes that would result in fewer spaces available to hospital-related users, such as introducing "No Parking" areas, changing unrestricted spaces to time restricted parking, etc.
- No significant increase in demand for parking from external sources (e.g. new development, schools, community facilities, etc.)

We have not quantified weekend parking demand as it will always be lower than the weekday peak due to:

- Lower volumes of staff, particularly administration and support services staff
- Limited or no outpatient activity

5.3.5. Verification Check

As a high-level reality check we tested the veracity of the current parking demand model by comparing the estimated peak parking demand with the observed peak demand from our surveys as follows:

Table 13 - Verification Check

Verification Check	Count
Estimated Peak Demand	94
Observed Peak Occupancy – On campus	102
Difference	(8)

The difference (8 vehicles) between the estimated peak demand (per the current model) and the observed peak occupancy within the ZOI is likely due to some non-hospital users parking in the Hospital car parks (e.g. parents who pick up their children, contractors etc.).

5.4. Planning Policy

Gunnedah Shire Council (GSC) Development Control Plan (DCP) provides parking rate requirements for medical centres, but makes no explicit mention of a rate for Hospitals. The parking based on the medical centre requirements are calculated below, however it is anticipated that provision of the same, or a greater number of parking space, is deemed to be acceptable given no new infrastructure or staffing increases proposed in the development.

5.5. Parking Requirements for Development Site

No DCP parking rate is provided for hospitals.

The DCP rate for medical centres is as follows:

1 space per 25m^2 GFA, OR

4 spaces per practitioner PLUS 1 space per employee, whichever is greater

It is to be noted that the site operates as a hospital, and as such the above rate is not entirely accurate or representative to use. As stated in previous sections of this report, the proposed hospital development does not intend to provide additional hospital services, and is instead a refurbishment and relocation of existing services on site. As such, parking requirements for the proposed site are deemed to be similar to the existing parking provision.

A summary of the existing and proposed parking at the site is provided in Table 14.

Table 14: Summary of Parking Supply (Based on provided Design Documents)

Car Park	Pre Development	Post Development
Public		131
Staff and Fleet		14
Drop off/ Pick up		5
TOTAL	156	150

5.6. Accessible Parking

With reference to *BCA Table D3.5 Car parking numbers for people with a disability*, for a Class 9a building—a health-care building, including those parts of the building set aside as a laboratory (a) Hospital (non-outpatient area) the requirement is 1 space for every 50 carparking spaces or part thereof.

Table 15: Accessible Parking Provision (Based on 70% Design Documents)

	Standard Spaces	Accessible Rate	Required Accessible Spaces	Provided Accessible Spaces
Parking	131	1 per 50 spaces	3	4

The proposed development exceeds the requirements for accessible parking provision.

5.7. Drop-Off Bays

The existing site layout has turn circles throughout to facilitate drop off and pick up of patients. These are to be retained and improved upon in the development, including the addition of drop off and short term parking zones to the eastern side of the site. The provision of drop-off areas is beneficial for mobility impaired patients who may struggle to walk from the carpark to the hospital entrance. Drop off areas provide a safe and efficient access point that limits conflicts in the carpark between pedestrians and vehicles. By enabling safe drop off, drive and park mode of transport to the hospital has the potential to be reduced.

The proposed site provides improved formalised drop off and pick up facilities, which will greatly assist in catering for any future increase in trips to and from the site, without a need to further reply on vehicular parking. It is expected that the provision of improved formalised pick up and drop off facilities will increase mode split for patients being dropped off and pick up.

Based on parking occupancy surveys of the existing site (demonstrating spare capacity), as well as anticipated traffic generation of the proposed development, adequate parking capacity exists to accommodate the future site needs. As such, the reduction of 6 spaces from existing is deemed to be adequate for the proposed development. Accessible parking spaces are provided in excess of the minimum requirement and is therefore compliant.

6. Access Assessment

6.1. Loading Dock and Service Vehicles

Access to the loading dock is proposed via Reservoir Street. This separation from the main car park area provides safety for vehicles and pedestrians from heavy vehicles accessing the loading dock and back of house areas. The swept path assessment for the service area is provided in Appendix B.

Access for large vehicles, such as 19m semi-trailers for oxygen delivery, is to be via Reservoir Street. This access arrangement is to be managed internally by the hospital, and all trucks accessing the site are to be notified of the access arrangements.

6.2. Car Park Access and Circulation

All car park areas have been assessed for access and circulation with a swept path assessment. The details of these assessments are shown in Appendix B.

Based on AS 2890.1 (2004), and the classification of the site as a hospital, Class 3 Parking is required.

AS2890.1 (2004) specifies that:

- Visitor spaces must be a minimum of 2.6m width by 5.4m length, with an aisle width of 5.8m.
- Staff parking spaces are to be a minimum of 2.4m width by 5.4m length, with an aisle width of 5.8m.
- Accessible parking spaces are to be a minimum of 2.4m width by 5.4m length, with a shared bay of the same dimensions alongside.

All parking areas and circulation aisles have been assessed and details of this are in Appendix B.

6.2.1. Main Carpark (Marquis Street)

A singular entry and exit driveway off Marquis Street is proposed for the main carparking area. This access point is opposite the local school, and at AM and PM peak times the street is busy with student pick up and drop off.

This carpark is expected to remain largely unchanged from the existing site, and as such all parking spaces already in existence and not being installed as part of this development are outside the scope of this assessment.

6.2.2. Doctor and Emergency Vehicle, Ambulance Dock (Reservoir Street)

Access to both the ambulance loading bay, as well as doctor and emergency vehicle parking is provided from Reservoir Street through a singular entry/exit driveway. These spaces are allocated and as such a turning bay is not required.

6.2.3. Fleet and Staff Parking

A separate, existing entry/exit point off Marquis Street is used for access to the staff and fleet car parking area. This car park is expected to be extended in the future to provide more adequate fleet car parking and to provide a safe and secure staff parking facility.

6.2.4. Public Car Park (ANZAC Parade)

Additional public parking is made available from the ANZAC Parade side of the hospital, with separated one way entry and one way exit driveways. Drop off and pick up facilities are also provided in this location. The ambulance station access is provided from the ANZAC Parade entry driveway.

All access and egress points across the site, for the various anticipated vehicle types, are suitable based on swept path assessments. All on-site parking spaces are to be compliant with Class 3 parking dimensions.

7. Traffic Impact Assessment

7.1. Existing Traffic Conditions

7.1.1. Traffic Surveys

Intersection traffic surveys were undertaken on Wednesday 27th July 2022. This date was selected as suitable given that it avoids any impact on data validity caused by school holidays or the first week back at school.

The following intersections were surveyed:

1.	Marquis Street / South Street	4-leg priority roundabout
2.	Marquis Street Pedestrian Crossing	pedestrian crossing
3.	Marquis Street / Reservoir Street	3-leg intersection
4.	Reservoir Street / Anzac Parade	4-leg intersection
5.	Anzac Parade / Eighth Division Memorial Avenue	3-leg intersection

Figure 18 provides the location of the intersections.

Figure 18: Traffic Survey Intersections

7.1.2. Survey Data Validation and Analysis

Following the completion of intersection traffic surveys, analysis of the data was undertaken to verify and validate the traffic volumes. Confirmation of accuracy of the data was by manual spot checks of the survey video against the recorded data.

Based on this validated traffic data, a SIDRA model was developed.

7.1.3. SIDRA Analysis

A volume analysis was performed using the SIDRA Intersection 9 software, a micro-analytical tool for individual intersection and whole-network modelling. The models are based on the collected traffic survey data. SIDRA provides a number of performance indicators outlined below:

- Degree of Saturation – The total usage of the intersection expressed as a factor of 1 with 1 representing 100% use/saturation. (e.g. 0.8=80% saturation).
- Average Delay – The average delay encountered by all vehicles passing through the intersection. It is often important to review the average delay of each approach as a side road could have a long delay time, while the large free flowing major traffic will provide an overall low average delay.
- 95% Queue Lengths (Q95) – is defined to be the queue length in metres that has only a 5-percent probability of being exceeded during the analysis time period. It transforms the average delay into measurable distance units.
- Level of Service (LoS) – This is a categorization of average delay, intended for simple reference. It is a good indicator of overall performance for individual intersections. The RMS adopts the following bands:

The LoS criteria is shown in Table 16.

Table 16: Intersection performance – Levels of Service

Level of Service	Average Delay (secs/vehicle)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	<14	Good operation	
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity. At signals, incidents would cause excessive delays. Roundabouts require other control mode	At capacity, requires other control mode
F	>70	Extra capacity required	Extreme delay, major treatment required

The SIDRA results from that report are provided in Table 17.

Table 17: Summary of Existing and Future Traffic Conditions

Intersection	Time	Period	Level of Service[1]	Degree of Saturation (v/c)	Average Delay (s)[2]	95% Queue Length (m)
Marquis Street / Oxley Highway	AM Peak	Existing	B	0.235	11.9	10
	PM Peak	Existing	B	0.220	11.8	9.2
Marquis Street Ped Crossing	AM Peak	Existing	A	0.411	6.0	17.5
	PM Peak	Existing	A	0.353	6.3	12.1
Marquis Street / Reservoir Street	AM Peak	Existing	A	0.170	7.4	1.6
	PM Peak	Existing	A	0.141	7.5	1.2
Reservoir Street / Anzac Parade	AM Peak	Existing	A	0.140	9.1	1.3
	PM Peak	Existing	A	0.105	8.5	1.2
Anzac Parade / Eighth Division Memorial Avenue	AM Peak	Existing	A	0.156	7.6	3.1
	PM Peak	Existing	A	0.141	7.5	2.7

7.1.4. SIDRA Analysis Summary

The existing scenario modelled, with the results shown above in Table 17, demonstrates that the network operates with spare capacity capable of supporting the future hospital site. This is especially true given that the proposed development has no new infrastructure or hospital facilities, nor any increase in staffing numbers. The proposed development is rather, a refurbishment of the existing site facilities.

Therefore, with traffic generation similar to the existing model, it is anticipated that the road network and traffic will experience no significant negative impact from the proposed development.

[1] For priority intersections, the LOS of the worst approach is taken
[2] For priority intersections, the Average Delay of the worst approach is taken

7.2. Proposed Traffic Generation and Parking Demand

Given that the proposed site has no major new infrastructure, new departments, or any notable increase in staffing numbers, it is assumed that there will be no significant net increase in parking demand for the future site. In combination with this, the proposed Green Travel Plan is to be implemented to encourage the uptake of active travel for those who live nearby to the hospital, or the use of the two town bus routes where suitable. It is expected that only a small number of staff will find these modes of travel suitable and thus any minor increase in staff due to the development is expected to be offset.

Given that there is expected to be little or no increase in staff and therefore minimal increased parking demand and traffic generation, a future SIDRA model for the development site is not warranted. Rather, an assessment of the existing site traffic and car parking habits and occupancy provides insight into the suitability of the existing car parking numbers.

Both the existing scenario model and our on-site Length of Stay carpark occupancy studies demonstrate that the existing provision of parking is suitable. Given the minimal increase to staff numbers and no new hospital infrastructure, it is expected that the existing parking numbers are suitable to be retained for the proposed development.

Based on the assumptions detailed above, the existing site provides adequate parking supply for the expected traffic generation. Furthermore, the surrounding road network operates with a good Level of Service, with spare capacity to handle any minor increases in traffic due to the proposed development.

7.2.1. Impacts of Construction on Parking

Construction vehicle activity including parking during construction work and any temporary reduction in on-site parking is expected to be supplemented by the available on-street and nearby public carparking amenity.

8. Green Travel Plan

It is expected that the details in this section will be developed further as the project progresses, with a view to implementation of a formalised monitoring and evaluation process to achieve the maximum benefits of a Green Travel Plan (GTP).

8.1. What is a green travel plan?

A GTP is a document that outlines how a development intends to make travel to and from the site safer and more sustainable for residents and their visitors. The GTP addresses local traffic issues around the site and encourages active, safe and sustainable travel methods, such as walking, cycling, scooting, public transport or car sharing. A GTP correlates with the development's overall aspirations and is a document that is monitored and reviewed regularly.

A GTP is not just the installation of bike racks or provision of end-of-trip facilities. A good GTP aims to promote and maximise the use of more sustainable modes of travel via a range of actions, promotional campaigns and incentives. The plan includes site management tools that encourage residents, staff and visitors to make more sustainable transport choices. A GTP requires ongoing implementation, monitoring and review. As such, nominating an individual or a team to oversee the implementation of a travel plan is a crucial component of success.

An effective GTP can offer many benefits such as reduced parking costs, less congestions on the public road networks, health and environmental benefits which generally results a healthier and happier campus with fewer sick days to staff and students.

8.2. Why a green travel plan is required

Development of a Green Travel Plan is widely accepted as one of the best ways to increase active travel around the site. A successful GTP offers many benefits for the community, including:

- Building confidence and improving social interaction by walking and/or cycling
- Assists in implementation of health, fitness and wellbeing programs
- Improving social interaction with others to be more interested and involved in the with the precinct as they walk or cycle
- Improving safety by reducing traffic and local road congestion
- Improving the environment by reducing air pollution from private vehicles;
- Creating opportunities for healthier lifestyles and more vibrant, cohesive and accessible communities; and
- Providing individuals with leadership opportunities.

It is likely that staff and visitors with a good understanding of an active and sustainable mode of transport will follow a healthy and active lifestyle, care about the environment and prioritise location and lifestyle over car ownership.

8.3. The purpose of a GTP

The purpose of the GTP is to provide a package of measures with the aim at promoting and reducing the reliance of private car usage and encourage and support the uptake of daily business in a more sustainable way. This may be achieved through the review of existing policies and identifying programmes to encourage residents, visitors and employees to adopt more active and sustainable forms of transport. This document identifies the following:

- Review of existing public transport infrastructure and future transport options;
- Assessment of existing travel patterns within the area;
- A modal share target for the development;
- A framework to identify and respond to travel demand from the development and surrounding area;
- Strategies to implement prior and during occupancy; and
- The monitoring strategy to track performance of the Green Travel Plan.

8.4. Opportunities and Targets

8.4.1. Walking

Walking is only likely to be an attractive option for people who live relatively close to the site.

It is a viable transport option for distances under one kilometre (approximately 10-15min) and is often quicker for short trips door to door. Walking is also the most space efficient mode of transport for short trips and presents the highest benefits.

Walkers might include staff, outpatients and visitors; however, staff on early morning or late evening/night shifts would be unlikely to walk for safety reasons. For these reasons, we expect that walking would only be an attractive mode share for people living locally. This appears to be supported by our surveys which show 100% of staff drive to work and 93% of visitors drive and park at the hospital.

Co-benefits where walking replaces a motorised trip include improved health for the individual, reduced congestion on the road network and reduced noise and emission pollution. Site observations show that the existing footpath networks and crossing points between the adjoining residential precincts and the hospital are generally adequate.

The pedestrian connections from the car parks to the site entry points are generally acceptable. Within the hospital precinct, paths are mostly quite generous. Away from the hospital, at many locations, footpaths are not provided or are provided only one side of the street. In many instances, the road network has been designed to prioritise vehicle movements, including intersections with roundabouts where pedestrians need to negotiate many directions of traffic whilst crossing the road. These often provide positive efficiency outcomes for vehicle movements. However, pedestrians have no priority and are at greater risk crossing when compared with other intersection layouts. It is recommended that any inadequate provision of footpaths be rectified.

8.4.2. Bicycle network

Similar to walking, cycling is only likely to be an attractive mode share for staff members who live within relatively close distance to the site.

Our site observations indicate that minimal cycling is currently occurring to the hospital and no bicycle racks were noted outside the hospital for visitor or staff use.

The existing bicycle network in the locality is highly fragmented (Figure 11). Generous road width and shoulder in the area provide an opportunity to those who are willing to ride on the road. However, less confident riders may not find the road network conducive for regular riding. Shoulder lanes between the moving traffic and the door opening zone presents safety implications to cyclists and on many occasions shoulder lanes generally end just before the intersections and reappear on the opposite side.

Due to its location, land use, geometry and road network, it is reasonable to consider that the cycling mode to the hospital by the day time staff will be a low percentile. However, similar to walk trips, staff living within 2.5m radius (considered as a short trip) should be encouraged to ride (Figure 11). Discussions should also be held with the Council for safe and direct cycling path to the hospital from the nearby residential precincts.

Existing bike racks should be upgraded and cycling should be promoted to the staff members. Additional bicycle racks, lockers and end of trip facilities should also be provided within the hospital.

8.4.3. Future Transport Targets

To encourage and promote more active travel opportunities, the hospital should consider adopting targets as set by similar hospitals. In addition, it is recommended that the hospital consider carrying out benchmarking by conducting intercept surveys to gain an accurate base from which this data can be improved upon year by year. Should the survey indicate staff living within the 800m-1km catchment area (approximately 10-20min walk), a walking trip should be promoted to these staff members.

These targets would apply to all staff travelling to and from work on a daily basis.

8.4.4. Bus Cards or Discounts

To improve the relative attractiveness of public transport, other transport modes such as driving should be benchmarked against and generally exceed the cost of public transport. Staff bus cards could be considered as an option for staff members to encourage the use of the private bus network around town. This could be offered at a discounted rate to encourage the uptake of this travel mode.

8.5. Strategies

There are a number of strategies which can be employed to encourage non-car modes of transport to and from the Hospital. The following table outlines potential strategies that can be adopted in achieving future transport targets.

Table 18: Potential strategies for adoption to achieve future transport targets

Target	Strategy
Public Transport	
Increase journeys to work by Public Transport	Create a map identifying the location of bus stops and routes and make this available to all staff and visitors. Promote the use of apps for public transport connectivity. Improve the promotion of Public Transport on the Hospital website.
Cycling	
Increase journeys to site by cycling	Create maps and bike routes, which link to surrounding key amenities and available facilities.

Target	Strategy
	Provide facilities on-site for staff and visitors to repair bikes. Ensure visitor bicycle racks are positioned in an accessible and sheltered location that provides good passive surveillance, and is easily recognisable to visitors. Provide secure, internal End of Trip facility with bike storage racks and shower and change amenities for staff.
Walking	
Encourage residents to walk to work as part of their journey	Work in partnership with Council to determine whether there are opportunities to improve the pedestrian connectivity to the Hospital. For example, ensure that pedestrians are considered within proposed road infrastructure upgrades.
Car Pooling/Car Share	
Improve accessibility to car share	Provide a forum or platform for staff to plan carpooling trips with colleagues to reduce the total vehicles travelling to site.

8.6. Workplace Transport Plans

The core principle in reducing the demand for car parking spaces (specifically for Hospital Staff) is to introduce and promote "Healthy Transport Plans".

The cycle and pedestrian network near the Hospital Precinct combined with a proportion of staff living within relatively close proximity to the Precinct clearly highlights the possibility of introducing a robust and sustainable travel plan. Travel plans should aim to:

- Encourage staff, patients and visitors to use more sustainable travel options to get to the Hospital
- Encourage staff to adopt healthy transport choices such as walking and cycling where this is a realistic option
- Pursue opportunities for sharing vehicles or transport not only for staff but to explore innovative solutions to minimise journeys
- Consider journey management and distance covered
- Ensure that the Hospital's actions in respect to transport do not have an adverse impact upon the environment and consequently the health of the population which we serve. There is a requirement to balance the needs of patients, visitors and staff against ensuring protection of the environment for which we all have a responsibility; and,

Furthermore, there are other methods of shifting the number of staff accessing work by incentivising and increasing the use of carpooling, cycling, park and ride. However these forms of transport need to be supported by an incentivised system to make these forms of access more desirable than driving.

8.6.1. Dedicated Carpooling Space

The hospital should allocate some dedicated carpooling spaces to promote carpooling by the staff members living in the same areas. There are many ways to manage carpooling spaces which can be explored in due course. As a start, two (2) to three (3) parking spaces are recommended for carpooling with an effective marketing strategy to promote these spaces to the staff members.

8.6.2. Public Transport

To improve the relative attractiveness of public transport, other transport modes such as driving should be benchmarked against and generally exceed the cost of public transport. Exploration of working with

Council to provide clear signage of bus routes between the town centre and hospital, to promote the use of public transport can be undertaken.

8.6.3. Car Share

Car share services will remove a common requirement to drive to the hospital for personal or business purposes. Subsidising car share membership will attract more car share users. Inter hospital trips can be made by car share vehicles, thus reducing the overall hospital fleet numbers. Discussion should be held with the car share operators to ascertain the demand for car share vehicles within the hospital campus. It is noted however that limited car share facilities are existing in regional NSW.

8.6.4. Shuttle Bus Service

Based on the staff survey, if there is reasonable number of staff is found to be living within the 5-10km radius of the hospital (within town), a shuttle bus can be considered in the future based on the demand. Discussion should be held with Transport for NSW/ Council for effective operation of the shuttle bus service.

8.6.5. Transport Access Guide

To encourage staff and visitors to adopt alternative sustainable transport options, a Transport Access Guide should be developed to summarise available transport options identified. A Transport Access Guide is a concise presentation of how to reach the site using low-energy, sustainable and active forms of transport.

The aim of a Transport Access Guide is to make sure people know how to get to the subject development by walking, cycling or public transport (as well as by car).

A Transport Access Guide can take many forms such as a map printed on the back of business cards or invitations to more comprehensive information provided to new staff as part of their induction kit. Guides may be incorporated into stationery, brochures and sales literature and provided electronically on the website and in emails. An electronic version can be kept on a computer and produced as needed. Reception and enquiry staff should be familiar with the content so they can advise callers about easy transport alternatives to car travel.
Transport and Access Guides should be included in Green Travel Plans and should comply with RMS guidelines.

8.7. Steps to develop the green travel plan

To develop a GTP, there are five (5) key steps to follow to commence its operation:

8.7.1. Step 1 – Set up an Advisory Committee

- Appoint an individual to coordinate specific actions and to track the progress of this work
- Develop a working group that involves representatives from the hospital community
- Identify ways how the whole community will be involved and informed of the work (e.g. regular articles in the precinct website / social media).

8.7.2. Step 2 – Data Collection & Review Existing Situation

As part of the development, it is expected that there will be a more patients, visitors and employees travelling to and from the hospital on a daily basis. To identify how staff and visitors living in the Gunnedah area travel elsewhere for work or shopping etc. and/or for people coming to the hospital, an initial survey should be conducted to identify the travel behaviour of staff and visitors. This may be conducted as an online survey or an intercept survey of those accessing the hospital. This would assist with developing and monitoring travel planning schemes and how access can be improved to the hospital. As a minimum the following questions should be considered:

- Are you staff/visitor to the site? Yes/No
- Did you park on site today? If so, where?

Staff Only Questions

- If you are a staff member, do you have an allocated parking space within the Site?
- How do you currently travel to work and the distance of their travel?
- Based on the public transport and other sustainable travel options available, which would be their preferred mode of travel?
    - Walk/run
    - Bicycle
    - Bus
    - Train
    - Combination of bus and train
    - Drive car
    - Passenger in car
    - other ____
- Is your residence in an area not serviced by any of the identified transport options?
- Do you need to drive to work for another reason? Why and how often this would occur (i.e. shift work)

Visitors Only Questions

- If you are a visitor, where did you travel from today?
- What mode of transport did you use?
- Why did you use this particular method of travel mode?

All Users

- Have you heard of car share? If this was readily available to you, would you use if you did not have a car parking is unavailable?
- If not, what are the barriers to you using car share to travel to and from site?
- What would make you consider using car share to access the site?
- Any suggestion/recommendations to encourage sustainable mode of transport etc.;

Once the survey findings are available, methods to achieve specific targets can be identified with proposed time frames.

8.7.3. Step 3 – Prepare the travel plan

Based on the data, an overall vision for the modal travel should be considered with clear objectives. The GTP should be prepared based on those objectives, notably:

- Build a precinct culture that supports active travel by motivating and encouraging the community to get involved
- Set specific SMART (Specific, Measurable, Achievable, Relevant, Timed) targets
- Develop an action plan that lists activities and strategies that eliminates the community's barriers to active travel to meet the objectives
- Estimate the budget required to meet the objectives, identify funding source and develop implementation strategies
- Review and consult with the community

8.7.4. Step 4 - Deliver & Implement

Once developed, launch the GTP and carry out regular monitoring (every 12 months is recommended) as part of the implementation strategy. Travel mode data should be collected and reviewed each quarter.

8.7.5. Step 5 - Recognise Process

The successes of the GTP should be celebrated regularly, for example at key community events. The plan should regularly be reviewed and include new ideas, targets and benchmarks.

8.8. Monitoring and evaluation

A Travel Plan Co-ordinator and Travel Plan Group should be established to monitor and review the sustainability targets.

As a minimum, the Plan should be reviewed on a quarterly basis incorporating consultation with staff and visitors at the completion of a regular travel survey.

The yearly review should result in an update to the Travel Plan which may include, where necessary:

- Modifications to the previously agreed targets as a result of data collected and analysed.
- Implementation of additional remedial actions if the Travel Plan is not meeting its objectives within the timescales specified which remedial actions may include but not be limited to, undertaking new or additional monitoring activities to those specified in the Travel Plan.

9. Conclusion

ptc. has been engaged on behalf of Health Infrastructure NSW (HI) to prepare a Traffic Impact Assessment to accompany the Development Application for the Smalls Hospital Initiative in relation to Gunnedah Hospital.

The parking demand for staff and visitors has been assessed using Length of Stay, Intercept, and Staff Surveys. The onsite provision of parking is to remain near identical to the existing site, and is deemed to be acceptable given that the development proposes no major new infrastructure or staffing increase. Furthermore, the proposed drop off and pick up facilities are expected to promote the increase of ode split trips to the site via drop off.

Construction vehicle activity including parking during construction work and any temporary reduction in on-site parking is expected to be supplemented by the available on-street and nearby public carparking amenity.

Traffic surveys and modelling have be undertaken for the existing site to confirm the network has no existing congestion issues. The development site traffic is expected to behave in a similar fashion with similar volumes based on the assumption that no major new infrastructure or staffing increases are proposed. The surrounding road network operates with a good Level of Service, with ample spare capacity to handle any minor increases in traffic due to the proposed development or construction activity.

All car parking and service vehicle areas of the site have been assessed for their respective use cases and found to be compliant with relevant standards including AS2890.1 (2004) Off-Street Car Parking, AS2890.2 (2018) Off Street Commercial Vehicle Facilities, AS2890.6 (2009) Off-Street Parking for People with Disabilities.

Appendix A Architectural Drawings

MARQUIS STREET

HARDSTAND FOR FIRE APPLIANCE

FIRE SPRINKLER AND HYDRANT BOOSTER VALVE

ENTRY / EXIT

CARPARK 1 (49 TOTAL)

CARPARK 6 (2 TOTAL)

DOCTORS ACCOMMODATION

LPG

PUMPSET

SUBSTATION

SERVICES ENTRY / EXIT ONLY

SPRINKLER & HYDRANT TANKS

EMERGENCY GENERATOR

MAIN SWITCH BOARD

OXYGEN

CONC PAD

MORTUARY

SERVICES ENTRY / EXIT ONLY

FUNCTION ROOM

MAIN ENTRY

RURAL HEALTH CENTRE

FRONT OF HOUSE

FORMER COMMUNITY HEALTH

RETAINING WALL

BACK OF HOUSE

MEDICAL RECORDS

LOADING ZONE

ENGINEERING

KITCHEN

DENTAL

PATH.

PHYSIO

RETAINING WALL

ALKIRA NURSING HOME

ELECTRICAL & COMMS PLANT ROOM

RAINWATER REUSE PLANT

FUTURE INFUSION SHOWN DASHED

GATHERING COURTYARD

CHAPEL

CENTRAL COURTYARD

CARPARK 5 (37 TOTAL)

ZONE FOR FLEET PARKING (14 SPACES)

FUTURE EXTENSION SHOWN DASHED

MATERNITY

DAY SURGERY

FORMER GENERAL WARD

EDUCATION CENTRE

INPATIENT

BIRTH SUITE

BIRTHING COURTYARD

CSSD

THEATRE

FORMER EMERGENCY

FUTURE CARPARK EXTENSION SHOWN DASHED

CARPARK 2 (9 TOTAL)

AMBULANCE BAY 1

AMBULANCE BAY 2

ENTRY / EXIT

EMERGENCY

FUTURE IMAGING SHOWN DASHED

OUTDOOR WAITING

FUTURE EXTENSION SHOWN DASHED

CARPARK 4 (30 TOTAL)

IMAGING

SHORT TERM PARKING

DROP-OFF ZONE

EMERGENCY ENTRY

HELIPAD

OUTDOOR WAITING

HELIPAD ACCESS

STAFF ACCOMMODATION

CARPARK 3 (18 TOTAL)

AMBULANCE ENTRY

AMBULANCE STATION

AMBULANCE EXIT

ENTRY

EXIT

RESERVOIR STREET

ANZAC PARADE

LIONS PARK

PROPOSED STAGE 1 CARPARKING

CARPARK 1	49	incl 2 ACCESSIBLE
CARPARK 2	9	
CARPARK 3	18	incl 2 ACCESSIBLE, 2 AMBULANCE
DROP OFF	5	
CARPARK 4	30	
CARPARK 5	37	incl 2 ACCESIBLE, 14 FLEET
CARPARK 6	2	
	= 150 (6 CARPARKS DISPLACED)	
EXISTING	**= 156**	

Notes

DEPARTMENT LEGEND

- EXISTING BUILDING
- FRONT OF HOUSE
- PLANT / ENGINEERING
- INPATIENT UNIT
- EMERGENCY DEPARTMENT
- DAY SURGERY & THEATRES
- VACANT

SITE LEGEND

- TURFED AREA
- MASS PLANTING OF NATIVE GRASSES
- MASS PLANTING AREA
- PAVING TYPE 1
- PAVING TYPE 2
- EXISTING ROADWAYS/PARKING
- NEW ROADWAYS/PARKING

DESIGN DEVELOPMENT

NOT TO BE USED DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
E	FOR INFORMATION	16.05.2023	LS	DC
D	FOR INFORMATION	09.05.2023	LS	DC
C	FOR INFORMATION	03.05.2023	LS	DC
B	FOR INFORMATION	26.04.2023	LS	DC
A	FOR INFORMATION	21.04.2023	SA	DC

Architect/ Designer
dwp
www.dwp.com

Client
NSW HEALTH INFRASTRUCTURE

Project
GUNNEDAH HOSPITAL REDEVELOPMENT

Location
MARQUIS STREET, GUNNEDAH, NSW 2380

Project Number
21-0218

Drawing
OPTION 2 - SITE FLOOR PLAN - STAGE 1

Scale (A1)
As indicated

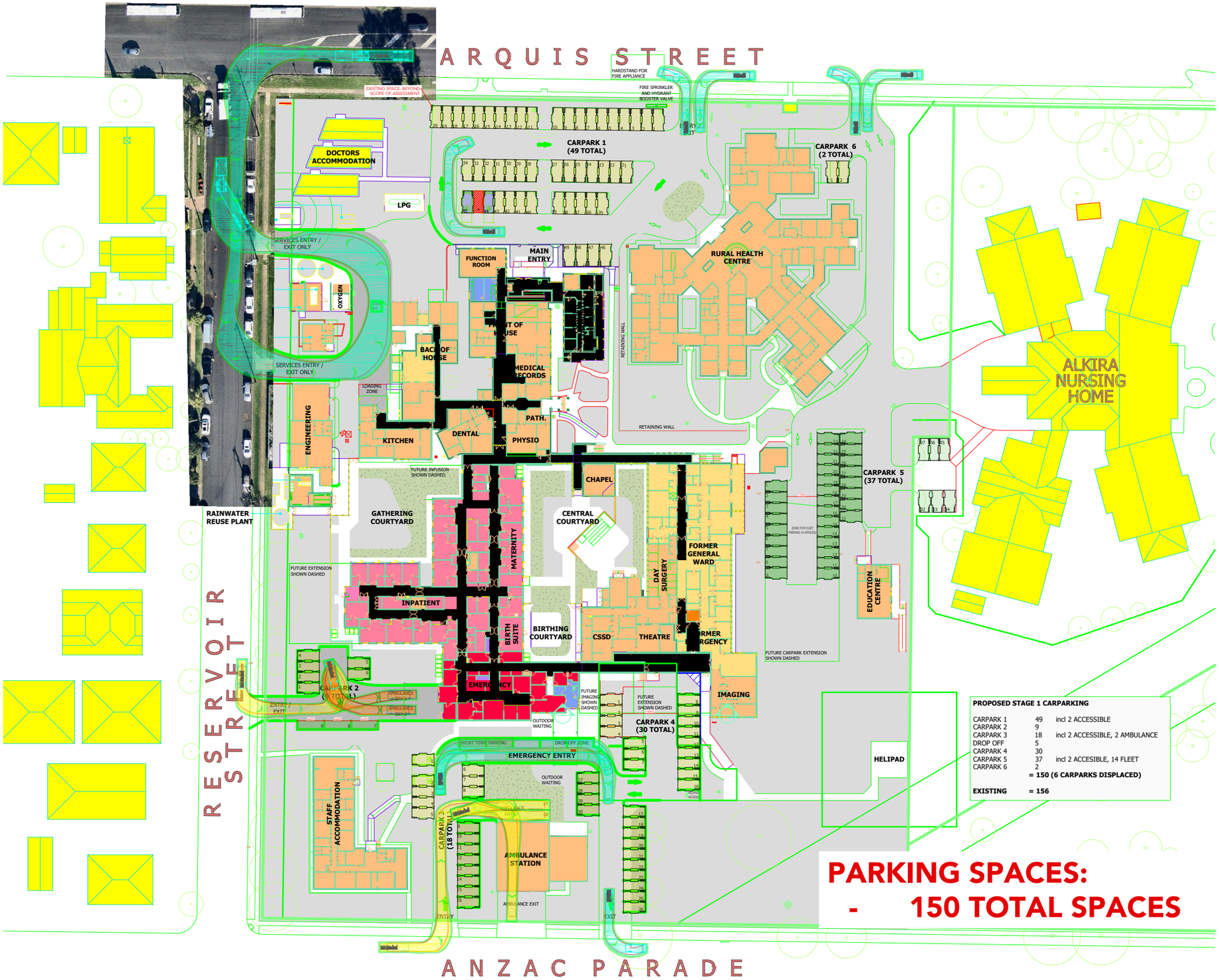
Date Printed
16/05/2023 1:49:30 PM

Drawing Number
SK-S1-9240

Issue
E

File Name: BIM 360://21-0218.-Gunnedah Hospital Redevelopment/21-0218-AR-GUNNEDAH HOSPITAL REDEVELOPMENT-R21.rvt

Appendix B ptc. Assessment



PROPOSED STAGE 1 CARPARKING

CARPARK 1	49	incl 2 ACCESSIBLE
CARPARK 2	9	
CARPARK 3	18	incl 2 ACCESSIBLE, 2 AMBULANCE
DROP OFF	5	
CARPARK 4	30	
CARPARK 5	37	incl 2 ACCESIBLE, 14 FLEET
CARPARK 6	2	
	= 150 (6 CARPARKS DISPLACED)	
EXISTING	**= 156**	

PARKING SPACES:
- 150 TOTAL SPACES

comments

A3

TYPICAL

Please note the following compliance requirements:

Height Clearance: **2.2m** (min) throughout all areas of the car park accessible to vehicles and bicycles.
2.5m above accessible and shared bays

Sight Splays: Visibility splays in the form of a **2.5m x 2m** right-angled triangle to be provided (AS2890.1). Ensure design avoids visual obstructions in sight splay (i.e. dense landscaping, tall fencing/walls etc.)

Parking Spaces: The parking envelopes shown, must be kept clear of all physical obstructions, including height clearance reductions. Ensure that grades within the parking module do not exceed 1:20 (1:40 for accessible bays).

Accessible Spaces: To be designed in accordance with AS2890.6. i.e, standard parking space with adjacent shared bay (2.4m x 5.4m), to be installed as per AS2890.6 requirements (bollard and markings).

2.6m x 5.4m Class-3 Car Space for hospital visitors

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

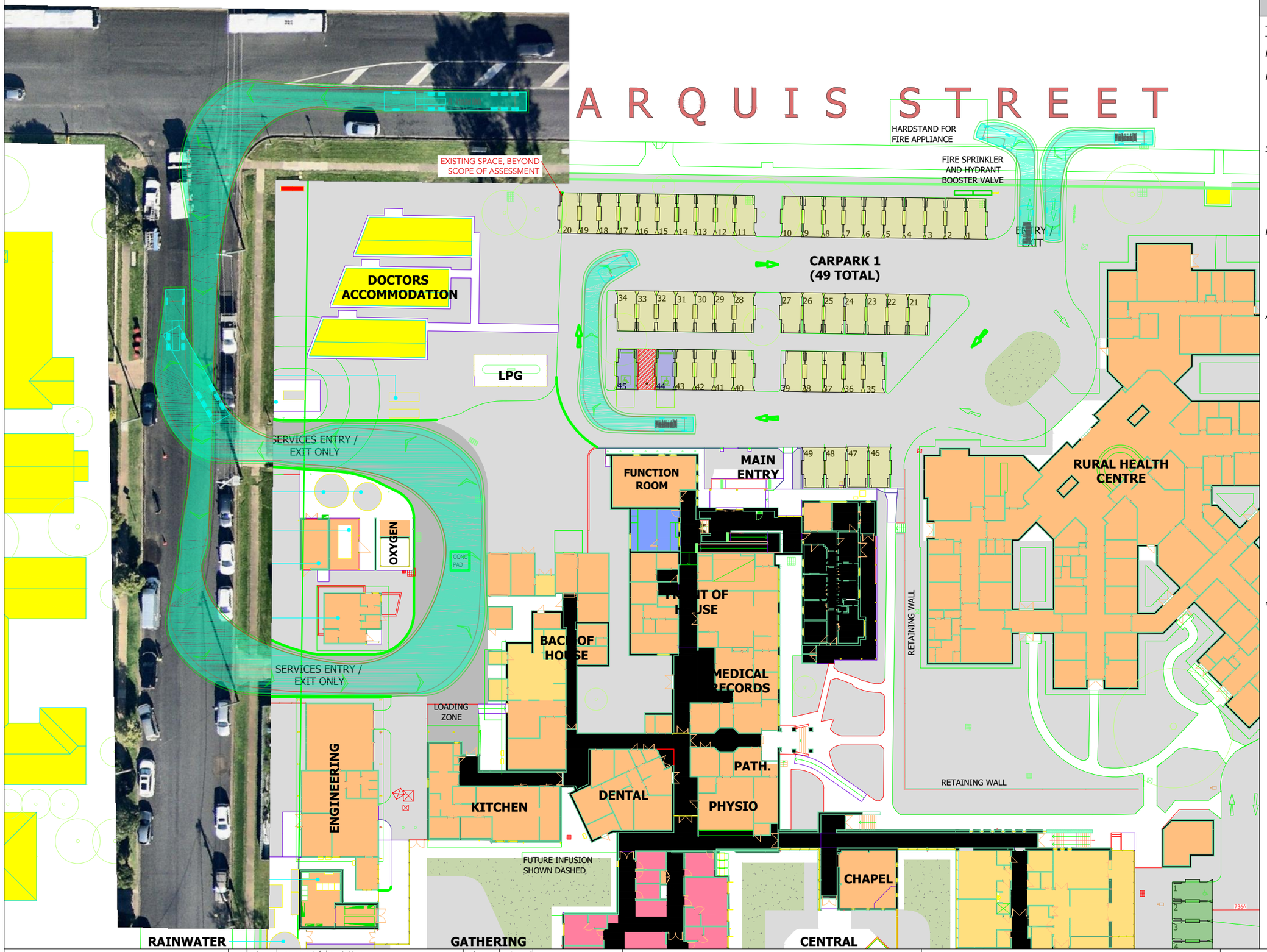
rev	date	comment / description	drawn	reviewed
P8	30.05.23	FOR INFORMATION	JAJ	DB
P6	03.02.23	FOR INFORMATION	JAJ	DB
P5	04.10.22	FOR INFORMATION	JAJ	DB
P4	23.09.22	FOR INFORMATION	JAJ	DB
P3	22/08/22	FOR INFORMATION	JAJ	DB
P2	15/8/22	For Information	PD, JAJ	DB
P1	22/07/22	For Infromation	JAJ	DB

project
GUNNEDAH HOSPITAL

drawing title
Sitewide Carpark Access and Circulation

client	RANBURY
drawing #	ptc-001
project #	22-0286
scale	1 : 1000

rev P8



comments

A3

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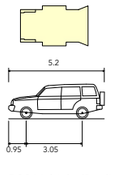
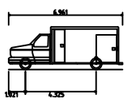


2.6m x 5.4m Class-3 Car Space for hospital visitors

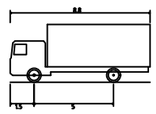
B99 Vehicle (Realistic min radius) (2004)

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.878m
Min Body Ground Clearance	0.272m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.250m



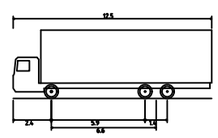
Bariatric Ambulance (General)

Overall Length	6.961m
Overall Width	1.993m
Overall Body Height	2.600m
Min Body Ground Clearance	0.307m
Track Width	1.993m
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	7.650m



MRV – Medium Rigid Vehicle

Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m



HRV – Heavy Rigid Vehicle

Overall Length	12.500m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.417m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m

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rev	date	comment / description	drawn	reviewed
P8	30.05.23	FOR INFORMATION	JAJ	DB
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P5	04.10.22	FOR INFORMATION	JAJ	DB
P4	23.09.22	FOR INFORMATION	JAJ	DB
P3	22/08/22	FOR INFORMATION	JAJ	DB
P2	15/8/22	For Information	PD, JAJ	DB
P1	22/07/22	For Infromation	JAJ	DB

project
GUNNEDAH HOSPITAL

drawing title
Marquis Street Carpark Access and Circulation, Loading Dock Access

client	RANBURY
drawing #	ptc-002
project #	22-0286
scale	1 : 500

rev P8

AINWATER
EUSE PLANT

ENGINEER

KITCHEN

DENTAL

PHYSIO

RETAINING WALL

FUTURE INFUSION
SHOWN DASHED

GATHERING
COURTYARD

CHAPEL

CENTRAL
COURTYARD

MATERNITY

FUTURE EXTENSION
SHOWN DASHED

INPATIENT

BIRTH
SUITE

BIRTHING
COURTYARD

DAY
SURGERY

FORMER
GENERAL
WARD

CSSD

THEATRE

RMER
RGENCY

CARPARK
(37 TOTA

ZONE FOR FLEET
PARKING (14 SPACES)

EDUCATION
CENTRE

FUTURE CARPARK EXTENSION
SHOWN DASHED

RESERVOIR
STREET

CARPARK 2
(9 TOTAL)

ENTRY /
EXIT

AMBULANCE
BAY 1

AMBULANCE
BAY 2

EMERG NCY

FUTURE
IMAGING
SHOWN
DASHED

IMAGING

FUTURE
EXTENSION
SHOWN DASHED

CARPARK 4
(30 TOTAL)

OUTDOOR
WAITING

SHORT TERM PARKING

DROP-OFF ZONE

EMERGENCY ENTRY

OUTDOOR
WAITING

HELIPA

HELIPAD
ACCESS

STAFF
ACCOMMODATION

CARPARK 3
(18 TOTAL)

AMBULANCE
ENTRY

AMBULANCE
STATION

AMBULANCE EXIT

ENTRY

EXIT

PARK

-

comments

A3

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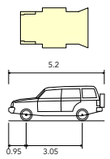

2.6m x 5.4m Class-3 Car
Space for hospital visitors

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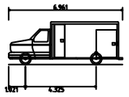

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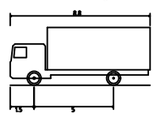

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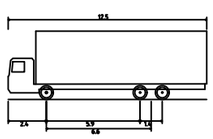
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m



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P2	15/8/22	For Infromation	PD, JAJ	DB
P1	22/07/22	For Infromation	JAJ	DB

project
GUNNEDAH HOSPITAL

drawing title
Ambulance Access, Anzac Parade Carpark Access

client	RANBURY
drawing #	ptc-003
project #	22-0286
scale	1 : 500

rev P8

Appendix C Parking Survey Results

Gunnedah Hospital Length of Stay Survey

Location: Hospital Car Park
Date: 27th July 2022, Wednesday
Time Surveyed: 8AM-6PM

SUMMARY

ALL SPACES SURVEYED

TOTAL CARS:	***205***	**AVERAGE LENGTH OF STAY:**	**4.20 HRS/CAR**
TOTAL SPACES:	***156***	**AVERAGE OCCUPANCY (%):**	**55.1%**
TOTAL CAR T/O:	***1.51*** **CARS/BAY**	**PEAK OCCUPANCY (%):**	**65.4%**
PATIENT & VISITOR CAR T/O:	***2.11*** **CARS/BAY**		

* Available spaces on 27/07/2022, Excl. Loading Zones, drop off zones, Ambulance etc.

CAR SPACE ALOS SUMMARY	0-1 HR	1-2 HRS	2-3 HRS	3-4 HRS	4-5 HRS	5-6 HRS	6-7 HRS	7-8 HRS	8-9 HRS	9-10 HRS	Weighted Average	Turnover*
Car Park 1	37	3	1	11	8	3	4	2	3	1	3.14	1.74
Car Park 3	13	3	1	4	3	0	2	3	1	1	3.55	1.82
Car Park 4	12	5	2	8	0	4	0	12	1	2	4.54	1.39
Car Park 5	4	3	5	7	1	3	7	2	2	11	5.98	1.25
Car Park 6	0	0	0	2	0	0	0	0	0	1	6.00	1.50
Emergency Car Park	3	2	0	0	0	0	0	1	0	1	3.57	1.17
Total	**69**	**16**	**9**	**32**	**12**	**10**	**13**	**20**	**7**	**17**	***4.20***	***1.51***

* Available spaces on 27/07/2022, Excl. Loading Zones, drop off zones, Ambulance etc.

ALOS SUMMARY BY BAY TYPES	0-1 HR	1-2 HRS	2-3 HRS	3-4 HRS	4-5 HRS	5-6 HRS	6-7 HRS	7-8 HRS	8-9 HRS	9-10 HRS	Weighted Average
UNRESTRICTED	61	13	7	29	11	9	13	19	7	6	3.99
DISABLED	5	1	0	1	0	0	0	0	0	0	1.57
PARENTS WITH PRAMS	0	0	0	0	1	0	0	0	0	0	5.00
DOCTORS ONLY	3	2	0	0	0	0	0	1	0	1	3.57
FLEET	0	0	2	1	0	1	0	0	0	10	8.29
OFFICE CARS ONLY	0	0	0	1	0	0	0	0	0	0	4.00
Total	**69**	**16**	**9**	**32**	**12**	**10**	**13**	**20**	**7**	**17**	***4.20***

* Available spaces on 27/07/2022, Excl. Loading Zones, drop off zones, Ambulance etc.

PUBLIC SPACE ALOS SUMMARY	0-1 HR	1-2 HRS	2-3 HRS	3-4 HRS	4-5 HRS	5-6 HRS	6-7 HRS	7-8 HRS	8-9 HRS	9-10 HRS	Weighted Average
Car Park 1	37	3	1	10	8	3	4	2	3	1	3.13
Car Park 3	13	3	1	4	3	0	2	3	1	1	3.55
Car Park 4	12	5	2	8	0	4	0	12	1	2	4.54
Car Park 5	4	3	3	6	1	2	7	2	2	1	4.94
Car Park 6	0	0	0	2	0	0	0	0	0	1	6.00
Emergency Car Park	0	0	0	0	0	0	0	0	0	0	N/A
Total	**66**	**14**	**7**	**30**	**12**	**9**	**13**	**19**	**7**	**6**	***3.91***

* Available spaces on 27/07/2022, Excl. Loading Zones, drop off zones, Ambulance etc.

PATIENT & VISITOR ALOS SUMMARY	0-1 HR	1-2 HRS	2-3 HRS	3-4 HRS	4-5 HRS	5-6 HRS	6-7 HRS	7-8 HRS	8-9 HRS	9-10 HRS	Weighted Average	Turnover*
Car Park 1	37	3	1	10	8	0	0	0	0	0	2.14	2.11
Car Park 3	13	3	1	4	3	0	0	0	0	0	2.21	2.40
Car Park 4	12	5	2	8	0	0	0	0	0	0	2.22	1.93
Car Park 5	4	3	3	6	1	0	0	0	0	0	2.82	2.13
Car Park 6	0	0	0	2	0	0	0	0	0	0	4.00	2.00
Emergency Car Park	0	0	0	0	0	0	0	0	0	0	N/A	N/A
Total	**66**	**14**	**7**	**30**	**12**	**0**	**0**	**0**	**0**	**0**	***2.29***	***2.11***

* Available spaces on 27/07/2022, Excl. Loading Zones, drop off zones, Ambulance etc.
** ASSUMED CARS WERE DRIVEN BY PATIENTS/VISITORS IF THEY STAYED NO MORE THAN 5 HOURS IN PUBLIC SPACE
*** Patient & Visitor turnover = No. of Patient/visitor cars / Public spaces used by Patient/visitor

STAFF ALOS SUMMARY	0-1 HR	1-2 HRS	2-3 HRS	3-4 HRS	4-5 HRS	5-6 HRS	6-7 HRS	7-8 HRS	8-9 HRS	9-10 HRS	Weighted Average
Car Park 1	0	0	0	1	0	3	4	2	3	1	7.36
Car Park 3	0	0	0	0	0	0	2	3	1	1	8.14
Car Park 4	0	0	0	0	0	4	0	12	1	2	7.84
Car Park 5	0	0	2	1	0	3	7	2	2	11	7.89
Car Park 6	0	0	0	0	0	0	0	0	0	1	10.00
Emergency Car Park	3	2	0	0	0	0	0	1	0	1	3.57
Total	**3**	**2**	**2**	**2**	**0**	**10**	**13**	**20**	**7**	**17**	***7.43***

* Available spaces on 27/07/2022, Excl. Loading Zones, drop off zones, Ambulance etc.
** ASSUMED CARS WERE DRIVEN BY STAFF IF THEY STAYED MORE THAN 5 HOURS IN PUBLIC SPACES + ALL CARS PARKED IN STAFF SPACE

Spaces used by Staff & Public	Capacity	Staff Use	Public Use	Empty
Car Park 1	50	14	28	8

Car Park 3	18	7	10	1
Car Park 4	41	19	14	8
Car Park 5	37	28	8	1
Car Park 6	2	1	1	0
Emergency Car Park	8	6	0	2

				PATIENT & VISITOR			*STAFF & SPECIAL*		
PARKING CAPACITY SUMMARY	**NO. OF SPACES (Excl. Motorbike)**	**PUBLIC**	**STAFF&SPECIAL**	**UNRESTRICTED**	**DISABLED**	**PARENTS WITH PRAMS**	**DOCTORS ONLY**	**FLEET**	**OFFICE CARS ONLY**
Car Park 1	50	49	1	44	3	2	0	0	1
Car Park 3	18	18	0	17	1	0	0	0	0
Car Park 4	41	41	0	40	1	0	0	0	0
Car Park 5	37	23	14	21	2	0	0	14	0
Car Park 6	2	2	0	2	0	0	0	0	0
Emergency Car Park	8	0	8	0	0	0	8	0	0
Total Spaces Surveyed	156	133	23	124	7	2	8	14	1

* Available spaces on 27/07/2022, Excl. Loading Zones, drop off zones, Ambulance etc.

SHOALHAVEN HOSPITAL PARKING STUDY
PARKING SURVEY ANALYSIS

OCCUPIED SPACES SUMMARY	Capacity	8:00-9:00	9:00-10:00	10:00-11:00	11:00-12:00	12:00-13:00	13:00-14:00	14:00-15:00	15:00-16:00	16:00-17:00	17:00-18:00
Car Park 1	50	16	26	28	28	28	30	22	29	14	8
Car Park 3	18	10	12	13	14	12	14	12	11	6	6
Car Park 4	41	19	20	22	21	26	27	25	24	13	12
Car Park 5	37	30	31	29	28	27	28	30	25	21	20
Car Park 6	2	1	2	2	2	2	1	2	2	2	2
Emergency Car Park	8	6	4	2	2	3	2	2	2	1	1
Total	156	82	95	96	95	98	102	93	93	57	49

* Available spaces on 27/07/2022, Excl. Loading Zones, drop off zones, Ambulance etc.

OCCUPIED BAYS SUMMARY - BAY TYPES	Capacity	8:00-9:00	9:00-10:00	10:00-11:00	11:00-12:00	12:00-13:00	13:00-14:00	14:00-15:00	15:00-16:00	16:00-17:00	17:00-18:00
UNRESTRICTED	124	64	78	79	81	80	86	78	77	42	34
DISABLED	7	0	0	2	0	3	2	1	1	1	1
PARENTS WITH PRAMS	2	0	1	1	1	1	1	0	0	0	0
DOCTORS ONLY	8	6	4	2	2	3	2	2	2	1	1
FLEET	14	12	12	12	11	11	11	11	12	12	12
OFFICE CARS ONLY	1	0	0	0	0	0	0	1	1	1	1
Total	156	82	95	96	95	98	102	93	93	57	49

* Available spaces on 27/07/2022, Excl. Loading Zones, drop off zones, Ambulance etc.

OCCUPANCY SUMMARY	Capacity	8:00-9:00	9:00-10:00	10:00-11:00	11:00-12:00	12:00-13:00	13:00-14:00	14:00-15:00	15:00-16:00	16:00-17:00	17:00-18:00	AVERAGE OCCUPANCY	PEAK OCCUPANCY
Car Park 1	50	32.0%	52.0%	56.0%	56.0%	56.0%	60.0%	44.0%	58.0%	28.0%	16.0%	45.8%	60.0%
Car Park 3	18	55.6%	66.7%	72.2%	77.8%	66.7%	77.8%	66.7%	61.1%	33.3%	33.3%	61.1%	77.8%
Car Park 4	41	46.3%	48.8%	53.7%	51.2%	63.4%	65.9%	61.0%	58.5%	31.7%	29.3%	51.0%	65.9%
Car Park 5	37	81.1%	83.8%	78.4%	75.7%	73.0%	75.7%	81.1%	67.6%	56.8%	54.1%	72.7%	83.8%
Car Park 6	2	50.0%	100.0%	100.0%	100.0%	100.0%	50.0%	100.0%	100.0%	100.0%	100.0%	90.0%	100.0%
Emergency Car Park	8	75.0%	50.0%	25.0%	25.0%	37.5%	25.0%	25.0%	25.0%	12.5%	12.5%	31.3%	75.0%
Total	156	*52.6%*	*60.9%*	*61.5%*	*60.9%*	*62.8%*	*65.4%*	*59.6%*	*59.6%*	*36.5%*	*31.4%*	*55.1%*	*65.4%*

* Available spaces on 27/07/2022, Excl. Loading Zones, drop off zones, Ambulance etc.

OCCUPANCY SUMMARY BY SPACE TYPE	Capacity	8:00-9:00	9:00-10:00	10:00-11:00	11:00-12:00	12:00-13:00	13:00-14:00	14:00-15:00	15:00-16:00	16:00-17:00	17:00-18:00	AVERAGE OCCUPANCY	PEAK OCCUPANCY
UNRESTRICTED	124	51.6%	62.9%	63.7%	65.3%	64.5%	69.4%	62.9%	62.1%	33.9%	27.4%	56.4%	69.4%
DISABLED	7	0.0%	0.0%	28.6%	0.0%	42.9%	28.6%	14.3%	14.3%	14.3%	14.3%	15.7%	42.9%
PARENTS WITH PRAMS	2	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%	0.0%	0.0%	0.0%	0.0%	25.0%	50.0%
DOCTORS ONLY	8	75.0%	50.0%	25.0%	25.0%	37.5%	25.0%	25.0%	25.0%	12.5%	12.5%	31.3%	75.0%
FLEET	14	85.7%	85.7%	85.7%	78.6%	78.6%	78.6%	78.6%	85.7%	85.7%	85.7%	82.9%	85.7%
OFFICE CARS ONLY	1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	100.0%	40.0%	100.0%
Total	156	*52.6%*	*60.9%*	*61.5%*	*60.9%*	*62.8%*	*65.4%*	*59.6%*	*59.6%*	*36.5%*	*31.4%*	*55.1%*	*65.4%*

* Available spaces on 27/07/2022, Excl. Loading Zones, drop off zones, Ambulance etc.

Appendix D Parking Demand Estimates

ATTACHMENT 6

HEALTH INFRASTRUCTURE
GUNNEDAH HOSPITAL
CURRENT BASE CASE ESTIMATE OF PARKING DEMAND

Notes	Base Estimate (Current)	People	% Cars requiring a car space	People per car (a)	Total cars per day	Turnover	Peak spaces required
	WEEKDAYS						
	STAFF						
	CLINICAL & ADMINISTRATION STAFF						
	Day Shift & Administration	28	96%	1.04	26	1.00	26
	Afternoon shift	11					
C	*Afternoon shift arriving before day shift leave (i.e. shift changeover allowance 90%)*	*1093*	*94%*	*1.03*	*1002*	*1.00*	*1002*
D	Night Shift	6	94%	1.03	6	1.00	
	VMO's	3	100%	1.00	3	3.00	1
							1029
	PUBLIC						
	OUTPATIENTS	21	75%	1.00	16	2.95	5
	VISITORS	227					
E	*Visitors during peak hours 8am -6pm (70%)*	*159*	*76%*	*1.68*	*72*	*2.95*	*24*
	EMERGENCY DEPARTMENT PRESENTATIONS	30					
F	*Emergency Dept presentations during peak hours 8am - 6pm*	*18*	*75%*	*1.00*	*13*	*2.95*	*4*
							34
	LHD CONTROLLED - FLEET VEHICLES	12	100%	1.00	12	1.00	**12**
	OTHER						
	EDUCATION & TRAINING	1	96%	1.04	1	1.00	1
	VOLUNTEERS	3	96%	1.04	3	1.00	3
	RETAIL STAFF	5	96%	1.04	5	1.00	5
							8
	GP SUPER CLINIC						
	Staff - GP Super Clinic Specialist & Administration	30	96%	1.04	28	1.00	28
	Public - GP Super Clinic	72	75%	1.00	54	2.95	18
	Public - Allied Health	7	75%	1.00	5	2.95	2
							48
	TOTAL WEEKDAYS						**1131**
	CURRENT PARKING SUPPLY HOSPITAL RELATED CAR PARKS						**535**
	CURRENT PARKING UNCONSTRAINED SHORTFALL						**-596**
	CURRENT OFF CAMPUS ON STREET PARKING SUPPLY WITHIN RPZ (400m) - TOTAL						**379**
	CURRENT OFF CAMPUS ON STREET PARKING SUPPLY WITHIN RPZ (400m) AVAILABLE TO HOSPITAL USERS (70%)						**265**
	CURRENT PARKING OVERALL SURPLUS						**-331**

Notes

A	Current hospital related car parks capacity - Car Park 1-6 (416) excl. emergency (6), ambulance (4), contractor only (3), maintenance only (1) & patient transit (2) + GP Super Clinic (65) + North St Car Park (34) + Cancer Care Centre (56-20); 11 spaces in Car park 2 (9) & Car Park 4 (2) and 22 spaces in the Cancer Care car park are temporarily not available.	535
B	Cancer Care Centre car spaces used by its patients/staff - 20 spaces per ptc. surveys	
C	Per Hospital data	
D	Night shift staff - assume 0% arrive during peak hours	
E	Per HI email 6 October 2016	58.50%

Verification check against observed peak occupancy:	
Estimated peak demand	***1131***
Observed peak occupancy - on campus (Wed 13:00-14:00)	*312*
Observed peak occupancy - GP Super Clinic (Wed 14:00)	*44*
Observed peak occupancy - North St Car Park (Wed 14:00)	*21*
Observed peak occupancy - Cancer Care Centre (Wed 14:00)	16
Observed peak occupancy - Cancer Care Centre (Wed 14:00) Used by Hospital users (per online and intercept surveys)	*0*
Observed peak occupancy RPZ on street (Wed 14.00)	301
Observed peak occupancy RPZ on street (Wed 14.00) Used by Hospital users (assume 70%)	*211*
	588
Difference	***543***

* This verification does not include people outside 400m which could partially explain the difference.

Appendix E SIDRA Output

MOVEMENT SUMMARY

Site: 101 [1A.1 Marquis St / Oxley Hwy (Site Folder: 1A Existing AM Peak)]

Network: N101 [1A Existing AM Peak (Network Folder: General)]

Existing AM Peak
08:00-09:00
27/07/22
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Marquis Street (S)														
1	L2	21	5.0	21	5.0	0.235	4.7	LOS A	1.4	10.0	0.29	0.48	0.29	50.8
2	T1	239	4.0	239	4.0	0.235	4.9	LOS A	1.4	10.0	0.29	0.48	0.29	33.5
3	R2	35	12.1	35	12.1	0.235	9.2	LOS A	1.4	10.0	0.29	0.48	0.29	45.7
3u	U	3	0.0	3	0.0	0.235	10.9	LOS B	1.4	10.0	0.29	0.48	0.29	40.2
Approach		298	4.9	298	4.9	0.235	5.4	LOS A	1.4	10.0	0.29	0.48	0.29	37.4
East: Oxley Highway (E)														
4	L2	36	5.9	36	5.9	0.098	5.2	LOS A	0.5	3.7	0.38	0.54	0.38	40.3
5	T1	59	8.9	59	8.9	0.098	5.5	LOS A	0.5	3.7	0.38	0.54	0.38	52.0
6	R2	12	0.0	12	0.0	0.098	9.4	LOS A	0.5	3.7	0.38	0.54	0.38	34.2
6u	U	1	0.0	1	0.0	0.098	11.4	LOS B	0.5	3.7	0.38	0.54	0.38	49.2
Approach		107	6.9	107	6.9	0.098	5.9	LOS A	0.5	3.7	0.38	0.54	0.38	48.5
North: Marquis Street (N)														
7	L2	2	0.0	2	0.0	0.145	2.6	LOS A	0.8	5.6	0.33	0.48	0.33	44.8
8	T1	151	0.7	151	0.7	0.145	3.1	LOS A	0.8	5.6	0.33	0.48	0.33	28.3
9	R2	20	5.3	20	5.3	0.145	6.8	LOS A	0.8	5.6	0.33	0.48	0.33	53.2
9u	U	1	0.0	1	0.0	0.145	8.7	LOS A	0.8	5.6	0.33	0.48	0.33	18.4
Approach		174	1.2	174	1.2	0.145	3.6	LOS A	0.8	5.6	0.33	0.48	0.33	38.2
West: Oxley Highway (W)														
10	L2	63	1.7	63	1.7	0.152	5.7	LOS A	0.8	5.9	0.47	0.60	0.47	42.1
11	T1	63	5.0	63	5.0	0.152	6.0	LOS A	0.8	5.9	0.47	0.60	0.47	51.2
12	R2	29	7.1	29	7.1	0.152	10.2	LOS B	0.8	5.9	0.47	0.60	0.47	48.9
12u	U	1	0.0	1	0.0	0.152	11.9	LOS B	0.8	5.9	0.47	0.60	0.47	54.6
Approach		157	4.0	157	4.0	0.152	6.7	LOS A	0.8	5.9	0.47	0.60	0.47	47.2
All Vehicles		736	4.1	736	4.1	0.235	5.3	LOS A	1.4	10.0	0.35	0.51	0.35	42.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 201 [1A.2 Marquis St / Ped Crossing (Site Folder: 1A Existing AM Peak)]

Network: N101 [1A Existing AM Peak (Network Folder: General)]

Exising AM Peak
08:00-09:00
27/7/22
Site Category: Existing Design
Pedestrian Crossing (Unsignalised)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Marquis Street (S)														
2	T1	285	4.4	285	4.4	0.411	5.6	LOS A	2.4	17.5	0.47	0.65	0.52	24.7
Approach		285	4.4	285	4.4	0.411	5.6	LOS A	2.4	17.5	0.47	0.65	0.52	24.7
North: Marquis Street (N)														
8	T1	145	1.4	145	1.4	0.206	6.0	LOS A	0.9	6.0	0.38	0.60	0.38	39.7
Approach		145	1.4	145	1.4	0.206	6.0	LOS A	0.9	6.0	0.38	0.60	0.38	39.7
All Vehicles		431	3.4	431	3.4	0.411	5.7	NA	2.4	17.5	0.44	0.63	0.47	32.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: Akçelik M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 301 [1A.3 Marquis St / Reservoir St (Site Folder: 1A Existing AM Peak)]

Network: N101 [1A Existing AM Peak (Network Folder: General)]

Existing AM Peak
08:00-09:00
27/07/22
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Marquis Steet (S)														
2	T1	285	4.4	285	4.4	0.170	0.1	LOS A	0.2	1.6	0.06	0.05	0.06	54.3
3	R2	25	16.7	25	16.7	0.170	6.2	LOS A	0.2	1.6	0.06	0.05	0.06	54.3
Approach		311	5.4	311	5.4	0.170	0.6	NA	0.2	1.6	0.06	0.05	0.06	54.3
East: Reservois Street (E)														
4	L2	19	5.6	19	5.6	0.034	6.1	LOS A	0.1	0.8	0.27	0.59	0.27	40.1
6	R2	17	0.0	17	0.0	0.034	7.4	LOS A	0.1	0.8	0.27	0.59	0.27	40.1
Approach		36	2.9	36	2.9	0.034	6.7	LOS A	0.1	0.8	0.27	0.59	0.27	40.1
North: Marquis Street (N)														
7	L2	17	6.3	17	6.3	0.085	4.1	LOS A	0.0	0.0	0.00	0.06	0.00	54.3
8	T1	145	1.4	145	1.4	0.085	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	57.5
Approach		162	1.9	162	1.9	0.085	0.4	NA	0.0	0.0	0.00	0.06	0.00	57.4
All Vehicles		508	4.1	508	4.1	0.170	1.0	NA	0.2	1.6	0.06	0.09	0.06	52.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 401 [1A.4 Reservoir St / Anzac Prde (Site Folder: 1A Existing AM Peak)]

Network: N101 [1A Existing AM Peak (Network Folder: General)]

Existing AM Peak
08:00-09:00
27/07/22
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Anzac Parade (S)														
1	L2	16	6.7	16	6.7	0.140	3.9	LOS A	0.0	0.1	0.00	0.04	0.00	56.2
2	T1	252	1.7	252	1.7	0.140	0.0	LOS A	0.0	0.1	0.00	0.04	0.00	56.2
3	R2	1	0.0	1	0.0	0.140	4.2	LOS A	0.0	0.1	0.00	0.04	0.00	51.4
Approach		268	2.0	268	2.0	0.140	0.3	NA	0.0	0.1	0.00	0.04	0.00	56.1
East: Reservoir Street (E)														
4	L2	1	0.0	1	0.0	0.049	5.9	LOS A	0.2	1.2	0.42	0.67	0.42	36.6
5	T1	6	16.7	6	16.7	0.049	6.6	LOS A	0.2	1.2	0.42	0.67	0.42	37.4
6	R2	28	0.0	28	0.0	0.049	7.9	LOS A	0.2	1.2	0.42	0.67	0.42	37.4
Approach		36	2.9	36	2.9	0.049	7.6	LOS A	0.2	1.2	0.42	0.67	0.42	37.4
North: Anzac Parade (N)														
7	L2	7	0.0	7	0.0	0.086	6.4	LOS A	0.2	1.3	0.14	0.11	0.14	51.2
8	T1	123	6.0	123	6.0	0.086	0.2	LOS A	0.2	1.3	0.14	0.11	0.14	51.9
9	R2	21	5.0	21	5.0	0.086	6.5	LOS A	0.2	1.3	0.14	0.11	0.14	49.3
Approach		152	5.6	152	5.6	0.086	1.4	NA	0.2	1.3	0.14	0.11	0.14	51.6
West: Reservois Street (W)														
10	L2	21	10.0	21	10.0	0.037	6.5	LOS A	0.1	1.1	0.37	0.60	0.37	39.8
11	T1	7	14.3	7	14.3	0.037	6.4	LOS A	0.1	1.1	0.37	0.60	0.37	43.2
12	R2	6	33.3	6	33.3	0.037	9.1	LOS A	0.1	1.1	0.37	0.60	0.37	37.1
Approach		35	15.2	35	15.2	0.037	7.0	LOS A	0.1	1.1	0.37	0.60	0.37	40.3
All Vehicles		491	4.1	491	4.1	0.140	1.6	NA	0.2	1.3	0.10	0.15	0.10	48.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 501 [1A.5 Anzac Prde / Eigth Div Memorial Ave (Site Folder: 1A Existing AM Peak)]

Network: N101 [1A Existing AM Peak (Network Folder: General)]

Existing AM Peak
08:00-09:00
27/07/22
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Anzac Parade														
2	T1	293	2.2	293	2.2	0.156	0.0	LOS A	0.0	0.4	0.02	0.01	0.02	59.2
3	R2	6	0.0	6	0.0	0.156	6.1	LOS A	0.0	0.4	0.02	0.01	0.02	54.3
Approach		299	2.1	299	2.1	0.156	0.1	NA	0.0	0.4	0.02	0.01	0.02	59.1
East: Eigth Division Memorial Avenue (E)														
4	L2	5	0.0	5	0.0	0.129	6.0	LOS A	0.4	3.1	0.42	0.71	0.42	41.9
6	R2	103	1.0	103	1.0	0.129	7.6	LOS A	0.4	3.1	0.42	0.71	0.42	42.8
Approach		108	1.0	108	1.0	0.129	7.6	LOS A	0.4	3.1	0.42	0.71	0.42	42.8
North: Anzac Parade (N)														
7	L2	27	7.7	27	7.7	0.096	5.6	LOS A	0.0	0.0	0.00	0.09	0.00	52.0
8	T1	152	5.6	152	5.6	0.096	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	54.4
Approach		179	5.9	179	5.9	0.096	0.9	NA	0.0	0.0	0.00	0.09	0.00	53.5
All Vehicles		586	3.1	586	3.1	0.156	1.7	NA	0.4	3.1	0.09	0.17	0.09	52.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 501 [1B.5 Anzac Prde / Eigth Div Memorial Ave (Site Folder: 1B Existing PM Peak)]

Network: N101 [1B Existing PM Peak (Network Folder: General)]

Existing AM Peak
08:00-09:00
27/07/22
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Anzac Parade														
2	T1	206	3.1	206	3.1	0.116	0.1	LOS A	0.1	0.6	0.05	0.03	0.05	58.2
3	R2	11	0.0	11	0.0	0.116	6.4	LOS A	0.1	0.6	0.05	0.03	0.05	53.7
Approach		217	2.9	217	2.9	0.116	0.4	NA	0.1	0.6	0.05	0.03	0.05	57.8
East: Eigth Division Memorial Avenue (E)														
4	L2	6	0.0	6	0.0	0.114	6.2	LOS A	0.4	2.7	0.41	0.70	0.41	42.2
6	R2	93	1.1	93	1.1	0.114	7.5	LOS A	0.4	2.7	0.41	0.70	0.41	43.0
Approach		99	1.1	99	1.1	0.114	7.4	LOS A	0.4	2.7	0.41	0.70	0.41	43.0
North: Anzac Parade (N)														
7	L2	73	1.4	73	1.4	0.141	5.6	LOS A	0.0	0.0	0.00	0.16	0.00	52.6
8	T1	194	2.7	194	2.7	0.141	0.0	LOS A	0.0	0.0	0.00	0.16	0.00	50.5
Approach		266	2.4	266	2.4	0.141	1.5	NA	0.0	0.0	0.00	0.16	0.00	51.6
All Vehicles		582	2.4	582	2.4	0.141	2.1	NA	0.4	2.7	0.09	0.20	0.09	50.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [1B.1 Marquis St / Oxley Hwy (Site Folder: 1B Existing PM Peak)]

Network: N101 [1B Existing PM Peak (Network Folder: General)]

Existing AM Peak
08:00-09:00
27/07/22
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Marquis Street (S)														
1	L2	18	5.9	18	5.9	0.208	4.9	LOS A	1.2	8.6	0.34	0.50	0.34	50.6
2	T1	206	4.1	206	4.1	0.208	5.1	LOS A	1.2	8.6	0.34	0.50	0.34	33.3
3	R2	20	15.8	20	15.8	0.208	9.5	LOS A	1.2	8.6	0.34	0.50	0.34	44.9
3u	U	1	0.0	1	0.0	0.208	11.1	LOS B	1.2	8.6	0.34	0.50	0.34	39.9
Approach		245	5.2	245	5.2	0.208	5.5	LOS A	1.2	8.6	0.34	0.50	0.34	36.7
East: Oxley Highway (E)														
4	L2	13	8.3	13	8.3	0.100	5.7	LOS A	0.5	3.8	0.45	0.56	0.45	39.6
5	T1	81	5.2	81	5.2	0.100	5.9	LOS A	0.5	3.8	0.45	0.56	0.45	51.7
6	R2	8	0.0	8	0.0	0.100	9.9	LOS A	0.5	3.8	0.45	0.56	0.45	33.7
6u	U	1	0.0	1	0.0	0.100	11.8	LOS B	0.5	3.8	0.45	0.56	0.45	48.5
Approach		103	5.1	103	5.1	0.100	6.2	LOS A	0.5	3.8	0.45	0.56	0.45	50.1
North: Marquis Street (N)														
7	L2	11	10.0	11	10.0	0.220	2.7	LOS A	1.3	9.2	0.33	0.49	0.33	42.4
8	T1	217	1.0	217	1.0	0.220	3.1	LOS A	1.3	9.2	0.33	0.49	0.33	27.9
9	R2	41	2.6	41	2.6	0.220	6.7	LOS A	1.3	9.2	0.33	0.49	0.33	53.2
9u	U	2	50.0	2	50.0	0.220	9.0	LOS A	1.3	9.2	0.33	0.49	0.33	17.9
Approach		271	1.9	271	1.9	0.220	3.7	LOS A	1.3	9.2	0.33	0.49	0.33	40.0
West: Oxley Highway (W)														
10	L2	52	4.1	52	4.1	0.143	5.4	LOS A	0.8	5.6	0.43	0.57	0.43	42.3
11	T1	75	4.2	75	4.2	0.143	5.7	LOS A	0.8	5.6	0.43	0.57	0.43	51.5
12	R2	25	8.3	25	8.3	0.143	9.9	LOS A	0.8	5.6	0.43	0.57	0.43	49.2
12u	U	1	0.0	1	0.0	0.143	11.6	LOS B	0.8	5.6	0.43	0.57	0.43	54.7
Approach		153	4.8	153	4.8	0.143	6.3	LOS A	0.8	5.6	0.43	0.57	0.43	48.1
All Vehicles		772	4.0	772	4.0	0.220	5.1	LOS A	1.3	9.2	0.37	0.52	0.37	43.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 201 [1B.2 Marquis St / Ped Crossing (Site Folder: 1B Existing PM Peak)]

Network: N101 [1B Existing PM Peak (Network Folder: General)]

Exising AM Peak
08:00-09:00
27/7/22
Site Category: Existing Design
Pedestrian Crossing (Unsignalised)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Marquis Street (S)														
2	T1	200	5.8	200	5.8	0.291	4.9	LOS A	1.3	9.6	0.41	0.61	0.41	26.6
Approach		200	5.8	200	5.8	0.291	4.9	LOS A	1.3	9.6	0.41	0.61	0.41	26.6
North: Marquis Street (N)														
8	T1	249	1.7	249	1.7	0.353	6.3	LOS A	1.7	12.1	0.44	0.63	0.44	39.0
Approach		249	1.7	249	1.7	0.353	6.3	LOS A	1.7	12.1	0.44	0.63	0.44	39.0
All Vehicles		449	3.5	449	3.5	0.353	5.7	NA	1.7	12.1	0.43	0.62	0.43	35.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: Akçelik M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 301 [1B.3 Marquis St / Reservoir St (Site Folder: 1B Existing PM Peak)]

Network: N101 [1B Existing PM Peak (Network Folder: General)]

Existing AM Peak
08:00-09:00
27/07/22
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Marquis Steet (S)														
2	T1	200	5.8	200	5.8	0.121	0.1	LOS A	0.2	1.2	0.08	0.05	0.08	53.9
3	R2	17	18.8	17	18.8	0.121	6.7	LOS A	0.2	1.2	0.08	0.05	0.08	53.9
Approach		217	6.8	217	6.8	0.121	0.7	NA	0.2	1.2	0.08	0.05	0.08	53.9
East: Reservois Street (E)														
4	L2	27	0.0	27	0.0	0.039	6.3	LOS A	0.1	1.0	0.34	0.60	0.34	40.1
6	R2	15	0.0	15	0.0	0.039	7.5	LOS A	0.1	1.0	0.34	0.60	0.34	39.7
Approach		42	0.0	42	0.0	0.039	6.7	LOS A	0.1	1.0	0.34	0.60	0.34	40.0
North: Marquis Street (N)														
7	L2	20	10.5	20	10.5	0.141	4.1	LOS A	0.0	0.0	0.00	0.04	0.00	55.9
8	T1	249	1.7	249	1.7	0.141	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	58.2
Approach		269	2.3	269	2.3	0.141	0.3	NA	0.0	0.0	0.00	0.04	0.00	58.2
All Vehicles		528	4.0	528	4.0	0.141	1.0	NA	0.2	1.2	0.06	0.09	0.06	53.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 401 [1B.4 Reservoir St / Anzac Prde (Site Folder: 1B Existing PM Peak)]

Network: N101 [1B Existing PM Peak (Network Folder: General)]

Existing AM Peak
08:00-09:00
27/07/22
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Anzac Parade (S)														
1	L2	17	6.3	17	6.3	0.093	3.9	LOS A	0.0	0.1	0.01	0.06	0.01	54.1
2	T1	159	2.6	159	2.6	0.093	0.0	LOS A	0.0	0.1	0.01	0.06	0.01	54.1
3	R2	1	0.0	1	0.0	0.093	4.4	LOS A	0.0	0.1	0.01	0.06	0.01	50.9
Approach		177	3.0	177	3.0	0.093	0.4	NA	0.0	0.1	0.01	0.06	0.01	54.0
East: Reservoir Street (E)														
4	L2	1	0.0	1	0.0	0.028	6.0	LOS A	0.1	0.7	0.39	0.64	0.39	37.2
5	T1	3	0.0	3	0.0	0.028	5.7	LOS A	0.1	0.7	0.39	0.64	0.39	38.2
6	R2	18	0.0	18	0.0	0.028	7.5	LOS A	0.1	0.7	0.39	0.64	0.39	38.2
Approach		22	0.0	22	0.0	0.028	7.2	LOS A	0.1	0.7	0.39	0.64	0.39	38.2
North: Anzac Parade (N)														
7	L2	15	0.0	15	0.0	0.105	5.9	LOS A	0.2	1.1	0.08	0.10	0.08	52.1
8	T1	163	3.2	163	3.2	0.105	0.1	LOS A	0.2	1.1	0.08	0.10	0.08	53.5
9	R2	18	0.0	18	0.0	0.105	6.0	LOS A	0.2	1.1	0.08	0.10	0.08	51.3
Approach		196	2.7	196	2.7	0.105	1.1	NA	0.2	1.1	0.08	0.10	0.08	53.2
West: Reservois Street (W)														
10	L2	38	5.6	38	5.6	0.043	6.1	LOS A	0.2	1.2	0.27	0.56	0.27	40.6
11	T1	5	0.0	5	0.0	0.043	5.7	LOS A	0.2	1.2	0.27	0.56	0.27	45.7
12	R2	6	33.3	6	33.3	0.043	8.5	LOS A	0.2	1.2	0.27	0.56	0.27	37.6
Approach		49	8.5	49	8.5	0.043	6.4	LOS A	0.2	1.2	0.27	0.56	0.27	40.9
All Vehicles		444	3.3	444	3.3	0.105	1.7	NA	0.2	1.2	0.09	0.16	0.09	49.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.