



Site Audit & Traffic Management Plan

Southern Cross University, Lismore



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Acoustics



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Waste

Revision Record

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Contents

1	Introduction	4
1.1	Background	4
1.2	Scope.....	4
1.3	Site Inspection	5
1.4	Authorities and Key Stakeholders.....	5
1.5	References.....	5
1.6	Methodology.....	5
2	Existing Transport Network Review	7
2.1	Access from External Network	7
2.2	Access Road Environment	7
	2.2.1 University Road	7
	2.2.2 Rifle Range Road.....	8
	2.2.3 Military Road	9
2.3	Public Transport Facilities.....	10
2.4	Pedestrians.....	11
2.5	Cycle Facilities	12
2.6	Car Parking Arrangements.....	14
3	Audit Findings.....	16
3.1	Site Inspection	16
3.2	Site Area 1	18
3.3	Site Area 2	19
3.4	Site Area 3	21
3.5	Site Area 4	22
3.6	Site Area 5	24
3.7	Site Area 6	25
3.8	Site Area 7	27
3.9	Site Area 8	28
3.10	Site Area 9	29
3.11	Site Area 10.....	31
3.12	Site Area 11	31

3.13	Site Area 12	32
3.14	Site Area 13	34
3.15	Site Area 14	35
3.16	Site Wide General.....	35
4	Conclusion.....	39

Table Index

Table 2.1	Bus Stop Summary	11
Table 3.1:	Site Areas.....	17

Figure Index

Figure 2.1:	Site Access Locations	7
Figure 2.2:	University Road (view eastbound)	8
Figure 2.3:	Rifle Range Road (view northbound)	9
Figure 2.4:	Military Road (view southbound).....	10
Figure 2.5:	Bus stop locations	10
Figure 2.6:	Pedestrian pathways.....	12
Figure 2.7:	Cycle routes	13
Figure 2.8:	Cycle parking locations.....	14
Figure 2.9:	Car park locations	15
Figure 3.1:	Site Areas Map	16
Figure 3.2:	Site Area 1 Imagery	18
Figure 3.3:	Site Area 2 Imagery	20
Figure 3.4:	Site Area 3 Imagery	21
Figure 3.5:	Site Area 3 Aerial Imagery	22
Figure 3.6:	Site Area 4 Imagery	23
Figure 3.7:	Site Area 5 Imagery	24
Figure 3.8:	Site Area 6 Imagery	26
Figure 3.9:	Site Area 7 Imagery	27
Figure 3.10:	Site Area 7 Imagery	28
Figure 3.11:	Site Area 9 Imagery	30
Figure 3.12:	Site Area 10 Imagery	31
Figure 3.13:	Site Area 11 Imagery	32
Figure 3.14:	Site Area 12 Imagery	33
Figure 3.15:	Site Area 13 Imagery	34
Figure 3.16:	Site Area 14 Imagery	35

1 Introduction

1.1 Background

TTM Consulting has been engaged by Southern Cross University (SCU) to undertake a safety audit and assessment of the existing campus in Lismore. The project is in response to the recent increasing site demand – in particular the licensing of several areas of the campus to external organisations, including a primary school and a high school.

The purpose of the project is to proactively seek to improve the safety of pedestrian and vehicular movements and operations throughout the campus.

1.2 Scope

TTM's review and assessment aims to identify potential safety issues within the sites pedestrian and vehicular movement network that could arise if not appropriately treated or managed. Specifically, the study focuses on areas of the campus where there is regular pedestrian and vehicular interaction (i.e. the schools).

The scope of the assessment includes the following:

- Review of background information of the site provided by SCU, including safety issues that have already been identified by SCU and other organisations on site.
- Undertake a site inspection to observe the operations of the car parking areas and general access arrangements.
- Utilise on-site observations and traffic engineering experience to identify potential safety issues and opportunities to improve safety.
- Identify existing pedestrian desire lines throughout the campus.
- Identify the existing movement infrastructure and review the general suitability.
- Identify an overall strategy, through discussion with SCU, and other site stakeholders, that could feasibly be implemented to improve the safety of pedestrian and vehicular movements throughout the site.
- Compare our findings to regulatory standards and current industry practices.
- Review the current site movement networks and recommend connectivity improvements for when accessing the various buildings on site, circulating through the car parks and navigating the loading dock
- Summarise our findings with a report that shows our findings and recommendations. The report is to present an actionable strategy to improve safety within the site.

1.3 Site Inspection

A site inspection of the campus was conducted on Tuesday 31st June 2022.

1.4 Authorities and Key Stakeholders

The site is located within the area of the Lismore City Council.

Key stakeholders include:

- Southern Cross University
- Trinity Catholic College
- Living School
- NSW TAFE
- Health North Coast

1.5 References

To assess the operational movement network arrangement of the existing site, the identified issues and recommended improvements have been reviewed and assessed against the following guidelines and planning documents:

- Australian Standard 2890.1:2004 Parking Facilities – Off Street Car Parking
- Austroads Guide to Road Design – Part 6 – Roadside Design, Safety and Barriers
- Austroads Guide to Road Design – Part 6A – Paths for Walking and Cycling
- Austroads Guide to Traffic Management Part 8: Local Area Traffic Management

The above standards and guidelines have been applied to the areas of the site where issues have been reported, in which the issue has resulted in recommended treatments and modifications.

Note: All images shown in this report are used for indicative guide purposes only and are not to be specifically referenced. Aerial backgrounds have been provided by either Nearmap or Google Maps with permissions.

1.6 Methodology

TTM have adopted the following methodology and principles when reviewing, assessing and identifying opportunities to improve safety.

These are as follows:

- Liaise with SCU, and other key stakeholders to identify key needs of users.

- Attend site to observe pedestrian and vehicular movements to determine existing desire lines, access points and existing issues.
- Review the safety of the existing desire lines, with respect to exposure to vehicle movements, driver awareness of pedestrians and measures input to reduce vehicular speeds.
- Identify whether there is potential opportunity to improve the safety of an area by reducing pedestrian exposure to vehicle movements, increasing driver awareness, reducing vehicle speeds or amendments to parking arrangements.

2 Existing Transport Network Review

2.1 Access from External Network

There are four points of access on to the site from the wider public road network. The primary access points, that are identified through directional signage on the public road network are:

- From the north - University Road via Ballina Road and Kellas Street.
- From the east – Rifle Range Road, via Invercauld Road and Cynthia Wilson Drive
- From the south and west – Military Road, via Wyrallah Road and Dalley Street.

In addition to the primary access points identified above, a secondary access point that is not signed is also provided as follows:

- From the west - Bright Street and College Road, via Ballina Road and Dibbs Street.

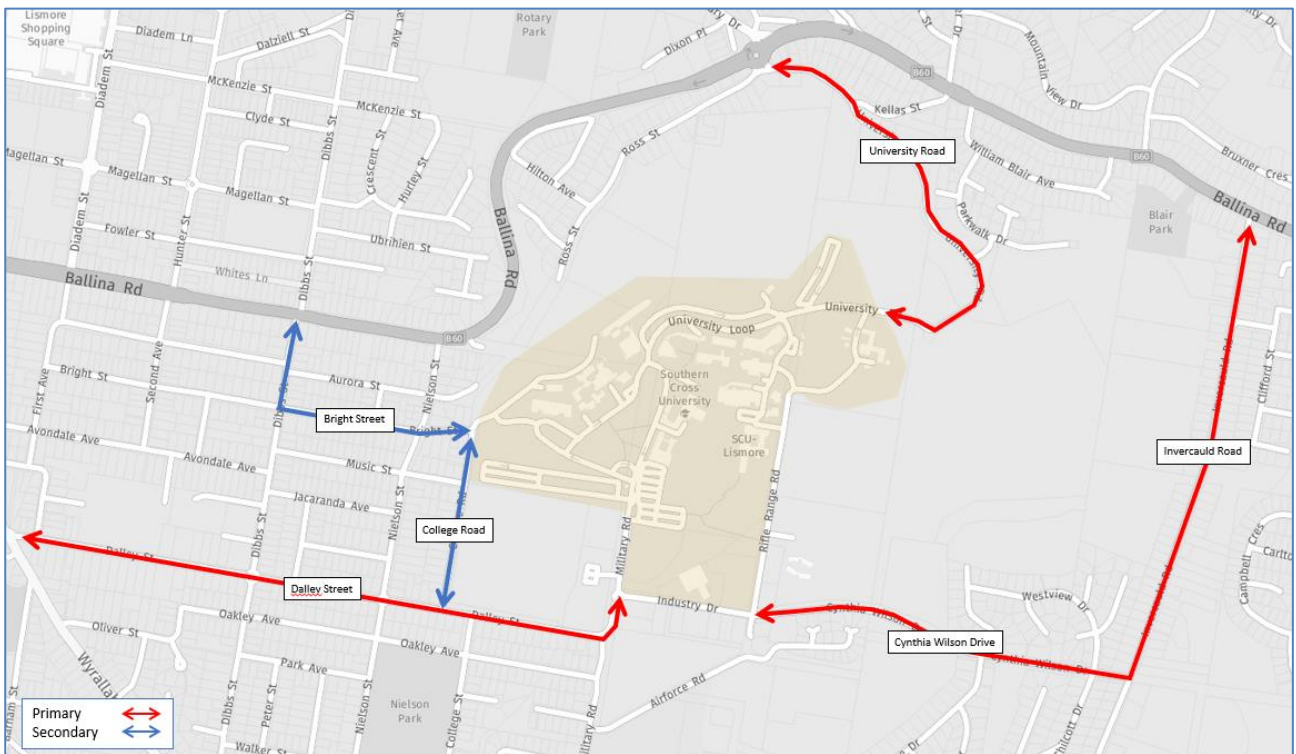


Figure 2.1: Site Access Locations

2.2 Access Road Environment

2.2.1 University Road

University Road accessed from Ballina Road (state highway) via a roundabout, is subject to a 50kph speed limit. The road is a two lane (one in each direction), undivided local road. Carriageway widths vary between

7.3m and 8.0m. The topography of the road is such that there is an elevation drop of approximately 63m from Ballina Road to the site entry – this is equivalent to an average grade of 7.0% (1:14). The University entry gateway signage is located 890m from Ballina Road, and immediately upon entry through the site gateway, the road grade increases to almost 16% (1:6.25).

Pedestrians are provided for via a dedicated route along the outbound side of the road. The pathway is formed as part of the road surface seal and is delineated from the traffic lanes via a surface mounted kerb as shown in Figure 2.2.



Figure 2.2: University Road (view eastbound)

2.2.2 Rifle Range Road

Rifle Range Road accessed from Cynthia Wilson Drive (sub-arterial road) via a priority controlled intersection, is subject to a 50kph speed limit. The road is a two lane (one in each direction), undivided local (c class) road. Carriageway widths vary between 5.6m and 6.6m. The topography of the road is relatively flat with an average grade of less than 1% (1:100) up from Cynthia Wilson Drive to the north end of Rifle Range Road.

There are no formal pedestrian pathways along the majority of the length of the road – for a length of approximately 400m from the intersection. Pedestrians are then provided for via a dedicated footpath on

the western side, with a new footpath having been provided (post site visit) on the eastern side in front of the new demountable buildings.

Watts profile speed humps are provided at distances 88m, 325m and 460m from the intersection.



Figure 2.3: Rifle Range Road (view northbound)

2.2.3 Military Road

Military Road provides the main access to the site and is subject to a 50kph speed limit. The road is a two lane (one in each direction), undivided sub-arterial road with kerbside parking. Carriageway widths vary between 8.8m and 12.3m kerb to kerb – with through lanes varying between 8.8m and 9.5m. The topography of the road is relatively flat with an average grade of less than 1.5% (1:65) up from Dalley Street (sub-arterial road) to the north end of Military Road.

Pedestrians are then provided for via a dedicated footpath on the western side of the road within the verge.



Figure 2.4: Military Road (view southbound)

2.3 Public Transport Facilities

The SCU Lismore campus is serviced by a number of bus routes operated by Northern Rivers Buslines and Blanch's Bus Company. A review of Transport for NSW (TfNSW) published routes and timetable information identifies five stops within the campus. These are presented in Figure 2.5.

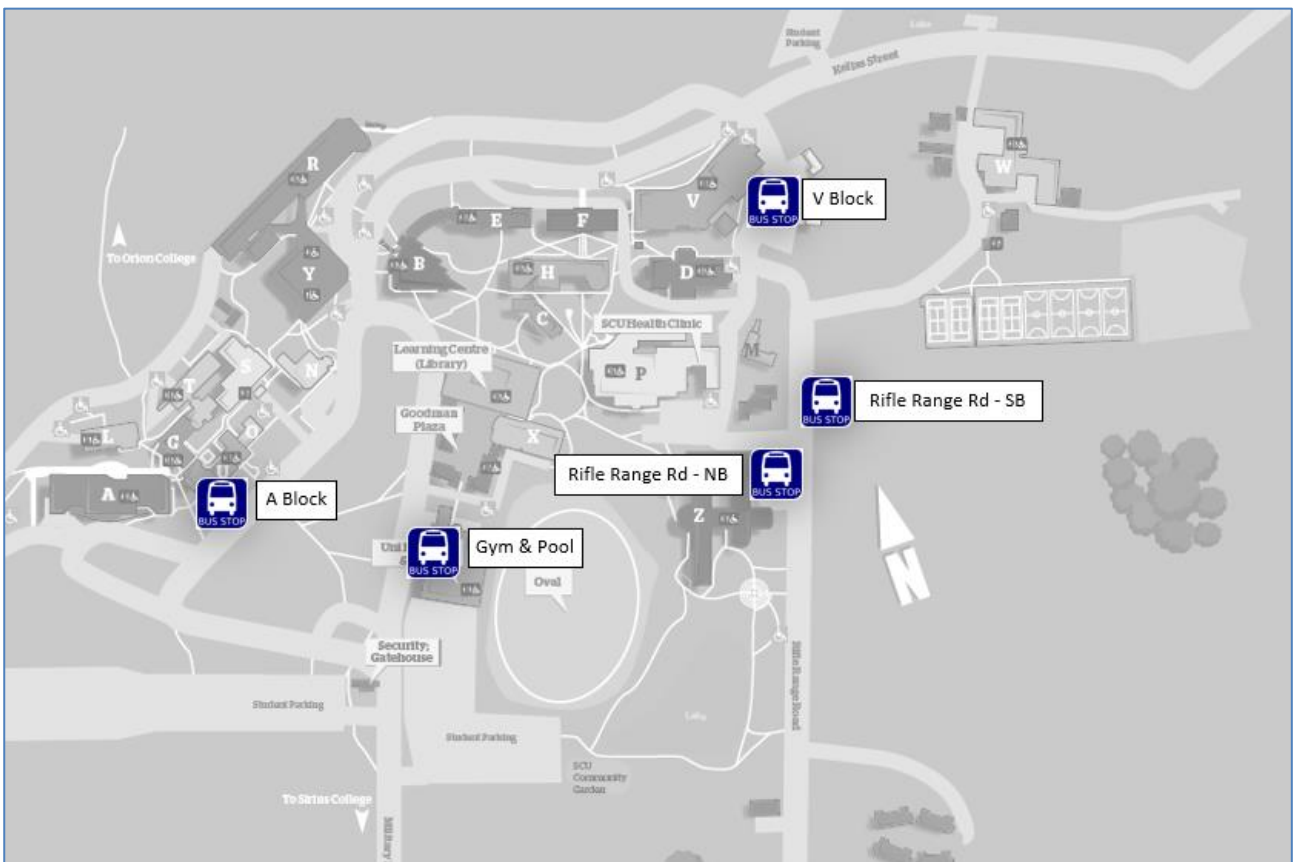


Figure 2.5: Bus stop locations

Table 2.1 Bus Stop Summary

Stop ID	Stop Name	Service No.	Key Route Locations	Operating Times at SCU Stop
248012	Rifle Range Road - NB	641X	Byron Bay to Lismore via Bangalow, Clunes & Bexhill	<u>Monday to Friday:</u> 3.55pm
		682	Lismore to Goonellabah via Southern Cross University (Loop Service)	<u>Monday to Friday:</u> 7.24am – 6.02pm <u>Saturday:</u> 8.25am – 5.24pm <u>Sunday:</u> 8.49am – 3.17pm
		699	Goonellabah to Lismore (Flood Recovery Shuttle)	<u>Daily:</u> 9.07am – 5.07pm
		640X	Byron Bay to Lismore via Lennox Head & Ballina	<u>Monday to Friday:</u> 7.20am
248013	Rifle Range Road - SB	641X	Lismore to Byron Bay via Bexhill, Clunes & Bangalow	<u>Monday to Friday:</u> 8.50am
		682	Lismore to Goonellabah via Southern Cross University (Loop Service)	<u>Monday to Friday:</u> 9.47am – 6.12pm <u>Saturday:</u> 9.37am – 4.42pm <u>Sunday:</u> 10.05am – 4.35pm
		683	Lismore to Lismore Heights via Southern Cross University (Loop Service)	<u>Monday to Friday:</u> 7.09am – 6.19pm <u>Saturday:</u> 8.49am – 4.59pm <u>Sunday:</u> 9.29am – 3.59pm
		699	Lismore to Goonellabah (Flood Recovery Shuttle)	<u>Daily:</u> 9.50am – 5.50pm
		640X	Lismore to Byron Bay via Ballina & Lennox Head	<u>Monday to Friday:</u> 5.00pm
2480157	Gym & Pool	661	Ballina via Goonellabah/Regatta Estate/Wollongbar/Alstonville/West Ballina	<u>Monday to Friday:</u> 7.09am – 6.19pm <u>Saturday:</u> 8.49am – 4.59pm <u>Sunday:</u> 9.29am – 3.59pm
2480501	V Block	699	Goonellabah to Lismore (Flood Recovery Shuttle)	<u>Daily:</u> 9.10am – 5.10pm
			Lismore to Goonellabah (Flood Recovery Shuttle)	<u>Daily:</u> 9.48am – 5.48pm
2480167	A Block ⁺	684	Lismore to South Lismore via East Lismore (Loop Service)	<u>Monday to Friday:</u> 7.26am – 5.27pm <u>Saturday:</u> 7.47am – 4.37pm

⁺ Whilst the above are presented as timetabled, it is understood that the A Block services currently utilise the 'Gym & Pool' stop.

2.4 Pedestrians

The site includes a network of pedestrian pathways through and around the site, leading to and from car parking areas and between buildings.

The topography of the site is such that there are a high number of pathways that require steps to achieve the change in height between buildings. A result of this is that there are limited number of routes that are to DDA standard.

SCU have provided TTM with a map identifying the routes that are suitable for DDA use – refer below map extract. The remainder are for general use. As can be seen, there is a disconnect between the Block W area

(which houses property services and NSW Ambulance). The remainder of the site includes a full network of routes.

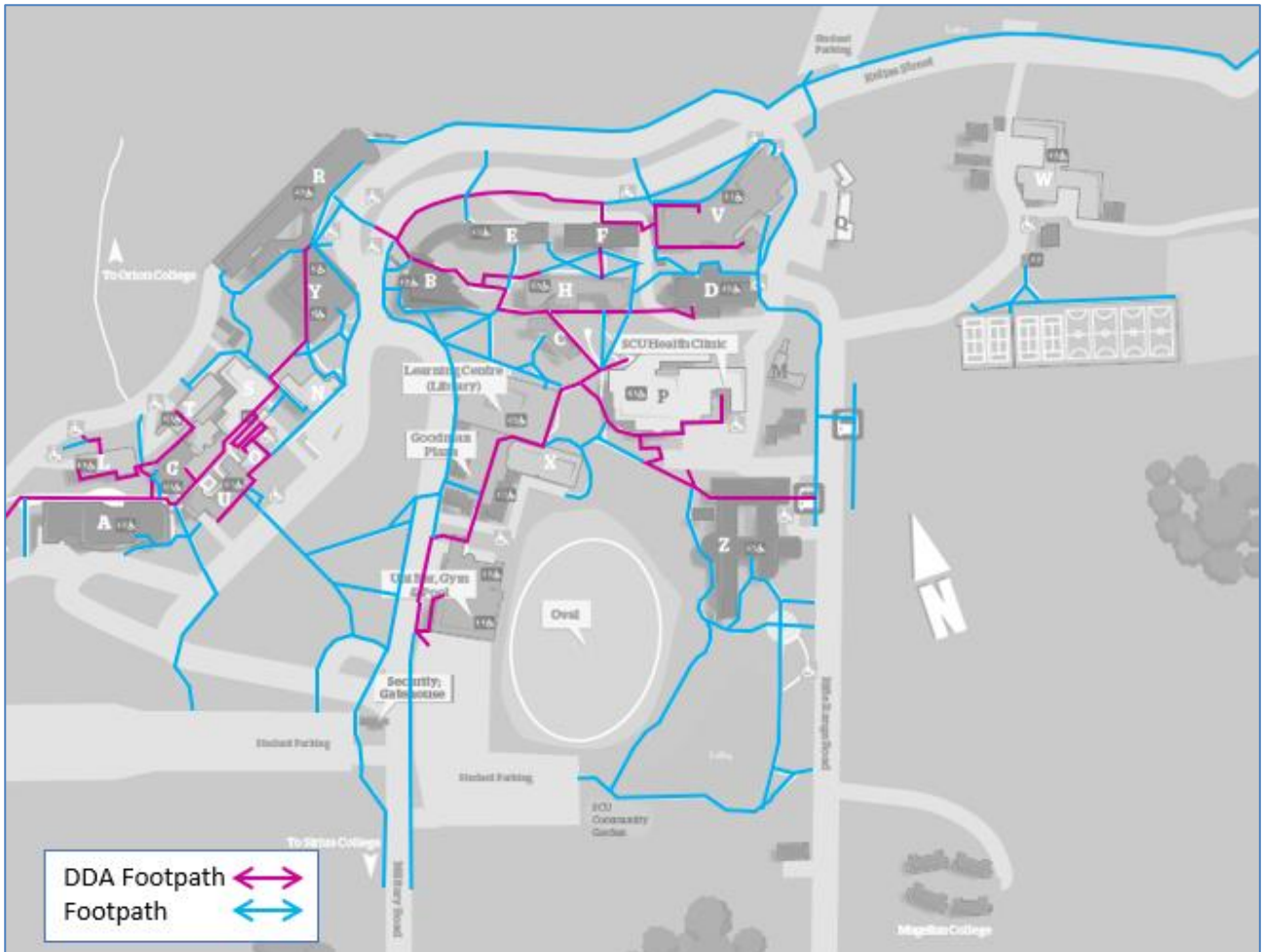


Figure 2.6: Pedestrian pathways

2.5 Cycle Facilities

The Campus is subject to a 20kph speed limit which is appropriate for cyclists to use the road.

There are no formal cycle routes leading to/from the University, however mapping identifies shared pathways along University Road to the north, connecting with Ballina Road and the wider network. Likewise, to the south west along Dalley Street connecting to Wyrallah Road. Figure 2.7 shows the routes surrounding the site.

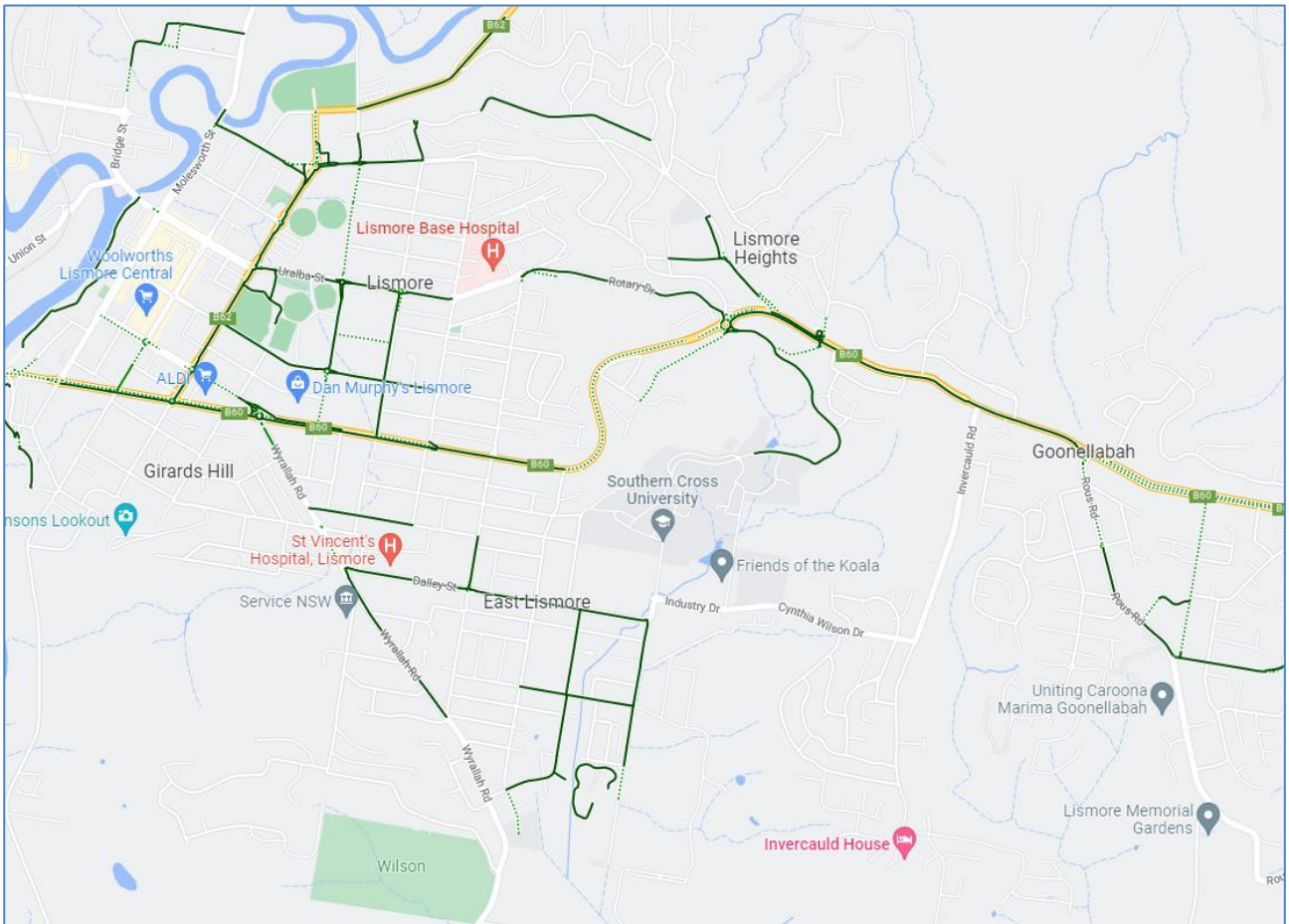


Figure 2.7: Cycle routes

Cycle parking racks are located at a number of locations throughout the campus. The parking locations are: outside the gym; outside A, B, V and Z blocks; and undercover bike racks are located outside Student Services (Learning Centre side) and the Whitebrook theatre. These are shown on Figure 2.7.

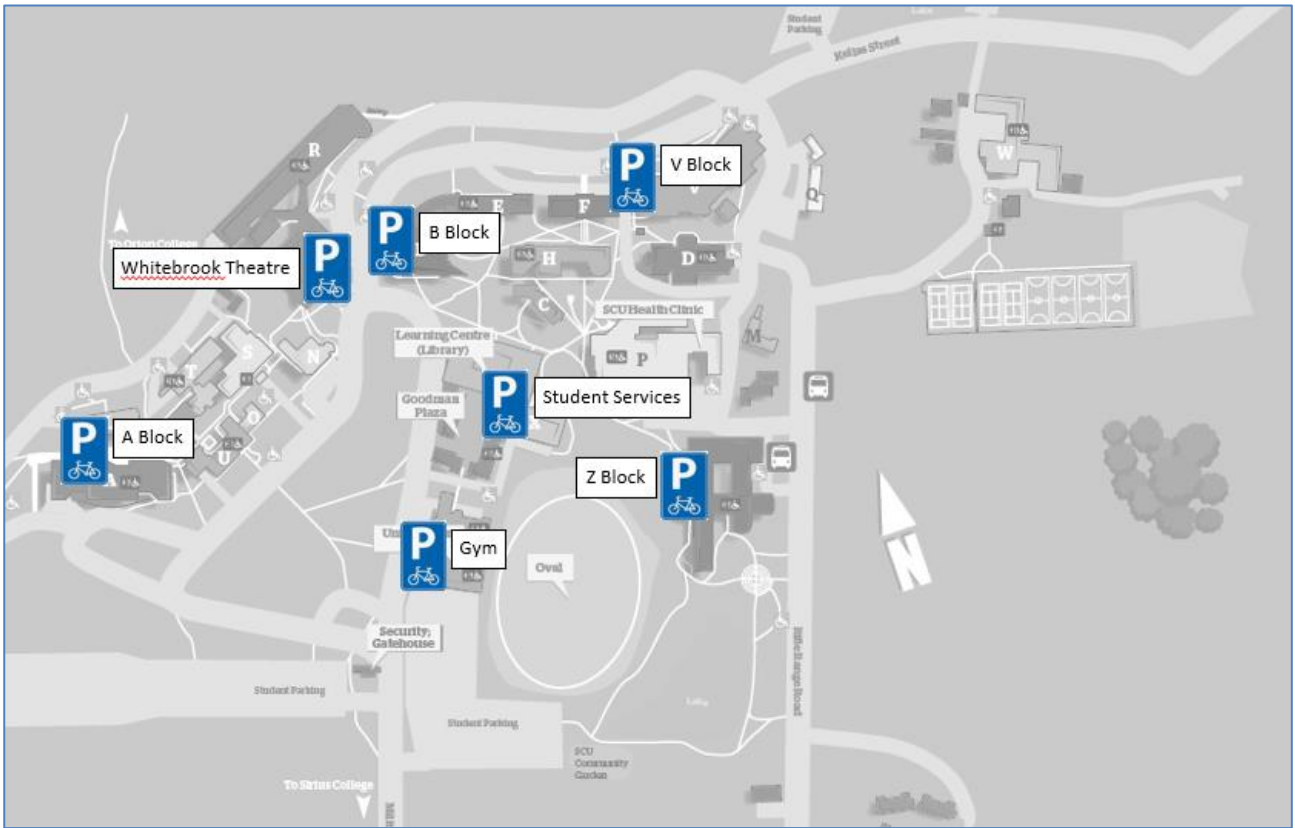


Figure 2.8: Cycle parking locations

All racks are ground mounted and allow for front and rear wheel locking of cycles.

2.6 Car Parking Arrangements

There are three public car parks located upon entry to the site. One on University Road and two on Military Road. There are a number of smaller off street car parks located immediately in front of Blocks L, N, P, U which are allocated to the buildings.

In addition to the public car parks and other off street parking areas, there are numerous locations of on street parking throughout the site. The locations of the off street car parks are presented in Figure 2.9.

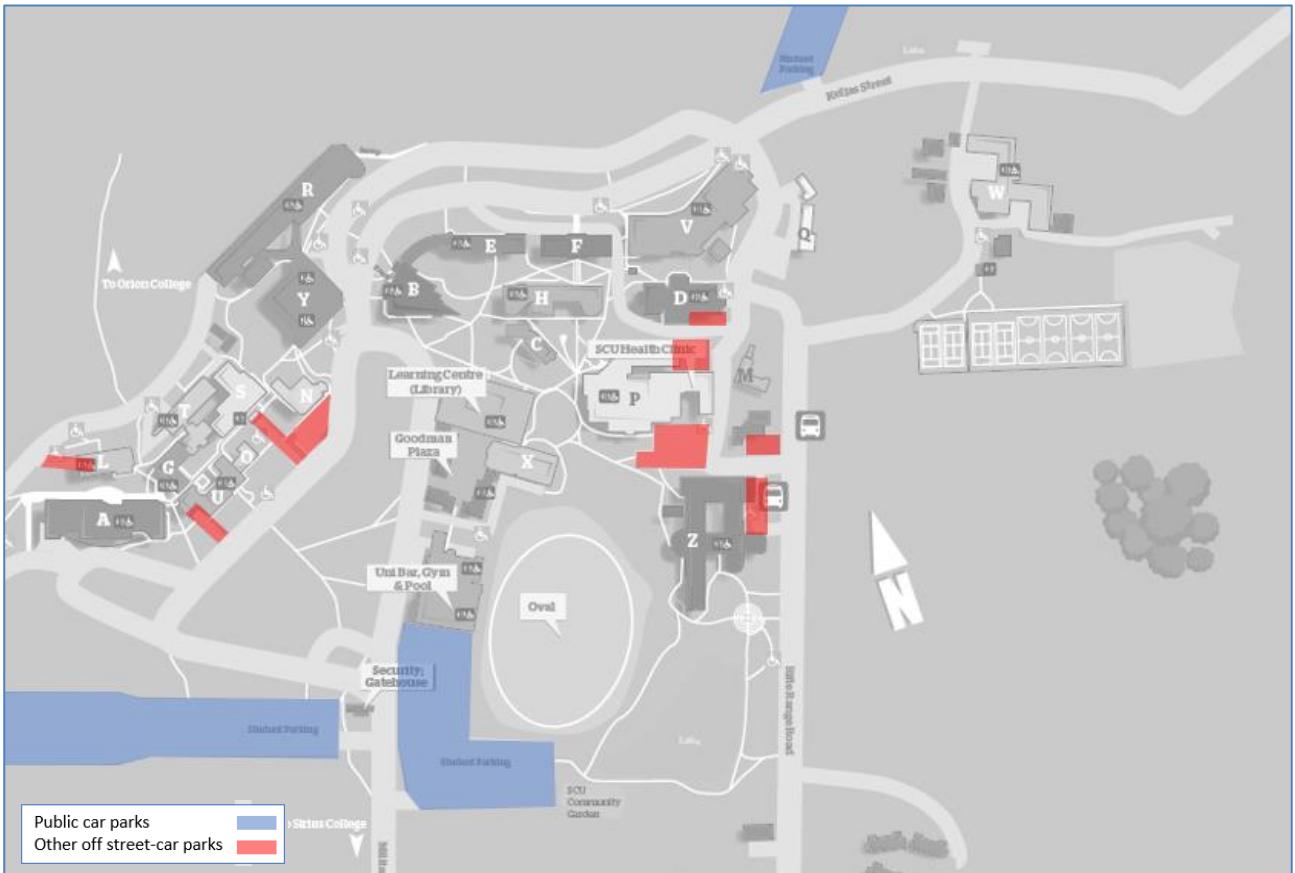


Figure 2.9: Car park locations

Parking Permits

All Southern Cross University staff and students must display a Parking Permit in their vehicle windscreen if they wish to park on university grounds.

Only one Parking Permit is issued to each SCU staff member and student; although a second vehicle may be nominated if users have access to multiple vehicles/or share with family.

All permit rules, regulations and processes identified above also apply to the following on site key stakeholders:

- Trinity Catholic College
- Living School
- NSW TAFE
- Health North Coast

Electric Vehicles

EV charging stations are provided free of charge to users. There are a total of four spaces throughout the site, of which two are located in front of Block F and two spaces are located outside the security office on Military Road.

3 Audit Findings

3.1 Site Inspection

A site inspection of the car park and servicing areas was conducted on Tuesday 31st June 2022. The inspection was conducted over a full day. The weather conditions during the inspection were dry and clear. The inspection was carried out on foot.

A series of photographs were taken as a part of the inspection to provide information on existing conditions relevant to the review. The most relevant of these follows together with an identifying number and a description of each.

For ease of review, the site has been apportioned into 14 key areas as identified in Figure 3.1 and Table 3.1 below.



Figure 3.1: Site Areas Map

Table 3.1: Site Areas

Ref	Block Ref		
1	Q & W	<ul style="list-style-type: none"> Forestry workshop Mailroom Property Services 	<ul style="list-style-type: none"> Stores NSW Ambulance Police Rescue
2	M	<ul style="list-style-type: none"> SCU Children's Centre 	
3	Z	<ul style="list-style-type: none"> Faculty of Health Health science labs 	<ul style="list-style-type: none"> Student Access and Inclusion
4	P	<ul style="list-style-type: none"> Health Clinic Counselling Multi-purpose centre 	<ul style="list-style-type: none"> Sport and exercise science labs Lismore Head to Health (Healthy North Coast) Headspace
5	C, D & H	<ul style="list-style-type: none"> Japan-Australia Centre Gallery and IAHA Music & Media Studio One29 SCU College 	<ul style="list-style-type: none"> Lecture theatre Gnibi College of Indigenous Australian Peoples Indigenous Australian Student Services (IASS)
6	B & E	<ul style="list-style-type: none"> Faculty of Education NSW TAFE 	<ul style="list-style-type: none"> Technology Services or the Service Desk The Living School
7	Learning Centre	<ul style="list-style-type: none"> University Library Academic Skills 	<ul style="list-style-type: none"> International
8	X & Goodman Plaza	<ul style="list-style-type: none"> Student Administration Services Advocacy & Careers Chaplaincy Equity & Diversity 	<ul style="list-style-type: none"> The Co-op, Unilife Campus Living Villages LEXSA Student Association Summerland Credit Union/SCU Cashier & ATM Food outlets
9	R & Y	<ul style="list-style-type: none"> Trinity High School 	<ul style="list-style-type: none"> Whitebrook Lecture Theatre
10	F	<ul style="list-style-type: none"> Rod Treyvaud Building 	
11	L	<ul style="list-style-type: none"> Faculty of Business Law and Arts 	<ul style="list-style-type: none"> NCNM Clinic
12	A	<ul style="list-style-type: none"> Faculty of Science and Engineering Enterprise Lab NCNM Partnerships and Engagement 	<ul style="list-style-type: none"> Alumni and Giving Teaching rooms Engineering labs;
13	G, N, O, S, T & U	<ul style="list-style-type: none"> Southern Cross Geo Science Environmental Analysis Laboratory (EAL) Forest Research Centre Marine Ecology Research Centre Science Labs 	<ul style="list-style-type: none"> NSW TAFE Southern Cross Plant Science Centre for Organics Research Faculty of Science and Engineering
14	V	<ul style="list-style-type: none"> Creative Arts Faculty of Business, Law and Arts 	<ul style="list-style-type: none"> NSW TAFE

The following sections provide details of the audit findings and identifies a series of recommendations for improvement to access, safety and amenity.

A meeting between TTM and the key stakeholders to discuss specifics of each stakeholder requirements was also held on Tuesday 24th June 2022 prior to the site inspection to understand third party user requirements and operations.

3.2 Site Area 1

Existing

The cluster of structures house the SCU Property Services, mailroom, cleaning services, St John Ambulance and NSW Ambulance. The parking also supports public tennis and basketball courts. The area experiences frequent heavy vehicle movements from third party courier trucks and trades, in addition to ambulances.



Figure 3.2: Site Area 1 Imagery

At the time of the site inspection three ambulances were observed to be parked within the area (image 1) – however subsequent review of aerial imagery shows that up to 5 can be present. Further, the site inspection identified access to the chemical store was blocked by parked vehicles and third party delivery vehicles are required to reverse over an extended length to access the mail room.

The access road leading out to University Road is one way in the northbound direction (image 3) – however this is not signed from the southern approach within the site area.

It was also observed that whilst the speed limit of the campus is 20kph, the solar powered speed check sign on University Road is set incorrectly to advise drivers to obey a 40kph speed limit, immediately before the location where the 20kph speed limit starts.

The St Johns Ambulance building is located to the south of the area (image 6) and has one allocated parking space at the frontage.

Parking along the roadway south of the St Johns Ambulance building is mostly staff allocated, with only 4 spaces being non allocated, but subject to a 2 hour stay limit between 8am and 5pm on weekdays only.

Recommendations

The area would benefit from some formalisation to manage vehicle movements and minimise conflict with pedestrians through the designation of formal parking and loading areas.

1. It is recommended that the entry points to the storage sheds and chemical store be clearly line marked to prevent the parking of private vehicles in front of access gates. The provision of formal loading access areas will allow for loading activities to safely take place within the secure boundary fences of the property. The formalisation retains a total of 10 car parks along the western boundary of the area.
2. To the east, the formalisation of three ambulance bays and a loading bay, plus the addition of a pedestrian walkway along the front of the building to provide safe passage of pedestrians between vehicles and the building – particularly due to the various reverse movements required.
3. Reconfigure the solar speed limit sign to read 20kph to minimise confusion of correct speed.
4. Include 20kph signage on entry to the site on University Road to encourage slower speeds on approach to the property services buildings exit.
5. Upgrade surface treatment/colouring of the threshold on entry to and exit from the site along University Road.
6. As cycle parking is not provided in the area, nor is there a safe pedestrian access route along the road leading to and from the courts – it is expected that those accessing the courts do so by car. There is limited parking for visitors to the courts – given they are permitted for use by visitors/students with valid permits – some or all of the SCU specific parking should be removed to free up spaces for those using the courts.

3.3 Site Area 2

Existing

Accommodating the SCU Children's Centre and ARUMA Disability Services - the area experiences tidal flows of traffic resulting from drop off and pick up activities specifically associated with the Children's Centre.

The Children's Centre has 7 dedicated drop off spaces at the immediate frontage of the property on Rifle Range Road (image 1 & 2) – these are signed accordingly. In addition, there are staff allocated spaces on the opposite side of Rifle Range Road (image 3).

Aruma has a dedicated off street parking area, reserved for the sole use of the property (image 5).



Figure 3.3: Site Area 2 Imagery

At the time of site visit it was noted that a series of demountable buildings were being constructed on the eastern side of Rifle Range Road for the use by Trinity Catholic College. TTM have received a plan view copy of design of the provision of the demountable buildings and note the following:

- A new pedestrian crossing is provided through an existing bus stop which is not a permitted provision due to the safety implications of vehicle/pedestrian conflict. In particular the impact of pedestrians walking around the vehicle when it is stationary at the stop.
- There is potential for the path of the vehicle on entry to the stop to overhang the kerb in the proximity of the crossing point which would place pedestrians at risk of being struck by the bus.

Recommendations

7. The bus or crossing is recommended to be repositioned to a location prior to the bus stop (in the vicinity of image 3).
8. SCU have advised that 6 of the Summerland allocated spaces on Rifle Range Road are able to be unallocated and returned to general parking.
9. The area would benefit from additional warning signage and identification of children in the area to reinforce reduced speeds and improve safety – including pedestrian crossing signage, and speed reduction measures such as humps on approach to the crossing.

3.4 Site Area 3

Existing

Accommodating the Faculty of Health there is a dedicated off street parking area (image 2), directly accessed from Rifle Range Road (image 1). There are three freely accessible spaces and two staff reserved spaces, with the remainder being accessible by student and staff permit holders (image 3).



Figure 3.4: Site Area 3 Imagery

Review of aerial imagery of the car parking area shows evidence of heavy vehicles (expected to be refuse collection) travelling through the car park but mounting a kerb on entry from the south – which conflicts with the adjacent car parking space. There is also evidence of vehicles parking in the PWD shared area and pedestrian access – however this has been rectified with the installation of bollards. Examples of these instances are presented below.

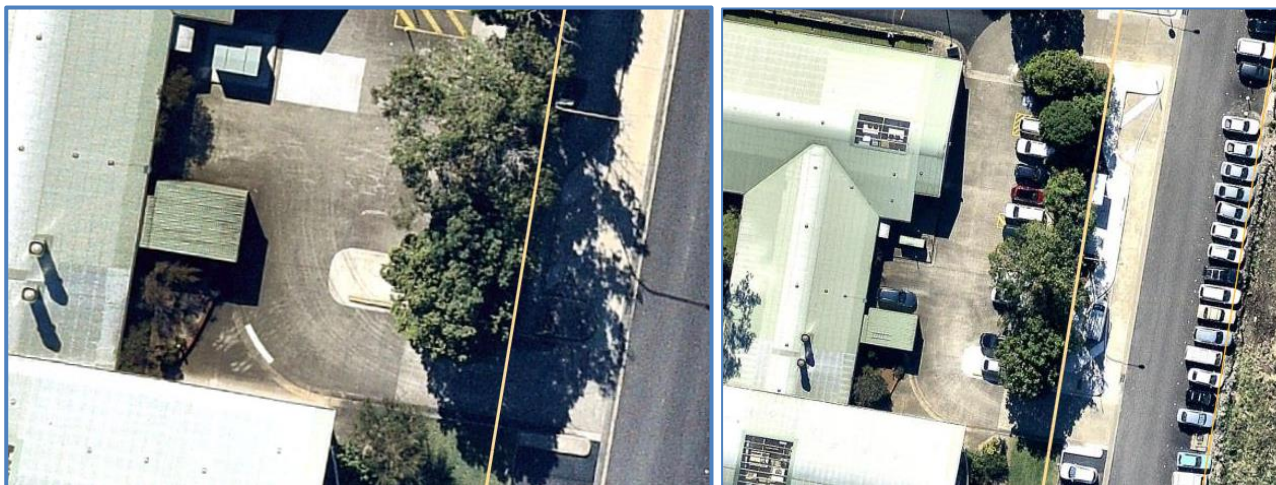


Figure 3.5: Site Area 3 Aerial Imagery

Recommendations

10. SCU have advised that the 2 staff allocated spaces are able to be unallocated and returned to general parking.
11. The area would benefit from signage and line marking to delineate two way movement – in particular at the northern access given the interaction with the access road that runs through area 4.
12. Reinforcement of the entry from the south – increase kerb or remove car park to facilitate service vehicle access without impacting car park.
13. SCU have also advised the parking that is currently signed for “staff and permit holders only” may be turned over to general parking accessible by all. Signage to be removed.

3.5 Site Area 4

Existing

The area includes a variety of facilities including the SCU Health Clinic, Lismore Health Precinct, Multi-purpose centre and Sport & exercise science labs. There are two main parking areas, one to the north side of the building providing for 10 staff reserved parking spaces (image 3).

To the south of the building there is a two tier parking area that includes a mix of reserved and non-reserved parking. Eleven of the reserved spaces are for sole use by the clinic – these are to remain.

Within the south parking area PWD parking is provided at the immediate frontage of the building, however bollards within shared areas are not provided (image 4).

It was also observed that a demountable office/container has been placed in the south westernmost area of the car park, however this position impacts on the accessibility and compliance of a couple of parking spaces.

The area is accessed via a one way road from north to south, with localised instances of speed calming. Where the road meets the car park accesses, convex mirrors are provided due to limited visibility.

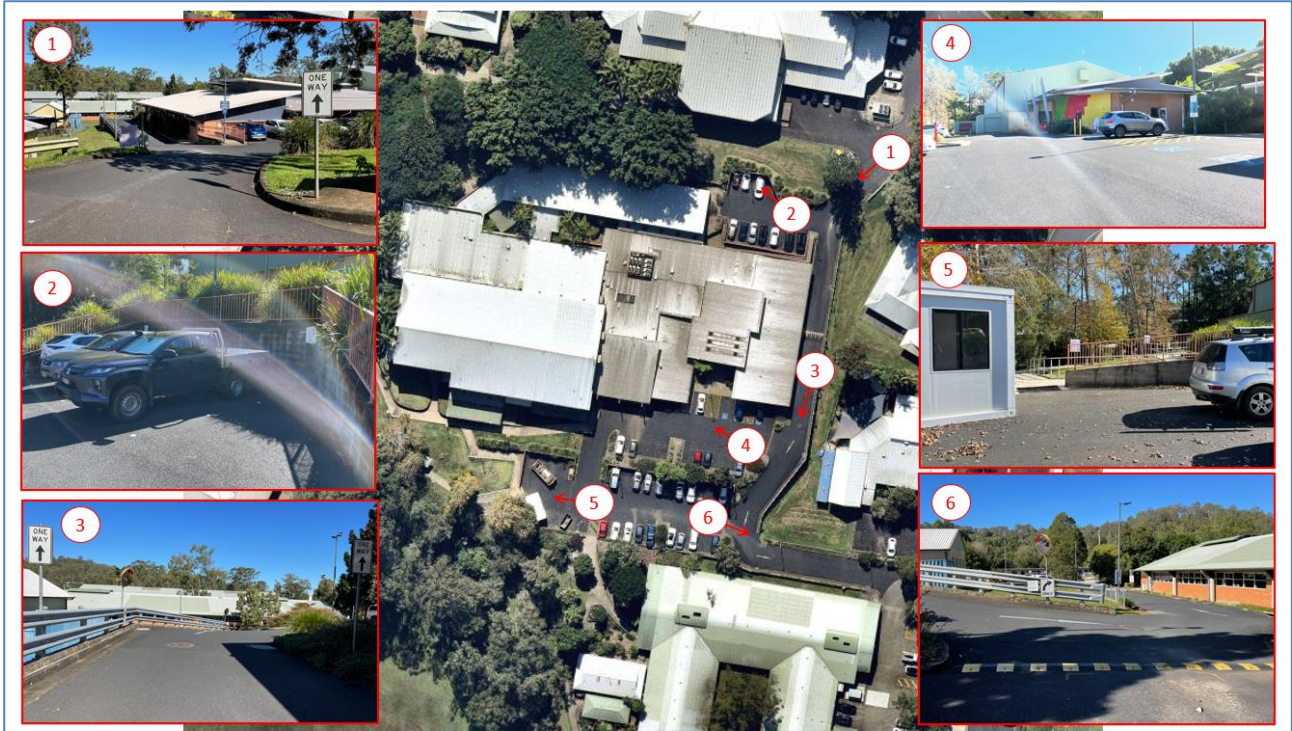


Figure 3.6: Site Area 4 Imagery

Recommendations

14. SCU have advised that 5 spaces to the rear (north) of the building are to be allocated. One for “Health North Coast” GP and 4 for “SCU Clinic” staff. As formal reserved for specific vehicles, it is recommended that these be towards the end of the aisle due to the common user of the spaces. Signage should be amended to accommodate these. In addition one space is to be converted to “loading bay” to accommodate smaller delivery vehicles. This should be towards the start of the area to allow for maximum visibility of the space to delivery drivers – it also maximise access and manoeuvring into and out of the space.
15. Due to the limited visibility of car park access points, because they are directly adjacent to structure or overgrown landscaping, and to address the confusion of entering the area from the rear, there would be benefit to reversing the one way road. This would also benefit the wayfinding, as many of the visitors to this area would be travelling along Rifle Range Road. This would tie in with signage and linemarking upgrades to area 3.
16. BCA recommends that PWD spaces be provided at a rate of 1 space per 50 standard spaces. The parking area includes less than 50 spaces and as such a minimum of 1 PWD space is required to be provided. It is recommended however that a minimum of 2 be provided given the mix of uses supported by the parking

area. Therefore 2 PWD spaces (including the central shared area) may be reconfigured to standard parking. A bollard should also be installed in the shared area of the remaining 2 PWD spaces.

17. Reposition the demountable or block off affected parking areas.

3.6 Site Area 5

Existing

The area accommodates a variety of SCU facilities including Music & Media, Gnibi College of Indigenous Australian Peoples and also Indigenous Australian Student Services (IASS). There are two parking areas adjacent to Block D.

The parking area directly facing the access road includes 2 PWD space with common shared area (image 3). It was noted that associative signage to these spaces was mounting on the adjacent building, however these do not align properly with the spaces.

During the site visit it was noted that there are three loading bays to southern side of Block D (image 5), however these were all occupied for durations exceeding the signed time limit. Additionally, a space that is reserved for a specific number plated vehicle, was occupied by a different vehicle. There is also an elevated platform to facilitate servicing by larger vehicles without rear lift platform.



Figure 3.7: Site Area 5 Imagery

Recommendations

18. To the south of Block D, parking should be re-signed for general use, with a single loading bay clearly signed and line marked. The shared use of a loading bay between departments will encourage short term occupation. The loading area should encompass the loading platform to ensure accessibility is maintained.
19. SCU have advised that the 2 PWD spaces to the east of Block D may be reallocated to general parking. TTM do however recommend that 1 space remains (with one space being reallocated to general parking) to ensure accessibility – given the grades in the area not providing suitable access route from other parking areas to the building.
20. Remove car parking space at the side of Block H.

3.7 Site Area 6

Existing

The area includes Block E which now accommodates The Living School. Discussion with the school prior to attending site, has identified the following:

- Classes run from 9.00am to 3.00pm, with supervision provided between 8.30am and 3.30pm.
- There are concerns of speeds and vehicles travelling the wrong way along the one way street immediately in front of the building.
- The school has 5 mini-buses (22-34 seats) that stop within the hardstand area immediately in front of the building. They also have one larger bus that stops on the roadway. TTM were advised that two of the buses are too high to travel under the pedestrian bridge that connects the building with University Road – thereby requiring them to reverse onto University Road. Up to four of the mini-buses that do fit under the bridge remain parked on site in the hardstand area (image 2).

During the site inspection, TTM observed traffic operations during the end of the school day (pick up) and it was noted that all of those that arrived prior to the 3pm pick-up time parked in marked bays and walked to the school frontage to wait for their child. It was also observed that those who arrived, whilst children were departing the building, simply stopped at the edge of the through road – in front of parking bays – and their child crossed the road unassisted to the vehicle.

Vehicles were also seen to park within the motorcycle bays near to the access road entrance, as well as the two bays signed as “no parking”.

There are three parking spaces within the access road that have been allocated to the school (image 4).



Figure 3.8: Site Area 6 Imagery

Recommendations

21. Introduce one way signage and pavement markings to the entrance of the access road – also include signage that restricts access to “authorised vehicles only” – to limit access by public vehicles. Improve signage at the end of the one way street within Area 5 to reinforce the restriction.
22. Install 10kph speed limit signage to the access road to keep speeds low through the area.
23. Install a formal bus zone at the kerbside on University Road for use by the larger buses that are not able to access the one way road. To the rear of the bus zone there should be provision for a kiss n ride facility – limited to 2 minutes passenger drop off/pick.
24. Introduce bollards at the front of the motorcycle parking area to prevent car access.
25. Install addition traffic calming and associative signage (including signage warning of children in the area) on approach to crossings to reinforce reduced speed limit. There is also be benefit to introducing school zone signage to advise of a school in the vicinity, including identifying times the coincide with the start and finish of the school day, which is of when activity of children is greatest (ie. 8.30-9.00am and 3.00-3.30pm).
26. Remove 2P parking in the bus parking area and install bus zone signage.

3.8 Site Area 7

Existing

Containing the library, this area experiences limited vehicular activity. There is an off street loading bay located to west side of the building accessed directly from Military Road. TTM understand that the bay is often used by light vehicles for drop off/pick a s well as longer term parking – this is verified by aerial imagery over the time the bay has been in place.

There is also a pedestrian route that runs along the western edge of the loading bay, this is protected by heavy duty bollards. During the site inspection it was found that a skip was placed at the start of the bay – this was blocking the pedestrian route (image 2).



Figure 3.9: Site Area 7 Imagery

Recommendations

27. Introduce pavement marking identifying “loading zone only” (or similar) to clearly define as a no parking area. It is recommended that chevron hatching be included along the roadside edge to also assist with defining the area whilst also keeping the pedestrian access route clear of obstruction.

Note: NSW road rules allow drivers to use loading zones while they are picking up or delivering goods, and bus drivers may use them to pick up and set down passengers

3.9 Site Area 8

Existing

The area includes a variety of land uses including student administration services, banking facilities, food court and pool/gym. The area experiences high pedestrian activity, particularly around lunchtime in the food court and late afternoon around the pool and gym.

There is limited parking available around the food court cluster of buildings – the parking that is available is allocated to specific tenants. It is understood that SCU would like to retain:

- 2 marked bays to the plaza (image 4). One for LEXSA (Student Association) and one for the Quick Brown Fox Café.
- 2 marked bays for SCU staff (image 3).
- 2 PWD spaces with adjacent shared zone (image 3).



Figure 3.10: Site Area 7 Imagery

Recommendations

28. Convert the three standard spaces (image 2) to loading zones – identified with chevron linemarking, loading only pavement marking and associative loading zone signage. Existing 2P signage is to be removed.

29. Three spaces on the north side of the access road to be converted to loading zones with chevron linemarking, loading only pavement marking and associative loading zone signage.
30. Introduce no through road and vehicle size limit on entry (due to inability for large vehicles to turnaround), visible at the entry from Military Road.

3.10 Site Area 9

Existing

The area includes Block R which now accommodates Trinity Catholic College. Discussion with the college prior to attending site and also subsequent liaison after, has identified the following:

- School hours are 8.45am to 4.00pm, with staff being on site generally between 6.00am and 8.00pm.
- The school has 900 students and 140 staff.
- Students arriving by bus (from the off site interchange) are dropped off and picked up at the bus stop at the turnaround on Military Road. Students are required to walk between the stop and the school in Block R.
- There is no timetable of buses attending the site. It is essentially first students down first students on. There are generally 3 buses waiting when the students arrive at the stop (2 x Northern Rivers Buslines and 1 x Sodhi's). A further 2 arrive soon after and 2 more at around 3.12pm – these are Northern Rivers Buslines plus 1 from Simes.
- In the morning the students arrive at SCU by 9.00am.
- No buses associated with the school remain at SCU during the day.

During the site inspection, TTM observed student pedestrian flow at the end of the school day. TTM discussed the operation with a teacher on site at the time also. It was observed that students walk along the northern footpath, then cross University Road to the south side of the bus area - with a teacher acting as crossing patrol - then they walk along the southern footpath and cross the park area to the bus turnaround.



Figure 3.11: Site Area 9 Imagery

Recommendations

31. Introduce a formal pedestrian crossing point on University Road, including advance warning signage, to formalise the provision and improve safety of students in the area.
32. The turnaround is unable to accommodate the number of buses being used by the school, without blocking the access road to Block A and the circulation road. In order to limit impact to through traffic it is recommended that the end portion of the off street car park be reconfigured to provide for the additional buses. Access is already provided by way of footpaths and crossings and these are used by students being picked up by parents in the off street car park. The car park is observed to be under utilised and is expected to be able to accommodate the additional bus facility.
33. Four SCU car parks immediately outside R Block (on the southern side of the eastbound University Road circulation (image 6) should be allocated to the school and signed for this purpose. The PWD spaces are to remain in this location.
34. The bus zone outside Y Block should be reactivated to be a bus zone – to allow school buses to drop off and limit the number of students walking across the site.
35. To the rear of R Block at the end of the access road, one space is to be allocated to the school with the remainder to be signed and line marked for loading.

3.11 Site Area 10

Existing

Accommodating the University executives, much of the parking at the immediate frontage of the building is reserved. It is proposed that these allocations remain.

There are also two electric vehicle spaces and two motorcycle spaces on the southern side of university Road.



Figure 3.12: Site Area 10 Imagery

Recommendations

- 36. Install bollards within the PWD shared areas.
- 37. Reline marking motorcycle parking to size 1.2m wide x 2.5m length.

3.12 Site Area 11

Existing

The car park immediately outside the building provides for 2 allocated clinic parking spaces and one PWD with adjacent shared space. All other spaces are signed for staff/student parking permit holders only.

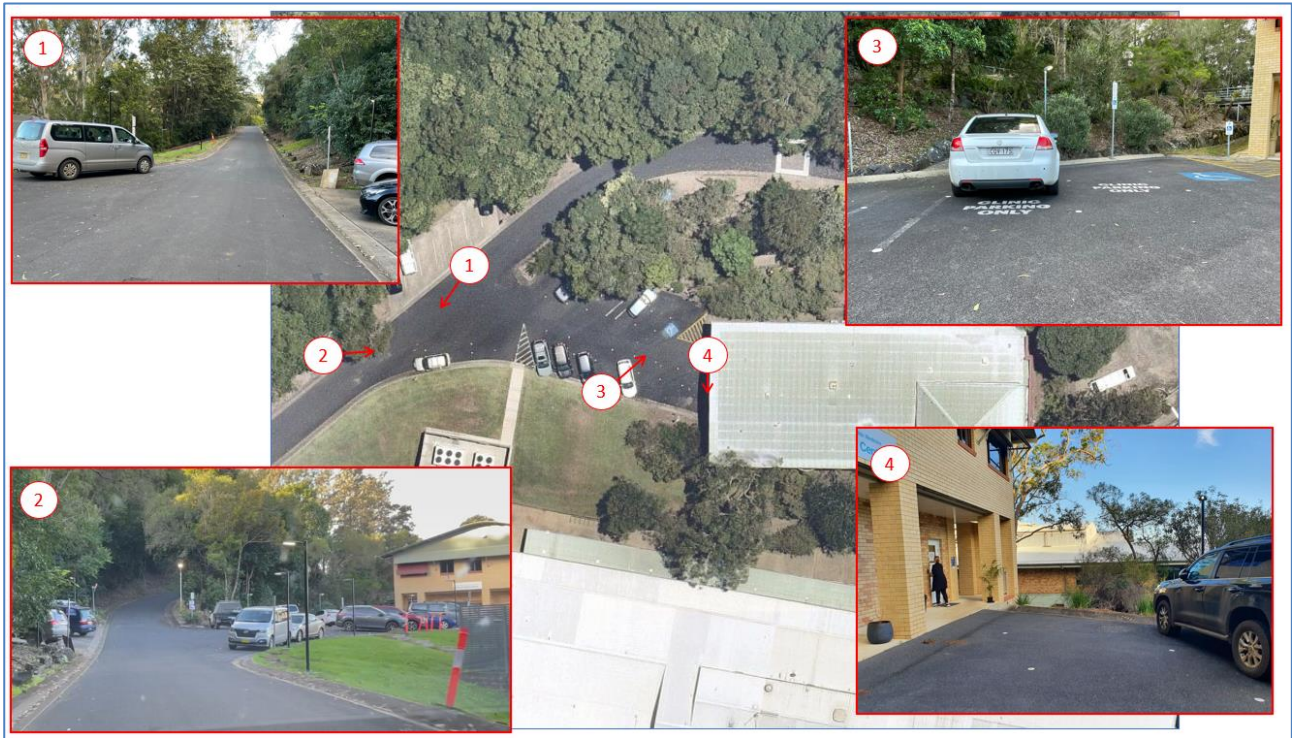


Figure 3.13: Site Area 11 Imagery

Recommendations

- 38. Remove staff/student permit holder signage and replace with general parking with 2P limit.
- 39. Reline marking motorcycle parking to size 1.2m wide x 2.5m length.

3.13 Site Area 12

Existing

Encompassing Block A, this area accommodates the Faculty of Science & Engineering and more recently NSW Police. The site inspection identified several instances of non-compliant parking including across footpaths (image 6) and on verges. It was noted that attempt to rectify this has been done through the installation of temporary traffic bollards, however many of these had been knocked over.

There were lengths of kerbside that previously were identified for no parking (used for loading), but these are now temporarily amended to allow police vehicles to park.

PWD parking spaces were worn and did not include bollards within shared areas.

Parking around the roadway – perpendicular to the carriageway – is provided, however localised instances where spaces are less than 5.4m in length have been identified, causing vehicles to park in correctly and overhanging the carriageway.

There is a small parking area to the north west side of the building (image 1). This is restricted to PWD parking, except one space which is allocated. TTM noted that the signs at the nose of these spaces are on a lean and the nose of spaces is protected only by a low kerb only – which allows the nose of vehicles to extend beyond the extents of the space.

On the approach to the turnaround, there is a digital speed limit sign that is set to the 20kph speed limit.



Figure 3.14: Site Area 12 Imagery

Recommendations

40. At the end of the southern boundary parking area, 3 spaces are to be allocated and signed for staff use only. The remainder are to be available for use by all.
41. Formally identified the length of road on the north side that is available to police vehicle parking to ensure that turns through the area are not impeded. These may be transferred to other uses when the police vacate the site.
42. Improve entry/exit arrangement of the intersection of the road up to Block L and beyond. The give way line is set back from the through line and visibility is blocked by parked vehicles.
43. Install no parking signage at repeated locations along the inside kerb of the turnaround. Supplement the signage with no stopping line marking to reinforce the prohibition.
44. Upgrade intersection (image 6) to formalise priority in the area.

3.14 Site Area 13

Existing

The area accommodates several uses including various science and research facilities. There are several dedicated off street parking areas that generally specific to the building they front.

Vehicles were found to be parking in an area signed as bus stop, the parked vehicles also blocked access to waste bins that are located along the kerb of the bus stop area (image 4).

Parking provided at the rear of the building is all staff reserved (image 6) – given that the road is a no through road this allocation is advised to remain.



Figure 3.15: Site Area 13 Imagery

Recommendations

45. Convert the bus stop signed area to loading zone, including chevron line marking and signage.
46. Reallocate spaces to SCU staff only.
47. Convert reserved parking spaces to SCU staff reserved (image 1). Retain existing PWD space but add in bollard in shared area.
48. Parking area in front of EAL to be limited to staff, with half of spaces being allocated to general public with 2P time limit. Two spaces should also be chevron line marked and identified for loading/storage of boats/containers.

49. On street loading zone to be signed and line marked to the rear of T block to facilitate small vehicle loading.

3.15 Site Area 14

Existing

Accommodating the visual arts department and storage sheds there is limited uses across this area.

Parking on University Road frontage is provided for PWD users and general public with no reserved spaces immediately in front of the building.

It is understood that the gravelled lot in front of the storage sheds is often used for parking by unauthorised vehicles – as shown below. No parking signage is provided at the kerbside at each end of the area, however this is not openly clear to relate to the off street area.

The area is required to remain open to access to the storage sheds so cannot be entirely blocked off.



Figure 3.16: Site Area 14 Imagery

Recommendations

50. Install bollards to PWD shared areas.
51. Enclose the kerbside area of the storage sheds to provide an entry an exit to the area, with signage identifying access limited to authorised vehicles only.

3.16 Site Wide General

Existing

The site includes a variety of land uses, including public and private facilities, with a varied access network. It is unclear when accessing the site whether signage is for pedestrians or vehicles to follow, and whether the signage directs to parking areas that are specific to the relevant blocks.

There is a disconnect with the consistency of speed limit representation, as well as incorrectly placed or inconsistent presentation of warnings of crossings and speed humps. Additionally, speed humps are in some cases difficult to see on approach.

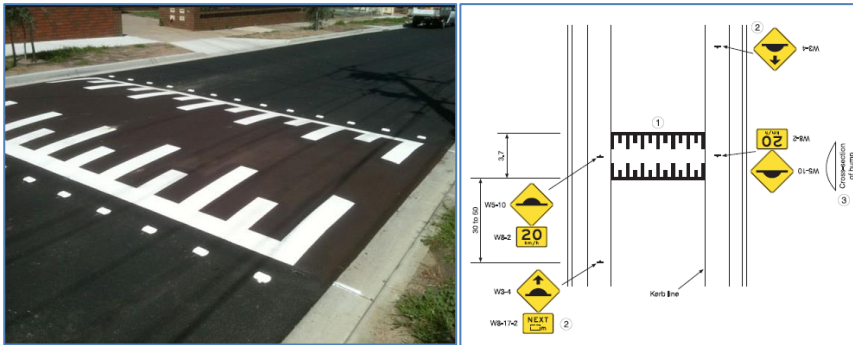


Recommendations

52. The site would benefit significantly from an upgraded wayfinding strategy – with signage needing to allow for clear differentiation between vehicle signage that leads to parking, and pedestrian signage that directs along footpaths. This would be a key provision for the site and would help to limit the number and instances of vehicles re-circulating. Pedestrian signage should also include DDA routes for clarity of the user. The installation of wayfinding signage is particularly important at the Military Road entrance, whereby the majority of users should be directed to use the off street car parks.
53. Install threshold speed limit pavement treatment and signage.
54. Install repeater 20kph speed limit signage.
55. Install pedestrian crossing signage on approach to all pedestrian crossing points.
56. Watts profile speed humps to be installed throughout the site with correct signage. All humps to identified with same pavement parking/pattern.
57. There a high number of allocated/signed spaces, however signage is often mounted at heights that are not visible when cars are parked in adjacent spaces. It would be of benefit to either raise the height of signs so they are visible over parked cars and/or colour code spaces or include pavement text at the entry to identify it as a reserved space.

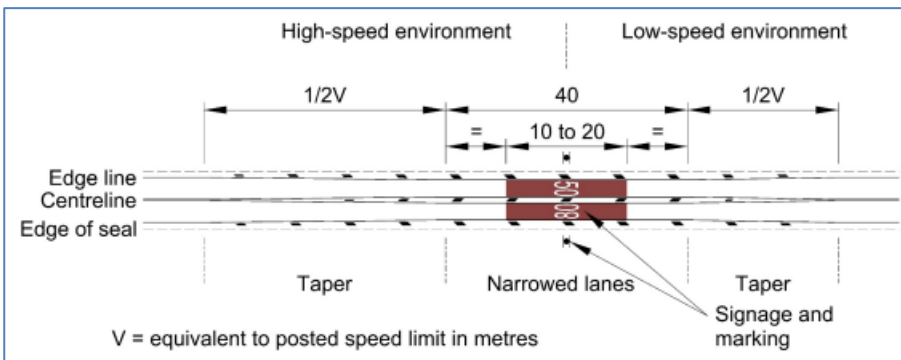
Technical Standards and References

- AS1742.13 Local Area Traffic Management



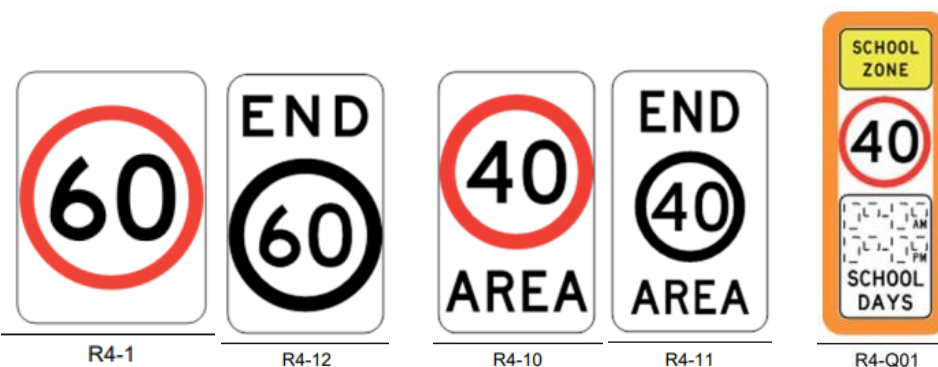
<https://roads-waterways.transport.nsw.gov.au/business-industry/partners-suppliers/documents/guidelines/as1742-p13.pdf>

- TS 00020:1.0 Town Entry Gateway Treatment



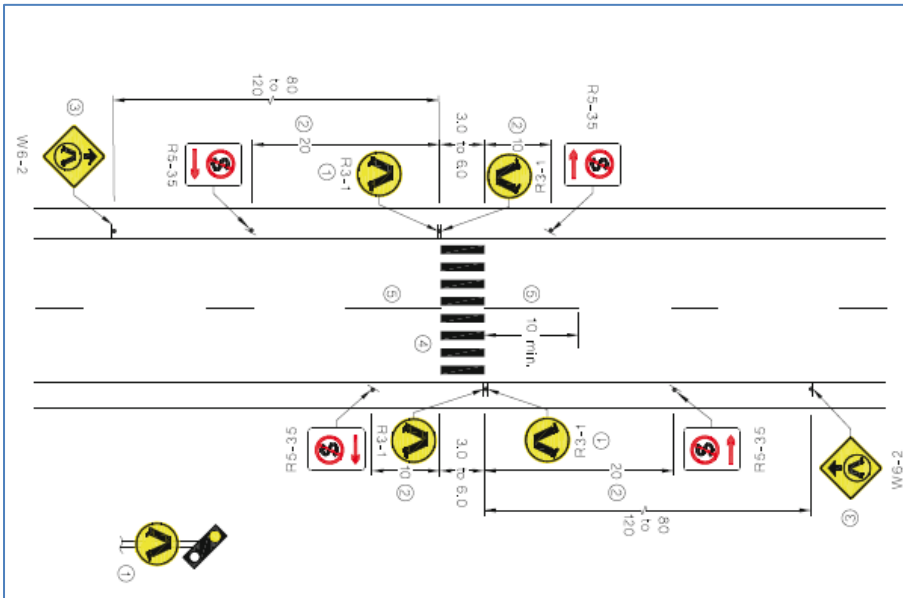
<https://roads-waterways.transport.nsw.gov.au/business-industry/partners-suppliers/documents/guides-manuals/ts-00020-1.0.pdf>

- AS1742.4 - Manual of Uniform Traffic Control Devices – Part 4: Speed Controls



<https://roads-waterways.transport.nsw.gov.au/business-industry/partners-suppliers/documents/guidelines/as1742-p4.pdf>

- AS1742.10 - Manual of Uniform Traffic Control Devices – Part 10: Pedestrian Control and Protection



<https://roads-waterways.transport.nsw.gov.au/business-industry/partners-suppliers/documents/guidelines/as1742-p10.pdf>

- AS1742.11 - Manual of Uniform Traffic Control Devices – Part 11: Parking Controls

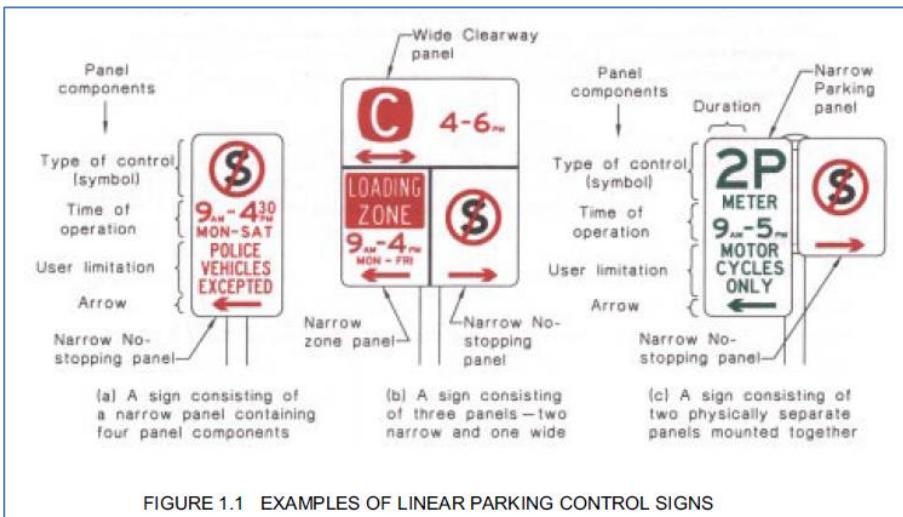


FIGURE 1.1 EXAMPLES OF LINEAR PARKING CONTROL SIGNS

<https://roads-waterways.transport.nsw.gov.au/business-industry/partners-suppliers/documents/guidelines/as1742-p11.pdf>

4 Conclusion

TTM declare that we have reviewed the site and identified the safety and operational deficiencies outlined in the preceding sections.

It should be noted that while every effort has been made to identify potential safety hazards, no guarantee can be made that every deficiency has been identified. We recommend that points of concern be investigated, and necessary corrective actions are undertaken.

There is no set priority order for implementing the recommendations within this report, as they are generally complementary of each other. However, it is advised that a staged implementation may be carried out in order to minimise implementation costs.

As such, TTM advises that non-invasive improvements, such as signage, be implemented in advance of more significant features so that variations to user behaviour can be monitored and amendments to the control system may be refined.