

Traffic Impact Assessment;

Sports & Health Centre of
Excellence, Campbelltown

For Campbelltown City Council
27 June 2018

parking;
traffic;
civil design;
communication;
ptc.

Document Control

Sports & Health Centre of Excellence, Campbelltown, Traffic Impact Assessment

Issue	Date	Issue Details	Author	Reviewed	For the attention of
1	18/04/18	Draft Issue	SH	AU	Rebecca Gordon
2	27/06/18	Draft Issue	SH	AU	Rebecca Gordon
3					

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1. Executive Summary

- **ptc.** has been engaged by TPG NSW Town Planning and Urban Design, on behalf of Campbelltown City Council (CCC), to prepare a traffic impact assessment as part of a Development Application (DA) submission for a combined indoor and outdoor community and health services facility, known as the Campbelltown Sports & Health Centre of Excellence ('The Centre');
- The Centre is proposed to be reserved for sports teams, elite athletes and members of the facility. General public access is anticipated to be limited;
- The existing driveway is to be demolished and replaced with a new driveway crossover along Goldsmith Avenue which will provide access into the proposed on-grade car park;
- In order to deter commuters, students and users not associated with the Centre, from parking within the on-grade car park for an extended period of time, a paid parking system is proposed to be incorporated into the development. It is understood that the on-grade car park facility will be free for registered members of the Centre. The paid parking system will be controlled by boom-gates at the entry and exit, with a number plate recognition system;
- The proposed parking provision has been calculated based on a first principle basis, with reference to the Campbelltown Sustainable City Development Control Plan (DCP) 2015, RMS Guide to Traffic Generating Developments (RMS Guide), ITE Parking Rates and survey results from comparable sites. The sites that were surveyed include the Robyn Webster Sports Centre (located in Tempe) and the Sydney Academy of Sport and Recreation (located in Narrabeen);
- When considering the survey results which indicated low occupancy rates (30% and 23%), the various published rates for parking provision, which ranged between 260 spaces to 280 spaces, were considered to be an overestimation of the number of parking spaces required for the subject development. Considering that general public access is to be limited, the parking demand is anticipated to be lower compared to public recreational facilities which is referenced in the Council DCP and RMS Guide. Moreover, the incorporation of a paid parking system is also expected to discourage any casual users from driving to the facility and overflowing of the car park;
- It is also noted that the proximity of Macarthur Train Station could also reduce the car parking demand. It is noted that there is an existing pedestrian connection between Goldsmith Avenue and the train station which provides pedestrian access to the station. Although it is acknowledged that this connection is slightly outside the comfortable walking distance of 800m, stipulated in the NSW Guidelines to Walking & Cycling (2004), the footpaths along Goldsmith Avenue are relatively flat, wide, straight and newly paved which will encourage walking as an attractive mode of transport. In light of this, the existing heavy rail services can provide an alternative mode of transport for the prospective users of the proposed facility;
- When considering the occupancy of the comparable sites, 127 spaces (Tempe) and 87 spaces (Narrabeen), a parking provision of 120 permanent spaces is expected to be adequate for the proposed development. This provision will likely to accommodate up to 400 patrons based on 60% arriving by car, and an average car occupancy of 2 persons per car. When considering that the centre will not be used by the general public, the parking demand is not expected to be as high as the rates published in the Council DCP and ITE, and a provision of 120 spaces is considered to be sufficient during peak operations of the site;

- The development traffic generation has also been estimated with reference to the RMS Guide and survey results from comparable sites. The RMS Guide suggests that the analysis of a recreational facility should be based on the predicted 85 percentile usage rather than usage at capacity. Based on a total capacity of 120 spaces, this will result in a peak traffic generation of approximately 102 vehicles;
- As noted previously, the data provided by the RMS Guide is based on surveys conducted for recreational facilities which are open to the general public. Moreover, the RMS Guide also indicates that recreational facilities are generally site and type specific in their operation and traffic generation. When considering that the subject site will not be open to the general public, the data provided by the RMS Guide is considered to be an overestimation of the anticipated peak traffic generation of the subject Centre;
- When considering the nature of the proposed development, the Sydney Academy of Sport and Recreation (Narrabeen) is considered to be a more comparable site, as it is not open to the general public during the weekend but only reserved for athletes and sports teams. The results indicate that the peak occupancy for both the comparable sites were considerably low with little traffic activity. Although the peak traffic volume is not anticipated to be as low as the comparable sites, it does provide an indication that the RMS data is primarily focused on recreational facilities which are open to the general public and the rates provided could be an overestimation of the expected peak traffic generation of the subject development;
- With this in consideration, a further 20% reduction is considered to be appropriate for the subject site, which will result in approximately 82 vehicular trips in the peak hour, which is equivalent to approximately 7 trips every five minutes.
- In order to conduct a more robust assessment, a traffic survey was conducted on Saturday 16th June 2018, between 12.00pm-1.00pm. The survey resulted in 209 vehicles along Goldsmith Avenue during the hour. An additional 82 vehicles, generated by the development will result in approximately 290 vehicles during the peak operations, which will still be within the RMS maximum environmental capacity threshold of 500 vehicles, for a major local or collector road;
- It is anticipated that the peak traffic volume associated with the development can be accommodated by Goldsmith Avenue and will have a minor impact on the surrounding road conditions and major intersections;
- A review of the facility has been undertaken with reference to AS2890.1:2004, AS2890.2:2002, AS2890.3:2015 and AS2890.6:2009, as well as a performance basis, and found the proposal to be in compliance and meeting the intent of the relevant standards; and
- In light of the above, the proposed development is endorsed in the context of parking and traffic.

2. Introduction

ptc. has been engaged by the proponent, Campbelltown City Council (CCC), to provide traffic consultation services in regards to the development application (DA) for a combined indoor and outdoor community and health services facility, known as the Sports & Health Centre of Excellence ('The Centre'). The Centre is located off Goldsmith Avenue in Campbelltown, highlighted in Figure 1.

This Traffic Impact Assessment comprises a review of the parking and traffic implications of the proposal both on-site and within the local context and has been prepared for submission to CCC with the DA documentation.

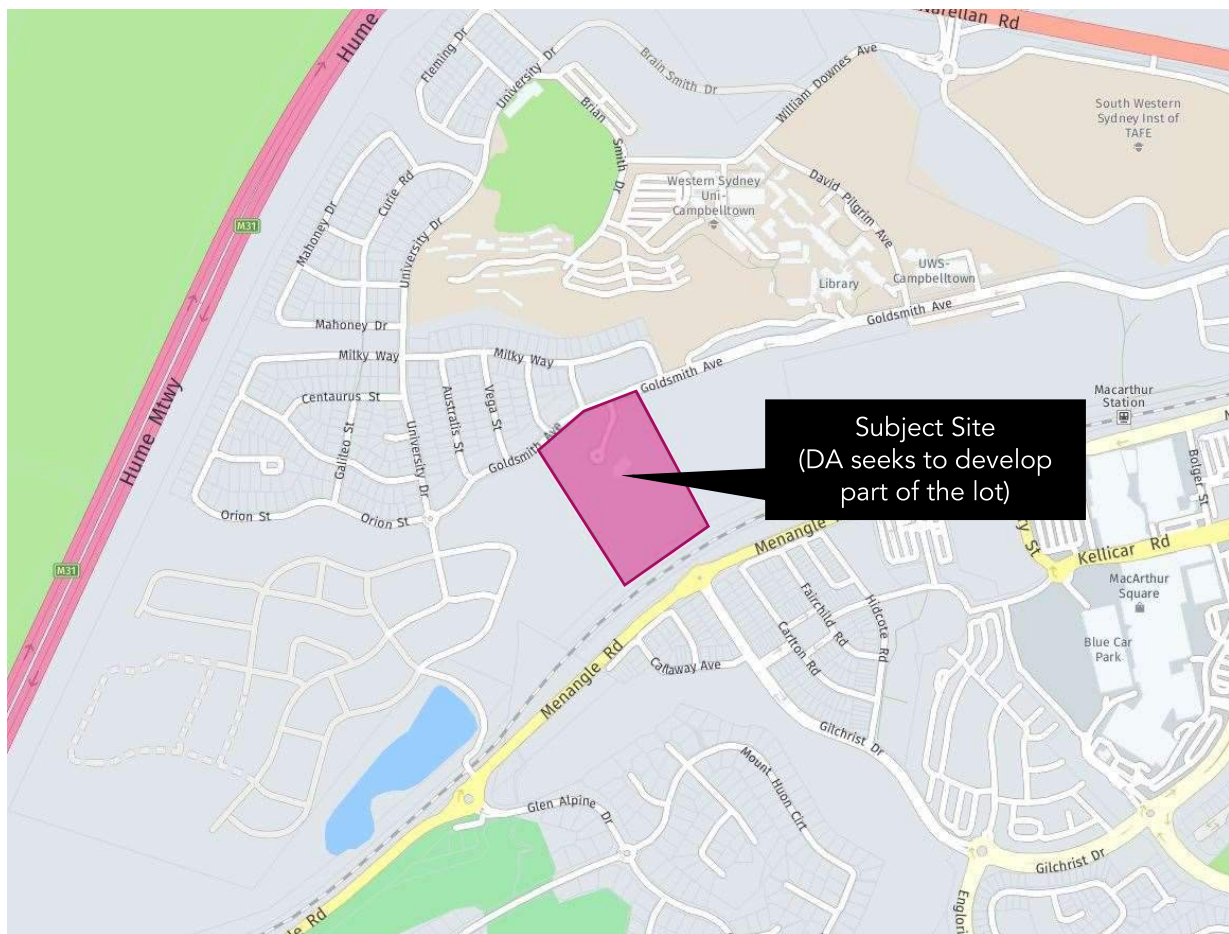


Figure 1 - Location of Proposed Site

2.1 Structure of this Report

This report presents the following considerations in relation to the Traffic and Parking assessment to form part of a DA to be prepared and submitted by the Applicant.

Section 1	Executive Summary;
Section 2	Introduction;
Section 3	A description of the project and background context;
Section 4	A review of the local transport environment serving the development site;
Section 5	Assessment of the proposed parking provision in the context of the relevant planning control requirements;
Section 6	Determination of the traffic activity associated with the Centre;
Section 7	Access & design assessment; and
Section 8	Summary.

3. Background

3.1 Site Context

The proposed site lies within a medium density residential zone (R3), situated to the west of Campbelltown town centre. Key features surrounding the site include:

- To the south-east, lies a commercial core (B3), mixed use (B4) and infrastructure: classified road (SP2) precincts comprising of Macarthur Shopping Centre and Macarthur Train Station;
- To the south-east also lies an infrastructure: health services facilities (SP2) precinct comprising of the Campbelltown Hospital;
- To the east, lies a commercial core (B3) precinct comprising of the Campbelltown Mall and Town Centre; and
- To the north, lies a deferred matter (DM) precinct which includes the University of Western Sydney (Campbelltown Campus); and
- The greater residential precinct of Campbelltown, comprising typically of low density residential (R2) and medium density residential (R4) zones.

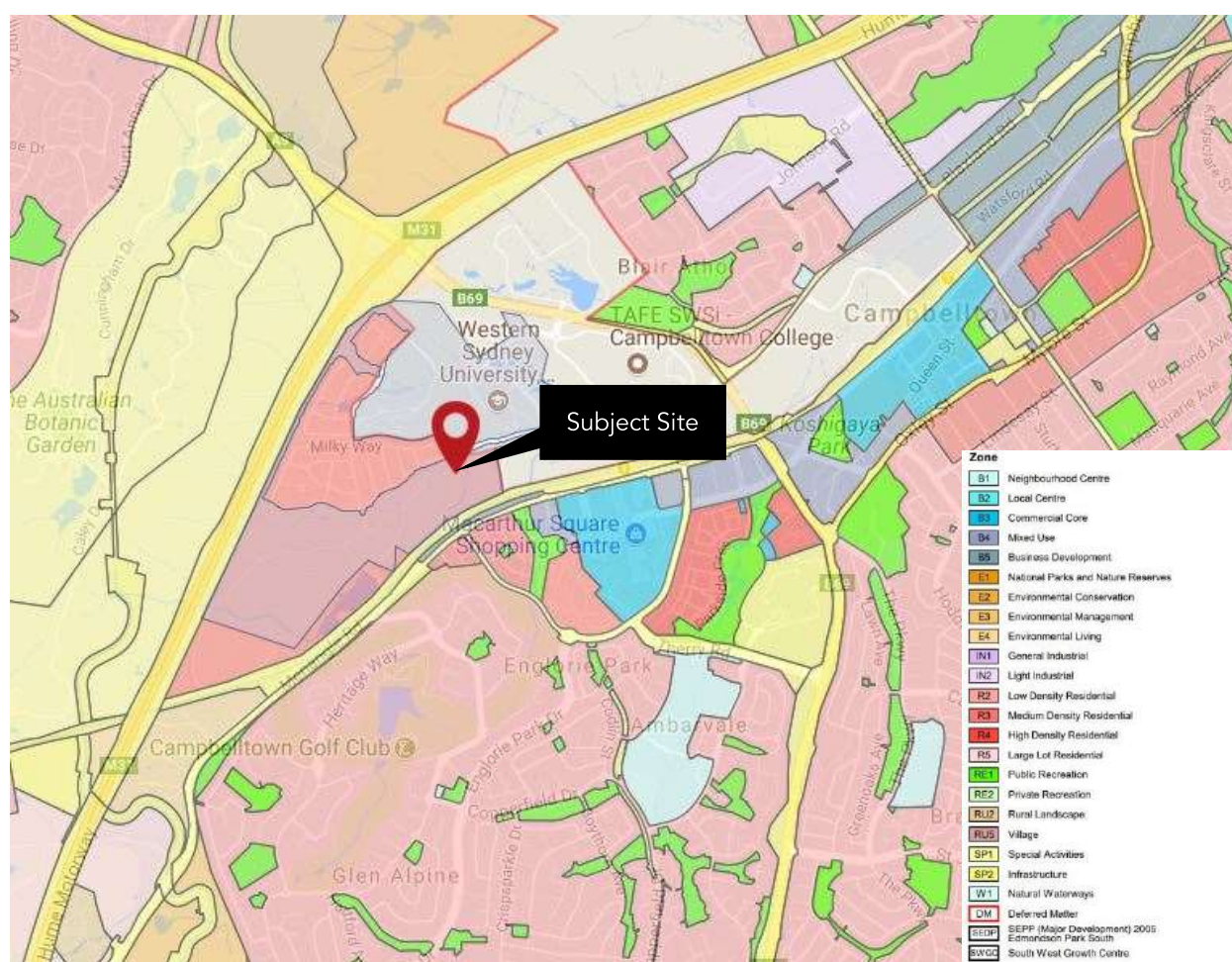


Figure 2 - Local Land Use Map (Source: NSW Planning Viewer)

3.2 Development Site

The proposal relates to the following site (see Figure 3):

- Goldsmith Avenue, Campbelltown (Part Lot No 4099, DP1206283)



Figure 3 - Aerial View of Subject Site & Surrounds (Source: Nearmap)

The site is currently part of a large plot of land (Lot 4099/DP1206283) that occupies much of the undeveloped land to the south of Goldsmith Avenue.

The extent of the proposed site occupies a site area of 13,262m². This is bound by Goldsmith Avenue to the north and the Southern Highlands/T8 railway line to the south.

The site is zoned as medium density residential (R3), under the Campbelltown Local Environmental Plan (CLEP) 2015. Surrounding land in the Macarthur precinct also consists of R3 zones, whilst the nearby University of Western Sydney (Campbelltown Campus) is currently deferred from the CLEP 2015.

Currently, the site is occupied by a single storey facility, with an outdoor basketball court, and an outdoor car park accommodating approximately 30 parking spaces, accessible via a combined entry/exit driveway off Goldsmith Avenue (see Figure 4).



Figure 4 - Existing driveway

3.3 Locality

The local characterisation of the precinct has been built along the T8 rail line.

North of the rail line, there is a strong educational presence, with the Western Sydney University Campbelltown Campus and the TAFE Campbelltown College located approximately 300m and 1,000m north-east of the site respectively. A significant proportion of the land is undeveloped medium density residential, although a residential precinct is growing to the north-west of the site. As such, the locality is anticipated to experience rapid growth in activity associated with future resident, university students and staff living locally and non-locally.

Land to the south of the rail line comprises the Macarthur Town Centre (B3) and the adjoining residential precinct of MacArthur, typically characterised as medium density residential near the town centre. The town centre is dominated by the Macarthur Square Shopping Centre, which provides an extensive range of retail and service businesses.

The north-south connections between these two precincts across the rail line are limited to:

- A pedestrian link bridge (via Macarthur Train Station), approximately 1km east of the site; and
- Gilchrist Drive, approximately 1.3m east of the site.

3.4 Development Proposal

The development proposal involves the construction of a community and health services facility. The following table summarises some of the Gross Floor Area (GFA) of the proposed facility.

Table 1 - Proposed yield

Floor	GFA (m ²)
Ground	2,500
Indoor Sports Hall	2,300
Level 1	1,700
Total	6,500

An on-grade car park is to be provided, via a new vehicle crossover off Goldsmith Avenue.

Details of the proposal are presented on the architectural drawings provided by Peter Hunt Architect (see Attachment 1).

3.5 Operational Details

The development is proposed to be categorised as a 'Community Sports and Health Centre of Excellence'. As such, the facility will generally not be open to the public but would be reserved for the use of elite athletes and those registered with facility. Key operational details are summarised below:

- The recovery pool will be restricted to athletes and users registered with the programs. The pool will be supervised by a rehab provider or a Learn to Swim (LTS) instructor;

- The gym facilities will be restricted to athletes or those with membership. Although the gym facilities will be open for casual members as walk-ins, this is expected to contribute less than 10% of utilisation;
- The indoor courts will be restricted to sport team training and athletes. Occasionally, the indoor courts will be open to the general public through pre-bookings, such as community programs or school events (expected to contribute approximately 5% of total use);
- The community health/ medical facility, located on Level 1, will be open to the general public and will comprise of six operating general practitioners, who will each see approximately 28 patients per day (15-minute appointments). Although these appointments are open to the general public, it is expected that the majority of the patients will be members/ athletes already using the facility; and
- The café will also be open to the general public but will primarily serve the members and users of the facility. External trips are anticipated to be minimal.

As part of the car parking strategy, the on-grade car park is proposed to be free parking for registered users of the facility and paid parking for other users (with the possibility of a two-hour free period). This would allow registered users of the facility to park within the on-grade car park and deter commuters or students, from the adjacent Western Sydney University campus, from parking within the car park.

The car park intends to incorporate a License Plate Recognition (LPR) system with a boom-gate at the entrance and exit.

4. Local Transport Environment

4.1 Local Road Review

4.1.1 Road Network Description

The subject site is located in the suburb of Macarthur and is primarily serviced by the State Roads including Narellan Road (A9) and the Hume Motorway (M31) as well as Regional Roads such as Gilchrist Drive. The site is also serviced by local roads managed by the Campbelltown City Council.

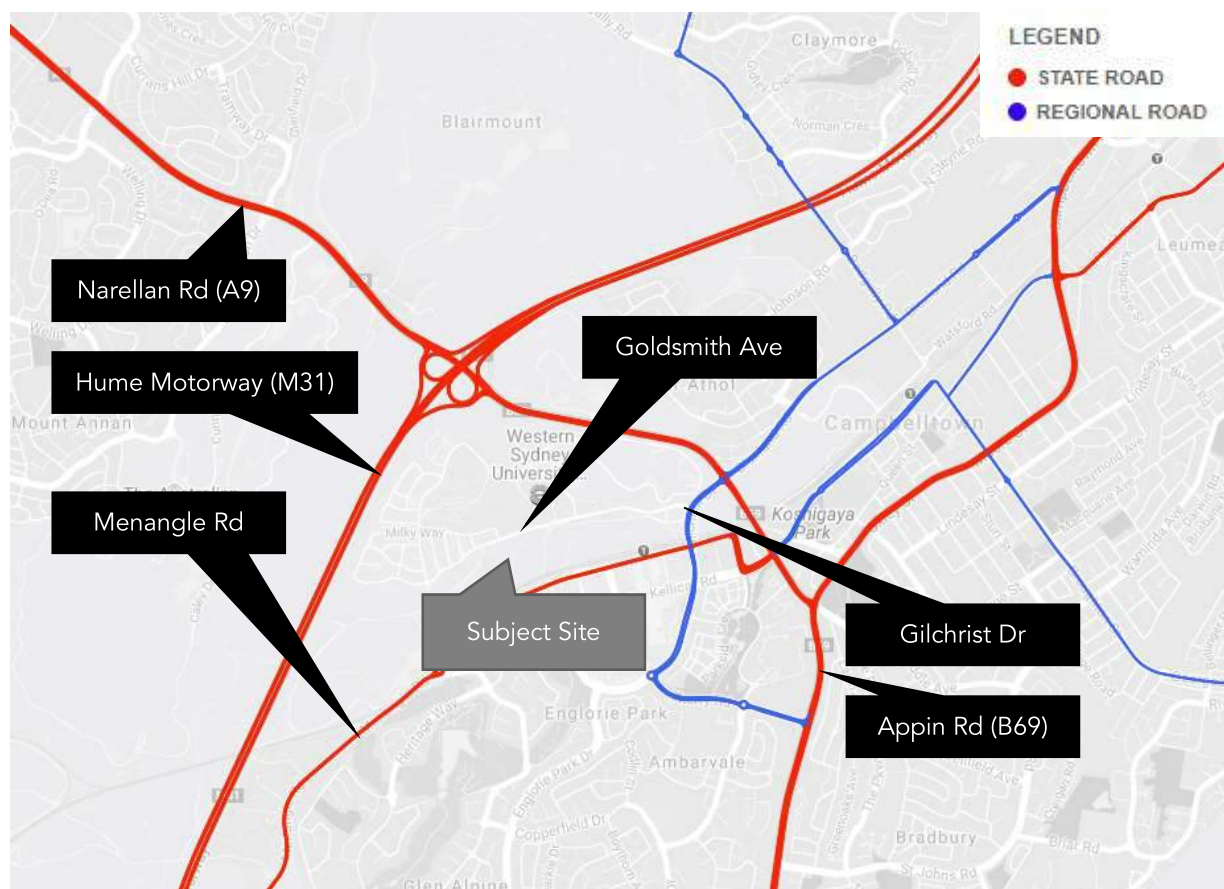


Figure 5 - Road Hierarchy (TfNSW)

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, Part funded by the State)
- Local Roads - Collector and local access roads (Council Managed)

Goldsmith Avenue

Road Classification	Local Road
Alignment	East - West
Number of Lanes	1 lane in each direction (with bicycle lane in each direction)
Carriageway Type	Divided
Carriageway Width	14m
Speed Limit	40 km/h along site frontage, otherwise 50km/h
School Zone	No
Parking Controls	No Parking and No Stopping
Forms Site Frontage	Yes



Figure 6 - Goldsmith Avenue (westbound towards Pegasus Street)

Milky Way

Road Classification	Local Road
Alignment	Varies – generally east-west
Number of Lanes	1 lane in each direction
Carriageway Type	Undivided
Carriageway Width	9m
Speed Limit	50 km/h
School Zone	No
Parking Controls	Unrestricted
Forms Site Frontage	No



Figure 7 - Milky Way (northbound)

Pegasus Street

Road Classification	Local Road
Alignment	North - South
Number of Lanes	1 lane in each direction
Carriageway Type	Undivided
Carriageway Width	7.5m
Speed Limit	50 km/h
School Zone	No
Parking Controls	Unrestricted
Forms Site Frontage	No



Figure 8 - Pegasus Street (northbound towards Milky Way)

Gilchrist Drive

Road Classification	Regional Road
Alignment	North - South
Number of Lanes	2 lanes in each direction
Carriageway Type	Divided
Carriageway Width	25m
Speed Limit	60 km/h
School Zone	No
Parking Controls	No Stopping
Forms Site Frontage	No



Figure 9 - Gilchrist Drive (southbound towards Goldsmith Avenue)

Menangle Road

Road Classification	State Road
Alignment	North - South
Number of Lanes	2 lanes in each direction with a bicycle lane eastbound
Carriageway Type	Divided
Carriageway Width	17m
Speed Limit	60 km/h
School Zone	No
Parking Controls	No Stopping
Forms Site Frontage	No



Figure 10 - Menangle Road (Eastbound towards Tindall Street)

Narellan Road

Road Classification	State Road
Alignment	Northwest – Southeast
Number of Lanes	2 lanes in each direction
Carriageway Type	Divided
Carriageway Width	14m
Speed Limit	60 km/h
School Zone	No
Parking Controls	No Stopping
Forms Site Frontage	No



Figure 11 - Narellan Road (northbound towards Gilchrist Drive)

4.2 Crash Statistics

Transport for NSW (TfNSW) crash data provides crash statistics in the immediate area over the last five years, extracted in Figure 12.

A review of the data indicates that crashes in the vicinity of the subject site have occurred at the following key intersections:

- Gilchrist Drive/ Narellan Road
- Menangle Road/ Gilchrist Drive

Over the five-year period reported (2012-2016), one fatal crash has been recorded at the Menangle Road and Geary Street intersection. Majority of the crashes that have been recorded range from non-casualty to moderate injuries. Two non-casualty crashes have been recorded, in 2015 and 2016, at the Goldsmith Avenue and Gilchrist Drive intersection. Both crashes were caused by a driver's mistake. Moreover, the data indicates that there has been no crash recorded along Goldsmith Avenue, at the vicinity of the site. It is noted, however, that this assessment does not imply that there are any existing traffic issues within the surrounding road network.

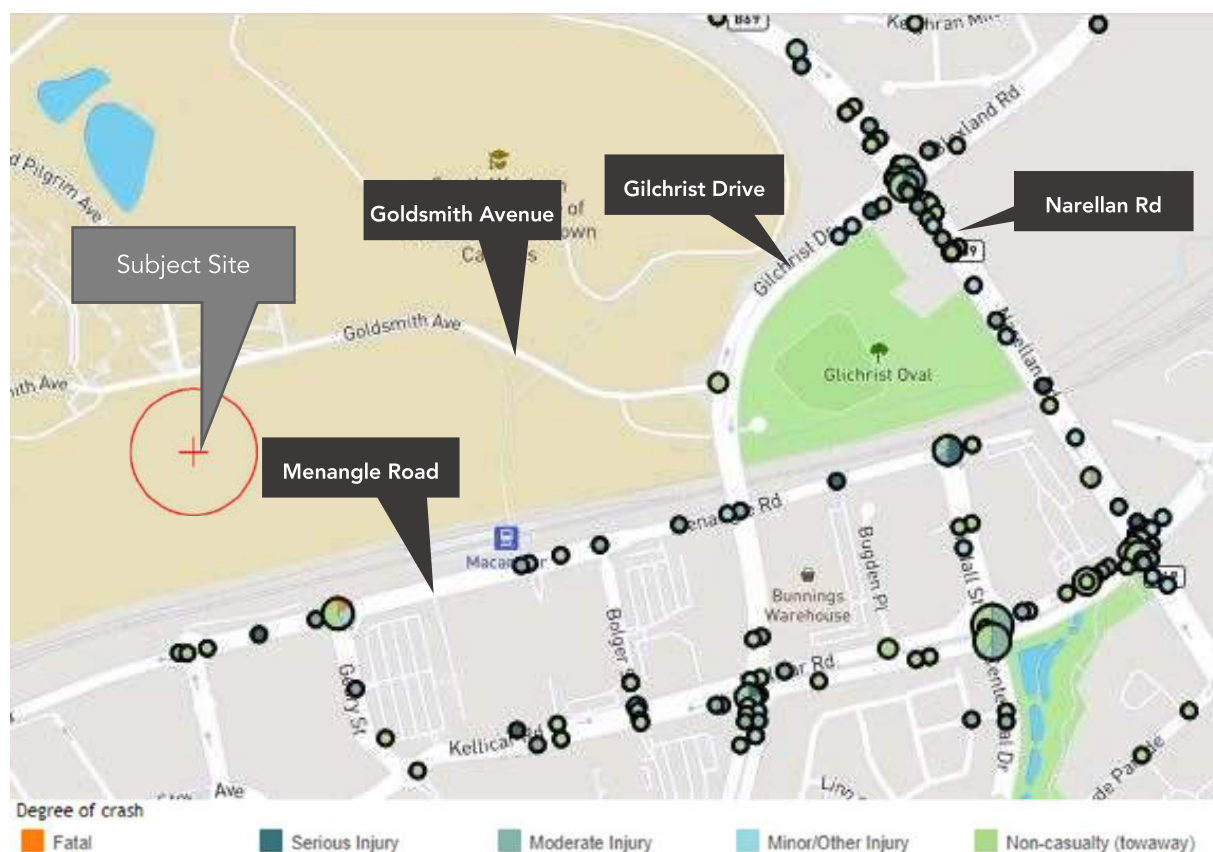


Figure 12 - TfNSW Crash and Casualty Statistics

4.3 Public Transport

The locality was assessed in the context of available forms of public transport that may be utilised by prospective residents and visitors. When defining accessibility, the NSW Guidelines to Walking & Cycling (2004) suggest that 400m-800m is a comfortable walking distance.



Figure 13 - 800m radius of the subject site

4.3.1 Heavy Rail Services

The subject site is serviced by Macarthur Train Station which in turn provides connection to Campbelltown Train Station. A footpath connection, to the train station, is provided near the Goldsmith Avenue and Gilchrist Drive intersection, which provides a north-south pedestrian/ cyclist access between Goldsmith Avenue and the train station.

The heavy rail services is anticipated to provide an alternative mode of transport for local residents and prospective users of the Campbelltown Sports and Health Centre of Excellence.

The Macarthur Station is on the Airport & South and Southern Highlands Line. Summary of the services are shown in Table 2.

Table 2 - Heavy Rail Service Summary

Train Line	From	To	Frequency (approx.)	Services operate approx. (Weekdays)	Services operate approx. (Weekends)
Airport & South	Macarthur	City	Every 15mins	3:23am to 11:58pm	3:43am to 11:28pm
Airport & South	City	Macarthur	Every 15mins	4:20am to 12:56am	4:40am to 12:55am
Southern Highlands	Goulburn	Campbelltown	Every 5-20mins during peak and 60min off-peak	4:47am to 11:43pm at Macarthur Station	5:22am to 11:28pm at Macarthur Station
Southern Highlands	Campbelltown	Goulburn	Every 10-30min during peak and 60mins off peak	5:31am to 12:27am at Macarthur Station	6:06am to 12:57am at Macarthur Station

Services via the South Highlands and Airport Lines are reasonably frequent and offer services throughout the day (from early morning to late evening). Although this footpath connection is approximately 1km walking distance from the site, which is slightly outside the comfortable walking distance of 800m, it is noted that Goldsmith Avenue is relatively flat and provides wide footpaths which are relatively straight, making it easier for pedestrian access. As such the train line could be a viable mode of transport for prospective users of the Centre of Excellence. It is noted that the possibility of providing a direct connection between the subject site and the train station, in the future, could further encourage the use of public and active transportation and would be in line with Campbelltown City Council's long-term town planning strategy.

4.3.2 Bus Services

The subject site is currently not serviced by a nearby bus stop. The closest bus stop is located along Menangle Road, on the other side of the rail line. There is also another bus stop located along Narellan Road, near Gilchrist Drive, which is approximately 1.5km walking distance from the subject site.

Considering that the subject site is located adjacent to the Western Sydney University (Campbelltown Campus) and a growing residential precinct (situated to the west), an improved bus network which provides services to neighbouring town centres and train stations (Macarthur and Campbelltown) would encourage local residents and employees to use public transportation. The improvement of the public transportation network and infrastructure has been outlined in Campbelltown City Council's "Campbelltown 2025 Looking Forward" report and it is anticipated that the provision of an improved bus network around the subject site is foreseeable in the future.

4.4 Active Transport

In addition to public transport, the locality was also assessed for its active transport potential. It is noted that the presence of Western Sydney University (Campbelltown Campus), TAFE South Western Sydney Institute (SWSI) and the growing residential precinct is expected to generate a high rate of walking and cycling. As

such, the local road network offers a high level of amenity and safety for pedestrians, providing refuge islands, separated footpaths, pedestrian crossings, supporting signage, on-road cycleway and appropriate lighting throughout the locality.

The site is also reasonably accessible to a well-developed bicycle network. Although not shown on the figure below, it is noted that a dedicated on-road cycleway has been provided on both sides of Goldsmith Avenue, between the Milky Way and Gilchrist Drive. From Milky Way, a shared path is provided which runs along the frontage of the site (see Figure 14 and Figure 15).

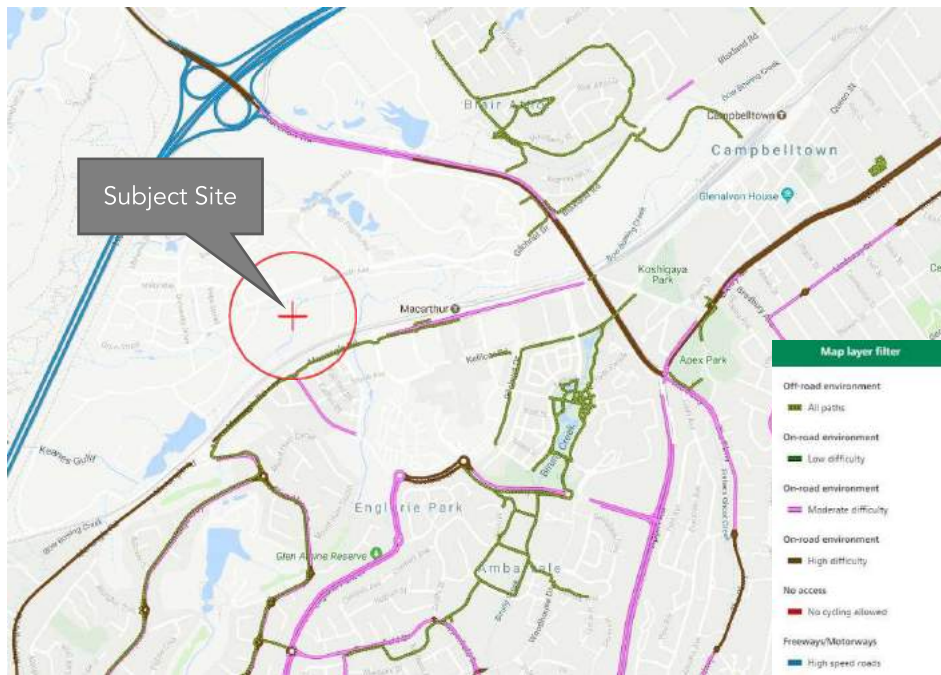


Figure 14 - Existing Cycleways



Figure 15 - Existing shared path

5. Parking Provision

5.1 Proposed Parking Provision

When considering the nature and future operations of the proposed development, it is often difficult to predict the parking requirements for such a sporting facility where parking demand is dependent of many factors.

As such, to calculate the required capacity of the proposed on-grade car park, the following sources have been considered:

- Campbelltown Sustainable City Development Control Plan (DCP) 2015;
- RMS Guide to Traffic Generating Developments (RMS Guide);
- ITE Parking Rates; and
- Surveys conducted at comparable sites.

5.1.1 Campbelltown (Sustainable City) DCP 2015

The Council DCP sets out the minimum parking requirements for developments and presents parking rates by land use. Although the subject development is classified as a 'community facility', the rates for a 'Recreational Facility Indoor' is considered to be the most appropriate. Table 6.4.2.1 stipulates that a 'Recreational Facility Indoor' development should provide parking spaces at a rate of 1 space per 25m² GFA. When applied to the proposed facility, having 5,475m² GFA (excluding community health centre & clinical room), this indicates a requirement for 219 parking spaces.

The Council DCP, Part 5 Table 5.3.1, stipulates that the parking provision for health consulting rooms should be based on a rate of 1 space per 35m² GFA. When applied to the community health centre & clinical room (included in Level 1), with a floor space of 1,025m² GFA, this indicates a requirement for approximately 30 parking spaces.

In total, the Council DCP suggests that approximately 249 parking spaces should be provided for this development.

5.1.2 RMS Guide to Traffic Generating Developments

The RMS Guide provides parking provision recommendations for a number of land uses based on somewhat outdated surveys. In relation to a few land uses, including Recreational Facilities the Guide states the following:

"Off-street car parking must be provided to accommodate peak demand periods at the facility. Analysis ideally should be based on a predicted 85th percentile usage."

"Research by the RTA has failed to find a conclusive relationship between parking demand and the size and nature of the recreation facilities surveyed, indicating that the number of parking spaces required is best determined by the nature of the proposed development. Comparisons may be drawn from the surveys conducted by the RTA on particular recreation facilities and other similar facilities".

This underlines the need for a first principles approach rather than the application of a rigid rate to an area.

5.1.3 ITE Parking Rates (US)

The Institute of Transportation Engineers collect parking and traffic generation rates for land uses throughout the US. The rates for some land uses are referred to in parts of the RMS Guide and it is accepted that there is some correlation between the data and outcomes in Australia.

In relation to the proposed centre, the ITE Parking Generation publication indicates the following rates:

- Athletic Club 3.9 spaces per 93m² GFA (1,000 feet) (8 study sites)
- Clinic 6.4 spaces per 93m² GFA (1,000 feet) + 1.1 spaces per employee (2 study sites)

When applied to the proposed development, having 5,475m² GFA of sports facilities and 1,025m² of health facilities, this indicates 308 spaces.

5.1.4 Survey Results at Comparable Sites

In order to conduct a more robust assessment of parking proposal, two comparable sites were surveyed on a typical weekend (Saturday, between 10.00am-2.00pm):

- Robyn Webster Sports Centre (located in Tempe)
- Sydney Academy of Sport and Recreation (located in Narrabeen)

The following table summarises the peak parking demands for each site, on a typical weekend.

Table 3 - Peak Occupancy Results

Site	Peak Period	Total Capacity	Occupancy	Occupancy Rate
Robyn Webster Sports Centre	11:00am-12:00pm	424	127	30%
Sydney Academy of Sport and Recreation	11:00am-12:00pm	375	87	23%

NOTE: It is noted that the Sydney Academy of Sport and Recreation facility, located in Narrabeen, is not open to the general public during the weekends, and is reserved for sports teams and elite athletes.

When considering the two sports centres surveyed, the Sydney Academy of Sport and Recreation is considered to be the most appropriate reflection of the subject development, as the Campbelltown Sports and Health Centre of Excellence will be reserved for sports teams and elite athletes and access for general public would be limited.

As such, it is anticipated that the subject development will not require the parking capacity, currently being provided in the Tempe (424 spaces) and Narrabeen centres (375 spaces), as the parking demand is expected to be lower than the demand experienced in centres open to the general public.

5.1.5 Proposed Parking Provision (First Principles Basis)

The various published rates indicate a parking provision range of 260 spaces to 310 spaces. It is anticipated that during normal operation, the facility will generate a lower parking demand, with the larger demands occurring in relation to events where transport management plans may address the parking demand/supply (i.e. the car occupancy is typically higher for events than typical use). Moreover, many of these events are

anticipated to be related to school events or community programs, where majority of the visitors are expected to arrive in a bus or coach and may not require the parking spaces. When considering that new facility will largely be reserved for members and elite athletes, the rates provided by the Council DCP, RMS Guide and the ITE are considered to be an overestimation of the realistic parking demand.

It is also noted that the parking demand associated with the community health centre & clinical room is anticipated to be minimal. As mentioned, although the health centre & clinical room will be open to the general public, it is expected to primarily serve the members and athletes already associated with the new facility. In light of this, it is considered that the health centre & clinical rooms will not generate a high level of additional parking demand.

As mentioned previously, the close proximity of Macarthur Train Station could also reduce the car parking demand. Although the pedestrian footpath connecting Goldsmith Avenue and the train station is located approximately 1km from the site, which is outside the comfortable 800m walking distance, it is noted that the footpath along Goldsmith Avenue is relatively flat, wide and straight making it easier for pedestrian access. This would allow the heavy rail service to be an alternative mode of transportation for the prospective users of the facility.

Moreover, the incorporation of a paid parking system will discourage casual users from driving to the facility and prevent overflow of the car park.

When considering the occupancy of the comparable sites, 127 spaces (Tempe) and 87 spaces (Narrabeen), a parking provision of 120 permanent spaces is expected to be appropriate for the proposed development. This provision will likely accommodate up to 400 people based on 60% arriving by car, and an average car occupancy of 2 persons per car. When considering that the centre will not be used by the general public, the parking demand is not expected to be as high as the rates published in the Council DPC and ITE, and a provision of 120 spaces is considered to be sufficient in accommodating the day to day operations of the proposed facility.

It is also noted that the proposed design can accommodate the option for future expansion of the car park, in the case that more parking spaces are needed to meet future parking demands.

5.2 Ticketless Parking System

In order to deter commuters, students and users not associated with the Centre, from parking within the on-grade car park for an extended period of time, a paid parking system is proposed to be incorporated into the development. As mentioned in Section 3.5, the on-grade car park will be free for users who are a registered member with the facility.

A License Plate Recognition (LPR) system with boom-gates at entry and exit are expected to be incorporated with the possibility of a 2-hour free period.

6. Development Traffic Assessment

The potential traffic generation of the proposed development has been estimated with reference to the RMS Guide to Traffic Generating Developments 2002 (RMS Guide).

6.1 Existing Traffic Generation

Currently, the site is occupied by a single storey facility, with an outdoor basketball court, and an outdoor car park accommodating approximately 27 parking spaces, accessible via a combined entry/exit driveway off Goldsmith Avenue.

Surveys have not been undertaken of the existing traffic conditions, however, it is anticipated that the existing land usage is not generating a significant volume of traffic and has a minimal impact on the surrounding road network.

6.2 Proposed Traffic Generation

As discussed in Section 5, the development proposes a total of 120 parking spaces with an additional two pick-up and drop-off spaces and a bus zone which can accommodate up to two buses.

The RMS Guide states that the analysis of a recreational facility should be based on the predicted 85 percentile usage rather than usage at capacity. Based on a total capacity of 120 spaces, this will result in a peak traffic generation of approximately 102 vehicles.

However, it is noted that data provided by the RMS Guide is based on surveys conducted for recreational facilities which are open to the general public. Moreover, the RMS Guide also indicates that recreational facilities are generally site and type specific in their operation and traffic generation. When considering that the subject site will not be open to the general public, the data provided by the RMS Guide is considered to be an overestimation of the anticipated peak traffic generation of the Centre.

It is acknowledged that the peak traffic volume may increase during events hosted by the Centre. Many of these events are anticipated to be school events or community programs (e.g. health education programs or programs for senior residents) which are likely to be outside of peak hours (typical weekday afternoon or weekend morning). Moreover, most visitors attending these events are expected to arrive by a shuttle bus or coach and will have minor impact to the predicted traffic volume.

As discussed in Section 4.3, the close proximity of Macarthur Station could reduce the reliance on private vehicles. Although the pedestrian connection between Goldsmith Avenue and the train station is slightly outside the comfortable walking distance, the footpath along Goldsmith Avenue is relatively flat, wide and newly paved which will improve pedestrian experience along this street. Moreover, the existing street lights have also been installed over the footpaths, allowing the existing paths along Goldsmith Avenue to be appropriately lit. This will allow active transportation to remain an attractive mode of transport during dark hours.

Nevertheless, in order to conduct a more robust assessment of the potential traffic generation, two comparable sites were surveyed on a typical weekend; Robyn Webster Sports Centre (located in Tempe) and Sydney Academy of Sport and Recreation (located in Narrabeen). The following table summarises the peak car park occupancy, as well as the peak volume of vehicles entering and exiting the site.

Table 4 - Survey Results

Site	Peak Occupancy	Peak IN	Peak OUT
Robyn Webster Sports Centre	30% (11:00am-12:00pm)	46 vehicles (45%)	57 vehicles (55%)
Sydney Academy of Sport and Recreation	23% (11:00am-12:00pm)	38 vehicles (57%)	29 vehicles (43%)

When considering the nature of the proposed development, the Sydney Academy of Sport and Recreation is considered to be a more comparable site, as it is not open to the general public during the weekend but is reserved for athletes and sports teams. The results indicate that the peak occupancy for both the comparable sites were considerably low with little traffic activity. Although the peak traffic volume is not anticipated to be as low as the comparable sites, it does provide an indication that the RMS data is primarily focused on recreational facilities which are open to the general public and the rates provided could be an overestimation of the expected peak traffic generation of the subject development.

When considering the above, a peak trip generation of 82 vehicles (20% reduction of 102 vehicles) is considered to be an appropriate reflection of the realistic peak trip volume.

The traffic volume and occupancy of the proposed car park is expected to peak during the late afternoon/evening on a typical weekday (as the majority of users will arrive after work) and also during the morning on a typical weekend. The following table summarises the proposed proportion of vehicles entering and exiting the site during the peak periods.

Table 5 - Proposed IN and OUT movement

	IN	OUT	TOTAL
Weekday – PM Peak	53 vehicles (65%)	29 vehicles (35%)	82 vehicles
Weekend – AM Peak	47 vehicles (57%)	35 vehicles (43%)	82 vehicles

The following figure represents the predicted trip distribution associated with the Centre.

The assumed trip distribution results in the following traffic volumes in the peak hour:

Time	Goldsmith Avenue towards Gilchrist Drive	Goldsmith Avenue towards Orion Street
Weekday – PM Peak	74	8
Weekend – AM Peak	74	8

The RMS Guide dictates that a collector road with a maximum speed of 50kph should have a maximum peak hour volume of 500 vehicles per hour. Goldsmith Avenue has been surveyed on Saturday 16 June 2018, between 12.00pm – 1.00pm. During this hour, 209 vehicles were surveyed along Goldsmith Avenue. An additional 82 vehicles, generated by the subject development, will result in approximately 290 vehicles during the peak operations on the weekend, which will still be within the RMS maximum environmental capacity performance standard, of 500 vehicles per hour, for a major local or collector road.

The two nearby intersections to the east and west are as follows:

- Signalised intersection between Goldsmith Avenue and Gilchrist Drive
- Roundabout between Goldsmith Avenue, Orion Street and University Drive.

These intersections are indicated in the figure below.



Figure 17 - Nearby intersections

It has been established, previously, that the majority of vehicles will be travelling towards Gilchrist Drive, and therefore any development traffic volume travelling towards the Orion Street, will have minor impacts on the operations of the roundabout. When considering that Gilchrist Drive is a regional road and the intersection is signalised, it is anticipated that the additional 6-7 vehicles every five minutes will have a minor impact on the existing operations of the signalised intersection.

In light of this, a SIDRA analysis is not considered to be necessary given that the nearby major intersections at the vicinity of the site would mostly carry vehicular traffic generated by other nearby land uses (e.g. Western Sydney university, TAFE and residential developments):

6.3 Traffic Impact Summary

The development traffic generation of 82 trips during the peak period is anticipated to have a minor impact on Goldsmith Avenue and the surrounding road network. It is anticipated that most vehicles accessing and exiting the site will travel via Goldsmith Avenue and onto Gilchrist Drive, which is a Regional Road. This will minimise the traffic impact which the proposed development will have on the adjacent residential precinct.

Therefore, in the context of traffic, the proposed development is unlikely to result in any significant traffic impact on local traffic conditions.

7. Access and Car Park Assessment

The following section presents an assessment of the proposed development with reference to the requirements of AS2890.1:2004 (Off-street car parking), AS2890.2:2002 (Off-street commercial vehicle facilities), AS2890.3:2015 (Bicycle Parking) and AS2890.6:2009 (Off-street parking for people with disabilities). This section is to be read in conjunction with the architectural plans provided by Peter Hunt Architect (see Attachment 1) and the car park assessment undertaken by **ptc.** (see Attachment 2).

It is noted that the design may be slightly redefined at a later stage.

7.1 Vehicular Access & Circulation

7.1.1 Access and Exit Driveway

The development proposes to provide a combined access and exit driveway along Goldsmith Avenue, as shown in Figure 18. This will result in the demolition of the existing driveway into the site.



Figure 18 - Proposed driveway crossover

The driveway will accommodate the entry and exit of general vehicles, service/refuse vehicles (up to an MRV) and buses/coaches. A 14.5m long coach is expected to be the largest vehicle required to access the site. This requires the driveway crossover to be designed in accordance with AS2890.2.

A swept path assessment demonstrating two-way passing of an entering and exiting coach (14.5m), with the appropriate clearances is included in Attachment 2. A median island is to be provided to accommodate separation between the entering/exiting vehicles. The assessment indicates that a driveway width of 33m will be adequate in providing two-way flow between two 14.5m coaches.

The driveway must also be designed in accordance with the grades stipulated in AS2890.2, where:

- Maximum grades do not exceed 1:6.5 (15.4%);
- Transition grades do not exceed 1:16 (6.25%) in 7.0m of travel; and
- Maximum grades do not exceed 1:20 (5%) for at least the longest wheelbase from the property line (8m).

As such, the grade of the driveway has been designed to incorporate a grade of 1:20 for the first 14.5m into the property and a maximum grade of 1:10 with a maximum change in grade of 1:16.7 (6%).

7.1.2 Internal Roundabout

An internal roundabout is to be provided with a diameter of approximately 9.5m. It is anticipated that the roundabout will improve the circulation of the vehicles within the site and allow large coaches to exit the site in a forward movement without impeding surrounding vehicular paths.

The roundabout is proposed to be mountable, which will allow coaches (up to 14.5m) to manoeuvre around the roundabout without conflicting with the adjacent "bins collection area" and the roundabout will not dominate the landscape and detract from the local environment.

Swept path assessments have been conducted to ensure that a 14.5m long coach can manoeuvre around the roundabout (see Attachment 2).

7.1.3 Circulation

Access into the controlled car park will be via the internal roundabout. A layback is proposed along the edge of the roundabout to accommodate a pick up/drop off zone for buses and coaches. The layback has been designed based on swept path assessments and will allow two buses (up to 14.5m) to park adjacent to the roundabout without conflicting with other vehicular movement (see Attachment 2).

A kiss and drop area is also proposed, adjacent to the bus zone, which will accommodate up to two vehicles at any given time. A swept path assessment has been conducted to ensure the feasibility of the design (see Attachment 2). Vehicles using the kiss and drop area can then exit the site via the 3.5m wide cross-aisle adjacent to the "bin collection area".

A one-way clock-wise circulation system will be incorporated within the car park. A 7.5m wide cross-aisle is to be provided to allow an MRV to reverse into the area adjacent to the Plant Room (between space 9 & 10). The swept path assessment indicates that an MRV can sufficiently enter and exit the site in a forward movement (see Attachment 2).

7.1.4 Servicing

Waste collection of the site is proposed to be undertaken in the "bin collection area". It is understood that waste collection will be conducted by a front-lift truck, which may encroach onto the circulation roadway during collection. A Loading Dock Management Plan will have to be prepared in due course to demonstrate the management of service vehicles accessing the site, and to ensure that there will be no conflict between waste collection periods and operation hours of the facility.

A service bay is also provided within the car park, between Space 9 & 10. This area will accommodate vehicles up to an MRV and will be restricted for vehicles servicing the recovery pool. Sufficient room has been provided to allow an MRV to reverse into this space without encroaching on to the parking aisle.

Removable bollards will be installed in this area to prevent vehicles from parking when this area is not in operation.

7.2 Sight Distance

The sight distance requirements are outlined in Section 3.2 of AS2890.1 and are prescribed on the basis of the posted speed limit or 85th percentile vehicles speeds along the frontage road.

Goldsmith Avenue has a posted speed limit of 50km/h which requires a desirable visibility distance of 69 metres and a minimum distance of 45 metres. The proposed driveway is located in a straight section of the road where sufficient sight distance is provided.

The proposed car park also allows for all vehicles to enter and exit in a forward direction, therefore minimising potential conflict points and maintaining the overall safety of the road network.

The proposed driveway also provides the minimum sight lines for pedestrian safety, as stipulated in AS2890.1. Triangular pedestrian sight splays (2.0m x 2.5m) has been provided on the left-hand side at exit.

7.3 Car Park Arrangement

7.3.1 Typical Requirements

The car park access and arrangements have been assessed against the requirements of AS2890.1:2004, with reference to Class 2 (sports facilities) car park. The development is to provide the following dimensions for the parking spaces:

- Car Spaces: 2.5m x 5.4m
- Aisle Width: 5.8m (minimum)

All parking spaces have been individually assessed and found to be 2.5m x 5.4m at minimum. All spaces meet the clearance requirements (door opening, entry flanges, column locations) of the parking space envelope requirements provided in Figure 5.2 of AS2890.1.

The aisle widths provided are 6.2m, which meet the minimum requirements for 90-degree parking spaces, whilst the circulation roadway is 7.4m to accommodate the turning path of an MRV (see Attachment 2).

7.3.2 Accessible Parking

Regarding the disability parking, four accessible parking spaces are proposed to be provided with minimum dimensions 2.4m x 5.4m, and an adjacent shared bay of equal dimensions. Shared bays and accessible spaces shall be installed in accordance with AS2890.6:2009, including the installation of bollards and relevant pavement markings.

7.3.3 Bicycle Parking

The development proposes to provide bicycle rails which can accommodate 5 horizontal bicycle spaces. Approved bicycle parking devices (BPD's) shall be installed as per the following requirements for AS2890.3:2015:

- Horizontal Parking: 1800mm x 500mm; and
- Accessible aisle: 1500mm

All proposed bicycle parking meets the above requirements.

8. Summary

ptc. has been engaged by TPG NSW Town Planning and Urban Design, on behalf of Campbelltown City Council (CCC), to prepare a traffic impact assessment as part of a Development Application (DA) submission for a combined indoor and outdoor community and health services facility, known as the Campbelltown Sports & Health Centre of Excellence ('The Centre').

The Centre is proposed to be reserved for sports teams, elite athletes and members of the facility. General public access is anticipated to be limited.

In order to deter commuters, students and users not associated with the Centre, from parking within the on-grade car park for an extended period of time, a paid parking system is proposed to be incorporated into the development. It is understood that the on-grade car park facility will be free for registered members of the Centre. The paid parking system will be controlled by boom-gates at the entry and exit, with a number plate recognition system.

The proposed parking provision has been calculated based on a first principle basis, with reference to the Campbelltown Sustainable City Development Control Plan (DCP) 2015, RMS Guide to Traffic Generating Developments (RMS Guide), ITE Parking Rates and survey results from comparable sites. The sites that have been surveyed include the Robyn Webster Sports Centre (located in Tempe) and the Sydney Academy of Sport and Recreation (located in Narrabeen).

When considering the survey results which indicated low occupancy rates (30% and 23%), the various published rates for parking provision, which ranged between 260 spaces to 280 spaces, were considered to be an overestimation of the number of parking spaces required for the subject development. Considering that general public access is to be limited, the parking demand is anticipated to be lower compared to public recreational facilities which is referenced in the Council DCP and RMS Guide. Moreover, the incorporation of a paid parking system is also expected to discourage any casual users from driving to the facility and overflowing of the car park.

It is also noted that the proximity of Macarthur Train Station could also reduce the car parking demand. It is noted that there is an existing pedestrian connection between Goldsmith Avenue and the train station which provides pedestrian access to the station. Although it is acknowledged that this connection is slightly outside the comfortable walking distance of 800m, stipulated in the NSW Guidelines to Walking & Cycling (2004), the footpaths along Goldsmith Avenue are relatively flat, wide, straight and newly paved which will encourage walking as an attractive mode of transport. In light of this, the existing heavy rail services can provide an alternative mode of transport for the prospective users of the proposed facility.

When considering the occupancy of the comparable sites, 127 spaces (Tempe) and 87 spaces (Narrabeen), a parking provision of 120 permanent spaces is expected to be adequate for the proposed development. This provision will likely accommodate up to 400 patrons based on 60% arriving by car, and an average car occupancy of 2 persons per car. When considering that the centre will not be used by the general public, the parking demand is not expected to be as high as the rates published in the Council DCP and ITE, and a provision of 120 spaces is considered to be sufficient during peak operations of the site.

The development traffic generation has also been estimated with reference to the RMS Guide and survey results from comparable sites. The RMS Guide suggests that the analysis of a recreational facility should be based on the predicted 85 percentile usage rather than usage at capacity. Based on a total capacity of 120 spaces, this will result in a peak traffic generation of approximately 102 vehicles.

As noted previously, the data provided by the RMS Guide is based on surveys conducted for recreational facilities which are open to the general public. Moreover, the RMS Guide also indicates that recreational facilities are generally site and type specific in their operation and traffic generation. When considering that the subject site will not be open to the general public, the data provided by the RMS Guide is considered to be an overestimation of the anticipated peak traffic generation of the subject Centre.

When considering the nature of the proposed development, the Sydney Academy of Sport and Recreation (Narrabeen) is considered to be a more comparable site, as it is not open to the general public during the weekend but only reserved for athletes and sports teams. The results indicate that the peak occupancy for both the comparable sites were considerably low with little traffic activity. Although the peak traffic volume is not anticipated to be as low as the comparable sites, it does provide an indication that the RMS data is primarily focused on recreational facilities which are open to the general public and the rates provided could be an overestimation of the expected peak traffic generation of the subject development.

With this in consideration, a further 20% reduction of trips is considered to be appropriate for the subject site, which will result in approximately 82 vehicular trips in the peak hour, which is equivalent to approximately 7 trips every five minutes. It is anticipated that the peak traffic volume associated with the development can be accommodated by Goldsmith Avenue and will have a minor impact on the surrounding road conditions and major intersections.

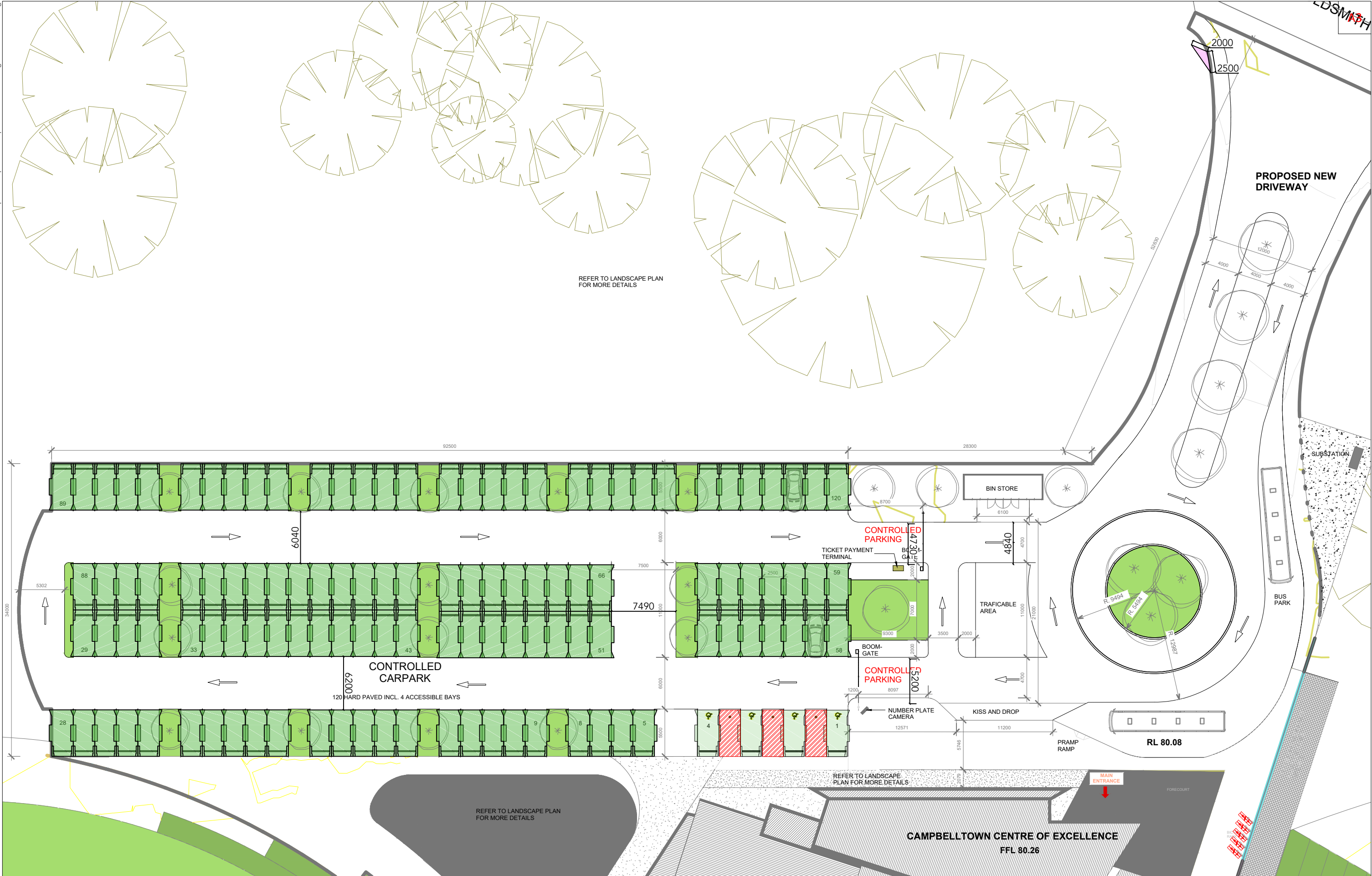
A review of the facility has also been undertaken with reference to AS2890.1:2004, AS2890.2:2002, AS2890.3:2015 and AS2890.6:2009, as well as a performance basis, and found the proposal to be in compliance and meeting the intent of the relevant standards.

In light of the above, the proposed development is endorsed in the context of parking and traffic.

Attachment 1 - Architectural Plans



Attachment 2 - Compliance Assessment



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REV	DATE	COMMENT	DRAWN	REVIEWED	REV	DATE	COMMENT	DRAWN	REVIEWED
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2	13/06/18	FOR INFORMATION	SH	AU					
1	04/05/18	FOR INFORMATION	SC	AU					



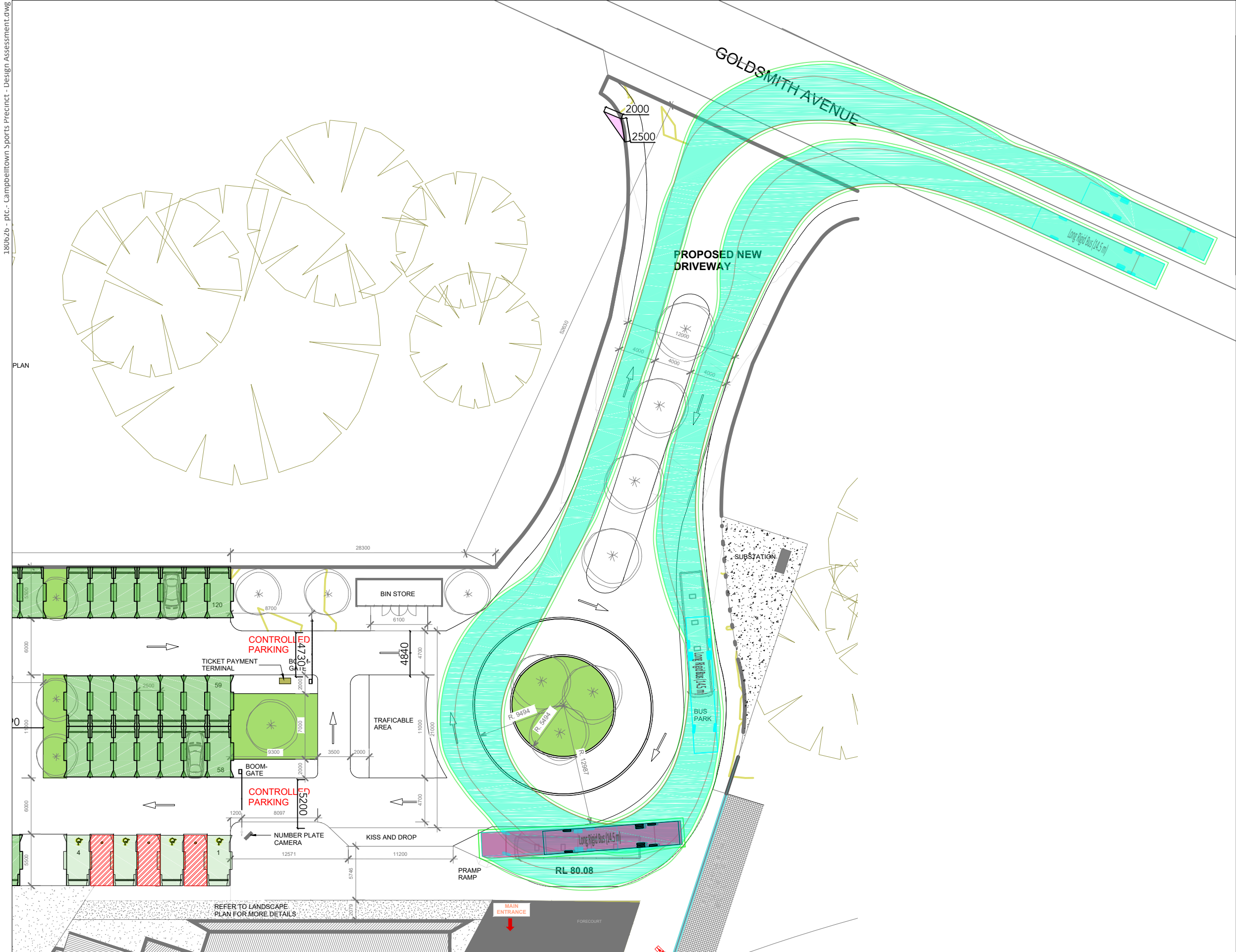
PROJECT:
**SPORTS AND HEALTH
CENTRE OF EXCELLENCE,
CAMPBELLTOWN**

DRAWING TITLE:
**DESIGN ASSESSMENT
CAR PARK**

CLIENT: **CAMPBELLTOWN CITY COUNCIL**
DRG. #: **PTC-001**
PROJECT #: **T2-2246**
SCALE: **1:400**

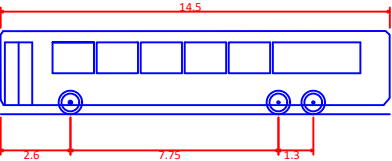
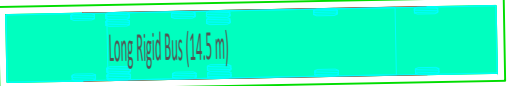
REV: 3

PLAN



COMMENTS

A3



Long Rigid Bus (14.5 m)	14.500m
Overall Length	2.500m
Overall Width	3.102m
Overall Body Height	0.337m
Min Body Ground Clearance	2.500m
Track Width	6.00s
Lock-to-lock time	15.000m
Curb to Curb Turning Radius	

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2	13/06/18	FOR INFORMATION	SH	AU					
1	04/05/18	FOR INFORMATION	SC	AU					



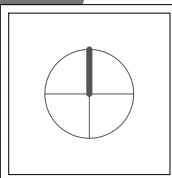
PROJECT:
**SPORTS AND HEALTH
CENTRE OF EXCELLENCE,
CAMPBELLTOWN**

DRAWING TITLE:
SWEPT PATH ASSESSMENT
14.5m COACH

CLIENT:	CAMPBELLTOWN CITY COUNCIL	
DRG. #:	PTC-002	REV: 3
PROJECT #:	T2-2246	
SCALE:	1:400	



REV	DATE	COMMENT	DRAWN	REVIEWED	REV	DATE	COMMENT	DRAWN	REVIEWED
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2	13/06/18	FOR INFORMATION	SH	AU					
1	04/05/18	FOR INFORMATION	SC	AU					



PROJECT:

**SPORTS AND HEALTH
CENTRE OF EXCELLENCE,
CAMPBELLTOWN**

DRAWING TITLE:

SWEPT PATH ASSESSMENT

**BIN COLLECTION & KISS AND
DROP AREA**

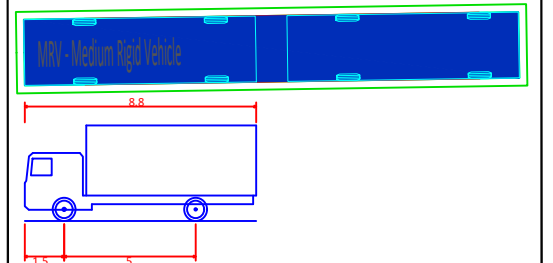
CLIENT: CAMPBELLTOWN CITY COUNCIL	
DRG. #: PTC-003	REV: 3
PROJECT #: T2-2246	
SCALE: 1:250	

COMMENTS

A3



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



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

REFER TO LANDSCAPE
PLAN FOR MORE DETAILS

**MAIN
ENTRANCE**

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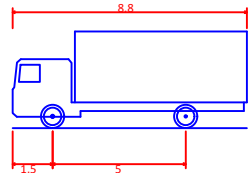
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COMMENTS

A3



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

LED
RK

SSIBLE BAYS

REFER TO LANDSCAPE PLAN
FOR MORE DETAILS

REFER TO LANDSCAPE
PLAN FOR MORE DETAILS

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3	27/06/18	FOR INFORMATION	SH	AU					
2	13/06/18	FOR INFORMATION	SH	AU					
1	04/05/18	FOR INFORMATION	SC	AU					



PROJECT:
**SPORTS AND HEALTH
CENTRE OF EXCELLENCE,
CAMPBELLTOWN**

DRAWING TITLE:
**SWEPT PATH ASSESSMENT
MEDIUM RIGID VEHICLE
(MRV) ENTRY AND REVERSE**

CLIENT: **CAMPBELLTOWN CITY COUNCIL**
DRG. #: **PTC-004**
PROJECT #: **T2-2246**
SCALE: **1:200**

REV: **3**