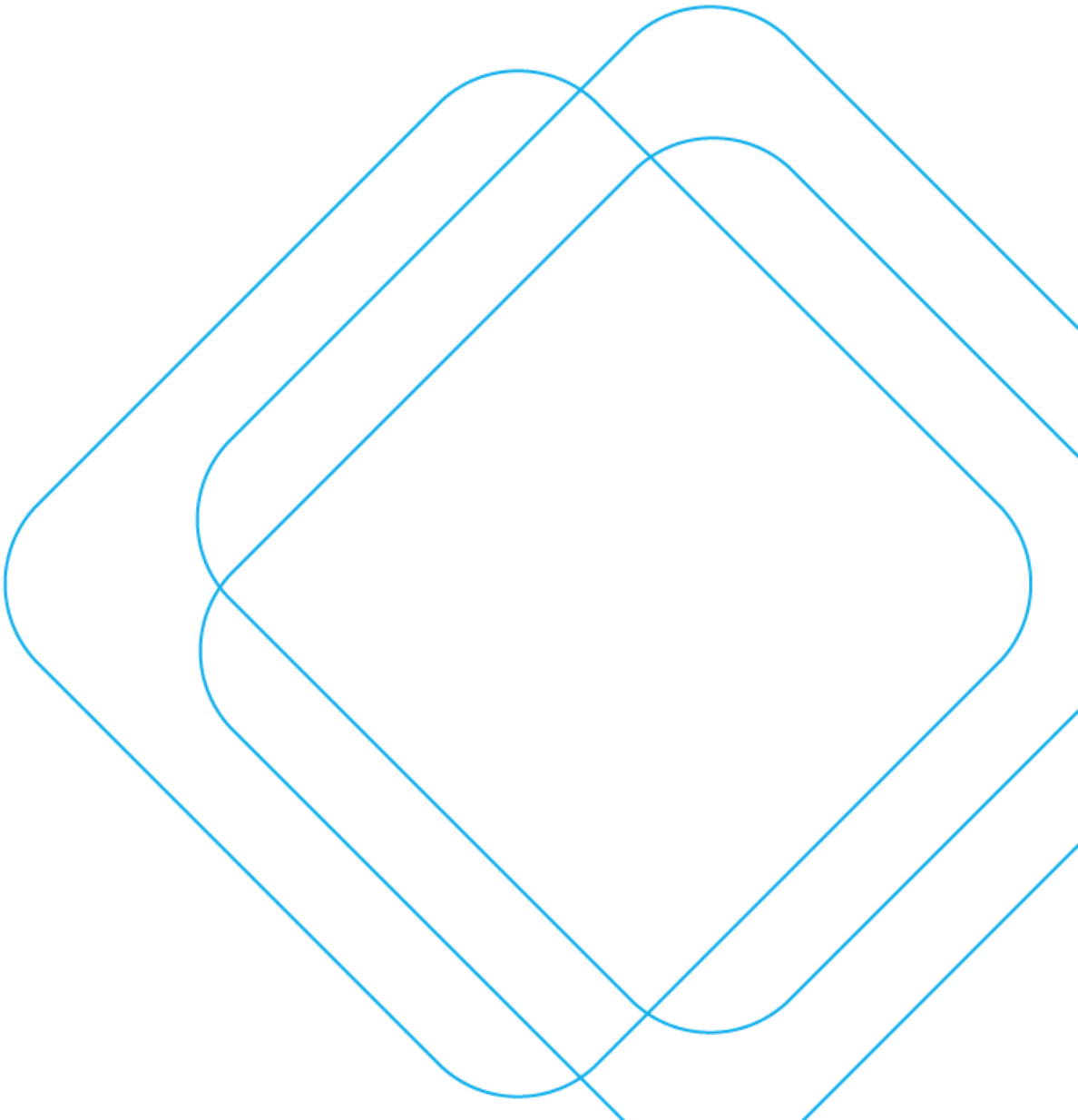
SCT Consulting

GOOGONG INDOOR SPORTS & AQUATIC CENTRE

Traffic and Parking Impact Assessment

10 APRIL 2024

SCT Consulting acknowledges the traditional owners of the lands on which we work.
We pay our respects to Elders past, present and emerging.



Quality Assurance

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1.0	12 March 2024	Draft report
2.0	10 April 2024	Updated draft report

Contents

Appendices

Executive summary

SCT Consulting was engaged by NBRS acting as architects for PEET to undertake a Traffic and Parking Impact Study to support the Development Application (DA) of the Googong Indoor Sports and Aquatic Centre (ISAC) located in Queanbeyan–Palerang Local Government Area (LGA).

The development will involve the construction of two basketball courts, two swimming pools and associated amenities and services. Car parking will be provided through the existing Googong Commons Carpark. Minor modifications to the carpark are proposed to create an additional pedestrian path connecting the footpath on Heazlett Street through the carpark and connecting to the front entrance. The easter end of the car parking area is proposed to be widened to allow for service vehicles to manoeuvre around the car park. This would result in a reduction in parking from 222 to 215 spaces.

The *Queanbeyan-Palerang Regional Council* (QPRC) *Development Control Plan* (DCP) would require a minimum provision of 83 spaces. Hence, the 215 spaces provided satisfy this requirement. Furthermore, parking occupancy data and peak hour trip generation also demonstrate that the potential maximum parking demand can be accommodated by the parking arrangement as a result of the proposal.

Vehicle swept paths completed by Spiire, indicate a Heavy Rigid Vehicle (HRV) is capable of entering the car park through the existing eastern vehicle entrance. The proposed modifications to the car park will enable a Heavy Rigid tomanoeuvre around the east end. A ‘pull in’ area adjacent an external waste enclosure is proposed that would enable waste vehicles to collect refuse whilst having minimal impact on other users. Service vehicles can then exit the car park onto Heazlett Street.

The proposed development is expected to generate 118 vehicles per hour during the peak period.

SIDRA traffic modelling has been undertaken to assess the intersection performance of Wellsvale Drive / Heazlett Street with the associated with the additional vehicle trips. It confirms that the level of service remains at the same level with an acceptable increase in delay and sufficient additional capacity. This intersection has been constructed and there is no need for any changes to the approved road network.

The Traffic and Parking Impact Study concluded that the development scale represents an acceptable increase in traffic and the impacts of the proposed development are at a level able to be accommodated by the existing and planned infrastructure.

1.0 Introduction

1.1 Purpose of report

NBRS engaged SCT Consulting to conduct a Traffic and Parking Assessment to support the Development Application (DA) for the Googong Indoor Sports and Aquatic Centre (ISAC).

This document has considered the following scope of work:

– Key relevant planning and technical documents, namely the Googong Development Control Plan (DCP), Queanbeyan–Palerang Regional Council (QPRC) DCP and Australian Standards 2890.1 and 2890.2.

– Historical traffic studies for Googong Common and Googong NH2

– Existing transport conditions, including road network conditions, public transport accessibility and connectivity to walking and cycling routes (based on publicly available data)

– The proposed development, parking provision and access arrangements and their consistency with the DCPs

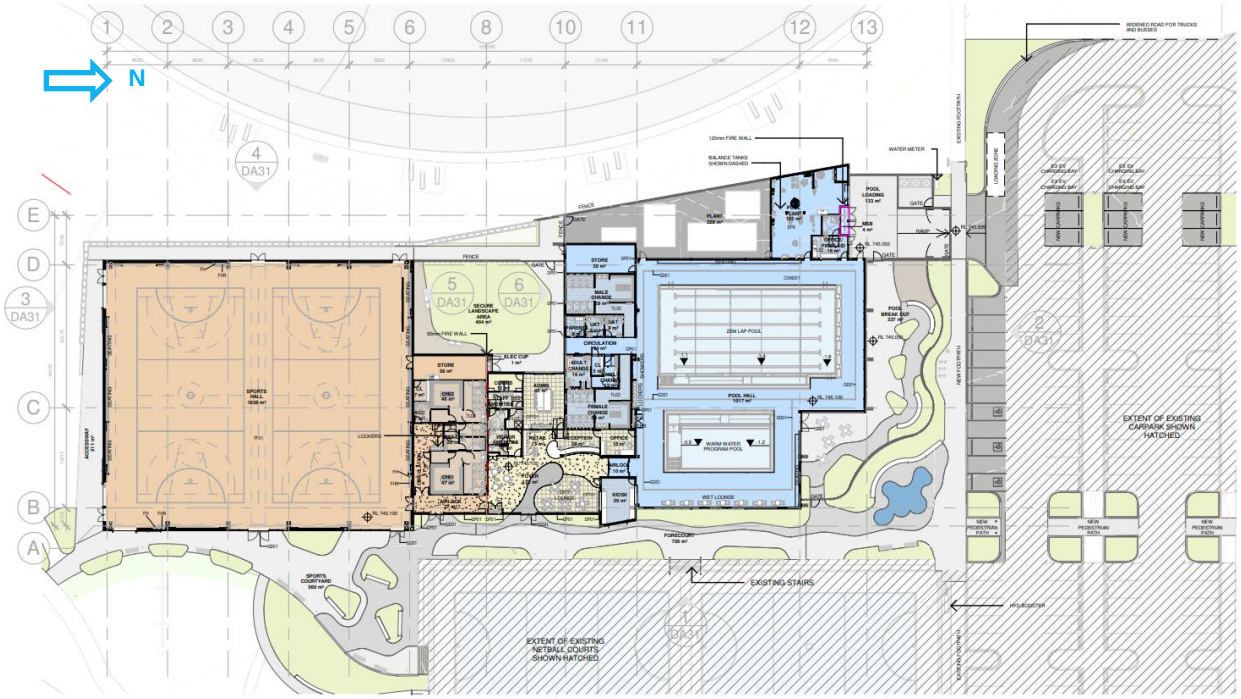
– Traffic impact of the proposed development. Intersection modelling was conducted to assess traffic impacts.

1.2 Development context

The Googong Township is located about 17 km to the south of Canberra and 8 km to the south of Queanbeyan town centre. The Googong township development is divided into five neighbourhoods whilst the site of the ISAC is situated within Googong NH2.

The site of the proposed development is located at Heazlett Street, an east-west local street connecting Wellsvale Drive and the southern part of NH1. The site of the ISAC is shown in **Figure 1-1**.

Figure 1-1 Proposed site plan



Source: NBRS, 2023

2.0 Previous studies

Many traffic studies have been carried out for the Googong township that examines the scale of development within Googong and the impact of planned land uses on the current and planned road network.

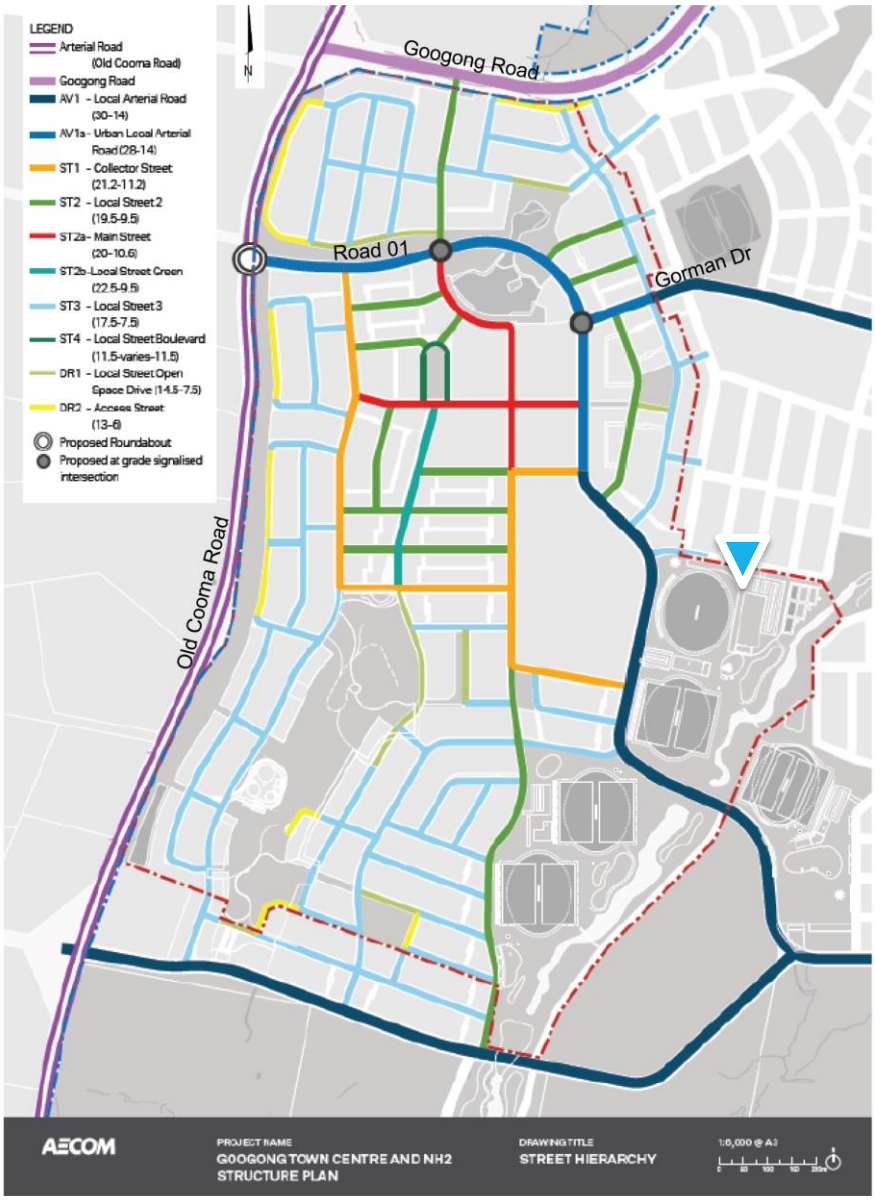
2.1 Googong Neighbourhood 2 Structure Plan, 2016

The structure plan for Googong NH2 was approved by Council in 2016. It guides the street hierarchy and possible intersection layouts throughout the NH2 area. **Figure 2-1** shows the road hierarchy of the network surrounding the site (labelled ▼). The site is bound by:

– Heazlett Street (Local Street) to the north

– Wellsvale Drive (Local arterial) to the West

Figure 2-1 Proposed road hierarchy in the structure plan



Source: AECOM (2016), Googong Neighbourhood 2 Structure Plan

2.2 Googong Neighbourhood 2 - Landscape Design Report, 2017

The structure plan for Googong outlined in the Googong *Local Environment Plan* includes the provision of many open spaces, community, sports and recreational facilities. As outlined, this structure plan has been approved for 2016. Onsite parking is to be provided to cater for the increased demand generated by developments.

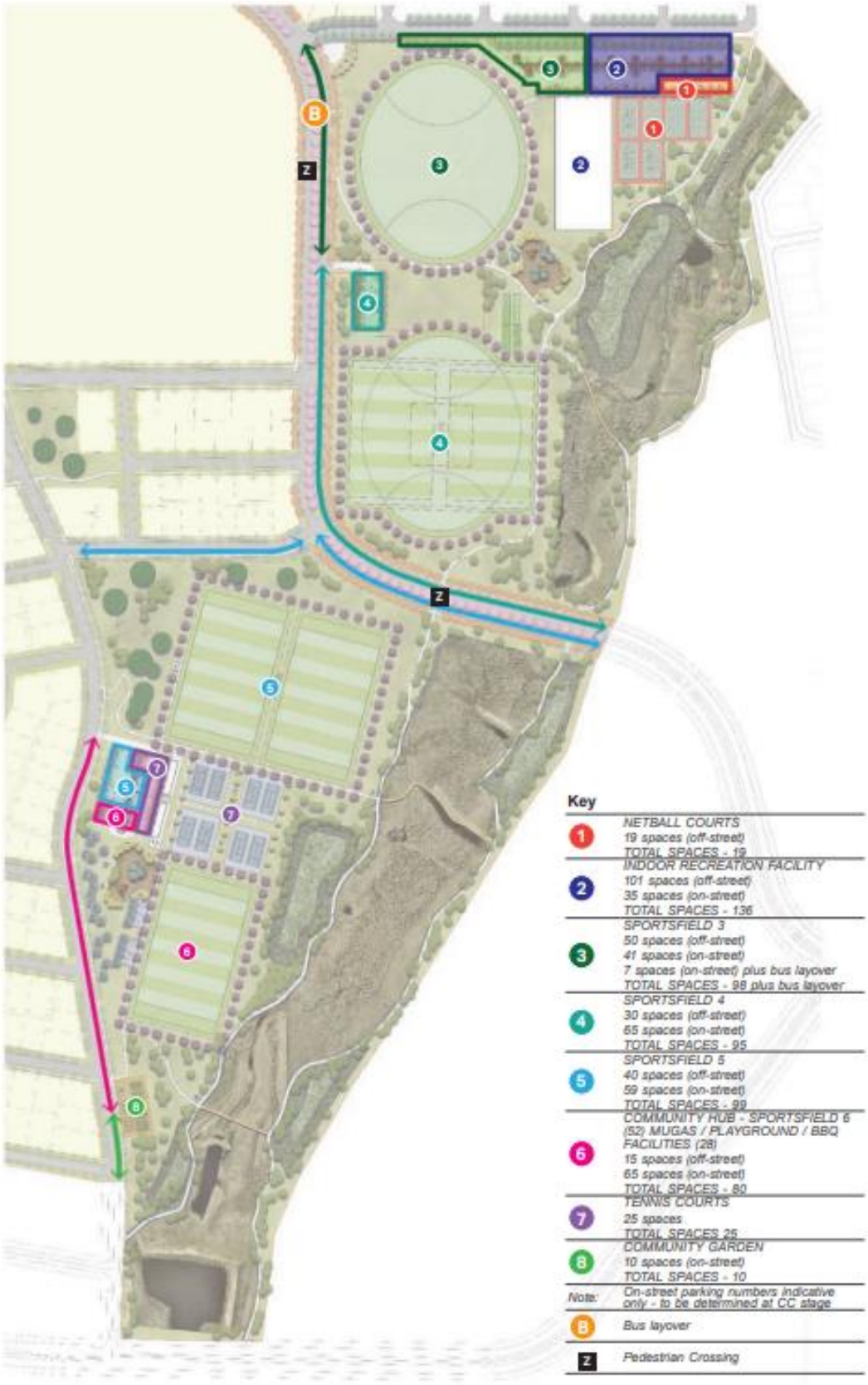
Car parking to service the sports and recreational facilities within Googong Common has been provided as a combination of off-street, on-street perpendicular parking and indented parallel parking. AECOM in their DA Landscape Design Report outlined the various facilities of the Googong Common and their corresponding parking requirements. The proposed parking arrangements approved in 2016 are described and shown in **Table 2-1** and **Figure 2-2**. 83 spaces are identified as being needed for the development under the QPRC DCP.

Table 2-1 Parking analysis for Googong Common and the proposed Indoor Sports and Aquatic Centre

Facility	Queanbeyan DCP 2012 - Part 2 Section 2.2 Requirement	Precedent Examples (QPRC)	Proposed Car Park Numbers		Total
			Off-Street	On Street (Adjacent)	
Indoor Recreation Facility	Within the CBD: 1 space per 60m² of GFA (At 5000 sqm would = 83 spaces). Outside the CBD - no guide	Queanbeyan Aquatic Centre (approx. 90 spaces)	101	35	136
Netball courts (6)	N/A	Steve Muager Sportsground - 6 netball courts plus sportsfield (38 unmarked spaces, approx 19 per facility)	19	0	19
Sportsfield 3 (AFL / Cricket Oval)	N/A	Freebody Oval - 2 ovals and 1 soccer pitch(241 spaces in total, approx. 80 per field)	50	48	98
Sportsfield 4 (AFL / Cricket Oval plus double Soccer/Rugby)	N/A	Freebody Oval - 2 ovals and 1 soccer pitch(241 spaces in total, approx. 80 per field)	30	65	95
Sportsfield 5 (double Soccer/Rugby)	N/A	Wright Park - 3 fields (82 spaces in total, approx. 27 spaces per field)	40	59	99
Community Hub: Sportsfield 6 - (Single soccer / rugby), MUGAs, playground and BBQ area	N/A	Wright Park - 3 fields (82 spaces in total, approx. 27 spaces per field)	15	65	80
Tennis courts (8)	3 spaces per court (8 courts would = 24 spaces)	Jerrabomberra Tennis Club - 6 courts (approx 32 spaces)	25	0	25
Community Garden	N/A	N/A	0	10	10
Total			**280**	**282**	**562**

Source: AECOM, 2017

Figure 2-2 Proposed parking for each use of Googong Common



Source: Googong NH2 Landscape Design Report – DA, AECOM, 2017

3.0 Existing conditions

The purpose of this chapter is to provide an understanding of the current traffic and transport conditions in the vicinity of the site.

3.1 Road network

The key roads surrounding the development site are shown in **Figure 3-1**.

Figure 3-1 Road network surrounding the site

Source: Nearmap, 2024

– **Old Cooma Road** connects Edwin Land Parkway to the north and Monaro Highway to the south. It has a signposted speed limit of 80 km/h adjacent to the site. The duplication of this arterial road was completed in 2020 between Edwin Land Parkway and Googong Road. It remains one lane in each direction to the south of Wellsvale Drive. A signalised T-intersection is provided at the Old Cooma Road / Wellsvale Drive with a pedestrian crossing on Wellsvale Drive. A footpath is provided on the east side of Old Cooma Road. On-road bicycle lanes are available in both directions to the north of Wellsvale Drive while parking is unrestricted on both sides of the road.

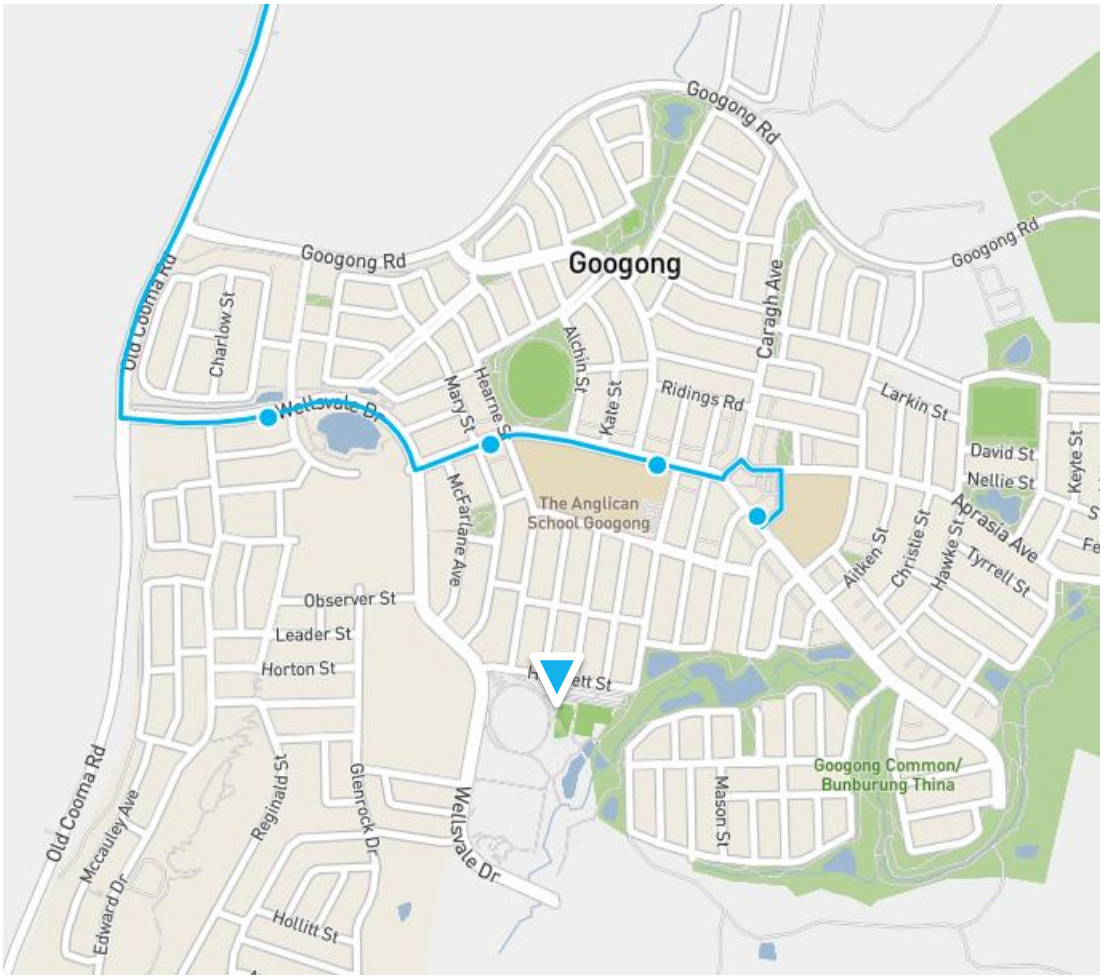
– **Wellsvale Drive** is classified as a combination of Arterial Road (AV1b between Old Cooma Road and Courtney Street) and Local Arterial Road (AV1 between Courtney Street and Gorman Drive). It has a signposted speed limit of 50 km/h with a variation of one to two lanes in each direction. Footpaths and on-road bicycle lanes are provided on both sides of the road. The section of Wellsvale Drive, south of Gorman Drive has recently been constructed until just past Hegarty Street (southeast of the site).

– **Heazlett Street** is a two-way local road that runs along the north boundary of the Googong Common. It intersects with Wellsvale Drive in the west and Rosa Street in the east. It has a signposted speed limit of 50 km/h and a carriageway width of approximately 9.2m. Footpaths are provided on both sides of the road.

3.2 Bus network

The public transport network in the vicinity of the site is shown in **Figure 3-2**.

Figure 3-2 Bus network near to the site



Source: TfNSW, 2024

There is one bus stop about 800m from the site on Gorman Drive. Bus routes 830 and 840X are available at the bus stop, which operates between Googong, Queanbeyan and Canberra.

There are five inbound bus services towards Queanbeyan and Canberra for a typical weekday peak hour between 7am and 8am.

3.3 Active transport

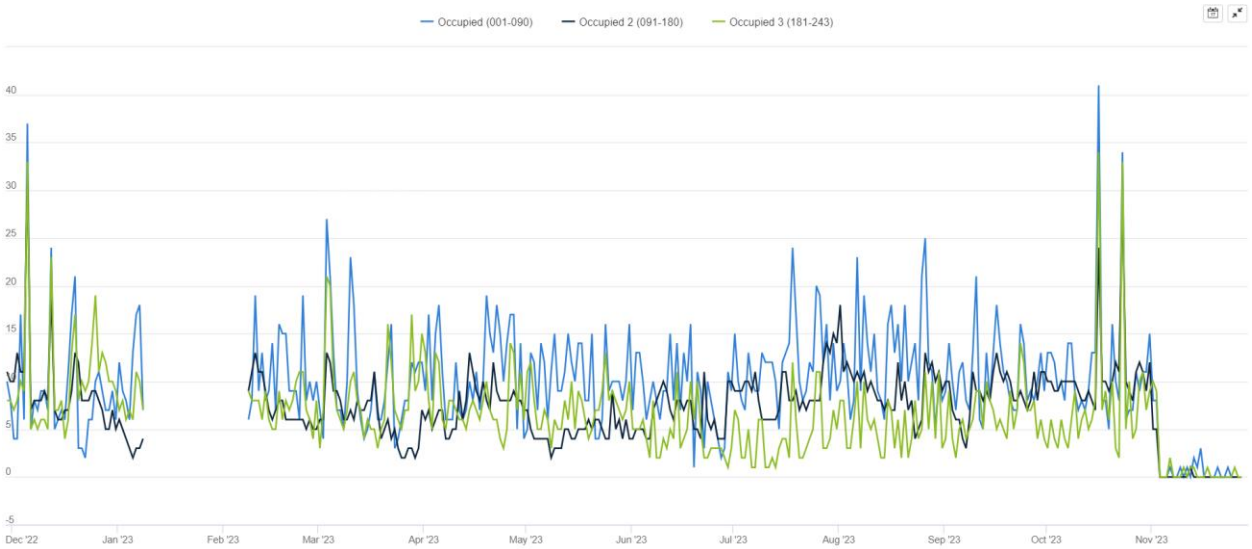
There are extensive walking and cycling facilities in the existing Googong Common. On-road bicycle lanes are available on Wellsvale Drive, Gorman Drive and Old Cooma Road. The grid-like footpath network enables pedestrians to have high-quality facilities for short-distance trips east towards Googong township and west towards Old Cooma Road.

3.4 Parking survey

Parking occupancy data for the existing Googong Commons carpark was supplied by One Wi-Fi & Infrastructure (**Figure 3-3**), the current capacity of the car park that has been constructed, for the netball courts, sports oval and the proposed ISAC at present has a capacity of 243 spaces.

Parking data collected by One Wi-FI & Infrastructure from December 2022 to November 2023 recorded a maximum occupancy of 99 cars, indicating a utilisation rate of around 40 per cent (**Figure 3-3**).

Figure 3-3 Googong Heazlett Street car park occupancy



Source: One Wi-Fi & Infrastructure, 2023

Figure 3-4 Current parking configuration and capacity

Source: One Wi-Fi & Infrastructure, 2023

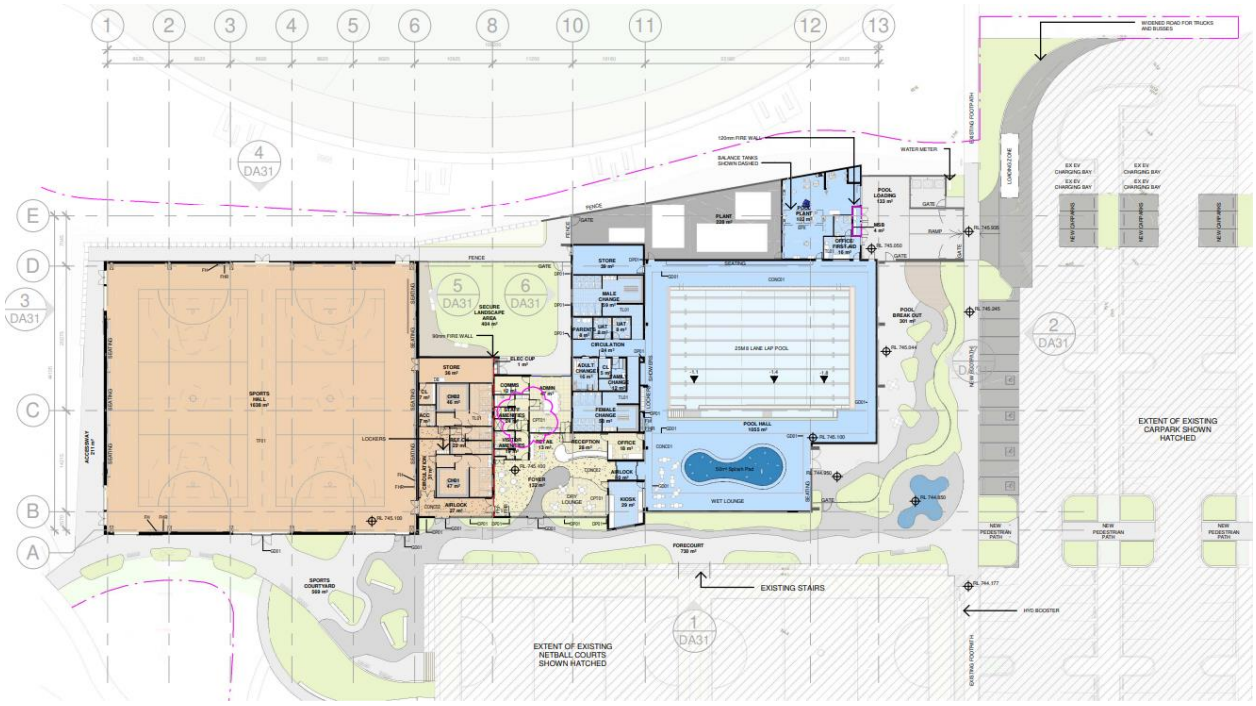
4.0 Proposed development

4.1 The development

4.1.1 Googong Indoor Sports Aquatic Centre

The proposed development of Googong ISAC is planned to be within the Googong Commons and will include two basketball courts, a 25m pool and a warm water pool as shown in **Figure 4-1**. The Gross Floor Area (GFA) of each aspect of the development is shown in **Figure 4-2**.

Figure 4-1 Proposed Indoor Sports Aquatic Centre



Source: NBRS, 2024

Figure 4-2 Area schedule for the proposed development

AREAS SCHEULDE

Name	Area	Volume
AQUATIC PAVILION		
ADULT CHANGE	16 m²	47 m³
AIRLOCK	10 m²	28 m³
CIRCULATION	24 m²	73 m³
CL	5 m²	14 m³
FAMILY CHANGE	12 m²	35 m³
FEMALE CHANGE	58 m²	173 m³
KIOSK	29 m²	79 m³
MALE CHANGE	59 m²	178 m³
MSB	4 m²	10 m³
OFFICE/ FIRST AID	16 m²	38 m³
PARENTS	8 m²	24 m³
POOL HALL	1055 m²	7264 m³
POOL PLANT	102 m²	350 m³
STAFF TOILET	7 m²	19 m³
STORE	39 m²	96 m³

AREAS SCHEULDE

Name	Area	Volume
UAT	8 m²	23 m³
UAT	8 m²	23 m³
	1459 m²	8474 m³
FOYER		
ADMIN	47 m²	141 m³
COMMS	12 m²	32 m³
FOYER	132 m²	395 m³
OFFICE	18 m²	48 m³
RECEPTION	28 m²	85 m³
RETAIL	13 m²	39 m³
STAFF AMENITIES	24 m²	64 m³
VISITOR AMENITIES	19 m²	50 m³
	292 m²	854 m³
SPORTS PAVILION ACC	7 m²	21 m³

AREAS SCHEULDE

Name	Area	Volume
AIRLOCK	27 m²	80 m³
CH01	47 m²	140 m³
CH02	46 m²	137 m³
CIRCULATION	31 m²	93 m³
CL	7 m²	19 m³
REF CH	22 m²	67 m³
SPORTS HALL	1638 m²	16779 m³
STORE	36 m²	87 m³
	1860 m²	17423 m³
	3611 m²	26751 m³

EXTERNAL AREAS

Name	Area
EXTERNAL AREAS	
POOL LOADING	133 m²
BINS	21 m²
	154 m²
LANDSCAPE AREAS	
SPORTS COURTYARD	569 m²
SECURE LANDSCAPE AREA	404 m²
ACCESSWAY	211 m²
FORECOURT	730 m²
POOL BREAK OUT	301 m²
	2216 m²
PLANT	
PLANT	228 m²
ELEC CUP	1 m²
	230 m²
	2600 m²

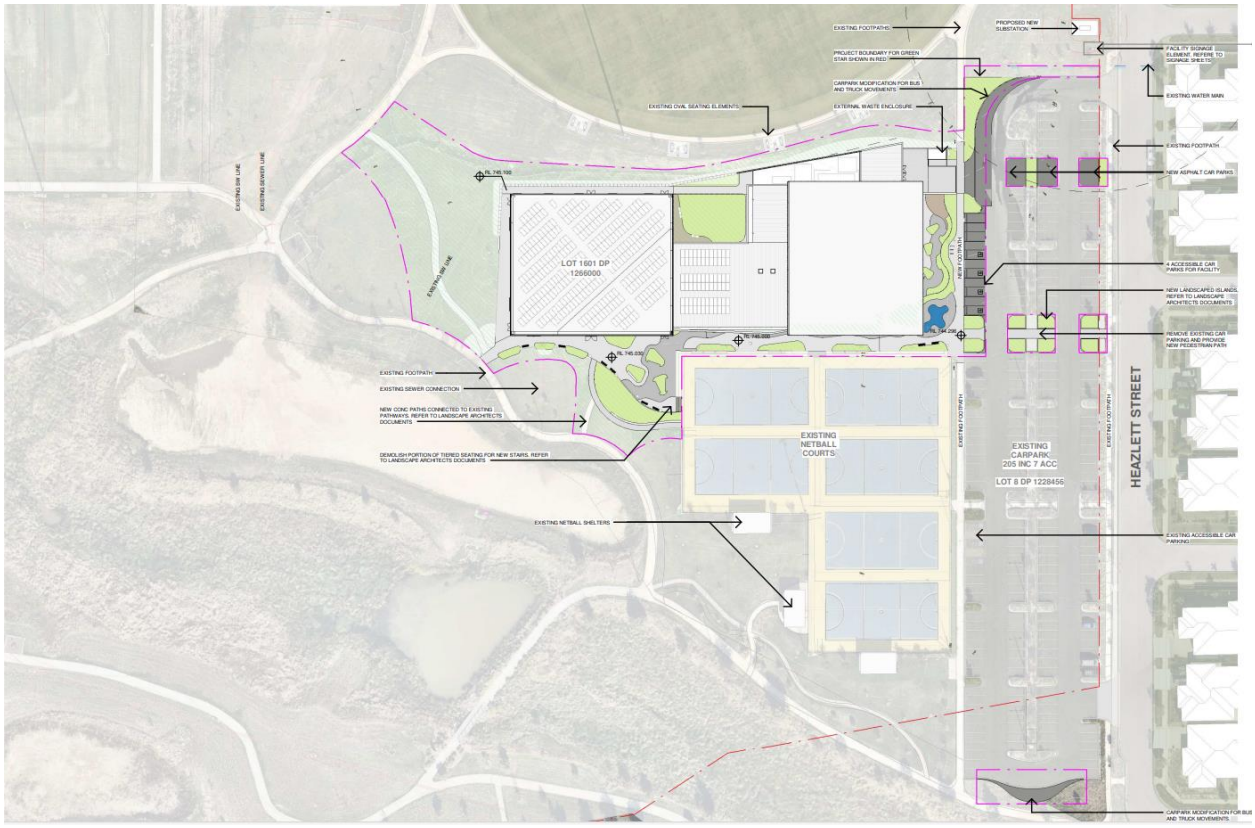
Source: NBRS, 2024

4.2 Proposed transport access

4.2.1 Googong Indoor Sports Aquatic Centre

The proposed ISAC shall be accessed by vehicles from two access points on Heazlett Street as shown in **Figure 4-3**. There is no change to the existing access point as part of the proposal.

Figure 4-3 Site Plan with vehicle access points



Source: NBRS, 2024

4.2.2 Pedestrian access

Minor modifications to the existing car park are proposed involving the removal of a small number of spaces to construct a direct pedestrian path linking the footpaths on the south side of Heazlett Street, to the entrance of the centre as shown in **Figure 4-3**.

4.2.3 Emergency/service vehicles

There is no specific requirement for on-site parking spaces for service vehicles in Googong DCP. The site plan proposes off-site servicing consistent with other higher-density areas in Googong (e.g. on Annlouise and Lurline Lanes, where waste servicing occurs for townhouses).

4.2.4 Waste collection vehicles

Waste collection is proposed to occur onsite. As shown in **Appendix B**, Vehicle swept paths completed by Spiire, indicate a Heavy Rigid Vehicle (HRV) is capable of entering the car park from the eastern vehicle entrance. Once it enters the carpark an HRV will then be required to turn its wheels from a stationary position before completing a 180-degree turn around the east end of the carpark, which is proposed to be modified through the addition of an indented turning bay shown in **Figure 4-3**. During this turning maneauvre, the vehicles wheels remain within the indented turning bay.The proposed waste collection area can contain an HRV and is likely not to conflict with pedestrians or other users as waste collection will likely take place outside of the facility's hours of operation.

4.2.5 Parking Provision

The schedule for the various aspects of the proposal are shown in **Figure 4-2**, from which there is approximately 4,965m^2 of GFA that will generate development traffic. This is congruous to the 5,000m^2 of GFA reported in the *Googong Common, Landscape Report (2017)* by AECOM. Areas such as landscaping were not included as these areas are inaccessible to users and do not function in the same capacity as the pool hall with regard to parking and traffic demands. Under the QPRC *DCP*, a parking rate of 1 space per 60m^2 of GFA applies for indoor sports facilities, this corresponds to a provision of 83 parking spaces, which is satisfied by the 215 spaces provided on site.

5.0 Traffic Impact Assessment

5.1 Trip generation

The *Guide to Traffic Generating Developments* by Transport for New South Wales (formally Road & Traffic Authority) does not contain trip generation rates for indoor sports facilities, swimming pools or basketball courts. To determine the trip generation of the proposed development the various usages of the facility that would generate vehicle trips were examined. The maximum number of people utilising each part of the facility (i.e., 25m lap pool and indoor sports courts) was approximated based on GFA of these areas, i.e. 80 people using the basket ball courts, 36 people in the 25m pool, 25 children in the warm water program pool and 20 people in the change room. Vehicle occupancies were then assigned to each part of the facility 'use', to determine the number of vehicles generated by the development. These are shown in **Table 5-1**.

To verify the above assumptions, trip generation rates for indoor sports facilities given by the *Institute of Transportation Engineers (ITE)* where used. The trip generation provided by the ITE is a rate of 2.31 trips per square foot of GFA. Applying the GFA determined by AECOM of 5,000m^2 results in 124 trips generated. This indicates that the assumptions used align with other established trip generation guidelines.

Table 5-1 Trip generation for proposed indoor sports and aquatic centre

Use	Number of people	Vehicle occupancy	Number of vehicles generated	Vehicle turnover per hour	Vehicles per hour
Indoor sports courts	80	1.2	67	0.67	44
25m swimming pool	36	1.3	28	1	28
Warm water program pool	25	2	13	2	25
Change rooms	20	1.2	17	1.22	20
Total	**161**	**-**	**124**	**-**	**118**

5.2 Road network impact

5.2.1 SIDRA network development

The performance of the intersection of Wellsvale Drive / Heazlett Street was assessed using the SIDRA Intersections traffic analysis tool. This software allows for the evaluation of signalised and un-signalised intersections by modelling separate transport modes such as light and heavy vehicles, as well as pedestrians at an intersection. Outputs from the software include Level of Service (LOS), Degree of Saturation (DOS) and vehicle queue lengths.

Intersection LOS is a tool to measure the level of congestion at an intersection as well as to identify locations requiring further investigation. The LOS as defined in the *Traffic Modelling Guidelines* is summarised in **Table 5-2**. For priority intersections, LOS is determined by using the worst delay on all legs of the intersection

Table 5-2 Level of Service definitions

Level of Service (LOS)	Average Delay per Vehicle (sec/h)	Performance explanation
A	Less than 14.5	Good operation
B	14.5 to 28.4	Good with acceptable delays and spare capacity
C	28.5 to 42.4	Satisfactory
D	42.5 to 56.4	Operating near capacity
E	56.5 to 70.4	At capacity, at signals incidents will cause excessive delays. Roundabouts require other control methods.
F	70.5 or greater	

Source: Roads and Maritime Services, 2002

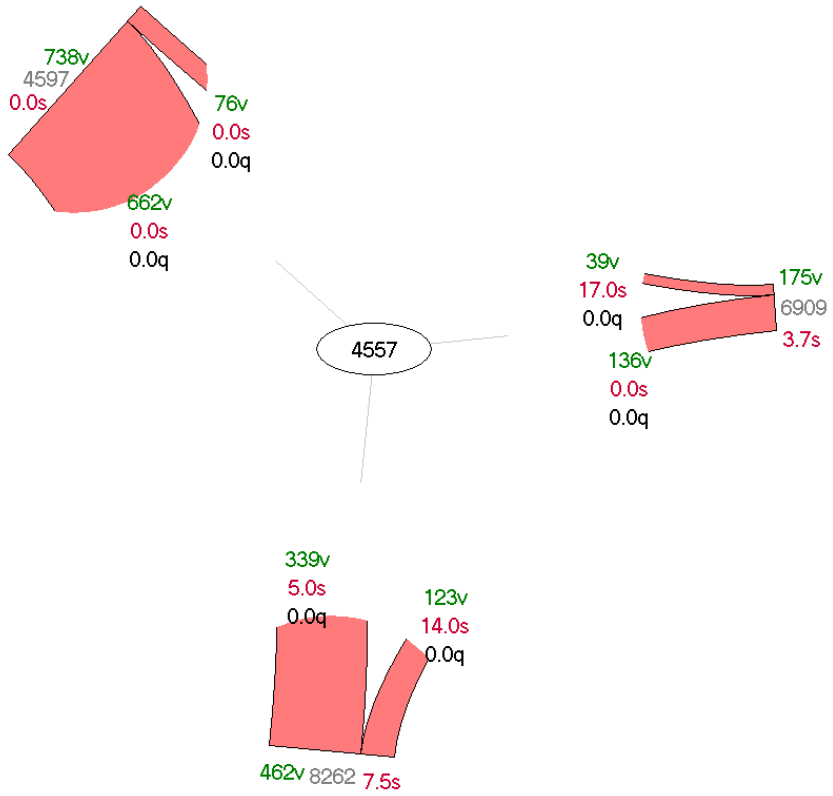
DOS is another metric to measure the performance of isolated intersections and approaches. DOS is a ratio of traffic demand to capacity. For intersections controlled by traffic signals, both queue length and delays typically increase rapidly as DOS approaches 1.0.

5.2.2 Traffic modelling assumptions

Traffic modelling was undertaken at the intersection of Wellsvale Drive / Heazlett Street for a weekday PM peak. To inform traffic volumes, the strategic TRACKS model developed by SCT Consulting in 2022 to forecast traffic network demand in 2031, at the opening of Googong Neighbourhood 1-5 was used. PM peak traffic volumes were extracted (**Figure 5-1**) and were used to model a future base case scenario in SIDRA, to determine the baseline performance of the intersection.

The 118 hourly trips as a result of the development, were inputted together with the future base case scenario volumes and distributed proportionally on each leg of the intersection.

Figure 5-1 2031 PM peak base year traffic volumes from Googong NH345 TRACKS strategic model



Source: SCT Consulting, 2023

5.2.3 Intersection performance

The modelling confirms that there is a relatively small difference between the two future year scenarios. Both scenarios remain at LOS C with an increase in delay by 8.9 seconds. The worst performing turning movement are right turning vehicles from the southern approach on Wellsvale Drive. All other approaches are operating at LOS A in both scenarios, with the second largest increase being five seconds on the northbound through movement on Wellsvale Drive. The increase in delay are considered acceptable, with DOS of 0.59 indicating that network has significant spare capacity.

Table 5-3 Comparison of intersection performance in 2031

Intersection	Weekday PM peak		
	Delay	LOS	DOS
Future year base case			
Wellsvale Drive / Heazlett Street	29.4s	C	0.47
Future year with additional 118 development vehicles			
Wellsvale Drive / Heazlett Street	38.3s	C	0.59

5.3 Walking and cycling impact

It is important to ensure a safe and well-connected, high-quality footpath and cycle path system around the site, to promote sustainable transport use, especially for short-distance trips. The proposed pedestrian paths through the car park connecting to Heazlett Street provide appropriate pedestrian access points for pedestrians and cyclists, which facilitate travelling to the surrounding destinations such as the town centre and the surrounding Googong Commons. The number of person/bicycle trips generated by the development during the peak periods could be accommodated by the planned infrastructure.

5.4 Parking impact

The proposed modifications to the car park will result in a small capacity reduction to 215 spaces (inclusive of seven accessible spots) from 222, with the additional 21 spaces to the west (**Figure 3-4**) coming to a total of 236 spaces provided. Under the QPRC *DCP*, a parking rate of 1 space per 60m^2 of GFA applies for indoor sports facilities, equating to required provision of 83 spaces. From the current parking occupancy data, a maximum of 99 vehicles was observed. This equates to a demand of 182 spaces (83 + 99 spaces) which is within the total provision of 236.

Further analysis would indicate that in a 'worst case' scenario, using the trip generation rates from **Section 5.1** that a maximum 118 vehicles could be expected to be generated during the peak hour. This would equate to a maximum occupancy of 223 spaces based on the assumed turnover rate.

This analysis demonstrates that the Googong ISAC carkpark modifications are still within the DCP required parking rates and can accommodate a potential 'worst case' scenario where peak usage for ISAC would coincide with peak usage for the greater Googong Common which is likely to occur highly infrequently.

6.0 Conclusion

PEET is seeking to construct the Googong Indoor Sports and Aquatic Centre within the Googong Common park and recreational area. In summary:

– 118 vehicle trips would be generated during hourly peak periods for the development

– The traffic modelling confirms that there is no material difference associated with the additional 118 vehicle trips. The LOS remains the same at the intersection of Wellsvale Drive / Heazlett Street and the DOS indicates additional capacity. There is therefore no need to propose any change to the infrastructure.

– 83 spaces would be required under the Googong DCP for the traffic generating aspects of the development. The additional trips generated and the current maximum parking occupancy data indicate that the proposed car park modifications will not exceed its capacity.

– The proposed pedestrian paths connecting to Heazlett Street and the entrance of the centre will provide direct and safe access to active transport users.

– Vehicle swept paths indicate that an HRV is capable of entering the car park, manoeuvring around it and exiting without impacting upon other road users or pedestrians. Given that waste collection will likely occur outside the hours of operation of the facility impacts will likely be minimal.

The Traffic and Parking Impact Study concluded that the development scale represents an acceptable increase in traffic and the impacts of the proposed development are at a level able to be accommodated by the existing and planned infrastructure.

APPENDIX A

SIDRA OUTPUTS

MOVEMENT SUMMARY

Site: 1PM [WEL_HAZ_31_PM (Site Folder: Base)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Wellsvale Drive															
2	T1	All MCs	357	10.0	357	10.0	0.445	2.5	LOS A	4.2	31.6	0.58	0.68	0.93	44.1
3	R2	All MCs	129	10.0	129	10.0	0.445	29.4	LOS C	4.2	31.6	0.58	0.68	0.93	42.9
Approach			486	10.0	486	10.0	0.445	9.7	NA	4.2	31.6	0.58	0.68	0.93	43.8
East: Heazlett Drive															
4	L2	All MCs	143	10.0	143	10.0	0.180	8.7	LOS A	0.7	5.3	0.64	0.83	0.64	43.6
6	R2	All MCs	41	10.0	41	10.0	0.083	9.7	LOS A	0.2	1.5	0.67	0.85	0.67	42.9
Approach			184	10.0	184	10.0	0.180	8.9	LOS A	0.7	5.3	0.65	0.83	0.65	43.5
North: Wellsvale Drive															
7	L2	All MCs	80	10.0	80	10.0	0.465	5.1	LOS A	0.0	0.0	0.00	0.05	0.00	48.1
8	T1	All MCs	777	10.0	777	10.0	0.465	0.2	LOS A	0.0	0.0	0.00	0.05	0.00	49.4
Approach			857	10.0	857	10.0	0.465	0.7	NA	0.0	0.0	0.00	0.05	0.00	49.3
All Vehicles			1527	10.0	1527	10.0	0.465	4.5	NA	4.2	31.6	0.26	0.34	0.38	46.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 1PM_DEV [WEL_HAZ_31_PM_DEV (Site Folder: Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Wellsvale Drive															
2	T1	All MCs	357	10.0	357	10.0	0.593	7.5	LOS A	7.7	58.4	0.72	0.87	1.58	40.3
3	R2	All MCs	172	10.0	172	10.0	0.593	38.3	LOS C	7.7	58.4	0.72	0.87	1.58	39.3
Approach			528	10.0	528	10.0	0.593	17.5	NA	7.7	58.4	0.72	0.87	1.58	40.0
East: Heazlett Drive															
4	L2	All MCs	143	10.0	143	10.0	0.180	8.7	LOS A	0.7	5.3	0.64	0.83	0.64	43.6
6	R2	All MCs	41	10.0	41	10.0	0.092	10.5	LOS A	0.2	1.6	0.70	0.87	0.70	42.5
Approach			184	10.0	184	10.0	0.180	9.1	LOS A	0.7	5.3	0.65	0.83	0.65	43.4
North: Wellsvale Drive															
7	L2	All MCs	147	10.0	147	10.0	0.504	5.2	LOS A	0.0	0.0	0.00	0.09	0.00	47.8
8	T1	All MCs	777	10.0	777	10.0	0.504	0.3	LOS A	0.0	0.0	0.00	0.09	0.00	49.2
Approach			924	10.0	924	10.0	0.504	1.1	NA	0.0	0.0	0.00	0.09	0.00	49.0
All Vehicles			1637	10.0	1637	10.0	0.593	7.3	NA	7.7	58.4	0.31	0.42	0.58	45.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

APPENDIX B

SWEPT PATHS

N

MGA 94
ZONE 55

SINGLE UNIT TRUCK/BUS (12.5m)

OVERALL LENGTH	12.5m
OVERALL WIDTH	2.5m
OVERALL BODY HEIGHT	4.3m
MIN BODY GROUND CLEARANCE	0.49m
TRACK WIDTH	2.5m
LOCK-TO-LOCK TIME	6.0s
KERB TO KERB TURNING RADIUS	12.5m
TURNING MOVEMENT SPEED	5.00km/h

NOTES:

1. INTERFACE OF ALL ROADS AT WORKS BOUNDARY ARE TO BE SURVEYED.

Rev	Amendments	Approved	Date
F	CLIENT COMMENTS ADDRESSED	BC	22/03/24
E	ISSUED FOR APPROVAL	BC	06/03/24
D	95% ISSUED TO CLIENT	C.C	23/11/23
C	75% ISSUED TO CLIENT	J.B	02/11/23
B	25% ISSUED TO CLIENT	B.C	19/09/23
A	ISSUED FOR CLIENT COMMENT	B.C	10/08/23

Scale

1:250@A1 SCALE 1:500@A3

0 2.5 5 7.5 10 12.5

System Certified

spiire
SUITE 3, LEVEL 1, 243 NORTHBOURNE AVENUE
CANBERRA ACT 2601
spiire.com.au ABN 55 050 029 635

NBRS

Designed	Checked
JB	CO
Authorised	Date
BC	06/03/2024

GOOGONG INDOOR SPORTS AND AQUATIC CENTRE

INTERSECTION TURNING MOVEMENT PLAN
SHEET 1
QPRC
DEVELOPMENT APPLICATION

Drg No: **321159-001CA320F**
Rev:

file name 321159-001CA320.dwg layout name CA320 plotted by Jordan Brereton
file location T:\321159\900 IC\Wi\ACAD plot date 22/03/2024 2:10 PM Sheet 20 of 35 Sheets

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