100 SOUTH CREEK ROAD, CROMER – WAREHOUSE 11

TRANSPORT IMPACT ASSESSMENT

PREPARED FOR PRECISION GOLF
28 SEPTEMBER 2022
300304136

Stantec

100 SOUTH CREEK ROAD, CROMER

Transport Impact Assessment

27 September 2022

Prepared for:
Precision Golf

Prepared by:
Stantec Pty Ltd

Project Number:
300304136

Revision	Date	Description	Author	Quality Check	Approver
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1 Introduction

1.1 Background

It is understood that a development application is to be lodged with Northern Beaches Council (Council) for a proposed Precision Golf indoor recreational facility within Warehouse 11 of the approved and currently-under-construction Northern Beaches Business Park at 100 South Creek Road, Cromer.

The proposal is for an indoor mini golf and driving range facility that would typically accommodate up to five staff and 35 customers/ patrons. Warehouse 11 has an area of 2,380 square metres gross floor area (GFA).

Precision Golf engaged Stantec to undertake a transport impact assessment for the proposal.

1.2 Proposal

Precision Golf proposes to operate the indoor golf and driving range facilities with the following operating characteristics:

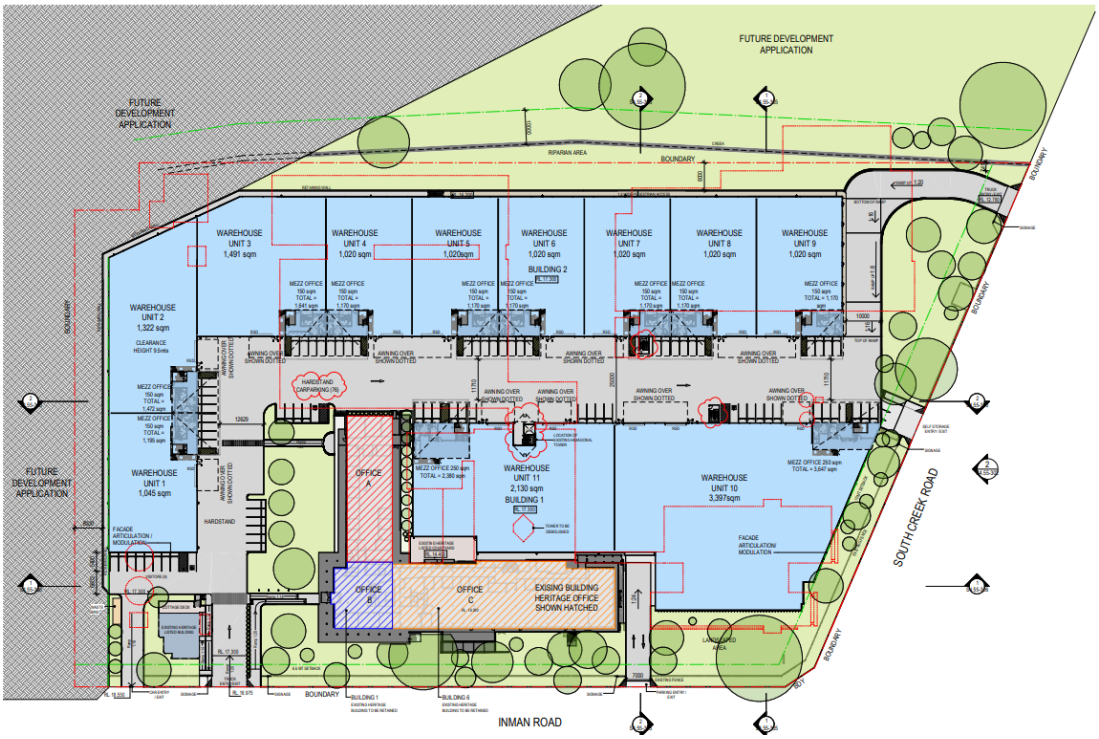
- Hours of Operation: 6:00am – 11:00pm Monday to Saturday

  6:00am – 6:00pm Sunday
- Staff: Five employees at any one time
- Person capacity: typically 40 persons (including staff)
- Parking allocation: 21 at-grade spaces with access to 10 additional spaces in the basement as overflow parking.

The indoor facility will have an 18-hole mini golf area, a 24-bay golf driving range, six simulators and a golf pitching range. It is expected that the facility would operate at 100 per cent capacity after 7:00pm, Monday to Saturday and at 70 per cent capacity on a weekend midday. During the typical weekday AM and PM road network peak periods, the facility would only operate at 45 and 60 per cent capacity, respectively.

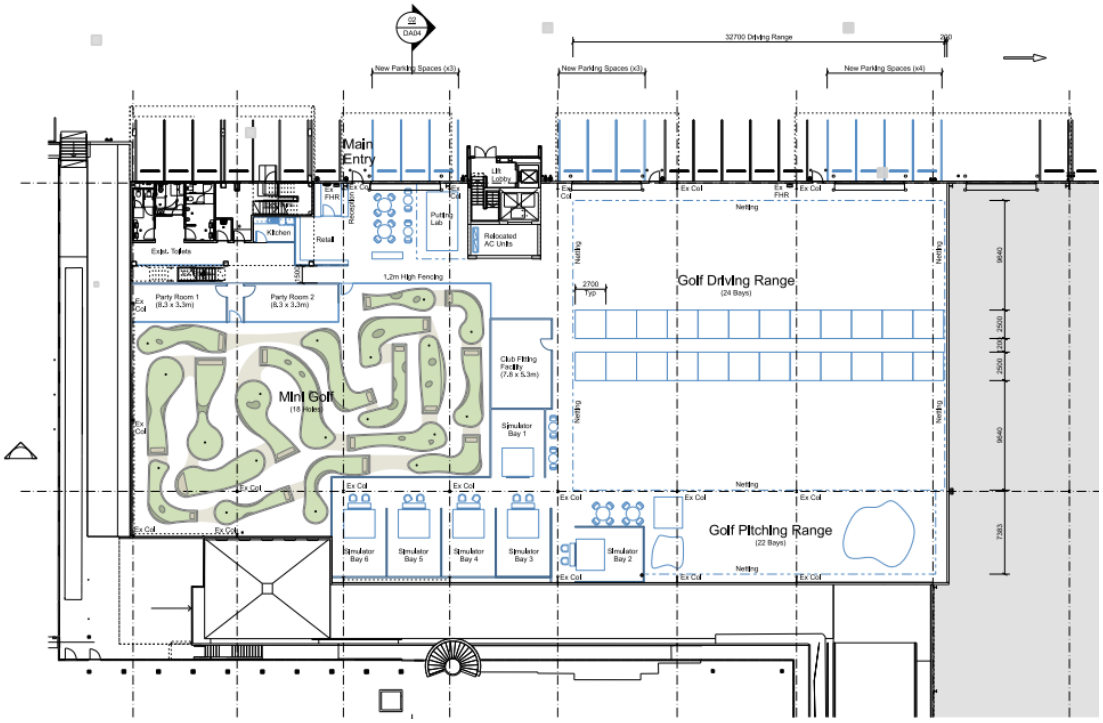
Figure 1 shows the overall approved Northern Beaches Business Park, whilst the proposed layout for Precision Golf is shown in Figure 2 and Appendix A.

Figure 1: Northern Beaches Industrial Park



Source: Drawing Number 4.55-202 Revision 1, prepared by SBA Architects, dated 12 October 2020

Figure 2: Proposed layout



Source: Drawing Number 22184 DA02 Revision A, prepared by SBA Architects, dated 10 August 2022

1.3 Purpose of this Report

This report sets out an assessment of the anticipated transport implications of the proposal, including consideration of the following:

- existing traffic and parking conditions surrounding the site
- suitability of the proposed parking in terms of supply (quantum) and layout
- pedestrian and bicycle requirements
- service vehicle requirements
- suitability of the proposed access arrangements to the site
- the traffic generating characteristics of the proposal
- the transport impact of the proposal on the surrounding road network.

1.4 References

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

- an inspection of the site and its surrounds for the approved Northern Beaches Business Park Development Application
- Warringah Development Control Plan (DCP) 2011
- Warringah Local Environmental Plan (LEP) 2011
- Australian Standard/ New Zealand Standard, Parking Facilities, Part 1: Off-Street Car Parking AS/NZS 2890.1:2004
- Australian Standard, Parking Facilities, Part 2: Off-Street Commercial Vehicle Facilities AS 2890.2:2018
- Australian Standard / New Zealand Standard, Parking Facilities, Part 6: Off-Street Parking for People with Disabilities AS/NZS 2890.6:2009
- Northern Beaches Business Park, 100 South Creek Road, Cromer, TIA, prepared by GTA Consultants, dated 27 October 2020
- plans for the proposed development prepared by SBA Architects, Drawing Set 22184
- other documents and data as referenced in this report.

2 Existing Conditions

2.1 Location

The subject site is Warehouse 11 of the approved Northern Beaches Business Park at 100 South Creek Road, Cromer. The warehouse comprises 2,380 square metres GFA. The site has a land use classification of IN1 General Industrial, with construction having commenced for the approved business park.

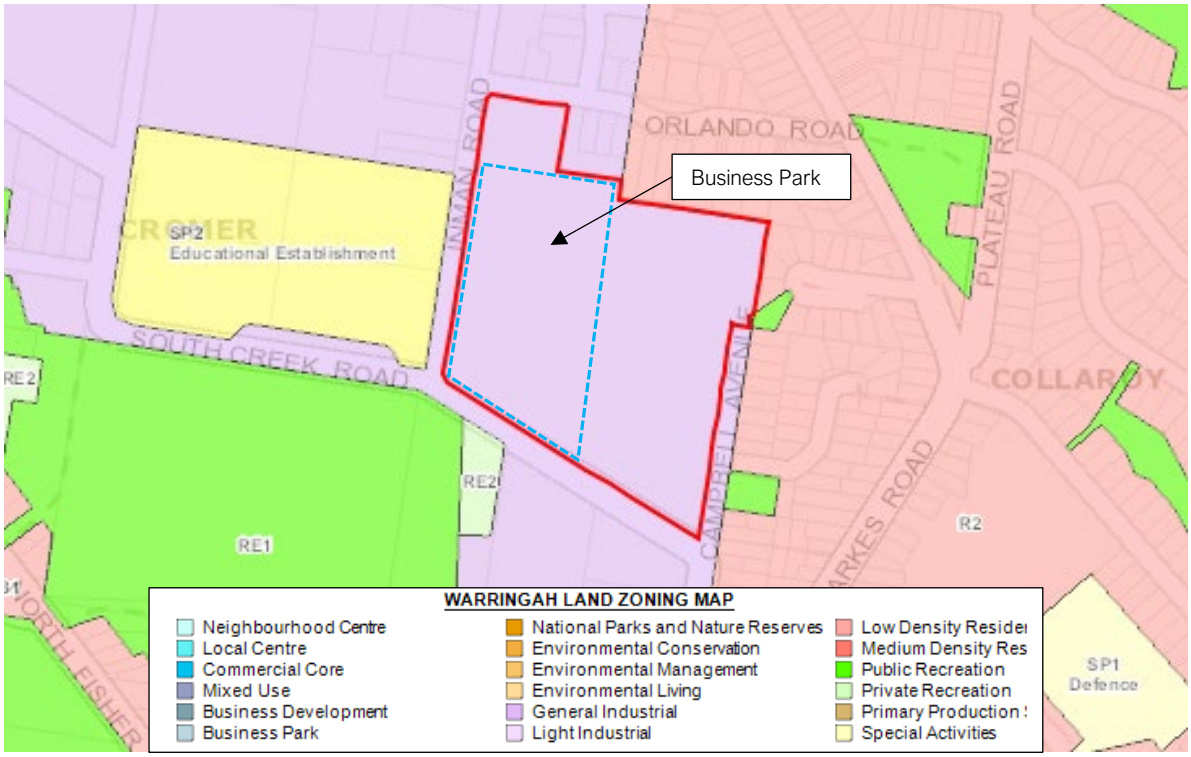
The surrounding properties predominantly include industrial developments to the north and south, Cromer Park sports fields to the southwest, Northern Beaches Secondary College (Cromer Campus) to the west and residential uses to the east of the site.

The location of the Northern Beaches Business Park and its surrounding environs is shown in Figure 3, while the Local Environmental Plan (LEP) land use map is shown in Figure 4.

Figure 3: Subject site and its environs

Base image source: Nearmap, accessed 10 September 2021

Figure 4: Land use map



Base image source: Warringah LEP 2011 (note: red outline represents the entire lot boundary)

2.2 Transport Network

2.2.1 ROAD HIERARCHY

Roads are classified according to the functions they perform. The main purpose of defining a road's functional class is to provide a basis for establishing the policies which guide the management of the road according to their intended service or qualities.

In terms of functional road classification, State roads are strategically important as they form the primary network used for the movement of people and goods between regions, and throughout the State. Transport for NSW (TfNSW) is responsible for funding, prioritising and carrying out works on State roads. State roads generally include roads classified as freeways, state highways, and main roads under the Roads Act 1993, and the regulation to manage the road system is stated in the Australian Road Rules, most recently amended on 19 March 2018.

TfNSW defines four levels in a typical functional road hierarchy, ranking from high mobility and low accessibility, to high accessibility and low mobility. These road classes are:

Arterial Roads – Controlled by TfNSW, typically no limit in flow and designed to carry vehicles long distance between regional centres.

Sub-Arterial Roads – Managed by either Council or TfNSW under a joint agreement. Typically, their operating capacity ranges between 10,000 and 20,000 vehicles per day, and their aim is to carry through traffic between specific areas in a sub region or provide connectivity from arterial road routes (regional links).

Collector Roads – Provide connectivity between local sites and the sub-arterial road network, and typically carry between 2,000 and 10,000 vehicles per day.

Local Roads – Provide direct access to properties and the collector road system and typically carry between 500 and 4,000 vehicles per day.

2.2.2 SURROUNDING ROAD NETWORK

Along the frontages of the site, South Creek Road, Inman Road, Orlando Road and Campbell Avenue function as local roads. South Creek Road and Campbell Avenue become sub-arterial roads east and south, respectively, of where they intersect.

These roads have a posted speed limit of 50 kilometres per hour, with one traffic lane and kerbside parking in each direction. There is a combination of unrestricted and eight-hour time restricted kerbside parking near the site. Inman Road and Orlando Road have dedicated on-road bicycle shoulder lanes between the kerbside parking and the traffic lanes.

Further to the south and east of the site, Pittwater Road provides the main arterial road connection for the area. Pittwater Road is a 20-kilometre arterial road that generally aligns north-south linking Mona Vale to the north with Manly to the south. It is a two-way road configured with three traffic lanes in each direction, including peak direction kerbside bus lanes (southbound in the morning peak periods and northbound in the afternoon peak periods) with kerbside parking at other times. It has a posted speed limit of 60 kilometres per hour.

The key roads are shown in Figure 5 to Figure 10, taken for approved Northern Beaches Business Park Development Application.

Figure 5: Inman Road (looking north)

Figure 6: Inman Road (looking south)

Figure 7: South Creek Road (looking east)

Figure 8: South Creek Road (looking west)

Figure 9: Pittwater Road (looking east)

Figure 10: Pittwater Road (looking west)

2.3 Car Parking

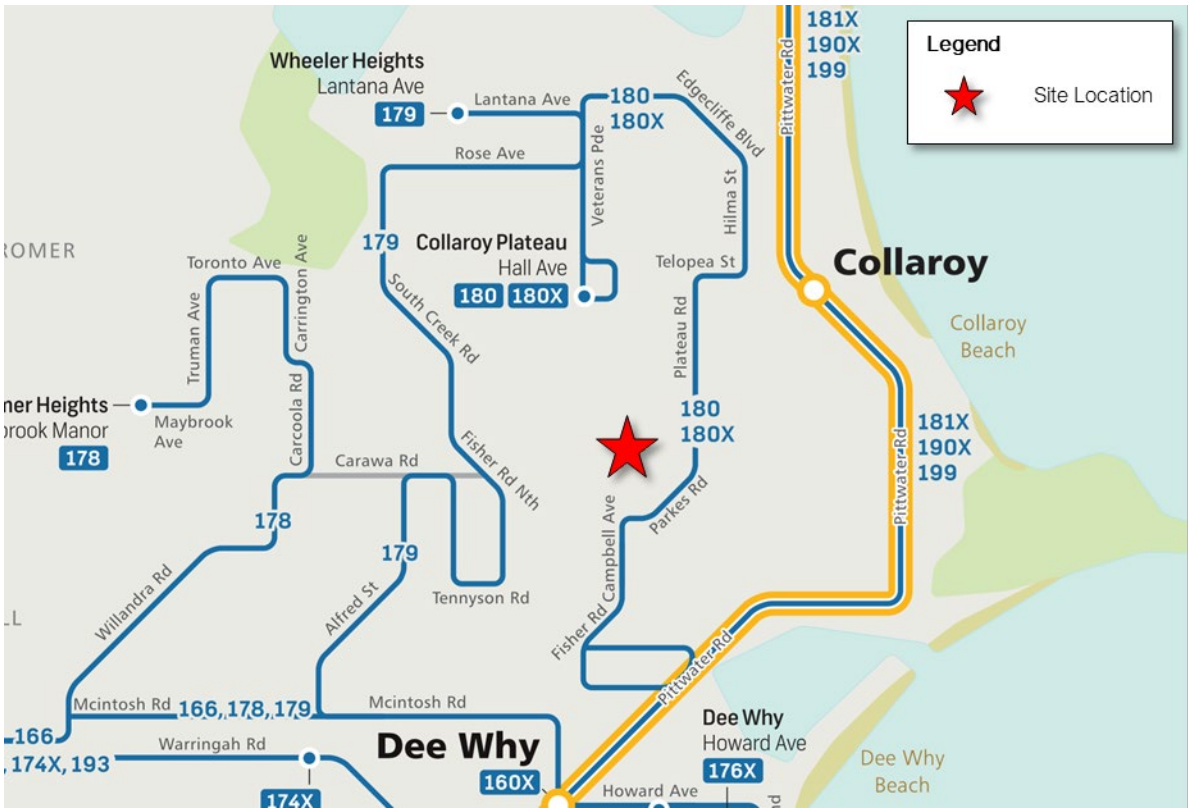
A review of publicly available car parking near the site indicates that eight-hour restricted parking is available on both sides of Inman Road and South Creek Road, with unrestricted parking on Orlando Road.

Historic observations of on-street car parking for approved Northern Beaches Business Park Development Application suggest there is low demand during the afternoon peak period. There were less than 30 vehicles parked in the afternoon along Inman Road (19 spaces both sides) and South Creek Road (nine spaces both sides), which have a kerbside supply of approximately 80 spaces and 75 spaces respectively on both sides. This suggests there are at least 125 spaces available historically. A review of more recent Nearmap aerial imagery suggests that there has been an increase in on-street demand since construction commenced for the business park therefore likely attributed to constructer worker parking activities.

2.4 Public Transport

The site is serviced by the 180 bus route, with several stops within a 400-metre radius of the site (along Parkes Road). The 180 bus route links Collaroy Plateau and Warringah Mall. It operates at 20-minute intervals in the AM peak, interpeak and the PM peak. It operates at 30-minute intervals in the evening off-peak. A review of the public transport is shown indicatively in Figure 10.

Figure 11:Surrounding public transport network



Base image source: Transport for NSW, accessed 27 September 2022

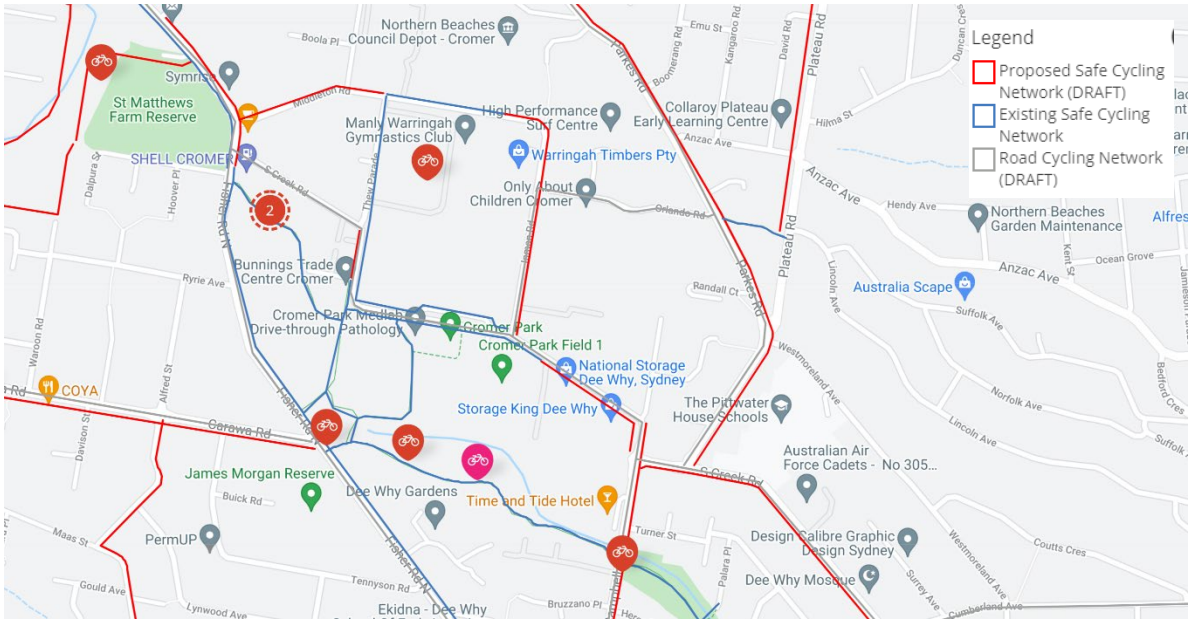
In addition, the 179 bus route operates along Fischer Road North, an approximately 12-minute walk from the site, linking Wheeler Heights and Warringah Mall.

2.5 Walking and Cycling Infrastructure

Footpaths are available on the south side of South Creek Road near the site and on the east side of Inman Road. The existing South Creek Road footpath ends at the bus stop adjacent to the site, with opportunity to extend the footpath to the South Creek Road/ Campbell Avenue roundabout.

On-road cycle shoulder lanes are located on both sides of Inman Road and Orlando Road, with off-road shared paths provided adjacent to Cromer Park and Northern Beaches Secondary College (Cromer Campus). The draft Northern Beaches Bike Plan proposes new and extended shared paths along Inman Road and South Creek Road towards Pittwater Road, illustrated in Figure 11.

Figure 12: Surrounding cycling network



Base image source: https://northernbeaches.mysocialpinpoint.com/northern-beaches-bike-plan?_ga=2.245940676.1585324789.1572220515-667743252.1572220515#/, accessed 28 September 2022

3 Parking and Loading Appraisal

3.1 Car Parking Requirements

3.1.1 INDUSTRIAL PARK PROVISIONS

The approved Northern Beaches Business Park will provide at least 279 car spaces across the estate, split between basement parking and spaces adjacent to warehouses on the ground level hardstand area.

Vehicle access to the basement car park is via Inman Road. Access to the ground level hardstand area warehouses is also via Inman Road, with an egress driveway provided on South Creek Road. Pedestrian access from the street is via Inman Road, with no changes proposed under this proposal to the arrangement approved as part of the broader business park.

Precision Golf proposes to have 21 parking spaces adjacent to Warehouse 11, with access to an additional 10 spaces in the basement for overflow demand. This parking supply is consistent with the allocation that would have been provided to the warehouse if it remained a warehouse land use.

Of the 21 spaces adjacent to Warehouse 11, 11 spaces were a part of the approved design, with the remaining 10 spaces proposed to be added as part of this DA in front of three approved roller doors that will not be used as shown in blue in Figure 2. No changes are proposed to the basement car parking layout/ arrangement as part of this DA.

In general, swept paths and design review were completed as part of the approved Northern Beaches Business Park. The additional parking adjacent to Warehouse 11 complies with Australian Standards (AS2890.1:2004).

3.1.2 EMPIRICAL ASSESSMENT OF CAR PARKING DEMAND

The car parking requirements for different development types are set out in the Warringah DCP 2011. A review of the Warringah DCP 2011 suggests there are no closely related land uses to the proposal.

As such, an empirical assessment has been completed using the following input variables provided by Precision Golf based on their other indoor mini golf/driving range facilities:

- People per vehicle: Most customers come in pairs or groups (i.e. on average 2-2.5 people per vehicle).
- Staff on duty: There will typically be five staff members on duty at any given time.
- Customers per day: The number of customers is expected to fluctuate depending on the day and time of day, with the typical maximum number of customers on site being 35 people.

The resultant anticipated demands during the surrounding road network and facility peak periods are provided in Table 1.

Table 1: Average parking demand estimate

Time	Operating Capacity	Category	Number of people	Parking Spaces
Weekday AM	45%	Staff	5	5
		Mini golf customers	-	-
		Driving range/ simulator	15	8
		Subtotal	20	13
Weekday PM	60%	Staff	5	5
		Mini golf customers	5	2
		Driving range/ simulator	15	8
		Subtotal	25	15
Weekend Midday	70%	Staff	5	5
		Mini golf customers	5	2
		Driving range/ simulator	20	10
		Subtotal	30	17
After 7:00pm Monday to Saturday	100%	Staff	5	5
		Mini golf customers	5	2
		Driving range/ simulator	30	15
		Subtotal	40	22

Table 1 suggests that the proposal could generate a demand for 13 and 15 parking spaces during the weekday AM and PM peaks, respectively, increasing to 17 spaces during the weekend midday peak and 22 spaces during the site peak that occurs after 7:00pm Monday to Saturday.

3.1.3 ADEQUACY OF CAR PARKING SUPPLY

The proposal will have a total of 21 parking spaces adjacent to the warehouse, with access to an additional 10 spaces within the basement car park for overflow demand (i.e. total of 31 spaces).

With a maximum anticipated demand of 22 parking spaces, the allocated parking is more than suitable for the proposal with parking available for any additional demand.

In the unlikely event that the site generates even more parking demand than allocated, on-street parking would be utilised to accommodate the additional demand. The site has some 400 metres of frontages along South Creek Road and Inman Road that provides kerbside parking for up to 40 vehicles directly adjacent to these site frontages. Given traditional commercial, warehouse and industrial uses expected with the business park typically generate lower demand in the proposal's weekday and weekend peaks (i.e. after 7pm Monday to Saturday and midday on weekends), there would be minimal conflicting demand for such on-street parking.

3.2 Bicycle Parking Requirements

Warringah DCP 2011 does not provide bicycle parking rates for mini golf/ driving range uses, with the nearest land use type being a recreational facility. The DCP bicycle parking requirement for a recreational facility is summarised in Table 2, which indicates 13-14 bicycle parking spaces would be required for the proposal.

Table 2: Warringah DCP 2011 bicycle parking spaces

Use	Size	AS2890.3 Class	Bicycle parking rate	Bicycle parking requirement
Recreational Facility	5 staff (at any one time)	Class 1-2	1 per 4 employees + 1 per 1,500 spectators	1-2 bicycle parking space
	2,380m^2 GFA	Class 3	1 per 200m^2 GFA + 1 per 250 spectator spaces	12 bicycle parking spaces

The business park will have some 40 on-site bicycle parking spaces that can accommodate the modest demand expected to be generated by the proposal, noting that the proposal's peak periods of demand occur outside of traditional commercial, warehouse and industrial peaks.

3.3 Loading Requirements

Warringah DCP 2011 does not provide service vehicles parking rates. It is expected that the Precision Golf facility will be serviced by vehicles up to the size of 6.4-metre-long small rigid vehicles, with less than one delivery daily.

Out of operating hours, service vehicles can utilise the angled parking provided adjacent to Warehouse 11.

On this basis, the available loading arrangement is more than suitable for the proposal, with swept path analysis and design review completed as part of the approved Northern Beaches Business Park.

4 Transport Appraisal

4.1 Traffic Generation

4.1.1 APPROVED DEVELOPMENT

The approved business park was assessed to generate 168 and 181 vehicle trips in the weekday AM and PM peak hours respectively (GTA, now Stantec, 2020). Warehouse 11 would have accounted for up to 13 of these vehicle trips in the peak hours. The proposed business park was determined to generate less traffic than the historic use on the site. Specifically, the business park was determined to generate approximately 134 vehicles less during the peak hours, or at least 40 per cent less traffic compared to the historic use.

4.1.2 WAREHOUSE 11- PRECISION GOLF

The TfNSW Guide 2002 does not provide traffic generation rates for mini golf/ driving range uses. As such, a rate of two vehicle trips per parking space occupied by visitors has been adopted, that is, it is assumed that each visitor parking space would turn over once each hour, which is considered to be conservatively on the higher end. Staff are not expected to generate vehicle trips during the peak hours based on the facility's operating hours.

Table 1 suggested that the proposal could generate a visitor demand for eight and 10 parking spaces during the weekday AM and PM peaks, respectively, increasing to 12 spaces during the weekend midday peak and 17 spaces during the site peak that occurs after 7:00pm Monday to Saturday.

On this basis, the proposal could generate 16 and 20 vehicle trips during the weekday AM and PM peaks, respectively, increasing to 24 vehicle trips during the weekend midday peak and 34 vehicle trips during the site peak that occurs after 7:00pm Monday to Saturday.

4.2 Distribution and Assignment

The directional distribution and assignment of traffic generated by the proposal will be influenced by several factors, including the:

- configuration of the arterial road network near the site
- existing operation of intersections providing access between the local and arterial road network
- likely distribution of customers in relation to the site
- configuration of access points to the site.

Unlike traditional commercial, warehouse and industrial uses that generate traffic with broader and wider origins and destinations, catchments for indoor mini golf and driving range facilities are typically more local. As a result, most of the anticipated traffic generated by the facility will not use Pittwater Road to access the site, but will instead use the local road network that provides more direct and free flowing access.

In addition, the directional split of traffic (i.e. the ratio between the inbound and outbound traffic movements) for the proposal is expected to be 50 percent entering and 50 per cent exiting during the peak periods.

4.3 Traffic Impact

4.3.1 INTERSECTION OPERATION

The transport impact assessment (GTA, 2020) that accompanied the broader Northern Beaches Business Park development application assessed the operation of the 2019 surveyed intersections using SIDRA INTERSECTION[1], a computer based modelling package which calculates intersection performance.

The commonly used measure of intersection performance, as defined by Transport for NSW, is vehicle delay. SIDRA INTERSECTION determines the average delay that vehicles encounter and provides a measure of the level of service.

Table 3 shows the criteria that SIDRA INTERSECTION adopts in assessing the level of service.

Table 3: SIDRA INTERSECTION level of service criteria

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

4.3.2 2019 CONDITIONS

Table 4 presents a summary of the 2019 operation of the intersections, extracted from the Northern Beaches Business Park transport impact assessment (GTA, 2020). Signalised intersection results are based on the overall operation, whilst unsignalised intersection results are based on the worst movement.

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

Table 4: 2019 conditions

Intersection	Peak	Leg	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Pittwater Road/ South Creek Road (traffic signals)	AM	East	0.83	13	312	A
		North	0.80	57	115	E
		West	0.53	20	138	B
		Overall	**0.83**	**21**	**312**	**B**
	PM	East	0.70	11	74	A
		North	0.60	54	75	D
		West	0.71	9	144	A
		Overall	**0.71**	**14**	**144**	**A**
South Creek Road/ Inman Road (priority control)	AM	East	0.14	6	4	A
		North	0.11	7	3	A
		West	0.11	5	0	A
	PM	East	0.17	6	5	A
		North	0.16	8	4	A
		West	0.14	6	0	A

Table 4 indicates that the study intersections historically operated satisfactorily during the peak periods. There is some queuing along Pittwater Road in the peak direction, which is expected along an arterial road. South Creek Road experiences some delays during the peak periods as the green time priority is given to Pittwater Road.

4.3.3 BASE CONDITIONS (2019 PLUS APPROVED NORTHERN BEACHES PARK)

The Northern Beaches Business Park transport impact assessment (GTA, 2020) also reassessed the study intersections to include traffic associated with the proposed business park, with the SIDRA modelling results reproduced in Table 5.

Table 5: 2019 plus approved NBBP development operating conditions

Intersection	Peak	Leg	Existing Level of Service (LOS)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Pittwater Road/ South Creek Road (traffic signals)	AM	East	A	0.85	16	343	B
		North	E	0.81	60	127	E
		West	B	0.74	19	245	B
		Overall	**B**	**0.85**	**23**	**343**	**B**
	PM	East	A	0.61	11	100	A

Intersection	Peak	Leg	Existing Level of Service (LOS)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
		North	D	0.71	52	92	D
		West	A	0.78	14	203	A
		Overall	**A**	**0.78**	**17**	**203**	**B**
South Creek Road/ Inman Road (priority control)	AM	East	A	0.23	6	9	A
		North	A	0.13	8	4	A
		West	A	0.11	5	0	A
	PM	East	A	0.18	6	5	A
		North	A	0.22	9	6	A
		West	A	0.14	6	0	A

Table 5 indicates that the Northern Beaches Business Park would not affect the existing LoS for any movement such that it drops below an acceptable LoS D (note: South Creek Road is already LoS E in the AM peak under 2019 conditions).

The 95th percentile queuing from Pittwater Road into South Creek Road in the right turn bay was expected to increase marginally from 59 to 66 metres (one vehicle) and therefore at the limit of the right turn bay and taper. It was also noted that the filtered right turn allows at least the first vehicle to store in front of the stop line during the phase. Given this is an infrequent occurrence (statistically less than twice in the PM peak hour), GTA, now Stantec did not consider that this warranted mitigation, which was accepted by relevant authorities as part of the development application approval process.

On this basis, the anticipated traffic volumes associated with the Northern Beaches Business Park were not expected to compromise the safety or function of the surrounding road network.

4.3.4 WAREHOUSE 11- PRECISION GOLF

Although the proposed indoor mini golf and driving range facility is anticipated to generate more traffic than traditional commercial, warehouse and industrial uses, most of the traffic is anticipated to be from nearby residential areas thus using the local road network to access the facility more directly.

In addition, peak activities at the facility are expected to occur after 7:00pm (Monday to Saturday) or on a weekend midday, therefore, the development traffic is unlikely to have a significant effect on the road network, as it would operate both outside the weekday peaks of the surrounding roads, and outside opening hours of traditional commercial, industrial and warehouse uses, which would be generally closed before 7:00pm and on the weekend.

The post-development traffic modelling completed for the Northern Beaches Business Park suggested that the Pittwater Road/ South Creek Road signalised intersection would operate at LoS B in the weekday peak hours. A review of nearby TfNSW permanent counter data for Pittwater Road suggests that average daily two-way traffic volumes in 2018- 2019 are around 15 per cent lower on a weekend compared to a weekday. Therefore, the intersection would operate better on a weekend,

with the additional vehicle trips generated by the proposal expected to have minor impact to its operation.

The post development traffic modelling also suggested that the South Creek Road/ Inman Road priority-controlled intersection, which will carry all the development traffic, would operate at LoS A in the weekday peak hours, with plenty of capacity to accommodate the increased demand.

Overall, the anticipated traffic volumes associated with the proposed indoor mini golf and driving range facility are not expected to compromise the safety or function of the surrounding road network during either the weekday or weekend, road network or facility peaks.

5 Conclusion

Based on the analysis and discussions presented within this report, the following conclusions are made:

- Based on a first-principles assessment, the proposed indoor mini golf and driving range facility is expected to generate an average demand for 13 and 15 car parking spaces in the weekday AM and PM peaks respectively, increasing to 17 spaces during the weekend midday peak and 22 spaces during the site peak that occurs after 7:00pm Monday to Saturday.
- The proposed allocation of 21 parking spaces adjacent to the warehouse and an additional 10 spaces within the basement car park (i.e. total 31 spaces) will accommodate the anticipated demand, with capacity available for any additional demand above the estimates.
- The proposal requires 13-14 bicycle parking spaces. There are 40 bicycle spaces provided across the business park to accommodate the demand associated with the proposal, noting the different peaks for the various uses within the business park.
- The proposal will have low demand for deliveries and waste collection, therefore the available provision would be suitable for the proposal.
- Based on a first-principles assessment, the proposal could generate 16 and 20 vehicle trips during the weekday AM and PM peaks, respectively, increasing to 24 vehicle trips during the weekend midday peak and 34 vehicle trips during the site peak that occurs after 7:00pm Monday to Saturday.
- It is anticipated that traffic generated by the facility will primarily use the local road network, which provides more direct and free flowing access, rather than Pittwater Road.
- There is adequate capacity in the surrounding road network to cater for the traffic generated by the proposal.

On this basis, the proposed indoor mini golf and driving range facility can be supported from a traffic and transport perspective.

Appendix A Architectural Plans