Raffertys Cams Wharf
Concept Assessment

Iris Capital

Traffic Assessment

June 2022

SECA solution

Raffertys Cams Wharf
Concept Masterplan Assessment

Traffic Impact Assessment

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1 Executive Summary

Raffertys Resort has been recently purchased by Iris Capital, with a view to redeveloping and reinvigorate the site to provide a distinctive village centre to be enjoyed by visitors and residents alike, and a landmark tourist facility for Lake Macquarie.

To drive and shape this vision a Concept Master Plan (the Concept) has been prepared to articulate the anticipated land uses and built form envisaged on the site. **The Concept Master Plan has been prepared for information only*, and is not for approval.***

At the heart of the village new Tavern (pub) and Function Centre incorporating a new pool resort facilities overlooking the lake, complimented by a new Hotel. Additional residential accommodation is proposed in the form of both residential apartments and multi dwelling housing to create a diversity of accommodation, providing alternative options to the current villas on the site.

Access to the site is via the Pacific Highway to Cams Wharf Road then Raffertys Road into the resort. Outbound traffic is directed at the intersections of Raffertys Road and Cams Wharf Road to turn left if heading north (Swansea/Newcastle) to connect with the arterial road network via Cams Wharf Road and the Pacific Highway at Catherine Hill Bay. Motorists with a destination to the south are directed by signage to turn right and travel via Nords Wharf to connect with the Pacific Highway at the intersection of Nords Wharf Road.

As part of the project, Seca Solution has collected traffic data at the key locations and have observed the traffic operations in the locality of the site during peak periods. Being primarily a tourist facility, surveys were undertaken on a Friday in the PM per the RTA Guide to Traffic Generating Developments.

Sidra intersection modelling of the intersection of the Pacific Highway and Cams Wharf Road/Flowers Drive demonstrates that the right turns out of the side roads, at this intersection suffer from delays, particularly Flowers Drive. The observations on site indicate that the delays / queues see drivers take smaller gaps which in turn however can impact on road safety, as per the history of accidents at this location.

The intersection of Cams Wharf Road/Flowers Drive/Pacific Highway has been identified by the road authorities for upgrade, to improve road safety due to on-going commuter feedback and a number of recorded accidents at this location. In the interim, motorists exiting Raffertys Road with a destination south towards Sydney are directed to travel via Nords Wharf to connect with the highway at alternate intersections. Advice from Transport for NSW indicates no design solution has been determined for this upgrade following community consultation.

Parking is provided throughout the site in a mix of private/garage parking, visitor parking bays and at grade parking for guests to the various tourist facilities. Parking associated with the approved masterplan has not been completed to with at least 14 parking spaces approved but not built on Lorikeet Loop and 31 parking spaces approved originally however removed in conjunction with a variation to the masterplan.

Observations on a busy Saturday in February showed that whilst not all spaces within the 38 space at-grade carpark were occupied, there were vehicles and trailers (boat and box) parked informally throughout the site on various verges and grassed areas.

The future development concept indicates the following:

Proposed Development	Proposed Parking Supply
Site A – New Residential 25 apartments (15x3 bedroom and 10 x 2 bedroom) with basement carpark	47 new spaces
Site B - Alterations to the existing function centre/restaurant (Ground floor tavern and 1st floor function centre), terraced outdoor area.	Use of 38 existing parking spaces per Site F
Site C - A 141 room hotel with basement parking	118 new parking spaces
Site D – new residential accommodation 21 Apartments (6x3 bedroom, 14x2 bedroom and 1x1 bedroom) with basement parking	36 new spaces
Site E – new residential accommodation to replace existing café and conference facility – 8 x 3 bedroom+study dwellings with garages and additional parking spaces	8 single garages and stacked parking spaces on driveways of units 2-7 2 spaces of the 24 previously approved (DA87/387) parking spaces never built.
Site F –38 public car parking spaces	38 existing parking spaces Additional spaces in a manner similar to previously approved if required
Site G – temporary site for marquee during construction of new function centre	Shall utilise 38 existing spaces in Site F

Taking into consideration the construction and formalisation of previous approvals for parking which have never been built it is considered that all future parking for the development can be contained within the subject site.

Consideration will be required however for the high number of trailers currently parked throughout the site, in particular in the vicinity of the boat ramp and hire shop. These are understood to be largely owned by existing Raffertys owners.

Traffic for the project has been assessed applying standard rates from the RTA Guide to Traffic Generating Developments. Consideration has been given to trip containment associated with the whole of concept development.

The intersection of Pacific Highway and Cams Wharf Road has been assessed using Sidra modelling to determine the impacts of the additional traffic. The overall conclusion is that the results demonstrate that the additional traffic shall have a minor impact upon the operation of this intersection, although the right turns out of the side roads will experience increased delays with more vehicles potentially taking smaller gaps in traffic to undertake these turns. It is noted that the proposed development doesn't increase the demand for right turns out of Cams Wharf Road as these movements are assumed to use the signposted route via Nords Wharf to join the highway at Nords Wharf Road or otherwise at Awabakal Drive which is currently being signalised. From the assessment of both the Proposed Concept and the development available under the existing LEP it can be seen there is no significant difference between the two scenarios for the critical right turn into Cams Wharf Road and left turn out.

The intersection of Cams Wharf Road and Raffertys Road can accommodate the additional traffic demands as can the local roads which shall continue to operate with a Level of Service A.

It is noted that the development proposed by Iris Capital is entirely consistent with the Section 7.14 of the LEP

7.14 Development on certain land near Rafferty's Road, Cams Wharf

(1) This clause applies to land identified as "Cams Wharf Area 1" on the Additional Permitted Uses Map.

(2) Development consent may be granted to development for the purpose of an integrated tourist facility that may contain a range of accommodation types (including dwellings) and a combination of land uses including retailing, recreational and community activities appropriate to the community's needs on land to which this clause applies.

*(3) In this clause, **an integrated tourist facility** means a facility that contains the following—*

(a) tourist facilities, including a range of accommodation types and dwellings, and

(b) a combination of land uses including community facilities, recreation areas, recreation facilities and retail premises, appropriate to the needs of the community.

In conclusion the additional traffic associated with the concept as proposed is consistent with the land uses contemplated in the LEP and can be accommodated within the local road network allowing for the current traffic management measures.

2 Introduction

2.1 Background

Raffertys Resort has been recently purchased by Iris Capital, with a view to redeveloping and reinvigorate the site to provide a distinctive village centre to be enjoyed by visitors and residents alike, and a landmark tourist facility for Lake Macquarie.

To drive and shape this vision a Concept Master Plan (the Concept) has been prepared to articulate the anticipated land uses and built form envisaged on the site. **The Concept Master Plan has been prepared for information only*, and is not for approval.***

At the heart of the village new Tavern (pub) and Function Centre incorporating a new pool resort facilities overlooking the lake, complimented by a new Hotel. Additional residential accommodation is proposed in the form of both residential apartments and multi dwelling housing to create a diversity of accommodation, providing alternative options to the current villas on the site consistent with the Section 7.14 of the LEP

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(a) tourist facilities, including a range of accommodation types and dwellings, and

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The proposed Concept Master Plan is intended to be delivered through a number of individual Development Applications. A Planning Proposal to amend the Lake Macquarie Local Environmental Plan 2014, is also required.

Seca Solution has been engaged to undertake a traffic, parking and access assessment for the proposed redevelopment of the resort that can support the Planning Proposal and the subsequent Development Applications.

The concept for the redevelopment allows for a staged development incorporating a mixture of tourist facilities and accommodation including an upgrade of restaurant and conference facilities.

Parking is to be provided on the site allowing for the shared use of the facilities by guests and residents within the resort.

Consideration is also given to the prior approval and masterplan for the site, some elements of which are yet to be built (on third party land) and some are to be incorporated into this concept.

All vehicle access will be as per the existing situation off Raffertys Road and the internal roads within the site.

As part of the project, Seca Solution has collected traffic data at the key locations and have observed the traffic operations in the locality of the site during peak periods.

2.2 Scope of Report

The scope of this report is to review the parking requirements for the whole of site and assess the impacts of traffic on both internal and external road networks.

2.3 Issues and Objectives of the study

The issues as they relate to the proposal are to:

- Assess impact on the local road network due to the additional traffic flows;
- Assess the impact of the additional parking generated by the proposed development;
- Review the access arrangements for the development;
- Review the service arrangement for the development; and
- Assess any other transport impacts associated with the development.

The objective of the report is to document the additional impacts of the proposed development over that previously assessed and approved and provide advice on any mitigation required to support the development.

2.4 Planning Context

In preparing this document, the following guides and publications were used:

- RTA Guide to Traffic Generating Developments, Version 2.2 Dated October 2002;
- RMS TDT 2013/04 “Update Traffic surveys August 2013”.
- SEPP Infrastructure
- Lake Macquarie City Council LEP and Development Control Plan
- Australian / New Zealand Standard – Parking Facilities (AS2890 2004);

3 Existing Situation

3.1 Site Description and Proposed Activity

The subject site is located on the eastern side of Lake Macquarie within the City of Lake Macquarie LGA.

The subject site forms part of the existing Raffertys Resort and includes:

- Existing pool facility (Site A)
- An existing reception and restaurant (Site B)
- Previously Approved DA 924-2009 Building C not built (Site C)
- Undeveloped (Site D)
- An existing café and conference facility (Site E).
- 90 degree informal parking allowing in the order of 10 on street parking spaces opposite Site E. There is an approval (DA87/387) for 24 parking spaces in this location which have not been constructed and formalised.
- An at grade carpark to the front of reception with 38 parking spaces (2 accessible) (Site F)

There is existing approval (approved development DA/924/2009) for the construction of 18 "units" capable of housing 50 bedrooms across 3 buildings. Of these, what were termed buildings A and B (10 units/28 bedrooms) are yet to be built on land owned by others and not forming part of this development site.

Building C of the approved development (DA/924/2009) (Site C) will not be constructed but rather incorporated into the Concept as part of the redevelopment of Site E.

The approved development also allowed for 48 parking spaces (30 at grade, 18 garages) including parking within the roundabout on Lorikeet Loop. This was subsequently modified to remove 31 of the approved parking spaces within the roundabout with 14 parking spaces instead to be built on the southern side of Lorikeet Loop. Only the parking associated with Buildings A and B (18 at grade and 10 secure single garages) are expected to be built.

The 14 spaces on Lorikeet Loop shown below have not been built.

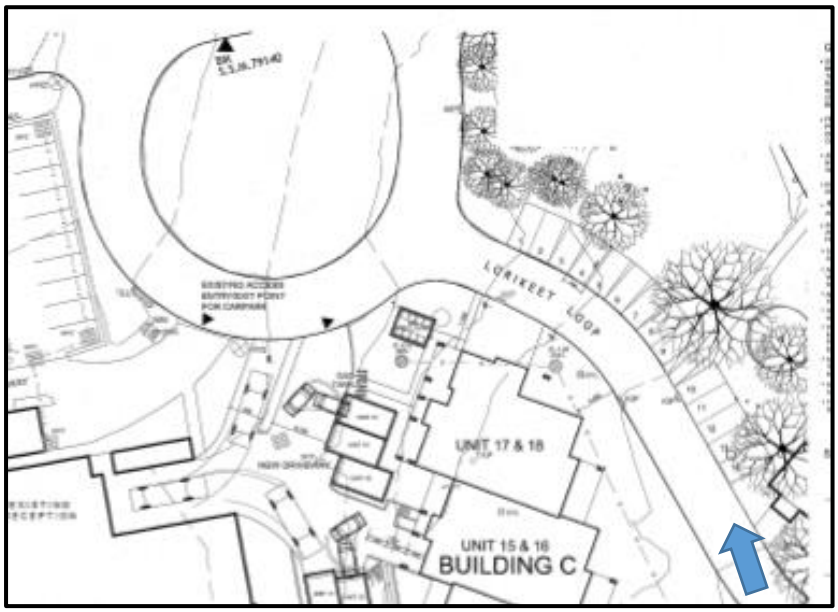

Figure 3-1 DA/924/2009B showing parking removed from central roundabout and 14 spaces approved on Lorikeet Loop

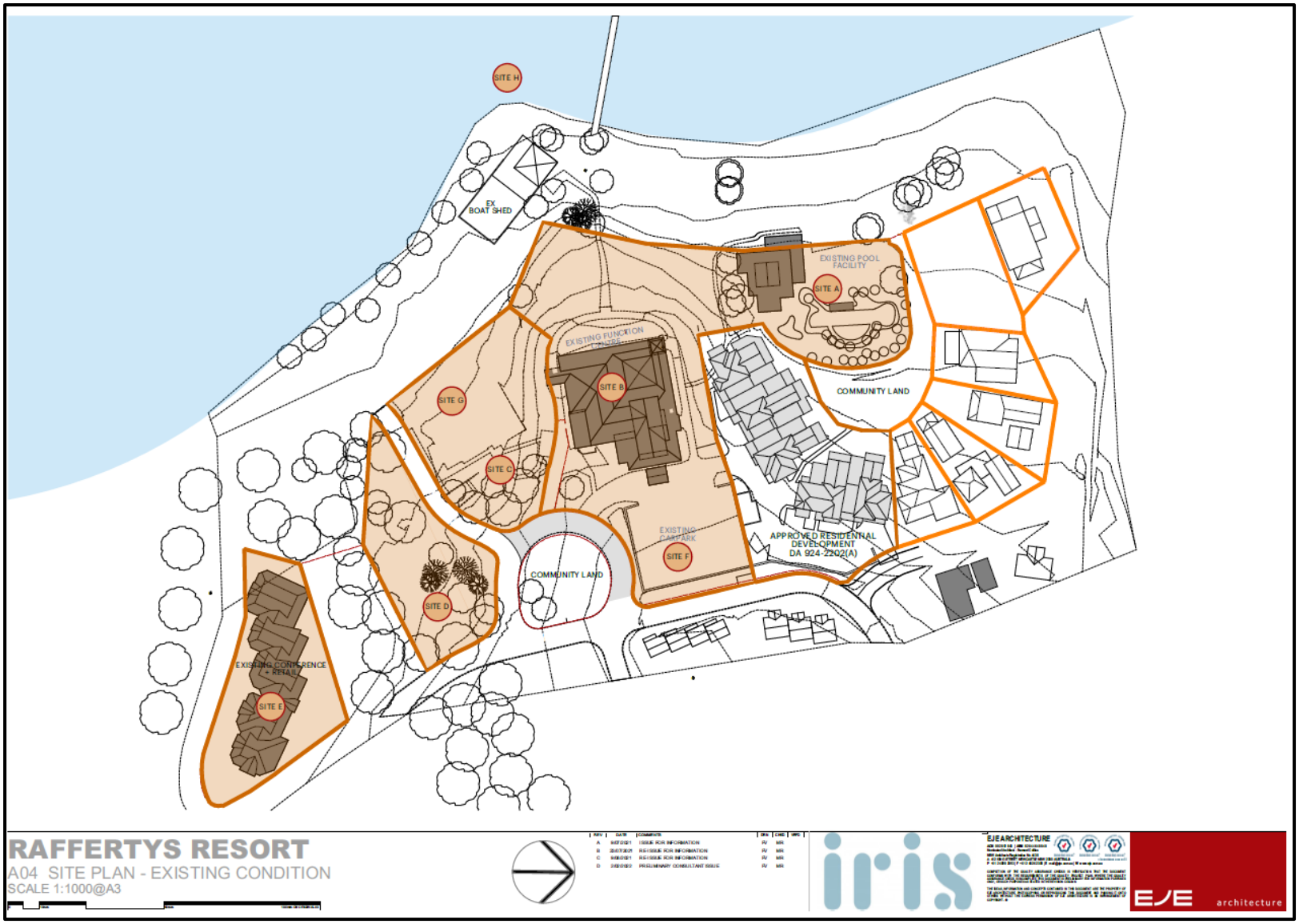

Figure 3-2 Site Plan for Raffertys Resort

Photo 1 Lorikeet Loop showing cross section and approved parking area along right hand side of road

3.2 Site Location

The site is located at Wild Duck Drive, Cams Wharf and sits within the Rafferty's Resort development, in the Lake Macquarie City Council (LMCC) local government area. It is situated on the eastern side of Lake Macquarie between the suburbs of Nord's Wharf and Murrays Beach.

The location of the site is shown below in Figure 3-3.

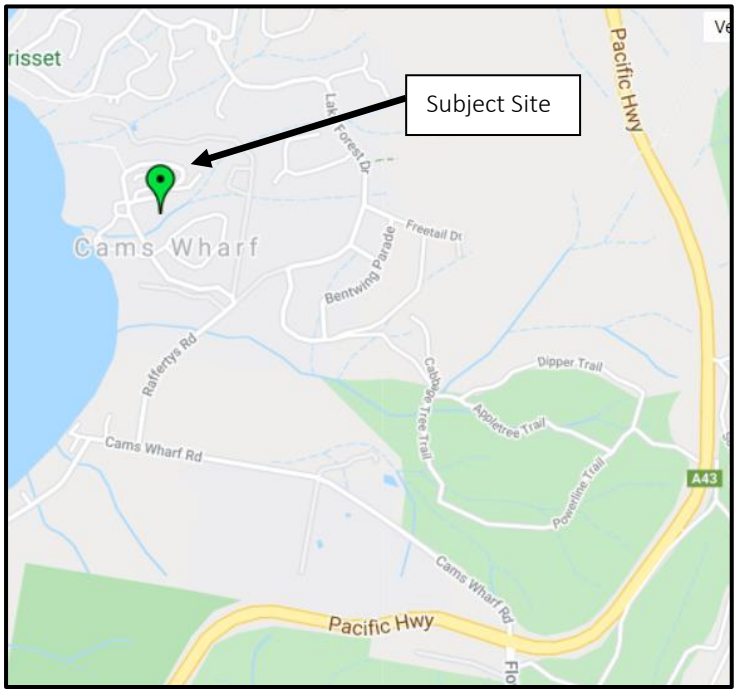

Figure 3-3 - Site Location (Source Nearmap)

3.2.1 Zoning and Adjacent Land Use

The current zoning, being SP3 Tourist, together with Clause 7.14 -Development on certain land near Rafferty's Road, Cams Wharf, in the Lake Macquarie LEP 2014.

7.14 Development on certain land near Rafferty's Road, Cams Wharf
(1) This clause applies to land identified as "Cams Wharf Area 1" on the Additional Permitted Uses Map.
(2) Development consent may be granted to development for the purpose of an integrated tourist facility that may contain a range of accommodation types (including dwellings) and a combination of land uses including retailing, recreational and community activities appropriate to the community's needs on land to which this clause applies.
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(a) tourist facilities, including a range of accommodation types and dwellings, and
(b) a combination of land uses including community facilities, recreation areas, recreation facilities and retail premises, appropriate to the needs of the community.

3.3 Site Access

Access to the site is via the Pacific Highway to Cams Wharf Road then Raffertys Road into the resort. Outbound traffic is directed at the intersections of Raffertys Road and Cams Wharf Road to turn left if heading north (Swansea/Newcastle) to connect with the arterial road network via Cams Wharf Road and the Pacific Highway at Catherine Hill Bay. Motorists with a destination to the south are directed to turn right and travel via Nords Wharf to connect with the Pacific Highway at the intersection of Nords Wharf Road.

3.4 Existing Traffic Conditions

3.4.1 Road Hierarchy

Pacific Highway

The main road through the locality is the **Pacific Highway** that runs to the east of Cams Wharf with a north south orientation connecting the M1 Pacific Motorway at Doyalson north through Swansea, Newcastle and beyond to Hexham. In the general vicinity of the site it provides two lanes of travel in each direction with a central median and in places a wire barrier. There are sealed verges but no pedestrian facilities. The posted speed limit varies but in the general locality is 90 km/hr, 80 km/hr further south. It has road widening and turn treatments at the various intersections to maintain capacity and safety with some intersections signalised. At the intersection of Cams Wharf Road is provides channelised right turn lanes for traffic entering both Cams Wharf Road and Flowers Drive opposite. There is also a left turn lane for northbound traffic approaching Cams Wharf Drive.

To the south, at the T-intersection of the Pacific Highway and Nords Wharf Road there is a seagull treatment to allow for right turns into Nords Wharf Road as well as a staged movement for southbound vehicles turning right. Further south the intersection of the Pacific Highway and Awabakal Drive is currently a simple T-intersection. However is shortly to be upgraded to signals to control turn movements and maintain road safety.

There is minimal demand for parking along this length of road with vehicles able to pull off onto the verge if necessary e.g. breakdown.

Cams Wharf Road

Cams Wharf Road provides a single lane in each direction with a minimal sealed verge becoming grass to each side. There are no pedestrian facilities or streetlights, reflecting what has been in the past access

to a pocket of lakeside dwellings. A bus route runs along Cams Wharf Road in each direction and has a posted speed limit of 60km/hr.

Raffertys Road

Raffertys Road connects with Cams Wharf Road at a simple T-intersection with Cams Wharf Road having priority. It allows for two-way movements with grass verges along each side. There are no pedestrian facilities however there are streets lights and a posted speed limit of 50km/hr.

Parking demands along both of these roads is minimal however during site work the use of the surrounding area for an adventure event showed that the grass verges do provide suitable width to allow for parking if required

Wild Duck Road and various Internal Roads

Within the Raffertys Resort there is a network of internal roads with the layout allowing for the safe movement of vehicles.

These roads operate as shared ways allowing for a mix of road users and are signposted 15km/hr which is reinforced with speed bumps. Wild Duck Drive has a width of 6.8 metres, allowing for two way movements. Lorikeet Loop is narrower (5.7m) but still provides for two vehicles to pass.

Wild Duck Drive connects with Raffertys Drive at a simple T-intersection with give way signage on Wild Duck Drive. There is road widening on the through road (AUR) that allows for a vehicle to pass a turning vehicle if required.

Photo 2 Wild Duck Drive showing typical cross section entering the site from Raffertys Road

3.4.2 Roadworks

The intersection of Cams Wharf Road/Flowers Drive/Pacific Highway has been identified by the road authorities for an upgrade, to improve road safety due to on-going commuter feedback and a number of

recorded accidents at this location. The proposed road safety improvements at this intersection was proposed to "involve extending the median wire rope barrier on the highway to ban right turns into Flowers Drive, and from Flowers Drive and Cams Wharf Road onto the highway. Motorists entering and exiting the highway would be redirected to safer merging lanes at Nords Wharf Road, significantly reducing the risk of crashes". Motorists will still be permitted to turn right into Cams Wharf Road from the Pacific Highway. The final design for this however is still subject to consultation and review with updated advice in February 2022 indicating that "other possible solutions to improve safety while minimising restrictions to turning movements at the intersection" are being investigated with the "hope to have an update on the next steps in coming months".

If implemented as initially outlined, these changes would formalise what is already in affect through the signage directing motorists heading south from Raffertys Resort to travel via Nords Wharf and so would see minimal changes over the existing situation for traffic turning out of Cams Wharf Road.

An upgrade to the intersection of the Pacific Highway and Awabakal Drive, Nords Wharf is also proposed to support development at the southern end of Nords Wharf. This would see the signalisation of this intersection to allow for all turn movements into and out of Awabakal Drive. Signage in this location indicates that this work may commence on the 14th February 2022 with work being undertaken until mid April 2022.

3.4.3 Traffic Management Works

The internal roads within the resort provide a shared zone with Local Area Traffic Management Plan (LATM) and a 15km/hr posted speed.

Awabakal Drive was to be closed between mid-February and mid-April 2022 due to the construction of the signal control on the highway with all vehicles directed to instead use Nords Wharf Road. This intersection re-opened in Jine 2022.

3.4.4 Pedestrian and Cycling Facilities

There are no pedestrian or cycling facilities provided along the majority of the length of the Pacific Highway with cyclists needing to ride on the sealed shoulder. Similarly, there are no paths on either Raffertys Road or Cams Wharf Road. Within the resort the roads operate as shared zones with pedestrians and cyclists able to walk and ride on the roads as required. There are also paths between the various villas within the site.

North of Wild Duck Road, there is a shared pathway along the western side of Lake Forest Drive towards Murrays Beach.

3.5 Traffic Flows

3.5.1 Peak Hour Flows

Traffic surveys were undertaken at the intersection of the Pacific Highway and Cams Wharf Road on Friday 7th May 2021. These were undertaken in the afternoon to reflect typical demands for a tourist-based facility per RMS Guide to Traffic Generating Developments and the peak hour was determined as being 4.15-5.15pm (Figure 3-4).

Surveys were also undertaken at the intersection of Cams Wharf Road and Raffertys Road to confirm demands and traffic distribution at this intersection. (Figure 3-5).

Afternoon peak flows at the intersection of Cams Wharf Road and Raffertys Road are low being 88 vehicles northbound and 36 vehicles southbound (124 vehicles per hour two way). Existing site flows would be less than this.

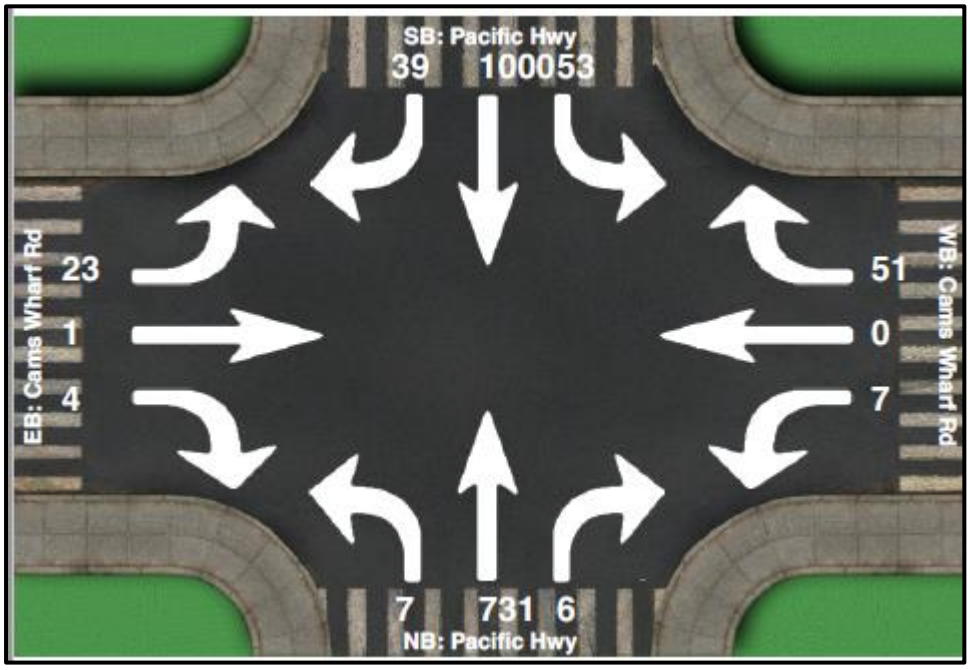

Figure 3-4 PM peak flows Pacific Highway and Cams Wharf Road/Flowers Drive (4.15-5.15pm)

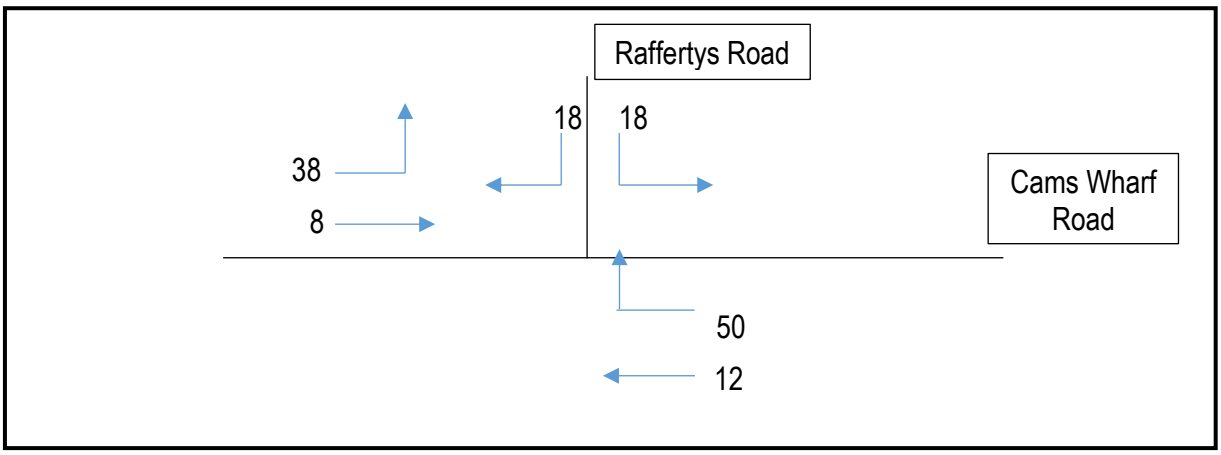

Figure 3-5 PM Counts at Raffertys Road and Cams Wharf Road

3.5.2 Daily Traffic Flows

The Transport for NSW Traffic Volume Viewer provides traffic data for AADT on the Pacific Highway north of Cams Wharf, 260m South of Nioka Place, Pinny Beach (ID 05002).

Data from 2018 shows average daily flows northbound of 9,846 vehicles per day (vpd) and southbound, 9,944 vpd giving 19,790 2-way per day which was consistent with 2017 data. The data also confirms that historically Fridays have been the busiest day of the week in this location with daily flows in the order of 22,500 two way.

Peak hour flows typically represent between 8-12% of the daily traffic flows. This would indicate daily traffic flows in the locality in the order of:

- 23,750 vehicles per day (vpd) on Pacific Highway north of Cams Wharf Road (peak being 8% of flows)
- 1,000 vpd along Cams Wharf Road (east of Raffertys Road).
- 1,300 vpd along Raffertys Road (north of Cams Wharf Road)

3.5.3 Daily Traffic Flow Distribution

A review of the daily traffic volumes on the Pacific Highway shows they are reasonably balanced in both directions, with a slight bias in movements northbound in the morning and southbound in the afternoon (Figure 3-6).

The traffic flows at Cams Wharf Road and the Pacific Highway shows a bias to the north with 83% of traffic travelling north.

Traffic surveys at the intersection of Raffertys Road and Cams Wharf Road confirm that outbound trips are evenly split to the east and west on Cams Wharf Road whilst inbound traffic is slightly bias from the east (57%) with the balance (43% from the west).

Figure 3-6 Distribution of daily flows on the Pacific Highway (Source: TfNSW Count station 05002)

3.5.4 Vehicle Speeds

No speed surveys were completed as part of the study work. It is considered however that traffic on the Pacific Highway tends to travel at or above the posted speed limit. It is noted that there is a speed camera located adjacent to the intersection of the Pacific Highway and Nords Wharf Road.

Within the site vehicles appear to travel at the posted speed limit due to the interaction with driveways, the layout of these roads and the LATM measures.

3.5.5 Existing Site Flows

The subject site forms part of the existing Raffertys Resort with traffic flows generated by the existing accommodation and tourist uses. A review of aerial imagery indicates in the order of 200 dwellings within the resort plus the existing conference centre and restaurant/function centre. As the cottages and terraces are primarily short stay accommodation, the traffic rates for 2 bedroom medium density dwellings has been applied.

Applying standard RMS rates the site could generate in the order of:

Table 3-1 Existing peak hour site flows

	Area	Trip Rate	Peak Trips in PM Peak
Dwellings	<200	0.5	100
Restaurant/Function	460m^2	5/100m^2	23
Office	4 staff		4
Conference	490m^2	5/100m^2	25
Café/retail	225m^2	5/100m^2	11

Applying this to the PM peak is likely to see the dwellings, restaurant and office demands being the primary generator inbound whilst conference demands are anticipated to be outbound in the PM peak. The café is most likely to be closed by the end of the day and so would not generate demands at this time. The site is therefore likely to generate in the order of 127 trips two way in the PM peak however there is a degree of trip containment likely to be associated with the restaurant with guests already on site dining.

3.5.6 Heavy Vehicle Flows

Heavy vehicle demands on the Pacific Highway are in the order of 1.5% of traffic flows in the afternoon, reflecting the role of this road to provide for a minor regional road between north Central Coast and Newcastle, east of Lake Macquarie.

Heavy vehicle flows on Raffertys Road and Cams Wharf Road are minimal (2 vehicles in the afternoon peak).

3.5.7 Current Road Network Operation

3.5.7.1 Cams Wharf Road and Pacific Highway - Sidra intersection analysis

The operation of the intersection of the Pacific Highway and Cams Wharf Road / Flowers Drive has been assessed with Sidra modelling, based on the existing PM traffic volumes surveyed at this intersection. The Sidra modelling was calibrated to take into account comments by Transport for NSW with the gap acceptance reduced for the right turn out from Flowers Drive and Cams Wharf Road.

The results of the Sidra modelling for the existing situation are provided below.

Table 3-2 – Sidra modelling, existing situation

Approach	LoS	Delay (seconds)	Queue (m)	Degree of Saturation
Flowers Drive	Left – A Through - E Right – E	9.5 57.9 58.3	0.1 12.1 12.1	0.009 0.619 0.619
Pacific Hwy (Swansea)	Left – A Through – A Right turn – A	7.4 0.0 12.0	0.0 0.0 1.8	0.030 0.276 0.096
Cams Wharf Road	Left turn – A Through – C Right - C	9.0 41.1 37.8	0.4 0.9 0.9	0.028 0.057 0.057
Pacific Hwy (Lake Munmorah)	Left turn – A Through – A Right - B	7.4 0.0 15.5	0.0 0.0 0.4	0.006 0.200 0.020

The results above demonstrate that the right turns out of the side roads, at this intersection suffer from delays, particularly Flowers Drive. The observations on site indicate that the delays / queues reflect drivers taking smaller gaps which in turn however can impact on road safety, as per the history of accidents at this location.

3.5.7.2 Cams Wharf Road and Raffertys Road

Observations on site during the peak period shows that traffic movements along Cams Wharf Road and Raffertys Road are low with minimal delays.

Table 4.1 from Austroads Part 5 Intersections at Grade provides advice on intersection operation (reproduced below). Where these limits are not met, traffic effectively experiences minor delays only.

Major Road Type[1]	Major Road Flow (vph)[2]	Minor Road Flow (vph)[3]
Two-lane	400	250
	500	200
	650	100
Four-lane	1000	100
	1500	50
	2000	25

Source: Table 4.1 Austroads Part 5 Intersection at Grade

It can be seen that for the current traffic flows, the limits above are not met therefore intersection modelling with Sidra is not required at this intersection.

Traffic flows on both of these roads are within their mid-block capacity and operate at Level of Service A (200 vehicles per direction per hour).

3.6 Traffic Safety and Accident History

Accident data from the Interactive Crash Data web site shown below confirms the history of crashes that have motivated safety upgrades at the intersection of the Pacific Highway and Cams Wharf Road/Flowers Drive.

Repo..	Crash ID	Degree of crash	RUM - code	RUM - description	Type of location	Natural lighting
2015	1080652	Non-casualty (t..	21	Right through	X-intersection	Daylight
2016	1097704	Serious Injury	81	Off left/rt bnd=>obj	X-intersection	Daylight
2018	1180061	Serious Injury	13	Right near	X-intersection	Daylight
2019	1209029	Fatal	13	Right near	X-intersection	Daylight
	1226739	Non-casualty (t..	20	Head on	X-intersection	Daylight

Observations on site confirm that the right turns out of the side roads onto the Pacific Highway suffer from delay. During the survey work drivers were observed undertaking the right turns with smaller gap acceptance tolerance. This in turn can lead to accidents, consistent with the accident history above.

Traffic from Raffertys Road with a destination south towards Sydney are directed to turn right onto Cams Wharf Road and connect with the Pacific Highway via Nords Wharf. The future upgrade of Awabakal Drive to traffic signals should provide enhanced safety for this southbound demand.

3.7 Parking Supply and Demand

3.7.1 On-street Parking Provision

The width of the internal resort roads generally do not allow for on-street parking with vehicles observed in some places parked on the nature strips.

90 degree informal parking allowing in the order of 10 on street parking spaces is provided off Lorikeet Loop opposite the existing conference centre and retail/café element. This parking forms part of 24 parking spaces approved in DA87/387 but not yet constructed and formalised.

Photo 3 Informal 90 degree parking opposite Site E

3.7.2 Off-Street Parking Provision

Off-street parking within the resort is provided through a mix of on site parking for individual lots, visitor parking bays and at grade parking for the key tourist elements. There is an at grade carpark to the front of reception with 38 parking spaces, 2 of which are accessible.

In the vicinity of the boat/kayak hire shop there is a mix of gravel and grass parking provided.

Adjacent to the restaurant/reception there is parking for three cars.

There is also an approval for 14 parking spaces off Lorikeet Loop as detailed above in Section 3.1 which have never been built.

3.7.3 Parking Demand and Utilisation

There was minimal on-street parking noted in the general vicinity of the site with 2 vehicles parked on the grass along Wild Duck Drive.

On Saturday 11th February 2022 parking was accommodated within the private properties and visitor bays with 29 vehicles parked in the main carpark.

Between the boat hire shop and the boat ramp there was a total of 17 cars and 17 boats/trailers as well as the Jet Boat.

Trailers (3) were parked along Lorikeet Loop in a manner similar to that shown in Photo 3 above.

Photo 4 Informal car and trailer parking in vicinity of boat ramp and hire shop

3.7.4 Short term Set down or pick up areas

Set down or pick up areas are available within the resort, particularly near reception. There are no formal set down area otherwise.

3.8 Public Transport

3.8.1 Rail Station Locations

The area is generally not supported by rail services with the closest railway station being Wyee, approximately 21 kilometres to the south of the subject site.

3.8.2 Bus Routes and Associated Facilities

Bus stops are provided on both sides of Cams Wharf Road near Raffertys Road some 490 metres from the resort entry.

These stops are serviced by Route 99 which operates between Lake Haven and Charlestown.

3.8.3 Rail and Bus Service Frequencies

Bus services typically run hourly with some services during the peak periods operating primarily along the Pacific Highway and connecting to various schools through this corridor.

3.9 Other Proposed Developments

For the existing resort the unbuilt development DA/924/2009 proposed 18 additional units with 51 bedrooms. Applying medium density residential trip rates (2-bedroom 0.5vph/unit and 3-bedroom 0.65vph per unit) the unbuilt development could generate 11 trips in the morning and afternoon peak and 111 trips per day. The impact of this traffic has been considered as part of the approval for the DA (DA/924/2009).

Eight of these units, (with 23 bedrooms), shall no longer be constructed but shall be incorporated into the new design with the impact of these trips considered as credits against the concept development. (5 trips in the peak hour and 50 trips per day).

There is ongoing residential development to the south of Cams Wharf in Nords Wharf and Catherine Hill Bay. These developments have been assessed and form part of recent or proposed upgrades to intersections in the area.

4 Proposed Development

4.1 Proposed Development

The masterplan is for a mixed-use development, comprising a tavern with associated facilities, function centre and accommodation (permanent and tourist), together with on-site parking.

- Site A – New Residential 25 apartments (15x3 bedroom and 10 x 2 bedroom) with basement carpark (47 spaces) ***Subject to Planning Proposal***
- Site B - Alterations to the existing function centre/restaurant (Ground floor tavern and 1st floor function centre), terraced outdoor area. ***Subject to Development Application***
- Site C - A 141 room hotel with basement parking (118 spaces) ***Subject to Planning Proposal***
- Site D – new residential accommodation 21 Apartments (6x3 bedroom, 14x2 bedroom and 1x1 bedroom) with basement parking (36 spaces) ***Subject to Planning Proposal***
- Site E – new residential accommodation to replace existing café and conference facility – 8 x 3 bedroom dwellings with garages and stacked parking spaces. 24 previously approved parking spaces not built including the 10 informal parking spaces. ***Subject to Development Application***
- Site F –38 public car parking spaces ***Subject to Development Application***
- Site G – temporary site for marquee during construction of new function centre ***Subject to Development Application***

The ten informal on street parking spaces opposite Site E shall be retained and expanded to provide for visitor and general parking in accordance with the approved DA DA87/387.

4.1.1 Planning Proposal

The Planning Proposal is intended to amend the Lake Macquarie Local Environmental Plan (LMLEP) 2014 to provide for the re-development of an existing tourist facility by increasing the allowable building heights for the site on the Height of Buildings LEP map.

The proposed LEP amendment will only apply to a small, centrally-located part of the resort and involves an increase in the building height limit:

- from 8.5 metres to 36.5 metres for Site C to permit an 8-storey hotel
- from 8.5 metres to 16.0 metres for Sites A and D to permit four story apartment buildings instead of 2 storey apartment buildings
-

It is important to note that the current availability of undeveloped land within the resort and the current zone will permit additional density and population for both visitors and permanent residents. Evaluation of the Planning Proposal should only consider the additional population that would be permitted by the proposed height amendment. Traffic generation for development that is already permitted, is considered at the development application stage.

4.1.2 Phasing and Timing

The development is proposed to be undertaken in stages and will be subject to individual development applications and assessments.

4.1.3 Selection of appropriate design vehicles for access and circulation requirements

As per the existing situation, the development will generally need to accommodate both light vehicles and heavy vehicles being those associated with deliveries and site servicing. This will include garbage collection and occasional heavy rigid vehicles.

There is no need anticipated for articulated vehicles to access the site.

4.2 Access

4.2.1 Driveway Location

No changes are proposed to the general layout of the internal roads with driveways for individual elements of the project subject to assessment in conjunction with each development application.

These will be designed and constructed in accordance with Council design requirements.

4.2.2 Sight Distances

The existing intersection of Wild Duck Road and Raffertys Drive/Lake Forest Drive is on a straight length of roadway which is slightly uphill south to north. The posted speed limit is 50k/hr with the Austroads sight distance requirements being 97 metres desirable, 90 metres minimum.

A review of the sight distances on site confirm that the desirable distance of 97 metres is available to the north (left) with in excess of 200 metres to the right (south).

Within the site it is anticipated that sight distances for driveways can be achieved in a safe manner taking into consideration the slow speed environment and the layout of the internal roads. These will be reviewed in conjunction with individual DAs.

4.2.3 Service Vehicle Access

The development will require service vehicle access in a manner consistent with its existing approved uses. Servicing for waste collection and deliveries to the conference/function centres and tavern will be similar to that previously required.

The garbage will be collected will be collected as per the current situation by a private contractor with vehicles typically between 10.8 and 12.5 metres long.

The internal layout of the site will be designed to accommodate the swept path movement of these vehicles as required.

4.2.4 Queuing at entrances

Given the overall traffic flows associated with the proposed development and the range in arrival and departure times associated with residents and events it is considered that there will be minimal queuing associated with the traffic movements into Cams Wharf Drive from the Pacific Highway or from Cams Wharf Drive into Raffertys Road.

Outbound traffic with a destination to the south are directed to use Nords Wharf Road to connect with the Pacific Highway which provides for a staged right turn with a seagull intersection. The future signalisation of Awabakal Drive further to the south will also support these southbound demands, reducing the impact at any one intersection and in turn reducing any queuing.

Opposing traffic on local roads will provide minimal delays at the various intersections for outbound traffic.

4.2.5 Current access compared with proposed access

No proposed changes to the overall site access over the existing situation.

4.2.6 Access to Public Transport

There will be no need for public transport to access the site.

4.3 Circulation

4.3.1 Pattern of circulation

Traffic will enter the site from Wild Duck Drive and circulate the site using the existing internal roads.

All vehicles will be able to enter and exit the site in a forward direction from the local road network. The internal design of the driveways and car parks will be in accordance with AS2890 permitting vehicles to turn around within the site and exit in a forward direction as required.

4.3.2 Internal Road width

No changes are proposed to the existing internal road network with the resort roads typically 5.5-5.8 metres wide whilst Wild Duck Drive is in the order of 6.8m.

4.3.3 Internal Bus Movements

It is considered that there will be minimal requirements for bus movements within the development site. There may be the occasional need associated with the function centre, consistent with the existing situation.

4.3.4 Service Area Layout

Dedicated service areas will be provided where appropriate for the development and shall be documented in individual DAs.

4.4 Parking

It should be noted that the following parking assessment is for use in supporting Council's assessment of future DAs.

4.4.1 Proposed Supply

The parking for the concept will be provided within the subject site to cater for the requirements of the residential and tourist units and the associated facilities. The parking layout shall be designed in accordance with AS2890. The proposed supply is provided below.

Proposed Development	**Proposed Parking Supply**
Site A – New Residential 25 apartments (15x3 bedroom and 10 x 2 bedroom) with basement carpark	47 new spaces
Site B - Alterations to the existing function centre/restaurant (Ground floor tavern and 1st floor function centre), terraced outdoor area.	Refer Site F below
Site C - A 141 room hotel with basement parking	118 new parking spaces
Site D – new residential accommodation 21 Apartments (6x3 bedroom, 14x2 bedroom and 1x1 bedroom) with basement parking	36 new spaces
Site E – new residential accommodation to replace existing café and conference facility – 8 x 3 bedroom+study dwellings with garages and additional parking spaces	8 single garages and stacked parking spaces on driveways of units 2-7 2 spaces of the 24 previously approved (DA87/387) parking spaces never built.
Site F –38 public car parking spaces	38 existing parking spaces

	Additional spaces in a manner similar to previously approved under the former masterplan if required
Site G – temporary site for marquee during construction of new function centre	Shall utilise 38 existing spaces in Site F

4.4.2 Construction Parking Supply

During the redevelopment of Sites B and E, Site D will be made available for temporary construction worker carparking This will also be available during construction of Site A and C.

Construction parking shall be reviewed to allow for parking during the Site D redevelopment.

4.4.3 Council code and local parking policies and plans

Authority parking per Lake Macquarie DCP

Element	Proposed Areas	Parking rate	Authority Requirement	Proposed Supply
Site A - Residential	10 x 2 bedroom	1/ 2xbedroom	10	47 This would allow 1 per 2 bedroom, 2 x 3 bedroom with 7 visitor parking
	15 x 3 bedroom	1.5/3xbedroom	22.5	
	Visitor	0.25- 0.5 per unit (flat v multi)	6.25-12.5	
			Total 38.75 - 45	
Site B				
Tavern – Ground Floor and pool terrace bar area	800m2	1 per 25m2	32	38 in existing at grade carpark to front of reception and restaurant Discounts detailed below (-46 spaces) 39 spaces required, shortfall within general site
Tavern-Gaming	120m2	No rate nominated		
Tavern-Outside	600m2	1 per 25m2 (Ancillary/seasonal)	24	
Function Room – Upper Level	720 m2 inc terrace bridal etc considered ancillary	1 per 25m2	29	
			Total 85 less concessions (-46)	
Site C - Hotel	141 rooms	1 per room Plus 1 space per 2 staff	141 3	118 - This allows staff plus 81% occupancy. 26 space shortfall throughout site
Site D – Residential	1 x 1 bedroom	0.75	0.75	
	14 x 2 bedroom	1/ 2xbedroom	14	36 - This allows 1 per 1-2 bedroom, 2 x 3 bedroom with 6 visitor parking and 3 staff parking from Site C.
	6 x 3 bedroom	1.5/3xbedroom	9	
	Visitor	0.25- 0.5 per unit	5.25 - 10.5	
			Total 29 – 34.25	
Site E – Residential Adaptive Reuse of existing café and conference centre	Attached Residences 8x3 bedroom Visitor	1.5/3xbedroom 0.5/unit	12 4	8 Garages 6 stacked parking spaces on site (Units 2-7), 2 opposite on Lorikeet Loop
TOTAL			**313-325 – 46 discount**	253 spaces + 24 spaces on Lorikeet Loop (Site E) and 14 on Lorikeet Loop (Site D).

4.4.4 Parking Layout

The site layout will allow for a mix of at grade and garage parking spaces.

In accordance with the DCP Disabled parking designed in accordance with AS2890.6 is to be provided at the rate of 1 space per 50 spaces. Where the requirement is between 5 and 50 spaces, at least 1 space is to be provided for persons with a disability.

4.5 Parking Analysis

The parking for the concept is based upon the end user demands, the location of the site and the parking requirements of the Council DCP together with the RTA Guide to Traffic Generating Developments. However, it can be seen that the project is unique in nature and the Council DCP and the RTA Guide do not provide for the cumulative parking required for the site.

The peak demand associated with this lakeside tourist development is anticipated to be in the summer when holiday lets, and function centre demands would be at their peak.

When determining the extent of parking required for the project, the following factors must be taken into account:

- there will be a significant amount of cross use between the various elements. For example; the tavern will appeal to the residents and visitors to the site, both future and existing
- The tourist units/hotel may be fully occupied during major events in the function centre e.g. weddings and at other times could have relatively low occupancy eg during the week with primary use of a weekend;
- Per the DCP: Where a mixture of these activities occurs calculate vehicle parking requirements based on activity mix
- The function centre is likely to be booked of a Friday evening, Saturday and possibly Sunday but vacant at other times during the week

Based upon the above the following assumptions could be made for the parking demands:

Discounts for Tavern and Function Centre:

Restaurant and Café type use 450m^2 – 50% discount for guests staying within the resort - 9 spaces.

Poolside Food and Drink use 350m^2 – 75% discount for guests staying within the resort - 11 spaces

External Terrace 600m^2 – 50% discount for guests staying within the resort -12 spaces.

Function Rooms and Upper Terrace 720m2 - 50% discount for guests staying within the resort - 14 spaces.

This gives a total discount of 46 spaces.

This is based on there being appropriate parking across the balance of the site.

Subject to acceptance of these parking concessions there is an operating parking shortfall as follows:

- Site E – 2 space short visitor parking for residential
- Hotel – 23 space shortfall

It is proposed to construct and formalise the approved parking opposite Site E (DA87/387) to provide 24 parking spaces. There are also 14 spaces previously approved but not yet built on Lorikeet Loop (Site D) which can ensure all development parking can be accommodated within the subject site.

Consideration will be required however for the high number of trailers and informal vehicles currently parked throughout the site, in particular in the vicinity of the boat ramp and hire shop.

It is considered that all future parking for the development can be contained within the site making use of existing or additional parking as required.

4.5.1 Service Vehicle Parking

There may be the requirement for some dedicated service vehicle parking in association with maintenance vehicles for the hotel etc.

Suitable loading areas shall be developed in association with individual DAs for the function centre and similar demands.

4.5.2 Pedestrian and Bicycle Facilities

There are no specific pedestrian and bicycle facilities proposed, as the internal roads act as shared zones and allow for these users on road as required.

Raffertys Resort is self contained with its own private foreshore which satisfies demands for foreshore activities and reduces the demand for external pedestrian movements.

Parking for bikes is to be provided in accordance with the DCP:

1. For customers and short term users:
    - Three bike parking spaces or one bike parking space for each 20 car parking spaces (as required in Table 10: Car Parking Rates), whichever is the greater.
    - Located close to the development's pedestrian entrance where there is active and passive surveillance;
    - Within easy and safe access from outside the site, without impeding the movement of pedestrians or other vehicles; and
    - At least 50% covered from the weather where there are more than 10 spaces.

2. For employees:
    - One employee bike parking space for each 20 employees, or part thereof;
    - One personal locker per two employee bike parking spaces;
    - One unisex change room and one shower for development greater than 1000m2 GFA and less than 5000m2 GFA;
    - One female change room with one shower and one male change room with one shower, for development greater than 5000m2 GFA; and
    - One additional shower (in each change room) for each additional 5000m2 GFA up to a maximum of five showers in each change room.
    - Bike parking for employees must be located in a secure undercover area.

5 Transportation Analysis

5.1 Traffic Generation

The following provides a detailed assessment of the potential traffic generation associated with the Potential Residential Yield under existing and proposed planning controls.

It is considered that the major use of this facility will be at weekends with reduced use during the week.

Traffic associated with the 54 residential units proposed will have an impact during the traditional morning and afternoon peak periods although some of these are likely to operate as holiday accommodation or appeal to retirees with flows outside of the typical road peak (particularly the morning peak hour).

The balance of the concept will have a greater impact over the weekend (Friday through to Sunday), associated with functions and weekend social use of the facilities. Periods of high demand for the function centre will be mainly associated with weddings etc. During this time it is anticipated that a large number of attendees will also be accommodated on site in the hotel. This cross use of the facilities will have an impact on the overall traffic generation of the site.

The traffic demands associated with the proposal has been assessed applying standard rates from the RTA Guide for the various elements proposed within the development. Concessions were then made for trip containment and shared trips based on the following assumptions with the following calculated for the concept as shown below in Table 5-1.

The concessions applied were:

- Function Room demands discounted by trips associated with the hotel on the basis that up to 50% of guests at a function are accommodated on site and have already travelled to the site in the PM peak. (40% containment tested as a worst-case scenario)
- Tavern discounted by up to 50% to allow for contained trips within the resort (both existing dwellings and future rooms/units) (40% containment tested as a worst-case scenario)
- 25% of tavern trips being local and contained within the Murrays Beach/Cams Wharf/Nords Wharf precinct, so do not impact the Pacific Highway
- 5 trips associated with 8 villas assessed as part of the previous approved DA

In addition, concessions were made for the existing site flows to allow for the modification and upgrade of various existing traffic generating elements:

- Credit for existing function centre/restaurant
- No credit for café/conference room uses to provide a conservative assessment

For the existing function centre (460m^2 GFA) a credit of 17 trips was applied based on 5 trips per 100m^2 with a 25% discount for contained trips allowing for guests and attendees to be staying in the resort.

Table 5-1 Traffic generation for proposed concept

Element		Rate	PM trips	Inbound	Outbound
Hotel	141	0.4 trips per room	56 trips	50	6 3 of these outbound via Nords Wharf Road
Tavern **Function Room** **Existing Function Centre**	1000m^2 720m^2	5 trips per 100m^2	51 -17	 31	 3 1 of these outbound via Nords Wharf Road
Residential **1 bedroom** **2 bedroom** **3 bedroom** **Approved DA**	 1 24 29 8 villas	 0.5 0.5 0.65	 0.5 trips 12 trips 18.85 trips -5 trips	 25 -4	 7 3 of these outbound via Nords Wharf Road -1
TOTAL			117 trips	102 inbound/	15 inbound

For the whole of development the concept has been assessed as generating the following additional traffic:

- 28 *additional* vph in the morning peak
- 117 *additional* vph in the afternoon peak; and
- 1013 *additional* trips (507 inbound 506 outbound) per day

The peak hour traffic generation was also determined based on the existing LEP which would see:

- Hotel 20 rooms
- Tavern/Function Centre – 25% trip containment given lower number of guest rooms
- Site A Residential – 14 units
- Site D Residential – 12 units

For this level of development the concept has been assessed as generating the following additional traffic:

- 10 *additional* vph in the morning peak
- 65 *additional* vph in the afternoon peak; and

5.1.1 Daily and Seasonal Factors

The nature of the concept will lead to typical tourist type demands Friday evening through to Monday morning with lower traffic generation associated with the residential part of the development Monday to Thursday.

The balance of the concept would be expected to generate traffic out of the traditional peak periods. It is further considered that the concept will have a high patronage associated with the boat ramp and leisure

facilities over the summer period. This could be further increased over the Christmas / New Year periods associated with holiday use and party events.

5.1.2 Pedestrian Movements

The proposal is expected to attract a significant number of internal pedestrian movements around the site. Internal pathways and the shared roadways allow for connection between the various elements of the development, including the existing dwellings. It is considered that there will be minimal external pedestrian demands except for the local residents, who may use the shared pathway on Lake Forest Drive. Given the self contained nature of the resort and the distance between the subject site and neighbourhood facilities including bus stops it is considered that external pedestrian demands will be relatively low.

5.2 Traffic Distribution and Assignment

5.2.1 Hourly Distribution of Trips

The afternoon (Friday PM) is the critical peak given that tourist type demands do not typically coincide with the local road peak hour in the morning (RTA Guide to Traffic Generating Developments).

Whilst peak demands on local roads, particularly the Pacific Highway, are typically associated with commuter movements in the mid-week, with morning demands potentially impacting queuing, this does not coincide with the peak demands associated with the project.

5.2.2 Origin / destinations assignment

The site is located between the Pacific Highway and Lake Macquarie. As such, traffic will typically approach the site via the Pacific Highway, with connections via one of a number of local roads.

Demands have been distributed with an origin/destination 60% north/40% south.

For the purposes of this assessment, the additional trips have been distributed to the road network consistent with existing demands at Cams Wharf Road.

All inbound traffic is anticipated to use the intersection of the Pacific Highway and Cams Wharf Road to then approach the site turning right into Raffertys Road.

Exiting traffic with a destination north shall use Cams Wharf Road and turn left at the Pacific Highway.

Exiting traffic with a destination south shall follow the road signs to turn right out of Raffertys Road onto Cams Wharf Road to then use either Nords Wharf Road or Awabakal Drive to connect with the Pacific Highway.

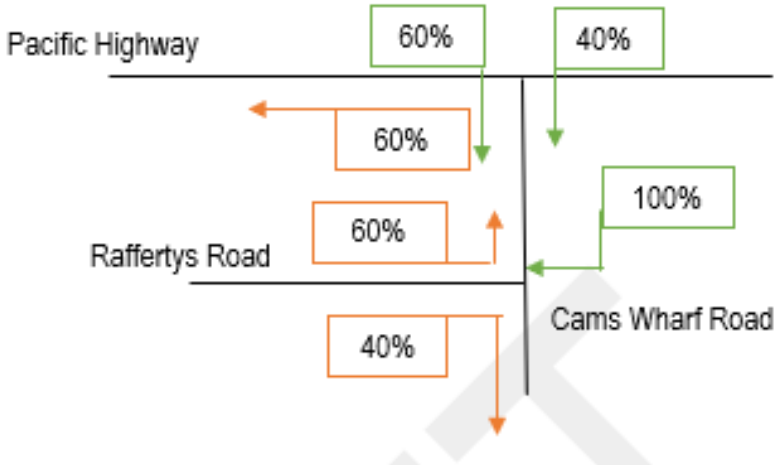

Figure 5-1 Trip distribution on local roads

Table 5-2 Traffic Distribution at intersection of Cams Wharf Road and Pacific Highway

Element	PM trips	To/from North	To/from South
Hotel	56 trips	30 inbound 3 outbound	20 inbound 3 outbound
Tavern/Function Rooms	51 trips	28 inbound 3 outbound	18 inbound 2 outbound (via Nords Wharf Road)
Residential	27 trips	13 inbound 3 outbound	9 inbound 2 outbound (via Nords Wharf Road)
Existing Site Flows for Function Centre/Restaurant	-17	-9 inbound -1 outbound	-6 inbound -1 outbound (via Nords Wharf Road)
TOTAL	117 trips	62 inbound/ 9 outbound	41 inbound 6 outbound (via Nords Wharf Road)
Other Approved Development not yet built	11	5 inbound 2 outbound	4 inbound

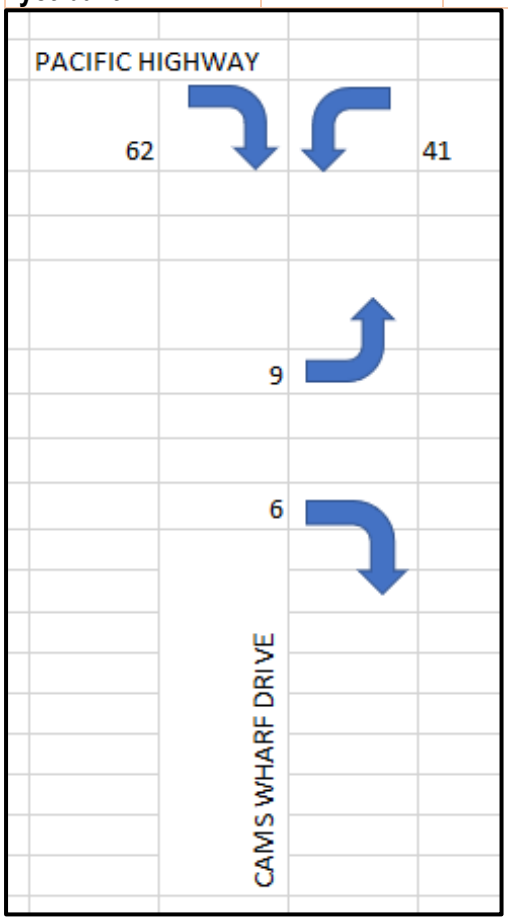

Figure 5-2 Traffic Distribution - Proposed LEP

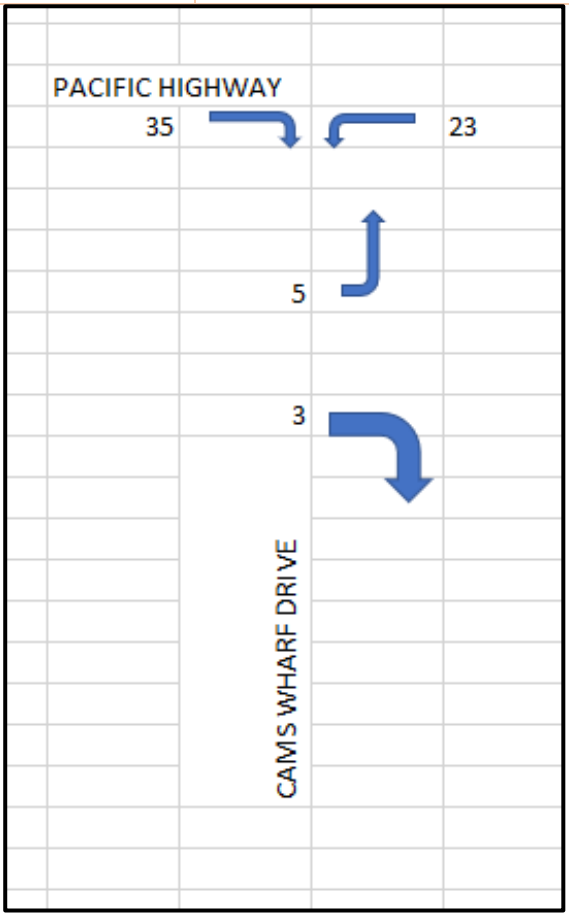

Figure 5-3 Traffic Distribution – Existing LEP

5.3 Impact on Road Safety

The additional traffic flows associated with the development of the subject site will have a minimal impact upon traffic safety. For the key intersection of the Pacific Highway and Cams Wharf Road, this intersection has already been identified for upgrade by Transport for NSW on safety grounds. The design elements of this is currently being considered.

The key safety concerns at this intersection are right turns out of the side roads (Cams Wharf Road and Flowers Drive) with motorists taking smaller gaps due to the volume of through traffic. Right turns from Cams Wharf Road are managed through directional signage at Raffertys Road promoting southbound traffic to exit via Nords Wharf. Nords Wharf Road provides a seagull intersection to enable a staged right turn whilst Awabakal Drive will be signalised shortly (2022) which shall provide for all turn movements.

For motorists turning right into Cams Wharf Road there is a channelised turn lane with good forward visibility of oncoming traffic enabling drivers to select suitable gaps.

The intersections of Raffertys Road and Cams Wharf Road and Raffertys Road and Wild Duck Drive are both laid out well with good visibility for road users. The BAR layout at Cams Wharf Road/Raffertys Drive intersection allows for safe movement of vehicles whilst other intersections provide suitable turn treatments.

The impact of the additional traffic is within the capacity of the local roads (Raffertys Road, Cams Wharf Road or Cranagan Bay Drive) which without intersections or the interaction of various driveways safety is unlikely to be impacted. Local crash data for the past five years shows no crashes indicating that these roads provide a suitable level of safety with motorists able to drive in a safe manner. Allowing for the above, the additional development traffic will have minimal impact on road safety with the local road network able to continue to operate in a safe manner.

5.4 Impact of Generated Traffic

5.4.1 Impact on daily Traffic Flows

The development could generate an additional 1013 vehicle trips per day (507 inbound and 506 outbound).

These vehicles would all use Wild Duck Drive and Raffertys Road to access the local road network at Cams Wharf Road where vehicles would distribute east towards the Pacific Highway or west towards Nords Wharf.

This could see an additional 810 vehicles two way east on Cams Wharf Road with the balance travelling west towards Nords Wharf. Some local trips may travel north towards Murrays Beach.

Daily traffic flows on these local roads are low being between 1,000 and 1,300 vehicles per day. Whilst there is no criteria for assessing the impact of daily flows, where the impact in the peak hour is acceptable, daily flows are also considered acceptable.

The additional trips in the peak hour could see the mid block flows on the local roads increase from 100-124 vph to up to 240 vehicles per hour two way (191 vph northbound on Raffertys Road).

Traffic flows on these roads are within their mid-block capacity and operate at Level of Service A (200 vehicles per direction per hour). This level would therefore be maintained with the impact of the development therefore acceptable.

5.4.2 Peak Hour Impacts on Intersections

As part of the assessment for the proposed development, the intersection capacity analysis program Sidra has been used. The Sidra analysis has reviewed the impact of the generated traffic plus background traffic growth along the Pacific Highway at the intersection with the highway and Cams Wharf Road. **(Appendix B)**

Sidra modelling has been completed for the intersection of the Pacific Highway and Cams Wharf Road to determine the capacity of this intersection to support the additional traffic demands associated with the proposed development. The following scenarios were considered in the modelling:

- 2022 base, with model calibrated to reduce the gap acceptance for the right turn out from Flowers Drive and Cams Wharf Road as requested by TfNSW.
- Scenario 1 Proposed LEP allowing for the concept design traffic flows and Scenario 2 LEP permitted development only

	Proposed LEP	Otherwise
Hotel	141	20
Site A Resi	25	14
Site D Resi	21	12

- Scenario 1 - These demands were reviewed and confirmed to reflect the following at this intersection:
    - 100% hotel demands in the PM peak (90% inbound/10% outbound)
    - Residential demands (80% inbound/20% outbound)
    - 40% trip containment for tavern and function space based on resort/hotel demands
- Scenario two-
    - 100% hotel demands in the PM peak (90% inbound/10% outbound)
    - Residential demands (80% inbound/20% outbound)
    - 25% trip containment for tavern and function space based on resort plus lower capacity for hotel demands

Table 5-3 – Sidra modelling, existing situation (PM Peak)

Approach	Level of service	Delay (seconds)	Queue (metres)
Flowers Drive	F (right turn out)	906.8	144.1
Pacific Hwy (Swansea)	A (B for right turn)	15.7 for critical right turn	2.6 for right turn
Cams Wharf Road	D (F for right turn)	105.4 for critical right turn	3.3 for right turn
Pacific Hwy (Lake Munmorah)	A (B for right turn)	21.5 for right turn	0.6 for right turn

The results demonstrate that the right turns out of the side roads, at this intersection suffer from delays, particularly Flowers Drive. The observations on site indicate that the delays / queues are less than those shown in the modelling, as drivers take smaller gaps which in turn however can impact on road safety, as per the history of accidents at this location.

Table 5-4 Allowance for the additional traffic associated with the approved development not yet built

	Total	Inbound	Outbound
Dwellings 80/20	11	9	2

Modelling shows minimal change over the existing situation with ongoing delays for right turns out of Flowers Drive in the PM peak as well as delays from Cams Wharf Road.

The intersection was then modelled with the additional concept development traffic and the results are presented below.

Table 5-5 Sidra modelling 2022 plus Proposed Concept

Approach	LoS	Delay (seconds)	Queue (m)	Degree of Saturation
Flowers Drive	Left – A Through - F Right – F	9.5 72.6 70.6	0.1 14.0 14.0	0.009 0.696 0.696
Pacific Hwy (Swansea)	Left – A Through – A Right turn – A	7.4 0.0 12.1	0.0 0.0 4.8	0.030 0.276 0.230
Cams Wharf Road	Left turn – A Through – D Right - C	9.2 46.0 42.3	0.6 1.0 1.0	0.037 0.065 0.065
Pacific Hwy (Lake Munmorah)	Left turn – A Through – A Right - B	6.0 0.0 15.5	0.0 0.0 0.4	0.029 0.197 0.020

The results above demonstrate that the additional traffic shall have a minor impact upon the overall operation of this intersection, although the right turns out of the side roads will experience increased delays with more vehicles potentially taking smaller gaps in traffic to undertake these turns. It is noted that the proposed development doesn't increase the demand for right turns out of Cams Wharf Road as these movements are assumed to use the signposted route via Nords Wharf to join the highway at Nords Wharf Road or otherwise at Awabakal Drive.

Table 5-6 Sidra modelling 2022 plus Existing LEP

Approach	LoS	Delay (seconds)	Queue (m)	Degree of Saturation
Flowers Drive	Left – A Through - E Right – E	9.5 64.8 63.9	0.1 13.0 13.0	0.009 0.656 0.656
Pacific Hwy (Swansea)	Left – A Through – A Right turn – A	7.4 0.0 11.7	0.0 0.0 3.2	0.030 0.277 0.165
Cams Wharf Road	Left turn – A Through – D Right - C	9.2 43.6 40.1	0.5 1.0 1.0	0.032 0.061 0.061
Pacific Hwy (Lake Munmorah)	Left turn – A Through – A Right - B	6.2 0.0 15.5	0.0 0.0 0.4	0.019 0.197 0.020

Allowing for background growth of 2% per annum for 10 years for through traffic gives the following Sidra results. These results show minimal change over the above results with ongoing delays for right turns out of Flowers Drive in the PM peak as well as delays from Cams Wharf Road.

Table 5-7 Sidra Modelling 2032

Approach	LoS	Delay (seconds)	Queue (m)	Degree of Saturation
Flowers Drive	Left – A Through - F Right – F	10.0 367.8 369.0	0.2 73.8 73.8	0.010 1.259 1.259
Pacific Hwy (Swansea)	Left – A Through – A Right turn – A	7.4 0.1 13.8	0.0 0.0 2.2	0.030 0.332 0.117
Cams Wharf Road	Left turn – A Through – F Right - E	9.3 74.6 68.0	0.5 1.7 1.7	0.030 0.114 0.114
Pacific Hwy (Lake Munmorah)	Left turn – A Through – A Right - B	7.4 0.0 19.5	0.0 0.0 0.5	0.006 0.240 0.028

Table 5-8 – Sidra modelling, 2032 PM adjusted base plus Proposed Concept

Approach	LoS	Delay (seconds)	Queue (m)	Degree of Saturation
Flowers Drive	Left – A Through - F Right – F	9.9 520.9 518.0	0.2 98.2 98.2	0.010 1.437 1.437
Pacific Hwy (Swansea)	Left – A Through – A Right turn – A	7.4 0.1 14.3	0.0 0.0 6.1	0.030 0.330 0.279
Cams Wharf Road	Left turn – A Through – F Right - F	9.5 86.5 78.7	0.6 2.0 1.0	0.039 0.134 0.134
Pacific Hwy (Lake Munmorah)	Left turn – A Through – A Right - B	6.0 0.0 19.4	0.0 0.0 0.5	0.029 0.237 0.028

Table 5-9 – Sidra modelling, 2032 PM base plus Existing LEP

Approach	LoS	Delay (seconds)	Queue (m)	Degree of Saturation
Flowers Drive	Left – A Through - F Right – F	10.0 438.9 437.8	0.2 85.9 85.9	0.010 1.343 1.343
Pacific Hwy (Swansea)	Left – A Through – A Right turn – A	7.4 0.1 13.7	0.0 0.0 4.0	0.030 0.331 0.200
Cams Wharf Road	Left turn – A Through – F Right - F	9.5 80.1 72.9	0.6 1.9 1.9	0.035 0.124 0.124

Pacific Hwy (Lake Munmorah)	Left turn – A Through – A Right - B	6.2 0.0 19.4	0.0 0.0 0.5	0.019 0.237 0.028

The overall conclusion is that the results demonstrate that the additional traffic shall have a minor impact upon the operation of this intersection, although the right turns out of the side roads will experience increased delays with more vehicles potentially taking smaller gaps in traffic to undertake these turns. It is noted that the proposed development doesn't increase the demand for right turns out of Cams Wharf Road as these movements are assumed to use the signposted route via Nords Wharf to join the highway at Nords Wharf Road or otherwise at Awabakal Drive which has recently been signalised.

The modelling for the Proposed Concept shows no changes in the level of service over the existing situation except for Flowers Drive where for the right turn queue length increasing by 2 metres and delays increasing by 12 seconds the level of service becomes LoS F. The future scenario without development also however sees this become LoS F, reflecting how sensitive this movement is to any change in opposing traffic.

The Existing LEP model sees this remain at LoS E for the current design year.

The critical movements for the development however are the right turn into Cams Wharf Road which continue to operate at LoS A for the 2032 Proposed Concept scenario as do the left turns from Cams Wharf Road onto the Pacific Highway. Through and right turns from Cams Wharf Road are LoS D and C respectively and in the future design year are at LoS F and E (without development) and LoS F for both with development. The major driver for these changes is the continual background growth along the Pacific Highway in this location.

There is no significant difference between the two scenarios (Existing LEP and Proposed Concept) for the critical right turn into Cams Wharf Road and left turn out.

Raffertys Road and Cams Wharf Road

Of these trips 29% is southbound, 31% northbound from the west (ie Nords Wharf) and the balance (40%) is westbound turning right into Raffertys Road.

While demands at this intersection increase, particularly for the right turn movement into Raffertys Road, the intersection continues to operate in an acceptable manner.

A review of the Austroads Guidelines for turn treatments indicates that this intersection does not trigger the warrants for turn treatment upgrades with the existing BAR providing a suitable layout.

5.4.3 Impact of Construction Traffic

The construction work will be undertaken across a number of stages.

There will be a requirement for construction vehicles (light and heavy) to access the site with the demolition and construction work contained within the resort.

The construction traffic will primarily be during the week when other demands within the resort are lower. The construction traffic will be less than the traffic associated with the completed development and as such is considered to have an acceptable impact upon the local road network

Construction parking can be contained within the site with parking to be provided within Site D (Attachment A) during the works associated with this majority of the development.

5.4.4 Background traffic and other developments

In accordance with normal TfNSW requirements, the impact of the additional traffic has been assessed allowing for 10 years background growth along the Pacific Highway. An allowance of 2% per annum, giving 20% overall growth, has been used.

In addition, trips associated with the approved but not yet built have been allowed for in the Sidra modelling.

5.5 Public Transport

5.5.1 Options for improving services

Minimal if any demand for public transport will be generated by the new site proposal.

5.5.2 Pedestrian Access to Bus Stops

There are bus stops on Cams Wharf Road south of the site. There is minimal demand anticipated for bus services in conjunction with this development.

5.6 Pedestrian and Cyclists

The site connects to pedestrian facilities in the area with internal roads operating as a shared zone.

No significant demand for external pedestrian movements given the contained nature of the resort.

Bike parking for staff and guests shall be incorporated into the development.

6 Summary and Recommendations

6.1 Summary

From the above assessment and the review of the proposal and associated plans against the requirements of the Guide to Traffic Generating Developments and Austroads Guide to Traffic Management, it is considered that the proposed development should be approved on traffic and access grounds.

The development proposed by Iris Capital is consistent with the Section 7.14 of the LEP

> ***7.14 Development on certain land near Rafferty's Road, Cams Wharf***
>
> *(1) This clause applies to land identified as "Cams Wharf Area 1" on the Additional Permitted Uses Map.*
>
> *(2) Development consent may be granted to development for the purpose of an integrated tourist facility that may contain a range of accommodation types (including dwellings) and a combination of land uses including retailing, recreational and community activities appropriate to the community's needs on land to which this clause applies.*
>
> *(3) In this clause, **an integrated tourist facility** means a facility that contains the following—*
>
> *(a) tourist facilities, including a range of accommodation types and dwellings, and*
>
> *(b) a combination of land uses including community facilities, recreation areas, recreation facilities and retail premises, appropriate to the needs of the community.*

The traffic associated with the redevelopment and upgrade of facilities on Raffertys Resort has been assessed taking into consideration the existing demands for the site. Consideration has been given to the potential for a high level of trip containment on site with visitors and guests along with residents within the resort likely to be patrons of the tavern and guests of the function centre.

The traffic movements generated by this development will have a minor and acceptable impact on the surrounding road network. The SIDRA results show that the key intersection of the Pacific Highway and Cams Wharf Road currently operates overall with noticeable delays for right turns out of the minor roads only, with the proposal not increasing this demand and with south bound traffic to follow signage to travel south via Nords Wharf. The turn demands associated with this project therefore have an acceptable impact on those movements. In addition, this intersection has been identified for upgrade by the road authority on safety grounds although no design solution has been determined for this

The intersections of Wild Duck Drive and Raffertys Road and Raffertys Road and Cams Wharf Road both operate with minimal delays and can provide for the additional traffic associated with proposal. The majority of this additional traffic will be of a weekend and is seasonal with peak demands being the summer and during school holidays.

Parking has been calculated, taking into consideration the high number of patrons already within the resort. The existing carpark adjacent to the tavern provides 38 spaces with the balance of the development able to accommodate parking adjacent to the various elements or within overflow parking to be provided throughout the site consistent with the approach of the former approved masterplan for

the site. The construction and formalisation of previously approved parking on Lorikeet Loop ensures there is suitable parking available for the proposed development.

The overall conclusion from the investigations is that traffic and parking arrangements for the development proposal are satisfactory and that there is no traffic or parking impediments to the development.

As the various elements are developed there are opportunities to enhance trip containment and allow for the shared use of facilities, including parking, within the resort.

Appendix A Concept Plan