AMENDED MASTERPLAN TRAFFIC AND PARKING IMPACT ASSESSMENT OF THE PROPOSED MIXED USE DEVELOPMENT AT 13 ENDEAVOUR ROAD, CARINGBAH

Address: Shop 7, 720 Old Princes Highway Sutherland NSW 2232
Postal: P.O Box 66 Sutherland NSW 1499

Telephone: +61 2 8355 2440
Fax: +61 2 9521 7199
Web: www.mclarentraffic.com.au
Email: admin@mclarentraffic.com.au

Division of RAMTRANS Australia ABN: 45067491678 RPEQ: 19457

Transport Planning, Traffic Impact Assessments, Road Safety Audits, Expert Witness

240383.04FB - 7 February

Development Type: **Mixed Use Development**

Site Address: **13 Endeavour Road, Caringbah**

Prepared for: **Aliro Group**

Document reference: **240383.04FB**

Reference: 230291.01FA

Status	Issue	Prepared By	Checked By	Date
Final	A	AT	CM	6 October 2023

Reference: 240383.01FB

Status	Issue	Prepared By	Checked By	Date
Final	A	MM	AT / DW	9 October 2024
Final	B	MM	AT/DW	7 February 2025

Please be aware that all information and material contained in this report is the property of McLaren Traffic Engineering. The information contained in this document is confidential and intended solely for the use of the client for the purpose for which it has been prepared and no representation is made or if to be implied as being made to any third party. Any third party wishing to distribute this document in whole or in part for personal or commercial use must obtain written confirmation from McLaren Traffic Engineering prior to doing so. Failure to obtain written permission may constitute an infringement of copyright and may be liable for legal action.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

M^CLaren Traffic Engineering (MTE) was commissioned by Aliro Group to provide a Amended Masterplan Traffic and Parking Impact Assessment *of the Mixed Use Development at 13 Endeavour Road, Caringbah.*

The proposed masterplan development consists of a variety of land uses, including commercial, industry, warehouse, child care centre and a small cafe which have been assessed as part of this this traffic and parking report. Building 1 and Building 2 are currently occupied on the site under recent approvals which have been included within the assessment of this report.

All vehicle access to and from the site will be via Endeavour Road and the existing roundabout intersection of Gannons Road / Captain Cook Drive.

Prior to recent development approvals, the subject site consisted of a number of office buildings around the site and a large Industrial / warehouse building on the western portion of the site. The existing facilities on-site (excluding recent approvals) generally comprise of a corporate head office with motor showroom and dealership operations, whereby parts delivery, car servicing, fleet management and other ancillary operations are undertaken. The existing site (including B1 and B2 prior to the recent approvals) did provide 722 car parking spaces for a total GFA of 44,521m^2.

The performance of the surrounding intersections, including Endeavour Road / Captain Cook Drive and Gannons Road / Captain Cook Drive has been assessed under various scenarios using SIDRA INTERSECTION 9.0. The road traffic conditions at these intersections are the following:

- *The intersection of Endeavour Road / Captain Cook Drive is overdue for an infrastructure upgrade, as prior to this development, it is failing under existing traffic conditions and will further deteriorate when Stage 4 of the Sharks development is occupied.*

- *Under the existing conditions, which includes the existing approved GFA on site and approved Sharks Stage 3 and 4, the intersection of Captain Cook Drive / Gannons Road will be operating close to capacity after development completion, although if the intersection of Endeavour Road / Captain Cook Drive was upgraded, this would alleviate some congestion from the intersection of Captain Cook Drive / Gannons Road.*

- *Under the proposed development, including Sharks Stage 3 and 4 the intersection of Captain Cook Drive / Gannons Road will be operating at capacity after development completion, although if the intersection of Endeavour Road / Captain Cook Drive was upgraded, this would alleviate some congestion from the intersection of Captain Cook Drive / Gannons Road.*

- *When comparing the proposed development against the existing approvals on the site, the impact of the development results in a minor increase to the average delay for the intersection of Captain Cook Drive / Gannons Road of 0.9 seconds and 5.1 seconds in the AM and PM peak hour periods respectively.*

- *An upgrade of Endeavour Road / Captain Cook Drive to a signalised intersection will result in a Level of Service "B" condition in the AM and PM peak hour period, with the intersection of Gannons Road / Captain Cook Drive forecast to operate with a Level of Service "B" condition. A Level of Service "B" condition indicates acceptable operations, maintaining spare capacity.*

- *Based upon the inclusion of a signalised intersection at Endeavour Road / Captain Cook Drive, the proposed development will resolve the existing traffic flow and safety issues within the road network at the intersection of Endeavour Road / Captain Cook Drive, providing a community benefit.*

*Considering the above and most notably the existing constrained traffic conditions within proximity to the site, it may be appropriate for the development to contribute to known or planned infrastructure upgrades. The additional traffic generation (above existing approvals) associated with the proposed development changes is estimated to contribute an additional **71** and **56** vehicle movements during the AM & PM peak hour traffic periods respectively to the overall traffic network. This additional traffic generation equates to an increase of 1.1% and 0.8% of peak hourly traffic volumes in the AM and PM peak hours respectively, at the intersection of Captain Cook Drive / Endeavour Road. This additional traffic generation equates to an increase of 0.9% and 0.7% of peak hourly traffic volumes in the AM and PM peak hours respectively, at the intersection of Captain Cook Drive / Gannons Road. The additional traffic generation (above existing approvals) associated with the proposed development changes is less than one (1) vehicle trip per minute.*

Whilst a contribution to the upgrade of Endeavour Road / Captain Cook Drive to a signalised intersection would be the most appropriate to reflect the extent of proposed development. The applicant is currently investigating the preferred design for the upgrade of Endeavour Road / Captain Cook Drive with TfNSW to enter into a WAD agreement with TfNSW for the upgrade of the intersection.

*The site is expected to demand **453** car parking spaces in accordance with the recommended car parking requirements for the site based upon the RTA Guide and Council's DCP. The proposed development provides **562** car parking spaces, exceeding the requirements by **109** car parking spaces.*

1 INTRODUCTION

M^CLaren Traffic Engineering was commissioned by *Aliro Group* to provide a Amended Masterplan Traffic and Parking Impact Assessment of the proposed Mixed Use Development at 13 Endeavour Road, Caringbah as depicted in **Annexure A** for reference.

Part of the subject site is currently occupied and operational under recent approvals (Building 1 & 2), while the remaining site area is proposed for redevelopment. Whilst the majority of the site is vacant there are current development application approvals for the operation and occupation of the existing buildings which have been considered within this Masterplan Traffic & Parking Impact Assessment.

This amended report updates the parking and traffic assessment as a result of the slightly modified scale in the amended plans. A summary of the overall changes in scale is outlined below:

- Building 3 Warehouse 3F reduced to 763m^2 GFA from 805m^2 GFA;
- Building 4 Ground:
    - Industrial scale increased to 4,249m^2 GFA (change from 4132m^2 GFA);
    - Office scale increased to 884m^2 GFA (change from 841m^2 GFA).
- Building 4 Level 1:
    - Industrial scale reduced to 2,972m^2 GFA (change from 3,028m^2 GFA);
    - Office scale increased to 937m^2 GFA (change from 924m^2 GFA).
- Building 5 Commercial portion:
    - Café scale increased to 112m^2 GFA (previously 76m^2 GFA);
    - Removal of common area and estate office.
- Building 6 change from four (4) tenancies to two (2) with the following overall scale:
    - Industrial scale increased to 2,580m^2 GFA (change from 2,465m^2 GFA);
    - Office –scale reduced to 335m^2 (change from 495m^2 GFA).
- Building 7 Warehouse 7D increased to 696m^2 GFA (change from 692m^2 GFA);
- Building 8 Warehouse decreased to 1,377m^2 GFA (change from 1378m^2 GFA).

For ease of a comparison assessment, the updated scale only generated eight (8) additional vehicle trip in comparison to the previous assessment and demands 19 more car parking spaces.

1.1 Description and Scale of Development

The proposed masterplan development consists of a variety of land uses which have been assessed to have the following scale relevant to this traffic and parking report as shown in **Table 1**.

TABLE 1: PROPOSED MASTERPLAN SCALE

Land Use	Masterplan Scale
Building 1	26,282m^2 GFA Warehouse Premises (existing occupied premises)
Building 2	2,015m^2 GFA Warehouse Premises (existing occupied premises)
Building 3	4,125m^2 GFA Warehouse Premises
	649m^2 GFA Industrial Premises
	126m^2 Office (ancillary)
Building 4	7,221m^2 GFA Industrial Premises
	1,821m^2 GFA Office (ancillary)
Building 5	68 place child care centre (1,219m^2 GFA)
	112m^2 GFA Cafe
	554m^2 GFA Office Premises
	1,071m^2 GFA Industrial Premises
	333m^2 GFA Industrial Office Premises (Ancillary)
	11,615m^2 GFA Warehouse Premises
Building 6	2,580m^2 GFA Industrial Premises
	335m^2 GFA Industrial Office Premises (Ancillary)
Building 7	3,976m^2 GFA Industrial Premises
	697m^2 GFA Industrial Office Premises (Ancillary)
Building 8	1,377m^2 GFA Industrial Premises
	269m^2 GFA Industrial Office Premises (Ancillary)
Total	**66,404m^2 GFA**

All vehicle access to and from the site is proposed to be as per the following:

- The roundabout intersection of Captain Cook Drive / Gannons Road / Site Access:
- Continued use of the existing driveways from Endeavour Road which are as per the following:
    - The northern-most driveway facilitates two-way and unrestricted turning movement access:
        - Limited to 20m length Articulated Vehicles.
    - The southern-most driveway facilitates two-way access restricted to left in / left out:

- Limited to passenger vehicles only.

- The two (2) middle driveways operate as one-way driveways and are limited to one (1) tenant from Warehouse 1:

  - Limited to 20m length Articulated vehicles.

1.2 State Environmental Planning Policy (Transport & Infrastructure) 2021

The proposed development does qualify as a traffic generating development with relevant size and/or capacity under *Section 2.122* of the *SEPP (Transport & Infrastructure) 2021*. Accordingly, formal referral to the Transport for New South Wales (TfNSW) is necessary as part of the proposal.

1.3 Site Description

The existing site prior to recent development approvals consists of a number of office buildings around the site and a large industrial / warehouse building on the western portion of the site. The existing facilities on-site are generally consisting of a corporate head office with motor showroom and dealership operations, whereby parts delivery, car servicing, fleet management and other ancillary operations are undertaken. The existing site did provide 722 car parking spaces. A breakdown of the floor areas associated with the existing use of the site (not including the recently approved Building 1) is provided in **Table 2** below.

TABLE 2: EXISTING SCALE OF DEVELOPMENT – PRIOR TO RECENT OCCUPATION AND APPROVALS OF BUILDING 1 AND BUILDING 2

Building	Use	Scale
Building 1 (not including recent approval)	Warehouse	27,305m^2
	Office	433m^2
Building 2 (not including recent approval)	Warehouse	1,395m^2
	Office	620m^2
Building 4 (Corporate Office)	Office	5,094m^2
	Retail	315m^2
Hub Building & Thiess Building	Office	5,708m^2
	Workshop (Industrial)	668m^2
Building 7 (Training Building)	Office	175m^2
	Mechanic (Industrial)	1,706m^2
	Training Rooms (Business Premises)	824m^2
Total	**-**	**44,243m^2 GFA**

The subject site is zoned *SP4 – Enterprise* under Sutherland Shire Council's *Local Environmental Plan 2015*, whilst the site has historically been zoned as B7 Business Park. The land zoning categories were updated in 2023 by the NSW Department of Planning and Environment. The site is currently zoned SP4 Enterprise which was previously known as B7 Business Park which was deemed to represent a non-direct equivalent zone as per the NSW Government Equivalent zone tables.

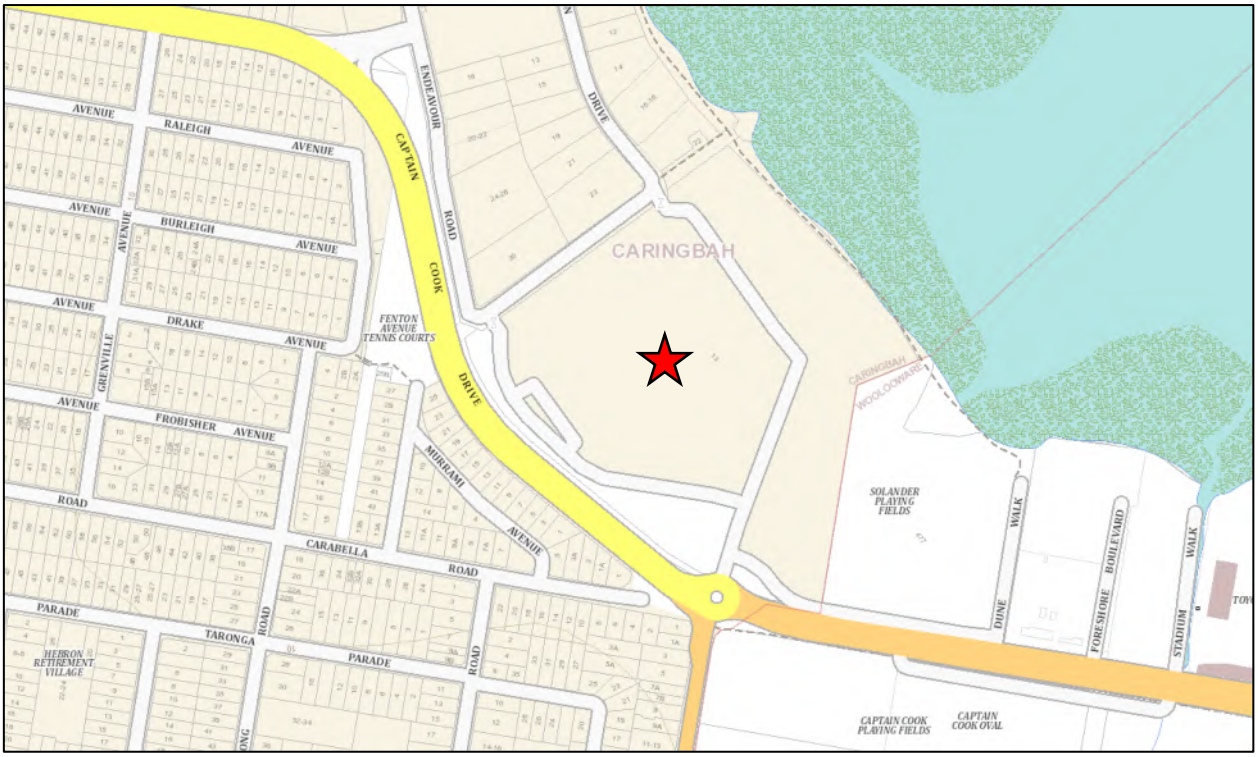
The proposed development is generally surrounded by industrial uses to the north, residential developments to the south-west, recreational facilities to the south-east (Woolooware Golf Club and playing fields) and east (Solander Grounds) and Shark Park and Woolooware Bay Town Centre (that includes the revamped Leagues Club) to the east, with Woolooware Bay to the north-east. Caringbah Train Station is located approximately 1.1km to the south-west and Woolooware Train Station is located approximately 1.5km to the south-east.

1.4 Site Context

The location of the site is shown in aerial imagery and a street map in **Figure 1** and **Figure 2** respectively.

Site Location

FIGURE 1: SITE CONTEXT – AERIAL PHOTO



Site Location

FIGURE 2: SITE CONTEXT – STREET MAP

2 EXISTING TRAFFIC AND PARKING CONDITIONS

2.1 Road Hierarchy

The road network servicing the site has characteristics as described in the following sub-sections.

2.1.1 Captain Cook Drive - West of Gannons Road

- Classified State Main Road (No 662);
- Approximately 23m width carriageway, facilitating three traffic flow lanes in each direction, which reduces to two lanes on the approach to the roundabout of Captain Cook Drive / Gannons Road for vehicles travelling eastbound. Kerbside parking is permissible on both sides of the road but is not typically used;
- Signposted 70km/h to the east of Endeavour Road and 60km/h to the west of Endeavour Road;
- Unrestricted kerbside parking permitted along both sides of the road. Provision of "*No Parking"* signage along the southern side of Captain Cook Drive, within proximity to Gannons Road. Kerbside parking along both sides of Captain Cook Drive is typically only utilised between Gannons Road and Endeavour Road during game days at Shark Park;
- No pedestrian facilities are provided between Gannons Road to Endeavour Road;
- Approved 25/26m B-double Route.

2.1.2 Captain Cook Drive - East of Gannons Road

- Classified Regional Secondary Road (No. 2075);
- Approximately 21m width carriageway, facilitating two traffic flow lanes in each direction and on road bicycle lanes on both sides of the road;
- Signposted 70km/h speed limit;
- '*No Stopping'* restrictions located on both sides of the road;
- Provision of off-road bicycle and pedestrian facilities on the southern side of the road within the verge;
- Approved 25/26m B-double Route.

2.1.3 Gannons Road

- Unclassified Regional Road (No 7031);
- Approximately 12m width carriageway, facilitating one traffic flow lane in each direction and a parking lane on both sides of the road;
- Signposted 60km/h speed limit;
- Unrestricted kerbside parking permitted along both sides of the road outside of "*No Stopping"* and "*Bus Zone"* signage;

- Provision of off-road bicycle and pedestrian facilities on the eastern side of the road within the verge.

2.1.4 Endeavour Road

- Unclassified Local Road;
- Approximately 12m width carriageway, facilitating one traffic flow lane in each direction and kerbside parking on both sides of the road;
- No speed limit signposted – 50 km/h speed limit applies;
- Approved 25/26m B-double Route;
- Unrestricted kerbside parking available on both sides of the road;
- No pedestrian facilities are provided on both sides of the road, with the exception of an existing shared path provided along the site fronting which was part of the approval for DA21/0777).

2.1.5 Resolution Drive

- Unclassified Local Road;
- Approximately 12m width carriageway, facilitating one traffic flow lane in each direction and kerbside parking on both sides of the road;
- No speed limit signposted – 50 km/h speed limit applies;
- Approved 25/26m B-double Route;
- Unrestricted kerbside parking available on both sides of the road;
- No pedestrian facilities are provided on both sides of the road.

2.1.6 Northumberland Road

- Unclassified Local Road;
- Approximately 12m width carriageway, facilitating one traffic flow lane in each direction and kerbside parking on both sides of the road;
- No speed limit signposted – 50 km/h speed limit applies;
- Unrestricted kerbside parking available on both sides of the road;

2.2 Existing Traffic Management

- Roundabout controlled intersection Captain Cook Drive / Gannons Road;
- Signalised controlled intersection of The Kingsway / Gannons Road;
- Signalised controlled intersection of Cawarra Road / Captain Cook Drive;
- Priority controlled left in / left out intersection of Dune Walk / Captain Cook Drive
- Signalised controlled intersection of Captain Cook Drive / Foreshore Boulevard;
- Signalised controlled intersection of Captain Cook Drive / Woolooware Road;

- Give-way controlled intersection of Captain Cook Drive / Endeavour Road designed as a seagull intersection;
- Give-way controlled intersection of Endeavour Road / Endeavour Road;
- Give-way controlled intersection of Endeavour Road / Northumberland Road / Resolution Drive.

2.3 Existing Traffic Volumes

Intersection traffic surveys were conducted at the intersections of Captain Cook Drive / Gannons Road and Captain Cook Drive / Endeavour Road on Tuesday the 4th of February 2020, between 7:00am to 9:00am and 4:00pm to 6:00pm, representing a typical weekday. The detailed survey results are reproduced in **Annexure B** for reference. The following are relevant to note with respect to collected traffic data:

- Endeavour Road / Captain Cook Drive:
    - AM peak hour period occurred between 7:30am to 8:30am;
    - PM peak hour period occurred between 4:30pm to 5:30pm.
- Captain Cook Drive / Gannons Road:
    - AM peak hour period occurred between 8:00am to 9:00am;
    - PM peak hour period occurred between 4:30pm to 5:30pm.

It should be noted that at the time of surveys being undertaken, construction was underway along Captain Cook Drive along the frontage of the Sharks development which had reduced the carriageway to a single traffic flow lane in each direction through the construction site. This may have had impacts on observed traffic flows at the intersection of Captain Cook Drive / Gannons Road.

The total traffic volumes observed during a traffic survey on the 4th of November 2016 during the PM peak hour period (survey duration 4:00pm to 7:00pm) at the roundabout of Captain Cook Drive / Gannons Road had a total traffic flow of 3,500 vehicles through the roundabout during the PM peak hour period (4:30pm to 5:30pm), whilst the current survey data observed 3,328 vehicles through the roundabout during the PM peak hour period. This is likely a result of the subject site being unoccupied or displaced vehicle traffic to other routes as a result of construction activity along Captain Cook Drive.

A review of the data from the 4th of November 2016, which is reproduced in **Annexure B** for reference, against the current survey results in 2020 indicate that approach flows along Captain Cook Drive east were approximately 100 less in 2020 compared to the 2016 surveys and the approach flows along Captain Cook Drive to the west were 100 less in 2020 compared to the 2016 surveys. Further the left turn movement from Gannons Road into Captain Cook Drive was 100 more in 2020 compared to 2016, which is likely a result of the infrastructure upgrade at the signalised intersection of The Kingsway / Gannons Road (duplication of the right turn lane into Gannons Road which occurred in 2018).

In view of the above, it is considered that the construction activity in front of sharks would have limited impact upon the observed traffic volumes as the surveyed 2020 traffic volumes provide a peak traffic volume of 1,205 and 1,235 vehicles travelling westbound and eastbound respectively. These volumes are within midblock capacities for a single lane (unrestricted) and would be operating at Level of Service (LoS) D based upon the '*RMS Guide to Traffic Generating Developments 2002"*.

2.3.1 Existing Road Performance

The performance of the surrounding intersections under the existing 2020 traffic conditions has been assessed using SIDRA INTERSECTION 9.0, **Table 3** summarises the resultant intersection performance data, with full SIDRA results reproduced in **Annexure C**.

As individual intersection modelling is being undertaken (no network model, or microsimulation), the modelled time periods are as that outlined in **Section 2.3** above. Further, the intersection of Captain Cook Drive / Endeavour Road has been modelled as two (2) stages due to the existing seagull arrangement.

To ensure a calibrated model, on the review of the video footage of the traffic surveys during the AM and PM peak hour periods, the right turn movements into and out of Endeavour Road largely benefited from platooning effects from the signalised intersection of Cawarra Road / Captain Cook Drive. This platooning enabled vehicles to turn in large quantities with gaps between southbound platooning vehicles observed to be up to 70 seconds. To incorporate platooning impacts, the extra bunching input has been used for vehicles travelling southbound along Captain Cook Drive at the intersection of Endeavour Road / Captain Cook Drive.

In addition to this, a review of the right turn movement from Endeavour Road has been undertaken, with the following site observations relevant to note:

- AM Observations:
    - During the AM peak hour period, some vehicles would attempt to turn right from Endeavour Road but chose to turn left onto Captain Cook Drive due to the opposing right turn movement into Endeavour Road.
    - There was no significant queuing observed for right turn movements from Endeavour Road.
    - There was overflow outside of the right turning lane into Endeavour Road, but only occurred occasionally.
    - Modification to bunching factor to be 15%, to ensure the right turn movement out of Endeavour Road operates with an average delay of 42.3 seconds as per **Annexure B**.

- PM Observations
    - The right turn movement from Captain Cook Drive into Endeavour Road did not overflow.
    - The right turn movement from Endeavour Road onto Captain Cook Drive sometimes had queues that backed up to Endeavour Road which runs north south, but never extended past.

To reflect the above condition, specifically the right turn queue from Endeavour Road during the PM peak hour period, the gap acceptance parameter has been modified for right turn movements from Endeavour Road onto Captain Cook Drive. Default gap acceptance parameters results in 95th percentile queue lengths in excess of 400m for the right turn from Endeavour Road during the PM peak hour period, which does not occur. The chosen gap acceptance parameter reduces the queue length to a realistic length.

TABLE 3: EXISTING INTERSECTION PERFORMANCES (SIDRA INTERSECTION 9.0)

Intersection	Peak Hour	Degree of Saturation(1)	Average Delay(2) (sec/vehicle)	Level of Service(3)(4)	Control Type	Worst Movement
EXISTING PERFORMANCE						
Captain Cook Drive / Gannons Road	AM	0.70	8.3 (Worst: 18.5)	**A** (Worst: B)	Roundabout	UT from Captain Cook Drive (E)
	PM	0.69	8.4 (Worst: 18.8)	**A** (Worst: B)		UT from Captain Cook Drive (E)
Captain Cook Drive / Endeavour Road(5)	AM	0.96	N/A (Worst: 43.2)	**N/A** (Worst: D)	Give Way (Seagull)	RT from Captain Cook Drive (S)
	PM	0.92	N/A (Worst: 81.3)	**N/A** (Worst: F)		RT from Endeavour Road (E)

NOTES:

(1) Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.

(2) Average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.

(3) Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets.

(4) N/A – Intersection LoS and Major Road Approach loS values are Not Applicable for two-way sign control since the average delay is not a good LoS measure due to zero delays associated with major through road movements.

(5) Results are based upon Stage 1 only

As shown above, the roundabout intersection of Captain Cook Drive / Gannons Road is operating at Level of Service (LoS) “A” during both the AM and PM peak hour periods. Whilst the intersection of Captain Cook Drive / Endeavour Road is operating with worst turning movement of LoS “D” and LoS “F” during the AM and PM peak hour period respectively.

It should be noted that the right turn movement from Endeavour Road onto Captain Cook Drive during the PM peak hour period is providing a reported 95th percentile queue length of 69m. This is consistent with observed conditions and as such the model can be used to forecast future development impacts.

A LoS "A" indicates the roundabout intersection is operating at a high level of efficiency, with low delays and spare capacity. A LoS "C" condition indicates that an intersection is operating satisfactory with some spare capacity and moderate delays. A LoS "F" condition reflects forced flow, with long delays and queues. The right turn movement from Endeavour Road during the PM peak hour period is operating at LoS "F", indicating that this movement is operating at capacity. The degree of saturation of close to 1 is a further indication that the intersection is at / close to capacity.

2.3.2 Existing Approved Road Environment

As mentioned in **Section 1**, the subject site is operationally redundant, with the exception of Building 1 and 2 and had an approved scale as outlined in **Section 1.3** (prior to Building 1 and 2 recent occupation). The traffic generation of the existing site, relying upon the same traffic generation rates applied in **Section 4** of this report, results in the following traffic generation of the existing approved development as outlined in **Table 4** below.

TABLE 4: ESTIMATED TRAFFIC GENERATION – EXISTING APPROVAL

Building	Use	Scale	Rate	Traffic Generation	
				AM	PM
Building 1	Warehouse(2)	27,738m2(1)	0.5 vehicle trip per 100m2 (AM/PM)	139	139
Building 2	Warehouse (2)	2,015m2(1)	0.5 vehicle trip per 100m2 (AM/PM)	10	10
Building 4	Office(2)	5,094m2	2 vehicle trips per 100m2 (AM/PM)	102	102
	Retail(3)	315m2	2.8 vehicle trips per 100m2 (AM) 5.6 vehicle trips per 100m2 (PM)	9	18
Hub Building & Thiess Building	Office(2)	5,708m2	2 vehicle trips per 100m2 (AM/PM)	114	114
	Workshop (2) (Industrial)	668m2	1 vehicle trip per 100m2 (AM/PM)	7	7
Building 7	Office(2)	175m2	2 vehicle trips per 100m2 (AM/PM)	4	4
	Mechanic (2) (Industrial)	1,706m2	1 vehicle trip per 100m2 (AM/PM)	17	17
	Training Rooms (2) (Business Premises)	824m2	2 vehicle trips per 100m2 (AM/PM)	16	16
Total	-	-	-	**418**	**427**
Directional Split	-	-	-	**333 in, 85 out**	**90 in, 337 out**

Note: 1 – Includes office premises

2 – Assumes 80% inbound, 20% outbound during AM peak; Vice versa for PM peak

3 – Assumes 50% inbound, 50% outbound during the AM peak and PM peak.

As shown above the existing approved development is anticipated to generate **418** vehicle trips in the AM (333 in, 85 out) and **437** vehicle trips in the PM (90 in, 337 out) peak hour periods. Adopting the same trip assignment as outlined in **Section 4.2** and local distribution as Scenario 1 results in the following intersection performances as summarised in **Table 5** below. The detailed SIDRA results are reproduced in **Annexure C** for reference.

TABLE 5: EXISTING PLUS APPROVED SCALE INTERSECTION PERFORMANCES (SIDRA INTERSECTION 9.0)

Intersection	Peak Hour	Degree of Saturation(1)	Average Delay(2) (sec/vehicle)	Level of Service(3)(4)	Control Type	Worst Movement
EXISTING PERFORMANCE + EXISTING APPROVED SCALE						
Captain Cook Drive / Gannons Road	AM	0.75	9.0 (Worst: 20.1)	**A** (Worst: B)	Roundabout	UT from Captain Cook Drive (E)
	PM	0.72	9.9 (Worst: 23.6)	**A** (Worst: B)		UT from Captain Cook Drive (E)
Captain Cook Drive / Endeavour Road(5)	AM	1.1	N/A (Worst: >70)	**N/A** (Worst: F)	Give Way (Seagull)	RT from Captain Cook Drive (S)
	PM	1.4	N/A (Worst: >70)	**N/A** (Worst: F)		RT from Endeavour Road (E)

NOTES:

(1) Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.

(2) Average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.

(3) Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets.

(4) N/A – Intersection LoS and Major Road Approach loS values are Not Applicable for two-way sign control since the average delay is not a good LoS measure due to zero delays associated with major through road movements.

(5) Results are based upon Stage 1 only

As shown above, the intersection of Captain Cook Drive / Gannons Road is operating at Level of Service “A” under the existing approved scale conditions, indicating acceptable delays and spare capacity.

The intersection of Captain Cook Drive / Endeavour Road is operating with worst turning movements of LoS “F” in both the AM and PM peak hour period. This indicates that the intersection of Endeavour Road / Captain Cook Drive is overdue for an infrastructure upgrade. The failing turn movements relate to right turns into Endeavour Road from Captain Cook Drive during the AM peak hour period and right turns out of Endeavour Road onto Captain Cook Drive during the PM peak hour period.

A sensitivity test of the above intersection operation has been undertaken based upon nil (0) increase to right turn movements from Endeavour Road into Captain Cook Drive during both the AM and PM peak hour period. The reason for this is alternative access is available via a right at Captain Cook Drive / Gannons Road roundabout. Based upon equilibrium, which are the basics of traffic engineering theory, road users would seek the shortest travel

time which would be the intersection of Captain Cook Drive / Gannons Road due to the known difficulty of turning right from Endeavour Road onto Captain Cook Drive.

Table 6 below summarises the intersection performance with the detailed SIDRA results reproduced in **Annexure C** for reference.

TABLE 6: EXISTING PLUS APPROVED SCALE INTERSECTION PERFORMANCES SENSITIVITY TEST (SIDRA INTERSECTION 9.0)

Intersection	Peak Hour	Degree of Saturation(1)	Average Delay(2) (sec/vehicle)	Level of Service(3)(4)	Control Type	Worst Movement
EXISTING PERFORMANCE + EXISTING APPROVED SCALE						
Captain Cook Drive / Gannons Road	AM	0.77	9.4 (Worst: 21.0)	**A** (Worst: B)	Roundabout	UT from Captain Cook Drive (E)
	PM	0.76	12.1 (Worst: 30.3)	**A** (Worst: C)		UT from Captain Cook Drive (E)
Captain Cook Drive / Endeavour Road(5)	AM	1.1	N/A (Worst: >70)	**N/A** (Worst: F)	Give Way (Seagull)	RT from Captain Cook Drive (S)
	PM	0.98	N/A (Worst: >70)	**N/A** (Worst: F)		RT from Endeavour Road (E)

NOTES:

(1) Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.

(2) Average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.

(3) Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets.

(4) N/A – Intersection LoS and Major Road Approach LoS values are Not Applicable for two-way sign control since the average delay is not a good LoS measure due to zero delays associated with major through road movements.

(5) Results are based upon Stage 1 only

As shown above, the intersection of Captain Cook Drive / Gannons Road is operating at Level of Service “A” under the existing approved scale conditions within this sensitivity test, indicating acceptable delays and spare capacity.

The intersection of Captain Cook Drive / Endeavour Road is operating with worst turning movements of LoS “F” in both the AM and PM peak hour period. This indicates that the intersection of Endeavour Road / Captain Cook Drive is overdue for an infrastructure upgrade. The failing turn movements relate to right turns into Endeavour Road from Captain Cook Drive during the AM peak hour period and right turns out of Endeavour Road onto Captain Cook Drive during the PM peak hour period.

2.4 Public Transport

Caringbah Train Station and Woolooware Train Station are located 2.2km walking distance to the south-west and 2.3km walking distance to the south-east from the Gannons Road site access respectively. Both stations service the T4 – Eastern Suburbs and Illawarra Line, providing access between Cronulla and Bondi Junction via the Sydney CBD (Central Station and Town Hall Station). Train services are provided 10 – 15 minutes within commuter peak hour periods and 30 minutes outside commuter peak periods.

The location of the site subject to the surrounding public transport network is shown in **Figure 3** below.

FIGURE 3: PUBLIC TRANSPORT NETWORK MAP

2.4.1 Pedestrian & Cycling Facilities

As detailed in **Section 2.1** there are a number of existing bicycle and pedestrian facilities within close proximity to the site along Captain Cook Drive which connect to nearby cycling routes within the Sutherland Shire. **Figure 4** below shows existing constructed bicycle routes. Bicycle routes have already been constructed within close proximity to the site, with the most recent construction completed along the east side of Endeavour Road (site frontage) completed by Aliro and the eastern side of Gannons Road to the south of the site which provided shared pedestrian and bicycle facilities.

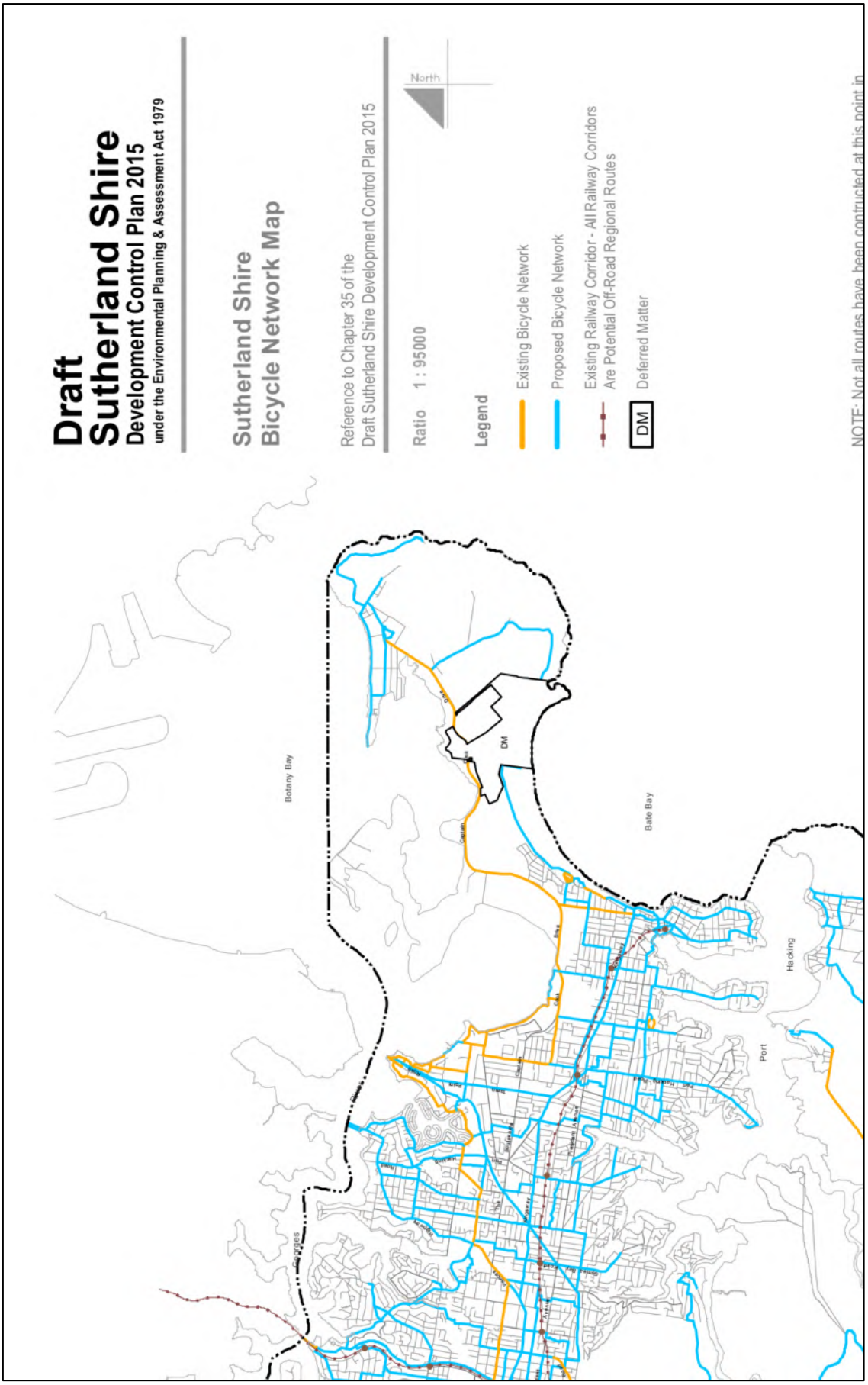


FIGURE 4: SUTHERLAND SHIRE COUNCIL BICYCLE NETWORK MAP

2.5 Future Road and Infrastructure Upgrades

Cronulla Sharks Leagues Club has undergone a four stage redevelopment consisting of residential apartments and retail land uses. Currently Stage 1 and 2 are completed and would have been captured within the existing 2020 intersection traffic surveys, whilst Stage 3 and Stage 4 would have been incomplete and under construction during the collection of survey data. Any future development on the subject site should consider additional traffic loads under the approved Sharks development.

Stage 3 and Stage 4 of the sharks redevelopment consist of the following based upon the *Traffic & Parking Impact Assessment Report* dated 10th February 2020 by *MCLaren Traffic Engineering (18574.01FF)* and the *Traffic & Parking Impact Assessment Report dated 11th August 2016* by *MCLaren Traffic Engineering (15084.05FC)* :

- Stage 3:
    - 238 high density residential developments.
- Stage 4:
    - 255 high density residential developments;
    - 38 hotel rooms;
    - 18,343m^2 Shopping Centre;
    - Revitalised Sharks Leagues Club (4,352m^2 GFA).

The traffic generation as a result of the approved Stage 3 and Stage 4 development is summarised below in **Table 7**.

TABLE 7: TRAFFIC GENERATION TRIPS PER LAND USE (2013 GUIDELINES)

Land Use	Rate[(1)] PM Peak Hour	Scale[(1)]	Traffic Generation AM Peak Hour (Trips per hour)[(2)]	Traffic Generation PM Peak Hour (Trips per hour)
High-Density Residential	0.19 trips / unit	493	94	94
Shopping Centre	6.7 trips / 100m^2 GLFA	18,343m^2	615	1229
Club	168 trips / 8,500m^2	4,352m^2	43	86
Hotel	0.5 trips / room	38	19	19
Total	**-**	**-**	**771**	**1417**

Note: 1- Rates above and scale have been adopted from *MCLaren Traffic Engineering (18574.01FF)* and the *Traffic & Parking Impact Assessment Report dated 11th August 2016* by *MCLaren Traffic Engineering (15084.05FC)*

2 – Retail AM peak hour trip rate is assumed to be half of the PM peak hour period

The above traffic generation has been added to the existing traffic volumes and existing traffic volumes plus existing approved scale based upon the trip distribution as outlined within the *Traffic & Parking Impact Assessment Report* dated 10th February 2020 by *MCLaren Traffic Engineering (18574.01FF).* The results of the SIDRA assessment are reproduced in **Table 8** below, with detailed SIDRA outputs reproduced in **Annexure C** for reference.

The modelling results below are based upon the existing approved development not adding development traffic to the right turn movement from Endeavour Road onto Captain Cook Drive due to existing known issues.

TABLE 8: EXISTING INTERSECTION PERFORMANCES (SIDRA INTERSECTION 9.0)

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2][5] (sec/vehicle)	Level of Service[3][4]	Control Type	Worst Movement
EXISTING PERFORMANCE						
Captain Cook Drive / Gannons Road	AM	0.70	8.3 (Worst: 18.5)	**A** (Worst: B)	Roundabout	UT from Captain Cook Drive (E)
	PM	0.69	8.4 (Worst: 18.8)	**A** (Worst: B)		UT from Captain Cook Drive (E)
Captain Cook Drive / Endeavour Road[5]	AM	0.96	N/A (Worst: 43.2)	**N/A** (Worst: D)	Give Way (Seagull)	RT from Captain Cook Drive (S)
	PM	0.92	N/A (Worst: >70)	**N/A** (Worst: F)		RT from Endeavour Road (E)
EXISTING PERFORMANCE + SHARKS STAGE 3 & 4						
Gannons Road / Captain Cook Drive	AM	0.80	9.8 (Worst: 20.7)	**A** (Worst: B)	Roundabout	U-Turn from Captain Cook Drive (E)
	PM	0.80	10.6 (Worst: 21.5)	**A** (Worst: B)		
Captain Cook Drive / Endeavour Road	AM	1.07	N/A (Worst: >70)	**N/A** (Worst: F)	Give Way (Seagull)	RT from Captain Cook Drive (S)
	PM	1.08	N/A (Worst: >70)	**N/A** (Worst: F)		RT from Endeavour Road (E)
EXISTING PERFORMANCE + SHARKS STAGE 3 & 4 + EXISTING APPROVED SCALE						
Gannons Road / Captain Cook Drive	AM	0.87	12.3 (Worst: 25.9)	**A** (Worst: B)	Roundabout	U-Turn from Captain Cook Drive (E)
	PM	0.94	23.7 (Worst: 73.7)	**B** (Worst: F)		RT from Site Access (N)
Captain Cook Drive / Endeavour Road	AM	1.23	N/A (Worst: >70)	**N/A** (Worst: F)	Give Way (Seagull)	RT from Captain Cook Drive (S)
	PM	1.17	N/A (Worst: >70)	**N/A** (Worst: F)		RT from Endeavour Road (E)

NOTES:

(1) Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.

(2) Average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.

(3) Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets.

(4) Intersection LOS and Major Road Approach LoS are not applicable (N/A) for two-way sign control since the average delays is not a good LOS measure due to zero delays associated with major road movements

(5) Average delay of seagull intersection (Captain Cook Drive / Endeavour Road) is based upon Stage 1 only.

As shown above, the roundabout intersection of Gannons Road / Captain Cook Drive is expected to operate at LoS “A” during the future conditions once the Sharks development has been completed and occupied in both the AM and PM peak hour periods. Under the existing approved development scale and the sharks development the roundabout is expected to operate at LoS “B”, most noticeable is the degree of saturation during the PM peak hour period, which is approaching 1, indicating that the intersection is almost at full operating capacity.

To avoid the intersection of Captain Cook Drive / Gannons Road reaching full capacity, if Endeavour Road / Captain Cook Drive was upgraded to a signalised intersection to facilitate right turns out onto Captain Cook Drive and right turns into Endeavour Road, this would provide greater capacity for the roundabout intersection of Captain Cook Drive / Gannons Road to operate with less average delay and less degree of saturation.

The intersection of Captain Cook Drive / Endeavour Road is expected to operate with worst turning movement of LoS “F” during the AM & PM peak hour periods indicating that under the Sharks development the intersection is exceeding its capacity during the AM & PM peak hour period. This indicates that the intersection requires and is overdue for an infrastructure upgrade regardless of if the site was operating.

Under the existing approved development scale and the Sharks development the intersection is expected to operate with worse turning movement of LoS “F” in both the AM and PM peak hour periods. This indicates that the intersection of Endeavour Road / Captain Cook Drive requires and is overdue for an infrastructure upgrade. The failing turn movements relate to right turns into Endeavour Road from Captain Cook Drive during the AM peak hour period and right turns out of Endeavour Road onto Captain Cook Drive during the PM peak hour period.

Of relevance to note is the degree of saturation for the intersection of Endeavour Road / Captain Cook Drive, which is equal to / exceeding 1, indicating that the right turn movement into Endeavour Road from Captain Cook Drive during the AM peak hour period and the right turn out of Endeavour Road during the PM peak hour period onto Captain Cook Drive is exceeding its operating capacity under the Sharks development scenario and Sharks development plus existing approved scale scenario. Considering this, the intersection of Endeavour Road / Captain Cook Drive will require an infrastructure upgrade.

It should be note that the applicant is currently investigating entering in a WAD agreement with TfNSW to provide an upgrade to the intersection of Endeavour Road / Captain Cook Drive to a signalised intersection.

3 PARKING ASSESSMENT

3.1 Car Parking Provision

To determine the appropriate provision of car parking for the site, reference will be made to *Sutherland Shire Council's Development Control Plan 2015 - Chapter 27 – B7 Business Park* and the *RTA Guide to Traffic Generating Developments 2002*.

Reference is made to *Sutherland Shire Council's Development Control Plan 2015 - Chapter 27 – B7 Business Park & Chapter 36 – Vehicular Access, Traffic, Parking and Bicycles* which outlines the applicable car parking rates for the proposed mixed-use development.

Warehouse & Distributions

Council – 1 space per 300m²

RTA Guide – 1 space per 300m²

Industrial

Council – 1 space per 100m², with a minimum of 2 spaces for each industrial unit.

Any ancillary office component to an industrial development shall provide 1 space per 30m² of gross floor area

RTA Guide – 1.3 spaces per 100m²

Office space component is in excess of 20% of the floor area (refer to Commercial premise for parking requirement)

Office & Business Premises

Council – 1 space per 45m²

RTA Guide – 1 space per 40m²

Retail Premises

Council – 1 space per 45m²

RTA Guide (Specialty Shop) – 1 space per 45m²

Child Care Centre

Council – 1 space per 4 children

RTA Guide – 1 space per 4 children

Based upon the above comparison of car parking rates, standalone office and business premises will rely upon the RTA Guide rather than Council's DCP and the Council Industrial rate makes little sense, as it requires more parking for an ancillary office component compared to a standalone office land use. Considering this, the RTA rate for industrial land uses will be relied upon, and any building that has an office component in excess of 20% for the floor area will be assessed at the RTA Guide office rate of 1 space per 40m².

A summary of the car parking requirements with consideration to the above is outlined in **Table 9** below.

TABLE 9: CAR PARKING REQUIREMENTS

Land Use	Masterplan Scale	Rate	Car Parking Required	Car Parking Provided
Building 1	26,282 GFA Warehouse Premises	1 space per 300m^2 GFA	87.6 (88)	190
Building 2	2,015m^2 GFA Warehouse Premises	1 space per 300m^2 GFA	6.7 (7)	12
Building 3	4,125m^2 GFA Warehouse Premises	1 space per 300m^2 GFA	13.75 (14)	24
	775m^2 GFA Industrial Premises (including office)	1.3 spaces per 100m^2 GFA	10	
Building 4	8,592m^2 GFA Industrial Premises (includes 20% office)	1.3 space per 100m^2 GFA	111.7 (112)	121
	377m^2 GFA Industrial Office Premises (Office space in excess of 20%)	1 space per 40m^2 GFA	9.4 (9)	
Building 5	68 place child care centre (1,219m^2 GFA)	1 space per 4 children	17	93
	112m^2 GFA Cafe	1 space per 45m^2 GFA	2.5 (3)	
	554m^2 GFA Office Premises	1 space per 40m^2 GFA	13.9 (14)	
	1,339m^2 GFA Industrial Premises (includes 20% office)	1.3 space per 100m^2 GFA	17.4 (17)	
	65m^2 GFA Industrial Office Premises (Office space in excess of 20%)	1 space per 40m^2 GFA	2.9 (3)	
	11,615m^2 GFA Warehouse Premises	1 space per 300m^2 GFA	38.7 (39)	
Building 6	2,915m^2 GFA Industrial Premises (includes office)	1.3 space per 100m^2 GFA	37.9 (38)	38
Building 7	4,673m^2 GFA Industrial Premises (includes office)	1.3 space per 100m^2 GFA	60.7 (61)	62
Building 8	1,646m^2 GFA Industrial Premises (include office)	1.3 space per 100m^2 GFA	21.4 (21)	22
Total	**66,404m^2 GFA**	**-**	**453**	**562**

As shown above the site is expected to provide **453** car parking spaces to comply with the recommended car parking requirements for the site based upon the RTA Guide and Council's DCP. The proposed development provides **562** car parking spaces, exceeding the requirements by **109** spaces.

Whilst the above is the case, it is important to ensure each building has a sufficient allocation of car parking. Upon review of the above, all building either comply or exceed the required car parking provision.

It should be noted that no discount has been made to the child care centre car parking requirements, whereas it is highly likely that the users will be associated with the other uses of the site, such that a reduced parent parking demand could be provided. Adopting a 30% reduction for the parent car parking demand, the child care centre could operate with the following allocation:

- 9 staff car parking spaces;
- 5-6 parent parking spaces (70% of 8 spaces).

3.2 Accessible Car Parking

Reference is made to the *National Construction Code 2019* (NCC) – *Volume 1 - Building Code of Australia's* (BCA's) *Table D3.5* which designates the following building classes and accessible parking rates to the proposed development uses. The appropriate accessible car parking rates are presented in **Table 10**.

TABLE 10: ACCESSIBLE PARKING REQUIREMENTS

Land Use	Class of Building	Rate	Car Parking Required	Accessible Space Required
Building 3	Class 7b	1 per 100 spaces	24	1
Building 4	Class 8	1 per 100 spaces	122	2
Building 5	Class 9	1 per 50 spaces	17	1
	Class 6	1 per 50 spaces	3	1
	Class 5	1 per 100 spaces	14	1
	Class 8	1 per 100 spaces	20	1
	Class 7b	1 per 100 spaces	39	1
Building 6	Class 8	1 per 100 spaces	38	1
Building 7	Class 8	1 per 100 spaces	61	1
Building 8	Class 8	1 per 100 spaces	21	1
Total	**-**		**N/A**	**11**

As shown above, the site would require the provision of **11** accessible car parking spaces throughout the car park. Consideration should be made to the location of the accessible car parking spaces in relation to the intended entrance points for each use.

3.3 Bicycle Parking Requirements

Reference is made to *Sutherland Shire Council's Development Control Plan 2015 – Chapter 36 – Vehicular Access, Traffic, Parking and Bicycles & Chapter 27 – B7 Business Park* which state "*Bicycle parking spaces must be provided at the rate of 1 space per 10 car parking spaces for the first 200 car spaces, then 1 space per 20 parking spaces thereafter*".

As no individual building exceeds 200 car parking spaces, bicycle provision will be assessed at a rate of 1 space per 10 car parking spaces. Based upon this, the site should provide 56 bicycle spaces to promote alternative modes of transport. The proposed plans detail the provision of 132 bicycle spaces, exceeding the Council requirements by 76 spaces.

As part of the on-site pedestrian and bicycle facilities, there will be a dedicated 2.5m bicycle and pedestrian shared path that connects to the existing slip road with Solander fields and the Foreshore existing bicycle and pedestrian paths.

3.4 Green Travel Plan

The proposal provides for large floor area of warehouse and distribution, with supplementary uses to support these uses, such as commercial and child care center. Hence, the use of the site will be predominantly by staff employed for the Warehouse & Distribution land uses and hence the need arises for strategies to promote sustainable transport to encourage a people focused hierarchy over the use of private motor vehicles.

To promote active and sustainable transport use, a Green Travel Plan has been prepared in accordance with the *Green Star Communities V1.1 Submission Guidelines* which is reproduced in **Annexure D** for reference. The Green Travel Plan provides an overall objective to shift travel from private cars to active or public transport options, with the following positive implications:

- Reduced parking demand;
- Reduced traffic congestion and trip duration;
- High benefit to cost (BCR) ratio;
- Positive health outcomes from walking and cycling;
- Improved air quality and reduced per-capita emissions;
- Continued recognition that promotion of sustainable transport is on-going and not a one-off.

The implementation of the Green Travel plan for the site will be the responsibility of building tenants and tenant employees and the estate manager.

To achieve a mode shift to promote sustainable transport the following has been incorporated into the masterplan design:

- A 2.5m wide shared path internally which connects to the existing slip road from Solander Fields and connects to existing on-road and off-road cycle paths along Captain Cook Drive:

- The shared path is intended to be utilised by the users of the site rather than enabling the shared path to be open to the public.

- The internal 2.5m wide shared path will also connect to the rear of the site to the existing foreshore shared path that runs between Captain Cook Bridge and Shark Park (up to Woolooware Road with the signalised intersection with Captain Cook Drive / Woolooware Road) which connects to existing on-road and off-road cycle paths.
- Two (2) additional pedestrian connections will be made to the rear shared path near Building 2 and between Building 3 and 4.
- It is expected that greater cycling and pedestrian connectivity will be made in the future, as Sutherland Shire Council's cycle network map details an off-road connection crossing Captain Cook Drive at Endeavour Road.
- The site as part of the sustainable travel mode will investigate the use of private bus facilities. This would potentially start using 12 seater shuttle buses and expand to larger bus facilities as demand increases. A bus stop is located near the intersection of Gannons Road / Captain Cook Drive within the site which is provided with pedestrian facilities to / from buildings on-site.

3.5 Servicing & Loading

Reference is made to Council's DCP which does not designate specific vehicle sizes required for servicing and loading, although Council's DCP does reference the *RTA Guide to Traffic Generating Developments* for design vehicles. Furthermore, Council requires all servicing and loading be undertaken on-site, with vehicles to achieve forward entry and forward exit from the site.

In view of the above, all service vehicles will be capable of entering and exiting the site in a forward direction and all buildings have been assessed for their maximum sized permissible service vehicle. A summary is provided below, with swept paths for the circulation of the estate provided in **Annexure E** for reference:

- Building 3 loading areas will be restricted to 12.5m length Heavy Rigid Vehicles;
- The circulation roadway in front of Building 3 can facilitate the turning movements of 20m length Articulated Vehicles.
- Building 5 loading areas will facilitate access for up to 20m length Articulated Vehicles with the exception of the most southern loading docks for Tenant 5C which is restricted to 12.5m length Heavy Rigid Vehicles.
- Building 4 will be restricted to a 8.8m length Medium Rigid Vehicles.
- Building 6 will be restricted to a combination of 12.5m length Heavy Rigid Vehicles and 8.8m length Medium Rigid Vehicle (end door closest to Solander Fields).

- Building 7 will be restricted to a combination of 12.5m length Heavy Rigid Vehicles and 8.8m length Medium Rigid Vehicle.

- Building 8 will be restricted to a combination of 12.5m length Heavy Rigid Vehicles and 8.8m length Medium Rigid Vehicle (end door furthest from Solander Fields).

- The circulation roadway between Building 5 (Block 1) and Captain Cook Drive can accommodate a 12.5m length Heavy Rigid Vehicle for emergency purposes.

Annexure E provides the swept paths for circulation of the estate by a 12.5m length Heavy Rigid Vehicle representing the circulation for emergency vehicle access throughout the site. These swept paths are successful, indicating that an emergency vehicle (12.5m HRV design vehicle) can successfully circulate the site in case of an emergency.

The above vehicle restrictions should be enforced through tenancy agreements where necessary, and identifiable on-site to drivers through the use of signposting and line marking, as required. The circulation of articulated vehicles through the site, and in particular in an anti-clockwise circulation direction around Building 5 (Block 2) is critical and should be clearly identified via signage, line marking and communications to all tenants.

3.6 Vehicle Access & Parking / Loading

The car parking layout as depicted in **Annexure A,** has been assessed against the relevant standards, namely *AS2890.1:2004*, *AS2890.2:2018* and *AS2890.6:2022.* The estate car parking achieves the following:

- Facilitates two-way passing for 20m length Articulated Vehicles and 12.5m length Heavy Rigid Vehicles where required;
- Facilitates two-way passing for 20m length Articulated Vehicles and 20m length Articulated Vehicles where required;
- Minimum circulation aisle of 7.0m to 8.0m for the major circulation roadway which facilitates two-way commercial vehicle flows. A minimum 7.0m width exceeds the requirements of 6.5m between kerbs as noted within AS2890.2:2018;
- Minimum circulation aisle of 7.0m for minor circulation roadways with parking.
- Car parking spaces with minimum dimensions of 2.4m in width by 5.4m in length for low turn over car parking spaces;
- Child care centre car parking spaces with minimum dimensions of 2.6m in width by 5.4m in length.

Whilst the plans have been assessed to comply with the relevant standards, it is usual and expected that a design certificate be required at the Construction Certificate stage to account for any changes following the development application.

In addition to the above, the following restrictions apply to the circulation of the estate. There are to be no left turns into the Ground Floor for Building 4 by vehicles greater than a 6.4m Length Small Rigid Vehicle.

4 TRAFFIC ASSESSMENT

The impact of the expected traffic generation levels associated with the subject proposal is discussed in the following sub-sections.

4.1 Traffic Generation

Traffic generation rates for the relevant land uses are provided in the *RTA Guide to Traffic Generating Developments (2002)* and recent supplements and are as follows:

RTA Guide

3.5 Office and commercial.

Evening peak hour vehicle trips = 2 per 100m^2 gross floor area

3.6.1 Shopping centres.

V(P) = 56 A(SS) vehicle trips per 1000m^2 GLFA

Where: A(SS): Specialty shops, secondary retail GLFA

3.10.1 Factories

Evening peak hour vehicle trips = 1 per 100m^2 gross floor area

3.10.2 Warehouses

Morning peak hour vehicle trips = 0.5 per 100m^2 gross floor area

TDT 2013/04a

Office blocks

Morning peak hour vehicle trips = 1.6 per 100m^2 gross floor area.

Evening peak hour vehicle trips = 1.2 per 100m^2 gross floor area.

In addition to the application of the above rates, the following assumptions have been incorporated in the calculations in order to conservatively estimate the traffic generation of the proposal:

- The RTA office rate has been applied as the proposed site has limited access to public transport services;
- The RTA office rate has been applied to the factory ancillary office areas only when the office component is in excess of 20% of the floor area;
- Half of the office rate has been adopted for the retail component of the site to consider traffic generated by staff to the retail component which would occur at a lower density compared to offices:
    - No traffic generation for visitors to and from the food and beverage component has been adopted, as it is assumed that all visitors to the retail component are wholly contained on-site and no external visitors come to the site specifically for the retail component.

- The AM and PM rate for factory uses is assumed to be equivalent;
- The AM and PM rate for warehouse uses is assumed to be equivalent;

It is further noted that the research and surveys behind the RTA traffic generation rates for business parks outline the following traffic generation rates:

- 0.52 vehicle trips per 100m^2 GFA during the AM peak hour period;
- 0.56 vehicle trips per 100m^2 GFA during the PM peak hour period;

Adopting the above traffic generation rates for the estate would result in lower overall traffic generation, hence it can be determined that the proposal provides for a conservative assessment.

Based upon the above, the expected traffic generation of the estate is shown in **Table 11.**

TABLE 11: ESTIMATED TRAFFIC GENERATION – MASTERPLAN

Land Use	Masterplan Scale	Rate	Traffic Generation	AM	PM
Building 1	26,282 GFA Warehouse Premises(1)	0.5 per 100m² GFA	131	105 in, 26 out	26 in, 105 out
Building 2	2,015m² GFA Warehouse Premises(1)	0.5 per 100m² GFA	10	8 in, 2 out	2 in, 8 out
Building 3	4,125m² GFA Warehouse Premises(1)	0.5 per 100m² GFA	20	16 in, 4 out	4 in, 16 out
	775m² GFA Industrial Premises (1) (includes office)	1 per 100m² GFA	8	6 in, 2 out	2 in, 6 out
Building 4	9,042m² GFA Industrial Premises (1) (includes office)	1 per 100m² GFA	90	72 in, 18 out	18 in, 72 out
Building 5	68 place child care centre (1,219m² GFA)(2)	0.8 per child – AM 0.7 per child - PM	54/48	27 in, 27 out	24 in, 24 out
	112m² GFA Cafe(1)	1 per 100m² GFA	1	1 in, 0 out	0 in, 1 out
	554m² GFA Office Premises(1)	2 per 100m² GFA	11	9 in, 2 out	2 in, 9 out
	1,404m² GFA Industrial Premises includes office (1)	1 per 100m² GFA	14	11 in, 3 out	3 in, 11 out
	11,615m² GFA Warehouse Premises(1)	0.5 per 100m² GFA	58	47 in, 11 out	11 in, 47 out
Building 6	2,915m² GFA Industrial Premises (includes office) (1)	1 per 100m² GFA	29	23 in, 6 out	6 in, 23 out
Building 7	4,673m² GFA Industrial Premises (includes office) (1)	1 per 100m² GFA	47	38 in, 9 out	9 in, 38 out
Building 8	1,646m² GFA Industrial Premises (include office) (1)	1 per 100m² GFA	16	13 in, 3 out	3 in, 13 out
Total	**66,404m² GFA**	**-**	**489/483**	**376 in, 113 out**	**110 in, 373 out**

Note: (1) Assumes 80% inbound, 20% outbound during AM peak: Vice versa for PM peak.
(2) Assumes 50% inbound, 50% outbound during AM peak and PM peak hour period

As shown, the traffic generation associated with the proposal is in the order of **489** vehicle trips in the AM peak hour period (376 inbound, 113 outbound) and **483** vehicles trips in the PM peak hour period (110 inbound, 373 outbound).

For ease of comparison with the existing operation of the site, the net change of traffic generated by the site between **Table 4** and **Table 11** is summarised in **Table 12**.

.

TABLE 12: ESTIMATED TRAFFIC GENERATION – MASTERPLAN

Development Scale	Traffic Generation	AM	PM
Existing	418 /427	333 in, 85 out	90 in, 337 out
Masterplan Scale	489/483	376 in, 113 out	110 in, 373 out
Net Change	**+71 / +56**	**+43 in, + 28 out**	**+20 in, +36 out**

As shown above the net change in traffic generated by the proposal is **71** additional vehicle trips during the AM peak hour period (43 in, 28 out) and **56** vehicle trips during the PM peak hour period (+20 in, +36 out).

4.2 Trip Assignment

The road network and the locations of residential areas surrounding the site have been assessed, in conjunction of an assessment against Journey to Work data and the following traffic assignment has been adopted for all traffic to and from the site:

- 10% to / from Gannons Road;
- 10% to / from Captain Cook Drive (east);
- 40% to / from Captain Cook Bridge:
    - 20% via Toorak Avenue;
    - 20% via Taren Point Road.
- 40% to / from The Boulevarde.

As the proposed development is predominantly office space, no alternative trip distribution has been adopted for the retail or child care centre of the development.

The detailed distribution to the external road network is outlined in **Annexure F**.

4.3 Traffic Impact

The traffic generation outlined in **Section 4.1** and **4.2** above has been added to the existing traffic volumes recorded and traffic from the approved Stage 3 & 4 Sharks Development. It should be noted that the full development scale traffic as outlined within **Table 11** has been added to ensure a complete reassessment of the site is undertaken. SIDRA INTERSECTION 9.0 was used to assess the intersections performance under the above scenarios. The purpose of this assessment is to compare the existing intersection operations to the future scenario under the increased traffic load.

The detailed SIDRA results are reproduced in **Annexure C** for reference, with a summary of the results shown in **Table 13** below.

TABLE 13: INTERSECTION PERFORMANCE (SIDRA INTERSECTION 9.0)

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2][5] (sec/vehicle)	Level of Service[3][4]	Control Type	Worst Movement
EXISTING PERFORMANCE						
Captain Cook Drive / Gannons Road	AM	0.70	8.3 (Worst: 18.5)	**A** (Worst: B)	Roundabout	UT from Captain Cook Drive (E)
	PM	0.69	8.4 (Worst: 18.8)	**A** (Worst: B)		UT from Captain Cook Drive (E)
Captain Cook Drive / Endeavour Road[5]	AM	0.96	N/A (Worst: 43.2)	**N/A** (Worst: D)	Give Way (Seagull)	RT from Captain Cook Drive (S)
	PM	0.92	N/A (Worst: >70)	**N/A** (Worst: F)		RT from Endeavour Road (E)
EXISTING PERFORMANCE + SHARKS STAGE 3 & 4						
Gannons Road / Captain Cook Drive	AM	0.80	9.8 (Worst: 20.7)	**A** (Worst: B)	Roundabout	U-Turn from Captain Cook Drive (E)
	PM	0.80	10.6 (Worst: 21.5)	**A** (Worst: B)		
Captain Cook Drive / Endeavour Road	AM	1.07	N/A (Worst: >70)	**N/A** (Worst: F)	Give Way (Seagull)	RT from Captain Cook Drive (S)
	PM	1.08	N/A (Worst: >70)	**N/A** (Worst: F)		RT from Endeavour Road (E)
EXISTING PERFORMANCE + SHARKS STAGE 3 & 4 + PROPOSED DEVELOPMENT						
Gannons Road / Captain Cook Drive	AM	0.86	12.0 (Worst: 24.7)	**A** (Worst: B)	Roundabout	U-Turn from Captain Cook Drive (E)
	PM	0.85	15.2 (Worst: 33.8)	**B** (Worst: C)		
Captain Cook Drive / Endeavour Road	AM	1.25	N/A (Worst: >70)	**N/A** (Worst: F)	Give Way (Seagull)	RT from Captain Cook Drive (S)
	PM	1.80	N/A (Worst: >70)	**N/A** (Worst: F)		RT from Endeavour Road (E)

NOTES:

(1) Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.

(2) Average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.

(3) Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets.

(4) Intersection LOS and Major Road Approach LoS are not applicable (N/A) for two-way sign control since the average delays is not a good LOS measure due to zero delays associated with major road movements

(5) Average delay of seagull intersection (Captain Cook Drive / Endeavour Road) is based upon Stage 1 only.

As shown above, the intersection of Gannons Road / Captain Cook Drive is forecast to operate at LoS “A” to LoS “C” during the AM and PM peak hour period respectively. This indicates acceptable delays and spare capacity.

The intersection of Captain Cook Drive / Endeavour Road is operating with worst turning movements of LoS “F” in both the AM and PM peak hour period. This indicates that the intersection of Endeavour Road / Captain Cook Drive is overdue for an infrastructure upgrade. The failing turn movements relate to right turns into Endeavour Road from Captain Cook Drive during the AM peak hour period and right turns out of Endeavour Road onto Captain Cook Drive during the PM peak hour period. This operation is similar to the existing approved operation of the site.

Similar to **Section 2.3.2** a sensitivity test of the above intersection operations has been undertaken based upon nil (0) increase to right turn movements from Endeavour Road into Captain Cook Drive during both the AM and PM peak hour period. The reason for this is alternative access available via right turns at the intersection of Captain Cook Drive / Gannons Road roundabout. Based upon equilibrium, which are the basics of traffic engineering theory, road users would seek the shortest travel time which would be the intersection of Captain Cook Drive / Gannons Road due to the known difficulty of turning right from Endeavour Road onto Captain Cook Drive.

Table 14 below summarises the intersection performance with the detailed SIDRA results reproduced in **Annexure C** for reference.

TABLE 14: INTERSECTION PERFORMANCE – SENSITIVITY TEST

(SIDRA INTERSECTION 9.0)

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2][5] (sec/vehicle)	Level of Service[3][4]	Control Type	Worst Movement
EXISTING PERFORMANCE + SHARKS STAGE 3 & 4 + PROPOSED DEVELOPMENT (NO INCREASE IN RIGHT TURNS AT ENDEAVOUR ROAD)						
Gannons Road / Captain Cook Drive	AM	0.89	13.2 (Worst: 27.8)	**A** (Worst: B)	Roundabout	U-Turn from Captain Cook Drive (E)
	PM	1.0	28.8 (Worst: 134.0)	**C** (Worst: F)		Site Access
Captain Cook Drive / Endeavour Road	AM	1.25	N/A (Worst: >70)	**N/A** (Worst: F)	Give Way (Seagull)	RT from Captain Cook Drive (S)
	PM	1.18	N/A (Worst: >70)	**N/A** (Worst: F)		RT from Endeavour Road (E)

NOTES:

(1) Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.

(2) Average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.

(3) Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets.

(4) Intersection LOS and Major Road Approach LoS are not applicable (N/A) for two-way sign control since the average delays is not a good LOS measure due to zero delays associated with major road movements

(5) Average delay of seagull intersection (Captain Cook Drive / Endeavour Road) is based upon Stage 1 only.

As shown above, the roundabout intersection of Gannons Road / Captain Cook Drive is expected to operate at LoS “A” during the AM peak hour period and LoS “C” during the PM peak hour period. Whilst this is the case, it is relevant to note that the roundabout is at a degree of saturation 1.0, which means that the intersection is at capacity and requires an infrastructure upgrade to increase capacity.

To avoid the intersection of Captain Cook Drive / Gannons Road reaching full capacity, if Endeavour Road / Captain Cook Drive was upgraded to a signalised intersection to facilitate right turns out onto Captain Cook Drive and right turns into Endeavour Road, this would provide greater capacity for the roundabout intersection of Captain Cook Drive / Gannons Road to operate with less average delay and less degree of saturation.

Once intersections reach capacity, large queues and delays start to occur. During the PM peak hour period the roundabout intersection of Gannons Road / Captain Cook Drive has the site access operating at LoS “F” condition with queue lengths up to 134m. Also, the westbound movements along Captain Cook Drive is operating at LoS “E” condition with 180m length queues. This indicates that both these approach legs are failing and an infrastructure upgrade should be investigated, unless there are other alternative travel routes available such as via Northumberland Road.

The intersection of Captain Cook Drive / Endeavour Road is expected to operate with worst turning movement of LoS “F” during the AM & PM peak hour periods indicating that the intersection requires an infrastructure upgrade.

Considering the above assessment, regardless of the proposed development the intersection of Captain Cook Drive / Endeavour Road will be required to be upgraded to ensure an acceptable Level of Service. In the event that the intersection of Captain Cook Drive / Endeavour Road is not upgraded, and the proposed development traffic seeks alternative travel routes to avoid the intersection delay, this results in the roundabout intersection of Gannons Road / Captain Cook Drive producing large queues and delays within the site and for vehicles travelling west through the intersection. This suggests (in addition to a degree of Saturation of 1), that an infrastructure upgrade would be required for the intersection of Captain Cook Drive / Gannons Road.

If the intersection of Captain Cook Drive / Endeavour Road is upgraded to a signalised intersection, the intersection of Captain Cook Drive / Gannons Road would operate under existing roundabout lane arrangements) with an acceptable level of service and delay.

4.3.1 Upgrade of Endeavour Road / Captain Cook Drive – Traffic Signals

To consider the upgraded form of Endeavour Road / Captain Cook Drive, additional traffic modelling has been carried out, based upon the intersection of Endeavour Road / Captain Cook Drive having a geometry as outlined in **Annexure G**, as per the following:

- Signalised intersection, including signalised pedestrian crossings on the southern and eastern side of the intersection;
- A leading right turn phase sequence with a total of three (3) phases.
    - Inclusion of a filter right functionality on the right turn from Captain Cook Drive.
- Extension of the right turn lane along Captain Cook Drive from 60m to 130m
- Adjustments of line marking on the Endeavour Road approach to create two (2) approach lanes (one left turn lane and one right turn lane)
    - Addition of a second 15m short right turn lane at the signalised location, with queuing back into the full-length right turn lane (ensuring that left lane does not become obstructed).
- Removal of the seagull acceleration lane and exit due to the signalisations of the intersection.

A summary of the SIDRA results is reproduced in **Annexure C** for reference, with a summary provided in **Table 15**.

It should be noted that the modelling below replicates the trip distribution as shown in **Annexure F**.

TABLE 15: INTERSECTION PERFORMANCE (SIDRA INTERSECTION 9.0)

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2][5] (sec/vehicle)	Level of Service[3][4]	Control Type	Worst Movement
EXISTING PERFORMANCE + SHARKS STAGE 3 & 4 + PROPOSED DEVELOPMENT						
Gannons Road / Captain Cook Drive	AM	0.86	12.0 (Worst: 24.7)	**A** (Worst: B)	Roundabout	U-Turn from Captain Cook Drive (E)
	PM	0.85	15.2 (Worst: 33.8)	**B** (Worst: C)		
Captain Cook Drive / Endeavour Road	AM	1.25	N/A (Worst: >70)	**N/A** (Worst: F)	Give Way (Seagull)	RT from Captain Cook Drive (S)
	PM	1.80	N/A (Worst: >70)	**N/A** (Worst: F)		RT from Endeavour Road (E)
EXISTING PERFORMANCE + SHARKS STAGE 3 & 4 + PROPOSED DEVELOPMENT WITH TRAFFIC LIGHTS						
Gannons Road / Captain Cook Drive	AM	0.86	12.0 (Worst: 24.7)	**A** (Worst: B)	Roundabout	U-Turn from Captain Cook Drive (E)
	PM	0.85	15.2 (Worst: 33.8)	**B** (Worst: C)		
Captain Cook Drive / Endeavour Road	AM	0.86	25.8	**B**	Signals	N/A
	PM	0.78	19.7	**B**		N/A

NOTES:

(1) Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.

(2) Average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.

(3) Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets.

(4) Intersection LOS and Major Road Approach LoS are not applicable (N/A) for two-way sign control since the average delays is not a good LOS measure due to zero delays associated with major road movements

(5) Average delay of seagull intersection (Captain Cook Drive / Endeavour Road) is based upon Stage 1 only.

As shown above, the upgrade of Captain Cook Drive / Endeavour Road provides significant increases in traffic capacity (and safety), with a change from the operation of the intersection from LoS “F” to LoS “B” in both the AM and PM peak hour periods. The LoS “B” condition represents minor delays and spare capacity.

Based upon the above, with the inclusion of a signalised intersection at Endeavour Road / Captain Cook Drive, the proposed development will resolve the existing traffic flow and safety issues within the road network at the intersection of Endeavour Road / Captain Cook Drive, providing a community benefit.

4.4 External Network Increase in traffic Volume along Captain Cook Drive

In order to accurately determine the increase in traffic generated by the site along Captain Cook Drive at the intersections of either Gannons Road / Captain Cook Drive and Endeavour Road / Captain Cook Drive. A summary has been provided in **Table 16** demonstrating the changes in traffic volumes at each intersection under the assessed scenarios:

TABLE 16: CHANGE IN TRAFFIC VOLUME BASED UPON ASSESSED SCENARIOS

Scenario	Peak Hour Two-way Traffic Volumes (Gannons Road / Captain Cook Drive)		Peak Hour Two-way Traffic Volumes (Endeavour Road / Captain Cook Drive)	
	AM	PM	AM	PM
Existing 2020 Volumes	3,223	3,223	3,162	3,464
Sharks Stage 3 & 4	3,548	3,524	3,344	3,640
Existing Approval	3,761	3,847	3,596	3,898
Proposed Development Net Difference	3,797	3,875	3,638	3,931
Percentage Change from Existing Approval	**0.9%**	**0.7%**	**1.1%**	**0.8%**

Note: Percentage change is based upon volumes under existing approvals to the proposed development traffic volumes - example: (3793-3761)/3761)*100

Based upon the above, it can be determined that the proposed development when considering the existing approval of the site does not contribute significant traffic volumes to the external road network in comparison to the existing traffic volumes recorded and approved development traffic flows.

Considering the above increase in traffic generated by the site along Captain Cook Drive, it may be appropriate for the development to contribute to known or planned infrastructure upgrades. The proposed developments additional traffic generation (above existing approvals) is contributing an additional **71** and **56** vehicle movements during the AM and PM peak hour traffic periods to the overall traffic network. The trip distribution of traffic relates to an increase of at most 1.1% and 0.8% of peak hourly traffic volumes at the intersection of Endeavour Road / Captain Cook Drive in the AM and PM peak hours, respectively. Further, the additional traffic generation equates to an increase of 0.9% and 0.7% of peak hourly traffic volumes at the intersection of Captain Cook Drive / Gannons Road in the AM and PM peak hours, respectively. The additional traffic generation (above existing approvals) associated with the proposed development changes is approximately one (1) vehicle trip per minute.

5 CONCLUSION

The subject Masterplan Mixed Use Development at 13 Endeavour Road, Caringbah (as depicted in **Annexure A**) has been assessed in regards to its traffic and parking impacts. The following outcomes of this masterplan traffic impact assessment are relevant to note:

a) The proposal requires the provision of **453** car parking spaces based upon the RTA Guide and Council's DCP requirements. The plans indicate the provision of **562** car parking spaces, a surplus of **109** spaces from Council's DCP.

b) The car parking layout as depicted in **Annexure A,** has be assessed at the development application stage to ensure compliance with the relevant Australian Standards, namely *AS2890.1:2004*, *AS2890.2:2018*, *AS2890.6:2022* and is deemed to comply. Relevant swept path testing is reproduced in **Annexure E** for reference.

c) All service vehicles will be capable of entering and exiting the site in a forward direction and all building have been assessed for their maximum sized permissible service vehicle. A summary is provided below:

   - Building 3 loading areas will be restricted to 12.5m length Heavy Rigid Vehicles;
   - The circulation roadway in front of Building 3 can facilitate the turning movements of 20m length Articulated Vehicles.
   - Building 5 loading areas will facilitate access for up to 20m length Articulated Vehicles with the exception of the most southern loading docks for Tenant 5C which is restricted to 12.5m length Heavy Rigid Vehicles.
   - Building 4 will be restricted to a 8.8m length Medium Rigid Vehicles.
   - Building 6, 7 ad 8 will be restricted to a combination of 12.5m length Heavy Rigid Vehicles and 8.8m length Medium Rigid Vehicle.

d) The traffic generation associated with the proposal is in the order of **489** vehicle trips in the AM peak hour period (376 inbound, 113 outbound) and **483** vehicles trips in the PM peak hour period (110 inbound, 373 outbound).

e) The impact of the development has been assessed in conjunction with the approved Sharks Development and the following are relevant to note:

   - Regardless of the proposed development, the intersection of Endeavour Road / Captain Cook Drive requires an infrastructure upgrade, with the intersection operating with worst turning movement of LoS "F" when considering the existing traffic volumes and the Sharks redevelopment.
   - Without an infrastructure upgrade at the intersection of Endeavour Road / Captain Cook Drive, the intersection of Gannons Road / Captain Cook Drive

will be operating at capacity under the proposed development scale. As a result of this, internal queues will be present unless there are alternative available traffic routes, such as the use of Northumberland Road.

- If the intersection of Endeavour Road / Captain Cook Drive is upgraded, the intersection of Captain Cook Drive / Gannons Road will be operating at LoS “A” and “B” during the AM and PM peak hour period, which indicates satisfactory operations.

f) Based upon the inclusion of a signalised intersection at Endeavour Road / Captain Cook Drive, the proposed development will resolve the existing traffic flow and safety issues within the road network at the intersection of Endeavour Road / Captain Cook Drive, providing a community benefit.

g) Whilst a contribution to the upgrade of Endeavour Road / Captain Cook Drive to a signalised intersection would be the most appropriate to reflect the extent of proposed development. The applicant is currently investigating the preferred design for the upgrade of Endeavour Road / Captain Cook Drive with TfNSW to enter into a WAD agreement with TfNSW for the upgrade of the intersection.

ANNEXURE A: PROPOSED PLANS

(1 SHEET)

LEVEL 1
BUILDING 4

NOTES

ALL NEW CROSSOVERS IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENTS

ALL DISABLED PARKING SPACES IN ACCORDANCE WITH AUSTRALIAN STANDARD AS2890
(5.4m x 2.4m)

SITE STORMWATER DRAINAGE IN ACCORDANCE WITH LOCAL AUTHORITY & COUNCIL REQUIREMENTS

ALL RELATIVE LEVELS ARE SHOWN TO A.H.D. (Australian Height Datum) LEVELS SHOWN ARE INDICATIVE ONLY AND SUBJECT TO FURTHER CIVIL DETAIL DESIGN. THESE MIGHT VARY +/- 1000 mm

EXTENT OF RETAINING WALLS SHOWN AS INDICATIVE ONLY SUBJECT TO CIVIL REVIEW

GROSS LETTABLE AREA (GLA) IS THE TOTAL FLOOR AREA OF A BUILDING, MEASURED FROM THE OUTSIDE OF EXTERNAL WALLS OR THE CENTRE OF PARTY WALLS AND INCLUDES ALL ROOFED AREAS

5% OF CARPARKING SPACES PROVIDED TO BE DEDICATED AS CAR SHARING BAYS
5% OF CARPARKING SPACES PROVIDED TO BE DEDICATED AS ELECTRICAL VEHICLE BAYS

DEVELOPMENT ANALYSIS

USE		GFA (EXCL LOADING ZONE)
BUILDING 3		
WAREHOUSE	3A	649 m²
WAREHOUSE	3B	676 m²
WAREHOUSE	3C	677 m²
WAREHOUSE	3D	677 m²
WAREHOUSE	3E	698 m²
WAREHOUSE	3F	763 m²
OFFICE	3A	126 m²
OFFICE	3B	127 m²
OFFICE	3C	127 m²
OFFICE	3D	127 m²
OFFICE	3E	127 m²
OFFICE	3F	126 m²
TOTAL AREA		4,900 m²
BUILDING 4		
WAREHOUSE	GROUND LEVEL	4,249 m²
WAREHOUSE	LEVEL 1	2,972 m²
OFFICE MEZZANINE	GROUND LEVEL	884 m²
OFFICE MEZZANINE	LEVEL 1	937 m²
TOTAL AREA		9,042 m²
BUILDING 5 BLOCK 1		
WAREHOUSE	5A	1,071 m²
WAREHOUSE	5B	3,048 m²
WAREHOUSE	5C	2,164 m²
OFFICE	5A	333 m²
OFFICE	5B	431 m²
OFFICE	5C	403 m²
TOTAL AREA		7,450 m²
BUILDING 5 BLOCK 2		
WAREHOUSE	5D	2,732 m²
WAREHOUSE	5E	2,023 m²
OFFICE	5D	424 m²
OFFICE	5E	391 m²
TOTAL AREA		5,570 m²
BUILDING 5 COMMERCIAL		
CAFE		112 m²
CHILDCARE		648 m²
CHILDCARE OUTDOOR		571 m²
COMMERCIAL		554 m²
TOTAL AREA		1,885 m²
BUILDING 6		
WAREHOUSE	6A	892 m²
WAREHOUSE	6B	1,688 m²
OFFICE	6A	154 m²
OFFICE	6B	181 m²
ESTATE MANAGER OFFICE		27 m²
TOTAL AREA		2,942 m²
BUILDING 7		
WAREHOUSE	7A	698 m²
WAREHOUSE	7B	647 m²
WAREHOUSE	7C	644 m²
WAREHOUSE	7D	696 m²
WAREHOUSE	7E	647 m²
WAREHOUSE	7F	644 m²
OFFICE	7A	117 m²
OFFICE	7B	118 m²
OFFICE	7C	117 m²
OFFICE	7D	110 m²
OFFICE	7E	118 m²
OFFICE	7F	117 m²
TOTAL AREA		4,673 m²
BUILDING 8		
WAREHOUSE	8A	744 m²
WAREHOUSE	8B	633 m²
OFFICE	8A	139 m²
OFFICE	8B	130 m²
TOTAL AREA		1,646 m²
GRAND TOTAL GFA		38,108 m²

SITE COVERAGE	
TOTAL SITE AREA	123,898 m²
BUILDING 3 - 8 FOOTPRINT	32,206 m²
BUILDING 1 & 2 FOOTPRINT APPROX.	27,878 m²
SITE COVERAGE APPROX.	48.49%
LANDSCAPING	13.25%

LEGEND

- ESTATE BOUNDARY
- FORESHORE LINE BOUNDARY
- TRANSMISSION EASEMENT
- LANDSCAPE SETBACK
- BUILDING SETBACK
- COUNCIL LAND DEDICATION
- 2.5 m BICYCLE & PEDESTRIAN SHARED PATH
- PEDESTRIAN CONCRETE FOOTPATH
- MAINTENANCE ACCESS TRACK & PEDESTRIAN PATH
- BIORETENTION BASIN / RAIN GARDEN
- EXISTING TREE PROTECTION ZONE
- PROPOSED TREE
- PYLON SIGN

RW	RETAINING WALL
OA	OUTDOOR AREA
RWT	RAIN WATER TANK
W	WASTE AREA
MSB	MAIN SWITCH BOARD
PL	PARCEL LOCKERS
BG	BOOM GATE
RPC	RAISED PEDESTRAIN CROSSING
DP	DELIVERY PARKING BAY
SP	SHARED PARKING BAY (5%)
EV	ELECTRICAL VEHICLE BAY (5%)
EMO	ESTATE MANAGER OFFICE

PARKING PROVISION

PARKING ALLOCATION SHOWN AS INDICATIVE ONLY

		CARS	BICYCLES
Building 1A		52	-
Building 1B		81	-
Building 1C		12	-
Building 1D		35	-
Building 1E		10	-
Building 2		12	-
Building 3		24	12
Building 4		121	64
Building 5	Block 1	48	12
Building 5	Block 2	13	8
Building 5	Childcare	17	4
Building 5	Commercial	15	8
Building 6		38	8
Building 7		62	12
Building 8		22	4
TOTAL		562	132
MOTORBIKES			20

No.	DATE:	REVISION:	BY:	CHK:
P20	24.09.2024	BUILDING 4 & 6, LANDSCAPE UPDATE	AS	JF
D	18.10.2024	FOR LODGEMENT	AS	JF
P21	06.12.2024	FOR INFORMATION	AS	JF
P22	14.01.2024	ISSUE FOR APPROVAL	AS	JF
E	07.02.2025	CAR PARKING REALLOCATION	IO	JF

All areas indicated are indicative for design and planning purposes only and should not be used for any contractual reasons without verification by a licensed surveyor or further design development being completed.

Watson Young Architects P/L Melbourne | Perth | Sydney 03 9516 8555 ACN: 111398700
8 Grattan Street Prahran VIC 3181 | e: info@watsonyoung.com.au | w: watsonyoung.com.au
© Watson Young Architects. This drawing is protected by copyright.

PROJECT:
CARINGBAH MASTERPLAN
13 ENDEAVOUR ROAD, CARINGBAH NSW 2229

TITLE:
ESTATE MASTERPLAN

TRUE NORTH

CLIENT: Aliro

DATE: SEPTEMBER, 2023
DRAWN BY: AS
SCALE: 1:1000 @ A1
SCALE: 1:2000 @ A3

JOB NO: 21366
DRAWING NO: 005
REVISION: E

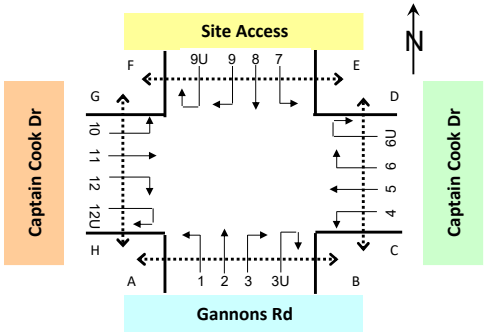
watson young

ANNEXURE B: TRAFFIC COUNTS

(6 SHEETS)

Job No.	: N5571
Client	: McLaren Traffic Engineering
Suburb	: Wooloware
Location	: 1. Captain Cook Dr/ Gannons Rd/ Site Access
Day/Date	: Tue, 4th Feb 2020
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

Classifications	**Class 1**	**Class 2**
	Lights	Heavies



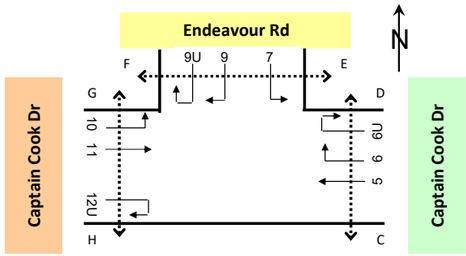
MATRIX Traffic and Transport Data

Approach	**Gannons Rd**												**Captain Cook Dr**											
Direction	**Direction 1 (Left Turn)**			**Direction 2 (Through)**			**Direction 3 (Right Turn)**			**Direction 3U (U Turn)**			**Direction 4 (Left Turn)**			**Direction 5 (Through)**			**Direction 6 (Right Turn)**			**Direction 6U (U Turn)**		
Time Period	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**
7:00 to 7:15	165	0	**165**	0	0	**0**	23	1	**24**	0	0	**0**	26	1	**27**	306	12	**318**	0	0	**0**	1	0	**1**
7:15 to 7:30	168	3	**171**	0	0	**0**	33	4	**37**	0	0	**0**	25	1	**26**	285	21	**306**	1	0	**1**	4	6	**10**
7:30 to 7:45	212	2	**214**	0	0	**0**	30	4	**34**	0	0	**0**	32	1	**33**	263	18	**281**	0	0	**0**	3	1	**4**
7:45 to 8:00	222	4	**226**	0	0	**0**	36	0	**36**	0	0	**0**	22	1	**23**	240	15	**255**	0	0	**0**	7	0	**7**
8:00 to 8:15	177	2	**179**	0	0	**0**	28	2	**30**	0	0	**0**	21	1	**22**	222	25	**247**	1	0	**1**	7	0	**7**
8:15 to 8:30	202	2	**204**	0	0	**0**	36	2	**38**	0	0	**0**	34	2	**36**	246	26	**272**	0	0	**0**	4	1	**5**
8:30 to 8:45	172	2	**174**	0	0	**0**	49	7	**56**	0	0	**0**	23	1	**24**	247	33	**280**	0	0	**0**	2	0	**2**
8:45 to 9:00	221	5	**226**	0	0	**0**	45	2	**47**	0	0	**0**	25	2	**27**	237	40	**277**	0	0	**0**	4	2	**6**
AM Totals	**1,539**	**20**	**1,559**	**0**	**0**	**0**	**280**	**22**	**302**	**0**	**0**	**0**	**208**	**10**	**218**	**2,046**	**190**	**2,236**	**2**	**0**	**2**	**32**	**10**	**42**
16:00 to 16:15	126	1	**127**	0	0	**0**	22	1	**23**	0	0	**0**	19	1	**20**	197	13	**210**	0	0	**0**	4	0	**4**
16:15 to 16:30	96	2	**98**	0	0	**0**	36	0	**36**	0	0	**0**	16	0	**16**	161	10	**171**	0	0	**0**	3	0	**3**
16:30 to 16:45	100	1	**101**	2	0	**2**	32	1	**33**	0	0	**0**	16	2	**18**	176	6	**182**	0	0	**0**	4	0	**4**
16:45 to 17:00	105	4	**109**	0	0	**0**	33	0	**33**	0	0	**0**	14	0	**14**	171	5	**176**	0	0	**0**	5	0	**5**
17:00 to 17:15	131	0	**131**	0	0	**0**	34	1	**35**	0	0	**0**	8	1	**9**	199	4	**203**	0	0	**0**	8	0	**8**
17:15 to 17:30	114	1	**115**	0	0	**0**	22	0	**22**	0	0	**0**	5	0	**5**	206	2	**208**	0	0	**0**	4	0	**4**
17:30 to 17:45	100	3	**103**	0	0	**0**	36	1	**37**	0	0	**0**	11	0	**11**	184	0	**184**	0	0	**0**	5	0	**5**
17:45 to 18:00	104	0	**104**	0	0	**0**	35	0	**35**	0	0	**0**	14	0	**14**	159	3	**162**	0	0	**0**	6	0	**6**
PM Totals	**876**	**12**	**888**	**2**	**0**	**2**	**250**	**4**	**254**	**0**	**0**	**0**	**103**	**4**	**107**	**1,453**	**43**	**1,496**	**0**	**0**	**0**	**39**	**0**	**39**

Approach	Site Access												Captain Cook Dr												Crossing Pedestrians								
Direction	Direction 7 (Left Turn)			Direction 8 (Through)			Direction 9 (Right Turn)			Direction 9U (U Turn)			Direction 10 (Left Turn)			Direction 11 (Through)			Direction 12 (Right Turn)			Direction 12U (U Turn)										
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	B to A	A to B	D to C	C to D	F to E	E to F	H to G	G to H	Total
7:00 to 7:15	1	0	**1**	3	0	**3**	8	0	**8**	0	0	**0**	0	0	**0**	109	32	**141**	103	7	**110**	1	0	**1**	0	0	0	0	0	0	0	0	**0**
7:15 to 7:30	0	0	**0**	3	0	**3**	5	0	**5**	0	0	**0**	0	0	**0**	110	21	**131**	57	8	**65**	1	1	**2**	0	0	0	0	0	0	0	0	**0**
7:30 to 7:45	0	0	**0**	2	0	**2**	4	0	**4**	0	0	**0**	0	0	**0**	146	19	**165**	64	7	**71**	4	1	**5**	0	0	0	0	0	0	0	0	**0**
7:45 to 8:00	2	0	**2**	3	0	**3**	5	0	**5**	0	0	**0**	3	0	**3**	138	30	**168**	67	5	**72**	0	0	**0**	0	0	0	0	0	0	0	0	**0**
8:00 to 8:15	0	0	**0**	4	0	**4**	0	0	**0**	0	0	**0**	0	0	**0**	110	27	**137**	88	11	**99**	1	0	**1**	0	0	0	0	0	0	0	0	**0**
8:15 to 8:30	0	0	**0**	4	0	**4**	3	0	**3**	0	0	**0**	1	0	**1**	150	28	**178**	84	1	**85**	0	0	**0**	0	1	0	0	1	0	0	0	**2**
8:30 to 8:45	3	0	**3**	2	0	**2**	3	0	**3**	0	0	**0**	1	0	**1**	129	14	**143**	129	23	**152**	1	1	**2**	0	0	1	0	0	1	0	0	**2**
8:45 to 9:00	1	0	**1**	3	0	**3**	2	1	**3**	0	0	**0**	4	0	**4**	132	21	**153**	74	3	**77**	1	3	**4**	0	0	0	0	0	0	0	0	**0**
AM Totals	**7**	**0**	**7**	**24**	**0**	**24**	**30**	**1**	**31**	**0**	**0**	**0**	**9**	**0**	**9**	**1,024**	**192**	**1,216**	**666**	**65**	**731**	**9**	**6**	**15**	**0**	**1**	**1**	**0**	**1**	**1**	**0**	**0**	**4**
16:00 to 16:15	0	0	**0**	0	0	**0**	3	0	**3**	0	0	**0**	0	0	**0**	240	9	**249**	167	1	**168**	2	0	**2**	0	0	0	0	0	0	0	0	**0**
16:15 to 16:30	1	0	**1**	1	0	**1**	2	0	**2**	0	0	**0**	0	0	**0**	282	8	**290**	170	0	**170**	3	0	**3**	0	0	0	0	0	0	0	0	**0**
16:30 to 16:45	0	0	**0**	4	0	**4**	9	0	**9**	0	0	**0**	0	0	**0**	285	3	**288**	174	3	**177**	3	0	**3**	0	0	0	0	0	0	0	0	**0**
16:45 to 17:00	1	0	**1**	2	0	**2**	2	0	**2**	0	0	**0**	0	0	**0**	282	6	**288**	169	1	**170**	3	0	**3**	0	0	0	0	0	0	0	0	**0**
17:00 to 17:15	0	0	**0**	2	0	**2**	3	0	**3**	0	0	**0**	0	0	**0**	343	3	**346**	141	2	**143**	8	0	**8**	0	0	0	0	0	0	0	0	**0**
17:15 to 17:30	0	0	**0**	0	0	**0**	5	0	**5**	0	0	**0**	1	0	**1**	310	3	**313**	139	1	**140**	3	0	**3**	0	0	0	0	0	0	0	0	**0**
17:30 to 17:45	0	0	**0**	2	0	**2**	6	0	**6**	0	0	**0**	0	0	**0**	305	1	**306**	131	0	**131**	6	0	**6**	0	0	0	0	0	0	0	0	**0**
17:45 to 18:00	0	0	**0**	1	0	**1**	3	0	**3**	0	0	**0**	0	0	**0**	254	3	**257**	129	0	**129**	3	0	**3**	0	0	0	0	0	0	0	0	**0**
PM Totals	**2**	**0**	**2**	**12**	**0**	**12**	**33**	**0**	**33**	**0**	**0**	**0**	**1**	**0**	**1**	**2,301**	**36**	**2,337**	**1,220**	**8**	**1,228**	**31**	**0**	**31**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Job No.	: N5571
Client	: McLaren Traffic Engineering
Suburb	: Wooloware
Location	: 2. Captain Cook Dr/ Endeavour Rd
Day/Date	: Tue, 4th Feb 2020
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

Classifications	**Class 1**	**Class 2**
	Lights	Heavies



MATRIX Traffic and Transport Data

Approach			**Captain Cook Dr**								
Direction			**Direction 5 (Through)**			**Direction 6 (Right Turn)**			**Direction 6U (U Turn)**		
Time Period			**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**
7:00	to	7:15	329	7	**336**	140	1	**141**	0	0	**0**
7:15	to	7:30	327	19	**346**	156	7	**163**	0	0	**0**
7:30	to	7:45	342	17	**359**	151	4	**155**	0	0	**0**
7:45	to	8:00	325	13	**338**	155	2	**157**	0	0	**0**
8:00	to	8:15	324	25	**349**	88	4	**92**	0	0	**0**
8:15	to	8:30	361	20	**381**	107	7	**114**	0	0	**0**
8:30	to	8:45	313	28	**341**	91	7	**98**	1	0	**1**
8:45	to	9:00	312	35	**347**	123	6	**129**	0	0	**0**
AM Totals			**2,633**	**164**	**2,797**	**1,011**	**38**	**1,049**	**1**	**0**	**1**
16:00	to	16:15	285	5	**290**	60	4	**64**	0	0	**0**
16:15	to	16:30	215	5	**220**	45	4	**49**	0	0	**0**
16:30	to	16:45	246	4	**250**	46	3	**49**	0	0	**0**
16:45	to	17:00	237	8	**245**	43	0	**43**	0	0	**0**
17:00	to	17:15	304	3	**307**	59	0	**59**	0	0	**0**
17:15	to	17:30	261	3	**264**	57	0	**57**	0	0	**0**
17:30	to	17:45	279	2	**281**	45	0	**45**	0	0	**0**
17:45	to	18:00	208	3	**211**	42	0	**42**	0	0	**0**
PM Totals			**2,035**	**33**	**2,068**	**397**	**11**	**408**	**0**	**0**	**0**

Approach	Endeavour Rd									Captain Cook Dr									Crossing Pedestrians						
Direction	Direction 7 (Left Turn)				Direction 9 (Right Turn)			Direction 9U (U Turn)			Direction 10 (Left Turn)			Direction 11 (Through)				Direction 12U (U Turn)							
Time Period	Lights	Heavies	Total		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total		Lights	Heavies	Total		D to C	C to D	F to E	E to F	H to G	G to H	Total
7:00 to 7:15	46	6	**52**		6	1	**7**	0	0	**0**	26	4	**30**	166	29	**195**		0	0	**0**		0	0	0	0	0	0	**0**
7:15 to 7:30	26	7	**33**		3	1	**4**	0	0	**0**	44	2	**46**	138	16	**154**		0	0	**0**		0	0	0	0	0	0	**0**
7:30 to 7:45	51	7	**58**		3	1	**4**	0	0	**0**	38	4	**42**	168	26	**194**		0	0	**0**		0	0	0	0	0	0	**0**
7:45 to 8:00	32	4	**36**		7	1	**8**	0	0	**0**	53	2	**55**	164	24	**188**		0	0	**0**		0	0	0	0	0	0	**0**
8:00 to 8:15	38	10	**48**		7	3	**10**	0	0	**0**	41	1	**42**	179	33	**212**		0	0	**0**		0	0	0	0	0	0	**0**
8:15 to 8:30	45	4	**49**		9	2	**11**	0	0	**0**	47	3	**50**	188	22	**210**		0	0	**0**		0	0	0	0	0	0	**0**
8:30 to 8:45	64	5	**69**		7	1	**8**	0	0	**0**	37	1	**38**	205	30	**235**		0	0	**0**		0	0	0	0	1	0	**1**
8:45 to 9:00	34	5	**39**		10	1	**11**	0	0	**0**	36	6	**42**	162	22	**184**		0	0	**0**		0	0	0	0	0	0	**0**
AM Totals	**336**	**48**	**384**		**52**	**11**	**63**	**0**	**0**	**0**	**322**	**23**	**345**	**1,370**	**202**	**1,572**		**0**	**0**	**0**		**0**	**0**	**0**	**0**	**1**	**0**	**1**
16:00 to 16:15	156	2	**158**		52	3	**55**	0	0	**0**	28	1	**29**	270	5	**275**		0	0	**0**		0	0	0	0	0	1	**1**
16:15 to 16:30	130	1	**131**		39	2	**41**	0	0	**0**	24	3	**27**	300	10	**310**		0	0	**0**		0	0	0	1	0	0	**1**
16:30 to 16:45	138	1	**139**		51	2	**53**	0	0	**0**	25	1	**26**	310	3	**313**		0	0	**0**		0	0	0	1	0	0	**1**
16:45 to 17:00	164	2	**166**		42	1	**43**	0	0	**0**	23	3	**26**	315	4	**319**		0	0	**0**		0	0	0	0	0	0	**0**
17:00 to 17:15	185	2	**187**		72	2	**74**	0	0	**0**	15	3	**18**	311	4	**315**		0	0	**0**		0	0	0	0	0	0	**0**
17:15 to 17:30	143	2	**145**		33	1	**34**	0	0	**0**	21	0	**21**	308	3	**311**		0	0	**0**		0	0	0	0	0	0	**0**
17:30 to 17:45	112	0	**112**		26	1	**27**	0	0	**0**	9	3	**12**	310	1	**311**		0	0	**0**		0	0	1	0	0	0	**1**
17:45 to 18:00	82	1	**83**		29	0	**29**	0	0	**0**	24	0	**24**	298	3	**301**		0	0	**0**		0	0	0	0	0	0	**0**
PM Totals	**1,110**	**11**	**1,121**		**344**	**12**	**356**	**0**	**0**	**0**	**169**	**14**	**183**	**2,422**	**33**	**2,455**		**0**	**0**	**0**		**0**	**0**	**1**	**2**	**0**	**1**	**4**

BVY TRAFFIC SURVEY
Quality data services proven since 2000
ABN 18 434 565 435
3 Hepburn Way * Caroline Springs * Victoria * 3023 * Australia
Phone: 1300 883 936 * Fax: 1300 882 932

SCI QUAL JAS-ANZ SCI QUAL JAS-ANZ
QUALITY ENDORSED COMPANY BY AS/NZS ISO 9001:2008
OH&S SYSTEM CERTIFIED TO AS/NZS ISO 4801:2001

TURNING MOVEMENT SURVEY

Captain Cook Dr and Gannons Rd, Woolooware
Friday, 4 November 2016

Weather:	Fine
Suburban:	Woolooware
Customer:	McLaren

Survey Start	
AM:	
PM:	16:00

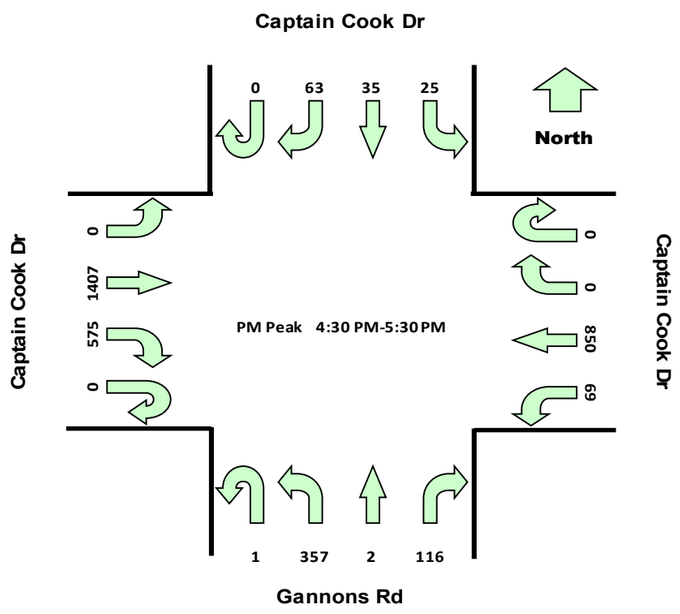
Peakhour	
AM:	
PM:	4:30 PM-5:30 PM

All Vehicles

Time		North Approach Captain Cook Dr				East Approach Captain Cook Dr				South Approach Gannons Rd				West Approach Captain Cook Dr				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
16:00	16:15	0	7	7	0	0	0	218	23	0	39	1	96	0	146	295	0	3327	
16:15	16:30	0	2	5	4	0	0	185	16	0	42	0	94	0	153	316	0	3402	
16:30	16:45	0	5	5	0	0	0	200	20	0	29	1	110	0	163	342	0	3500	Peak
16:45	17:00	0	8	7	2	0	0	185	12	0	32	0	86	0	143	328	0	3376	
17:00	17:15	0	33	13	16	0	0	225	23	1	27	1	89	0	149	330	0	3361	
17:15	17:30	0	17	10	7	0	0	240	14	0	28	0	72	0	120	407	0	3205	
17:30	17:45	0	14	6	6	0	0	191	14	0	36	0	62	0	110	312	0	2978	
17:45	18:00	0	13	2	1	0	0	211	15	1	31	0	69	0	152	293	0	2948	
18:00	18:15	0	13	5	3	0	0	174	18	0	32	1	64	0	136	305	0	2661	
18:15	18:30	0	9	5	3	0	0	165	12	1	31	1	66	0	111	284	0		
18:30	18:45	0	6	2	1	0	0	175	12	1	29	0	61	0	148	284	2		
18:45	19:00	0	2	1	0	0	0	117	12	0	35	0	60	0	81	192	1		

Peak Time		North Approach Captain Cook Dr				East Approach Captain Cook Dr				South Approach Gannons Rd				West Approach Captain Cook Dr				Peak total
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	
16:30	17:30	0	63	35	25	0	0	850	69	1	116	2	357	0	575	1407	0	3500

Graphic



Light Vehicles

Time		North Approach Captain Cook Dr				East Approach Captain Cook Dr				South Approach Gannons Rd				West Approach Captain Cook Dr			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
16:00	16:15	0	6	7	0	0	0	200	23	0	38	1	93	0	144	286	0
16:15	16:30	0	2	5	4	0	0	170	16	0	42	0	89	0	152	308	0
16:30	16:45	0	5	5	0	0	0	192	20	0	28	1	109	0	162	333	0
16:45	17:00	0	8	7	2	0	0	177	12	0	31	0	85	0	143	323	0
17:00	17:15	0	33	13	16	0	0	223	23	1	27	1	88	0	148	322	0
17:15	17:30	0	17	10	7	0	0	239	14	0	28	0	72	0	119	401	0
17:30	17:45	0	14	6	6	0	0	189	14	0	36	0	60	0	108	307	0
17:45	18:00	0	13	2	1	0	0	210	15	1	29	0	68	0	151	288	0
18:00	18:15	0	13	5	3	0	0	173	18	0	32	1	64	0	135	301	0
18:15	18:30	0	9	5	3	0	0	161	12	1	31	1	65	0	110	279	0
18:30	18:45	0	6	2	1	0	0	174	12	1	29	0	61	0	147	278	0
18:45	19:00	0	2	1	0	0	0	116	12	0	35	0	59	0	81	192	0

Heavy Vehicles

Time		North Approach Captain Cook Dr				East Approach Captain Cook Dr				South Approach Gannons Rd				West Approach Captain Cook Dr			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
16:00	16:15	0	1	0	0	0	0	18	0	0	1	0	3	0	2	9	0
16:15	16:30	0	0	0	0	0	0	15	0	0	0	0	5	0	1	8	0
16:30	16:45	0	0	0	0	0	0	8	0	0	1	0	1	0	1	9	0
16:45	17:00	0	0	0	0	0	0	8	0	0	1	0	1	0	0	5	0
17:00	17:15	0	0	0	0	0	0	2	0	0	0	0	1	0	1	8	0
17:15	17:30	0	0	0	0	0	0	1	0	0	0	0	0	0	1	6	0
17:30	17:45	0	0	0	0	0	0	2	0	0	0	0	2	0	2	5	0
17:45	18:00	0	0	0	0	0	0	1	0	0	2	0	1	0	1	5	0
18:00	18:15	0	0	0	0	0	0	1	0	0	0	0	0	0	1	4	0
18:15	18:30	0	0	0	0	0	0	4	0	0	0	0	1	0	1	5	0
18:30	18:45	0	0	0	0	0	0	1	0	0	0	0	0	0	1	6	2
18:45	19:00	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1

Cyclists

Time		North Approach Captain Cook Dr				East Approach Captain Cook Dr				South Approach Gannons Rd				West Approach Captain Cook Dr			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
16:00	16:15	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0
16:15	16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
16:30	16:45	0	1	0	1	0	0	0	1	0	0	0	0	0	1	1	0
16:45	17:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	3	0
17:00	17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0
17:15	17:30	0	0	1	0	0	0	0	0	0	0	0	0	0	0	4	0
17:30	17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0
17:45	18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
18:00	18:15	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0
18:15	18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
18:30	18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
18:45	19:00	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0

Review of Video Footage

AM Peak (7:30am to 8:30am)

Vehicle Arrival	Vehicle Departure	Time	
7:32:52	7:33:13 - turned left		
7:33:06	7:33:16 - turned left		
7:34:07	7:34:12	0:00:05	
7:35:27	7:35:31	0:00:04	
7:36:28	7:37:40	0:01:12	
7:38:28	7:39:23	0:00:55	
7:40:29	7:40:52 - turned left		
7:46:40	7:47:51	0:01:11	
7:48:39	7:49:49	0:01:10	(illegal turn)
7:49:18	7:51:42	0:02:24	
7:49:49	7:51:45	0:01:56	
7:50:59	7:52:00	0:01:01	
7:51:28	7:53:22	0:01:54	illegal turn
7:57:47	7:58:12	0:00:25	
7:58:40	7:59:19	0:00:39	
8:01:57	8:02:06	0:00:09	
8:02:01	8:03:16	0:01:15	
8:04:24	8:05:33	0:01:09	
8:05:08	8:05:53	0:00:45	
8:06:34	8:07:33	0:00:59	
8:09:25	8:09:27	0:00:02	
8:10:46	8:11:01	0:00:15	
8:12:18	8:12:50	0:00:32	
8:13:00	8:13:02	0:00:02	
8:15:09	8:15:45	0:00:36	
8:17:18	8:17:26	0:00:08	
8:18:33	8:19:14	0:00:41	
8:19:40	8:20:25	0:00:45	
8:20:15	8:20:37	0:00:22	
8:22:39	8:22:41	0:00:02	
8:23:31	8:24:02	0:00:31	
8:23:40	8:24:15	0:00:35	
8:23:51	8:24:29	0:00:38	
8:27:19	8:27:58	0:00:39	
8:29:10	8:29:20	0:00:10	
Average Delay		0:00:43	

ANNEXURE C: SIDRA RESULTS

(32 SHEETS)

MOVEMENT SUMMARY

Site: 1 [Captain Cook Drive / Gannons Road - Existing AM (Site Folder: SIDRA FOR 230291 Masterplan Report)]

Captain Cook Drive / Gannons Road
Existing Volumes (4/2/20)
Peak 8:00AM - 9:00AM
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gannons Rd (S)														
1	L2	783	11	824	1.4	0.455	2.5	LOS A	0.0	0.0	0.00	0.34	0.00	48.6
2	T1	1	0	1	0.0	0.302	7.5	LOS A	1.7	12.6	0.82	0.93	0.82	34.2
3	R2	171	13	180	7.6	0.302	11.4	LOS A	1.7	12.6	0.82	0.93	0.82	47.9
3u	U	1	0	1	0.0	0.302	13.0	LOS A	1.7	12.6	0.82	0.93	0.82	45.7
Approach		956	24	1006	2.5	0.455	4.1	LOS A	1.7	12.6	0.15	0.44	0.15	48.5
East: Captain Cook Drive (E)														
4	L2	109	6	115	5.5	0.699	11.3	LOS A	7.1	54.3	0.83	0.95	1.07	49.4
5	T1	1076	124	1133	11.5	0.699	11.4	LOS A	7.3	56.1	0.83	0.94	1.05	55.1
6	R2	1	0	1	0.0	0.699	15.5	LOS B	7.3	56.1	0.82	0.93	1.05	40.4
6u	U	20	3	21	15.0	0.699	18.5	LOS B	7.3	56.1	0.82	0.93	1.05	54.9
Approach		1206	133	1269	11.0	0.699	11.5	LOS A	7.3	56.1	0.83	0.94	1.06	54.5
North: Toyota Access (N)														
7	L2	4	0	4	0.0	0.009	5.4	LOS A	0.0	0.3	0.70	0.57	0.70	38.7
8	T1	13	0	14	0.0	0.034	3.4	LOS A	0.2	1.2	0.70	0.65	0.70	36.0
9	R2	9	1	9	11.1	0.034	6.4	LOS A	0.2	1.2	0.70	0.65	0.70	37.8
9u	U	1	0	1	0.0	0.034	6.9	LOS A	0.2	1.2	0.70	0.65	0.70	31.1
Approach		27	1	28	3.7	0.034	4.8	LOS A	0.2	1.2	0.70	0.64	0.70	36.7
West: Captain Cook Drive (W)														
10	L2	6	0	6	0.0	0.442	6.0	LOS A	3.2	25.3	0.54	0.57	0.54	39.6
11	T1	611	90	643	14.7	0.442	6.5	LOS A	3.4	25.9	0.53	0.59	0.53	59.2
12	R2	413	38	435	9.2	0.442	11.2	LOS A	3.4	25.9	0.51	0.65	0.51	51.8
12u	U	7	4	7	57.1	0.442	14.7	LOS B	3.4	25.9	0.51	0.65	0.51	46.6
Approach		1037	132	1092	12.7	0.442	8.4	LOS A	3.4	25.9	0.52	0.61	0.52	55.8
All Vehicles		3226	290	3396	9.0	0.699	8.3	LOS A	7.3	56.1	0.53	0.68	0.61	52.7

MOVEMENT SUMMARY

Site: 1 [Captain Cook Drive / Gannons Road - Existing PM (Site Folder: SIDRA FOR 230291 Masterplan Report)]

Captain Cook Drive / Gannons Road
Existing Volumes (4/2/20)
Peak 4:30PM - 5:30PM
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gannons Rd (S)														
1	L2	456	6	480	1.3	0.265	2.4	LOS A	0.0	0.0	0.00	0.34	0.00	48.7
2	T1	2	1	2	50.0	0.170	8.0	LOS A	0.9	6.4	0.70	0.83	0.70	34.4
3	R2	123	2	129	1.6	0.170	10.0	LOS A	0.9	6.4	0.70	0.83	0.70	49.5
3u	U	1	1	1	100.0	0.170	15.7	LOS B	0.9	6.4	0.70	0.83	0.70	45.0
Approach		582	10	613	1.7	0.265	4.0	LOS A	0.9	6.4	0.15	0.44	0.15	48.8
East: Captain Cook Drive (E)														
4	L2	46	3	48	6.5	0.583	12.4	LOS A	5.0	35.5	0.86	0.99	1.07	48.9
5	T1	769	17	809	2.2	0.583	12.0	LOS A	5.2	37.0	0.86	0.98	1.07	56.5
6	R2	1	0	1	0.0	0.583	16.4	LOS B	5.2	37.0	0.86	0.97	1.06	40.1
6u	U	21	0	22	0.0	0.583	18.8	LOS B	5.2	37.0	0.86	0.97	1.06	58.1
Approach		837	20	881	2.4	0.583	12.2	LOS A	5.2	37.0	0.86	0.98	1.07	56.0
North: Toyota Access (N)														
7	L2	1	0	1	0.0	0.003	9.2	LOS A	0.0	0.1	0.84	0.62	0.84	37.2
8	T1	8	0	8	0.0	0.064	7.5	LOS A	0.4	2.5	0.88	0.85	0.88	34.5
9	R2	19	0	20	0.0	0.064	10.2	LOS A	0.4	2.5	0.88	0.85	0.88	37.3
9u	U	1	0	1	0.0	0.064	11.0	LOS A	0.4	2.5	0.88	0.85	0.88	30.0
Approach		29	0	31	0.0	0.064	9.4	LOS A	0.4	2.5	0.88	0.84	0.88	36.2
West: Captain Cook Drive (W)														
10	L2	1	0	1	0.0	0.693	6.2	LOS A	7.4	52.0	0.63	0.56	0.63	39.3
11	T1	1235	15	1300	1.2	0.693	6.3	LOS A	7.5	53.1	0.62	0.58	0.62	59.5
12	R2	630	7	663	1.1	0.693	11.1	LOS A	7.5	53.1	0.58	0.61	0.58	52.0
12u	U	17	0	18	0.0	0.693	13.5	LOS A	7.5	53.1	0.58	0.61	0.58	59.2
Approach		1883	22	1982	1.2	0.693	8.0	LOS A	7.5	53.1	0.61	0.59	0.61	56.7
All Vehicles		3331	52	3506	1.6	0.693	8.4	LOS A	7.5	53.1	0.59	0.67	0.64	54.7

MOVEMENT SUMMARY

Site: 1 [Captain Cook Drive / Gannons Road - Existing Approved Scale AM (Site Folder: SIDRA FOR 230291 Masterplan Report)]

Captain Cook Drive / Gannons Road
Existing Volumes (4/2/20)
Peak 8:00AM - 9:00AM
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gannons Rd (S)														
1	L2	783	11	824	1.4	0.455	2.5	LOS A	0.0	0.0	0.00	0.34	0.00	48.6
2	T1	34	0	36	0.0	0.383	8.4	LOS A	2.3	17.2	0.86	0.97	0.93	34.0
3	R2	171	13	180	7.6	0.383	12.4	LOS A	2.3	17.2	0.86	0.97	0.93	47.7
3u	U	1	0	1	0.0	0.383	13.9	LOS A	2.3	17.2	0.86	0.97	0.93	45.5
Approach		989	24	1041	2.4	0.455	4.4	LOS A	2.3	17.2	0.18	0.47	0.19	47.7
East: Captain Cook Drive (E)														
4	L2	109	6	115	5.5	0.748	13.0	LOS A	8.6	65.3	0.89	1.04	1.23	48.3
5	T1	1076	124	1133	11.5	0.748	13.0	LOS A	8.8	67.6	0.89	1.02	1.22	53.7
6	R2	34	0	36	0.0	0.748	17.1	LOS B	8.8	67.6	0.89	1.01	1.21	39.7
6u	U	20	3	21	15.0	0.748	20.1	LOS B	8.8	67.6	0.89	1.01	1.21	53.5
Approach		1239	133	1304	10.7	0.748	13.3	LOS A	8.8	67.6	0.89	1.02	1.22	52.7
North: Toyota Access (N)														
7	L2	13	0	14	0.0	0.032	5.9	LOS A	0.1	1.0	0.73	0.67	0.73	38.5
8	T1	22	0	23	0.0	0.090	3.8	LOS A	0.5	3.3	0.75	0.75	0.75	35.7
9	R2	35	1	37	2.9	0.090	6.6	LOS A	0.5	3.3	0.75	0.75	0.75	38.4
9u	U	1	0	1	0.0	0.090	7.3	LOS A	0.5	3.3	0.75	0.75	0.75	30.9
Approach		71	1	75	1.4	0.090	5.6	LOS A	0.5	3.3	0.74	0.73	0.74	37.4
West: Captain Cook Drive (W)														
10	L2	106	0	112	0.0	0.511	6.5	LOS A	3.9	30.0	0.64	0.63	0.64	39.4
11	T1	611	90	643	14.7	0.511	7.0	LOS A	4.1	31.5	0.63	0.65	0.63	58.8
12	R2	413	38	435	9.2	0.511	11.7	LOS A	4.1	31.5	0.61	0.68	0.61	51.6
12u	U	7	4	7	57.1	0.511	15.3	LOS B	4.1	31.5	0.61	0.68	0.61	46.5
Approach		1137	132	1197	11.6	0.511	8.7	LOS A	4.1	31.5	0.62	0.66	0.62	53.5
All Vehicles		3436	290	3617	8.4	0.748	9.0	LOS A	8.8	67.6	0.60	0.74	0.72	51.0

MOVEMENT SUMMARY

Site: 1 [Captain Cook Drive / Gannons Road - Existing Approved Scale PM (Site Folder: SIDRA FOR 230291 Masterplan Report)]

Captain Cook Drive / Gannons Road
Existing Volumes (4/2/20)
Peak 4:30PM - 5:30PM
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gannons Rd (S)														
1	L2	456	6	480	1.3	0.265	2.4	LOS A	0.0	0.0	0.00	0.34	0.00	48.7
2	T1	11	1	12	9.1	0.200	7.1	LOS A	1.1	7.9	0.75	0.86	0.75	34.4
3	R2	123	2	129	1.6	0.200	10.5	LOS A	1.1	7.9	0.75	0.86	0.75	49.5
3u	U	1	1	1	100.0	0.200	16.5	LOS B	1.1	7.9	0.75	0.86	0.75	45.0
Approach		591	10	622	1.7	0.265	4.2	LOS A	1.1	7.9	0.17	0.46	0.17	48.5
East: Captain Cook Drive (E)														
4	L2	46	3	48	6.5	0.680	17.7	LOS B	6.9	49.1	0.95	1.12	1.39	45.7
5	T1	769	17	809	2.2	0.680	17.0	LOS B	7.4	52.4	0.95	1.12	1.39	52.4
6	R2	10	0	11	0.0	0.680	21.2	LOS B	7.4	52.4	0.96	1.13	1.39	38.1
6u	U	21	0	22	0.0	0.680	23.6	LOS B	7.4	52.4	0.96	1.13	1.39	53.9
Approach		846	20	891	2.4	0.680	17.3	LOS B	7.4	52.4	0.95	1.12	1.39	51.8
North: Toyota Access (N)														
7	L2	35	0	37	0.0	0.118	10.3	LOS A	0.6	4.2	0.86	0.87	0.86	36.8
8	T1	42	0	44	0.0	0.396	10.4	LOS A	2.5	17.8	0.94	1.04	1.08	33.6
9	R2	121	0	127	0.0	0.396	13.1	LOS A	2.5	17.8	0.94	1.04	1.08	36.2
9u	U	1	0	1	0.0	0.396	13.9	LOS A	2.5	17.8	0.94	1.04	1.08	29.3
Approach		199	0	209	0.0	0.396	12.0	LOS A	2.5	17.8	0.92	1.01	1.04	35.7
West: Captain Cook Drive (W)														
10	L2	28	0	29	0.0	0.717	6.4	LOS A	7.8	55.2	0.69	0.59	0.69	39.2
11	T1	1235	15	1300	1.2	0.717	6.5	LOS A	8.0	56.5	0.67	0.60	0.67	59.2
12	R2	630	7	663	1.1	0.717	11.3	LOS A	8.0	56.5	0.64	0.63	0.64	51.8
12u	U	17	0	18	0.0	0.717	13.7	LOS A	8.0	56.5	0.64	0.63	0.64	59.0
Approach		1910	22	2011	1.2	0.717	8.2	LOS A	8.0	56.5	0.66	0.61	0.66	56.1
All Vehicles		3546	52	3733	1.5	0.717	9.9	LOS A	8.0	56.5	0.66	0.73	0.77	52.1

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Existing AM, Stage 1 (Site Folder: SIDRA FOR 230291 Masterplan Report)]

Captain Cook Drive / Endeavour Road
Existing Volumes (4/2/20)
Peak 7:30AM - 8:30AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
3	R2	518	17	545	3.3	0.963	44.0	LOS D	20.7	148.7	0.98	2.24	4.97	34.4
Approach		518	17	545	3.3	0.963	44.0	NA	20.7	148.7	0.98	2.24	4.97	34.4
East: Endeavour Road (E)														
4	L2	191	25	201	13.1	0.118	5.8	LOS A	0.0	0.0	0.00	0.52	0.00	54.4
6	R2	33	7	35	21.2	0.304	43.2	LOS D	1.0	8.3	0.92	1.00	1.05	34.3
Approach		224	32	236	14.3	0.304	11.3	LOS A	1.0	8.3	0.14	0.59	0.15	50.1
North: Captain Cook Drive (N)														
7	L2	189	10	199	5.3	0.223	8.4	LOS A	0.8	5.7	0.50	0.75	0.50	52.0
8	T1	804	105	846	13.1	0.235	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		993	115	1045	11.6	0.235	1.7	LOS A	0.8	5.7	0.10	0.14	0.10	58.2
All Vehicles		1735	164	1826	9.5	0.963	15.6	NA	20.7	148.7	0.36	0.83	1.56	47.4

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Existing AM, Stage 2 (Site Folder: SIDRA FOR 230291 Masterplan Report)]

Captain Cook Drive / Endeavour Road
Existing Volumes (4/2/20)
Peak 7:30AM - 8:30AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
2	T1	1427	75	1502	5.3	0.398	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach		1427	75	1502	5.3	0.398	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.7
East: Endeavour Road (E)														
6	R2	33	7	35	21.2	0.024	7.7	LOS A	0.1	0.7	0.60	0.76	0.60	45.5
Approach		33	7	35	21.2	0.024	7.7	LOS A	0.1	0.7	0.60	0.76	0.60	45.5
All Vehicles		1460	82	1537	5.6	0.398	0.3	NA	0.1	0.7	0.01	0.02	0.01	59.5

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Existing Approved Scale AM, Stage 1 (Site Folder: SIDRA FOR 230291 Masterplan Report)]

Captain Cook Drive / Endeavour Road
Existing Volumes (4/2/20)
Peak 7:30AM - 8:30AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
3	R2	518	17	545	3.3	1.103	128.6	LOS F	47.3	340.3	1.00	3.71	10.04	19.1
Approach		518	17	545	3.3	1.103	128.6	NA	47.3	340.3	1.00	3.71	10.04	19.1
East: Endeavour Road (E)														
4	L2	191	25	201	13.1	0.118	5.8	LOS A	0.0	0.0	0.00	0.52	0.00	54.4
6	R2	59	7	62	11.9	0.603	63.7	LOS E	2.3	17.5	0.96	1.09	1.38	28.8
Approach		250	32	263	12.8	0.603	19.4	LOS B	2.3	17.5	0.23	0.65	0.33	45.1
North: Captain Cook Drive (N)														
7	L2	289	10	304	3.5	0.336	8.9	LOS A	1.4	10.4	0.54	0.81	0.63	51.7
8	T1	904	105	952	11.6	0.262	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1193	115	1256	9.6	0.336	2.2	LOS A	1.4	10.4	0.13	0.20	0.15	57.6
All Vehicles		1961	164	2064	8.4	1.103	37.8	NA	47.3	340.3	0.37	1.18	2.78	36.7

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Existing Approved Scale AM, Stage 2 (Site Folder: SIDRA FOR 230291 Masterplan Report)]

Captain Cook Drive / Endeavour Road
Existing Volumes (4/2/20)
Peak 7:30AM - 8:30AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
2	T1	1453	75	1529	5.2	0.405	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach		1453	75	1529	5.2	0.405	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.7
East: Endeavour Road (E)														
6	R2	59	7	62	11.9	0.043	7.8	LOS A	0.2	1.3	0.61	0.80	0.61	46.1
Approach		59	7	62	11.9	0.043	7.8	LOS A	0.2	1.3	0.61	0.80	0.61	46.1
All Vehicles		1512	82	1592	5.4	0.405	0.4	NA	0.2	1.3	0.02	0.03	0.02	59.3

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Existing PM, Stage 1 (Site Folder: SIDRA FOR 230291 Masterplan Report)]

Captain Cook Drive / Endeavour Road
Existing Volumes (4/2/20)
Peak 4:30PM - 5:30PM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
3	R2	208	3	219	1.4	0.692	28.2	LOS B	4.0	28.5	0.92	1.20	1.78	40.4
Approach		208	3	219	1.4	0.692	28.2	NA	4.0	28.5	0.92	1.20	1.78	40.4
East: Endeavour Road (E)														
4	L2	637	7	671	1.1	0.364	5.7	LOS A	0.0	0.0	0.00	0.53	0.00	54.7
6	R2	204	6	215	2.9	0.913	81.3	LOS F	9.6	68.8	0.99	1.63	3.31	25.4
Approach		841	13	885	1.5	0.913	24.1	LOS B	9.6	68.8	0.24	0.79	0.80	42.9
North: Captain Cook Drive (N)														
7	L2	91	7	96	7.7	0.074	6.5	LOS A	0.3	2.0	0.27	0.56	0.27	53.0
8	T1	1258	14	1324	1.1	0.342	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1349	21	1420	1.6	0.342	0.5	LOS A	0.3	2.0	0.02	0.04	0.02	59.3
All Vehicles		2398	37	2524	1.5	0.913	11.2	NA	9.6	68.8	0.17	0.40	0.45	50.4

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Existing PM, Stage 2 (Site Folder: SIDRA FOR 230291 Masterplan Report)]

Captain Cook Drive / Endeavour Road
Existing Volumes (4/2/20)
Peak 4:30PM - 5:30PM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
2	T1	1066	18	1122	1.7	0.291	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1066	18	1122	1.7	0.291	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
East: Endeavour Road (E)														
6	R2	204	6	215	2.9	0.108	7.0	LOS A	0.4	3.2	0.54	0.75	0.54	46.8
Approach		204	6	215	2.9	0.108	7.0	LOS A	0.4	3.2	0.54	0.75	0.54	46.8
All Vehicles		1270	24	1337	1.9	0.291	1.2	NA	0.4	3.2	0.09	0.12	0.09	58.2

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Existing Approved Scale PM, Stage 1 (Site Folder: SIDRA FOR 230291 Masterplan Report)]

Captain Cook Drive / Endeavour Road
Existing Volumes (4/2/20)
Peak 4:30PM - 5:30PM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
3	R2	208	3	219	1.4	0.724	30.8	LOS C	4.3	30.6	0.93	1.23	1.90	39.3
Approach		208	3	219	1.4	0.724	30.8	NA	4.3	30.6	0.93	1.23	1.90	39.3
East: Endeavour Road (E)														
4	L2	637	7	671	1.1	0.364	5.7	LOS A	0.0	0.0	0.00	0.53	0.00	54.7
6	R2	306	6	322	2.0	1.448	450.1	LOS F	71.1	506.1	1.00	4.42	13.64	7.0
Approach		943	13	993	1.4	1.448	149.9	LOS F	71.1	506.1	0.32	1.79	4.43	17.2
North: Captain Cook Drive (N)														
7	L2	118	7	124	5.9	0.095	6.4	LOS A	0.3	2.5	0.27	0.56	0.27	53.1
8	T1	1285	14	1353	1.1	0.349	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1403	21	1477	1.5	0.349	0.6	LOS A	0.3	2.5	0.02	0.05	0.02	59.2
All Vehicles		2554	37	2688	1.4	1.448	58.2	NA	71.1	506.1	0.21	0.79	1.80	30.4

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Existing Approved Scale PM, Stage 2 (Site Folder: SIDRA FOR 230291 Masterplan Report)]

Captain Cook Drive / Endeavour Road
Existing Volumes (4/2/20)
Peak 4:30PM - 5:30PM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
2	T1	1168	18	1229	1.5	0.318	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1168	18	1229	1.5	0.318	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
East: Endeavour Road (E)														
6	R2	305	6	321	2.0	0.174	7.2	LOS A	0.7	5.1	0.57	0.80	0.57	46.8
Approach		305	6	321	2.0	0.174	7.2	LOS A	0.7	5.1	0.57	0.80	0.57	46.8
All Vehicles		1473	24	1551	1.6	0.318	1.6	NA	0.7	5.1	0.12	0.17	0.12	57.6

MOVEMENT SUMMARY

Site: 1 [Captain Cook Drive / Gannons Road - Existing Approved Scale AM (Site Folder: Sensitivty Test for no Additional Right Turns at Endeavour Road)]

Captain Cook Drive / Gannons Road
Existing Volumes (4/2/20)
Peak 8:00AM - 9:00AM
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gannons Rd (S)														
1	L2	783	11	824	1.4	0.455	2.5	LOS A	0.0	0.0	0.00	0.34	0.00	48.6
2	T1	34	0	36	0.0	0.393	8.8	LOS A	2.4	17.9	0.87	0.98	0.95	33.9
3	R2	171	13	180	7.6	0.393	12.7	LOS A	2.4	17.9	0.87	0.98	0.95	47.5
3u	U	1	0	1	0.0	0.393	14.3	LOS A	2.4	17.9	0.87	0.98	0.95	45.4
Approach		989	24	1041	2.4	0.455	4.5	LOS A	2.4	17.9	0.18	0.47	0.20	47.7
East: Captain Cook Drive (E)														
4	L2	109	6	115	5.5	0.765	14.0	LOS A	9.1	69.5	0.91	1.08	1.31	47.7
5	T1	1076	124	1133	11.5	0.765	14.0	LOS A	9.4	72.2	0.91	1.07	1.30	52.9
6	R2	34	0	36	0.0	0.765	18.0	LOS B	9.4	72.2	0.91	1.06	1.29	39.3
6u	U	20	3	21	15.0	0.765	21.0	LOS B	9.4	72.2	0.91	1.06	1.29	52.7
Approach		1239	133	1304	10.7	0.765	14.2	LOS A	9.4	72.2	0.91	1.07	1.30	51.9
North: Toyota Access (N)														
7	L2	13	0	14	0.0	0.032	5.9	LOS A	0.1	1.0	0.73	0.67	0.73	38.5
8	T1	22	0	23	0.0	0.130	3.9	LOS A	0.7	4.8	0.76	0.78	0.76	35.6
9	R2	61	1	64	1.6	0.130	6.6	LOS A	0.7	4.8	0.76	0.78	0.76	38.4
9u	U	1	0	1	0.0	0.130	7.4	LOS A	0.7	4.8	0.76	0.78	0.76	30.8
Approach		97	1	102	1.0	0.130	5.9	LOS A	0.7	4.8	0.75	0.77	0.75	37.6
West: Captain Cook Drive (W)														
10	L2	106	0	112	0.0	0.512	6.5	LOS A	3.9	30.1	0.64	0.63	0.64	39.4
11	T1	611	90	643	14.7	0.512	7.0	LOS A	4.1	31.6	0.63	0.65	0.63	58.8
12	R2	413	38	435	9.2	0.512	11.7	LOS A	4.1	31.6	0.62	0.68	0.62	51.6
12u	U	7	4	7	57.1	0.512	15.3	LOS B	4.1	31.6	0.62	0.68	0.62	46.5
Approach		1137	132	1197	11.6	0.512	8.7	LOS A	4.1	31.6	0.63	0.66	0.63	53.5
All Vehicles		3462	290	3644	8.4	0.765	9.4	LOS A	9.4	72.2	0.61	0.75	0.75	50.6

MOVEMENT SUMMARY

Site: 1 [Captain Cook Drive / Gannons Road - Existing Approved Scale PM (Site Folder: Sensitivty Test for no Additional Right Turns at Endeavour Road)]

Captain Cook Drive / Gannons Road
Existing Volumes (4/2/20)
Peak 4:30PM - 5:30PM
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gannons Rd (S)														
1	L2	456	6	480	1.3	0.265	2.4	LOS A	0.0	0.0	0.00	0.34	0.00	48.7
2	T1	11	1	12	9.1	0.217	7.6	LOS A	1.2	8.8	0.79	0.89	0.79	34.3
3	R2	123	2	129	1.6	0.217	11.0	LOS A	1.2	8.8	0.79	0.89	0.79	49.3
3u	U	1	1	1	100.0	0.217	17.4	LOS B	1.2	8.8	0.79	0.89	0.79	44.9
Approach		591	10	622	1.7	0.265	4.3	LOS A	1.2	8.8	0.18	0.46	0.18	48.5
East: Captain Cook Drive (E)														
4	L2	46	3	48	6.5	0.756	24.9	LOS B	8.9	64.0	1.00	1.24	1.73	42.0
5	T1	769	17	809	2.2	0.756	23.9	LOS B	9.8	69.7	1.00	1.24	1.73	47.8
6	R2	10	0	11	0.0	0.756	27.9	LOS B	9.8	69.7	1.00	1.25	1.73	35.6
6u	U	21	0	22	0.0	0.756	30.3	LOS C	9.8	69.7	1.00	1.25	1.73	49.1
Approach		846	20	891	2.4	0.756	24.2	LOS B	9.8	69.7	1.00	1.24	1.73	47.3
North: Toyota Access (N)														
7	L2	35	0	37	0.0	0.118	10.3	LOS A	0.6	4.2	0.86	0.87	0.86	36.8
8	T1	42	0	44	0.0	0.642	17.7	LOS B	5.1	35.9	0.98	1.29	1.50	31.4
9	R2	222	0	234	0.0	0.642	20.4	LOS B	5.1	35.9	0.98	1.29	1.50	33.8
9u	U	1	0	1	0.0	0.642	21.2	LOS B	5.1	35.9	0.98	1.29	1.50	27.7
Approach		300	0	316	0.0	0.642	18.8	LOS B	5.1	35.9	0.96	1.24	1.42	33.7
West: Captain Cook Drive (W)														
10	L2	28	0	29	0.0	0.718	6.4	LOS A	7.9	55.7	0.69	0.59	0.69	39.2
11	T1	1235	15	1300	1.2	0.718	6.5	LOS A	8.1	57.1	0.68	0.60	0.68	59.2
12	R2	630	7	663	1.1	0.718	11.3	LOS A	8.1	57.1	0.64	0.63	0.64	51.8
12u	U	17	0	18	0.0	0.718	13.7	LOS A	8.1	57.1	0.64	0.63	0.64	59.0
Approach		1910	22	2011	1.2	0.718	8.2	LOS A	8.1	57.1	0.67	0.61	0.67	56.1
All Vehicles		3647	52	3839	1.4	0.756	12.1	LOS A	9.8	69.7	0.69	0.78	0.90	49.9

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Existing Approved Scale AM, Stage 1 (Site Folder: Sensitivty Test for no Additional Right Turns at Endeavour Road)]

Captain Cook Drive / Endeavour Road
Existing Volumes (4/2/20)
Peak 7:30AM - 8:30AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
3	R2	518	17	545	3.3	1.103	128.6	LOS F	47.3	340.3	1.00	3.71	10.04	19.1
Approach		518	17	545	3.3	1.103	128.6	NA	47.3	340.3	1.00	3.71	10.04	19.1
East: Endeavour Road (E)														
4	L2	191	25	201	13.1	0.118	5.8	LOS A	0.0	0.0	0.00	0.52	0.00	54.4
6	R2	33	7	35	21.2	0.394	58.8	LOS E	1.3	10.7	0.95	1.02	1.13	29.9
Approach		224	32	236	14.3	0.394	13.6	LOS A	1.3	10.7	0.14	0.59	0.17	48.6
North: Captain Cook Drive (N)														
7	L2	289	10	304	3.5	0.336	8.9	LOS A	1.4	10.4	0.54	0.81	0.63	51.7
8	T1	904	105	952	11.6	0.262	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1193	115	1256	9.6	0.336	2.2	LOS A	1.4	10.4	0.13	0.20	0.15	57.6
All Vehicles		1935	164	2037	8.5	1.103	37.4	NA	47.3	340.3	0.36	1.18	2.80	36.9

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Existing Approved Scale AM, Stage 2 (Site Folder: Sensitivty Test for no Additional Right Turns at Endeavour Road)]

Captain Cook Drive / Endeavour Road
Existing Volumes (4/2/20)
Peak 7:30AM - 8:30AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
2	T1	1453	75	1529	5.2	0.405	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach		1453	75	1529	5.2	0.405	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.7
East: Endeavour Road (E)														
6	R2	33	7	35	21.2	0.024	7.8	LOS A	0.1	0.8	0.61	0.76	0.61	45.5
Approach		33	7	35	21.2	0.024	7.8	LOS A	0.1	0.8	0.61	0.76	0.61	45.5
All Vehicles		1486	82	1564	5.5	0.405	0.3	NA	0.1	0.8	0.01	0.02	0.01	59.5

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Existing Approved Scale PM, Stage 1 (Site Folder: Sensitivty Test for no Additional Right Turns at Endeavour Road)]

Captain Cook Drive / Endeavour Road
Existing Volumes (4/2/20)
Peak 4:30PM - 5:30PM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
3	R2	208	3	219	1.4	0.724	30.8	LOS C	4.3	30.6	0.93	1.23	1.90	39.3
Approach		208	3	219	1.4	0.724	30.8	NA	4.3	30.6	0.93	1.23	1.90	39.3
East: Endeavour Road (E)														
4	L2	637	7	671	1.1	0.364	5.7	LOS A	0.0	0.0	0.00	0.53	0.00	54.7
6	R2	204	6	215	2.9	0.980	111.1	LOS F	13.1	93.7	1.00	1.87	4.22	21.1
Approach		841	13	885	1.5	0.980	31.3	LOS C	13.1	93.7	0.24	0.85	1.02	39.6
North: Captain Cook Drive (N)														
7	L2	118	7	124	5.9	0.095	6.4	LOS A	0.3	2.5	0.27	0.56	0.27	53.1
8	T1	1285	14	1353	1.1	0.349	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1403	21	1477	1.5	0.349	0.6	LOS A	0.3	2.5	0.02	0.05	0.02	59.2
All Vehicles		2452	37	2581	1.5	0.980	13.7	NA	13.1	93.7	0.17	0.42	0.52	48.7

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Existing Approved Scale PM, Stage 2 (Site Folder: Sensitivty Test for no Additional Right Turns at Endeavour Road)]

Captain Cook Drive / Endeavour Road
Existing Volumes (4/2/20)
Peak 4:30PM - 5:30PM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
2	T1	1168	18	1229	1.5	0.318	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1168	18	1229	1.5	0.318	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
East: Endeavour Road (E)														
6	R2	204	6	215	2.9	0.116	7.1	LOS A	0.5	3.4	0.56	0.78	0.56	46.7
Approach		204	6	215	2.9	0.116	7.1	LOS A	0.5	3.4	0.56	0.78	0.56	46.7
All Vehicles		1372	24	1444	1.7	0.318	1.1	NA	0.5	3.4	0.08	0.12	0.08	58.3

MOVEMENT SUMMARY

Site: 1 [Captain Cook Drive / Gannons Road - Existing + Sharks AM (Site Folder: Sharks Additional Volume + Existing Approved Development)]

Captain Cook Drive / Gannons Road
Existing Volumes (4/2/20)
Peak 8:00AM - 9:00AM
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gannons Rd (S)														
1	L2	783	11	824	1.4	0.455	2.5	LOS A	0.0	0.0	0.00	0.34	0.00	48.6
2	T1	1	0	1	0.0	0.509	10.6	LOS A	3.5	25.3	0.91	1.04	1.09	33.3
3	R2	253	13	266	5.1	0.509	14.4	LOS A	3.5	25.3	0.91	1.04	1.09	46.6
3u	U	1	0	1	0.0	0.509	16.0	LOS B	3.5	25.3	0.91	1.04	1.09	44.1
Approach		1038	24	1093	2.3	0.509	5.4	LOS A	3.5	25.3	0.22	0.51	0.27	48.1
East: Captain Cook Drive (E)														
4	L2	157	6	165	3.8	0.798	13.7	LOS A	10.5	79.1	0.93	1.07	1.33	47.9
5	T1	1186	124	1248	10.5	0.798	13.7	LOS A	10.8	82.4	0.93	1.05	1.31	53.4
6	R2	1	0	1	0.0	0.798	17.8	LOS B	10.8	82.4	0.93	1.04	1.30	39.4
6u	U	25	3	26	12.0	0.798	20.7	LOS B	10.8	82.4	0.93	1.04	1.30	53.8
Approach		1369	133	1441	9.7	0.798	13.8	LOS A	10.8	82.4	0.93	1.05	1.32	52.7
North: Toyota Access (N)														
7	L2	4	0	4	0.0	0.011	6.4	LOS A	0.0	0.3	0.75	0.63	0.75	38.3
8	T1	13	0	14	0.0	0.040	4.2	LOS A	0.2	1.5	0.77	0.71	0.77	35.8
9	R2	9	1	9	11.1	0.040	7.3	LOS A	0.2	1.5	0.77	0.71	0.77	37.6
9u	U	1	0	1	0.0	0.040	7.7	LOS A	0.2	1.5	0.77	0.71	0.77	31.0
Approach		27	1	28	3.7	0.040	5.7	LOS A	0.2	1.5	0.77	0.70	0.77	36.5
West: Captain Cook Drive (W)														
10	L2	6	0	6	0.0	0.519	6.7	LOS A	4.0	31.4	0.68	0.64	0.68	39.2
11	T1	688	90	724	13.1	0.519	7.2	LOS A	4.3	32.8	0.67	0.65	0.67	58.6
12	R2	413	38	435	9.2	0.519	11.8	LOS A	4.3	32.8	0.66	0.69	0.66	51.5
12u	U	7	4	7	57.1	0.519	15.5	LOS B	4.3	32.8	0.66	0.69	0.66	46.4
Approach		1114	132	1173	11.8	0.519	8.9	LOS A	4.3	32.8	0.67	0.66	0.67	55.5
All Vehicles		3548	290	3735	8.2	0.798	9.8	LOS A	10.8	82.4	0.64	0.77	0.80	51.9

MOVEMENT SUMMARY

Site: 1 [Captain Cook Drive / Gannons Road - Existing+ Sharks PM (Site Folder: Sharks Additional Volume + Existing Approved Development)]

Captain Cook Drive / Gannons Road
Existing Volumes (4/2/20)
Peak 4:30PM - 5:30PM
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gannons Rd (S)														
1	L2	456	6	480	1.3	0.265	2.4	LOS A	0.0	0.0	0.00	0.34	0.00	48.7
2	T1	2	1	2	50.0	0.298	8.7	LOS A	1.7	12.1	0.78	0.87	0.78	34.3
3	R2	199	2	209	1.0	0.298	10.4	LOS A	1.7	12.1	0.78	0.87	0.78	49.4
3u	U	1	1	1	100.0	0.298	16.7	LOS B	1.7	12.1	0.78	0.87	0.78	44.8
Approach		658	10	693	1.5	0.298	4.9	LOS A	1.7	12.1	0.24	0.50	0.24	48.9
East: Captain Cook Drive (E)														
4	L2	84	3	88	3.6	0.712	15.1	LOS B	7.6	54.4	0.96	1.11	1.34	47.1
5	T1	850	17	895	2.0	0.712	14.8	LOS B	8.0	57.2	0.96	1.10	1.34	54.2
6	R2	1	0	1	0.0	0.712	19.1	LOS B	8.0	57.2	0.97	1.10	1.33	39.0
6u	U	29	0	31	0.0	0.712	21.5	LOS B	8.0	57.2	0.97	1.10	1.33	55.7
Approach		964	20	1015	2.1	0.712	15.0	LOS B	8.0	57.2	0.96	1.10	1.34	53.5
North: Toyota Access (N)														
7	L2	1	0	1	0.0	0.004	12.3	LOS A	0.0	0.2	0.91	0.68	0.91	36.1
8	T1	8	0	8	0.0	0.091	10.6	LOS A	0.6	3.9	0.95	0.93	0.95	33.5
9	R2	19	0	20	0.0	0.091	13.3	LOS A	0.6	3.9	0.95	0.93	0.95	36.2
9u	U	1	0	1	0.0	0.091	14.1	LOS A	0.6	3.9	0.95	0.93	0.95	29.3
Approach		29	0	31	0.0	0.091	12.5	LOS A	0.6	3.9	0.95	0.92	0.95	35.1
West: Captain Cook Drive (W)														
10	L2	1	0	1	0.0	0.796	9.1	LOS A	11.9	84.2	0.87	0.77	0.99	38.7
11	T1	1330	15	1400	1.1	0.796	9.0	LOS A	11.9	84.2	0.85	0.75	0.96	58.2
12	R2	630	7	663	1.1	0.796	13.2	LOS A	11.6	82.3	0.82	0.72	0.89	51.2
12u	U	17	0	18	0.0	0.796	15.5	LOS B	11.6	82.3	0.82	0.72	0.89	58.2
Approach		1978	22	2082	1.1	0.796	10.4	LOS A	11.9	84.2	0.84	0.74	0.94	55.7
All Vehicles		3629	52	3820	1.4	0.796	10.6	LOS A	11.9	84.2	0.77	0.80	0.92	53.6

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Existing+ Sharks AM, Stage 1 (Site Folder: Sharks Additional Volume + Existing Approved Development)]

Captain Cook Drive / Endeavour Road
Existing Volumes (4/2/20)
Peak 7:30AM - 8:30AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
3	R2	518	17	545	3.3	1.069	102.2	LOS F	39.6	285.1	1.00	3.32	8.66	22.1
Approach		518	17	545	3.3	1.069	102.2	NA	39.6	285.1	1.00	3.32	8.66	22.1
East: Endeavour Road (E)														
4	L2	191	25	201	13.1	0.118	5.8	LOS A	0.0	0.0	0.00	0.52	0.00	54.4
6	R2	33	7	35	21.2	0.344	50.0	LOS D	1.1	9.4	0.94	1.01	1.09	32.2
Approach		224	32	236	14.3	0.344	12.3	LOS A	1.1	9.4	0.14	0.59	0.16	49.5
North: Captain Cook Drive (N)														
7	L2	189	10	199	5.3	0.223	8.4	LOS A	0.8	5.7	0.50	0.75	0.50	52.0
8	T1	881	105	927	11.9	0.256	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		1070	115	1126	10.7	0.256	1.6	LOS A	0.8	5.7	0.09	0.13	0.09	58.3
All Vehicles		1812	164	1907	9.1	1.069	31.7	NA	39.6	285.1	0.36	1.10	2.55	39.1

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Existing + Sharks AM, Stage 2 (Site Folder: Sharks Additional Volume + Existing Approved Development)]

Captain Cook Drive / Endeavour Road
Existing Volumes (4/2/20)
Peak 7:30AM - 8:30AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
2	T1	1537	75	1618	4.9	0.428	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach		1537	75	1618	4.9	0.428	0.2	NA	0.0	0.0	0.00	0.00	0.00	59.7
East: Endeavour Road (E)														
6	R2	33	7	35	21.2	0.026	8.0	LOS A	0.1	0.8	0.64	0.79	0.64	45.3
Approach		33	7	35	21.2	0.026	8.0	LOS A	0.1	0.8	0.64	0.79	0.64	45.3
All Vehicles		1570	82	1653	5.2	0.428	0.3	NA	0.1	0.8	0.01	0.02	0.01	59.4

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Existing+ Sharks PM, Stage 1 (Site Folder: Sharks Additional Volume + Existing Approved Development)]

Captain Cook Drive / Endeavour Road
Existing Volumes (4/2/20)
Peak 4:30PM - 5:30PM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
3	R2	208	3	219	1.4	0.813	40.9	LOS C	5.5	38.7	0.96	1.35	2.36	35.4
Approach		208	3	219	1.4	0.813	40.9	NA	5.5	38.7	0.96	1.35	2.36	35.4
East: Endeavour Road (E)														
4	L2	637	7	671	1.1	0.364	5.7	LOS A	0.0	0.0	0.00	0.53	0.00	54.7
6	R2	204	6	215	2.9	1.084	173.1	LOS F	20.9	150.1	1.00	2.32	5.94	15.4
Approach		841	13	885	1.5	1.084	46.3	LOS D	20.9	150.1	0.24	0.96	1.44	33.9
North: Captain Cook Drive (N)														
7	L2	91	7	96	7.7	0.074	6.5	LOS A	0.3	2.0	0.27	0.56	0.27	53.0
8	T1	1353	14	1424	1.0	0.368	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1444	21	1520	1.5	0.368	0.5	LOS A	0.3	2.0	0.02	0.04	0.02	59.3
All Vehicles		2493	37	2624	1.5	1.084	19.3	NA	20.9	150.1	0.17	0.46	0.69	45.2

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Existing + Sharks PM, Stage 2 (Site Folder: Sharks Additional Volume + Existing Approved Development)]

Captain Cook Drive / Endeavour Road
Existing Volumes (4/2/20)
Peak 4:30PM - 5:30PM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
2	T1	1147	18	1207	1.6	0.313	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1147	18	1207	1.6	0.313	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
East: Endeavour Road (E)														
6	R2	204	6	215	2.9	0.115	7.1	LOS A	0.5	3.4	0.56	0.78	0.56	46.8
Approach		204	6	215	2.9	0.115	7.1	LOS A	0.5	3.4	0.56	0.78	0.56	46.8
All Vehicles		1351	24	1422	1.8	0.313	1.2	NA	0.5	3.4	0.08	0.12	0.08	58.2

MOVEMENT SUMMARY

Site: 1 [Captain Cook Drive / Gannons Road - Existing Approved + Sharks AM (Site Folder: Sharks Additional Volume + Existing Approved Development)]

Captain Cook Drive / Gannons Road
Existing Volumes (4/2/20)
Peak 8:00AM - 9:00AM
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gannons Rd (S)														
1	L2	783	11	824	1.4	0.455	2.5	LOS A	0.0	0.0	0.00	0.34	0.00	48.6
2	T1	34	0	36	0.0	0.611	12.9	LOS A	4.5	33.0	0.95	1.09	1.22	32.7
3	R2	253	13	266	5.1	0.611	16.8	LOS B	4.5	33.0	0.95	1.09	1.22	45.5
3u	U	1	0	1	0.0	0.611	18.4	LOS B	4.5	33.0	0.95	1.09	1.22	43.2
Approach		1071	24	1127	2.2	0.611	6.2	LOS A	4.5	33.0	0.26	0.54	0.33	47.1
East: Captain Cook Drive (E)														
4	L2	157	6	165	3.8	0.873	19.3	LOS B	14.7	110.4	1.00	1.26	1.74	44.7
5	T1	1186	124	1248	10.5	0.873	19.1	LOS B	15.3	115.9	1.00	1.25	1.72	49.5
6	R2	34	0	36	0.0	0.873	23.0	LOS B	15.3	115.9	1.00	1.24	1.71	37.3
6u	U	25	3	26	12.0	0.873	25.9	LOS B	15.3	115.9	1.00	1.24	1.71	49.9
Approach		1402	133	1476	9.5	0.873	19.3	LOS B	15.3	115.9	1.00	1.25	1.73	48.6
North: Toyota Access (N)														
7	L2	13	0	14	0.0	0.037	7.0	LOS A	0.2	1.2	0.78	0.73	0.78	38.0
8	T1	74	0	78	0.0	0.154	4.9	LOS A	0.9	6.1	0.83	0.82	0.83	35.9
9	R2	9	1	9	11.1	0.154	8.0	LOS A	0.9	6.1	0.83	0.82	0.83	37.7
9u	U	1	0	1	0.0	0.154	8.4	LOS A	0.9	6.1	0.83	0.82	0.83	31.0
Approach		97	1	102	1.0	0.154	5.5	LOS A	0.9	6.1	0.82	0.81	0.82	36.3
West: Captain Cook Drive (W)														
10	L2	106	0	112	0.0	0.599	8.2	LOS A	5.5	42.4	0.77	0.79	0.85	39.0
11	T1	688	90	724	13.1	0.599	8.5	LOS A	5.7	43.5	0.77	0.78	0.83	58.1
12	R2	413	38	435	9.2	0.599	12.8	LOS A	5.7	43.5	0.76	0.76	0.80	51.3
12u	U	7	4	7	57.1	0.599	16.8	LOS B	5.7	43.5	0.76	0.76	0.80	46.2
Approach		1214	132	1278	10.9	0.599	10.0	LOS A	5.7	43.5	0.77	0.77	0.82	53.3
All Vehicles		3784	290	3983	7.7	0.873	12.3	LOS A	15.3	115.9	0.71	0.88	1.02	49.1

MOVEMENT SUMMARY

Site: 1 [Captain Cook Drive / Gannons Road - Existing Approved + Sharks PM (Site Folder: Sharks Additional Volume + Existing Approved Development)]

Captain Cook Drive / Gannons Road
Existing Volumes (4/2/20)
Peak 4:30PM - 5:30PM
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gannons Rd (S)														
1	L2	456	6	480	1.3	0.265	2.4	LOS A	0.0	0.0	0.00	0.34	0.00	48.7
2	T1	11	1	12	9.1	0.363	8.6	LOS A	2.2	15.9	0.86	0.96	0.89	34.0
3	R2	199	2	209	1.0	0.363	11.9	LOS A	2.2	15.9	0.86	0.96	0.89	48.9
3u	U	1	1	1	100.0	0.363	18.9	LOS B	2.2	15.9	0.86	0.96	0.89	44.4
Approach		667	10	702	1.5	0.363	5.3	LOS A	2.2	15.9	0.27	0.53	0.28	48.4
East: Captain Cook Drive (E)														
4	L2	84	3	88	3.6	0.934	49.6	LOS D	19.1	136.3	1.00	1.61	2.87	32.8
5	T1	850	17	895	2.0	0.934	48.4	LOS D	21.3	151.7	1.00	1.63	2.89	36.4
6	R2	9	0	9	0.0	0.934	52.1	LOS D	21.3	151.7	1.00	1.64	2.90	29.0
6u	U	29	0	31	0.0	0.934	54.5	LOS D	21.3	151.7	1.00	1.64	2.90	37.3
Approach		972	20	1023	2.1	0.934	48.7	LOS D	21.3	151.7	1.00	1.63	2.89	36.0
North: Toyota Access (N)														
7	L2	34	0	36	0.0	0.156	13.7	LOS A	0.9	6.1	0.93	0.93	0.93	35.5
8	T1	42	0	44	0.0	0.920	70.2	LOS E	12.5	87.5	1.00	2.05	2.81	21.9
9	R2	223	0	235	0.0	0.920	72.9	LOS F	12.5	87.5	1.00	2.05	2.81	23.0
9u	U	1	0	1	0.0	0.920	73.7	LOS F	12.5	87.5	1.00	2.05	2.81	20.0
Approach		300	0	316	0.0	0.920	65.8	LOS E	12.5	87.5	0.99	1.92	2.60	23.8
West: Captain Cook Drive (W)														
10	L2	27	0	28	0.0	0.823	10.2	LOS A	13.6	95.9	0.93	0.83	1.11	38.6
11	T1	1330	15	1400	1.1	0.823	10.0	LOS A	13.6	95.9	0.91	0.81	1.07	57.8
12	R2	630	7	663	1.1	0.823	14.0	LOS A	13.5	95.0	0.87	0.77	1.00	50.8
12u	U	17	0	18	0.0	0.823	16.4	LOS B	13.5	95.0	0.87	0.77	1.00	57.6
Approach		2004	22	2109	1.1	0.823	11.3	LOS A	13.6	95.9	0.90	0.79	1.05	55.0
All Vehicles		3943	52	4151	1.3	0.934	23.7	LOS B	21.3	151.7	0.82	1.04	1.49	43.9

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Existing Approved + Sharks AM, Stage 1 (Site Folder: Sharks Additional Volume + Existing Approved Development)]

Captain Cook Drive / Endeavour Road
Existing Volumes (4/2/20)
Peak 7:30AM - 8:30AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
3	R2	518	17	545	3.3	1.231	235.8	LOS F	75.3	541.8	1.00	5.01	14.78	12.2
Approach		518	17	545	3.3	1.231	235.8	NA	75.3	541.8	1.00	5.01	14.78	12.2
East: Endeavour Road (E)														
4	L2	191	25	201	13.1	0.118	5.8	LOS A	0.0	0.0	0.00	0.52	0.00	54.4
6	R2	33	7	35	21.2	0.449	69.6	LOS E	1.5	12.2	0.96	1.03	1.17	27.5
Approach		224	32	236	14.3	0.449	15.2	LOS B	1.5	12.2	0.14	0.60	0.17	47.6
North: Captain Cook Drive (N)														
7	L2	289	10	304	3.5	0.336	8.9	LOS A	1.4	10.4	0.54	0.81	0.63	51.7
8	T1	981	105	1033	10.7	0.283	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1270	115	1337	9.1	0.336	2.1	LOS A	1.4	10.4	0.12	0.19	0.14	57.7
All Vehicles		2012	164	2118	8.2	1.231	63.7	NA	75.3	541.8	0.35	1.47	3.91	29.1

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Existing Approved + Sharks AM, Stage 2 (Site Folder: Sharks Additional Volume + Existing Approved Development)]

Captain Cook Drive / Endeavour Road
Existing Volumes (4/2/20)
Peak 7:30AM - 8:30AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
2	T1	1589	75	1673	4.7	0.442	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach		1589	75	1673	4.7	0.442	0.2	NA	0.0	0.0	0.00	0.00	0.00	59.7
East: Endeavour Road (E)														
6	R2	33	7	35	21.2	0.027	8.2	LOS A	0.1	0.8	0.65	0.80	0.65	45.2
Approach		33	7	35	21.2	0.027	8.2	LOS A	0.1	0.8	0.65	0.80	0.65	45.2
All Vehicles		1622	82	1707	5.1	0.442	0.3	NA	0.1	0.8	0.01	0.02	0.01	59.4

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Existing Approved + Sharks PM, Stage 1 (Site Folder: Sharks Additional Volume + Existing Approved Development)]

Captain Cook Drive / Endeavour Road
Existing Volumes (4/2/20)
Peak 4:30PM - 5:30PM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
3	R2	208	3	219	1.4	0.852	47.5	LOS D	6.2	43.9	0.97	1.42	2.65	33.3
Approach		208	3	219	1.4	0.852	47.5	NA	6.2	43.9	0.97	1.42	2.65	33.3
East: Endeavour Road (E)														
4	L2	637	7	671	1.1	0.364	5.7	LOS A	0.0	0.0	0.00	0.53	0.00	54.7
6	R2	204	6	215	2.9	1.168	234.9	LOS F	28.1	202.0	1.00	2.67	7.32	12.1
Approach		841	13	885	1.5	1.168	61.3	LOS E	28.1	202.0	0.24	1.05	1.77	29.7
North: Captain Cook Drive (N)														
7	L2	118	7	124	5.9	0.095	6.4	LOS A	0.3	2.5	0.27	0.56	0.27	53.1
8	T1	1380	14	1453	1.0	0.375	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1498	21	1577	1.4	0.375	0.6	LOS A	0.3	2.5	0.02	0.04	0.02	59.2
All Vehicles		2547	37	2681	1.5	1.168	24.5	NA	28.1	202.0	0.17	0.49	0.82	42.5

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Existing Approved + Sharks PM, Stage 2 (Site Folder: Sharks Additional Volume + Existing Approved Development)]

Captain Cook Drive / Endeavour Road
Existing Volumes (4/2/20)
Peak 4:30PM - 5:30PM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
2	T1	1351	18	1422	1.3	0.368	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1351	18	1422	1.3	0.368	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
East: Endeavour Road (E)														
6	R2	204	6	215	2.9	0.134	7.5	LOS A	0.5	3.8	0.60	0.84	0.60	46.6
Approach		204	6	215	2.9	0.134	7.5	LOS A	0.5	3.8	0.60	0.84	0.60	46.6
All Vehicles		1555	24	1637	1.5	0.368	1.1	NA	0.5	3.8	0.08	0.11	0.08	58.4

MOVEMENT SUMMARY

Site: 1 [Captain Cook Drive / Gannons Road - Future + Sharks AM (Site Folder: FUTURE MODELLING - Annexure F Distribution)]

Captain Cook Drive / Gannons Road
Future Scenario + Sharks
Peak 8:00AM - 9:00AM
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gannons Rd (S)														
1	L2	783	11	824	1.4	0.455	2.5	LOS A	0.0	0.0	0.00	0.34	0.00	48.6
2	T1	37	0	39	0.0	0.632	13.8	LOS A	4.8	34.9	0.96	1.10	1.26	32.5
3	R2	253	13	266	5.1	0.632	17.7	LOS B	4.8	34.9	0.96	1.10	1.26	45.1
3u	U	1	0	1	0.0	0.632	19.3	LOS B	4.8	34.9	0.96	1.10	1.26	42.7
Approach		1074	24	1131	2.2	0.632	6.5	LOS A	4.8	34.9	0.26	0.54	0.34	46.9
East: Captain Cook Drive (E)														
4	L2	157	6	165	3.8	0.863	18.0	LOS B	13.9	105.1	1.00	1.23	1.66	45.4
5	T1	1186	124	1248	10.5	0.863	17.9	LOS B	14.5	110.1	1.00	1.21	1.64	50.4
6	R2	37	0	39	0.0	0.863	21.8	LOS B	14.5	110.1	1.00	1.20	1.63	37.8
6u	U	25	3	26	12.0	0.863	24.7	LOS B	14.5	110.1	1.00	1.20	1.63	50.7
Approach		1405	133	1479	9.5	0.863	18.1	LOS B	14.5	110.1	1.00	1.21	1.65	49.3
North: Toyota Access (N)														
7	L2	15	0	16	0.0	0.043	7.1	LOS A	0.2	1.4	0.78	0.75	0.78	38.0
8	T1	24	0	25	0.0	0.124	4.9	LOS A	0.7	4.9	0.82	0.84	0.82	35.3
9	R2	42	1	44	2.4	0.124	7.7	LOS A	0.7	4.9	0.82	0.84	0.82	38.1
9u	U	1	0	1	0.0	0.124	8.4	LOS A	0.7	4.9	0.82	0.84	0.82	30.7
Approach		82	1	86	1.2	0.124	6.8	LOS A	0.7	4.9	0.82	0.82	0.82	37.1
West: Captain Cook Drive (W)														
10	L2	116	0	122	0.0	0.607	8.3	LOS A	5.7	43.7	0.78	0.80	0.87	39.0
11	T1	688	90	724	13.1	0.607	8.7	LOS A	5.9	45.1	0.78	0.79	0.85	58.0
12	R2	413	38	435	9.2	0.607	13.0	LOS A	5.9	45.1	0.77	0.78	0.82	51.2
12u	U	7	4	7	57.1	0.607	16.9	LOS B	5.9	45.1	0.77	0.78	0.82	46.2
Approach		1224	132	1288	10.8	0.607	10.1	LOS A	5.9	45.1	0.78	0.79	0.84	53.1
All Vehicles		3785	290	3984	7.7	0.863	12.0	LOS A	14.5	110.1	0.71	0.88	1.00	49.4

MOVEMENT SUMMARY

Site: 1 [Captain Cook Drive / Gannons Road - Future + Sharks PM (Site Folder: FUTURE MODELLING - Annexure F Distribution)]

Captain Cook Drive / Gannons Road
Future Scenario + Sharks Stage 3 & 4
Peak 4:30PM - 5:30PM
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gannons Rd (S)														
1	L2	456	6	480	1.3	0.265	2.4	LOS A	0.0	0.0	0.00	0.34	0.00	48.7
2	T1	13	1	14	7.7	0.345	7.8	LOS A	2.1	14.7	0.83	0.93	0.84	34.2
3	R2	199	2	209	1.0	0.345	11.1	LOS A	2.1	14.7	0.83	0.93	0.84	49.3
3u	U	1	1	1	100.0	0.345	17.8	LOS B	2.1	14.7	0.83	0.93	0.84	44.8
Approach		669	10	704	1.5	0.345	5.1	LOS A	2.1	14.7	0.26	0.53	0.27	48.5
East: Captain Cook Drive (E)														
4	L2	84	3	88	3.6	0.849	28.2	LOS B	12.5	89.2	1.00	1.32	1.97	40.5
5	T1	850	17	895	2.0	0.849	27.4	LOS B	13.6	96.7	1.00	1.33	1.97	45.8
6	R2	11	0	12	0.0	0.849	31.4	LOS C	13.6	96.7	1.00	1.33	1.97	34.5
6u	U	29	0	31	0.0	0.849	33.8	LOS C	13.6	96.7	1.00	1.33	1.97	47.0
Approach		974	20	1025	2.1	0.849	27.7	LOS B	13.6	96.7	1.00	1.33	1.97	45.1
North: Toyota Access (N)														
7	L2	37	0	39	0.0	0.172	13.9	LOS A	1.0	6.7	0.93	0.94	0.93	35.5
8	T1	45	0	47	0.0	0.611	24.7	LOS B	4.8	33.6	1.00	1.27	1.46	29.8
9	R2	129	0	136	0.0	0.611	27.4	LOS B	4.8	33.6	1.00	1.27	1.46	31.9
9u	U	1	0	1	0.0	0.611	28.2	LOS B	4.8	33.6	1.00	1.27	1.46	26.4
Approach		212	0	223	0.0	0.611	24.5	LOS B	4.8	33.6	0.99	1.21	1.37	31.9
West: Captain Cook Drive (W)														
10	L2	33	0	35	0.0	0.827	10.5	LOS A	13.8	97.7	0.93	0.84	1.13	38.5
11	T1	1330	15	1400	1.1	0.827	10.2	LOS A	13.8	97.7	0.91	0.82	1.09	57.7
12	R2	630	7	663	1.1	0.827	14.2	LOS A	13.7	97.0	0.88	0.78	1.01	50.7
12u	U	17	0	18	0.0	0.827	16.6	LOS B	13.7	97.0	0.88	0.78	1.01	57.5
Approach		2010	22	2116	1.1	0.827	11.5	LOS A	13.8	97.7	0.90	0.80	1.06	54.9
All Vehicles		3865	52	4068	1.3	0.849	15.2	LOS B	13.8	97.7	0.82	0.91	1.17	49.2

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Future + Sharks AM, Stage 1 (Site Folder: FUTURE MODELLING - Annexure F Distribution)]

Captain Cook Drive / Endeavour Road
Future Scenario + Sharks
Peak 7:30AM - 8:30AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
3	R2	518	17	545	3.3	1.249	251.6	LOS F	79.0	568.6	1.00	5.17	15.37	11.6
Approach		518	17	545	3.3	1.249	251.6	NA	79.0	568.6	1.00	5.17	15.37	11.6
East: Endeavour Road (E)														
4	L2	191	25	201	13.1	0.118	5.8	LOS A	0.0	0.0	0.00	0.52	0.00	54.4
6	R2	66	7	69	10.6	0.767	92.2	LOS F	3.2	24.8	0.98	1.17	1.72	23.6
Approach		257	32	271	12.5	0.767	28.0	LOS B	3.2	24.8	0.25	0.69	0.44	40.8
North: Captain Cook Drive (N)														
7	L2	299	10	315	3.3	0.347	9.0	LOS A	1.5	10.9	0.54	0.82	0.64	51.6
8	T1	991	105	1043	10.6	0.286	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1290	115	1358	8.9	0.347	2.1	LOS A	1.5	10.9	0.13	0.19	0.15	57.7
All Vehicles		2065	164	2174	7.9	1.249	67.9	NA	79.0	568.6	0.36	1.50	4.00	28.1

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Future+ Sharks AM, Stage 2 (Site Folder: FUTURE MODELLING - Annexure F Distribution)]

Captain Cook Drive / Endeavour Road
Future Scenario + Sharks
Peak 7:30AM - 8:30AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
2	T1	1570	75	1653	4.8	0.437	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach		1570	75	1653	4.8	0.437	0.2	NA	0.0	0.0	0.00	0.00	0.00	59.7
East: Endeavour Road (E)														
6	R2	66	7	69	10.6	0.054	8.1	LOS A	0.2	1.5	0.65	0.84	0.65	45.8
Approach		66	7	69	10.6	0.054	8.1	LOS A	0.2	1.5	0.65	0.84	0.65	45.8
All Vehicles		1636	82	1722	5.0	0.437	0.5	NA	0.2	1.5	0.03	0.03	0.03	59.2

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Future + Sharks PM, Stage 1 (Site Folder: FUTURE MODELLING - Annexure F Distribution)]

Captain Cook Drive / Endeavour Road
Future Scenario + Sharks
Peak 4:30PM - 5:30PM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
3	R2	208	3	219	1.4	0.860	49.0	LOS D	6.4	45.1	0.97	1.44	2.72	32.9
Approach		208	3	219	1.4	0.860	49.0	NA	6.4	45.1	0.97	1.44	2.72	32.9
East: Endeavour Road (E)														
4	L2	637	7	671	1.1	0.364	5.7	LOS A	0.0	0.0	0.00	0.53	0.00	54.7
6	R2	314	6	331	1.9	1.793	754.7	LOS F	100.1	712.2	1.00	5.02	16.23	4.4
Approach		951	13	1001	1.4	1.793	253.0	LOS F	100.1	712.2	0.33	2.01	5.36	11.6
North: Captain Cook Drive (N)														
7	L2	123	7	129	5.7	0.099	6.4	LOS A	0.4	2.6	0.27	0.56	0.27	53.1
8	T1	1385	14	1458	1.0	0.376	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1508	21	1587	1.4	0.376	0.6	LOS A	0.4	2.6	0.02	0.05	0.02	59.1
All Vehicles		2667	37	2807	1.4	1.793	94.4	NA	100.1	712.2	0.21	0.86	2.14	23.3

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Future + Sharks PM, Stage 2 (Site Folder: FUTURE MODELLING - Annexure F Distribution)]

Captain Cook Drive / Endeavour Road
Future Scenario + Sharks
Peak 4:30PM - 5:30PM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
2	T1	1257	18	1323	1.4	0.342	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1257	18	1323	1.4	0.342	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
East: Endeavour Road (E)														
6	R2	314	6	331	1.9	0.192	7.4	LOS A	0.8	5.6	0.59	0.82	0.59	46.7
Approach		314	6	331	1.9	0.192	7.4	LOS A	0.8	5.6	0.59	0.82	0.59	46.7
All Vehicles		1571	24	1654	1.5	0.342	1.6	NA	0.8	5.6	0.12	0.16	0.12	57.7

MOVEMENT SUMMARY

Site: 1 [Captain Cook Drive / Gannons Road - Future + Sharks AM (Site Folder: FUTURE MODELLING - No Additional Right Turns at Endeavour)]

Captain Cook Drive / Gannons Road
Future Scenario + Sharks
Peak 8:00AM - 9:00AM
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gannons Rd (S)														
1	L2	783	11	824	1.4	0.455	2.5	LOS A	0.0	0.0	0.00	0.34	0.00	48.6
2	T1	37	0	39	0.0	0.646	14.6	LOS B	5.0	36.3	0.97	1.12	1.29	32.2
3	R2	253	13	266	5.1	0.646	18.5	LOS B	5.0	36.3	0.97	1.12	1.29	44.6
3u	U	1	0	1	0.0	0.646	20.1	LOS B	5.0	36.3	0.97	1.12	1.29	42.4
Approach		1074	24	1131	2.2	0.646	6.7	LOS A	5.0	36.3	0.26	0.55	0.35	46.8
East: Captain Cook Drive (E)														
4	L2	157	6	165	3.8	0.889	21.2	LOS B	15.9	119.9	1.00	1.31	1.86	43.6
5	T1	1186	124	1248	10.5	0.889	21.0	LOS B	16.6	126.2	1.00	1.30	1.85	48.3
6	R2	37	0	39	0.0	0.889	24.8	LOS B	16.6	126.2	1.00	1.29	1.83	36.6
6u	U	25	3	26	12.0	0.889	27.8	LOS B	16.6	126.2	1.00	1.29	1.83	48.7
Approach		1405	133	1479	9.5	0.889	21.2	LOS B	16.6	126.2	1.00	1.30	1.85	47.4
North: Toyota Access (N)														
7	L2	15	0	16	0.0	0.043	7.1	LOS A	0.2	1.4	0.78	0.75	0.78	38.0
8	T1	24	0	25	0.0	0.185	5.1	LOS A	1.0	7.4	0.84	0.88	0.84	35.2
9	R2	75	1	79	1.3	0.185	7.8	LOS A	1.0	7.4	0.84	0.88	0.84	38.0
9u	U	1	0	1	0.0	0.185	8.6	LOS A	1.0	7.4	0.84	0.88	0.84	30.5
Approach		115	1	121	0.9	0.185	7.1	LOS A	1.0	7.4	0.83	0.87	0.83	37.3
West: Captain Cook Drive (W)														
10	L2	116	0	122	0.0	0.607	8.3	LOS A	5.7	43.8	0.79	0.80	0.87	39.0
11	T1	688	90	724	13.1	0.607	8.7	LOS A	5.9	45.2	0.78	0.79	0.85	58.0
12	R2	413	38	435	9.2	0.607	13.0	LOS A	5.9	45.2	0.77	0.78	0.82	51.2
12u	U	7	4	7	57.1	0.607	16.9	LOS B	5.9	45.2	0.77	0.78	0.82	46.2
Approach		1224	132	1288	10.8	0.607	10.1	LOS A	5.9	45.2	0.78	0.79	0.85	53.1
All Vehicles		3818	290	4019	7.6	0.889	13.2	LOS A	16.6	126.2	0.72	0.91	1.07	48.5

LANE SUMMARY

Site: 1 [Captain Cook Drive / Gannons Road - Future + Sharks PM (Site Folder: FUTURE MODELLING - No Additional Right Turns at Endeavour)]

Captain Cook Drive / Gannons Road
Future Scenario + Sharks Stage 3 & 4
Peak 4:30PM - 5:30PM
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Gannons Rd (S)													
Lane 1	480	1.3	1811	0.265	100	2.4	LOS A	0.0	0.0	Short	100	0.0	NA
Lane 2 d	224	1.9	605	0.371	100	12.0	LOS A	2.3	16.4	Full	500	0.0	0.0
Approach	704	1.5		0.371		5.4	LOS A	2.3	16.4				
East: Captain Cook Drive (E)													
Lane 1	475	2.3	495	0.960	100	59.5	LOS E	22.1	158.1	Full	500	0.0	0.0
Lane 2 d	550	1.8	574	0.960	100	57.6	LOS E	24.9	177.3	Full	500	0.0	0.0
Approach	1025	2.1		0.960		58.5	LOS E	24.9	177.3				
North: Toyota Access (N)													
Lane 1	39	0.0	226	0.172	100	13.9	LOS A	1.0	6.7	Full	500	0.0	0.0
Lane 2 d	300	0.0	300	1.000	100	105.8	LOS F	19.1	133.9	Full	500	0.0	0.0
Approach	339	0.0		1.000		95.2	LOS F	19.1	133.9				
West: Captain Cook Drive (W)													
Lane 1	962	1.1	1161	0.828	100	10.8	LOS A	14.0	98.6	Full	500	0.0	0.0
Lane 2 d	1154	1.1	1393	0.828	100	12.3	LOS A	13.9	98.0	Full	500	0.0	0.0
Approach	2116	1.1		0.828		11.6	LOS A	14.0	98.6				
Intersection	4184	1.3		1.000		28.8	LOS C	24.9	177.3				

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Future + Sharks AM, Stage 1 (Site Folder: FUTURE MODELLING - No Additional Right Turns at Endeavour)]

Captain Cook Drive / Endeavour Road
Future Scenario + Sharks
Peak 7:30AM - 8:30AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
3	R2	518	17	545	3.3	1.249	251.6	LOS F	79.0	568.6	1.00	5.17	15.37	11.6
Approach		518	17	545	3.3	1.249	251.6	NA	79.0	568.6	1.00	5.17	15.37	11.6
East: Endeavour Road (E)														
4	L2	191	25	201	13.1	0.118	5.8	LOS A	0.0	0.0	0.00	0.52	0.00	54.4
6	R2	33	7	35	21.2	0.461	72.2	LOS F	1.5	12.5	0.96	1.04	1.18	27.0
Approach		224	32	236	14.3	0.461	15.6	LOS B	1.5	12.5	0.14	0.60	0.17	47.4
North: Captain Cook Drive (N)														
7	L2	299	10	315	3.3	0.347	9.0	LOS A	1.5	10.9	0.54	0.82	0.64	51.6
8	T1	991	105	1043	10.6	0.286	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1290	115	1358	8.9	0.347	2.1	LOS A	1.5	10.9	0.13	0.19	0.15	57.7
All Vehicles		2032	164	2139	8.1	1.249	67.2	NA	79.0	568.6	0.35	1.50	4.03	28.3

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Future+ Sharks AM, Stage 2 (Site Folder: FUTURE MODELLING - No Additional Right Turns at Endeavour)]

Captain Cook Drive / Endeavour Road
Future Scenario + Sharks
Peak 7:30AM - 8:30AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
2	T1	1603	75	1687	4.7	0.446	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach		1603	75	1687	4.7	0.446	0.2	NA	0.0	0.0	0.00	0.00	0.00	59.7
East: Endeavour Road (E)														
6	R2	33	7	35	21.2	0.028	8.2	LOS A	0.1	0.8	0.66	0.81	0.66	45.1
Approach		33	7	35	21.2	0.028	8.2	LOS A	0.1	0.8	0.66	0.81	0.66	45.1
All Vehicles		1636	82	1722	5.0	0.446	0.3	NA	0.1	0.8	0.01	0.02	0.01	59.4

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Future + Sharks PM, Stage 1 (Site Folder: FUTURE MODELLING - No Additional Right Turns at Endeavour)]

Captain Cook Drive / Endeavour Road
Future Scenario + Sharks
Peak 4:30PM - 5:30PM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
3	R2	208	3	219	1.4	0.860	49.0	LOS D	6.4	45.1	0.97	1.44	2.72	32.9
Approach		208	3	219	1.4	0.860	49.0	NA	6.4	45.1	0.97	1.44	2.72	32.9
East: Endeavour Road (E)														
4	L2	637	7	671	1.1	0.364	5.7	LOS A	0.0	0.0	0.00	0.53	0.00	54.7
6	R2	204	6	215	2.9	1.184	247.8	LOS F	29.5	212.0	1.00	2.74	7.57	11.6
Approach		841	13	885	1.5	1.184	64.4	LOS E	29.5	212.0	0.24	1.06	1.84	29.0
North: Captain Cook Drive (N)														
7	L2	123	7	129	5.7	0.099	6.4	LOS A	0.4	2.6	0.27	0.56	0.27	53.1
8	T1	1385	14	1458	1.0	0.376	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1508	21	1587	1.4	0.376	0.6	LOS A	0.4	2.6	0.02	0.05	0.02	59.1
All Vehicles		2557	37	2692	1.4	1.184	25.6	NA	29.5	212.0	0.17	0.49	0.84	41.9

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road - Future + Sharks PM, Stage 2 (Site Folder: FUTURE MODELLING - No Additional Right Turns at Endeavour)]

Captain Cook Drive / Endeavour Road
Future Scenario + Sharks
Peak 4:30PM - 5:30PM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)														
2	T1	1367	18	1439	1.3	0.372	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1367	18	1439	1.3	0.372	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
East: Endeavour Road (E)														
6	R2	204	6	215	2.9	0.136	7.6	LOS A	0.5	3.9	0.61	0.84	0.61	46.6
Approach		204	6	215	2.9	0.136	7.6	LOS A	0.5	3.9	0.61	0.84	0.61	46.6
All Vehicles		1571	24	1654	1.5	0.372	1.1	NA	0.5	3.9	0.08	0.11	0.08	58.4

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road + Development AM (Site Folder: FUTURE MODELLING - Annexure F Distribution)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Captain Cook Drive / Endeavour Road
AM Peak
With Development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 121 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)															
2	T1	All MCs	1653	4.8	1653	4.8	0.587	8.0	LOS A	21.7	158.3	0.49	0.45	0.49	53.5
3	R2	All MCs	545	3.3	545	3.3	* 0.763	43.1	LOS D	23.1	166.3	0.93	1.03	0.94	34.8
Approach			2198	4.4	2198	4.4	0.763	16.7	LOS B	23.1	166.3	0.60	0.60	0.60	46.8
East: Endeavour Road (E)															
4	L2	All MCs	201	13.1	201	13.1 *	0.135	6.3	LOS A	1.0	8.1	0.15	0.57	0.15	52.5
6	R2	All MCs	69	10.6	69	10.6	0.128	53.5	LOS D	1.8	13.6	0.89	0.72	0.89	31.2
Approach			271	12.5	271	12.5	0.135	18.5	LOS B	1.8	13.6	0.34	0.61	0.34	44.7
North: Captain Cook Drive (N)															
7	L2	All MCs	315	3.3	315	3.3	0.320	17.7	LOS B	6.3	45.4	0.52	0.71	0.52	48.3
8	T1	All MCs	1043	10.6	1043	10.6	* 0.858	49.3	LOS D	32.8	250.6	1.00	0.98	1.12	33.9
Approach			1358	8.9	1358	8.9	0.858	42.0	LOS C	32.8	250.6	0.89	0.92	0.98	35.4
All Vehicles			3826	6.6	3826	6.6	0.858	25.8	LOS B	32.8	250.6	0.69	0.71	0.72	41.9

MOVEMENT SUMMARY

Site: 101 [Captain Cook Drive / Endeavour Road + Development PM (Site Folder: FUTURE MODELLING - Annexure F Distribution)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Captain Cook Drive / Endeavour Road
PM Peak
With Development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 127 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Captain Cook Drive (S)															
2	T1	All MCs	1323	1.4	1323	1.4	0.473	7.7	LOS A	16.8	118.9	0.45	0.41	0.45	53.3
3	R2	All MCs	219	1.4	219	1.4	* 0.678	48.4	LOS D	12.7	90.3	1.00	0.98	1.02	32.9
Approach			1542	1.4	1542	1.4	0.678	13.5	LOS A	16.8	118.9	0.53	0.49	0.53	48.9
East: Endeavour Road (E)															
4	L2	All MCs	671	1.1	671	1.1	* 0.414	8.6	LOS A	4.9	34.3	0.20	1.19	0.20	52.7
6	R2	All MCs	331	1.9	331	1.9	0.782	64.7	LOS E	16.3	115.8	1.00	0.94	1.15	28.7
Approach			1001	1.4	1001	1.4	0.782	27.2	LOS B	16.3	115.8	0.47	1.10	0.51	40.6
North: Captain Cook Drive (N)															
7	L2	All MCs	129	5.7	129	5.7	0.138	19.1	LOS B	3.1	22.8	0.50	0.68	0.50	46.3
8	T1	All MCs	1458	1.0	1458	1.0	* 0.665	21.2	LOS B	31.0	219.0	0.75	0.68	0.75	45.4
Approach			1587	1.4	1587	1.4	0.665	21.1	LOS B	31.0	219.0	0.73	0.68	0.73	44.5
All Vehicles			4131	1.4	4131	1.4	0.782	19.7	LOS B	31.0	219.0	0.59	0.71	0.60	45.0

ANNEXURE D: GREEN TRAVEL PLAN

(30 SHEETS)

SUSTAINABLE TRAVEL PLAN

FOR THE

MIXED USE DEVELOPMENT

AT

13 ENDEAVOUR ROAD, CARINGBAH

Prepared By:

McLaren Traffic Engineering & Road Safety Consultants

www.mclarentraffic.com.au

1 Introduction

M^CLaren Traffic Engineering (MTE) was commissioned by *EDM* to provide a Sustainable Travel Plan (STP) for the mixed use development at 13 Endeavour Road, Caringbah. This STP has been prepared to support the Greenstar rating for the site and will be assessed against the requirements as outlined within the *Green Star Communities V1.1 Submission Guidelines*.

The objective of the Sustainable Transport and Movement as outlined within the *Green Star Communities V1.1 Submission Guidelines* is to *encourage and recognise integrated responses to transport and movement that encourage a people- focused hierarchy*. It is with this in mind that this STP has been developed to achieve the 3 points that are available within the sustainable transport and movement performance pathway (27A), with specific regard to development strategies to encourage the use of sustainable transport by those travelling to and from the site.

1.1 Development Characteristics

The subject site was previously operated by Toyota, with Toyota vacating the site over a period between 2017 and 2019. This left the subject site being effectively without occupancy in 2020 which will be replaced with future development. Currently, the site has recent planning approvals for two (2) development applications (DA21/0446, DA21/0777) which relate to the continued use of the main warehouse on the site and demolition of the buildings to the south of the existing warehouse.

The future redevelopment and masterplan of the site has the potential to create a number of jobs when fully developed, with the masterplan proposal having the following scale

TABLE 1: PROPOSED MASTERPLAN SCALE

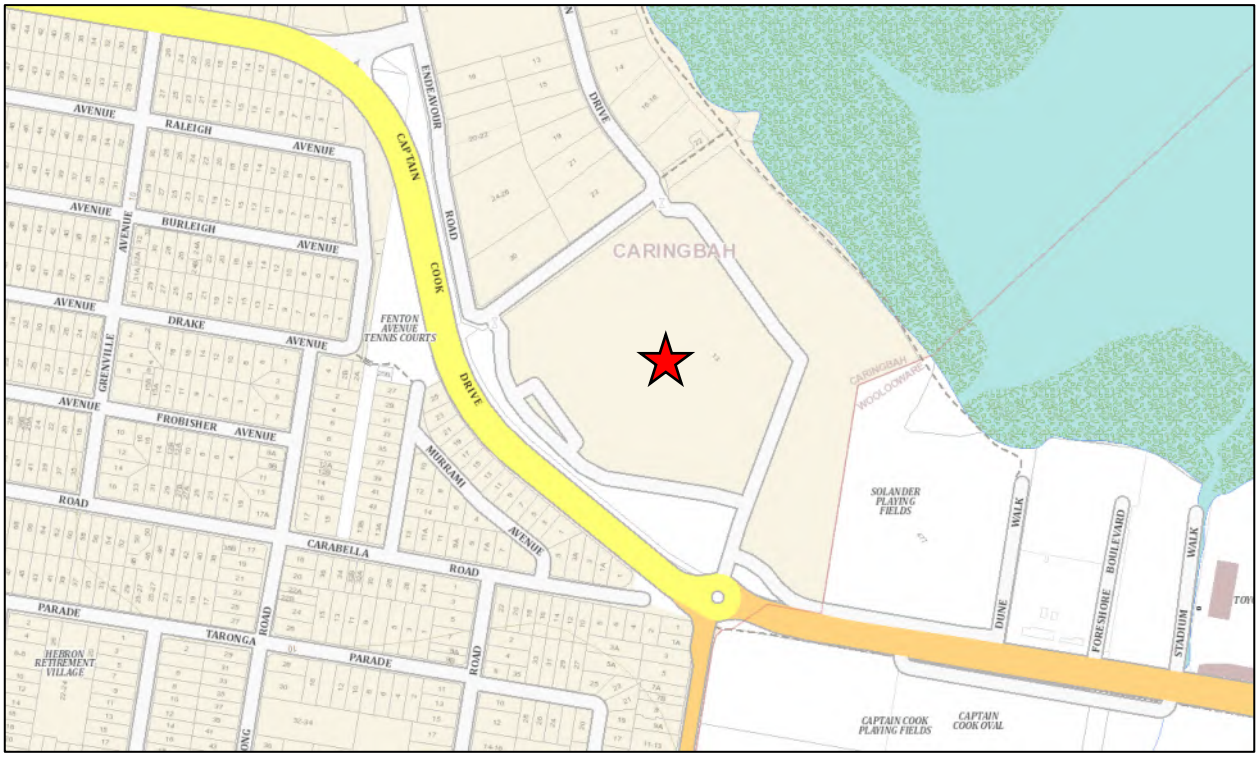
Land Use	Masterplan Scale
Building 1	26,282m^2 GFA Warehouse Premises (existing occupied premises)
Building 2	2,015m^2 GFA Warehouse Premises (existing occupied premises)
Building 3	4,900m^2 GFA Warehouse Premises
Building 4	7,221m^2 GFA Industrial Premises
	1,821m^2 GFA Office (ancillary)
Building 5	68 place child care centre (1,219m^2 GFA)
	112m^2 GFA Cafe
	554m^2 GFA Office Premises
	1,071m^2 GFA Industrial Premises
	333m^2 GFA Industrial Office Premises (Ancillary)
	11,615m^2 GFA Warehouse Premises
Building 6	1,869m^2 GFA Warehouse Premises
	892m^2 GFA Industrial Premises
	154m^2 GFA Industrial Office Premises (Ancillary)
Building 7	3,976m^2 GFA Industrial Premises
	697m^2 GFA Industrial Office Premises (Ancillary)
Building 8	1,377m^2 GFA Industrial Premises
	269m^2 GFA Industrial Office Premises (Ancillary)
Total	**66,404m^2 GFA**

As shown above, the proposal provides for large floor area of warehouse and distribution, with supplementary uses to support these uses, such as commercial and child care centre. Hence, the use of the site will be predominantly by staff employed for the Warehouse & Distribution land uses and hence the need arises for strategies to promote sustainable transport to encourage a people focussed hierarchy over the use of private motor vehicles.

The location of the site is shown on aerial imagery and a street map **Figure 1** and **Figure 2**, respectively.

Site Location

FIGURE 1: SITE CONTEXT – AERIAL PHOTO



Site Location

FIGURE 2: SITE CONTEXT – STREET MAP

All vehicular access to the site will continue to occur from the intersection of Captain Cook Drive / Gannons Road / Site Access and from Endeavour Road.

1.2 References

A number of sources have been consulted to inform the preparation of this Sustainable Travel Plan including:

- NSW Premier's Council for Active Living's Workplace Travel Plan Guidelines – Final Report (April 2010);
- NSW State Government Long Term Transport Master Plan;
- Transport for NSW Future Transport Strategy 2056;
- ABS Census Data;
- NSW Bureau of Transport Statistics Journey to Work Data;
- Public Transport or Private Vehicle: Factors That Impact on Mode Choice, Grace Corpuz (Transport Data Centre, New South Wales Ministry of Transport);
- Sutherland to Cronulla Active Transport Link Stage 2 REF;
- Green Star Communities V1.1 Submission Guidelines.

2 Objectives

Alternative modes of transport including walking, cycling and public transport quantifiably promote positive transport and health outcomes. The NSW State Government's *Future Transport Strategy 2056* emphasises the importance of encouraging active travel (walking and cycling) and the use of public transport.

Additionally, the *NSW Premier's Council (April 2010)* provides examples of travel plans appropriate for different size and types of employers outlining that for:

> ***Greater than 250 employees***
>
> *A full package of travel plan measures is likely to be required, with a dedicated travel plan coordinator*
>
> *Larger organisations could consider working in partnership with transport providers and the local authority to offer new / enhanced services*
>
> *Dedicated employee buses may be appropriate*
>
> *WTP is likely to need to consider transport & travel impacts on the local community*

This Sustainable Travel Plan (STP) is developed to assist in identifying a range of initiatives and promotions which will directly benefit employees and guests attending the site. This plan will help advise employees and visitors of sustainable and alternative transport options, with the overall objective to shift travel from private cars to active or public transport options, with the following positive implications:

- Reduced parking demand;
- Reduced traffic congestion and trip duration;
- High benefit to cost (BCR) ratio;
- Positive health outcomes from walking and cycling;
- Improved air quality and reduced per-capita emissions;
- Continued recognition that promotion of sustainable transport is on-going and not a one-off.

2.1 Green Star Requirements

Reference is made to the *Green Star Communities V1.1 Submission Guidelines* which outlines the compliance requirements to meet the performance pathway to be awarded three (3) points under the Sustainable Transport and movement Performance Pathway. A summary of the performance criteria and a summary of how it is addressed by this STP is outlined in **Table 2**.

TABLE 2: 27A PERFORMANCE PATHWAY SUMMARY

Performance Pathway No.	Criteria	STP Summary
27A.1	A people focused transport assessment or statement must be developed for the project, and its recommendations must be implemented.	This STP outlines strategies to promote sustainable and active transport opportunities over private vehicle usage. **Section 6** of this STP outlines the strategies that can be implemented, which will be further developed over the lifecycle of the site.
27A.2	The assessment process must include scoping discussions with the relevant authorities and stakeholders and include following up on any feedback received. Project teams must outline the authorities that are relevant for their development, and discuss the process used for these interactions, within their Green Star Submission documentation. If the transport assessment or transport statement has been provided to local and state government for comment, evidence must be provided that any comments received have been responded to.	Relevant stakeholders include TfNSW and Sutherland Shire Council. It is recommended that this STP be provided to both Sutherland Shire Council and TfNSW for feedback as part of the relevant development application process.
27A.3	The transport assessment must be developed by a suitably qualified professional and provide evidence that a wide variety of sustainable transport and movement options have been investigated.	This STP has been prepared by a suitable qualified professional. The CV's of the authors of this GTA are reproduced in **Annexure A**. A wide variety of sustainable transport and movement options have been investigated and provided in **Section 6**.
27A.4(a)	The transport assessment or statement must at least include recommendations or plans to address the following: Reduce the dependence on single vehicle transport for travel, by promoting active movement within the community and the use of public transport.	The recommendations to reduce car dependencies from a high cost perspective include the following: • Provision of on-site bus facilities; • Provision of safe crossing facilities along Captain Cook Drive to provide links to nearby train stations and existing walking and cycling routes. • Provide connectivity to existing bicycle routes. Alternatively lower cost strategies are outlined in **Section 6**, whereby it is the responsibility of the site manager to implement between all tenants and tenant employees.

Performance Pathway No.	Criteria	STP Summary
27A.4(b)	Reduce the vehicle kilometres travelled per trip.	Through the promotion of strategies as outlined in **Section 6**, it is expected that a mode shift will occur away from private vehicle trips (for all or part of the journey) and hence this will reduce the overall vehicle kilometres generated by the site.
27A.4(c)	Create efficient pedestrian, bicycle and vehicle linkages internally and connections to surrounding urban development (particularly to and from public transport stops, community services and major traffic generators).	Throughout the planning process for each development application undertaken on the site, the internal site will be designed to provide bicycle, pedestrian and vehicle linkages to the external areas. The recommendations of infrastructure as required by the masterplan will be significantly beneficial in achieving this outcome, especially when considering the surrounding environs is well serviced by existing pedestrian and cycling facilities. The current Masterplan is shown in **Annexure B**, which demonstrates that there will be internal pedestrian footpaths, whilst cyclists can utilise the internal road network. There will also be a connection to the rear of the site which connects to the existing bicycle network.
27A.4(d)	Promote a more sustainable pattern of urban development.	Each development application as part of the masterplan will provide the required end of trip facilities, such as bicycle and shower facilities to promote the use of sustainable transport.
27A.4(e)	Reduce the physical barriers within the project boundary.	As the masterplan develops, there will be an internal road network which supports bicycle, pedestrian and vehicles. The internal road network will provide pedestrian connectivity within the site to any retail facilities so to promote the use of walking within the site boundary.
27A.4(f)	Reduce distances from building to public transport nodes.	External infrastructure is subject to the outcome of the development application. It is expected a signalised intersection will be provided along Captain Cook Drive / Endeavour Road which is currently at capacity. Bus facilities will also be provided internally of the site which promotes the use of safe walking routes and existing bicycle and walking infrastructure.
27A.4(g)	Improve sustainable transport infrastructure such as increased or improved walking / cycling and public transport networks including end-of-line facilities.	The masterplan and proceeding development applications for each building will ensure end of trip facilities are provided such as bicycle spaces and shower facilities. The internal layout will connect to the existing bicycle and pedestrian network, which is outlined in **Section 3.2**

Performance Pathway No.	Criteria	STP Summary
27A.4(h)	Ensure safe and easy access to workplaces, shopping, leisure facilities and open public places by walking, cycling and public transport.	The recommendations to provide safe and easy access dependencies from a high-cost perspective include the following: • Provision of on-site bus facilities; • Provision of safe crossing facilities along Captain Cook Drive to provide links to nearby train stations and existing walking and cycling routes. • Provide connectivity to existing bicycle routes. Additionally, the internal layout will cater for safe walking and cycling infrastructure.
27A.4(i)	Accommodate and demonstrate consistency with future public transport options / proposals and future growth;	A detailed Transport and Parking Assessment is in the process of being undertaken for the Masterplan and preliminary findings / recommendations from that are to provide a signalised intersections along Captain Cook Drive / Endeavour Road to support the existing traffic along Captain Cook Drive. The signalised intersection at Captain Cook Drive / Endeavour Road will ensure safe pedestrian, cycling and vehicle connectivity is provided to the site, which will further increase the accessibility of the site to nearby public transport facilities including rail. The intersection of Endeavour Road / Captain Cook Drive is at capacity, which Council and TfNSW are aware of.
27A.4(j)	The assessment must consider transport capacity to ensure there is sufficient provision and flexibility for changes to the transport regime over time.	As an ongoing implementation within this STP, monitoring of bicycle spaces is recommended, with car parking spaces to potentially be refit as bicycle spaces if the need arises based upon the monitoring of bicycle parking demand. As part of the masterplan new bus stops are proposed internally to the site. This infrastructure considers the change in transport modes of travel to the site. The provision of bus facilities will reduce vehicle trips generated by the site. It is expected that each building on the site as it is developed as part of a future development applications will ensure it provides sufficient end of trip facilities.

Performance Pathway No.	Criteria	STP Summary
27A.5	Evidence must be provided that the findings of the assessment positively influenced the sustainability outcomes of the master planned development and emphasised the health and wellbeing of project occupants.	Providing bus facilities will positively promote sustainable transport by promoting bus as a mode of travel. The provision of signalised intersections along Captain Cook Drive / Endeavour Road will further promote sustainable and active modes of transport to and from the site (walking and cycling) which promotes healthy lifestyle choices for tenants and tenant employees. As part of this STP, the monitoring and reporting of the impact of strategies that are implemented to promote a sustainable transport is outlined in **Section 5**.
27A.6	A travel plan or similar document must be developed for the project site by a suitable qualified professional, outline how the design methods and planning solutions detailed in the transport assessment or statement, and used for the project, encourage and implement people focused sustainable transport and movement initiatives.	This STP has been development specifically to address this comment. The management of the site shall promote the use of strategies to promote sustainable and active transport to and from the site. These strategies will be developed further throughout the life cycle of the site. Initial strategies to implement across the various tenants within the site are outlined in **Section 6**, with the responsibility of the implementation and distribution of strategies outlined in **Section 4**, which is the responsibility of the site manager.

3 Existing Alternative Transport Facilities

The following sub-sections outlines the available alternative transport modes to and from the site. To communicate the available alternative transport facilities available to both staff and patrons, a Travel Access Guide (TAG) should be developed as part of a Green Travel Plan for each building on the site and is to be advertised to all users travelling to and from the site.

3.1 Public Transport – Bus Services

The subject site has access to existing bus stops (ID: 222938 & 2230173) located approximately 200m to the south and 330m to the east of the roundabout intersection of Gannons Road / Captain Cook Drive. The bus stops service existing bus route 985 (Cronulla to Miranda via Woolooware Bay) provided by Transdev NSW and provides services every 30 minutes during peak commuter periods and 60 minutes outside peak commuter periods. Further, an existing bus stop (ID: 2229141) is located approximately 330m to the south-west of the site on Taronga Parade. The bus stop services existing bus route 969 (Cronulla to Sutherland) provided by Transdev NSW and provides services every hour.

Caringbah Train Station and Woolooware Train Station are located via a 2.2km walking distance to the south-west and 2.3km walking distance to the south-east from the Gannons Road site access respectively. Both stations service the T4 – Eastern Suburbs and Illawarra

Line, providing access between Cronulla and Bondi Junction via the Sydney CBD (Central Station and Town Hall Station). Train services are provided every 10 – 15 minutes within commuter peak hour periods and every 30 minutes outside commuter peak periods.

The location of the site subject to the surrounding public transport network is shown in **Figure 3** below.

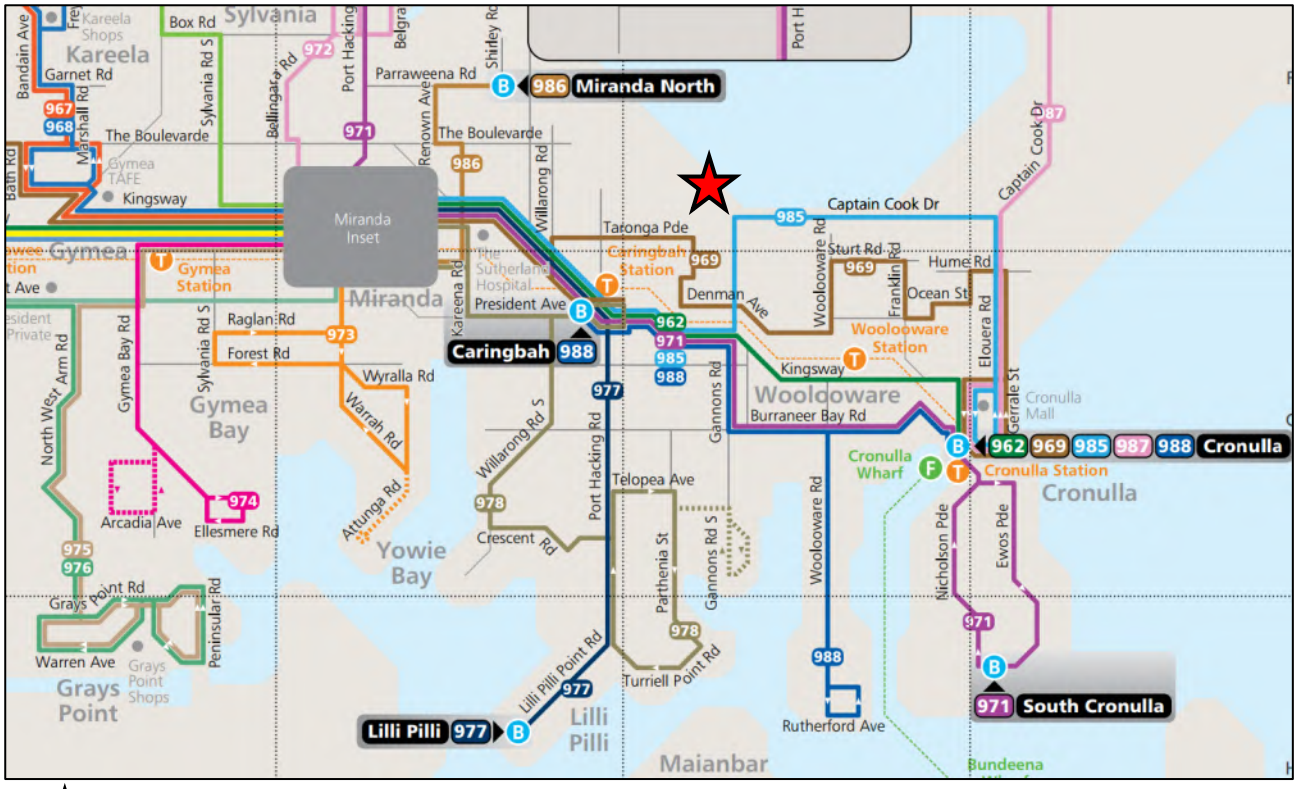


FIGURE 3: PUBLIC TRANSPORT NETWORK MAP

3.2 Public Transport - Pedestrian & Cycling Facilities

Cycle paths encourage individuals to utilise bicycles as a mode to travel, reducing congestion, overall motor vehicle usage and provides a significant environmental and health benefit by encouraging people to walk or cycle in the area.

There are a number of existing bicycle and pedestrian facilities within close proximity to the site along Captain Cook Drive which connect to nearby cycling routes within the Sutherland Shire. **Figure 4** below shows existing constructed bicycle routes. Bicycle routes have already been constructed within close proximity to the site, with the most recent construction completed along the eastern side of Gannons Road to the south of the site which provided shared pedestrian and bicycle facilities. As part of the masterplan development it is recommended that the site provide connectivity to existing pedestrian and bicycle routes that immediately exist next to the site to promote sustainable transport. The following routes are available within close proximity to the site:

- Cycling & Pedestrian access is available to / from Captain Cook Drive via existing bicycling network;

- Cycling & Pedestrian access is available to / from Kurnell and Cronulla via Captain Cook Drive;

- Cycling & Pedestrian access is available to / from Kingsway to the south of the site.

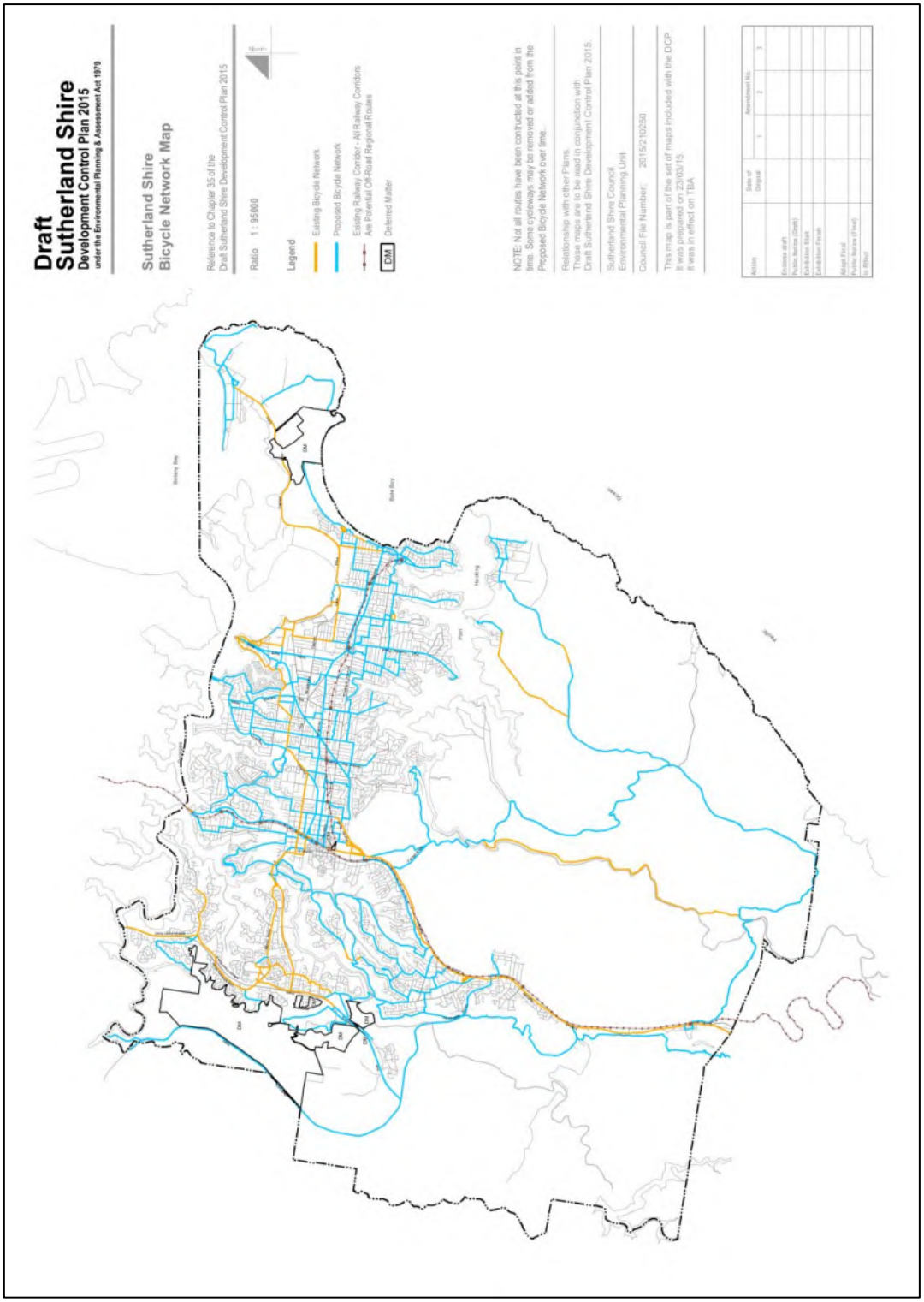
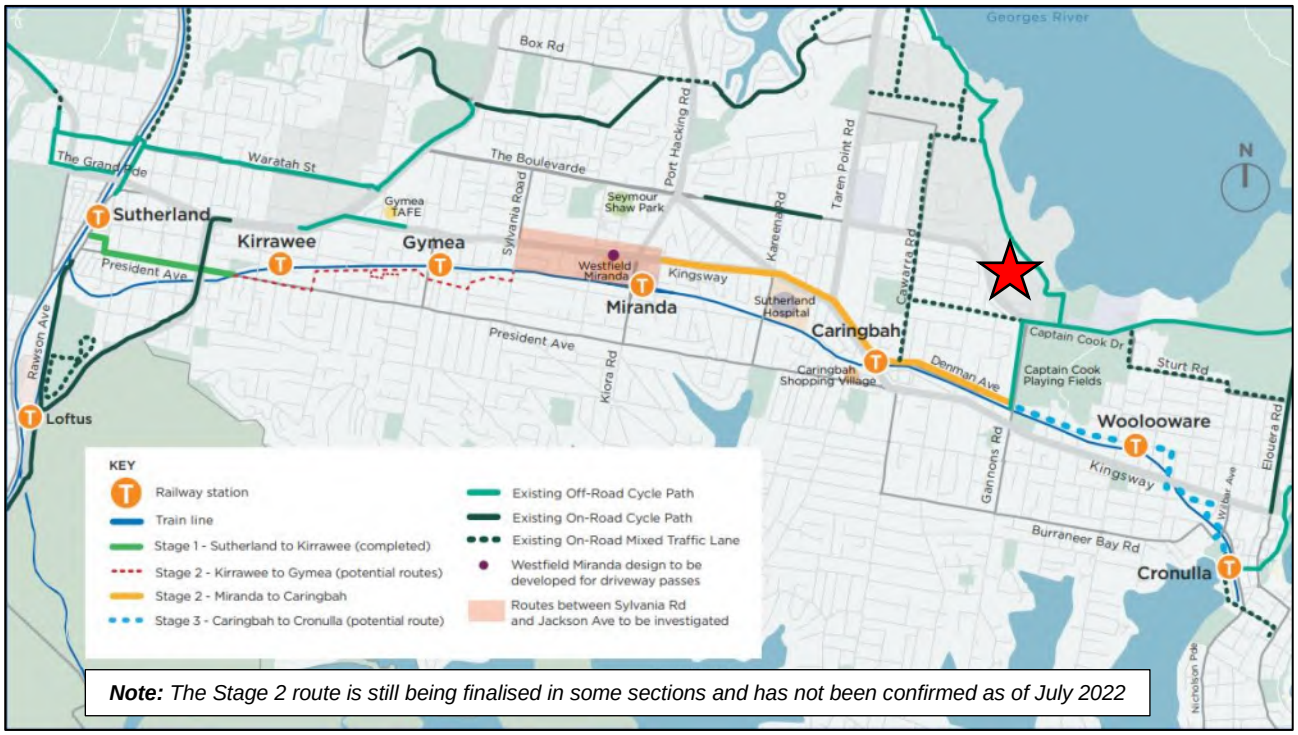


FIGURE 4: SUTHERLAND SHIRE COUNCIL BICYCLE NETWORK MAP

In addition to the above-mentioned routes, as shown in **Figure 4**, Sutherland Shire Council is committed on providing additional cycling routes within the entire LGA, although it is likely that these facilities will take time and will not occur in the short term. Of the known additional short-term bicycle and pedestrian network improvements, planning for the second stage of the Sutherland to Cronulla Active Transport Link (SCATL) is currently in progress with the aim to provide a cycle route between Sutherland and Cronulla. Stage 2 of the SCATL will extend the current shared cycle path that was completed under Stage 1 (Sutherland to Kirrawee).

The location of the site relative to the proposed SCATL cycling routes is depicted in **Figure 5**. It should be reiterated that Stage 1 (green line) is completed whilst the route for Stage 2 is undergoing some revision and has not been confirmed for the entirety of Stage 2.



Source: *Sutherland to Cronulla Active Transport Link – Community Update – June 2022*

Site Location

FIGURE 5: SITE CONTEXT – PROPOSED SUTHERLAND TO CRONULLA ACTIVE TRANSPORT LINK (SCATL)

Once the Sutherland to Cronulla Active Transport Link (SCATL) is completed in full (Stage 2 and Stage 3). The subject site will have additional connections via bicycle and pedestrian facilities to nearby Train Stations, particularly Caringbah and Woolooware and also greater bicycle connectivity from the site between Sutherland and Cronulla.

To promote cycling use to and from the site, it is important for the site to both advertise the cycling routes to and from the site via a Travel Access Guide (TAG), but also provide end of trip facilities and promote the use of both walking and cycling to and from the site via strategies.

It should be noted that the subject site is located on the northern side of Captain Cook Drive, a busy arterial road. The closest crossing facility is provided at Captain Cook Drive / Foreshore Boulevard to the east and Cawarra Road / Captain Cook Drive to the west, which does not provide an attractive route to cross Captain Cook Drive to promote the use of cyclists and pedestrians. Consideration should be given to providing safe pedestrian and cyclist crossing points within close proximity of the site, although this is largely the responsibility of the road authorities.

3.3 Public Transport – Bus Services

The subject site does not have easily accessible access to nearby bus stops, with the closest bus stop being located at Woolooware Bay to the east or along Gannons Road. Investigations should be made to providing additional indented bus stops along the site frontage to Captain Cook Drive to service the development. Alternatively, consideration should be made to providing bus facilities wholly within the site boundary, which is currently proposed and shown on the masterplan.

Discussions should be held with relevant stakeholders including TfNSW, Council and bus operators. It is noted that the masterplan development has sufficient road width available within the site to facilitate vehicles up to and include 12.5m length buses. Such that the provision of internal bus facilities is capable of being provided. Although it is considered that bus facilities would be better serviced external to the site along the Captain Cook Drive site frontage to avoid delays associated with bus routes. As buses travelling within the site can result in increases to travel time resulting in inefficient bus routes, making the use of bus facilities unattractive to users.

4 Implementation

4.1 Management and Authority

The distribution and implementation of the measures detailed in this Sustainable Travel Plan is the responsibility of the management and operators of the site. It is the responsibility of management to include alternative transport methods and initiatives in their regular communications to tenants and tenant employees.

As outlined in **Section 2**, due to the scale of the overall masterplan, the site would gain a large benefit from having a dedicated travel plan coordinator both implement initiatives and strategies and to evolve / update the STP as the site develops into the future, noting that STP's are not just a one off implementation but an ongoing measure to encourage a reduction in the use of private motor vehicles and encourage the use of active travel (walking, cycling) as well as sustainable transport (public transport).

Accordingly, authority is to be provided to the site management to implement measures, review the plan and undertake further relevant and appropriate actions.

4.2 Distribution

The site management will be responsible to inform tenants and tenant employees about any initiatives that they choose to implement via regular communications and any message boards accessible to tenants and tenant employees.

Further distribution methods will include regular meetings with tenants and tenant employees, which should not just be limited to distribution of information, but also a discussion about what strategies tenants and tenant employees would like to be implemented with a focus on active and sustainable transport.

5 Alternative Transport Strategy

5.1 Timeframe

As mentioned in **Section 1.1**, the site is the subject of a masterplan which will see significant further redevelopment of the site. In addition, the existing site has been recently approved for the continued use of the existing warehouse on the site. As such, this STP will apply from the opening of the existing Warehouse and any other tenants on the site.

5.2 Existing Transport Use in Surrounding Area

To assist in setting the targets and milestones for transport use, the NSW Bureau of Transport Statistics 2016 Journey to Work data has been consulted for the suburb of Caringbah. The data shows that on average 82% of employees who work in Caringbah drive to and from work, with the detailed travel mode split summarised in **Table 3** and illustrated in **Figure 6**.

TABLE 3: CARINGBAH (SA2) EXISTING TRAVEL MODE SPLIT

Mode of Transport	Usage Rate
Vehicle Driver	83%
Vehicle Passenger	6%
Train	6%
Bus	1%
Walk Only	3%
Bicycle	1%
Motorbike / Scooter	0%
Other	0%

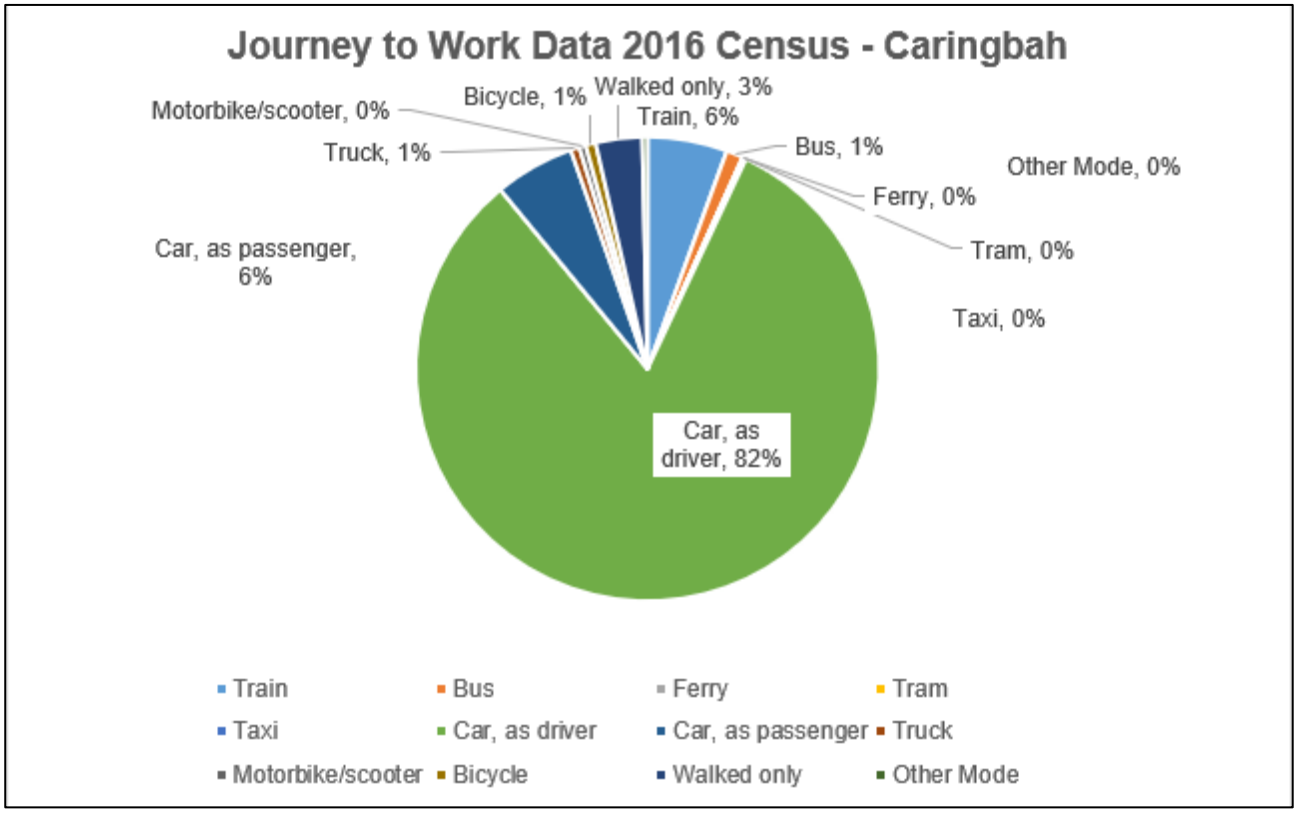


FIGURE 6: JTW DATA FOR CARINGBAH

5.3 Targets and Milestones

Through the implementation of actions described in **Section 6**, continuous increases in alternative transport use are anticipated for the duration of this Sustainable Travel Plan's effectiveness, which will be implemented for the life of the site. Reference is made to the *NSW Premier's Council (April 2010)*, which outlines that evidence from the mid 90's shows that good workplace travel plans reduce the amount of people driving to work by 5% to 15%.

Based upon the above, the overall shift to sustainable and active transport should fall within 5% to 15%. These changes in travel modes are not anticipated to occur within a short term frame, but over multiple years and as such the overall target per year will be a 1% reduction in the use of private motor vehicles.

The 1% year-on-year increase is assumed to occur generally in proportion to the current alternative modes of transport, resulting in a target 10% shift over ten years. The resulting 1, 3, 5 and 10-year goals for the travel mode split for the site are depicted in **Table 4**, with the 10-year goal also illustrated in **Figure 6**.

TABLE 4: TARGETED TRANSPORT MODE SPLIT

Mode of Transport	Usage Rate				
	Existing(1)	1yr	3yr	5yr	10yr
Vehicle Driver	83%	82%	80%	78%	73%
Vehicle Passenger	6%	6.1%	6.3%	6.5%	7%
Train	6%	6.4%	7.2%	8%	10%
Bus	1%	1.2%	1.6%	2%	3%
Bicycle	3%	3.2%	3.6%	4%	5%
Walk Only	1%	1.1%	1.3%	1.5%	2%
Motorbike / Scooter	0%	0%	0%	0%	0%
Other	0%	0%	0%	0%	0%

Notes:

(1) Based upon Table 4 and is subject to change with known data from the site.

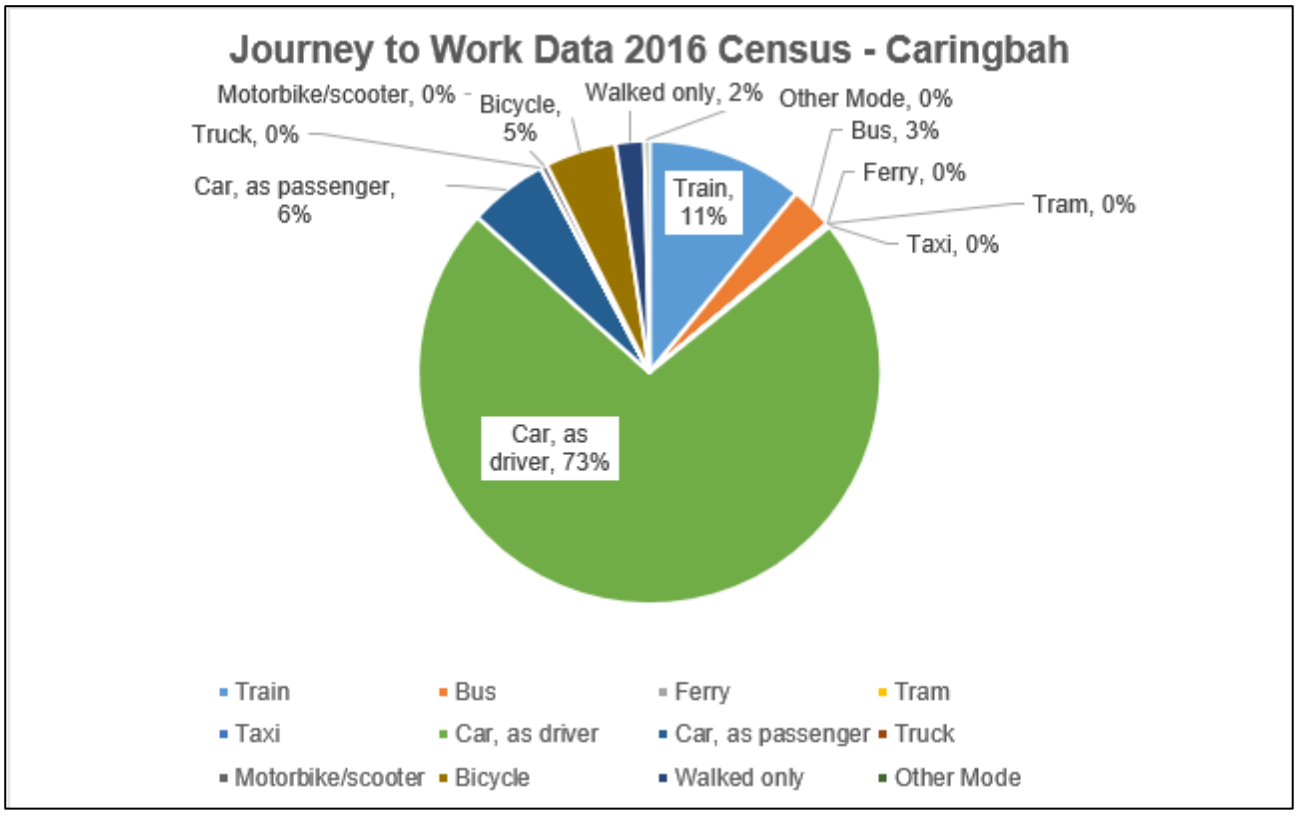


FIGURE 7: TARGETED 10-YEAR TRANSPORT MODE SPLIT

The transport mode split of the site once operating is unknown and hence a travel mode surveys need to be undertaken at the opening of the site to determine a baseline transport mode split, using the survey method outlined in **Section 5.4.2**. These surveys should be

then undertaken regularly after the commencement of operations of the site as outlined in **Section 5.4.1**.

It should be noted that the above mode shift is currently based upon the existing journey to work data, it is likely that if bus facilities are provided for the site along the site frontage to Captain Cook Drive, a higher shift to buses as a transport mode will occur.

5.4 Measurement and Reporting

5.4.1 Frequency

Travel mode surveys are to be undertaken annually for the first three years of occupation of the development, and once every three (3) years thereafter.

5.4.2 Method

The building management will engage an independent team to undertake the travel mode surveys, which will include gathering travel mode surveys from tenants and tenant employees and visitors during operating hours on a weekday and a weekend day. The survey would take the following form in order to capture a sufficient sample size.

- Surveyor conducting brief interview of tenant and tenant employees when they arrive and depart work over one full day of operation to determine trip destination and travel mode used;
- Surveyor conducting brief interview at the major pedestrian entrances and exits to determine trip destination / purpose and travel mode used.

By undertaking the survey on such a basis, the travel mode of a large proportion (estimated at 80%) of tenant and tenant employees moving into and out of the development could be ascertained.

5.4.3 Reporting

Following the completion of surveys, the results will be compiled into a report and provided to management, with new initiative suggested in this report when a shortfall is identified in any targeted travel mode.

6 Projects and Programs

The following actions form the basis for the implementation of the Sustainable Travel Plan.

Collectively, these actions have been designed to help achieve the targets and milestones set out in **Section 5.3**, aiming to reduce car usage and increase the use of public and active transport modes. It should be noted that these actions are not necessarily a compulsory task but rather potential options that should be investigated and implemented as appropriate by the site manager.

6.1 Initiatives to Specifically Reduce Staff Private Car Use

The following initiatives are suggested to lower private car usage by providing for facilities or programs with the aim to allow for greater flexibility in the choice of travel mode to and from the workplace. The strategies that can be implemented with this goal in mind are not limited to the following actions as shown in **Table 5**, but these are the basis for further reduction in private car reliance.

TABLE 5: POSSIBLE INITIATIVES TO REDUCE STAFF PRIVATE CAR USAGE

Action	Cost	Target Group	Date
Provide large lockers or storage areas for the storing work uniforms and equipment	Moderate	Staff	Ongoing
Encourage staff to plan ahead and to transport heavy/bulky items once or twice per week only	Minimal	Staff	From date of implementation

6.2 Public Transport Initiatives

The following actions are focused on encouraging staff and visitors to partake in public transport when travelling to and from work or events. These strategies could also assist in encouraging other visitors to utilise public transport when accessing the site. The strategies to be implemented are not limited to the following actions as shown in **Table 6**, but these are the basis for further development of public transport options.

TABLE 6: POSSIBLE PUBLIC TRANSPORT INITIATIVES

Action	Cost	Target Group	Date
Develop a map showing public transport routes to the site	Minimal	Staff and Visitors	Ongoing
Put up a notice board with leaflets and maps showing the main public transport routes to and from the site.	Minimal	Staff and Visitors	From date of implementation
Encourage public transport for business travel	Nil	Staff	From date of implementation
Prepare a Transport Access Guide (TAG) for the site.	Minimal	Staff	From date of implementation
Provide additional bus stop infrastructure along the site frontage and additional bus stops	High	Public	From date of implementation

6.3 Walking and Cycling Initiatives

6.3.1 Walking

The following actions are focused on encouraging staff to partake in walking when travelling to and from the site. The strategies to be implemented are not limited to the following actions as shown in **Table 7**, but these are the basis for further development of active transport options.

TABLE 7: POSSIBLE WALKING INITIATIVES

Action	Cost	Target Group	Date
Identify employees living near work that may be interested in walking to work	Nil	Staff	Ongoing
Produce a map showing safe walking routes to and from the site with times, not distances, to local facilities, such as shops and public transport	Minimal	Staff, Visitors & Guests	From date of implementation
Encourage the use of facility's showers, lockers and change rooms	Nil	Staff	From date of implementation
Implement incentive schemes to encourage employees to walk to work.	Minimal	Staff	From date of implementation
Take part in '*National Walk to Work Day*'	Nil	Staff	Annually
Have some '*TravelSmart Get to Work*' days encouraging staff to commute by alternative transport modes	Nil	Staff	Annually
Encourage staff to walk as a method of exercise	Nil	Staff	Ongoing
Provide safe crossing locations over Captain Cook Drive to nearby residential areas and bus and train locations	High	All Users	From date of implementation

6.3.2 Cycling

The following actions are focused on encouraging staff and visitors to partake in cycling when travelling to and from the site. The strategies to be implemented are not limited to the actions as shown in **Table 8**, but these are the basis for further development of active transport options.

TABLE 8: POSSIBLE CYCLING INITIATIVES

Action	Cost	Target Group	Date
Organise an after-work ride. It does not have to be long or strenuous and could end somewhere for dinner or drinks. This idea is to encourage people who might be reluctant to cycle to give it a go!	Nil	Staff	Quarterly
Monitor bicycle parking and increase to meet peak needs	Minimal	Staff and Visitors	From date of implementation
Have good, secure bicycle parking in an easily accessible location	Minimal	Staff and Visitors	From date of implementation
Provide bicycle parking for visitors	As per construction	Staff and Visitors	From date of implementation
Circulate maps of cycle paths in the vicinity	Nil	Staff and Visitors	Ongoing
Participate in annual events such as '*Ride to Work Day*'	Nil	Staff	Annually
Arrange information sessions outlining cycling safety and health benefits.	Minimal	Staff	Annually
Review bicycle parking CCTV and increase if required	Minimal	Staff and Visitors	From date of implementation
Provide safe crossing locations over Captain Cook Drive to nearby residential areas and bus and train locations	High	All Users	From date of implementation

6.4 Sustainable Transport Initiatives

6.4.1 Carpooling & Public Transport

The following actions are focused on encouraging staff to partake in carpooling and limiting the number of cars used to travel when travelling to and from the site. The strategies to be implemented are not limited to the following actions as shown in **Table 9**, but these are the basis for further development of alternative transport.

TABLE 9: POSSIBLE CARPOOLING INITIATIVES

Action	Cost	Target Group	Date
Set up carpooling databases for staff	Nil	Staff	From date of implementation
Organise postcode lunches	Nil	Staff	From date of implementation
Provide priority parking for carpooling vehicles	Nil	Staff	From date of implementation
Encourage use of carpooling apps and/or subsidise costs of car pooling trips	Nil	Staff	From date of implementation
Provide a privately run bus service, which provides access to and from the site from areas of which staff are heavily populated	Moderate	Staff	From date of implementation
Promote the use of train services by providing a shuttle bus service to and from nearby train stations	Minor	Staff / Visitors	From date of implementation

6.4.1 Car Parking

The following actions are focused on encouraging staff to partake in alternative options when travelling to and from the site. The strategies to be implemented are not limited to the following actions as shown in **Table 10**, but these are the basis for further development of alternative transport.

TABLE 10: POSSIBLE CAR PARKING INITATIVES

Action	Cost	Target Group	Date
Identify priority users of car parking e.g. people with disabilities, shift workers, carpoolers	Nil	Staff	From date of implementation
Introduce or increase charges for car parking and use money raised for TravelSmart initiatives	Nil	Staff	From date of implementation
Re-allocate car parking spaces for bicycle spaces	As per construction	Staff	From date of implementation

6.5 Use of Incentives

Many of the alternative transport initiatives described above require the willing participation of employees and would not otherwise be effective. The incentivisation of alternative transport options could increase the number of employees and guests, using alternative transport options.

A review of the NSW Household Travel Survey by Grace Corpuz identified a number of factors that affected the use of alternative travel options, identifying the following factors as most influential on alternative transport use (in order of importance):

- Parking capacity and arrangements (destination factor);
- Where a vehicle is not available or accessible (origin factor);
- Where it is cheaper (origin & destination factor);
- Travel time (origina & Destination factor);
- Convenience (origin & destination factor);
- Accessibility (origin & destination factor).

In addition to the above, the direct advertisement of and incentives for alternative transport use is suggested as a part of increasing alternative transport utilisation. Some incentivisation strategies are outlined below.

- Provide a yearly seminar of the benefits of utilising public transport and active transport including reduced greenhouse gas emissions and health benefits;
- Parking on-site could be restricted to car-pooling vehicles to encourage the use of car-pooling and alternative transport options;
- Flexible start and finish times could be implemented to facilitate the catching of scheduled bus and train services;
- Public transport ticketing costs could be subsidised by business owners to encourage public transport use;
- Incentives to encourage staff to walk to work.

The above incentivisation strategies could be implemented to boost update of alternative travel modes if annual targets are not met.

ANNEXURE A: CURRICULUM VITAE

Matthew McCarthy (Senior Traffic Engineer)

Experienced consulting traffic engineer within the private sector for the preparation and review of traffic impact assessments for a wide range of land uses and scales. Skilled in traffic modelling and analysis, preparation of road safety audits, traffic and transport planning, provision of detailed design advice for small and large scale developments. Regular appearances as an expert witness in the NSW Land and Environment Court to provide evidence on matters related to traffic, parking and road safety aspects of development.

Qualifications

Bachelor of Civil Engineering,
University of New South Wales Australia
2013

Masters of Engineering Science (Civil)
Majoring in Transport Engineering
University of New South Wales Australia
2015

RMS Accredited level 2 Road Safety Auditor (RSA-02-1197)
RMS Accredited Work Zone Traffic Management Plan Designer

Experience

MCLAREN TRAFFIC ENGINEERING
2016 to date

- Preparation & Review of Traffic Impact Assessment
- Construction Traffic Management Plans
- Road Safety Audits
- Concept Road and Parking Designs
- Expert Witness in the NSW Land and Environment Court
- SIDRA Modelling
- Transport Planning
- Detailed Design Advice for a variety of Land Uses
- Invarian Rapid Plan

Daniel Walker (Traffic Engineer)

Experienced traffic Engineer for the preparation and review of traffic and parking impact assessments for a wide range of land uses and scales. Skilled in traffic modelling and analysis, provision of detailed design advice for small and large scale developments.

Qualifications

Bachelor of Engineering (Honours) (Scholar), Class I, Civil Engineering, University of Wollongong, 2018

Accredited Level 1 Road Safety Auditor, 2020

Experience:

McLAREN TRAFFIC ENGINEERING

2016 to date:

- Preparation & Review of Traffic and Parking Impact Assessments
- Construction Traffic Management Plans
- Concept Road and Parking Designs
- SIDRA Traffic Modelling
- Transport and Traffic Planning and Management
- Detailed Design Advice for a variety of Land Uses
- Invarian Rapid Plan

ANNEXURE B: MASTERPLAN

LEVEL 1
BUILDING 4

NOTES

ALL NEW CROSSOVERS IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENTS

ALL DISABLED PARKING SPACES IN ACCORDANCE WITH AUSTRALIAN STANDARD AS2890
(5.4m x 2.4m)

SITE STORMWATER DRAINAGE IN ACCORDANCE WITH LOCAL AUTHORITY & COUNCIL REQUIREMENTS

ALL RELATIVE LEVELS ARE SHOWN TO A.H.D. (Australian Height Datum) LEVELS SHOWN ARE INDICATIVE ONLY AND SUBJECT TO FURTHER CIVIL DETAIL DESIGN. THESE MIGHT VARY +/- 1000 mm

EXTENT OF RETAINING WALLS SHOWN AS INDICATIVE ONLY SUBJECT TO CIVIL REVIEW

GROSS LETTABLE AREA (GLA) IS THE TOTAL FLOOR AREA OF A BUILDING, MEASURED FROM THE OUTSIDE OF EXTERNAL WALLS OR THE CENTRE OF PARTY WALLS AND INCLUDES ALL ROOFED AREAS

5% OF CARPARKING SPACES PROVIDED TO BE DEDICATED AS CAR SHARING BAYS
5% OF CARPARKING SPACES PROVIDED TO BE DEDICATED AS ELECTRICAL VEHICLE BAYS

DEVELOPMENT ANALYSIS

USE		GFA (EXCL LOADING ZONE)
BUILDING 3		
WAREHOUSE	3A	649 m²
WAREHOUSE	3B	676 m²
WAREHOUSE	3C	677 m²
WAREHOUSE	3D	677 m²
WAREHOUSE	3E	698 m²
WAREHOUSE	3F	763 m²
OFFICE	3A	126 m²
OFFICE	3B	127 m²
OFFICE	3C	127 m²
OFFICE	3D	127 m²
OFFICE	3E	127 m²
OFFICE	3F	126 m²
TOTAL AREA		4,900 m²
BUILDING 4		
WAREHOUSE	GROUND LEVEL	4,249 m²
WAREHOUSE	LEVEL 1	2,972 m²
OFFICE MEZZANINE	GROUND LEVEL	884 m²
OFFICE MEZZANINE	LEVEL 1	937 m²
TOTAL AREA		9,042 m²
BUILDING 5 BLOCK 1		
WAREHOUSE	5A	1,071 m²
WAREHOUSE	5B	3,048 m²
WAREHOUSE	5C	2,164 m²
OFFICE	5A	333 m²
OFFICE	5B	431 m²
OFFICE	5C	403 m²
TOTAL AREA		7,450 m²
BUILDING 5 BLOCK 2		
WAREHOUSE	5D	2,732 m²
WAREHOUSE	5E	2,023 m²
OFFICE	5D	424 m²
OFFICE	5E	391 m²
TOTAL AREA		5,570 m²
BUILDING 5 COMMERCIAL		
CAFE		112 m²
CHILDCARE		648 m²
CHILDCARE OUTDOOR		571 m²
COMMERCIAL		554 m²
TOTAL AREA		1,885 m²
BUILDING 6		
WAREHOUSE	6A	892 m²
WAREHOUSE	6B	1,688 m²
OFFICE	6A	154 m²
OFFICE	6B	181 m²
ESTATE MANAGER OFFICE		27 m²
TOTAL AREA		2,942 m²
BUILDING 7		
WAREHOUSE	7A	698 m²
WAREHOUSE	7B	647 m²
WAREHOUSE	7C	644 m²
WAREHOUSE	7D	696 m²
WAREHOUSE	7E	647 m²
WAREHOUSE	7F	644 m²
OFFICE	7A	117 m²
OFFICE	7B	118 m²
OFFICE	7C	117 m²
OFFICE	7D	110 m²
OFFICE	7E	118 m²
OFFICE	7F	117 m²
TOTAL AREA		4,673 m²
BUILDING 8		
WAREHOUSE	8A	744 m²
WAREHOUSE	8B	633 m²
OFFICE	8A	139 m²
OFFICE	8B	130 m²
TOTAL AREA		1,646 m²
GRAND TOTAL GFA		38,108 m²

SITE COVERAGE	
TOTAL SITE AREA	123,898 m²
BUILDING 3 - 8 FOOTPRINT	32,206 m²
BUILDING 1 & 2 FOOTPRINT APPROX.	27,878 m²
SITE COVERAGE APPROX.	48.49%
LANDSCAPING	13.25%

LEGEND

- ESTATE BOUNDARY
- FORESHORE LINE BOUNDARY
- TRANSMISSION EASEMENT
- LANDSCAPE SETBACK
- BUILDING SETBACK
- COUNCIL LAND DEDICATION
- 2.5 m BICYCLE & PEDESTRIAN SHARED PATH
- PEDESTRIAN CONCRETE FOOTPATH
- MAINTENANCE ACCESS TRACK & PEDESTRIAN PATH
- BIORETENTION BASIN / RAIN GARDEN
- EXISTING TREE PROTECTION ZONE
- PROPOSED TREE
- PYLON SIGN

RW	RETAINING WALL
OA	OUTDOOR AREA
RWT	RAIN WATER TANK
W	WASTE AREA
MSB	MAIN SWITCH BOARD
PL	PARCEL LOCKERS
BG	BOOM GATE
RPC	RAISED PEDESTRAIN CROSSING
DP	DELIVERY PARKING BAY
SP	SHARED PARKING BAY (5%)
EV	ELECTRICAL VEHICLE BAY (5%)
EMO	ESTATE MANAGER OFFICE

PARKING PROVISION

PARKING ALLOCATION SHOWN AS INDICATIVE ONLY

		CARS	BICYCLES
Building 1A		52	-
Building 1B		81	-
Building 1C		12	-
Building 1D		35	-
Building 1E		10	-
Building 2		12	-
Building 3		24	12
Building 4		121	64
Building 5	Block 1	48	12
Building 5	Block 2	13	8
Building 5	Childcare	17	4
Building 5	Commercial	15	8
Building 6		38	8
Building 7		62	12
Building 8		22	4
TOTAL		562	132
MOTORBIKES			20

No.	DATE:	REVISION:	BY:	CHK:
P20	24.09.2024	BUILDING 4 & 6, LANDSCAPE UPDATE	AS	JF
D	18.10.2024	FOR LODGEMENT	AS	JF
P21	06.12.2024	FOR INFORMATION	AS	JF
P22	14.01.2024	ISSUE FOR APPROVAL	AS	JF
E	07.02.2025	CAR PARKING REALLOCATION	IO	JF

All areas indicated are indicative for design and planning purposes only and should not be used for any contractual reasons without verification by a licensed surveyor or further design development being completed.

Watson Young Architects P/L Melbourne | Perth | Sydney 03 9516 8555 ACN: 111398700
8 Grattan Street Prahran VIC 3181 | e: info@watsonyoung.com.au | w: watsonyoung.com.au
© Watson Young Architects. This drawing is protected by copyright.

PROJECT:
CARINGBAH MASTERPLAN
13 ENDEAVOUR ROAD, CARINGBAH NSW 2229

TITLE:
ESTATE MASTERPLAN

TRUE NORTH

CLIENT: Aliro

DATE: SEPTEMBER, 2023
DRAWN BY: AS
SCALE: 1:1000 @ A1
SCALE: 1:2000 @ A3

JOB NO: 21366
DRAWING NO: 005
REVISION: E

watson young

ANNEXURE E: SWEPT PATH TESTING

(9 SHEETS)

STAIR

RL 2.20

1xSP

RL 2.40

RW

RW BELOW

RW

RW

AV STANDARDS 2018 (AU)

SHARED UNLOADING AREA

AV STANDARDS 2018 (AU)

BUILDING 3

RL 3.60

FFL 3.700

8000

15000

MDB

GF EXIT

5000

8000

RL 3.60

5m MAINTENANCE AC

TRACK TO AUSGRID P

RW BELOW

RL

BIORETENTION FILTER AREA

McLaren Traffic Engineering & Road Safety Consultants

MCLAREN TRAFFIC ENGINEERING
A division of RAMTRANS Australia Pty. Ltd.
Shop 7, 716-720 Old Princes Hwy, Sutherland NSW 2232
Email: admin@mclarentraffic.com.au
Phone : (02) 9521 - 7199
www.mclarentraffic.com.au

CLIENT / Project:
Aliro

Project Address:
13 Endeavour Road, Caringbah

Project Number: 240383

Drawing Title:
03 - Building 3 20m AV Circulation (2)

Revision History		
Version	Date	Notes
A	10/10/2024	

Notes:

CONCEPT PLAN ONLY.
NOT FOR CONSTRUCTION.

Tested Using:
*AutoTURN 11
*ZWCAD 2019

Filename: circulation paths.dwg

Scale @ A3 - 1:400

CAPTAIN COOK DRIVE

BUILDING 5
BLOCK 1
FFL 3.900

5A
5B
5C

BRIGADE ONLY
RW BELOW
RW
RL 3.60
LOADING ZONE
3m CANOPY ABOVE
COMMON O/A
RL 3.65
RPC
BATTER
3x SP
EV
E
ICE
HRV STANDARDS 2018 (AU)
22830
7000
LOADING ZONE
RL 3.70
TENANT 1
CHILDCARE
TENANT 2
1x SP
RL 3.60
1x SP
MAP
4500
6200
4x SP
BG
2x SP
DROP OFF
BRANDING SIGN

McLaren Traffic Engineering & Road Safety Consultants

MCLAREN TRAFFIC ENGINEERING
A division of RAMTRANS Australia Pty. Ltd.
Shop 7, 716-720 Old Princes Hwy, Sutherland NSW 2232
Email: admin@mclarentraffic.com.au
Phone : (02) 9521 - 7199
www.mclarentraffic.com.au

CLIENT / Project:
Aliro

Project Address:
13 Endeavour Road, Caringbah

Project Number: 240383

Drawing Title:
04 - Emergency Vehicle Circulation (2)

Revision History		
Version	Date	Notes
A	10/10/2024	

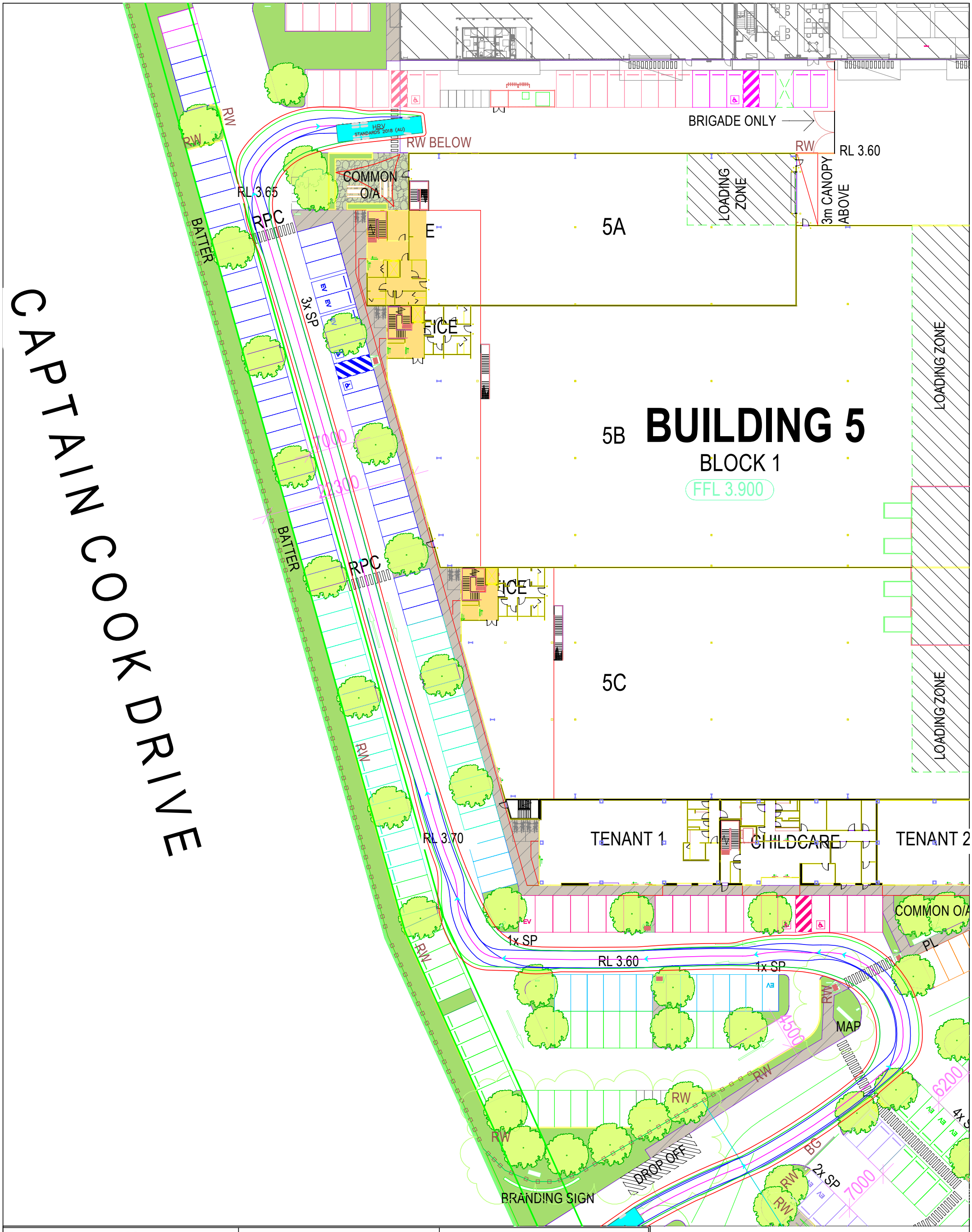
Notes:

CONCEPT PLAN ONLY.
NOT FOR CONSTRUCTION.

Tested Using:
*AutoTURN 11
*ZWCAD 2019

Filename: circulation paths.dwg

Scale @ A3 - 1:500



McLaren Traffic Engineering & Road Safety Consultants

MCLAREN TRAFFIC ENGINEERING
A division of RAMTRANS Australia Pty. Ltd.
Shop 7, 716-720 Old Princes Hwy, Sutherland NSW 2232
Email: admin@mclarentraffic.com.au
Phone : (02) 9521 - 7199
www.mclarentraffic.com.au

CLIENT / Project:
Aliro

Project Address:
13 Endeavour Road, Caringbah

Project Number: 240383

Drawing Title:
05 - Emergency Vehicle Circulation (2)

Revision History		
Version	Date	Notes
A	10/10/2024	

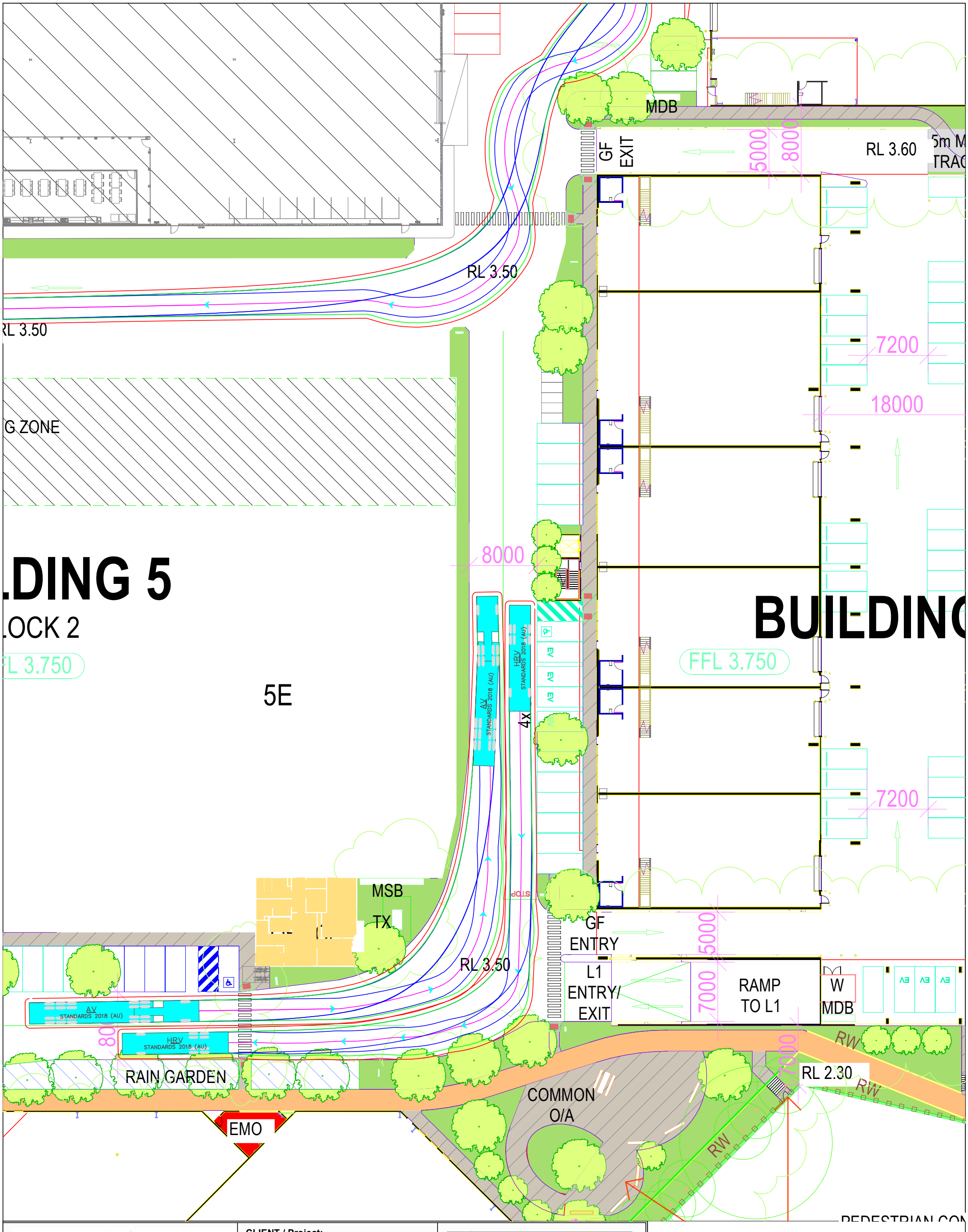
Notes:

CONCEPT PLAN ONLY.
NOT FOR CONSTRUCTION.

Tested Using:
*AutoTURN 11
*ZWCAD 2019

Filename: circulation paths.dwg

Scale @ A3 - 1:500



MCLAREN TRAFFIC ENGINEERING
A division of RAMTRANS Australia Pty. Ltd.
Shop 7, 716-720 Old Princes Hwy, Sutherland NSW 2232
Email: admin@mclarentraffic.com.au
Phone : (02) 9521 - 7199
www.mclarentraffic.com.au

CLIENT / Project:
Aliro

Project Address:
13 Endeavour Road, Caringbah

Project Number: 240383

Drawing Title:
06 - General Circulation

Revision History		
Version	Date	Notes
A	10/10/2024	

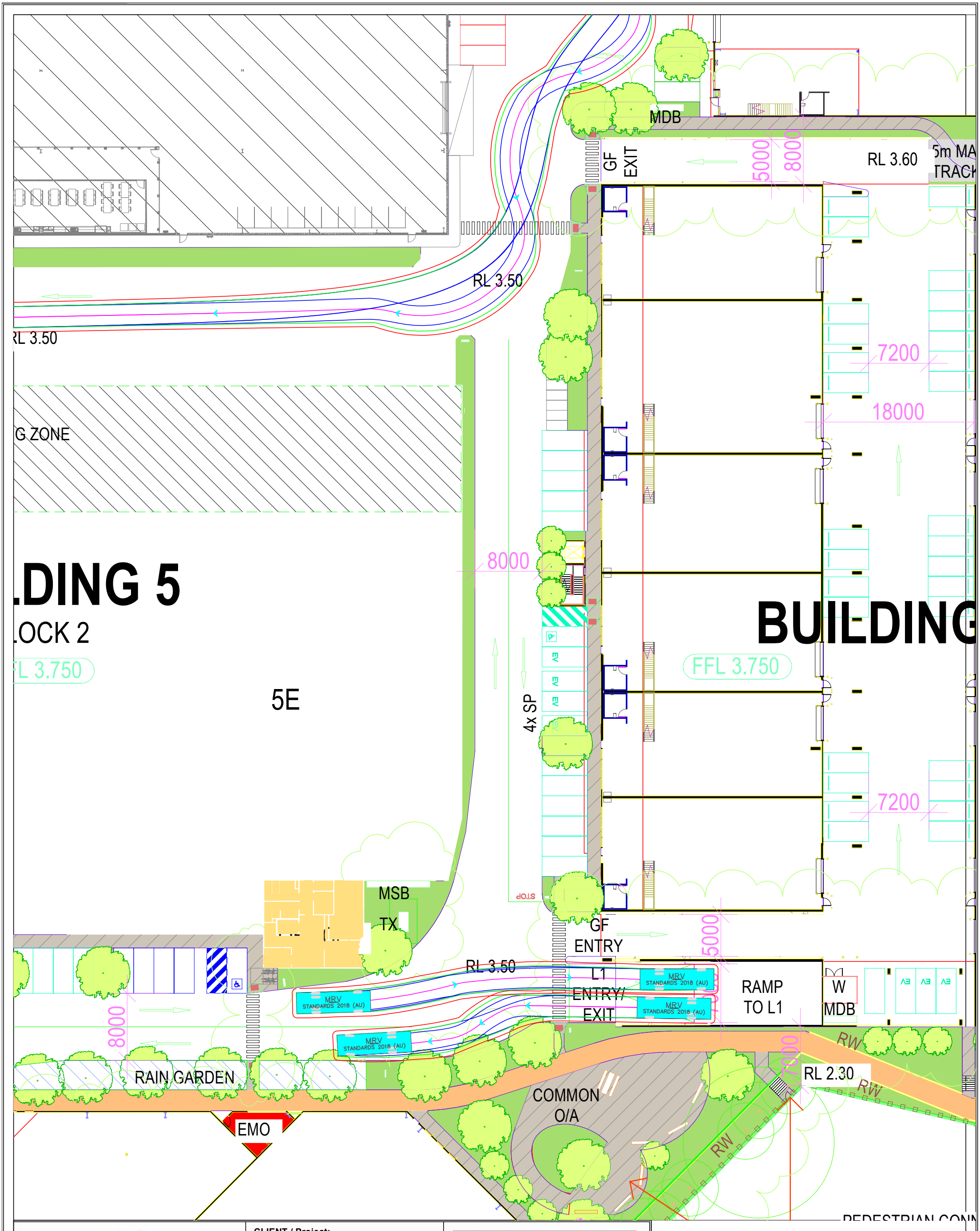
Notes:

CONCEPT PLAN ONLY.
NOT FOR CONSTRUCTION.

Tested Using:
*AutoTURN 11
*ZWCAD 2019

Filename: circulation paths.dwg

Scale @ A3 - 1:400



MCLAREN TRAFFIC ENGINEERING
A division of RAMTRANS Australia Pty. Ltd.
Shop 7, 716-720 Old Princes Hwy, Sutherland NSW 2232
Email: admin@mclarentraffic.com.au
Phone : (02) 9521 - 7199
www.mclarentraffic.com.au

CLIENT / Project:
Aliro

Project Address:
13 Endeavour Road, Caringbah

Project Number: 240383

Drawing Title:
07 - General Circulation

Revision History		
Version	Date	Notes
A	10/10/2024	

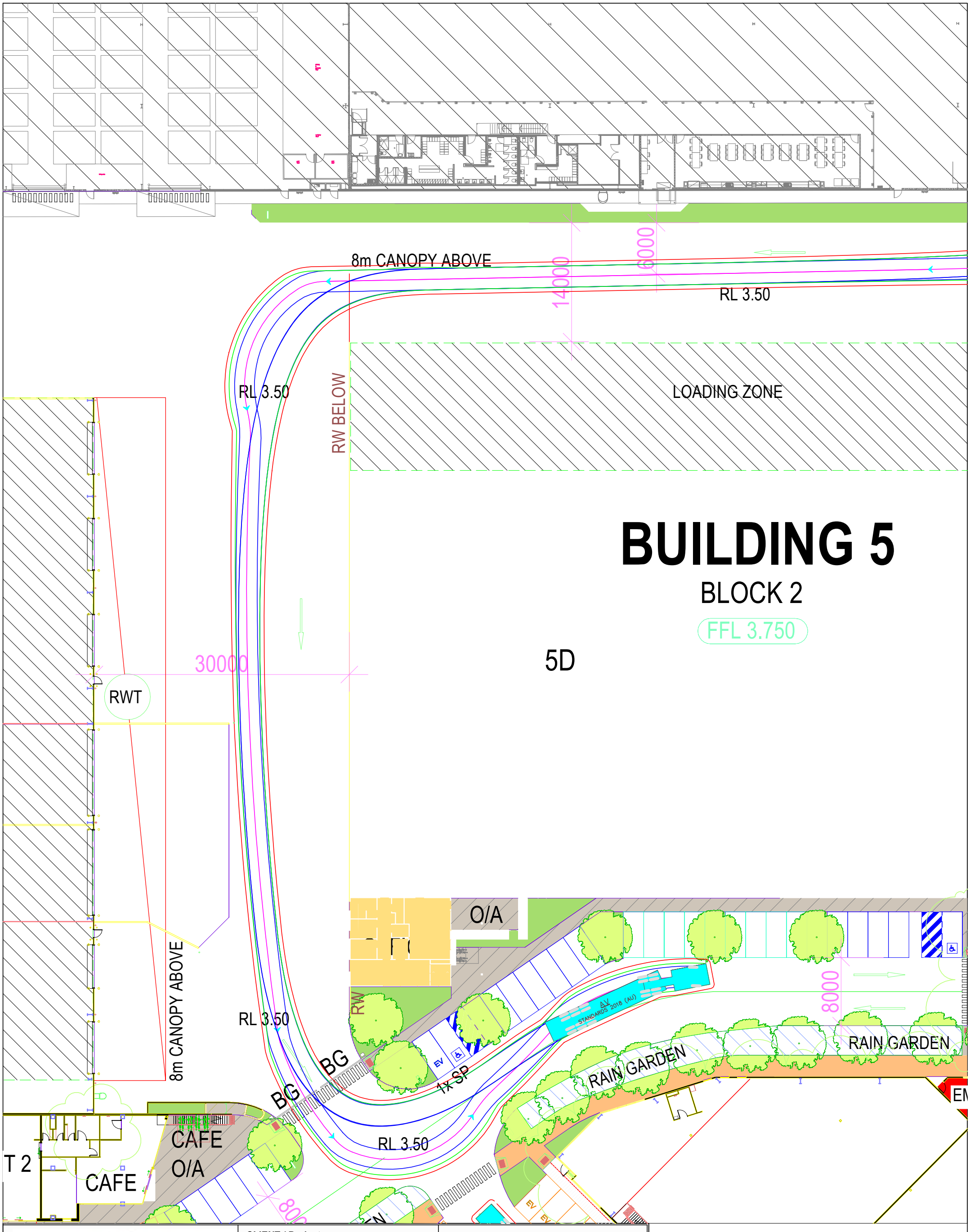
Notes:

CONCEPT PLAN ONLY.
NOT FOR CONSTRUCTION.

Tested Using:
*AutoTURN 11
*ZWCAD 2019

Filename: circulation paths.dwg

Scale @ A3 - 1:400



McLaren Traffic Engineering & Road Safety Consultants

MCLAREN TRAFFIC ENGINEERING
A division of RAMTRANS Australia Pty. Ltd.
Shop 7, 716-720 Old Princes Hwy, Sutherland NSW 2232
Email: admin@mclarentraffic.com.au
Phone : (02) 9521 - 7199
www.mclarentraffic.com.au

CLIENT / Project:
Aliro

Project Address:
13 Endeavour Road, Caringbah

Project Number: 240383

Drawing Title:
08 - General Circulation

Revision History		
Version	Date	Notes
A	10/10/2024	

Notes:

CONCEPT PLAN ONLY.
NOT FOR CONSTRUCTION.

Tested Using:
*AutoTURN 11
*ZWCAD 2019

Filename: circulation paths.dwg

Scale @ A3 - 1:400

BUILDING 7

FFL 3.700

LOADING ZONE
8m CANOPY ABOVE
RL 3.50
BG
BG
RW
O/A
1x SP
EV
AV
STANDARDS 2018 (AU)
HRV
STANDARDS 2018 (AU)
RAIN GARDE
RAIN GARDEN
CAFE
O/A
CAFE
IANT 2
RL 3.50
8000
RAIN GARDEN
EV
EV
BUILDIN
MON O/A
DP
PL
HRV
STANDARDS 2018 (AU)
2xMSB
2xTX
COMMON
O/A
6200
4X SP
EV
EV
EV
7000
21000
7400
HRV
STANDARDS 2018 (AU)
RW
LER
ON O/A

MCLAREN TRAFFIC ENGINEERING
A division of RAMTRANS Australia Pty. Ltd.
Shop 7, 716-720 Old Princes Hwy, Sutherland NSW 2232
Email: admin@mclarentraffic.com.au
Phone : (02) 9521 - 7199
www.mclarentraffic.com.au

CLIENT / Project:
Aliro

Project Address:
13 Endeavour Road, Caringbah

Project Number: 240383

Drawing Title:
09 - General Circulation

Revision History

Version	Date	Notes
A	10/10/2024	

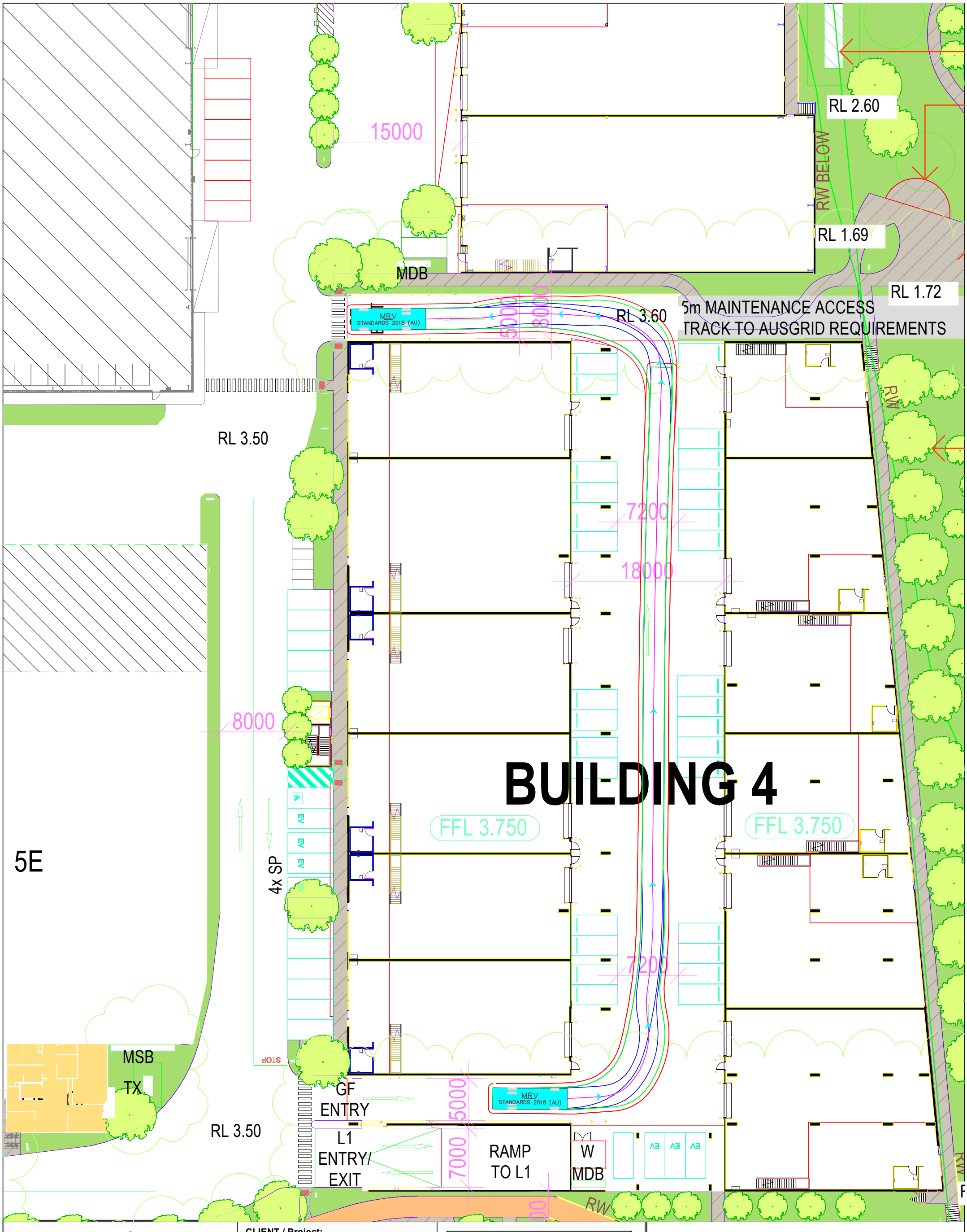
Notes:

CONCEPT PLAN ONLY.
NOT FOR CONSTRUCTION.

Tested Using:
*AutoTURN 11
*ZWCAD 2019

Filename: circulation paths.dwg

Scale @ A3 - 1:400



MCLAREN TRAFFIC ENGINEERING
A division of RAMTRANS Australia Pty. Ltd.
Shop 7, 716-720 Old Princes Hwy, Sutherland NSW 2232
Email: admin@mclarentraffic.com.au
Phone : (02) 9521 - 7199
www.mclarentraffic.com.au

CLIENT / Project:
Aliro

Project Address:
13 Endeavour Road, Caringbah

Project Number: 240383

Drawing Title:
10 - General Circulation

Revision History		
Version	Date	Notes
A	10/10/2024	

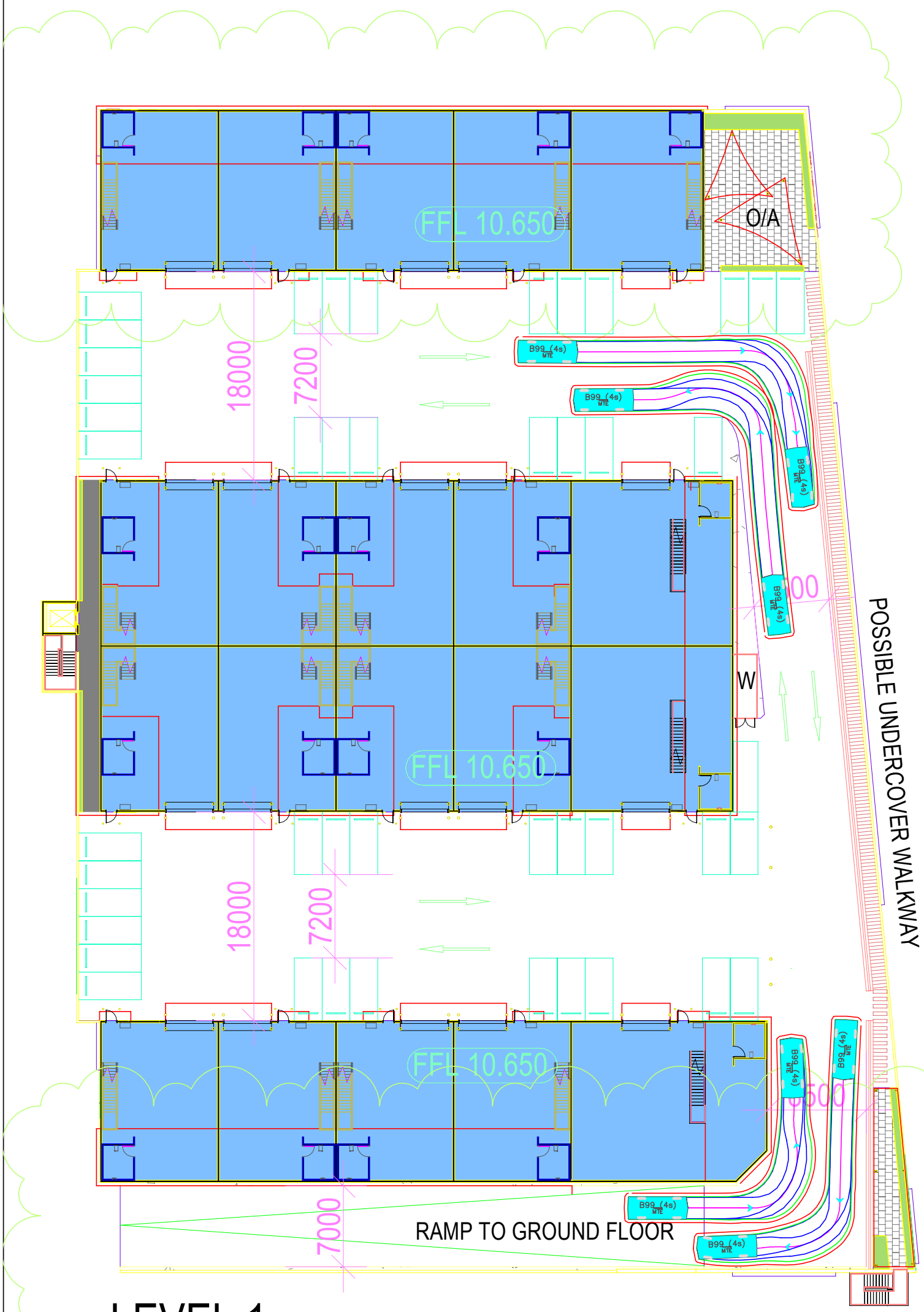
Notes:

CONCEPT PLAN ONLY.
NOT FOR CONSTRUCTION.

Tested Using:
*AutoTURN 11
*ZWCAD 2019

Filename: circulation paths.dwg

Scale @ A3 - 1:400



LEVEL 1

BUILDING 4

MCLAREN TRAFFIC ENGINEERING
A division of RAMTRANS Australia Pty. Ltd.
Shop 7, 716-720 Old Princes Hwy, Sutherland NSW 2232
Email: admin@mclarentraffic.com.au
Phone : (02) 9521 - 7199
www.mclarentraffic.com.au

CLIENT / Project:
Aliro

Project Address:
13 Endeavour Road, Caringbah

Project Number: 240383

Drawing Title:
11 - General Circulation

Revision History		
Version	Date	Notes
A	10/10/2024	

Notes:

CONCEPT PLAN ONLY.
NOT FOR CONSTRUCTION.

Tested Using:
*AutoTURN 11
*ZWCAD 2019

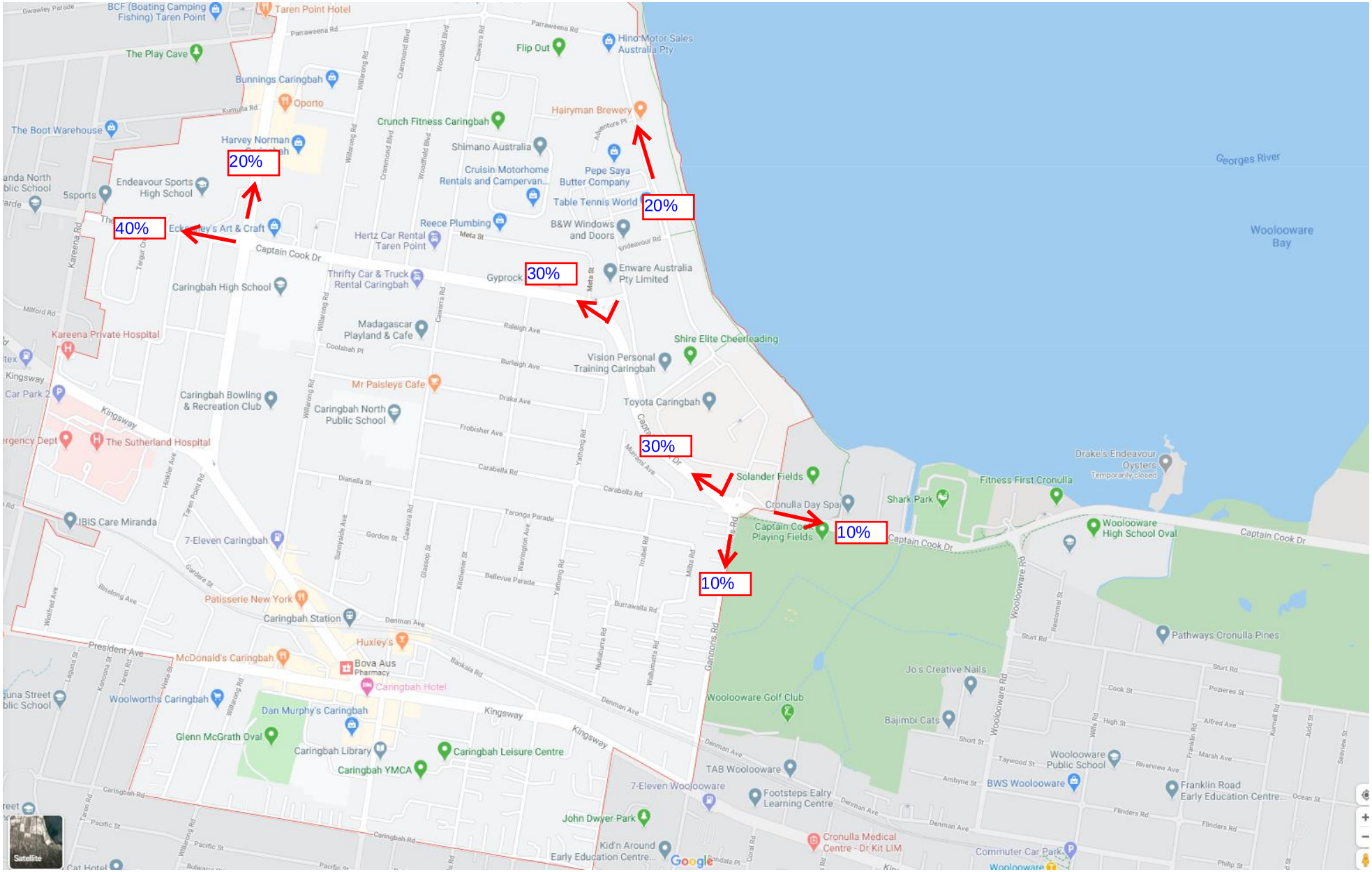
Filename: circulation paths.dwg

Scale @ A3 - 1:400

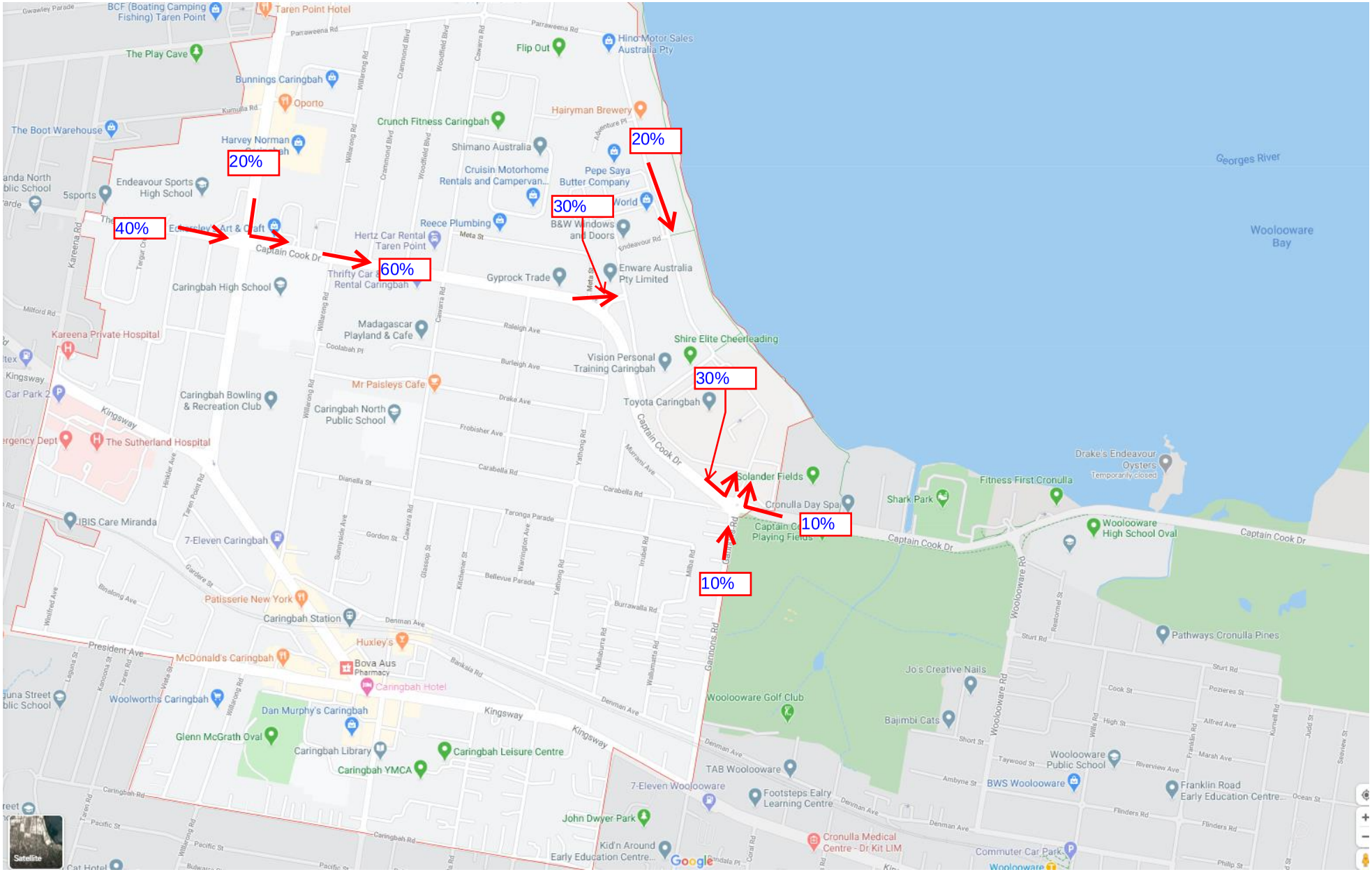
ANNEXURE F: TRAFFIC DISTRIBUTION

(2 SHEETS)

Outbound Distribution



Inbound Distribution



ANNEXURE G: ENDEAVOUR ROAD / CAPTAIN COOK DRIVE DESIGN (SIDRA)

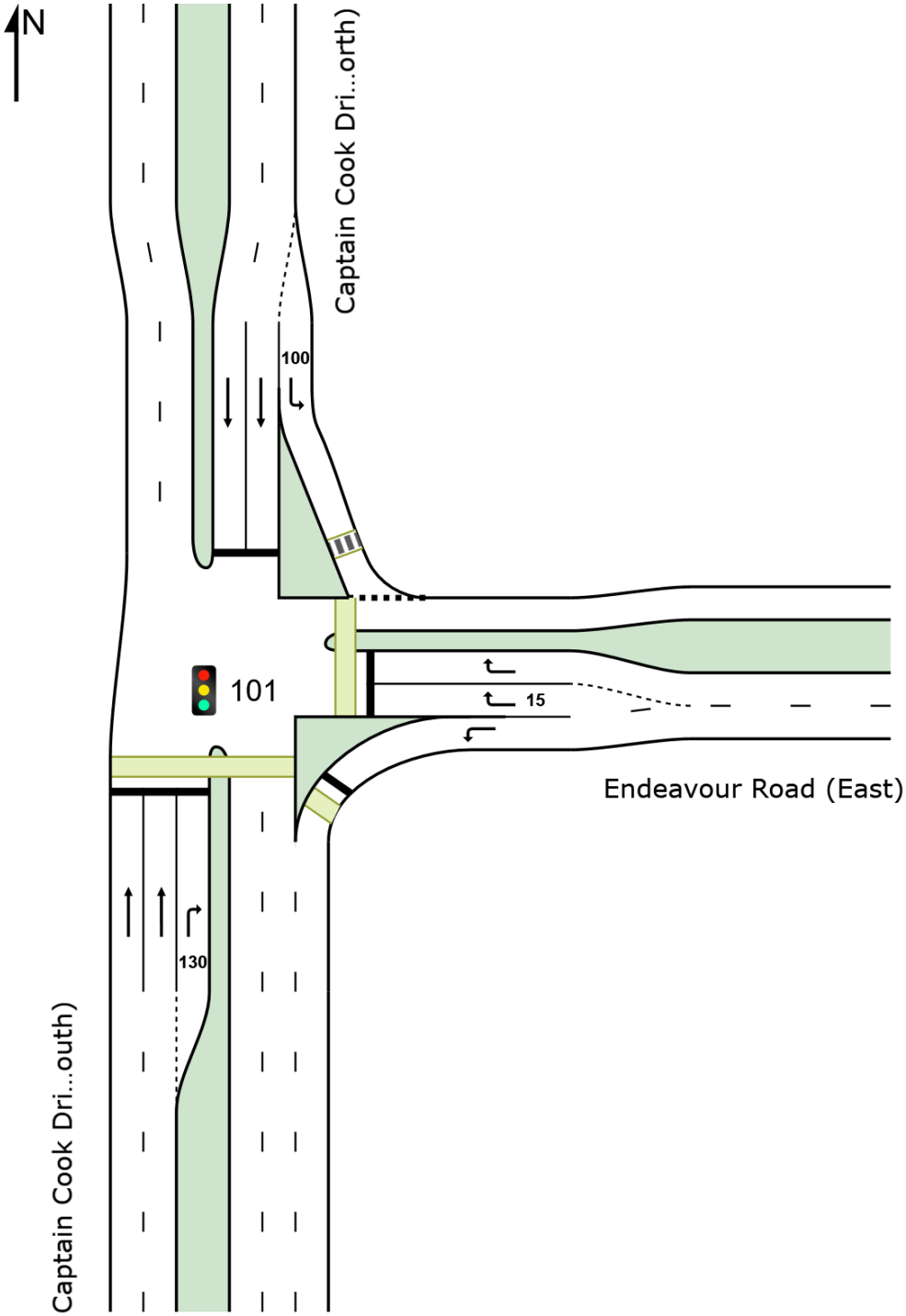
(2 SHEETS)

SITE LAYOUT

Site: 101 [Captain Cook Drive / Endeavour Road - 2024 Existing AM + Filter RHT + Dev + Upgrade (Site Folder: Future (2024 + Development + Upgrade))]

Captain Cook Drive / Endeavour Road
September 2024 Vols (7:45AM - 8:45AM)
UPGRADED SIGNALS - EXISTING (2024) + DEVELOPMENT - AM PEAK
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



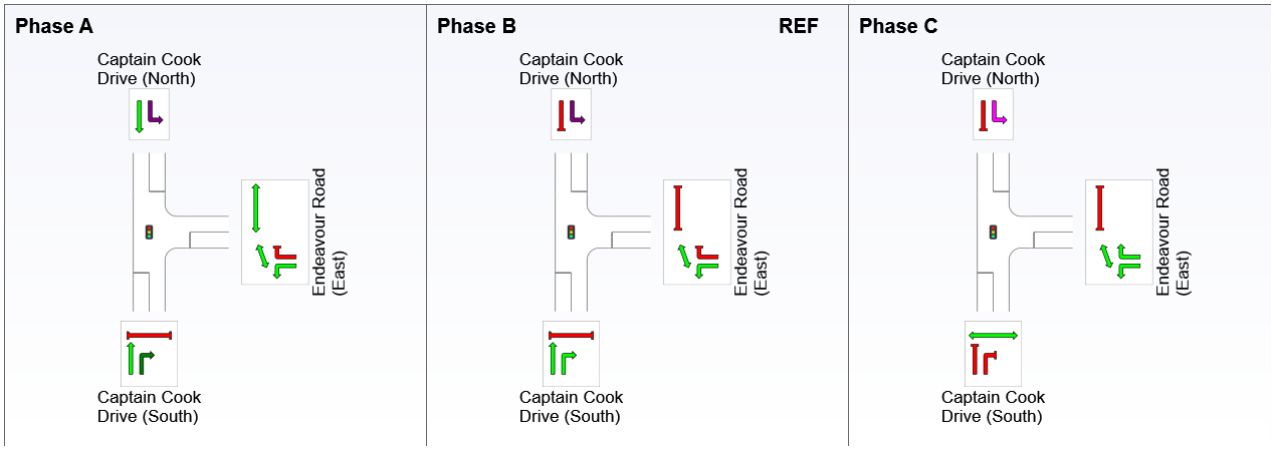
INPUT PHASE SEQUENCE

All Movement Classes

Site: 101 [Captain Cook Drive / Endeavour Road - 2024 Existing AM + Filter RHT + Dev + Upgrade (Site Folder: Future (2024 + Development + Upgrade))]

Captain Cook Drive / Endeavour Road
September 2024 Vols (7:45AM - 8:45AM)
UPGRADED SIGNALS - EXISTING (2024) + DEVELOPMENT - AM PEAK
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Phase Sequence: Leading Right Turn
Reference Phase: Phase B
Input Phase Sequence: A, B, C



REF: Reference Phase
VAR: Variable Phase

SIDRA INTERSECTION 9.1 | Copyright © 2000-2024 Akcelik and Associates Pty Ltd | sidrasolutions.com