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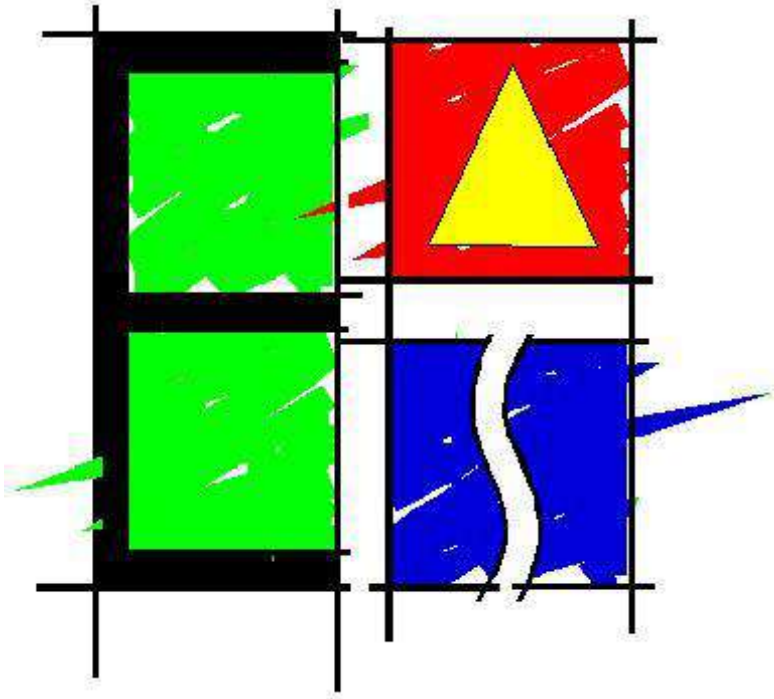
Appendix G5: Traffic Impact Assessment

TRAFFIC IMPACT ASSESSMENT

FOR A
PROPOSED RESIDENTIAL DEVELOPMENT
ON ERF 2074, PLETTENBERG BAY



August 2024

Prepared for: **Duinesand (Pty) Ltd**

Prepared by: **Engineering Advice and Services (Pty) Ltd**
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CLIENT REF: **DUINESAND (PTY) LTD**

PROJECT NAME: **PROPOSED RESIDENTIAL DEVELOPMENT ON ERF 2074, PLETTENBERG BAY**

DOCUMENT TITLE: **TRAFFIC IMPACT ASSESSMENT**

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ABBREVIATIONS

EAS	Engineering Advice & Services (Pty) Ltd
Km/h	kilometres per hour
LOS	Level of Service
LSDF	Local Spatial Development Framework
TIA	Traffic Impact Assessment
TMH	Technical Methods for Highways
TRH	Technical Recommendations for Highways

1 INTRODUCTION

1.1 BACKGROUND

Engineering Advice & Services (Pty) Ltd was appointed by Duinesand (Pty) Ltd during July 2024 to prepare a Traffic Impact Assessment for a proposed residential (Group Housing) Development on 2074, Plettenberg Bay, situated in the Bitou Local Municipality. The location of the site and proposed development is indicated on **Figure 1** overleaf.

View of the site from Marine Way (MR00383)

1.2 OBJECTIVES OF THE STUDY

In broad terms, the purpose of the traffic assessment is to determine the extent and nature of the traffic generated by the proposed development, assess the impact of this traffic on the operation of the associated road network, and devise solutions for any problems identified. The following key elements, *inter alia*, are addressed in this traffic impact assessment:

- The suitability and safety of proposals for access to and egress from the site;
- The capacity of the existing and future road network within the influence radius; and
- The road upgrading measures required to accommodate traffic generated by the proposed development.

In general, this report serves to satisfy the Bitou Local Municipality and the Department of Mobility of the Western Cape Government that the traffic impact of the envisaged development is within acceptable limits and that the suggested improvements conform to the standards and parameters set by the relevant road authority.

1.3 METHODOLOGY

The approach followed in conducting the traffic impact statement was in accordance with the guidelines set by **TMH 16 Volume 1- South African Traffic Impact and Site Assessment Manual** [(1)].

Given the extent of the proposed development and in terms of the aforementioned guidelines, the development is considered to be a medium-sized development. As such, this assessment considered impact for both the development (assumed to be 2025) and development plus five-year (2030) horizons.

The methodology used was as follows:

- Present traffic flow patterns were obtained and the affected intersections analysed, where after recommendations were made on the present need for road upgrading, without taking the proposed development into account;
- Given the development extent, trips generated by the development were determined using applicable trip generation rates specified in **TMH 17 Volume 1 - South African Trip Data Manual** [(2)] document;
- The distribution of the generated trips was estimated where after the generated traffic was assigned to the surrounding road network;
- Operation of affected intersections and the proposed access point was analysed to ensure that they operate safely at acceptable levels of service and recommendations made on the need for road upgrading taking cognisance of the proposed development for the 2025 and 2030 planning horizons;
- The suitability of the location and configuration of the proposed access point was assessed in terms of the **Access Management Guidelines** [(3)]**;** and
- Taking into account the major findings of the study, conclusions were made regarding the financial responsibilities of the affected parties for required road upgrading measures.

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N

Legend

Subject Site

Project Title: Traffic Impact Assessment for a Proposed Residential Development on Erf 2074, Plettenberg Bay	*Drawing No:* 2296-P-001
Drawing Title: Figure 1: Locality Plan	*Drawing Date:* July 2024

0 25 50 100 150 200 Meters

Scale 1:10 000

Prepared by : EHN

Checked by : CH

1.4 STUDY AREA

Based on the type and extent of the development the study area extended along Marine Way (Main Road 00383) from its intersection with the Ultra City access to the intersection with Challenge Drive as it is considered that trips generated by the proposed development will approach along these roads and through these intersections.

1.5 ASSUMPTIONS AND LIMITATIONS

The scope of this TIA is limited to the project as described in this report. The scope only deals with vehicular and pedestrian traffic related impacts to the site and excludes consideration of the following:

- Any vehicular activity 500m east of the Marine Way / Challenge Drive intersection;
- Any vehicular activity at the N2 / Marine Way intersection;

The report is based on a number of assumptions and is subject to certain limitations. These are as follows:

- That vehicle trips are based on development information supplied by the site owner / developer;
- That trips generated by the proposed development are distributed to and from the site based on the location of the development site, relative to trip attractors (e.g., places of employment and shopping centres) and the major road networks;
- That access to the proposed residential development will be provided from Marine Way (MR00383); and
- That the site will be used for the purposes as advised by the developer.

Notwithstanding these assumptions and limitations, it is our view that this Traffic Impact Assessment provides the necessary framework to allow the developer to conduct activities within the necessary legal, planning and operational requirements set by the relevant road authorities.

2 LAND USE RIGHTS, DEVELOPMENT AND ENVIRONS

2.1 DEVELOPMENT ENVIRONS

The site, which is currently vacant, is situated to the west of the Plettenberg Bay CBD. The site is located immediately to the south of Marine Way (MR00383) approximately 300m east of the N2 / Marine Way roundabout as indicated on **Figure 1**.

The site is bordered by residential development of varying types and densities.

The site slopes upward away from the road to the south.

2.2 OVERVIEW OF DEVELOPMENT

The proposed development is a residential development comprising 228 two- and three-bedroom residential units in multi-level apartment blocks.

2.3 CURRENT AND PROPOSED LAND –USE RIGHTS

The site measures 6.2458 ha in extent and is currently zoned for Agricultural Zone 1 purposes in terms of the **Bitou Municipality Zoning Scheme By-law [(4)]**.

To accommodate the proposed development, it is proposed to rezone the property to "General Residential II" purposes and then subdivide the property into 3 or 4 portions to facilitate phased implementation.

A copy of the Planning report is attached as **Annexure A**.

3 DATA COLLECTION

3.1 PEAK HOUR TRAFFIC VOLUMES

Peak hour traffic turning movement counts were conducted at the following intersections during typical weekday AM and PM peak periods on Wednesday 14 August 2024.

- Marine Way / N2 westbound off-ramp
- Marine Way / Erf 2073
- Marine Way / Challenge Drive

The detailed survey data is attached as **Annexure B** and summarised on **Figure 2** overleaf.

It is noted that the existing traffic volumes observed at the erf 2073 access point are deemed to reflect the traffic generated by the existing Phase 1 development on erf 2073, and will be reassigned to the planned new access point to erf 2074 at the existing Challenge Drive intersection.

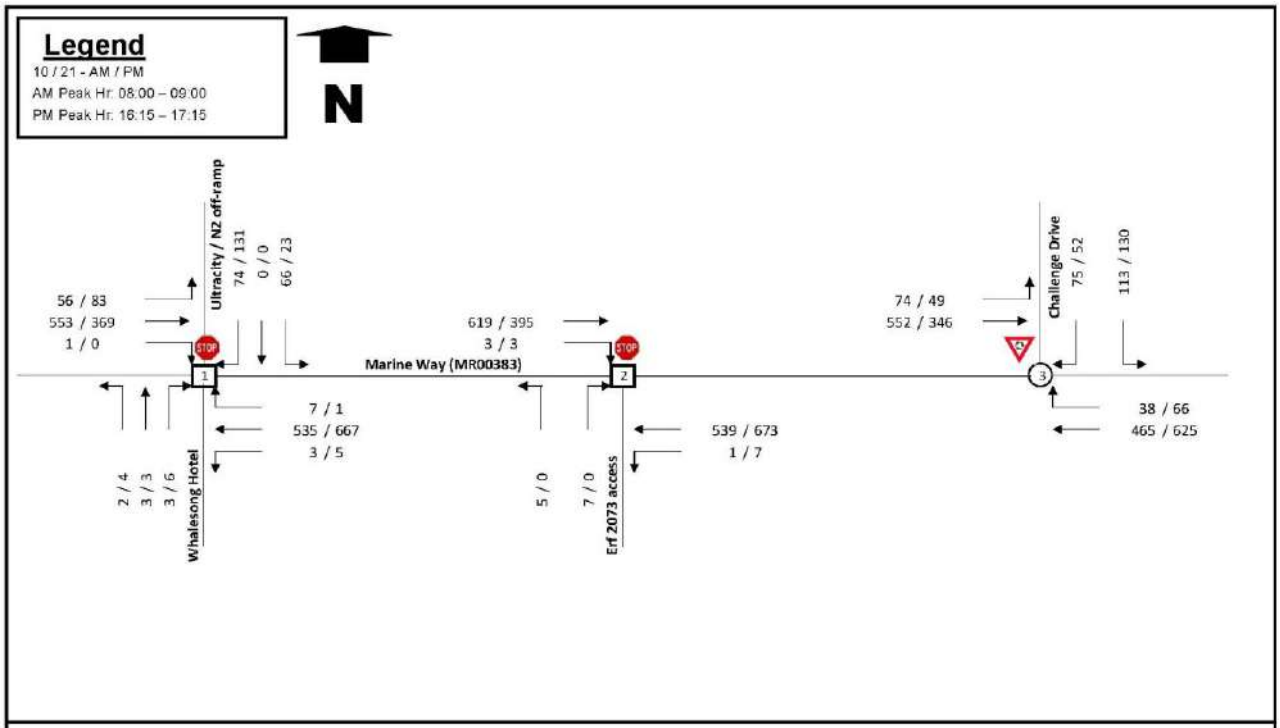


Figure 2: Existing Peak Hour Traffic Volumes - 2024

3.2 DAILY TRAFFIC VOLUMES

As this study will also assess the impact of the development for the 2025 and 2030 planning horizons, traffic volumes will be escalated to approximate conditions for these horizons.

Ideally, given that Marine Way (MR00383) is a provincial main road historical daily traffic volume data would be available on the Western Cape Government's Road Network Information System (RNIS).

However, as no historical data exists for MR00383 is available, the nearest available data is along Robberg Road (MR00382) to the west of the town centre.

The growth trend at this count location is summarised in **Table 1** below and the data sheets attached as **Annexure C**.

Table 1: Growth Trends - AADT

Road no.	Description	Initial count (2000)	Latest count (2022)	Growth Rate*	Recalculated Rate #
MR00382	Robberg Rd	1944	4692	2.43%	3.7 %

* Growth Rate based on last 5 available counts
\# Recalculated growth rate based on selected counts

The growth rate of 2.5% per annum will be used to escalate background traffic volumes.

The escalated background traffic volumes for the 2025 and 2030 development horizons are indicated on **Figure 3** and **Figure 4** overleaf.

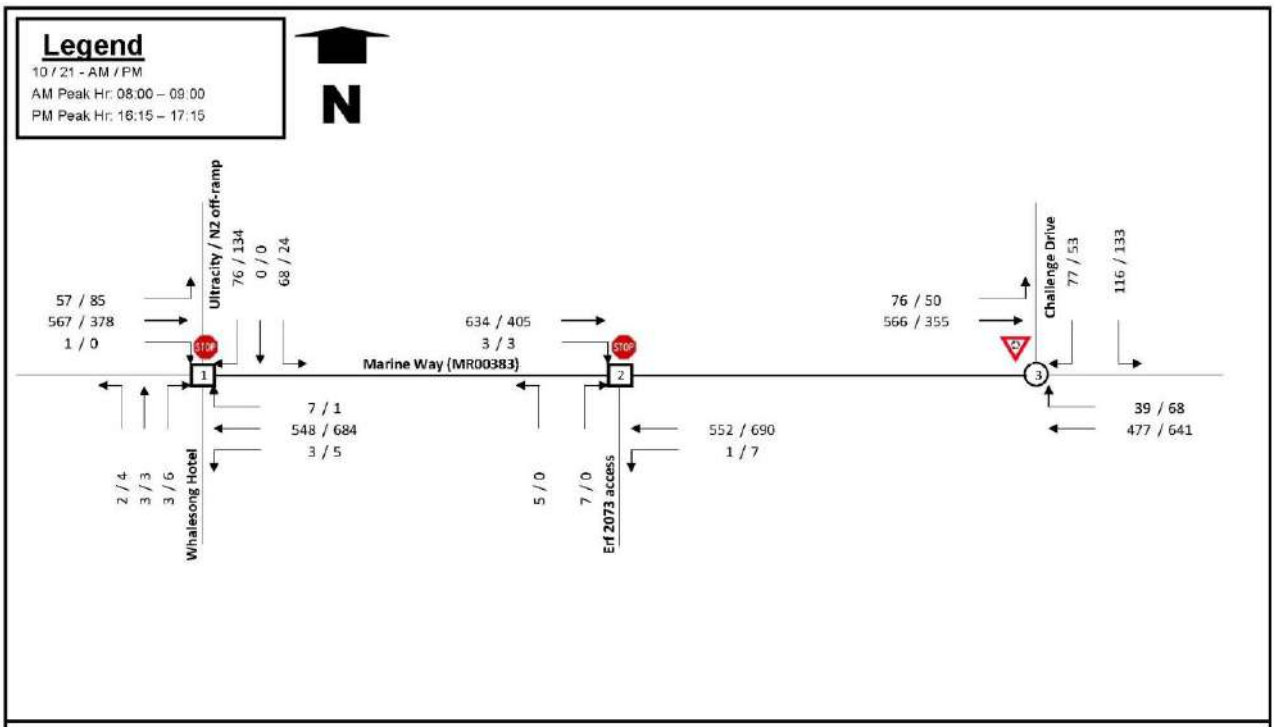


Figure 3: Escalated Background Peak Hour Traffic Volumes - 2025

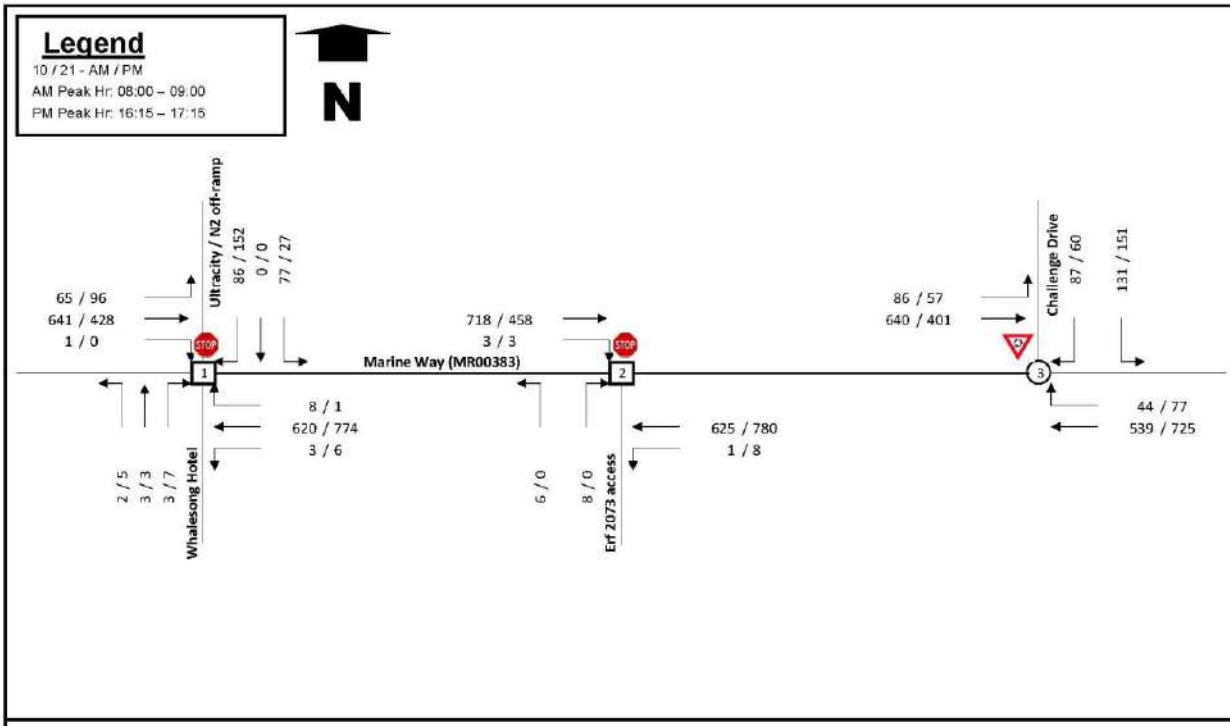


Figure 4: Escalated Background Peak Hour Traffic Volumes - 2030

3.3 PEAK SEASON PEAK HOUR TRAFFIC VOLUMES

Given that the proposed development is located in area which experiences seasonal traffic fluctuations, this study will also assess the impact of the proposed development during the peak holiday period. To achieve this, it is necessary to either source peak season volumes or apply an expansion factor to adjust normal traffic volumes to reflect peak season volumes.

Normal traffic occurs on a typical weekday during a school term, while peak season traffic is traffic that occurs during peak holiday periods i.e., Easter, June/July, September/October and Christmas/New Year.

As stated earlier, surveys were conducted on a typical weekday during August 2024. However, this peak period does not reflect the worst-case scenario, which is normally experienced during December / January.

In the interests of speedily addressing the requirements at the affected intersections as soon as possible, it is necessary to consider traffic flow during peak holiday periods. As it is not always possible to conduct surveys during peak holiday periods for various reasons, the approach followed was to make use of a Modification Factor to expand surveyed peak hour traffic volume to a required peak season peak hour making use of variations in traffic flow at a permanent count station in the vicinity.

A paper entitled **Quantification of the Natural Variation in Traffic Flow on Selected National Roads in South Africa** [3] presented at the SA Transport Conference in 2017, indicates how a Modification Factor can be used to expand surveyed peak hour traffic volume to a required peak season peak hour making use of variations in traffic flow at a nearby permanent count station.

Traffic data was sourced from the permanent SANRAL count station on the N2 at Goose Valley (Station 18051 – attached as **Annexure D**). The relationship between the data at this station on the same day as the peak hour traffic counts conducted in Marine Way (Wednesday 14 August) and peak season December data (generally the highest peak seasonal period) was used to modify the surveyed peak hour traffic to represent peak season traffic volumes at the Marine Way intersections.

Figure 5 below and **Figure 6** overleaf respectively indicate traffic volume variances from 1 January to 31 December 2019. Based on the data analysed, December is the peak volume and equates to 100%. The average volumes for the remainder of the surveyed 12-month period based on monthly averages are in the order of 63%. Average volumes during August based on total monthly volumes are in the order of 61% of the December peak season period.

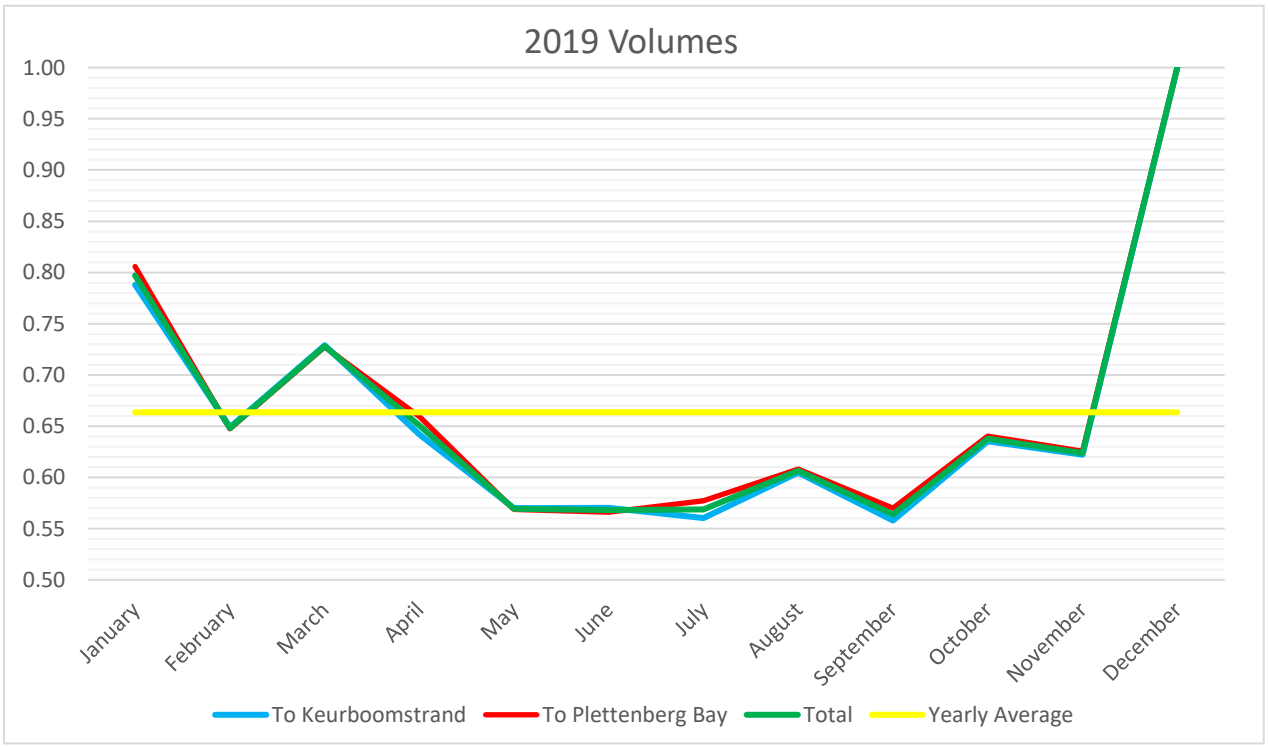


Figure 5: 2019 Traffic Volume Variation (Dec ~ 100%)

Analysis of the N2 data throughout the year indicates that on Wednesday 14 August (which is assumed to equate to Wednesday 14 August 2024) the N2 volume equates to 44% of the highest recorded daily volume on the N2 (which occurs during the December peak period).

Further analysis of the daily volumes during the December peak period, indicate that the average volume for December is 70%. **Figure 6** below indicates that the average volume was exceeded on 15 days.

For the purposes of this study therefore, an additional After Development peak season scenario will be conducted for 2030, where the escalated surveyed background peak hour traffic volumes will be increased by a factor of 1.59 to reflect the December Peak season average. The average peak season volume is considered a more realistic measure.

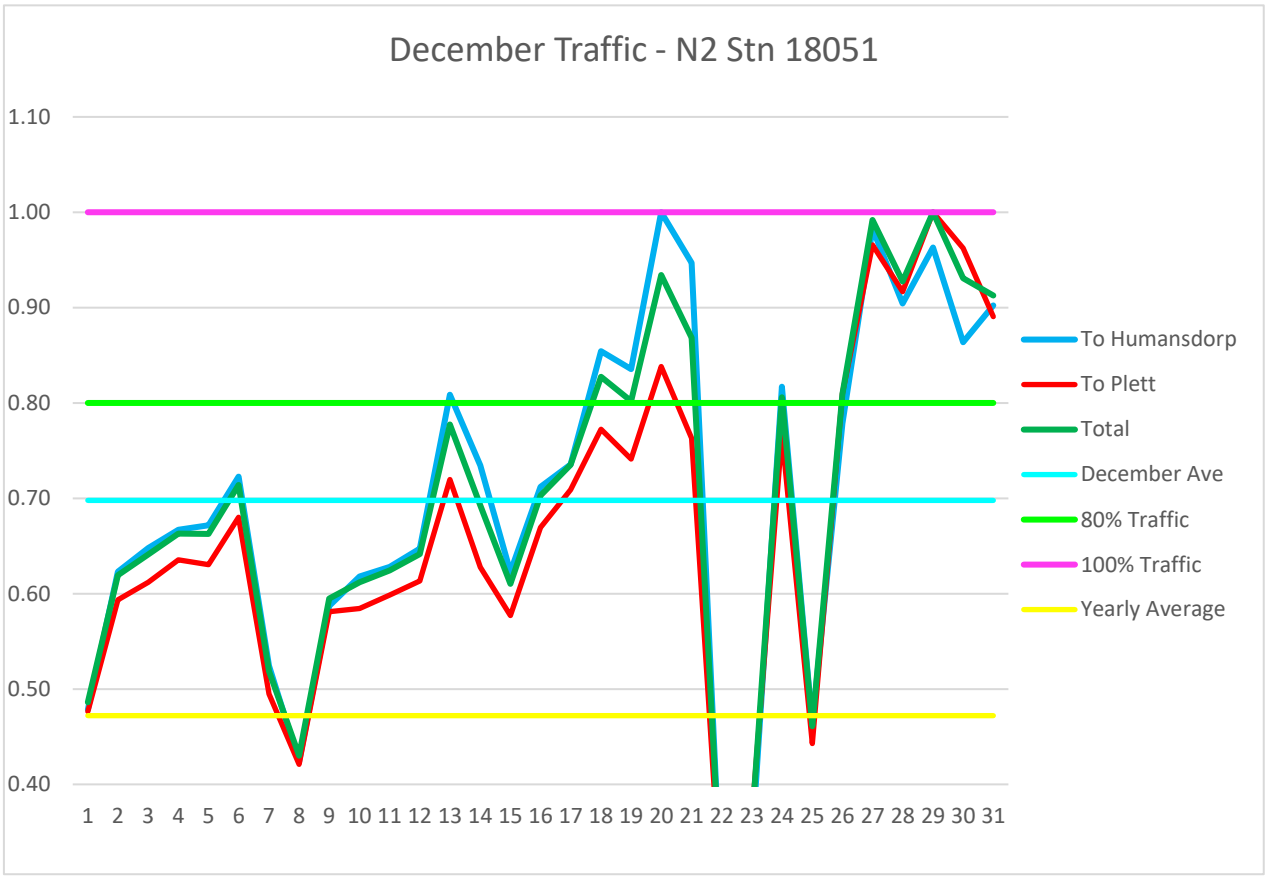


Figure 6: December 2019 Traffic Volume Variation (20 Dec = 100%)

The adjusted peak season escalated background traffic volumes for the 2030 development horizon are indicated on **Figure 7**Error! Reference source not found..

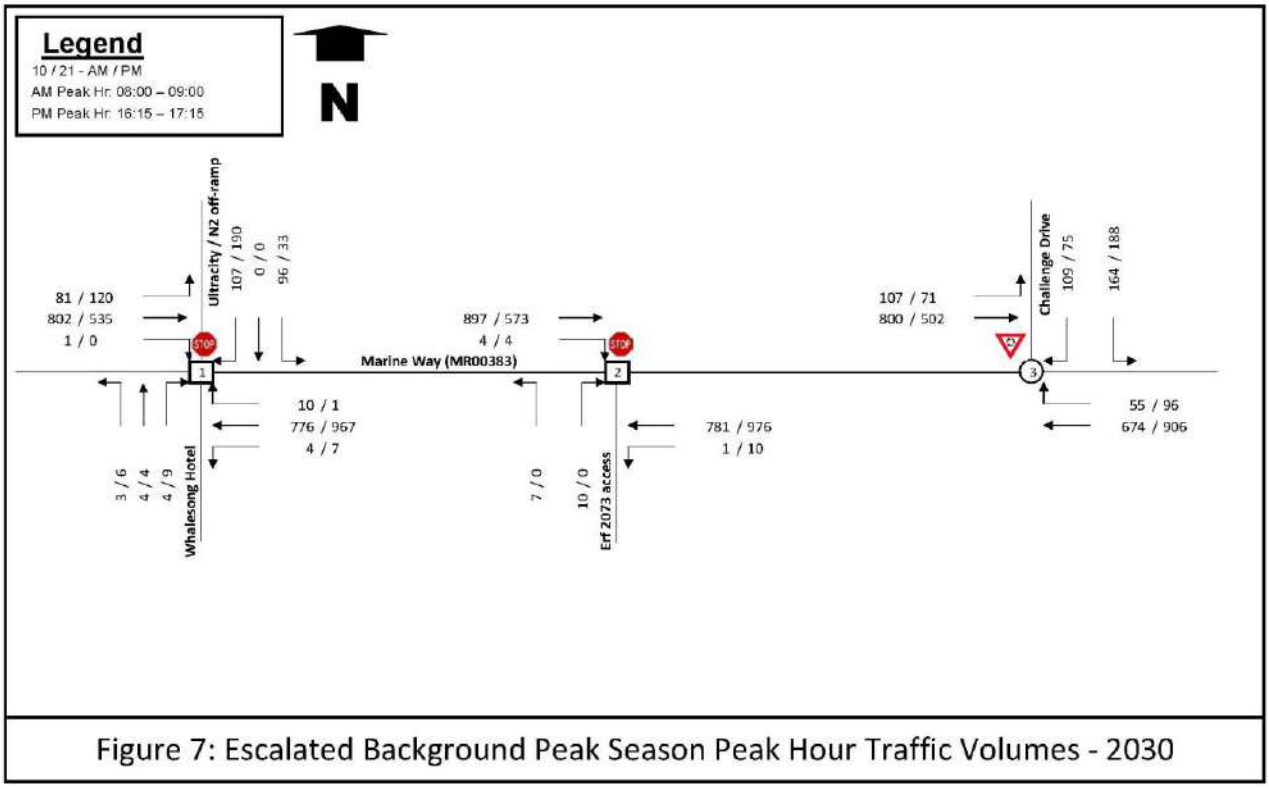


Figure 7: Escalated Background Peak Season Peak Hour Traffic Volumes - 2030

3.4 EXISTING ROAD NETWORK

- **Marine Way** (MR00383) is a Class U3 provincial main road that provides the main access to Plettenberg Bay from N2 Section 8 passing through the Bitou Municipality

  The road consists of a single 4.8m wide lane per direction, sidewalks on the northern edge (towards the town centre) and is in a good condition. Turning lanes are configured on the approach to the Ultracity / Whalesong intersection and the Challenge Drive intersection is configured as a single-lane roundabout.

  The posted speed limit is 60km/hr.

Marine Way approaching Challenge Drive

- **Challenge Drive** is a Class U5 residential street serving residential suburbs to the north of Marine Way.

  The road consists of a single 3.4m wide lane per direction and is in a very good condition based on visual assessments conducted as part of the District Municipality RRAMS programme.

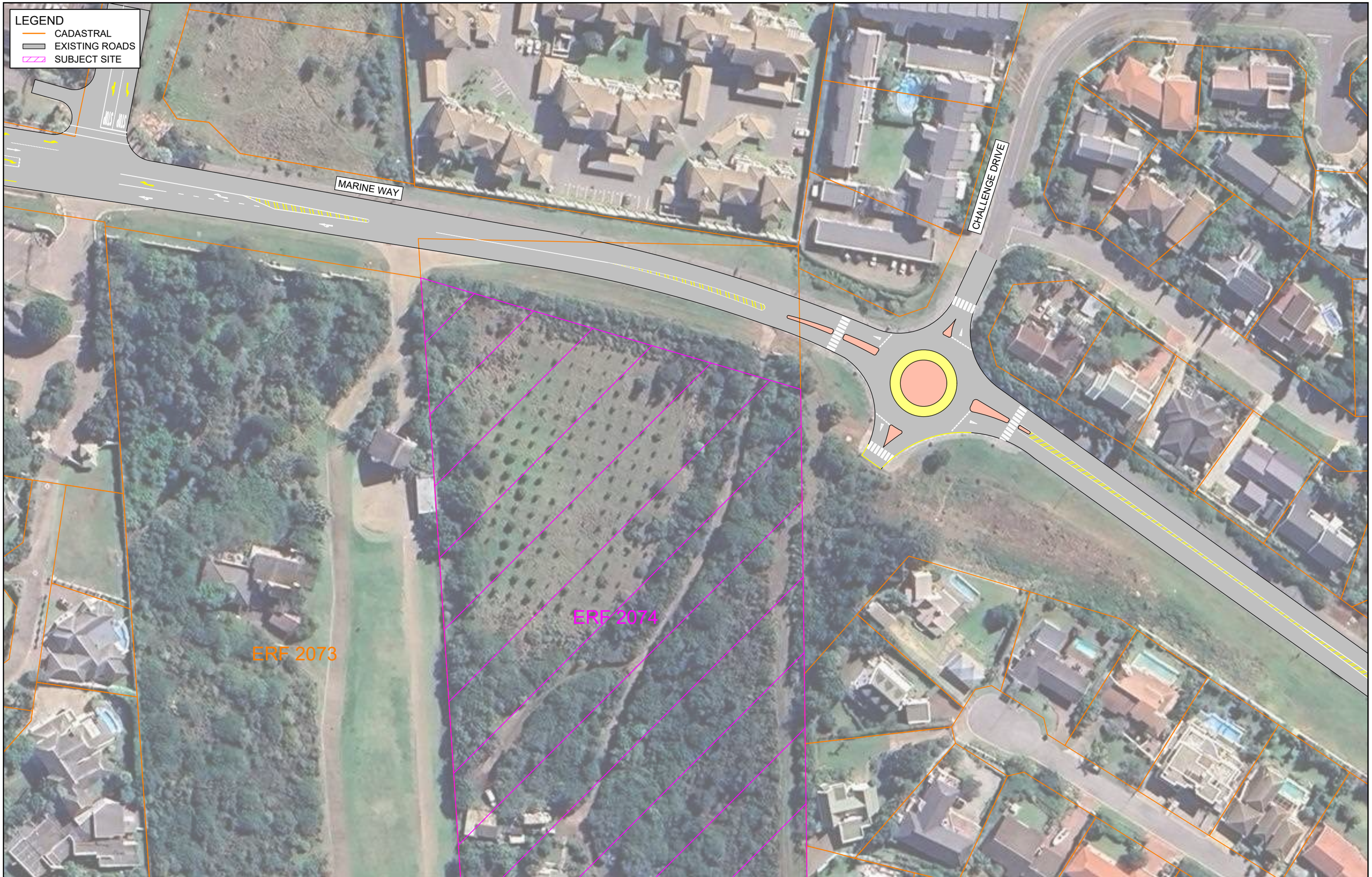
  The posted speed limit is 60km/h.

Challenge Drive exiting Marine Way

- **Ultracity Access** provides access to the Shell Ultracity development situated next to the N2 / Marine Way intersection.

  The access road is configured with one 3.4 m wide exiting lane and two 3.4m wide approach lanes and is in good condition.

The existing road network configuration is indicated on **Figure 8** overleaf.



"AS BUILT" - NOTES

FOR REPORT

AMENDMENTS			
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DATE	JULY 2024

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APPROVED — CLIENT — DATE

PROJECT: TRAFFIC IMPACT ASSESSMENT FOR A PROPOSED RESIDENTIAL DEVELOPMENT ON ERF 2074, PLETTENBERG BAY

CONTRACT NO.

DWG DESCRIPTION: FIGURE 8: EXISTING ROADS AND INTERSECTION CONFIGURATION

DWG.NO. 2296-P-008

ISSUE

3.5 SPATIAL DEVELOPMENT FRAMEWORK

Figure 9 below is an extract of the **Bitou Spatial Development Framework** [6] prepared by the Bitou Municipality.

The SDF denotes the area in which the development is proposed as a Strategic Development area.

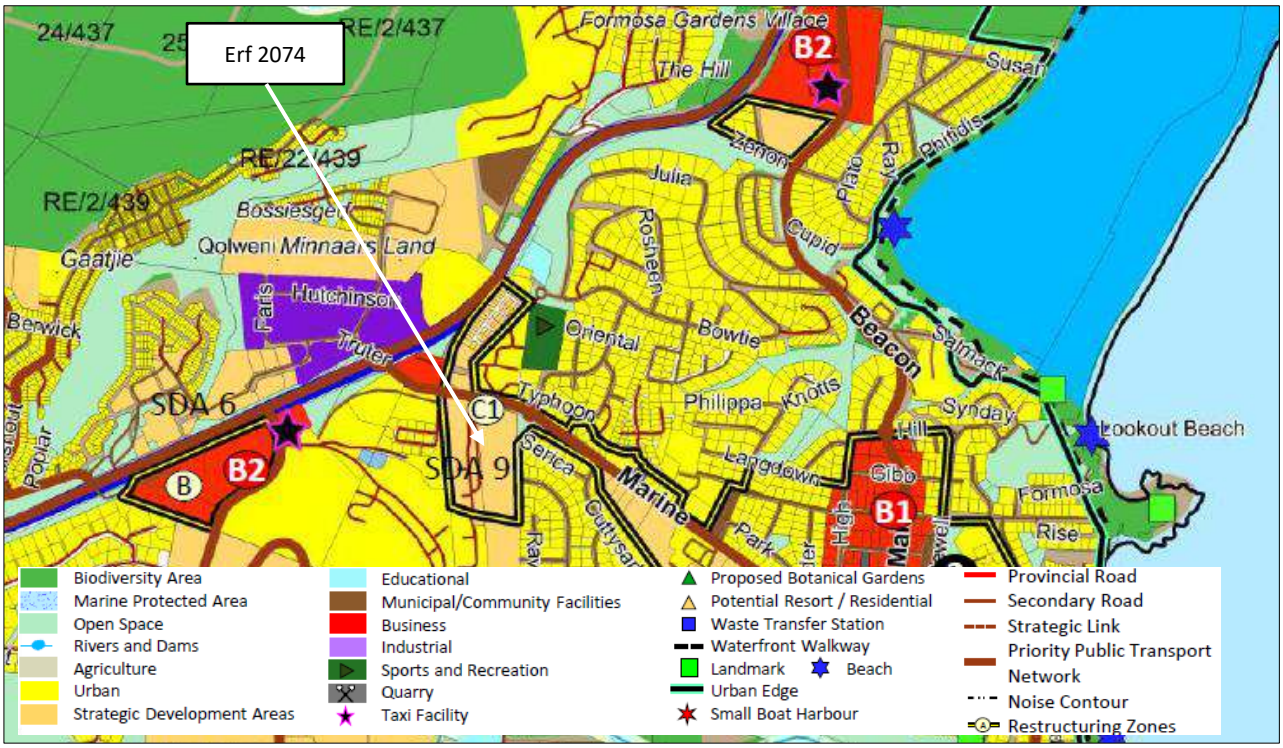


Figure 9: Bitou Spatial Development Framework

3.6 NON-MOTORISED TRANSPORT

A 2m wide paved pedestrian walkway exists on the north side of Marine Way (MR00383) from the N2 to the CBD.

Pedestrian crossing facilities are in place across Marine Way as well as across the side roads at the Challenge Drive intersectioon.

Pedestrian walkway along Marine Way (MR00383)

3.7 PUBLIC TRANSPORT

Minibus-taxi services currently operate along MR00383 between the CBD and residential / industrial areas.

4 CAPACITY ANALYSIS – BEFORE DEVELOPMENT

Level of Service (LOS) is defined as the operating condition that may occur at a intersection when it accommodates various traffic volumes. LOS is a qualitative measure of the effect of speed, travel time, traffic interruptions, freedom to manoeuvre, safety, driving comfort and convenience, and operating costs. **LOS D** is considered an acceptable design standard. The LOS applicable to intersections under various control conditions, as defined in the **Highway Capacity Manual** [7] are indicated in **Table 2** below:

Table 2: Level of Service definitions for Vehicles (Highway Capacity Manual [7] method)

Level of Service	Control delay per vehicle in seconds (d) (Including geometric delay)		LOS Colour Rating
	Signals and Roundabouts	Stop Signs and Yield Signs	
A	d ≤ 10	d ≤ 10	Excellent
B	10 < d ≤ 20	10 < d ≤ 15	Very Good
C	20 < d ≤ 35	15 < d ≤ 25	Good
D	35 < d ≤ 55	25 < d ≤ 35	Acceptable
E	55 < d ≤ 80	35 < d ≤ 50	Poor
F	80 < d	50 < d	Very Poor

The 2025 background traffic situation was analysed in order to determine the Level of Service at which the affected intersections would operate before development occurs for the 2025 development horizon.

The capacity analysis was undertaken using the **SIDRA Intersection 9 Network** [8] capacity analysis method but applying the **Highway Capacity Manual** [7] gap acceptance criteria for unsignalised intersections.

The results are shown in **Table 3** below and the detailed SIDRA output sheets attached as **Annexure E**.

Table 3: Results of Intersection Capacity Analysis – 2025 Before Development

Intersection	Delay		V/C		LOS*	
	AM	PM	AM	PM	AM	PM
Marine Way / Ultra-City	6.2	59.4	0.759	>1.000	A*	F*
Marine Way / Erf 2073	0.2	0.1	0.344	0.376	A*	A*
Marine Way / Challenge Drive	5.2	5.0	0.442	0.501	A	A

* - **SIDRA Intersection Network** [8] does not calculate intersection LOS for stop-controlled intersections. The LOS indicated is sourced from the **Highway Capacity Manual** [7] (**Table 2** above).

As can be seen from the results contained in **Table 3**, no capacity problems are experienced at the affected intersections under current normal weekday conditions for the escalated 2025 before development scenario apart from the Ultra City intersection which operates at LOS F during the PM peak hour.

Further analysis with this intersection configured as a roundabout, results in operation at LOS A as indicated in **Table 4**.

Table 4: Results of Intersection Capacity Analysis – 2025 Before Development – Marine / Ultra City

Configuration	Delay		V/C		LOS*	
	AM	PM	AM	PM	AM	PM
Existing - Priority	6.2	59.4	0.759	>1.000	A*	F*
Roundabout	5.6	6.0	0.390	0.520	A	A

* - **SIDRA Intersection Network** [8] does not calculate intersection LOS for stop-controlled intersections. The LOS indicated is sourced from the **Highway Capacity Manual** [7] (**Table 2** above).

5 TRIP GENERATION

5.1 ERF 2073

The total development on erf 2073 comprise 200 residential units, the first phase of which has been developed. The current peak hour trips entering and exiting the site – indicated on **Figure 2** - will be reassigned to the new access for erf 2074 at the existing intersection at Challenge Drive.

TMH 17 Volume 1 - South African Trip Data Manual [2] recommends peak hour trip generation rates of 0.85 vehicle trips / residential unit for simplex or duplex townhouse complexes for both weekday AM and PM peak hours. A trip is defined as the movement from an origin to a destination.

For the Phase 2 component of erf 2073 comprising an additional 200 units this relates to the following generated trips.

TGR (Weekday AM/PM)	=	0.85 * units
	=	0.85 * 200
	=	**170 trips** (in and out)
Split in / out	=	25 : 75 (AM)
	=	70 : 30 (PM)

The trips generated by the proposed development are summarised in **Table 5** below.

Table 5: Peak Hour Trip Generation Summary

COMPONENT	AM		PM	
	IN	OUT	IN	OUT
Town House Complex (231)	43	128	119	51

Considering the existing observed reassigned peak hour trips the peak hour trips for the full development of erf 2073 are indicated on **Figure 10.**

The generated trips have been distributed 40% to the west and 60% to the east along Marine Way.

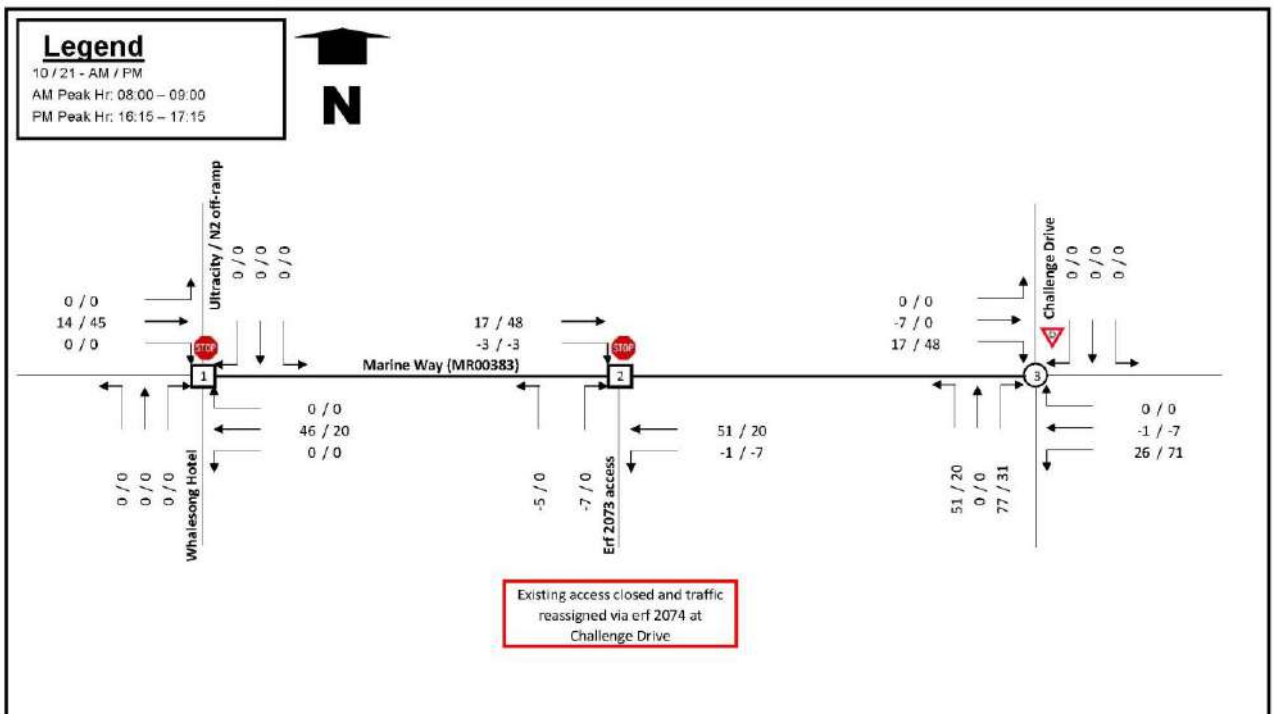


Figure 10: Reassigned Peak Hour Traffic Volumes - Erf 2073

5.2 ERF 2074

TMH 17 Volume 1 - South African Trip Data Manual (2Error! Reference source not found.) recommends peak hour trip generation rates of 0.85 vehicle trips / residential unit for simplex or duplex townhouse complexes for both the weekday AM and PM peak hours. A trip is defined as the movement from an origin to a destination.

For a proposed development of 228 units this relates to the following generated trips.

TGR (Weekday AM/PM)	=	0.85 * units
	=	0.85 * 228
	=	**194 trips** (in and out)
Split in / out	=	25 : 75 (AM)
	=	70 : 30 (PM)

The trips generated by the proposed development are summarised in **Table 6** below.

Table 6: Peak Hour Trip Generation Summary

COMPONENT	AM		PM	
	IN	OUT	IN	OUT
Town House Complex (231)	48	145	136	58

6 TRIP DISTRIBUTION

Based on the observed traffic volumes and taking into account the location of the development relative to the surrounding residential areas, the following distribution has been assumed for trips generated by the development:

- 35% to and from the west via Marine Way (MR00383) and the N2; and
- 60% to and from the east via Marine Way (MR00383); and
- 5% to and from the north via Challenge Drive.

The generated peak hour trips for erf 2074 are indicated on **Figure 11** overleaf and the generated trips plus the reassigned and generated trips for erf 2073 added to the weekday AM and PM peak hour volumes for the 2025 and 2030 development horizons are indicated on **Figure 12** and **Figure 13** overleaf.

The generated and reassigned peak hour trips added to the peak season weekday AM and PM peak hour volumes for the 2030 development horizon are indicated on **Figure 14.**

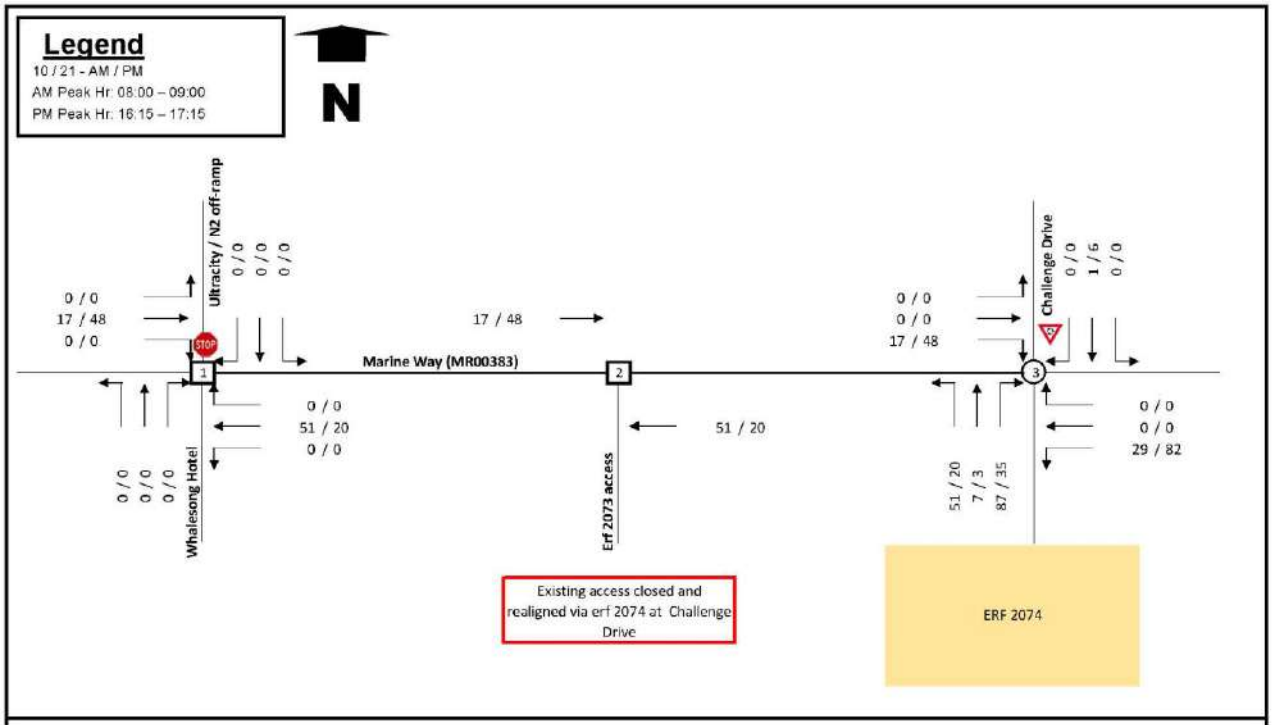


Figure 11: Generated Peak Hour Traffic Volumes

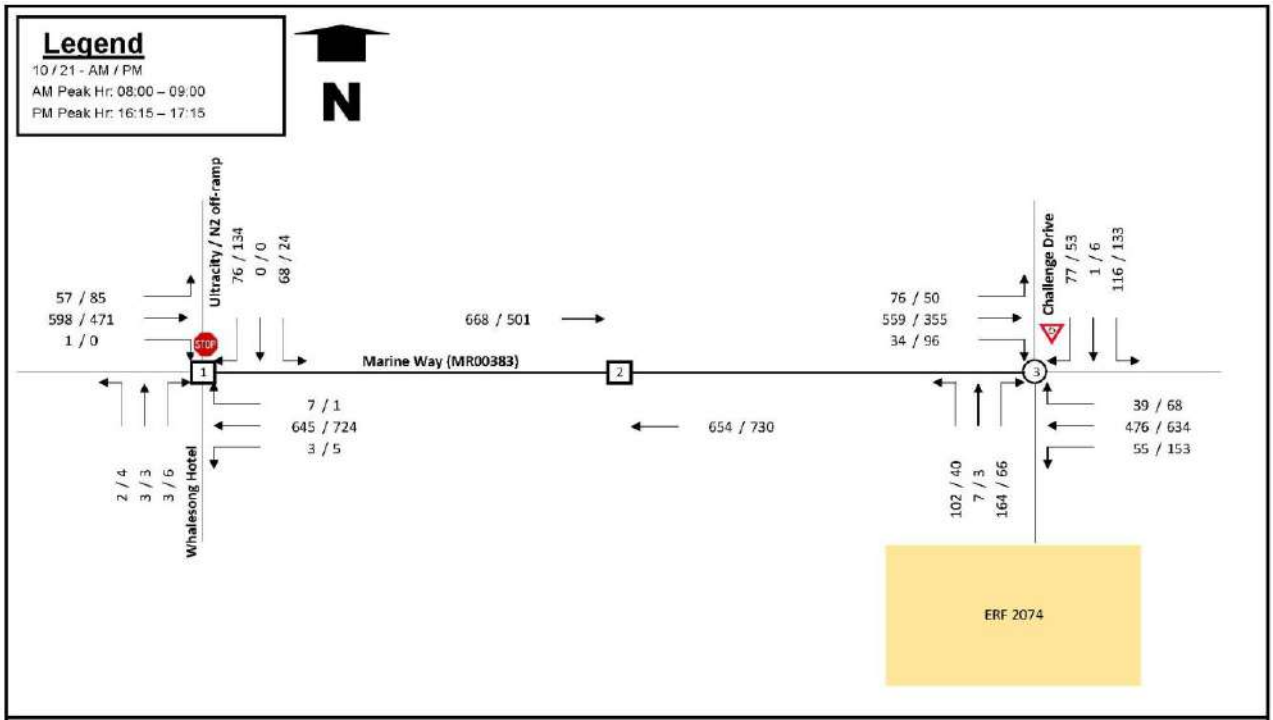


Figure 12: Peak Hour Traffic Volumes after Development - 2025

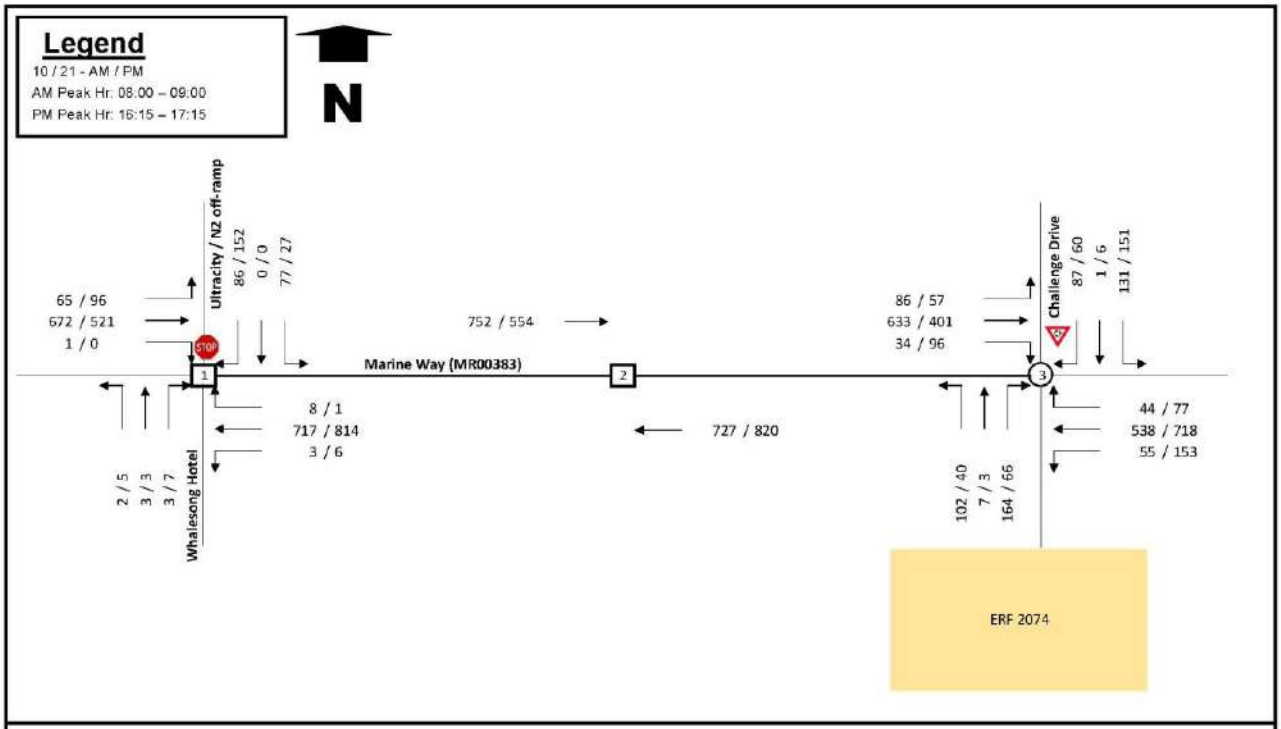


Figure 13: Peak Hour Traffic Volumes after Development - 2030

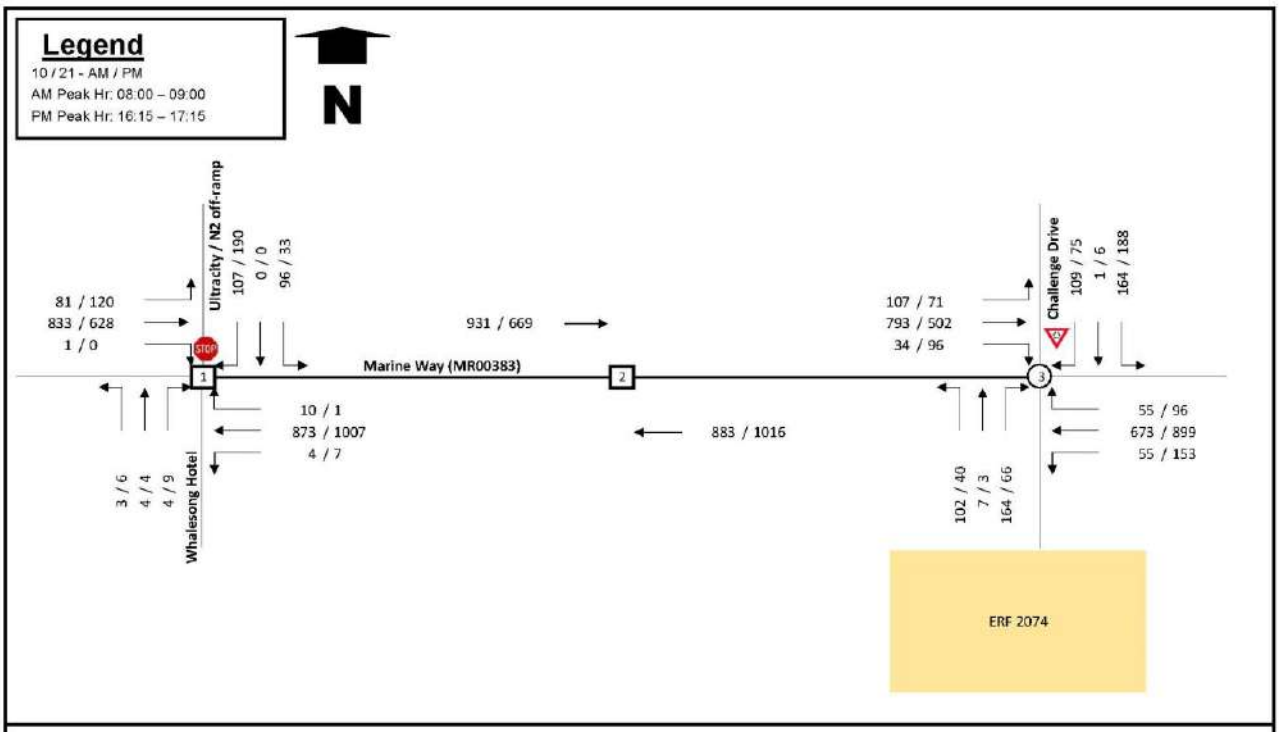


Figure 14: Peak Hour Traffic Volumes after Development - 2030 Peak Season

7 PROPOSED ACCESS ARRANGEMENTS

7.1 ACCESS LOCATION AND CONFIGURATION

Separate access to erf 2074 does not meet the spacing requirements for a Class 3 urban arterial road in terms of the **Access Management Guidelines** [3].

As such, the Western Cape Government has indicated that in order to meet the required access spacing standards, access would only be permitted at the existing intersection at Challenge Drive.

In addition, the adjacent development on erf 2703, Phase 1 of which gains direct access from Marine Way may not development further until the access is realigned via the Challenge Drive intersection.

This requires that the access to erf 2073 would need to traverse erf 2074.

As indicated on **Figure 15,** access to the proposed development as well as erf 2073 is proposed at the existing Marine Way / Challenge Drive intersection.

The access road to serve erf 2073 is accommodated at the northern end of erf 2074 such that the planned development is contained from a security perspective.

Configuration of the approach to the existing roundabout is detailed on **Figure 15**, and provides for free-flow for vehicles entering the erf 2073 access road, i.e., the traffic exiting erf 2074 is controlled such that the movement entering erf 2073 enjoys free flow. The required stacking distance between the proposed access gate and Marine Way is discussed in further detail

Shoulder sight distance for a stop condition to accommodate a single-unit truck and trailer vehicle on a road with a posted speed limit of 60km/h is 192m. 125m is required for a passenger car.

The available sight distance from the proposed access at the Challenge Drive intersection exceeds 200m, given that the alignment is straight and the road is flat to both the east and west.

View of access from Marine Way

View from access towards the site

7.2 ACCESS CONTROL

Access to the development will be security controlled. Service flow rates at access-controlled entrances in vehicles / hour from Table 30 of **TMH 16 Vol 2 - South African Traffic Impact and Site Assessment Standards and Requirements Manual** [9] are indicated in **Table 7** below.

As noted, the flow rates range from the slowest throughput – 50 vph in the case of intercom operated gates to 480 vph in the case of swiping magnetic cards.

The higher the service flow rate, the less likely that there will be congestion at the entrance.

Table 7: Access Control Service Flow Rates

Service flow rates (veh/h) for different control types	
Control type	**Service flow (vph)**
Swipe magnetic card	480
Remote controlled gates	450
Ticket dispenser: Automatic	390 -450
Ticket dispenser: Push button	220 - 360
Pin number operated gates	150
Pay fee on entry	120
Cell-phone operated gates (gate opens when a call is received)	100
Manual recording, Visitor completes form	80
Intercom operated gates (visitor contacts resident by intercom)	50

The number of entry lanes and the number of vehicles queuing in each lane are calculated after determining a Traffic Ratio over all entry lanes using the following formula:

$$\text{Traffic ratio} = \frac{\text{Total Volume / PHF}}{\text{Service flow rate}} \cdot 100$$

The number of lanes and queue length is then determined from **Table 8** below (Table 31 in TM16 Vol 2).

Table 8: Access Control Queue Lengths

95th Percentile queue length (vehicles per channel) at controlled accesses						
Storage (Vehs)	Traffic ratio (Percentage) for different Numbers of Channels					
N_{Que}	1 Channel	2 Channel	3 Channel	4 Channel	5 Channel	6 Channel
1	23	58	97	140	188	235
2	39	94	155	220	292	363
3	49	115	186	261	341	421
4	56	128	205	283	367	449
5	61	137	216	297	382	466
6	65	143	224	306	392	476
7	68	147	229	312	399	484
8	70	151	233	317	403	489
9	71	153	236	321	407	493
10	73	155	239	324	410	496

It is expected that up to 136 vehicles will enter the site during the PM peak hour (highest entering peak).

Given a peak hour volume of 136 vehicles entering the development the traffic ratios for each control type are indicated in **Table 9** below.

Table 9: Access Control Queue Lengths for erf 2074

Peak Hour Trips - IN (PM Peak Hour)	136	Traffic ratio	Q-Length Veh	Lanes Required	Q-Length (m)
Access Control Options	Flow (Vph)				
Swipe Magnetic card	480	39.0	2	1	13
Remote controlled gates	450	39.0	2	1	13
Ticket Dispenser: Automatic	390	39.0	2	1	13
Ticket Dispenser: Pushbutton	220	39.0	2	1	13
Pin number operated gates	150	115.0	3	2	19.5
Cell-phone operated gates (opens when call received)	100	153.0	2	3	13
Manual Recording (Visitor Completes form)	80	205.0	4	3	26
Intercom Operated Gates (Contact resident by Intercom)	50	306.0	6	42	39

As indicated in **Table 9**, a number of options are possible, all requiring a minimum of one entry lane and the access gate set back a minimum of 6.5m (one vehicle length) from the road edge, apart from the pin or cell-phone number operated control which requires the gate set back 13m and 19.5m respectively.

It is recommended that two entry lanes be provided at the entrance to ensure that no delays are caused by visitors obstructing access and such that any potential queue does not impact on access to erf 2073 and subsequently extend into Marine Way.

7.3 EMERGENCY ACCESS

Provision has also been made for two additional secondary access points between the development and the municipal road network to the east via Cutty Sark Avenue and Ariel Drive.

These access points will be gated and locked and only opened should an emergency, e.g., a fire in the complex, result in access via the main entrance from Marine Way being compromised.

8 CAPACITY ANALYSIS – AFTER DEVELOPMENT

8.1 2025 AFTER DEVELOPMENT

After adding generated and reassigned peak hour traffic volumes to the escalated background peak hour volumes, the traffic situation was analysed in order to determine the LOS at which the affected intersections and access points would operate during normal weekday peak hours after development occurs.

The results are shown in **Table 10** below and the detailed SIDRA output sheets attached as **Annexure F.**

Table 10: Results of Intersection Capacity Analysis – 2025 After Development

Intersection	Delay		V/C		LOS*	
	AM	PM	AM	PM	AM	PM
Marine Way / Ultra-City	5.6	6.0	0.457	0.550	A	A
Marine Way / Challenge Drive	6.8	6.5	0.599	0.695	A	A

* - **SIDRA Intersection Network** [8] does not calculate intersection LOS for stop-controlled intersections. The LOS indicated is sourced from the **Highway Capacity Manual** [7] (**Table 2** above).

As can be seen from the results contained in **Table 10**, the additional traffic generated by the development has little or no impact on the operation of the affected intersections in terms of capacity.

8.2 2030 AFTER DEVELOPMENT

After adding generated and reassigned peak hour traffic volumes to the escalated background peak hour volumes, the traffic situation was analysed in order to determine the LOS at which the affected intersections and access points would operate after development occurs for the 2030 development horizon.

The results are shown in **Table 11** below and the detailed SIDRA output sheets attached as **Annexure G.**

Table 11: Results of Intersection Capacity Analysis – 2030 After Development – Normal

Intersection	Delay		V/C		LOS*	
	AM	PM	AM	PM	AM	PM
Marine Way / Ultra-City	5.8	6.3	0.515	0.632	A	A
Marine Way / Challenge Drive	7.4	7.0	0.675	0.773	A	A

* - **SIDRA Intersection Network** [8] does not calculate intersection LOS for stop-controlled intersections. The LOS indicated is sourced from the **Highway Capacity Manual** [7] (**Table 2** above).

As can be seen from the results contained in **Table 11**, the additional traffic generated by the development has little or no impact on operation of the affected intersections in terms of capacity for the 2030 development horizon.

8.3 2030 AFTER DEVELOPMENT – PEAK SEASON

After adding generated and reassigned peak hour traffic volumes to the escalated background peak hour volumes, the traffic situation was analysed in order to determine the LOS at which the affected intersections and access points would operate after development occurs for the 2030 peak season development horizon.

The results are shown in **Table 12** below and the detailed SIDRA output sheets attached as **Annexure H.**

Table 12: Results of Intersection Capacity Analysis – 2030 After Development – Peak Season

Intersection	Delay		V/C		LOS*	
	AM	PM	AM	PM	AM	PM
Marine Way / Ultra-City	6.2	7.8	0.645	0.816	A	A
Marine Way / Challenge Drive	11.4	11.9	0.843	0.948	B	B

* - **SIDRA Intersection Network** [8] does not calculate intersection LOS for stop-controlled intersections. The LOS indicated is sourced from the **Highway Capacity Manual** [7] (**Table 2** above).

As can be seen from the results contained in **Table 12**, when considering peak season traffic, the additional traffic generated by the development has minimal impact on operation of the affected intersections in terms of capacity during a typical peak season weekday.

It is noted however that the LOS at the Challenge Drive intersection operates at LOS B during both peak hours.

LEGEND
- CADASTRAL
- EXISTING ROADS
- PROPOSED ROADS
- SUBJECT SITE

MARINE WAY

CHALLENGE DRIVE

PROPOSED ACCESS TO ERF 2073

ERF 2073

ERF 2074

POOL

25m

AS BUILT / NOTES	AMENDMENTS				SCALE	SCALE ON REDUCED DRAWING	DESIGN	CH	ENGINEERING ADVICE AND SERVICES associated with ULWAZI	APPROVED	APPROVED	PROJECT	CONTRACT NO.
FOR REPORT	NO.	DATE	DESCRIPTION	APPROVED	1 : 1000	0 2.5 5 10 15m	DRAWN	EHN	73 Heugh Road, Walmer P.O. Box 13867 Humewood Port Elizabeth 6013 tel/fax: (041) 581 2421	ENGINEER	CLIENT	TRAFFIC IMPACT ASSESSMENT FOR A PROPOSED RESIDENTIAL DEVELOPMENT ON ERF 2074, PLETTENBERG BAY	
							APPROVED	CH		DATE	DATE	DWG DESCRIPTION	DWG.NO.
							DATE	JULY 2024				FIGURE 15: PROPOSED LAYOUT AND ACCESS CONFIGURATION	2296-P-015
													ISSUE

9 PUBLIC TRANSPORT OPERATIONS AND PEDESTRIAN ARRANGEMENTS

Neither additional public transport nor pedestrian facilities are required.

10 PARKING REQUIREMENTS

A total of 2 bays plus a further 0.25 visitor bays per unit will be required in terms of the requirements of the **Bitou Municipality Zoning Scheme Bylaw** [(4)] and will be provided on the site.

The required parking provision can be accommodated on site and will be indicated on the Site Development Plan to be submitted to the Bitou Municipality.

11 CONCLUSIONS

The following conclusions can thus be drawn from the study:

- Under escalated (2025) background normal traffic conditions no problems are experienced at the affected intersections in terms of capacity apart from the Marine Way / Ultra City access which operates at LOS F during the PM peak hour;
- Configuration of this intersection as a roundabout results in a significant improvement in operation to LOS A;
- Based on 2019 daily traffic surveys at the N2 Goose Valley counting station volumes on 14 August equate to 44% of the Highest daily volumes during December. The average daily volumes during December represent 70% of the highest volumes are considered a more realistic measure to compare to. As such the surveyed peak hour volumes have been escalated by 1.59 to provide an indication of the impact of the development during average daily peak season traffic conditions;
- The proposed development generates a total of 228 peak hour vehicle trips during the weekday AM and PM peak hours with a maximum of 136 entering during the PM peak hour;
- Access to the development can safely be accommodated from Marine Way (MR00383) at the Challenge Drive intersection provided the access is configured as indicated on **Figure 15**;
- Access to the adjacent development on erf 2073 will also be gained via the erf 2074 access and across erf 2074 as indicated on **Figure 15;**
- Access control gates to the development on erf 2074 should be configured with a minimum of two entry lanes set back a minimum of 19.5m (3 car lengths) from the erf 2073 access road so that entering vehicles do not block access to erf 2073 as indicated on **Figure 15**;
- Additional secondary access points to the municipal road network to the east via Cutty Sark Avenue and Ariel Drive will be provided for use should an emergency arise in the complex comprising the main access onto Marine Way;
- When considering the traffic generated by the proposed development added to escalated background traffic, the affected intersections and access points all operate at acceptable Levels of Service in terms of capacity for the 2025 development horizon for normal season traffic conditions with the Ultra City intersection configured as a roundabout;
- When considering the traffic generated by the proposed development added to escalated background traffic, the affected intersections and access points all operate at acceptable Levels of Service in terms of capacity for the 2030 development horizon for normal season traffic conditions with the Ultra City intersection configured as a roundabout; and
- When considering the traffic generated by the proposed development added to escalated peak season background traffic, the affected intersections and access points all operate at acceptable Levels of Service in terms of capacity for the 2030 development horizon with only the Challenge Drive intersection LOS worsening slightly from A to B.

12 RECOMMENDATIONS

In view of the findings of this study, it is recommended that:

- This Traffic Impact Assessment be approved by the Bitou Local Municipality;
- The Bitou Municipality consider reconfiguring the Marine Way / Ultra City intersection as a roundabout as it operates at LOS F during the PM peak hour under current conditions;
- The main access to the development be provided from Marine Way (MR00383) at the Challenge Drive intersection;
- Secondary locked access gates be provided at Cutty Sark Avenue and Ariel Drive for use in the event of emergency(ies); and
- The main access gate to erf 2074 be set back a minimum of 20m from the erf 2073 access road and the access be configured with two entering lanes as indicated on **Figure 15** with the cost of access arrangements being met by the developer.

13 REFERENCES

1. *Joubert, Sampson, et al*, **TMH 16 Volume 1- South African Traffic Impact and Site Assessment Manual,** COTO, September 2013.
2. *Joubert, Sampson, et al*, **TMH 17 Volume 1- South African Trip Data Manual**, COTO, September 2013.
3. *Roads Branch, ITS Engineers, K&T, CNdV Africa, et al*, **Transport and Public Works, Access Management Guidelines**, Western Cape Government – Transport and Public Works, 2020.
4. *Bitou Local Municipality*, **Bitou Municipality Zoning Scheme By-law (Extraordinary Gazette 8801)**, Bitou LM, 28 July 2023
5. *F de Jongh & M Bruwer*, **Quantification of the Natural Variation in Traffic Flow on Selected National Roads in South Africa,** 2017.
6. *Bitou Local Municipality*, **Bitou Spatial Development Framework**, Bitou LM, 2021.
7. *Transportation Research Board*, **Highway Capacity Manual**, 2000.
8. *Akcelik & Associates (Pty) Ltd*, **SIDRA Intersection Network 9 User Guide**, SIDRA Solutions, April 2019.
9. *Joubert, Sampson, et al*, **TMH 16 Volume 2- South African Traffic Impact and Site Assessment Standards and Requirements Manual**, COTO, September 2013.
10. *Bitou Local Municipality*, **Bitou Local Municipality Zoning Scheme Bylaw**, Bitou LM, 28 July 2023

ANNEXURE A
Town Planning
Report

Remainder of Erf 2074

Plettenberg Bay

TOWN PLANNING REPORT

(Prepared as part of the Draft Basic Assessment Report)

Planning Space

Town and Regional Planners

7/17/2024

TABLE OF CONTENTS

LIST OF PLANS

LIST OF ANNEXURES:

1. Introduction

Planning Space Garden Route Pty Ltd has been appointed by Eco Route Environmental Consultants to prepare a Town Planning Report to inform the Basic Assessment Report (BAR) to be submitted for Environmental Authorisation in terms of the National Environmental Management Act, 1998 (NEMA) in respect of listed activities that have been triggered by the planned residential development on the Remainder Erf 2074 Plettenberg Bay.

The purpose of this document is to report on the existing land use rights, biophysical opportunities, and constraints of the property, and to assess the need and desirability of the project in terms of the planning policies and principles contained in National, Provincial, and Municipal Spatial Development Frameworks applicable to the area.

2. Property Information

2.1 LOCALITY

The property is situated in the Bitou Municipal area, Plettenberg Bay (See Diagram 1: Locality Plan). The property can be accessed directly from Marine Drive which connects with the N2. The site is approximately 330m east of the Marine Drive/N2 intersection and approximately 1km from the Plettenberg Bay Central Business District (CBD).

Figure 1: Extract indicating the locality of the subject property.

2.2 PROPERTY DESCRIPTION

Title Deed Description	Remainder of Erf 2074 Plettenberg Bay
21 Digit code	C03900080000207400000
Title Deed Number	T54527/1981
S.G. Diagram Nr	S.G 1693/1901
Title Deed Restrictions	None, relevant to the application: A Conveyancer Certificate dated 2006 confirms that there are no title deed restrictions in the current title deed that will prohibit a residential development on the property.
Servitudes	None
Property Size	6.2ha
Property Owner	DUINESAND (EIENDOMS) BEPERK
Bonds	None
Zoning	Agriculture 1 in terms of the Bitou Zoning Scheme By-Law
Land Use	Rural Residential

2.3. BACKGROUND

The property is one of the last remaining Agricultural smallholdings set within the urban fabric of Plettenberg Bay. The property has been in the ownership of the current owners since 1981. There is an old farmhouse and outbuilding on the site. Photographic evidence suggests that the property has been under cultivation since 1938. Currently, the land is not being actively farmed. However, remnants of its agricultural past, such as an olive grove and protea orchard, still exist, though they are not maintained.

Figure 2: Old Farmhouse and outbuilding.

In 2006, an application for the rezoning and subdivision of the land into 32 Single Residential Erven, 1 General Residential Erf and Open Spaces and Streets, was submitted to the Plettenberg Bay Municipality. For reasons unknown, the application was never concluded.

In August 2012, an application was made for a second dwelling which allowed a new house to be constructed in the southern portion of the site. The application was approved, and the house construction commenced but was never completed. Remnants of the building footprint and access road still exist.

Figure 3: Remains of additional dwelling.

2.4 SITE CHARACTERISTICS

2.4.1 TOPOGRAPHY

The northern portion of the property has an even gradient sloping in a north direction toward Marine Drive. The middle section of the property is very even with a slight western slope. The southern section of the site slopes in a southwestern direction toward the Piesang Valley and is very steep.

A detailed Contour Plan and Slope Analysis was prepared by Shaun McMillan and is attached as Diagram 5 and Figure 4.

The slope analysis indicates that the entire northern and central section of the site has a gradient of less than 25% and is therefore suitable for development. Development on steep slopes with a gradient > 1:4 is in general not supported due to erosion and stability concerns. Only the steep cliffs in the southern portion of the site are not suitable for development. This section (indicated as pink in the adjacent Figure 4) measures about 1ha in extent.

There are no mapped water courses within the boundaries of RE/2074. However, according to the Aquatic statement from Confluent Environmental, there is a non-perennial drainage line flowing south on the neighbouring property to the west, which connects with the Piesang River.

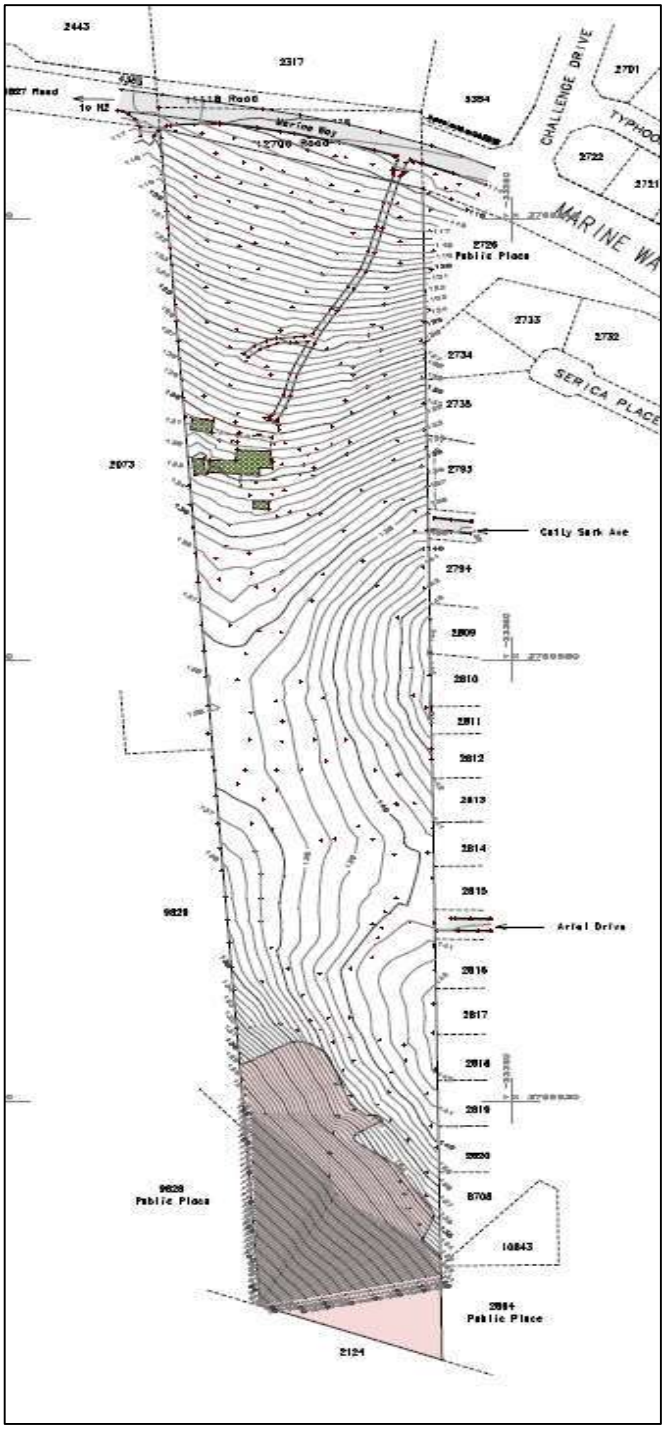


Figure 4: Contour Plan.

2.4.2 VEGETATION

Historically the vegetation on the site has been disturbed since 1938 until the present by various activities, including small-scale agriculture, the introduction of alien vegetation, vegetation clearing as well and the construction of the farmhouses.

The mapped vegetation type at the site is South Outeniqua Sandstone Fynbos which is labelled as "Least Concern". Confluent Environmental was contracted by Eco Route to undertake a specialist assessment of the botanical and terrestrial sensitivity of the Remainder of Erf 2074. The vegetation Report is attached as an Annexure to the Draft BAR.

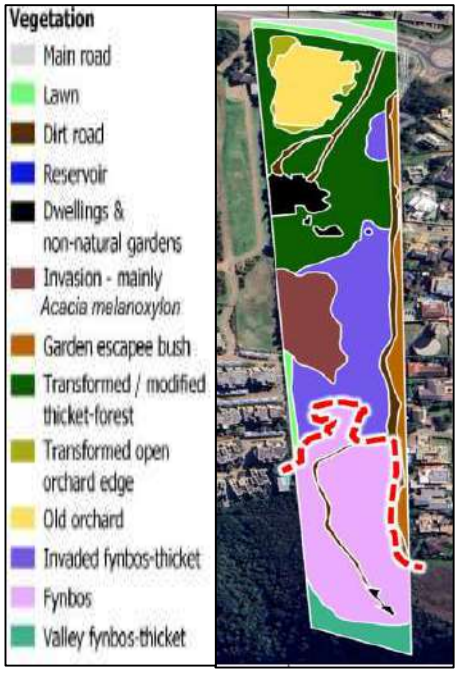


Figure 5: Vegetation Map.

The study concluded that the northern section has a low terrestrial biodiversity and that the southern side has a very high terrestrial biodiversity. The red broken line on the attached Vegetation Map (Figure 5) indicates the divide between the southern and the northern areas. Some of the southern areas identified as having high biodiversity have been disturbed by agricultural activity in the past.

The Biodiversity Spatial Plan for the Western Cape (WC BSP) excludes the majority of the Remainder of Erf 2074 from the conservation planning areas (Figure 6). Only the southernmost section of the site, i.e., the valley and a section of the fynbos habitat on the site, is mapped as a terrestrial critical biodiversity area (CBA1).

Figure 6: Critical Biodiversity Area Map.

The only connectivity to a wider natural area is along the southern boundary of the site where it connects to the valley below. The report therefore recommends that the development should avoid the southern section of the site – which also contains the most pristine vegetation on the site and the steep slopes. The proposed development footprint slightly encroaches over the recommended line proposed by the Terrestrial Biodiversity Report but aligns with the development footprint of the adjacent residential development. The proposal still permits more than 1ha of conservation area along the southern slope of the land that will tie in with the existing green belt along the Piesang Valley.

2.2.3 AQUATIC BIODIVERSITY

The property is situated in a catchment area of the Piesang River and the Aquatic Biodiversity sensitivity for RE/2074 was therefore identified as Very High according to the DFFE Screening Tool. Confluent Environmental

Pty (Ltd) was appointed by Eco Route Environmental Consultancy to conduct an aquatic assessment for a proposed residential. The Report is attached as an Annexure of the Draft BAR.

The Report confirms that the site has no watercourses or wetlands within its boundaries. The property is located on a watershed with approximately half of the property draining to the north and the other half draining to the south. The northern drainage would indirectly drain to the Keurbooms River via stormwater in urban areas, while the southern drainage would drain more directly to the Piesang River via a non-perennial drainage line flowing south on the neighbouring property to the west which connects with the Piesang River.

The Report recommends a **48 m** buffer for the adjacent drainage line. For the most part, this buffer is aligned with the southwestern boundary of RE/2074, but a small area intrudes into the property boundary near the corner of the property (refer to Figure 7).

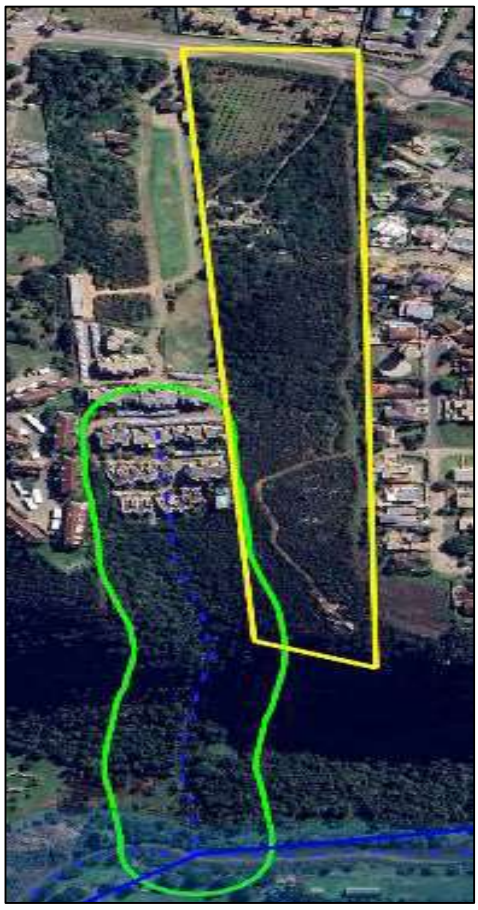


Figure 7: Drainage Line and buffer on the adjacent property.

Stormwater management has been identified as an important consideration due to the proximity of this drainage line. Although the planned development footprint will include the southern section of the watershed or any potential impacts to the drainage line on the neighbouring property or the Piesang River can be effectively managed to minimise any negative impact.

The Stormwater Management Plan will be based on implementing SUDS-type stormwater management systems to encourage water infiltration, improve runoff quality, and minimise runoff velocities throughout the proposed development. The project Engineers proposed in the Engineering Services report that The City of Cape Town norms for SUDS will be adopted for this project. The attenuation criteria are that stormwater be detained to reduce the post-development runoff rates not to exceed the pre-development rates for the 1 in 10-year and 1 in 50-year return storm intervals. This will include vegetated swales along the eastern boundary and permeable paving.

2.4.4 SOIL

The soil conditions of the site have not been investigated yet. The generally observed geology of the site is mostly sandstone with relatively nutrient-poor sandy soil and poses no risk for development.

2.4.5 IMPROVEMENTS

There is an existing farmhouse that may be older than 60 years and some outbuildings on the site. It is the intention to preserve the original farmhouse and to use it as a communal facility on the planned estate.

The building footprint of the additional dwelling in the southern section of the property will be preserved and can be used as a lookout point or viewing deck for residents.

2.4.6 SERVITUDES AND OTHER RESTRICTIONS

There are municipal services along the eastern boundary of the property. The exact position of the services is unconfirmed, but indications are that they are within the 3m building line. A servitude will be registered to protect these services once the municipality has indicated the correct position.

Marine Drive Road reserve traversed through the northern section of the property and was subdivided off the Remainder of the property in 2013 (Unregistered Erf 12706 measuring ±2963m²).

Presently there is an ongoing dispute that involves access to the Thulana Hills development situated on the adjacent Erf 2073, directly to the west of the Remainder of Erf 2074. Temporary access to Thulana Hills was approved directly from the N2 but the municipality unlawfully set a condition that requires that Phase II of the Thulana Hills development must derive access to and egress from the development over the Remainder of Erf 2074, to connect to the traffic circle to the east of the Remainder of Erf 2074, without the owners of the Remainder of Erf 2074 consenting to such arrangements. There is also a further condition to the approval of the Thulana Hill development [Condition 2 (j)] of the rezoning approval dated 25 January, which requires that "the cost of incurring for the construction of the circle be proportionally reimbursed by the owner of the Remainder of Erf 2074 as and when this property is developed" (bearing in mind that the developer of Erf 2073 will in return be responsible for the land and the construction cost to provide a road via the Remainder of Erf 2074).

To date, the matter has not been resolved, but with the planned development on the Remainder of Erf 2074, there is an opportunity to finally resolve the issue. Presently the communication with the owner of Erf 2073 is ongoing and an agreement will be reached. The layout makes provision for a 6m access road over Erf 2074, parallel to Marine Drive. The access design will be done by a qualified Traffic Engineer and will eventually be protected by way of an access servitude.

3. Proposal

3.1 DEVELOPMENT CONCEPT

The aim is to develop a medium/high-density residential development that caters for an identified need for affordable residential units for the middle-income bracket. The prefered Concept Proposal includes about 228 2 and 3-bedroom apartments in 3-storey buildings. Each unit will be between 100m² and 130m² in size.

The intention is to have 3 or 4 phases that can be developed as the market demands. A certain level of flexibility in design is required to allow the development to respond to a changing market. It is proposed that individual Site Development Plans be submitted to the Local Authority for each phase. The proposal currently on the table presents the maximum number of units that can be achieved taking into account the site characteristics, position of the existing structures and infrastructure development parameters of the Zoning Scheme, as well as parking and access requirements.

3.2. THE DEVELOPMENT FOOTPRINT

The biophysical site characteristics described in Section 2.4 determined the development footprint. The site poses very limited constraints. In summary, the following site constraints were identified and excluded from the development footprint:

- Steep slopes in the southern area.
- Sensitive vegetation in the southern area
- Services along the eastern boundary line.
- Access consideration to Erf 2073.
- Access from the constructed traffic circle on Marine Drive.
- Existing farmhouse (heritage implications).

The developed footprint measures ±5ha as indicated in Diagram 7 attached.

3.3 ACCESS

The site access will be from the traffic circle on Marine Drive that was originally constructed to accommodate the access requirements of the development of Erven 2073 and the Remainder of Erf 2074. The layout also makes provision for Erf 2073 to gain access over the Remainder of Erf 2074.

Figure 8: Access Servitude to access the circle.

Access via the circle is possible over an access servitude that was registered over Erf 1726 (Public Place) See Diagram 6325/2008 attached as Annexure C.

Secondary connections to the existing road network from Cutty Shark and Ariel Street are proposed, especially as an emergency exit for the development or the residents of Cutty Sark. The Traffic Impact on the existing residential road network will be assessed in the Traffic Impact Assessment.

EAS Consulting Engineers will be appointed to assess the extent and nature of the traffic generated by the proposed development, the impact of this traffic on the operation of the associated road network, and devise solutions for any problems identified.

The internal road network will be privately owned and will consist of landscaped lanes and parking.

3.4 DENSITY

The developer wants to provide a high-quality yet affordable housing product. To make this project financially viable and responsive to the target market, the cost of land, services and building costs need to be limited and to do so, a certain economy of scale needs to be attained. The most relevant design aspect to achieve this is development density.

The property is ±6.2 in size and the draft SDP2 proposes 228 units of approximately 100m² -130m² each, which calculates to a gross density of ±36.7 units per ha. The nett density is calculated excluding the undevelopable steep slopes and natural vegetation to the south of the site. The identified development area measures approximately 5ha and 228 units will calculate to a nett density of ±45.6 units per ha.

The density is in line with the SDF which earmark areas medium-density housing (3-4 storeys).

3.5 PROPOSED REZONING AND SUBDIVISION

3.5.1 ZONING

It is proposed to rezone the property to "General Residential II" which permits flats, group housing and townhouses as primary rights.

Land use description: "Flats" means a building containing three or more dwelling units of which at least one does not have a ground floor, together with such outbuildings, open space and private roads as are ordinarily associated with flats.

Development parameters:

(a) Coverage

The maximum coverage is 60%.

(b) Floor factor

The floor factor may not exceed 1,5.

(c) Height

(i) The highest point of a building may not exceed 10,67 metres

(ii) The general provisions regarding earth banks and retaining structures in this By-law apply.

(d) Building lines

(i) The street building line is at least 5 metres.

(ii) Side and rear building lines are at least 4,5 metres,

(iii) The general building line encroachments in this By-law apply.

(e) Parking and access

1.5 bays per unit in PTA1 areas

The proposed concept site plan complies with the development parameters stipulated above.

3.5.2 SUBDIVISION

The intention is to phase the development. To implement the phasing it is proposed to subdivide the development into 3 or 4 phases.

3.6 ENGINEERING SERVICES

Poise Structural and Civil Engineering Design Consultants have been appointed to investigate the supply and demand of the services for the proposed development. The Report is attached to the Draft BAR. The report confirms that the property is situated within an urban area where services are available, and the development can easily connect to these services.

An electrical bulk service report is outstanding at this stage but will be requested.

A GLA Report will be requested to report on the bulk capacity of the municipality. In general, it is known that the Bitou Municipal Infrastructure networks require upgrades and capacity. However, the Bitou Spatial Development Plan states that engineering services are critical towards the establishment of sustainable human settlements and facilitating economic development and job creation. Hence, infrastructure investment within the Bitou Local municipality should primarily be focussed on:

- Maintaining existing infrastructure and associated equipment, and
- Expanding infrastructure to serve the identified Strategic Development
- Areas (and Potential Development Areas) within the municipal area

3.7 PLANNING PERMISSIONS REQUIRED

3.7.1 APPLICATIONS TO THE BITOU MUNICIPALITY IN TERMS OF THE BITOU MUNICIPALITY: STANDARD MUNICIPAL LAND-USE PLANNING BY-LAW (2016)

(i) **Rezoning in terms of Section 15 (2) (a) of the said Bylaw:** The property is currently zoned "Agricultural I" in terms of the Bitou Zoning Scheme By-Law applicable to the area. To facilitate the development of the land the property will have to be rezoned to a "General Residential II".

(ii) **Subdivision in terms of Section 15 (2) (d) of the said Bylaw:** It is the intention to sell the units as sectional title. The development will however be phased and a Subdivision Plan indicating the different phases, private roads and communal open space will be submitted.

(iii) **Approval of Site development Plan:** Once the property has been successfully rezoned and subdivided, each Phase of the development will be subject to the approval of a detailed Site Development Plan that will have to comply with any conditions of approval and development parameters as set out in the Bitou Zoning Scheme By-Law.

3.7.2 NATIONAL HERITAGE RECOURSES ACT 25 OF 1999

The rezoning of more than a hectare of land requires approval in terms of Section 38 of the Heritage Resources Act. A Notice of Intent to Develop (NID) must be submitted to Western Cape Heritage. In 2006 a Heritage approval was obtained for the previous development proposal without the need for further heritage assessments such as archaeological assessment, palaeontology assessment or visual impact assessments.

3.7.3 SUBDIVISION OF AGRICULTURAL LAND ACT 70 OF 1970

The property was originally earmarked in the Knysna Wilderness Plettenberg Bay Guide plan for "Township" purposes and does not have a farm number and therefore does not form part of the agriculture register. This means that although the property is zoned for agricultural purposes, it is not subject to the provisions of the Subdivision of Agricultural Land Act (Act 70 of 70).

Agriculture will be requested to comment on the rezoning application.

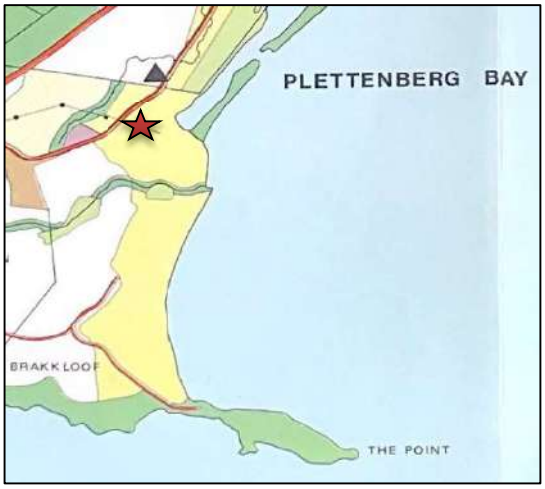


Figure 9: Extract from Knysna Wilderness Plett Guide Plan.

3.7.4 APPLICATION TO SANRAL IN TERMS OF THE SOUTH AFRICAN NATIONAL ROADS AGENCY LIMITED AND NATIONAL ROADS ACT, ACT 7 OF 1998

The property is situated within a building restriction area as defined in Act 7 of 1998. A building restriction area means the area consisting of land (but excluding land in an urban area) situated alongside a national road within a distance of 60 metres from the boundary of the national road or situated within a distance of 500 metres from any point of intersection with the road. The proposed access to the development is approximately 420m from the Intersection with the N2 but within an urban area. A formal approval from SANRAL may not be required, but the application will be forwarded to them for comment.

3.7.5 ADVERTISING ON ROADS AND RIBBON DEVELOPMENT ACT 21 OF 1940

The Surveyor General may not approve a General Plan or the diagrams of erven situated wholly or partly outside an urban area if any part of any such erf, lot, or holding falls within a distance of 95m of the centre line of a building restriction road or of a main road, or within 500m of an intersection with a similar or national road, without written approval from the controlling authority concerned.

The property borders a Main Road (Marine Drive), and it is our understanding that the road falls under the jurisdiction of the Provincial Roads authority.

There are also Conditions in the Title Deed that prevent the subdivision of the property without the consent of the controlling authority in terms of Act 21 of 1940.

An application to the Western Cape Road Authority will be required.

3.7.6 OUTENIQUA SENSITIVE COASTAL AREA REGULATION

Certain areas have been designated as sensitive in terms of these regulations and require approval from the local municipality should activities such as clearance of vegetation and earthworks be undertaken. The property has not been listed as within the identified OSCAE area.

4. Need & Desirability

In terms of the Promotion of Administrative Justice Act, 2000 (Act No. 3 of 2000) ("PAJA") all administrative action must be based on the "relevant considerations". NEMA and the EIA Regulations highlight specific considerations which include specifically having to consider "**the need for and desirability of the activity.**"

4.1 NEED

4.1.1 THE NEED FOR AFFORDABLE HOUSING

The first question that needs to be asked when any development is considered is whether there is a need for the contemplated land use. This is normally a question that the potential investor would answer before he embarks on a long and expensive application process. Development, like any other business, is about supply and demand.

It is a well-documented fact that the Garden Route is becoming increasingly popular among people who want to seek a quieter lifestyle and move out of the cities.

According to the 2021 Socio-Economic Profile of the Bitou Municipality prepared by the Western Cape Provincial Government, the population of Bitou is 69 321 people in 2021, making it the most populated municipal area in the Garden Route District (GRD). This total is expected to grow to 77 243 by 2025, equating

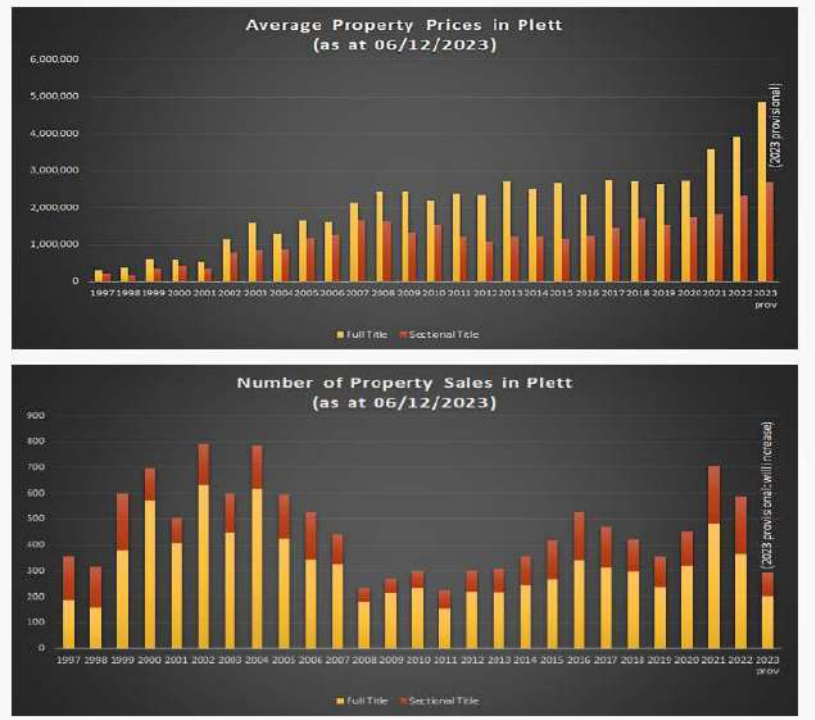
to an average annual growth rate of 2.7 per cent. Statistics show that historically most people moving to the Bitou area are from the Eastern Cape. Most of these people are poor, low-skilled individuals who are searching for employment opportunities. Although most of the population growth and subsequent housing needs are in the poorer communities, there is also a known need for middle-income properties in Plettenberg Bay.

There is currently a "semigration" trend, with many people from Gauteng and KwaZulu/Natal moving to smaller towns in the Western Cape. It seems that Covid-19 has caused a lot of people to introspect and re-evaluate their priorities, which has led to the current influx of affluent city dwellers to the Garden Route. This leads to a situation where demand, and therefore property prices, are well above national averages.

According to a recent Article in the Financial Mail, the average value for a property in Plett increased by 24% from 2020 to 2021 to R3million, a further 9% in 2022 to R3,3million and 26% to R4,2million in 2023. Entry-level asking prices in Plett have increased considerably over the past 4 years. It is now almost impossible to find full-title homes below R3,500,000.

The Plettenberg Bay area historically has very few housing opportunities for middle-income earners. The mentioned influx of higher-income families moving to the area and subsequent sharp increases in housing prices have further exacerbated the lack of affordable housing. Many residents are displaced as property values rise to the point of unaffordability. This displacement of the middle class and lack of affordable housing has a tremendous effect on the economy of the town, as the middle-class workforce actively contributing to these economies can no longer afford to live here.

In the coming years, it is critical that the housing shortage in the middle-income bracket be addressed to ensure the efficient functioning of the Plettenberg Bay economy. The Spatial Development Framework of the town has also identified this need and has identified Strategic Development Areas where affordable housing should be a priority. This development aims to address the housing need of the middle-income earners who live and work in the area and are situated in an



area that has been identified as suitable for this type of housing typology. **Figure 10: Property sales and prices between 1997 and 2023.**

4.1.2 SOCIO-ECONOMIC NEED OF THE LARGER COMMUNITY

South Africa has an ever-increasing challenge of high unemployment and skills shortages. At the end of 2018, the unemployment rate was reported to be 27,2%5. One of the main goals that South Africa has set itself in the National Development Plan, is to reduce poverty and to cut the unemployment rate to 6% by 2030. Notwithstanding decades of legislated environmental impact assessment and integrated development planning, "*poverty remains endemic ".*

The planned residential estate stands to contribute positively to the economic growth of the area by creating job opportunities for the local community without detrimentally affecting the environment. It will create construction jobs for local contractors and labourers. The employment opportunities associated with the construction phase are frequently regarded as temporary employment. However, while these jobs may be classified as "temporary" it is worth noting that the people employed in the construction industry by its very nature rely on "temporary" jobs for their survival. In this regard "permanent" employment in the construction sector is linked to the ability of construction companies to secure a series of temporary projects over some time. Each development, such as the proposed development, therefore, contributes to creating "permanent" employment in the construction sector.

The construction industry is an important player in job creation, not only in the construction sector but in other sectors of the economy as well. The construction industry uses a wide range of inputs such as manufacturing of construction materials and equipment, mining of raw materials, forestry, transportation, real estate, finance, and professional services which all contribute indirectly to more jobs that are created across several sectors.

Plettenberg Bay has a very similar demographic profile to the rest of the country. Socio-economic studies indicate high levels of poverty and unemployment. The social needs of the larger community form part of the "surrounding environment" and should receive due consideration when new developments are investigated. The "ripple effect" that a development of this scale has on the local economy and social well-being of the community cannot be ignored.

4.2 DESIRABILITY OF THE SITE TO ACCOMMODATE THIS DEVELOPMENT

Desirability factors relate to place. Is the land physically suitable to accommodate the proposed development? Does the proposed development fit in with the surrounding land uses? Is the proposal compatible with credible spatial plans? Is there perhaps a better land-use alternative for the land parcel?

4.2.1 PHYSICAL SITE CONSTRAINTS AND OPPORTUNITIES

Diagram 7 provides a summary of the site constraints that were considered when the development footprint was identified. The site has limited constraints, the 5ha development footprint excludes steep areas and provides an opportunity to conserve the southern slopes for conservation purposes.

The planned residential footprint however extends over the vegetation sensitivity divide proposed in the Terrestrial Biodiversity Report, but the encroachment is motivated by the urban context of the site. The proposed footprint aligns with adjacent residential development to the east and west of the property and still permit a conservation corridor along the southern section of the site, similar to what has been allowed for on the surrounding properties. Given that the property has been identified as a strategic development area it should be considered that in some instance the development footprint should be optimised, and that some biodiversity loss will occur. This is still preferable to more development in outer areas where valuable farm land is sacrificed to cater for the growing housing need.

It can be concluded that the site has limited constraints and that the unique site characteristics will be preserved within the planned development. The site characteristic described above makes this site highly desirable for development.

4.2.2 COMPATIBILITY WITH THE SURROUNDING AREA

The property is situated along Marine Drive which is a major transportation route. The area has a mixed-use character as can be seen from the attached Zoning Map (Diagram 3) and Land Use Map (Diagram 4).

The Thulana Hills development directly to the west has a similar shape and size and has received planning permission for medium-density residential development of approximately 200 units. Phase 1 consisting of about 70 units has been implemented. Further west is Castleton, another medium-density residential development consisting of about 129 units and the Whale Song Hotel and Spa. To the east is the existing low-density residential neighbourhood known as Cutty Sark. Direct across the road from the Remainder of Erf 2074 are two more medium-density residential complexes, Santini Village which consists of about 120 units and

Laridae with about 24 units. Further along Marine Drive is a mix of residential, community and business use including Shell Garage to the west at the intersection with the N2, a Medical Clinic to the east and a church and the municipal depo and offices further east.

To provide further context for this density evaluation, the following table offers a comparative analysis with other developments in the vicinity.

DEVELOPMENT DENSITIES IN THE AREA					
Development Name	**Property Description**	**Height**	**Nr of Units**	**Property size**	**Density**
Thulana	2073	3 Storey	200	6ha	33u/ha
Castleton	6527	3 Storey	129	11ha	
Santini Village	Re2317	3 Storey	120	2.7ha	44u/ha
Laridae	3354	3 Storey	24	4808m²	50u/ha
Fynbos Rand	RE/2074	3 Storeys	228	6.2ha	37u/ha

It can be stated that the proposed development will not have any impact on the character of the area. The scale, nature and typology of the development are similar to surrounding developments.

Figure 11: View of Santini Village from the site.

4.2.3 COMPATIBILITY WITH APPLICABLE FORWARD PLANNING DOCUMENTS

Another test of the desirability of a project is by considering the broader communities' needs and interests as reflected in credible Spatial Development Frameworks on Local, Municipal, District, Regional, Provincial and National levels.

4.2.3.1 National Development Plan (NDP 2030)

The NDP aims to eliminate poverty and reduce inequality by 2030. According to the plan, South Africa can realise these goals by drawing on the energies of its people, growing an inclusive economy, building

capabilities, enhancing the capacity of the state, and promoting leadership and partnerships throughout society. Growth and jobs, education and skills, and a capable and developmental state are the main aims of this document.

South Africa is mandated by this Act to be a developmental state. In this light, it will be difficult for any decision-making body to deny any form of economic activity unless there are substantial negative environmental impacts that cannot be mitigated.

4.2.3.2 Western Cape Provincial Spatial Development Framework 2014

The PSDF 2014 has been approved by the Executive Authority, Minister Anton Bredell, Minister of Local Government, Environmental Affairs and Development Planning, and endorsed by the Provincial Cabinet. The Western Cape PSDF sets out to put in place a coherent framework for the province's urban and rural areas.

The Provincial SDF indicates George as the regional center for the eastern part of the province, with Knysna and Plettenberg Bay being smaller centres along the Regional Connector Route (N2). It earmarks the area along the Garden Route as a tourism route with leisure activities of provincial significance.

The sustainable use of provincial assets is one of the main aims of the policy. The protection of non-renewable natural and agricultural resources is achieved through clear settlement edges for towns by defining limits to settlements and through establishing buffers/transitions between urban and rural areas. The urban fringe must ensure that urban expansion is structured and directed away from environmentally sensitive land and farming land; agricultural resources are reserved; environmental resources are protected; appropriate levels of services are feasible to support urban fringe land uses, and land use allocations within the urban fringe are compatible and sustainable.

4.2.3.3 Bitou Spatial Development Framework 2021

The Bitou Spatial Development Framework 2021 was approved by the Council in March 2022. The main objective of this development framework is to achieve a balance between development and the environment to ensure that growth is spatially just, financially viable and environmentally sustainable by working towards compact, vibrant, livable, and efficient settlements serving all communities.

The protection of natural environmental resources of the area is fundamental to future economic development in the area as the two key economic sectors of the municipality (tourism and agriculture) are both resource-based. To protect these valuable resources, the Bitou SDF has defined an urban edge aimed at containing lateral urban sprawl within the municipality.

As conceptually illustrated in Figure 12, the property is situated in a first-order settlement, where urban growth is promoted.

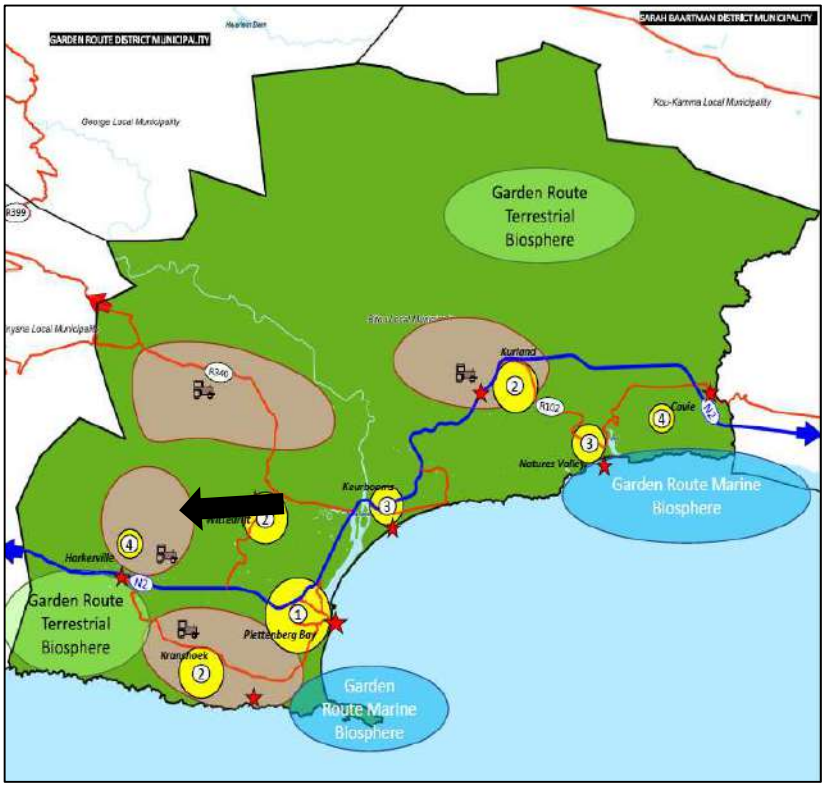


Figure 12: Spatial Vision/Concept.

As can be seen from the extract of the SDF map below, the property is situated within the urban edge of the Plettenberg town settlement which is regarded as the first-order settlement where most investment should be focused towards.

The property is also situated in an area that has been identified as a "Strategic Development Area", with the potential for medium-density (3 to 4-storey) residential development (SDA9).

The Strategic Development Areas are earmarked to accommodate the bulk of future residential development within the municipality are and graphically indicated by the orange areas in Figure 13 below.

The SDF points out that the development of land identified as a priority or Strategic Development Area should take into account the surrounding area(s) in terms of context, character, prevailing property values, aesthetics and other factors as may be determined by the Municipality, as to not unreasonably detract from the aforementioned aspects and general appeal of the area(s) in question. It is submitted that the proposal fits into the surrounding urban environment with similar land uses and densities found on Erf 2073 (Thulana Hills) directly to the west and RE/2317 (Santini Village) directly to the north.

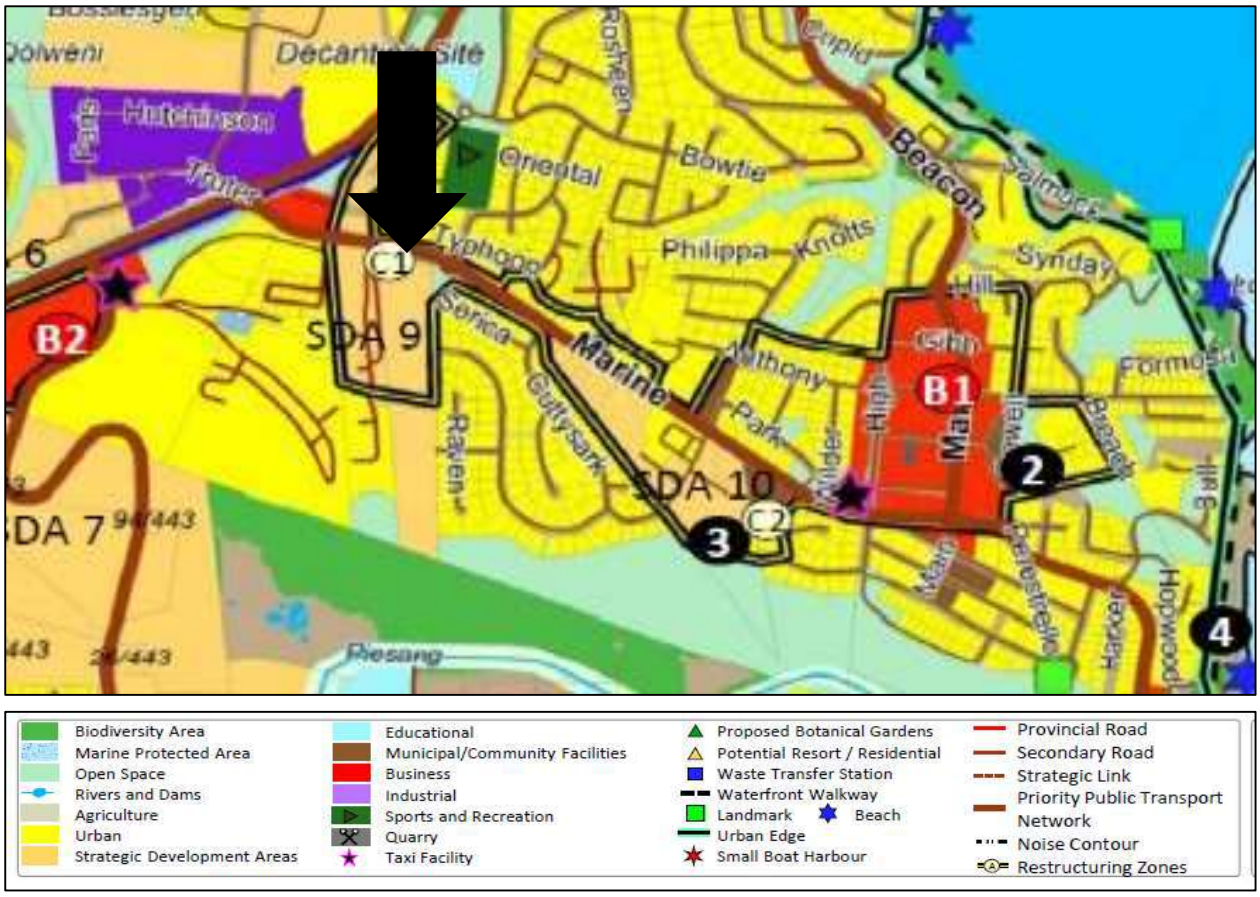


Figure 13: Extract from SDF indicating that the property is situated in SDA9.

Furthermore, this area also forms part of the Restructuring Zones of the Bitou Local Municipality (i.e. it is intended to accommodate medium-density housing, including Social Housing).

The proposal completely aligns with the Spatial Planning proposals for the Bitou municipal area.

4.2.4 COMPLIANCE WITH SPLUMA DEVELOPMENT PRINCIPLES

In considering the application, the decision-maker needs to be guided by the DEVELOPMENT PRINCIPLES contained in (Chapter II) of the Spatial Planning and Land Use Management Act 2013 (Act no 16 of 2013) SPLUMA and Chapter VI of the Land Use Planning Act, 2014 (Act 3 of 2014) (LUPA).

Section 7 of the Act describes a set of development principles that need to be considered when evaluating any development application. These principles include the following:

4.2.4.1 Spatial Justice

Social justice targets the marginalised and disadvantaged groups in society. Spatial justice principles seek to eliminate spatial injustices that resulted from previous discrimination and marginalisation. Inequitable access to housing, educational and economic opportunities and health facilities are consequences of spatial injustice. The instruments used to promote spatial justice are varied and include Spatial Development Frameworks, Precinct Plans, and Urban Regeneration Plans and Policies which require government intervention. The development of this property in an identified Strategic Development Area can contribute to spatial reform and integration as it will allow 228 households to own a home in an established urban area which is near jobs, schools and other urban amenities.

4.2.4.2 Spatial Sustainability

Land development should be spatially compact, resource-frugal, compatible with cultural and scenic landscapes, and should not involve the conversion of high-potential agricultural land or compromising ecosystems. The proposal supports this principle of spatial sustainability in the sense that it proposes a more compact development of underutilised land within an existing urban area, thereby limiting the need for urban sprawl and encouraging the optimal use of existing urban land and services. The proposal does not impact on scarce resources such as valuable agricultural land or conservation-worthy natural environmental features.

4.2.4.3 Spatial Efficiency

Efficiency relates to the form of settlements and use of resources - compaction as opposed to sprawl; mixed-use, as opposed to mono-functional land, uses; residential areas close to work opportunities as opposed to dormitory settlement. The proposal supports the efficient use of existing resources and infrastructure with minimum negative financial, social, economic, or environmental impacts. The layout is compact and makes the best use of available land.

4.2.4.4 Spatial Resilience and Good Administration

These principles mostly relate to spatial plans, policies, land use schemes, and procedures, which, although important on a wider scale, do not have direct relevance to a proposal of this nature.

5. Summary

The Remainder of Erf 2074 measures about 6.2ha and is zoned for Agricultural I purposes. The southern section of the property has a steep gradient covered in sensitive vegetation while the northern and central areas have even gradients, and the vegetation has been historically disturbed. It is the vision of the landowner to create an affordable and sustainable housing project specifically targeting the middle-income group, in line with the identified need for affordable housing in the town.

The development is planned in the northern and central areas of the site while the southern section will be protected as a nature conservation area. At this stage, the layout proposes about 228 apartments of about 100-130m² in size with a communal open space that will include roads, infrastructure, parks and other amenities. This density is in line with other medium-density residential developments in the direct vicinity of the site.

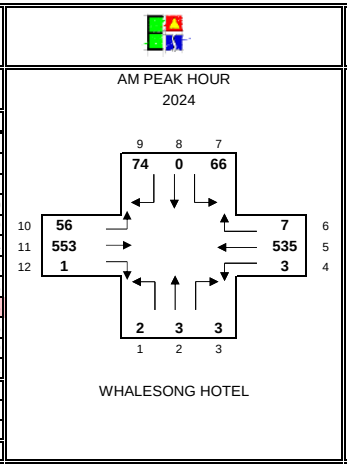
The site is physically suitable for development and can cost-effectively connect to the existing municipal services networks that are located along the eastern boundary of the property.

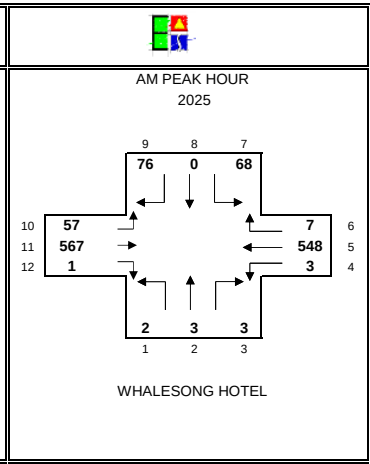
The Bitou Spatial Development Framework earmarked the entire property for development and specifically earmarked the site as a priority development area for medium-density development. The proposal is in line with the long-term development vision of the town and will contribute significantly toward the need for housing stock, job creation and economic growth.

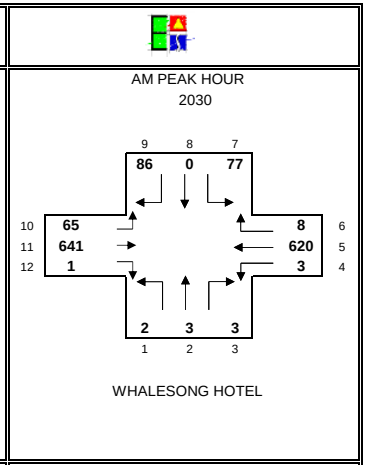
ANNEXURE B
Peak Hour
Traffic Counts

Project : TIA : PROPOSED DEVELOPMENT ON ERF 2074, PLETTENBERG BAY — Day & date : 30/8/2024
Intersection : MARINE WAY / N2 WB OFF RAMP — NO. 1 — Time period: 06:00 - 09:00

STARTING TIME	WHALESONG HOTEL Northbound				MARINE WAY Westbound				- Southbound				MARINE WAY Eastbound				INTER-SECTION	
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	Hour
6:00	0	0	0	0	0	7	0	7	1	0	8	9	0	6	0	6	22	
6:15	0	0	0	0	0	18	0	18	2	0	5	7	7	14	0	21	46	
6:30	1	0	0	1	0	27	0	27	3	0	7	10	6	24	0	30	68	
6:45	0	0	0	0	0	63	4	67	10	1	11	22	13	51	1	65	154	290
7:00	0	0	0	0	0	58	1	59	4	0	13	17	12	53	0	65	141	409
7:15	0	0	2	2	0	129	0	129	10	0	17	27	13	140	0	153	311	674
7:30	0	1	0	1	1	139	5	145	11	0	19	30	17	162	1	180	356	962
7:45	2	0	1	3	0	136	0	136	22	0	21	43	12	131	0	143	325	1133
8:00	0	2	0	2	2	131	2	135	23	0	17	40	14	120	0	134	311	1303
8:15	2	0	0	2	1	115	4	120	20	0	22	42	18	72	0	90	254	1246
8:30	0	0	1	1	3	95	10	108	6	1	25	32	11	97	0	108	249	1139
8:45	0	0	0	0	0	74	5	79	16	1	16	33	8	78	0	86	198	1012
Total	5	3	4	12	7	992	31	1030	128	3	181	312	131	948	2	1081	2435	
Peak hour	2	3	3	8	3	535	7	545	66	0	74	140	56	553	1	610	1303	
Peak 15 min				3				145				43				180	356	
PHF				0.67				0.94				0.81				0.85	0.92	



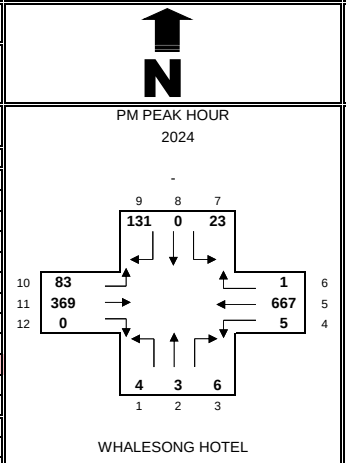


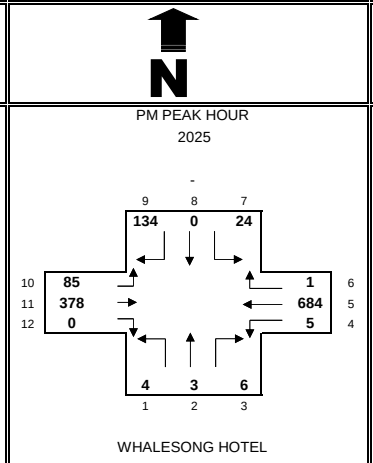


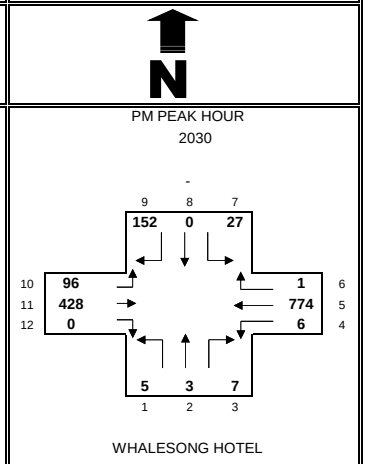
3

Project : TIA : PROPOSED DEVELOPMENT ON ERF 2074, PLETTENBERG BAY — Day & date : 30/8/2024
Intersection : MARINE WAY / N2 WB OFF RAMP — NO. 1 — Time period: 15:00 - 18:00

STARTING TIME	WHALESONG HOTEL Northbound				MARINE WAY Westbound				- Southbound				MARINE WAY Eastbound				INTER-SECTION	
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	Hour
15:00	0	0	1	1	3	82	6	91	12	0	16	28	11	31	0	42	162	
15:15	0	0	2	2	0	102	4	106	10	2	18	30	16	58	0	74	212	
15:30	0	0	1	1	1	92	0	93	25	1	22	48	22	135	1	158	300	
15:45	0	0	1	1	0	116	0	116	24	8	26	58	10	49	0	59	234	908
16:00	0	0	0	0	1	75	2	78	8	9	16	33	6	30	0	36	147	893
16:15	0	3	0	3	1	64	0	65	2	0	12	14	7	48	1	56	138	819
16:30	3	1	3	7	0	97	0	97	8	0	17	25	15	89	0	104	233	752
16:45	0	0	0	0	0	197	1	198	10	0	26	36	25	76	0	101	335	853
17:00	0	1	1	2	0	181	0	181	3	0	34	37	24	95	0	119	339	1045
17:15	1	1	2	4	5	192	0	197	2	0	54	56	19	109	0	128	385	1292
17:30	0	0	0	0	1	115	0	116	0	0	45	45	1	4	0	5	166	1225
17:45	0	0	0	0	0	12	0	12	0	0	12	12	14	19	0	33	57	947
Total	4	6	11	21	12	1325	13	1350	104	20	298	422	170	743	2	915	2651	
Peak hour	4	3	6	13	5	667	1	673	23	0	131	154	83	369	0	452	1292	
Peak 15 min				7				198				56				128	385	
PHF				0.46				0.85				0.69				0.88	0.84	





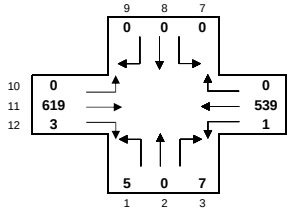


Project : TIA : PROPOSED DEVELOPMENT ON ERF 2074, PLETTENBERG BAY — Day & date : 30/8/2024
Intersection : MARINE WAY / ERF 2073 — NO. 2 — Time period: 06:00 - 09:00

STARTING TIME	2073 ACCESS Northbound				MARINE WAY Westbound				- Southbound				MARINE WAY Eastbound				INTER-SECTION	
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	Hour
6:00	0	0	0	0	0	5	0	5	0	0	0	0	0	6	0	6	11	
6:15	1	0	1	2	0	20	0	20	0	0	0	0	0	19	0	19	41	
6:30	0	0	0	0	0	34	0	34	0	0	0	0	0	34	0	34	68	
6:45	0	0	1	1	0	70	0	70	0	0	0	0	0	68	0	68	139	259
7:00	0	0	2	2	1	61	0	62	0	0	0	0	0	72	0	72	136	384
7:15	1	0	0	1	0	111	0	111	0	0	0	0	0	134	0	134	246	589
7:30	2	0	2	4	1	137	0	138	0	0	0	0	0	166	1	167	309	830
7:45	1	0	3	4	0	143	0	143	0	0	0	0	0	180	1	181	328	1019
8:00	1	0	2	3	0	148	0	148	0	0	0	0	0	139	1	140	291	1174
8:15	3	0	1	4	1	131	0	132	0	0	0	0	0	110	1	111	247	1175
8:30	2	0	0	2	1	100	0	101	0	0	0	0	0	124	0	124	227	1093
8:45	0	0	1	1	0	104	0	104	0	0	0	0	0	127	1	128	233	998
Total	11	0	13	24	4	1064	0	1068	0	0	0	0	0	1179	5	1184	2276	
Peak hour	5	0	7	12	1	539	0	540	0	0	0	0	0	619	3	622	1174	
Peak 15 min				4				148				0				181	328	
PHF				0.75				0.91				######				0.86	0.89	

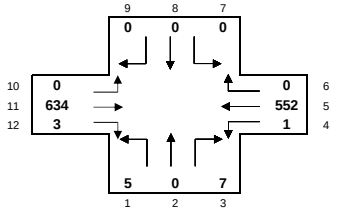
4

AM PEAK HOUR 2024



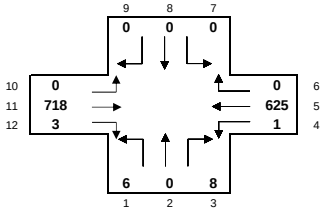
2073 ACCESS

AM PEAK HOUR 2025



2073 ACCESS

AM PEAK HOUR 2030

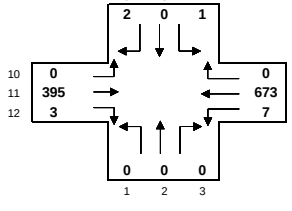


2073 ACCESS

Project : TIA : PROPOSED DEVELOPMENT ON ERF 2074, PLETTENBERG BAY — Day & date : 30/8/2024
Intersection : MARINE WAY / ERF 2073 — NO. 2 — Time period: 15:00 - 18:00

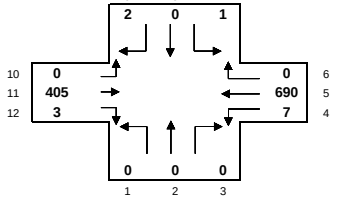
STARTING TIME	2073 ACCESS Northbound				MARINE WAY Westbound				- Southbound				MARINE WAY Eastbound				INTER-SECTION	
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	Hour
15:00	0	0	0	0	0	108	0	108	0	0	1	1	0	56	2	58	167	
15:15	0	0	0	0	0	113	0	113	0	0	2	2	0	86	1	87	202	
15:30	0	0	0	0	2	110	0	112	0	0	1	1	0	96	0	96	209	
15:45	0	0	0	0	2	99	0	101	0	0	2	2	0	78	0	78	181	759
16:00	0	0	0	0	1	148	0	149	0	0	1	1	0	107	0	107	257	849
16:15	0	0	0	0	2	144	0	146	0	0	0	0	0	103	1	104	250	897
16:30	0	0	0	0	1	202	0	203	0	0	0	0	0	109	0	109	312	1000
16:45	0	0	0	0	3	159	0	162	0	0	2	2	0	77	1	78	242	1061
17:00	0	0	0	0	2	173	0	175	0	0	0	0	0	111	1	112	287	1091
17:15	0	0	0	0	1	139	0	140	1	0	0	1	0	98	1	99	240	1081
17:30	0	0	0	0	0	104	0	104	0	0	0	0	0	64	1	65	169	938
17:45	0	0	0	0	4	70	0	74	2	0	0	2	0	55	1	56	132	828
Total	0	0	0	0	18	1569	0	1587	3	0	9	12	0	1040	9	1049	2516	
Peak hour	0	0	0	0	7	673	0	680	1	0	2	3	0	395	3	398	1081	
Peak 15 min				0				203				2				112	312	
PHF				#DIV/0!				0.84				0.38				0.89	0.87	

PM PEAK HOUR 2024



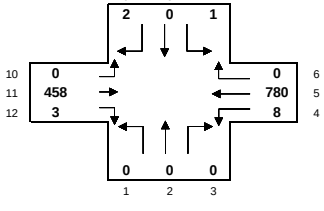
2073 ACCESS

PM PEAK HOUR 2025



2073 ACCESS

PM PEAK HOUR 2030



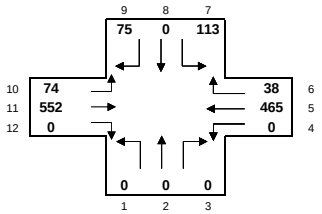
2073 ACCESS

Project : TIA : PROPOSED DEVELOPMENT ON ERF 2074, PLETTENBERG BAY — Day & date : 30/8/2024
Intersection : MARINE WAY / CHALLENGE DRIVE — NO. 3 — Time period: 06:00 - 09:00

STARTING TIME	0 Northbound				MARINE WAY Westbound				CHALLENGE DRIVE Southbound				MARINE WAY Eastbound				INTER-SECTION	
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	Hour
6:00	0	0	0	0	0	2	0	2	0	0	1	1	0	8	0	8	11	
6:15	0	0	0	0	0	17	0	17	7	0	0	7	0	19	0	19	43	
6:30	0	0	0	0	0	25	2	27	9	0	1	10	2	31	0	33	70	
6:45	0	0	0	0	0	62	3	65	16	0	1	17	6	60	0	66	148	272
7:00	0	0	0	0	0	45	2	47	16	0	1	17	9	59	0	68	132	393
7:15	0	0	0	0	0	138	4	142	9	0	29	38	21	151	0	172	352	702
7:30	0	0	0	0	0	97	13	110	29	0	29	58	13	116	0	129	297	929
7:45	0	0	0	0	0	114	9	123	51	0	26	77	21	167	0	188	388	1169
8:00	0	0	0	0	0	116	12	128	24	0	-9	15	19	118	0	137	280	1317
8:15	0	0	0	0	0	69	17	86	26	0	9	35	6	82	0	88	209	1174
8:30	0	0	0	0	0	100	6	106	21	0	8	29	7	108	0	115	250	1127
8:45	0	0	0	0	0	72	6	78	39	0	7	46	5	97	0	102	226	965
Total	0	0	0	0	0	857	74	931	247	0	103	350	109	1016	0	1125	2406	
Peak hour	0	0	0	0	0	465	38	503	113	0	75	188	74	552	0	626	1317	
Peak 15 min				0				142				77				188	388	
PHF				#DIV/0!				0.89				0.61				0.83	0.85	

0

AM PEAK HOUR 2024



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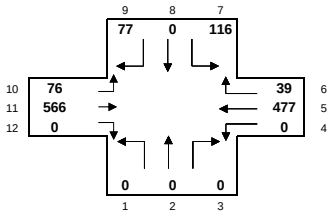
AM PEAK HOUR 2025



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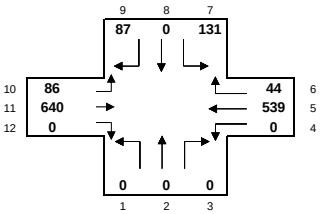
AM PEAK HOUR 2030



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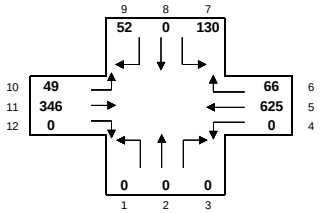
Project : TIA : PROPOSED DEVELOPMENT ON ERF 2074, PLETTENBERG BAY — Day & date : 30/8/2024
Intersection : MARINE WAY / CHALLENGE DRIVE — NO. 3 — Time period: 15:00 - 18:00

STARTING TIME	0 Northbound				MARINE WAY Westbound				CHALLENGE DRIVE Southbound				MARINE WAY Eastbound				INTER-SECTION	
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	Hour
15:00	0	0	0	0	0	114	8	122	26	0	2	28	9	60	0	69	219	
15:15	0	0	0	0	0	100	11	111	18	0	6	24	13	55	0	68	203	
15:30	0	0	0	0	0	99	6	105	15	0	3	18	14	70	0	84	207	
15:45	0	0	0	0	0	94	9	103	15	0	2	17	10	62	0	72	192	821
16:00	0	0	0	0	0	135	11	146	29	0	11	40	18	88	0	106	292	894
16:15	0	0	0	0	0	99	8	107	18	0	16	34	11	79	0	90	231	922
16:30	0	0	0	0	0	202	24	226	57	0	12	69	16	122	0	138	433	1148
16:45	0	0	0	0	0	229	6	235	35	0	7	42	9	94	0	103	380	1336
17:00	0	0	0	0	0	125	9	134	22	0	10	32	13	92	0	105	271	1315
17:15	0	0	0	0	0	69	27	96	16	0	23	39	11	38	0	49	184	1268
17:30	0	0	0	0	0	35	13	48	14	0	6	20	5	47	0	52	120	955
17:45	0	0	0	0	0	43	13	56	7	0	5	12	18	22	0	40	108	683
Total	0	0	0	0	0	1344	145	1489	272	0	103	375	147	829	0	976	2732	
Peak hour	0	0	0	0	0	625	66	691	130	0	52	182	49	346	0	395	1268	
Peak 15 min				0				235				69				138	433	
PHF				#DIV/0!				0.74				0.66				0.72	0.73	

PM PEAK HOUR 2024

CHALLENGE DRIVE



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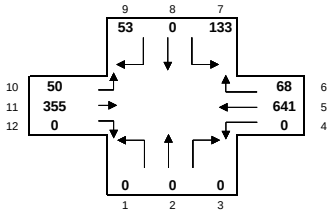
PM PEAK HOUR 2025

CHALLENGE DRIVE



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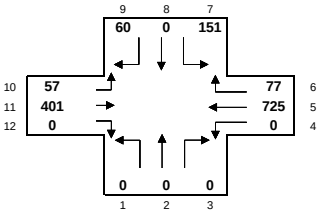
PM PEAK HOUR 2030

CHALLENGE DRIVE



0

ANNEXURE C
Historical
Traffic Data –
MR00382

Traffic Counts

Time	Light	Heavy	Taxis	Buses
00-01h00				
01-02h00				
02-03h00				
03-04h00				
04-05h00	5	1	1	0
05-06h00	19	1	3	0
Sub-Totals	**24**	**2**	**4**	**0**
06-07h00	143	12	5	1
07-08h00	495	16	24	7
08-09h00	403	26	17	2
09-10h00	295	36	3	0
10-11h00	300	29	1	0
11-12h00	305	27	0	0
12-13h00	327	29	4	0
13-14h00	321	26	5	5
14-15h00	369	42	4	4
15-16h00	402	28	5	1
16-17h00	433	24	9	1
17-18h00	378	16	6	0
Sub-Totals	**4171**	**311**	**83**	**21**
18-19h00	183	3	5	0
19-20h00	85	1	2	0
20-21h00	60	2	0	0
21-22h00	33	1	0	0
22-23h00				
23-24h00				
Sub-Totals	**361**	**7**	**7**	**0**
Totals	**4556**	**320**	**94**	**21**

Station AADT's

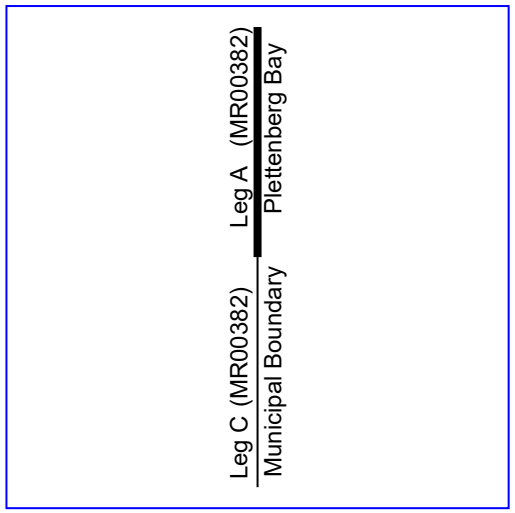
Light	Heavy	Taxis	Buses
4283	**301**	**88**	**20**

Total **4692**

Station Data

Station No	2368A
Road No	MR00382
Km Distance	2.12
Count Date	24/08/2022
Hours Counted	18
Day Counted	Wednesday
Counted by	C
Expansion Factor	0.94
Stratum	CA
Peak Hour Ratio	11.80
Total AADT	4692

Sketch (Click on Leg to Display Data)



Print

Print

Intersection

Diagram

Growth Rate

Growth Rate Chart

Historical Data 1 of 7

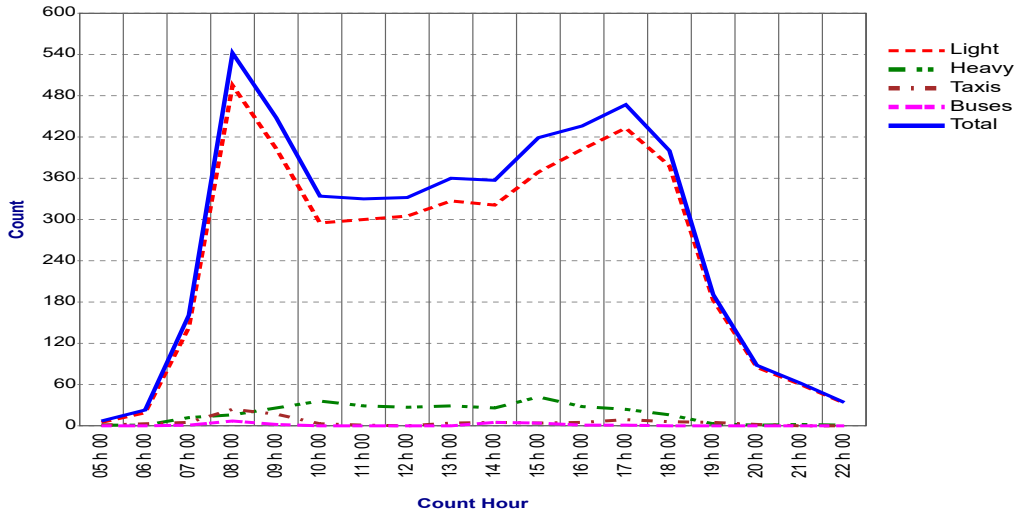
< 2022/08/24 >

Exit

Station Data

Station Counts Chart

Light Heavy Taxis Buses Total Stratum Pattern



Western Cape Government

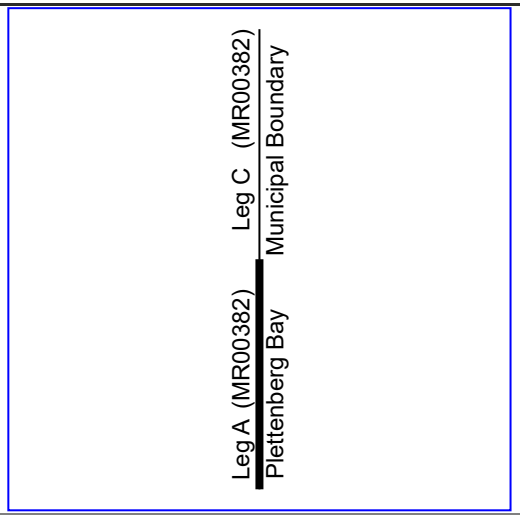
Intersection Diagram

Node- 2368 Leg- C Growth Rate: 2.43 (C)

Date	Light	Heavy	Taxis	Buses	Total
24/08/22	4283	301	88	20	4692
08/11/18	4345	320	112	21	4798
17/11/15	3380	540	124	24	4068
17/03/10	2525	251	76	6	2858
26/10/04	2807	494	162	23	3486
02/10/01	1979	264	81	6	2330
18/07/00	1634	230	66	14	1944

Km per Leg

Node	Leg	Road No	Km
2368	A	MR00382	2.12
2368	C	MR00382	2.12



Node- 2368 Leg- A Growth Rate: 2.43 (C)

Date	Light	Heavy	Taxis	Buses	Total
24/08/22	4283	301	88	20	4692
08/11/18	4345	320	112	21	4798
17/11/15	3380	540	124	24	4068
17/03/10	2525	251	76	6	2858
26/10/04	2807	494	162	23	3486
02/10/01	1979	264	81	6	2330
18/07/00	1634	230	66	14	1944

Print Exit

Western Cape Government

Growth Rate Chart

Station Data

Road Number:	MR00382
Km Distance:	2.12
Growth Rate: (Based on the last 5 available counts)	2.43 (C)
Recalculated Growth Rate: (Based on Selected Counts)	3.70
Node:	2368
Leg:	A

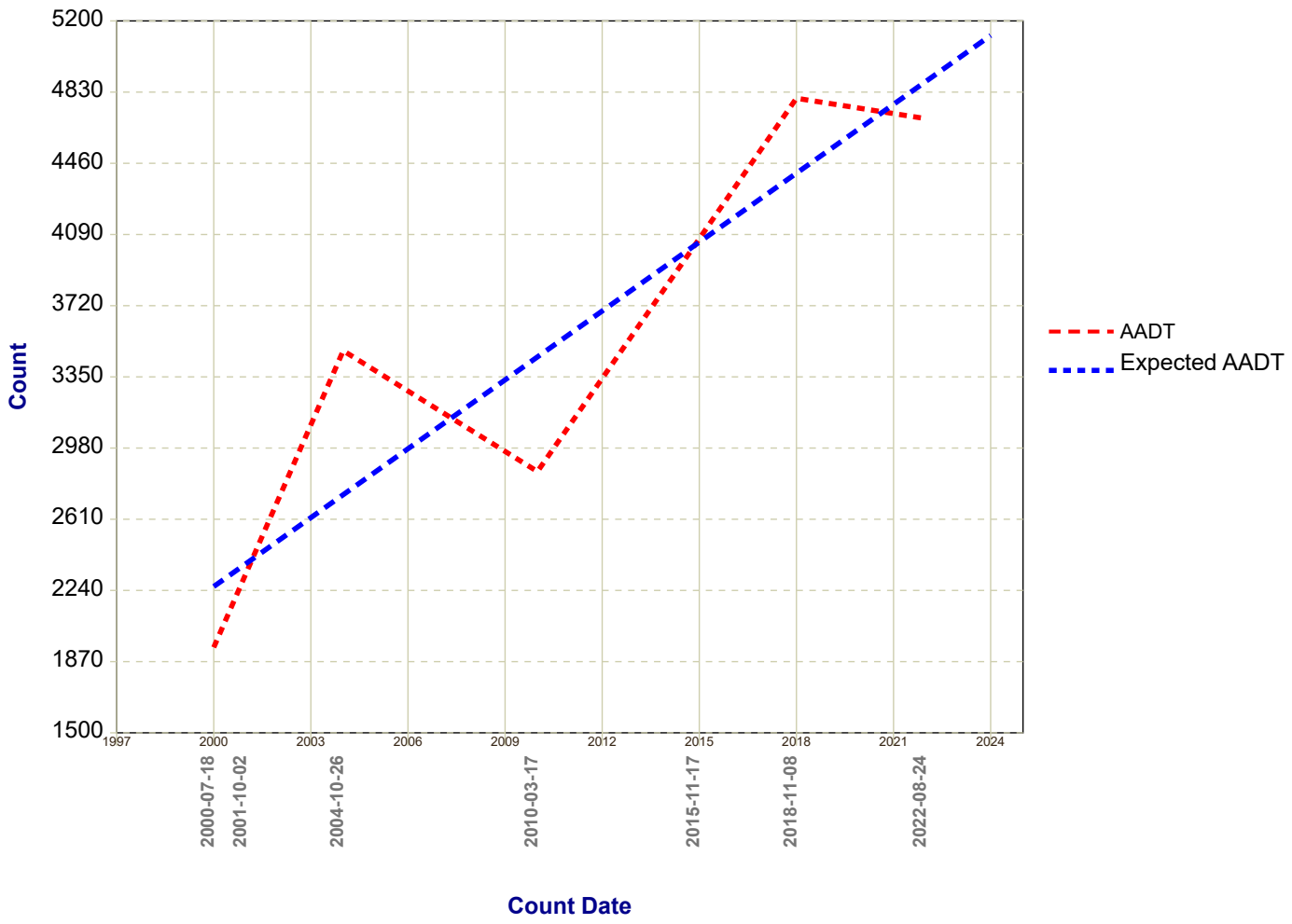
Count Dates

> >
> <
> >>
> <<

2000-07-18
2001-10-02
2004-10-26
2010-03-17
2015-11-17
2018-11-08
2022-08-24

Print

Exit



ANNEXURE D
N2 Station
18051 Goose
Valley

Traffic Highlights of Site: Goose Valley (18051)	
Site No	18051
Site Name	Goose Valley
Site Description	Between Plettenberg & R340
Road Description	Route : N002 Section : 08E Distance : 62.89 km
GPS Position	Latitude: -34.027432 Longitude: 23.378207
Number of Lanes	2
Station Type	Permanent

Requested Data Period	01 Jan 2019 - 31 Dec 2019
First and Last Data Dates	01 Jan 2019 - 31 Oct 2019
Data Available for Requested Period as Percentage	83%

Last Full Day Count for ADT and ADTT	31 Oct 2019
Number of Full Days in Requested Period	303

Highlights per Stream		Str 1: To Keurboomstrand	Str 2: To Plettenberg	Value
1.1	Total Number of Vehicles	1,652,680	1,674,851	3,327,531
1.2	Average Daily Traffic (ADT)	5,438	5,510	10,948
1.3	Average Daily Truck Traffic (ADTT)	495	454	949
1.4	Percentage of Trucks	9.1 %	8.2 %	8.7 %
1.5	Truck Split % (Short : Medium : Long)	38 : 15 : 47	40 : 17 : 43	39 : 16 : 45
1.6	Percentage of Night Traffic [20h00 - 6h00)	8.6 %	7.9 %	8.3 %
2.1	Speed Limit			100
2.2	Average Speed (km/hr)	86.9	85.1	86.0
2.3	Average Speed - Light Vehicles (km/hr	87.7	86.3	87.0
2.4	Average Speed - Heavy Vehicles (km/hr)	84.0	80.7	82.4
2.5	Average Night Speed (km/hr)	92.0	88.2	90.1
2.6	15th Centile Speed (km/hr)	71.5	70.6	71.1
2.7	85th Centile Speed (km/hr)	95.6	95.7	95.7
2.8	Percentage of Vehicles in Excess of Speed Limit	51.8 %	51.5 %	51.6 %
3.1	Percentage Vehicles in Flows Over 600 (vehs/hr)	5.4 %	4.0 %	78.20%
3.2	Percentage of Vehicles less than 2s behind vehicle ahead	0 %	0 %	0 %

4.1	Total Number of Heavy Vehicles	150,594	138,072	288,666
4.2	Estimated Average Number of axles per Truck	4.8	4.7	4.8
4.3	Estimated Truck Mass (Ton/Truck)	27.6	26.8	27.2
4.4	Estimated Average E80 / Truck	2.3	2.2	2.25
4.5	Estimated Daily E80 on the Road			2,054.0
4.6	Estimated Daily E80 in the East Direction			3,215.0
4.7	Estimated Daily E80 in the West Direction			2,948.0
4.8	Estimated Daily E80 in the Worst East Lane			3,215.0
4.9	Estimated Daily E80 in the Worst West Lane			2,948.0
5.1	ASSUMPTION on Axles/Truck (Short:Medium:Long)			(2.0 : 5.0 : 7.0)
5.2	ASSUMPTION on Mass/Truck (Short:Medium:Long)			(10.9 : 31.5 : 39.8)
5.3	ASSUMPTION on E80s/Truck (Short:Medium:Long)			(0.5 : 2.1 : 3.9)

Traffic Volumes		Date and Time	Value
6.1	Highest Volume on the Road (vehs/hr)	03 Jan 2019 (11:00 - 12:00)	1,997
6.2	Highest Volume in the East (vehs/hr)	02 Jan 2019 (12:00 - 13:00)	1,067
6.3	Highest Volume in the West (vehs/hr)	03 Jan 2019 (11:00 - 12:00)	1,006
6.4	Highest Volume in a Lane (vehs/hr)	02 Jan 2019 (12:00 - 13:00)	1,067
6.5	15th Highest Volume on the Road (vehs/hr)	05 Jan 2019 (12:00 - 13:00)	1,704
6.6	15th Highest Volume in the East Direction (vehs/hr)	05 Jan 2019 (13:00 - 14:00)	829
6.7	15th Highest Volume in the West Direction (vehs/hr)	02 Jan 2019 (15:00 - 16:00)	844
6.8	30th Highest Volume on the Road (vehs/hr)	01 Jan 2019 (13:00 - 14:00)	1,473
6.9	30th Highest Volume in the East Direction (vehs/hr)	08 Jan 2019 (12:00 - 13:00)	752
6.10	30th Highest Volume in the West Direction (vehs/hr)	02 Jan 2019 (12:00 - 13:00)	712

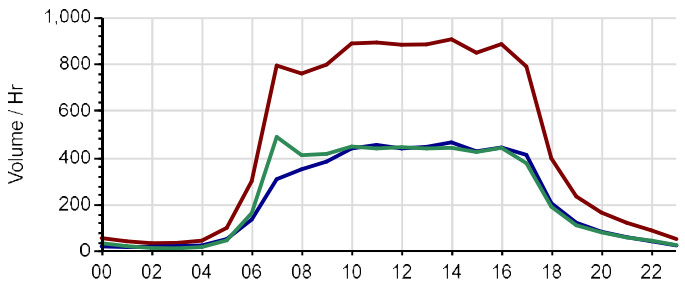
Station Typical Flow Graphs

Site	18051 - Goose Valley
Region	West
Actual Period	01 Jan 2019 - 31 Oct 2019
Classification	RSA Ext Lgt/Hvy
Day Type	Normal Day & Fixed Public Holiday+

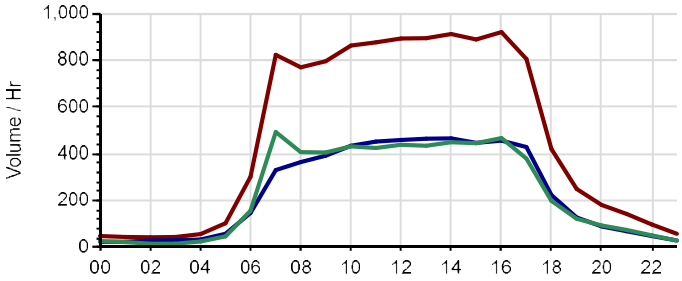
Total
To Keurboomstrand
To Plettenberg

Total
Light
Heavy

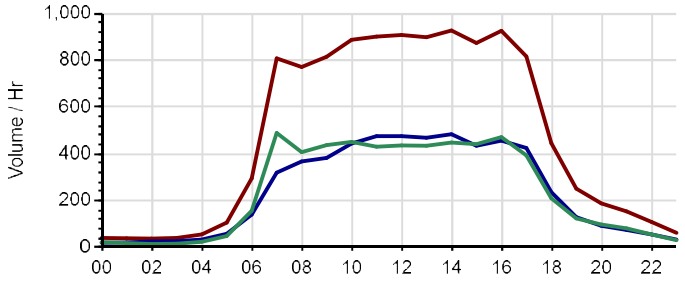
Typical Flow for a Monday



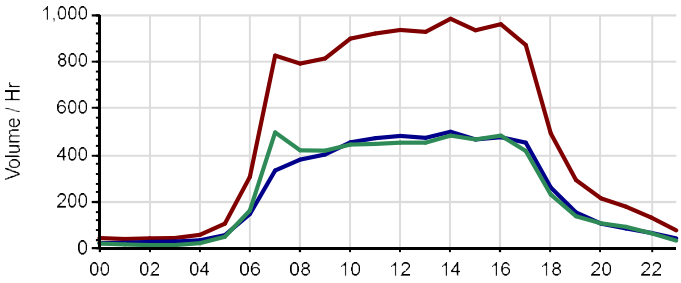
Typical Flow for a Tuesday



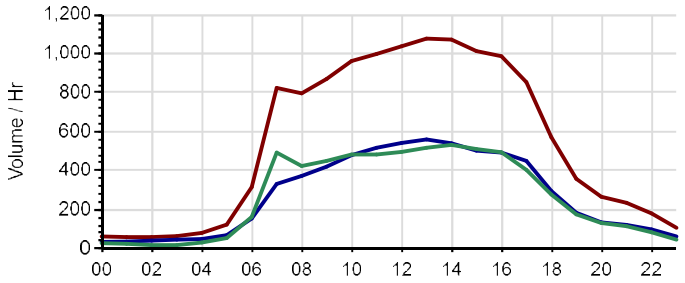
Typical Flow for a Wednesday



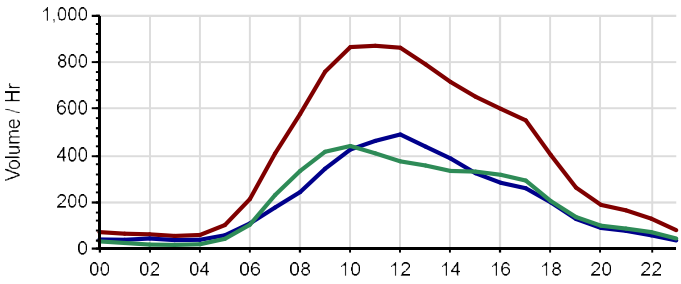
Typical Flow for a Thursday



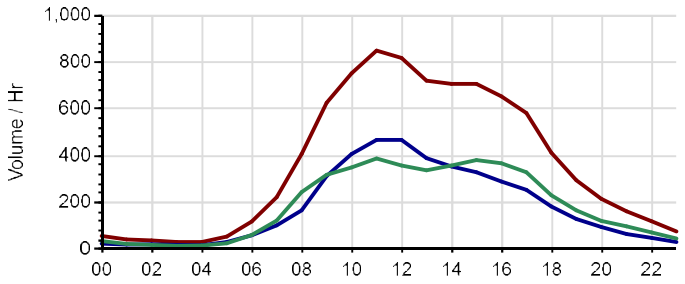
Typical Flow for a Friday



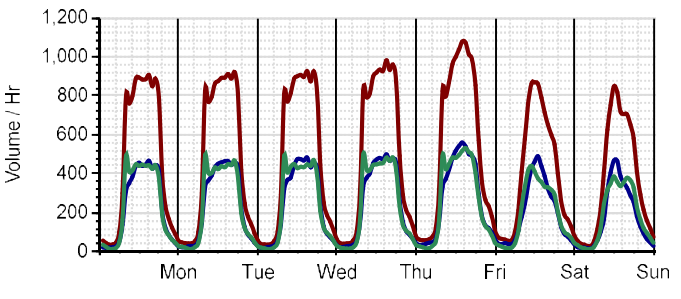
Typical Flow for a Saturday



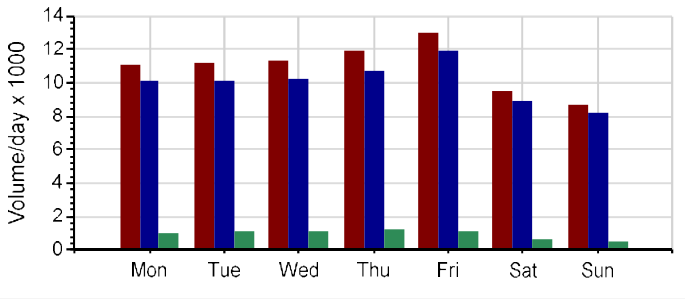
Typical Flow for a Sunday



Typical Flow for a Week



Typical Flow for a Week

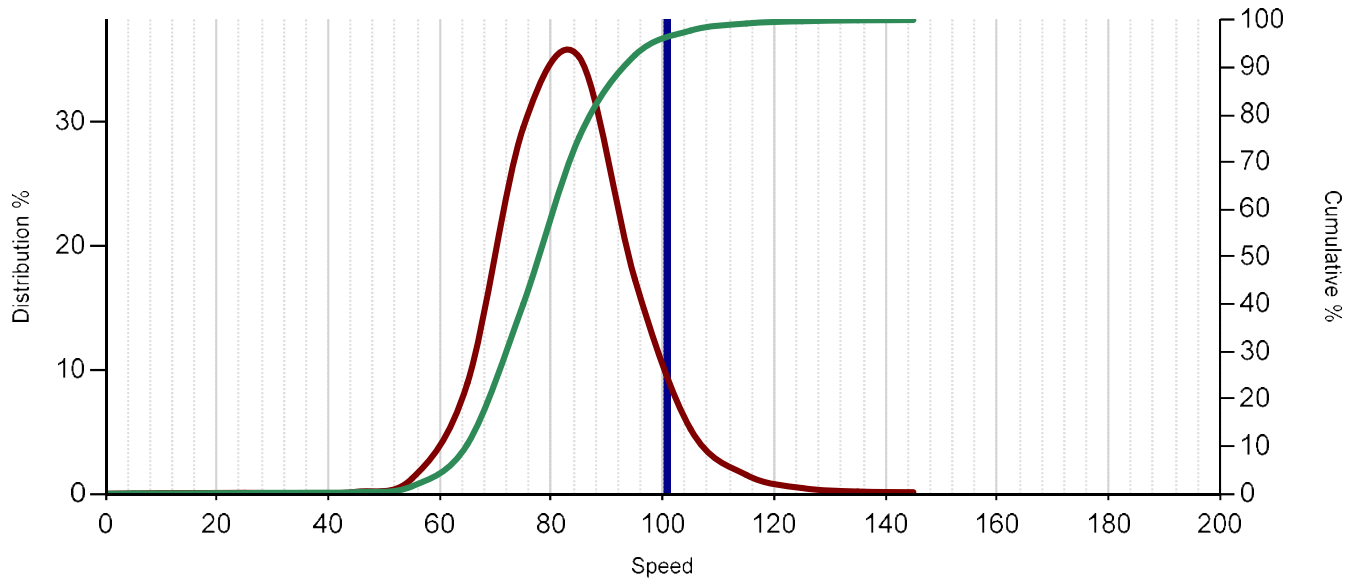


Station Speed Distribution

Site	18051 - Goose Valley
Speed Limit	100 km/hr
Period	01 Jan 2019 - 31 Dec 2019

Distribution
Cumulative
Speed Limit

Lane 1 - To Keurboomstrand

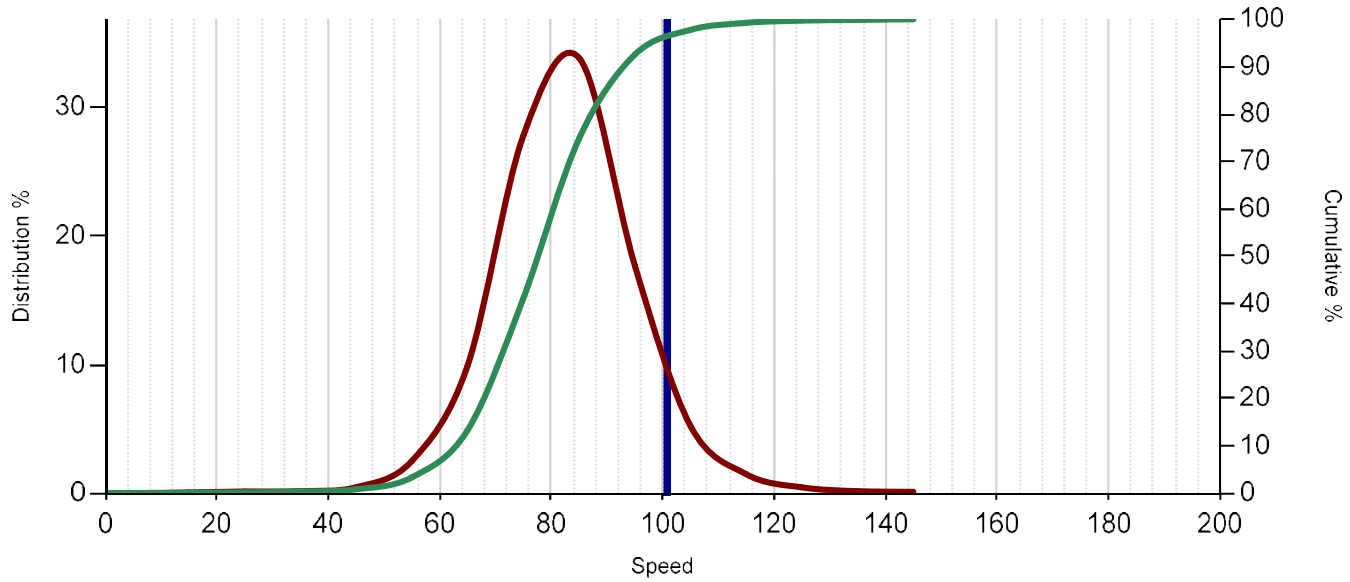


Station Speed Distribution

Site	18051 - Goose Valley
Speed Limit	100 km/hr
Period	01 Jan 2019 - 31 Dec 2019

Distribution
Cumulative
Speed Limit

Lane 2 - To Plettenberg



ANNEXURE E
SIDRA
OUTPUT
SHEETS 2025
Before
Development

MOVEMENT SUMMARY

Site: 101 [[01] 01 am nd (Site Folder: 2025 Before Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Traffic Impact Assessment for proposed residential development on erf 2074, Plettenberg Bay
2025 Before Development
Site Category: Base Year
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Whalesong Access															
1	L2	All MCs	2	0.0	2	0.0	0.061	10.2	LOS B	0.2	1.3	0.84	1.00	0.84	18.6
2	T1	All MCs	3	0.0	3	0.0	0.061	33.4	LOS D	0.2	1.3	0.84	1.00	0.84	17.5
3	R2	All MCs	3	0.0	3	0.0	0.061	40.9	LOS E	0.2	1.3	0.84	1.00	0.84	14.4
Approach			8	0.0	8	0.0	0.061	30.4	LOS D	0.2	1.3	0.84	1.00	0.84	16.7
East: Marine Way															
4	L2	All MCs	3	0.0	3	0.0	0.298	5.5	LOS A	0.0	0.0	0.00	0.00	0.00	48.1
5	T1	All MCs	577	0.0	577	0.0	0.298	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
6	R2	All MCs	7	0.0	7	0.0	0.008	7.5	LOS A	0.0	0.2	0.46	0.61	0.46	36.3
Approach			587	0.0	587	0.0	0.298	0.1	NA	0.0	0.2	0.01	0.01	0.01	59.2
North: Ultra City Access															
7	L2	All MCs	72	0.0	72	0.0	0.103	10.5	LOS B	0.4	2.5	0.48	0.93	0.48	33.7
8	T1	All MCs	1	0.0	1	0.0	0.103	36.4	LOS E	0.4	2.5	0.48	0.93	0.48	30.8
9	R2	All MCs	80	0.0	80	0.0	0.759	75.8	LOS F	3.5	24.6	0.96	1.20	1.80	12.5
Approach			153	0.0	153	0.0	0.759	44.9	LOS E	3.5	24.6	0.73	1.07	1.17	17.0
West: Marine Way															
10	L2	All MCs	60	0.0	60	0.0	0.032	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	42.7
11	T1	All MCs	398	0.0	398	0.0	0.204	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
12	R2	All MCs	1	0.0	1	0.0	0.001	7.6	LOS A	0.0	0.0	0.53	0.57	0.53	34.4
Approach			459	0.0	459	0.0	0.204	0.8	NA	0.0	0.0	0.00	0.08	0.00	56.4
All Vehicles			1207	0.0	1207	0.0	0.759	6.2	NA	3.5	24.6	0.10	0.18	0.16	43.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [[01] 01 pm nd (Site Folder: 2025 Before Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Traffic Impact Assessment for proposed residential development on erf 2074, Plettenberg Bay
2025 Before Development
Site Category: Base Year
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Whalesong Access															
1	L2	All MCs	4	0.0	4	0.0	0.138	12.3	LOS B	0.4	2.8	0.90	1.00	0.90	15.1
2	T1	All MCs	3	0.0	3	0.0	0.138	50.3	LOS F	0.4	2.8	0.90	1.00	0.90	14.1
3	R2	All MCs	6	0.0	6	0.0	0.138	55.4	LOS F	0.4	2.8	0.90	1.00	0.90	11.4
Approach			14	0.0	14	0.0	0.138	41.0	LOS E	0.4	2.8	0.90	1.00	0.90	13.2
East: Marine Way															
4	L2	All MCs	5	0.0	5	0.0	0.372	5.5	LOS A	0.0	0.0	0.00	0.00	0.00	48.1
5	T1	All MCs	720	0.0	720	0.0	0.372	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.6
6	R2	All MCs	1	0.0	1	0.0	0.001	7.6	LOS A	0.0	0.0	0.47	0.57	0.47	36.2
Approach			726	0.0	726	0.0	0.372	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.5
North: Ultra City Access															
7	L2	All MCs	25	0.0	25	0.0	0.045	10.3	LOS B	0.2	1.1	0.51	0.89	0.51	32.6
8	T1	All MCs	1	0.0	1	0.0	0.045	49.3	LOS E	0.2	1.1	0.51	0.89	0.51	29.7
9	R2	All MCs	141	0.0	141	0.0	2.110	577.7	LOS F	26.5	185.2	1.00	2.02	5.42	2.0
Approach			167	0.0	167	0.0	2.110	488.8	LOS F	26.5	185.2	0.92	1.84	4.65	2.3
West: Marine Way															
10	L2	All MCs	89	0.0	89	0.0	0.048	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	42.7
11	T1	All MCs	398	0.0	398	0.0	0.204	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
12	R2	All MCs	1	0.0	1	0.0	0.001	8.6	LOS A	0.0	0.0	0.58	0.61	0.58	33.0
Approach			488	0.0	488	0.0	0.204	1.0	NA	0.0	0.0	0.00	0.11	0.00	55.1
All Vehicles			1396	0.0	1396	0.0	2.110	59.4	NA	26.5	185.2	0.12	0.27	0.57	13.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101v [[01] 01 am nd - Circle (Site Folder: 2025 Before Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2025 Before AM (Network Folder: Before Development)]

Traffic Impact Assessment for proposed residential development on erf 2074, Plettenberg Bay
2025 Before Development
Site Category: Base Year
Roundabout

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Whalesong Access															
1	L2	All MCs	2	0.0	2	0.0	0.012	7.4	LOS A	0.0	0.2	0.70	0.64	0.70	33.9
2	T1	All MCs	3	0.0	3	0.0	0.012	7.8	LOS A	0.0	0.2	0.70	0.64	0.70	33.2
3	R2	All MCs	3	0.0	3	0.0	0.012	10.9	LOS B	0.0	0.2	0.70	0.64	0.70	19.7
Approach			8	0.0	8	0.0	0.012	8.9	LOS A	0.0	0.2	0.70	0.64	0.70	30.1
East: Marine Way															
4	L2	All MCs	3	0.0	3	0.0	0.004	5.6	LOS A	0.0	0.1	0.30	0.50	0.30	32.2
5	T1	All MCs	577	0.0	577	0.0	0.390	5.2	LOS A	1.4	9.5	0.35	0.46	0.35	40.5
6	R2	All MCs	7	0.0	7	0.0	0.390	8.5	LOS A	1.4	9.5	0.35	0.46	0.35	38.1
Approach			587	0.0	587	0.0	0.390	5.3	LOS A	1.4	9.5	0.35	0.46	0.35	40.5
North: Ultra City Access															
7	L2	All MCs	72	0.0	72	0.0	0.075	7.2	LOS A	0.2	1.2	0.55	0.62	0.55	34.2
8	T1	All MCs	1	0.0	1	0.0	0.075	6.8	LOS A	0.2	1.2	0.53	0.66	0.53	32.5
9	R2	All MCs	80	0.0	80	0.0	0.075	10.0	LOS B	0.2	1.2	0.53	0.66	0.53	37.2
Approach			153	0.0	153	0.0	0.075	8.7	LOS A	0.2	1.2	0.54	0.64	0.54	36.3
West: Marine Way															
10	L2	All MCs	60	0.0	60	0.0	0.056	5.0	LOS A	0.1	0.9	0.11	0.53	0.11	43.0
11	T1	All MCs	398	0.0	398	0.0	0.234	4.8	LOS A	0.7	4.7	0.10	0.45	0.10	41.3
12	R2	All MCs	1	0.0	1	0.0	0.234	8.0	LOS A	0.7	4.7	0.10	0.45	0.10	39.0
Approach			459	0.0	459	0.0	0.234	4.8	LOS A	0.7	4.7	0.10	0.46	0.10	41.6
All Vehicles			1207	0.0	1207	0.0	0.390	5.6	LOS A	1.4	9.5	0.28	0.48	0.28	40.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101v [[01] 01 pm nd - Circle (Site Folder: 2025 Before Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2025 Before PM (Network Folder: Before Development)]

Traffic Impact Assessment for proposed residential development on erf 2074, Plettenberg Bay
2025 Before Development
Site Category: Base Year
Roundabout

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Whalesong Access															
1	L2	All MCs	4	0.0	4	0.0	0.026	9.8	LOS A	0.1	0.5	0.81	0.72	0.81	30.7
2	T1	All MCs	3	0.0	3	0.0	0.026	10.2	LOS B	0.1	0.5	0.81	0.72	0.81	29.9
3	R2	All MCs	6	0.0	6	0.0	0.026	13.3	LOS B	0.1	0.5	0.81	0.72	0.81	16.4
Approach			14	0.0	14	0.0	0.026	11.5	LOS B	0.1	0.5	0.81	0.72	0.81	25.8
East: Marine Way															
4	L2	All MCs	5	0.0	5	0.0	0.006	6.1	LOS A	0.0	0.1	0.39	0.52	0.39	31.6
5	T1	All MCs	720	0.0	720	0.0	0.520	5.8	LOS A	2.0	14.2	0.53	0.50	0.53	39.2
6	R2	All MCs	1	0.0	1	0.0	0.520	9.1	LOS A	2.0	14.2	0.53	0.50	0.53	36.8
Approach			726	0.0	726	0.0	0.520	5.8	LOS A	2.0	14.2	0.53	0.50	0.53	39.1
North: Ultra City Access															
7	L2	All MCs	25	0.0	25	0.0	0.039	8.7	LOS A	0.1	0.6	0.58	0.65	0.58	31.5
8	T1	All MCs	1	0.0	1	0.0	0.131	6.9	LOS A	0.3	2.2	0.55	0.67	0.55	32.3
9	R2	All MCs	141	0.0	141	0.0	0.131	10.2	LOS B	0.3	2.2	0.55	0.67	0.55	37.1
Approach			167	0.0	167	0.0	0.131	9.9	LOS A	0.3	2.2	0.56	0.66	0.56	36.6
West: Marine Way															
10	L2	All MCs	89	0.0	89	0.0	0.080	4.9	LOS A	0.2	1.4	0.10	0.53	0.10	43.0
11	T1	All MCs	398	0.0	398	0.0	0.232	4.8	LOS A	0.8	5.3	0.10	0.45	0.10	41.3
12	R2	All MCs	1	0.0	1	0.0	0.232	8.0	LOS A	0.8	5.3	0.10	0.45	0.10	39.1
Approach			488	0.0	488	0.0	0.232	4.8	LOS A	0.8	5.3	0.10	0.47	0.10	41.8
All Vehicles			1396	0.0	1396	0.0	0.520	6.0	LOS A	2.0	14.2	0.39	0.51	0.39	39.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [[01] 02 am nd (Site Folder: 2025 Before Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2025 Before AM (Network Folder: Before Development)]

Traffic Impact Assessment for proposed residential development on erf 2074, Plettenberg Bay
2025 Before Development
Site Category: Base Year
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Erf 2073 Access															
1	L2	All MCs	5	0.0	5	0.0	0.041	9.3	LOS A	0.0	0.3	0.72	0.99	0.72	12.6
3	R2	All MCs	7	0.0	7	0.0	0.041	20.1	LOS C	0.0	0.3	0.72	0.99	0.72	12.6
Approach			13	0.0	13	0.0	0.041	15.6	LOS C	0.0	0.3	0.72	0.99	0.72	12.6
East: Marine Way															
4	L2	All MCs	1	0.0	1	0.0	0.297	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	50.6
5	T1	All MCs	581	0.0	581	0.0	0.297	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach			582	0.0	582	0.0	0.297	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.7
West: Marine Way															
11	T1	All MCs	667	0.0	667	0.0	0.344	0.0	LOS A	0.0	0.1	0.01	0.01	0.01	59.4
12	R2	All MCs	3	0.0	3	0.0	0.344	6.4	LOS A	0.0	0.1	0.01	0.01	0.01	46.7
Approach			671	0.0	671	0.0	0.344	0.0	NA	0.0	0.1	0.01	0.01	0.01	59.3
All Vehicles			1265	0.0	1265	0.0	0.344	0.2	NA	0.0	0.3	0.01	0.01	0.01	58.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

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

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

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

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 101 [[01] 02 pm nd (Site Folder: 2025 Before Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2025 Before PM (Network Folder: Before Development)]

Traffic Impact Assessment for proposed residential development on erf 2074, Plettenberg Bay
2025 Before Development
Site Category: Base Year
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Erf 2073 Access															
1	L2	All MCs	1	0.0	1	0.0	0.006	10.7	LOS B	0.0	0.1	0.72	0.88	0.72	13.7
3	R2	All MCs	1	0.0	1	0.0	0.006	17.7	LOS C	0.0	0.1	0.72	0.88	0.72	13.7
Approach			2	0.0	2	0.0	0.006	14.2	LOS B	0.0	0.1	0.72	0.88	0.72	13.7
East: Marine Way															
4	L2	All MCs	7	0.0	7	0.0	0.376	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	50.4
5	T1	All MCs	726	0.0	726	0.0	0.376	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.4
Approach			734	0.0	734	0.0	0.376	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.3
West: Marine Way															
11	T1	All MCs	426	0.0	426	0.0	0.223	0.0	LOS A	0.0	0.1	0.01	0.02	0.01	59.1
12	R2	All MCs	3	0.0	3	0.0	0.223	8.1	LOS A	0.0	0.1	0.01	0.02	0.01	46.5
Approach			429	0.0	429	0.0	0.223	0.1	NA	0.0	0.1	0.01	0.02	0.01	58.9
All Vehicles			1165	0.0	1165	0.0	0.376	0.1	NA	0.0	0.1	0.01	0.01	0.01	59.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

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

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

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

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 101 [[01] 03 am nd (Site Folder: 2025 Before Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2025 Before AM (Network Folder: Before Development)]

Traffic Impact Assessment for proposed residential development on erf 2074, Plettenberg Bay
2025 Before Development
Site Category: Base Year
Roundabout

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Marine Way															
5	T1	All MCs	502	0.0	502	0.0	0.390	4.5	LOS A	1.2	8.7	0.33	0.43	0.33	50.2
6	R2	All MCs	41	0.0	41	0.0	0.390	9.1	LOS A	1.2	8.7	0.33	0.43	0.33	52.7
Approach			543	0.0	543	0.0	0.390	4.8	LOS A	1.2	8.7	0.33	0.43	0.33	50.6
North: Challenge Drive															
7	L2	All MCs	122	0.0	122	0.0	0.238	7.5	LOS A	0.6	4.0	0.67	0.69	0.67	50.8
9	R2	All MCs	81	0.0	81	0.0	0.238	12.3	LOS B	0.6	4.0	0.67	0.69	0.67	46.2
Approach			203	0.0	203	0.0	0.238	9.4	LOS A	0.6	4.0	0.67	0.69	0.67	49.6
West: Marine Way															
10	L2	All MCs	80	0.0	80	0.0	0.442	4.1	LOS A	1.4	9.9	0.22	0.40	0.22	51.3
11	T1	All MCs	596	0.0	596	0.0	0.442	4.3	LOS A	1.4	9.9	0.22	0.40	0.22	51.8
Approach			676	0.0	676	0.0	0.442	4.2	LOS A	1.4	9.9	0.22	0.40	0.22	51.7
All Vehicles			1422	0.0	1422	0.0	0.442	5.2	LOS A	1.4	9.9	0.33	0.45	0.33	50.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [[01] 03 pm nd (Site Folder: 2025 Before Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2025 Before PM (Network Folder: Before Development)]

Traffic Impact Assessment for proposed residential development on erf 2074, Plettenberg Bay
2025 Before Development
Site Category: Base Year
Roundabout

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Marine Way															
5	T1	All MCs	675	0.0	675	0.0	0.501	4.4	LOS A	1.8	12.8	0.30	0.42	0.30	50.4
6	R2	All MCs	72	0.0	72	0.0	0.501	9.0	LOS A	1.8	12.8	0.30	0.42	0.30	52.7
Approach			746	0.0	746	0.0	0.501	4.8	LOS A	1.8	12.8	0.30	0.42	0.30	50.8
North: Challenge Drive															
7	L2	All MCs	140	0.0	140	0.0	0.193	5.9	LOS A	0.4	3.1	0.53	0.62	0.53	52.3
9	R2	All MCs	56	0.0	56	0.0	0.193	10.7	LOS B	0.4	3.1	0.53	0.62	0.53	48.6
Approach			196	0.0	196	0.0	0.193	7.3	LOS A	0.4	3.1	0.53	0.62	0.53	51.6
West: Marine Way															
10	L2	All MCs	53	0.0	53	0.0	0.302	4.2	LOS A	0.8	5.5	0.26	0.41	0.26	51.1
11	T1	All MCs	374	0.0	374	0.0	0.302	4.4	LOS A	0.8	5.5	0.26	0.41	0.26	51.6
Approach			426	0.0	426	0.0	0.302	4.4	LOS A	0.8	5.5	0.26	0.41	0.26	51.5
All Vehicles			1368	0.0	1368	0.0	0.501	5.0	LOS A	1.8	12.8	0.32	0.45	0.32	51.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

ANNEXURE F
SIDRA
OUTPUT
SHEETS 2025
After
Development

MOVEMENT SUMMARY

Site: 101v [[02] 01 am ad - Circle (Site Folder: 2025 After Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2025 After AM (Network Folder: After Development)]

Traffic Impact Assessment for proposed residential development on erf 2074, Plettenberg Bay
2025 After Development
Site Category: Proposed Design 1
Roundabout

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Whalesong Access															
1	L2	All MCs	2	0.0	2	0.0	0.014	8.5	LOS A	0.0	0.2	0.75	0.66	0.75	32.5
2	T1	All MCs	3	0.0	3	0.0	0.014	8.9	LOS A	0.0	0.2	0.75	0.66	0.75	31.8
3	R2	All MCs	3	0.0	3	0.0	0.014	12.0	LOS B	0.0	0.2	0.75	0.66	0.75	18.2
Approach			8	0.0	8	0.0	0.014	9.9	LOS A	0.0	0.2	0.75	0.66	0.75	28.6
East: Marine Way															
4	L2	All MCs	3	0.0	3	0.0	0.004	5.6	LOS A	0.0	0.1	0.30	0.50	0.30	41.6
5	T1	All MCs	679	0.0	679	0.0	0.457	5.3	LOS A	1.8	12.4	0.39	0.46	0.39	45.4
6	R2	All MCs	7	0.0	7	0.0	0.457	8.6	LOS A	1.8	12.4	0.39	0.46	0.39	43.6
Approach			689	0.0	689	0.0	0.457	5.3	LOS A	1.8	12.4	0.39	0.46	0.39	45.4
North: Ultra City Access															
7	L2	All MCs	72	0.0	72	0.0	0.093	9.2	LOS A	0.2	1.5	0.68	0.69	0.68	30.7
8	T1	All MCs	1	0.0	1	0.0	0.089	8.4	LOS A	0.2	1.5	0.67	0.71	0.67	30.6
9	R2	All MCs	80	0.0	80	0.0	0.089	11.6	LOS B	0.2	1.5	0.67	0.71	0.67	35.6
Approach			153	0.0	153	0.0	0.093	10.5	LOS B	0.2	1.5	0.67	0.70	0.67	34.0
West: Marine Way															
10	L2	All MCs	60	0.0	60	0.0	0.056	5.0	LOS A	0.1	0.9	0.11	0.53	0.11	43.0
11	T1	All MCs	629	0.0	629	0.0	0.365	4.8	LOS A	1.2	8.6	0.12	0.45	0.12	41.1
12	R2	All MCs	1	0.0	1	0.0	0.365	8.0	LOS A	1.2	8.6	0.12	0.45	0.12	38.9
Approach			691	0.0	691	0.0	0.365	4.8	LOS A	1.2	8.6	0.12	0.45	0.12	41.3
All Vehicles			1541	0.0	1541	0.0	0.457	5.6	LOS A	1.8	12.4	0.30	0.48	0.30	42.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101v [[02] 01 pm ad - Circle (Site Folder: 2025 After Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2025 After PM (Network Folder: After Development)]

Traffic Impact Assessment for proposed residential development on erf 2074, Plettenberg Bay
2025 After Development
Site Category: Proposed Design 1
Roundabout

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Whalesong Access															
1	L2	All MCs	4	0.0	4	0.0	0.028	10.5	LOS B	0.1	0.5	0.84	0.73	0.84	30.0
2	T1	All MCs	3	0.0	3	0.0	0.028	10.8	LOS B	0.1	0.5	0.84	0.73	0.84	29.3
3	R2	All MCs	6	0.0	6	0.0	0.028	13.9	LOS B	0.1	0.5	0.84	0.73	0.84	15.8
Approach			14	0.0	14	0.0	0.028	12.1	LOS B	0.1	0.5	0.84	0.73	0.84	25.1
East: Marine Way															
4	L2	All MCs	5	0.0	5	0.0	0.006	6.1	LOS A	0.0	0.1	0.40	0.52	0.40	41.1
5	T1	All MCs	762	0.0	762	0.0	0.550	5.9	LOS A	2.3	15.8	0.56	0.50	0.56	44.4
6	R2	All MCs	1	0.0	1	0.0	0.550	9.2	LOS A	2.3	15.8	0.56	0.50	0.56	42.6
Approach			768	0.0	768	0.0	0.550	5.9	LOS A	2.3	15.8	0.56	0.50	0.56	44.3
North: Ultra City Access															
7	L2	All MCs	25	0.0	25	0.0	0.042	9.6	LOS A	0.1	0.6	0.63	0.69	0.63	29.9
8	T1	All MCs	1	0.0	1	0.0	0.141	7.5	LOS A	0.3	2.4	0.61	0.69	0.61	31.5
9	R2	All MCs	141	0.0	141	0.0	0.141	10.8	LOS B	0.3	2.4	0.61	0.69	0.61	36.4
Approach			167	0.0	167	0.0	0.141	10.6	LOS B	0.3	2.4	0.62	0.69	0.62	35.8
West: Marine Way															
10	L2	All MCs	89	0.0	89	0.0	0.080	4.9	LOS A	0.2	1.4	0.10	0.53	0.10	43.0
11	T1	All MCs	496	0.0	496	0.0	0.287	4.8	LOS A	1.0	7.0	0.10	0.45	0.10	41.2
12	R2	All MCs	1	0.0	1	0.0	0.287	8.0	LOS A	1.0	7.0	0.10	0.45	0.10	39.0
Approach			586	0.0	586	0.0	0.287	4.8	LOS A	1.0	7.0	0.10	0.46	0.10	41.6
All Vehicles			1536	0.0	1536	0.0	0.550	6.0	LOS A	2.3	15.8	0.39	0.51	0.39	42.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [[02] 03 am ad (Site Folder: 2025 After Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2025 After AM (Network Folder: After Development)]

Traffic Impact Assessment for proposed residential development on erf 2074, Plettenberg Bay
2025 After Development
Site Category: Proposed Design 1
Roundabout

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Erf 2074 Access															
1	L2	All MCs	107	0.0	107	0.0	0.354	6.3	LOS A	0.9	6.6	0.75	0.73	0.75	20.0
2	T1	All MCs	7	0.0	7	0.0	0.354	6.7	LOS A	0.9	6.6	0.75	0.73	0.75	46.2
3	R2	All MCs	173	0.0	173	0.0	0.354	10.9	LOS B	0.9	6.6	0.75	0.73	0.75	45.0
Approach			287	0.0	287	0.0	0.354	9.1	LOS A	0.9	6.6	0.75	0.73	0.75	41.3
East: Marine Way															
4	L2	All MCs	58	0.0	58	0.0	0.452	4.6	LOS A	1.5	10.3	0.42	0.46	0.42	48.6
5	T1	All MCs	501	0.0	501	0.0	0.452	4.8	LOS A	1.5	10.3	0.42	0.46	0.42	49.7
6	R2	All MCs	41	0.0	41	0.0	0.452	9.4	LOS A	1.5	10.3	0.42	0.46	0.42	52.3
Approach			600	0.0	600	0.0	0.452	5.1	LOS A	1.5	10.3	0.42	0.46	0.42	49.9
North: Challenge Drive															
7	L2	All MCs	122	0.0	122	0.0	0.310	9.5	LOS A	0.9	6.0	0.84	0.76	0.84	49.5
8	T1	All MCs	1	0.0	1	0.0	0.310	9.7	LOS A	0.9	6.0	0.84	0.76	0.84	43.9
9	R2	All MCs	81	0.0	81	0.0	0.310	14.3	LOS B	0.9	6.0	0.84	0.76	0.84	44.1
Approach			204	0.0	204	0.0	0.310	11.4	LOS B	0.9	6.0	0.84	0.76	0.84	48.0
West: Marine Way															
10	L2	All MCs	80	0.0	80	0.0	0.599	5.7	LOS A	2.2	15.4	0.66	0.55	0.66	49.9
11	T1	All MCs	588	0.0	588	0.0	0.599	5.8	LOS A	2.2	15.4	0.66	0.55	0.66	50.3
12	R2	All MCs	36	0.0	36	0.0	0.599	10.5	LOS B	2.2	15.4	0.66	0.55	0.66	39.9
Approach			704	0.0	704	0.0	0.599	6.0	LOS A	2.2	15.4	0.66	0.55	0.66	50.0
All Vehicles			1796	0.0	1796	0.0	0.599	6.8	LOS A	2.2	15.4	0.62	0.57	0.62	48.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [[02] 03 pm ad (Site Folder: 2025 After Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2025 After PM (Network Folder: After Development)]

Traffic Impact Assessment for proposed residential development on erf 2074, Plettenberg Bay
2025 After Development
Site Category: Proposed Design 1
Roundabout

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Erf 2074 Access															
1	L2	All MCs	42	0.0	42	0.0	0.178	7.3	LOS A	0.5	3.3	0.81	0.75	0.81	18.6
2	T1	All MCs	3	0.0	3	0.0	0.178	7.7	LOS A	0.5	3.3	0.81	0.75	0.81	45.1
3	R2	All MCs	69	0.0	69	0.0	0.178	11.9	LOS B	0.5	3.3	0.81	0.75	0.81	44.0
Approach			115	0.0	115	0.0	0.178	10.1	LOS B	0.5	3.3	0.81	0.75	0.81	40.2
East: Marine Way															
4	L2	All MCs	161	0.0	161	0.0	0.695	5.5	LOS A	2.9	20.5	0.63	0.53	0.63	47.3
5	T1	All MCs	667	0.0	667	0.0	0.695	5.7	LOS A	2.9	20.5	0.63	0.53	0.63	48.3
6	R2	All MCs	72	0.0	72	0.0	0.695	10.3	LOS B	2.9	20.5	0.63	0.53	0.63	51.5
Approach			900	0.0	900	0.0	0.695	6.0	LOS A	2.9	20.5	0.63	0.53	0.63	48.6
North: Challenge Drive															
7	L2	All MCs	140	0.0	140	0.0	0.232	7.0	LOS A	0.6	4.0	0.66	0.67	0.66	51.5
8	T1	All MCs	6	0.0	6	0.0	0.232	7.2	LOS A	0.6	4.0	0.66	0.67	0.66	46.9
9	R2	All MCs	56	0.0	56	0.0	0.232	11.9	LOS B	0.6	4.0	0.66	0.67	0.66	47.3
Approach			202	0.0	202	0.0	0.232	8.4	LOS A	0.6	4.0	0.66	0.67	0.66	50.7
West: Marine Way															
10	L2	All MCs	53	0.0	53	0.0	0.412	4.8	LOS A	1.2	8.5	0.43	0.50	0.43	50.6
11	T1	All MCs	374	0.0	374	0.0	0.412	4.9	LOS A	1.2	8.5	0.43	0.50	0.43	51.0
12	R2	All MCs	101	0.0	101	0.0	0.412	9.6	LOS A	1.2	8.5	0.43	0.50	0.43	41.1
Approach			527	0.0	527	0.0	0.412	5.8	LOS A	1.2	8.5	0.43	0.50	0.43	49.9
All Vehicles			1744	0.0	1744	0.0	0.695	6.5	LOS A	2.9	20.5	0.59	0.55	0.59	48.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

ANNEXURE G
SIDRA
OUTPUT
SHEETS 2030
After
Development

MOVEMENT SUMMARY

Site: 101v [[03] 01 am ad - Circle (Site Folder: 2030 After Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2030 After AM (Network Folder: After Development)]

Traffic Impact Assessment for proposed residential development on erf 2074, Plettenberg Bay
2030 After Development
Site Category: Proposed Design 2
Roundabout

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Whalesong Access															
1	L2	All MCs	2	0.0	2	0.0	0.016	9.6	LOS A	0.0	0.3	0.80	0.68	0.80	31.2
2	T1	All MCs	3	0.0	3	0.0	0.016	10.0	LOS A	0.0	0.3	0.80	0.68	0.80	30.5
3	R2	All MCs	3	0.0	3	0.0	0.016	13.1	LOS B	0.0	0.3	0.80	0.68	0.80	16.9
Approach			8	0.0	8	0.0	0.016	11.1	LOS B	0.0	0.3	0.80	0.68	0.80	27.2
East: Marine Way															
4	L2	All MCs	3	0.0	3	0.0	0.004	5.7	LOS A	0.0	0.1	0.33	0.50	0.33	41.5
5	T1	All MCs	755	0.0	755	0.0	0.515	5.4	LOS A	2.2	15.2	0.45	0.46	0.45	45.0
6	R2	All MCs	8	0.0	8	0.0	0.515	8.7	LOS A	2.2	15.2	0.45	0.46	0.45	43.3
Approach			766	0.0	766	0.0	0.515	5.5	LOS A	2.2	15.2	0.45	0.46	0.45	45.0
North: Ultra City Access															
7	L2	All MCs	81	0.0	81	0.0	0.114	10.1	LOS B	0.3	1.9	0.72	0.71	0.72	29.3
8	T1	All MCs	1	0.0	1	0.0	0.107	9.1	LOS A	0.3	1.9	0.71	0.72	0.71	29.8
9	R2	All MCs	91	0.0	91	0.0	0.107	12.4	LOS B	0.3	1.9	0.71	0.72	0.71	34.9
Approach			173	0.0	173	0.0	0.114	11.3	LOS B	0.3	1.9	0.72	0.72	0.72	33.0
West: Marine Way															
10	L2	All MCs	68	0.0	68	0.0	0.063	5.0	LOS A	0.1	1.0	0.11	0.53	0.11	42.9
11	T1	All MCs	707	0.0	707	0.0	0.410	4.8	LOS A	1.5	10.2	0.13	0.45	0.13	40.9
12	R2	All MCs	1	0.0	1	0.0	0.410	8.1	LOS A	1.5	10.2	0.13	0.45	0.13	38.8
Approach			777	0.0	777	0.0	0.410	4.8	LOS A	1.5	10.2	0.13	0.45	0.13	41.2
All Vehicles			1724	0.0	1724	0.0	0.515	5.8	LOS A	2.2	15.2	0.33	0.49	0.33	42.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101v [[03] 01 pm ad - Circle (Site Folder: 2030 After Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2030 After PM (Network Folder: After Development)]

Traffic Impact Assessment for proposed residential development on erf 2074, Plettenberg Bay
2030 After Development
Site Category: Proposed Design 2
Roundabout

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Whalesong Access															
1	L2	All MCs	5	0.0	5	0.0	0.039	12.6	LOS B	0.1	0.7	0.90	0.78	0.90	28.0
2	T1	All MCs	3	0.0	3	0.0	0.039	12.9	LOS B	0.1	0.7	0.90	0.78	0.90	27.1
3	R2	All MCs	7	0.0	7	0.0	0.039	16.0	LOS B	0.1	0.7	0.90	0.78	0.90	14.0
Approach			16	0.0	16	0.0	0.039	14.2	LOS B	0.1	0.7	0.90	0.78	0.90	22.9
East: Marine Way															
4	L2	All MCs	6	0.0	6	0.0	0.008	6.3	LOS A	0.0	0.1	0.42	0.52	0.42	41.0
5	T1	All MCs	857	0.0	857	0.0	0.632	6.2	LOS A	2.9	20.1	0.66	0.53	0.66	43.7
6	R2	All MCs	1	0.0	1	0.0	0.632	9.5	LOS A	2.9	20.1	0.66	0.53	0.66	42.0
Approach			864	0.0	864	0.0	0.632	6.2	LOS A	2.9	20.1	0.65	0.53	0.65	43.7
North: Ultra City Access															
7	L2	All MCs	28	0.0	28	0.0	0.050	10.2	LOS B	0.1	0.7	0.66	0.71	0.66	29.0
8	T1	All MCs	1	0.0	1	0.0	0.167	8.0	LOS A	0.4	2.9	0.65	0.70	0.65	31.0
9	R2	All MCs	160	0.0	160	0.0	0.167	11.3	LOS B	0.4	2.9	0.65	0.70	0.65	35.9
Approach			189	0.0	189	0.0	0.167	11.1	LOS B	0.4	2.9	0.65	0.70	0.65	35.3
West: Marine Way															
10	L2	All MCs	101	0.0	101	0.0	0.090	4.9	LOS A	0.2	1.7	0.11	0.53	0.11	43.0
11	T1	All MCs	548	0.0	548	0.0	0.318	4.8	LOS A	1.2	8.2	0.11	0.45	0.11	41.1
12	R2	All MCs	1	0.0	1	0.0	0.318	8.0	LOS A	1.2	8.2	0.11	0.45	0.11	38.9
Approach			651	0.0	651	0.0	0.318	4.8	LOS A	1.2	8.2	0.11	0.46	0.11	41.5
All Vehicles			1720	0.0	1720	0.0	0.632	6.3	LOS A	2.9	20.1	0.45	0.52	0.45	42.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [[03] 03 am ad (Site Folder: 2030 After Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2030 After AM (Network Folder: After Development)]

Traffic Impact Assessment for proposed residential development on erf 2074, Plettenberg Bay
2030 After Development
Site Category: Future Conditions 1
Roundabout

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Erf 2074 Access															
1	L2	All MCs	107	0.0	107	0.0	0.385	7.2	LOS A	1.1	7.5	0.81	0.75	0.81	18.9
2	T1	All MCs	7	0.0	7	0.0	0.385	7.6	LOS A	1.1	7.5	0.81	0.75	0.81	45.3
3	R2	All MCs	173	0.0	173	0.0	0.385	11.7	LOS B	1.1	7.5	0.81	0.75	0.81	44.2
Approach			287	0.0	287	0.0	0.385	9.9	LOS A	1.1	7.5	0.81	0.75	0.81	40.3
East: Marine Way															
4	L2	All MCs	58	0.0	58	0.0	0.511	4.8	LOS A	1.8	12.7	0.48	0.47	0.48	48.2
5	T1	All MCs	566	0.0	566	0.0	0.511	5.0	LOS A	1.8	12.7	0.48	0.47	0.48	49.2
6	R2	All MCs	46	0.0	46	0.0	0.511	9.6	LOS A	1.8	12.7	0.48	0.47	0.48	52.1
Approach			671	0.0	671	0.0	0.511	5.3	LOS A	1.8	12.7	0.48	0.47	0.48	49.5
North: Challenge Drive															
7	L2	All MCs	138	0.0	138	0.0	0.393	11.0	LOS B	1.2	8.3	0.91	0.80	0.94	48.5
8	T1	All MCs	1	0.0	1	0.0	0.393	11.2	LOS B	1.2	8.3	0.91	0.80	0.94	42.6
9	R2	All MCs	92	0.0	92	0.0	0.393	15.8	LOS B	1.2	8.3	0.91	0.80	0.94	42.6
Approach			231	0.0	231	0.0	0.393	12.9	LOS B	1.2	8.3	0.91	0.80	0.94	46.8
West: Marine Way															
10	L2	All MCs	91	0.0	91	0.0	0.675	6.3	LOS A	2.9	20.5	0.74	0.59	0.76	49.5
11	T1	All MCs	666	0.0	666	0.0	0.675	6.4	LOS A	2.9	20.5	0.74	0.59	0.76	49.9
12	R2	All MCs	36	0.0	36	0.0	0.675	11.1	LOS B	2.9	20.5	0.74	0.59	0.76	39.3
Approach			793	0.0	793	0.0	0.675	6.6	LOS A	2.9	20.5	0.74	0.59	0.76	49.6
All Vehicles			1981	0.0	1981	0.0	0.675	7.4	LOS A	2.9	20.5	0.68	0.60	0.69	48.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [[03] 03 pm ad (Site Folder: 2030 After Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2030 After PM (Network Folder: After Development)]

Traffic Impact Assessment for proposed residential development on erf 2074, Plettenberg Bay
2030 After Development
Site Category: Future Conditions 1
Roundabout

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Erf 2074 Access															
1	L2	All MCs	42	0.0	42	0.0	0.212	8.7	LOS A	0.6	4.2	0.89	0.78	0.89	17.1
2	T1	All MCs	3	0.0	3	0.0	0.212	9.1	LOS A	0.6	4.2	0.89	0.78	0.89	43.9
3	R2	All MCs	69	0.0	69	0.0	0.212	13.2	LOS B	0.6	4.2	0.89	0.78	0.89	42.8
Approach			115	0.0	115	0.0	0.212	11.4	LOS B	0.6	4.2	0.89	0.78	0.89	38.7
East: Marine Way															
4	L2	All MCs	161	0.0	161	0.0	0.773	6.2	LOS A	4.0	28.0	0.75	0.57	0.77	46.6
5	T1	All MCs	756	0.0	756	0.0	0.773	6.4	LOS A	4.0	28.0	0.75	0.57	0.77	47.5
6	R2	All MCs	81	0.0	81	0.0	0.773	11.0	LOS B	4.0	28.0	0.75	0.57	0.77	51.1
Approach			998	0.0	998	0.0	0.773	6.8	LOS A	4.0	28.0	0.75	0.57	0.77	47.9
North: Challenge Drive															
7	L2	All MCs	159	0.0	159	0.0	0.276	7.5	LOS A	0.7	4.9	0.71	0.69	0.71	51.2
8	T1	All MCs	6	0.0	6	0.0	0.276	7.7	LOS A	0.7	4.9	0.71	0.69	0.71	46.4
9	R2	All MCs	63	0.0	63	0.0	0.276	12.4	LOS B	0.7	4.9	0.71	0.69	0.71	46.8
Approach			228	0.0	228	0.0	0.276	8.9	LOS A	0.7	4.9	0.71	0.69	0.71	50.3
West: Marine Way															
10	L2	All MCs	60	0.0	60	0.0	0.459	4.9	LOS A	1.4	9.9	0.46	0.50	0.46	50.5
11	T1	All MCs	422	0.0	422	0.0	0.459	5.0	LOS A	1.4	9.9	0.46	0.50	0.46	50.9
12	R2	All MCs	101	0.0	101	0.0	0.459	9.7	LOS A	1.4	9.9	0.46	0.50	0.46	40.9
Approach			583	0.0	583	0.0	0.459	5.8	LOS A	1.4	9.9	0.46	0.50	0.46	49.9
All Vehicles			1924	0.0	1924	0.0	0.773	7.0	LOS A	4.0	28.0	0.67	0.58	0.67	48.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

ANNEXURE H
SIDRA
OUTPUT
SHEETS 2030
After
Development:
Peak Season

MOVEMENT SUMMARY

Site: 101v [[04] 01 am ad - Circle (Site Folder: 2030 Peak Season After Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2030 Peak Season AM (Network Folder: After Development)]

Traffic Impact Assessment for proposed residential development on erf 2074, Plettenberg Bay
2025 Before Development
Site Category: Future Conditions 2
Roundabout

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Whalesong Access															
1	L2	All MCs	3	0.0	3	0.0	0.029	13.0	LOS B	0.1	0.5	0.90	0.76	0.90	27.9
2	T1	All MCs	4	0.0	4	0.0	0.029	13.4	LOS B	0.1	0.5	0.90	0.76	0.90	27.0
3	R2	All MCs	4	0.0	4	0.0	0.029	16.4	LOS B	0.1	0.5	0.90	0.76	0.90	13.8
Approach			12	0.0	12	0.0	0.029	14.4	LOS B	0.1	0.5	0.90	0.76	0.90	23.9
East: Marine Way															
4	L2	All MCs	4	0.0	4	0.0	0.005	5.9	LOS A	0.0	0.1	0.37	0.50	0.37	41.3
5	T1	All MCs	919	0.0	919	0.0	0.645	5.8	LOS A	3.3	22.9	0.60	0.49	0.60	44.1
6	R2	All MCs	11	0.0	11	0.0	0.645	9.1	LOS A	3.3	22.9	0.60	0.49	0.60	42.3
Approach			934	0.0	934	0.0	0.645	5.9	LOS A	3.3	22.9	0.60	0.49	0.60	44.0
North: Ultra City Access															
7	L2	All MCs	101	0.0	101	0.0	0.172	12.6	LOS B	0.4	3.1	0.82	0.76	0.82	26.0
8	T1	All MCs	1	0.0	1	0.0	0.157	11.1	LOS B	0.4	3.0	0.82	0.75	0.82	27.8
9	R2	All MCs	113	0.0	113	0.0	0.157	14.4	LOS B	0.4	3.0	0.82	0.75	0.82	33.0
Approach			215	0.0	215	0.0	0.172	13.5	LOS B	0.4	3.1	0.82	0.76	0.82	30.6
West: Marine Way															
10	L2	All MCs	85	0.0	85	0.0	0.080	5.0	LOS A	0.2	1.3	0.13	0.52	0.13	42.8
11	T1	All MCs	877	0.0	877	0.0	0.512	4.9	LOS A	2.1	15.0	0.17	0.44	0.17	40.4
12	R2	All MCs	1	0.0	1	0.0	0.512	8.1	LOS A	2.1	15.0	0.17	0.44	0.17	38.4
Approach			963	0.0	963	0.0	0.512	4.9	LOS A	2.1	15.0	0.17	0.45	0.17	40.7
All Vehicles			2123	0.0	2123	0.0	0.645	6.2	LOS A	3.3	22.9	0.43	0.50	0.43	41.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101v [[04] 01 pm ad - Circle (Site Folder: 2030 Peak Season After Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2030 Peak Season PM (Network Folder: After Development)]

Traffic Impact Assessment for proposed residential development on erf 2074, Plettenberg Bay
2025 Before Development
Site Category: Future Conditions 2
Roundabout

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Whalesong Access															
1	L2	All MCs	6	0.0	6	0.0	0.085	20.2	LOS C	0.2	1.7	1.00	0.86	1.00	22.5
2	T1	All MCs	4	0.0	4	0.0	0.085	20.5	LOS C	0.2	1.7	1.00	0.86	1.00	21.6
3	R2	All MCs	9	0.0	9	0.0	0.085	23.6	LOS C	0.2	1.7	1.00	0.86	1.00	9.9
Approach			20	0.0	20	0.0	0.085	21.9	LOS C	0.2	1.7	1.00	0.86	1.00	17.5
East: Marine Way															
4	L2	All MCs	7	0.0	7	0.0	0.010	6.7	LOS A	0.0	0.2	0.47	0.54	0.47	40.6
5	T1	All MCs	1060	0.0	1060	0.0	0.816	8.8	LOS A	5.8	40.6	0.94	0.67	1.02	42.1
6	R2	All MCs	1	0.0	1	0.0	0.816	12.1	LOS B	5.8	40.6	0.94	0.67	1.02	40.4
Approach			1068	0.0	1068	0.0	0.816	8.8	LOS A	5.8	40.6	0.93	0.67	1.02	42.1
North: Ultra City Access															
7	L2	All MCs	35	0.0	35	0.0	0.067	11.6	LOS B	0.1	1.0	0.71	0.75	0.71	27.2
8	T1	All MCs	1	0.0	1	0.0	0.229	9.1	LOS A	0.6	4.3	0.74	0.73	0.74	29.8
9	R2	All MCs	200	0.0	200	0.0	0.229	12.4	LOS B	0.6	4.3	0.74	0.73	0.74	34.8
Approach			236	0.0	236	0.0	0.229	12.3	LOS B	0.6	4.3	0.73	0.73	0.73	34.1
West: Marine Way															
10	L2	All MCs	126	0.0	126	0.0	0.113	5.0	LOS A	0.3	2.2	0.13	0.52	0.13	42.8
11	T1	All MCs	661	0.0	661	0.0	0.386	4.8	LOS A	1.6	11.1	0.15	0.44	0.15	40.7
12	R2	All MCs	1	0.0	1	0.0	0.386	8.1	LOS A	1.6	11.1	0.15	0.44	0.15	38.6
Approach			788	0.0	788	0.0	0.386	4.8	LOS A	1.6	11.1	0.15	0.45	0.15	41.2
All Vehicles			2113	0.0	2113	0.0	0.816	7.8	LOS A	5.8	40.6	0.62	0.60	0.66	40.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [[04] 03 am ad (Site Folder: 2030 Peak Season After Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2030 Peak Season AM (Network Folder: After Development)]

Traffic Impact Assessment for proposed residential development on erf 2074, Plettenberg Bay
2030 Peak Season After Development
Site Category: Future Conditions 2
Roundabout

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Erf 2074 Access															
1	L2	All MCs	107	0.0	107	0.0	0.489	11.5	LOS B	1.7	11.7	0.94	0.87	1.11	14.5
2	T1	All MCs	7	0.0	7	0.0	0.489	11.9	LOS B	1.7	11.7	0.94	0.87	1.11	41.4
3	R2	All MCs	173	0.0	173	0.0	0.489	16.0	LOS B	1.7	11.7	0.94	0.87	1.11	40.5
Approach			287	0.0	287	0.0	0.489	14.2	LOS B	1.7	11.7	0.94	0.87	1.11	35.8
East: Marine Way															
4	L2	All MCs	58	0.0	58	0.0	0.644	5.2	LOS A	2.8	19.4	0.63	0.51	0.63	47.3
5	T1	All MCs	708	0.0	708	0.0	0.644	5.4	LOS A	2.8	19.4	0.63	0.51	0.63	48.2
6	R2	All MCs	58	0.0	58	0.0	0.644	10.0	LOS A	2.8	19.4	0.63	0.51	0.63	51.5
Approach			824	0.0	824	0.0	0.644	5.7	LOS A	2.8	19.4	0.63	0.51	0.63	48.5
North: Challenge Drive															
7	L2	All MCs	173	0.0	173	0.0	0.699	27.0	LOS C	3.2	22.3	1.00	1.12	1.56	40.1
8	T1	All MCs	1	0.0	1	0.0	0.699	27.1	LOS C	3.2	22.3	1.00	1.12	1.56	31.9
9	R2	All MCs	115	0.0	115	0.0	0.699	31.8	LOS C	3.2	22.3	1.00	1.12	1.56	31.4
Approach			288	0.0	288	0.0	0.699	28.9	LOS C	3.2	22.3	1.00	1.12	1.56	37.4
West: Marine Way															
10	L2	All MCs	113	0.0	113	0.0	0.843	10.0	LOS A	6.3	43.9	0.98	0.77	1.17	47.8
11	T1	All MCs	835	0.0	835	0.0	0.843	10.1	LOS B	6.3	43.9	0.98	0.77	1.17	48.2
12	R2	All MCs	36	0.0	36	0.0	0.843	14.8	LOS B	6.3	43.9	0.98	0.77	1.17	36.8
Approach			983	0.0	983	0.0	0.843	10.3	LOS B	6.3	43.9	0.98	0.77	1.17	47.9
All Vehicles			2383	0.0	2383	0.0	0.843	11.4	LOS B	6.3	43.9	0.85	0.73	1.02	45.1

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Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [[04] 03 pm ad (Site Folder: 2030 Peak Season After Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2030 Peak Season PM (Network Folder: After Development)]

Traffic Impact Assessment for proposed residential development on erf 2074, Plettenberg Bay
2030 Peak Season After Development
Site Category: Future Conditions 2
Roundabout

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Erf 2074 Access															
1	L2	All MCs	42	0.0	42	0.0	0.346	13.6	LOS B	1.1	7.6	1.00	0.86	1.00	13.0
2	T1	All MCs	3	0.0	3	0.0	0.346	14.0	LOS B	1.1	7.6	1.00	0.86	1.00	39.7
3	R2	All MCs	69	0.0	69	0.0	0.346	18.2	LOS B	1.1	7.6	1.00	0.86	1.00	38.8
Approach			115	0.0	115	0.0	0.346	16.4	LOS B	1.1	7.6	1.00	0.86	1.00	34.1
East: Marine Way															
4	L2	All MCs	161	0.0	161	0.0	0.948	14.9	LOS B	12.2	85.1	1.00	1.01	1.35	40.2
5	T1	All MCs	946	0.0	946	0.0	0.948	15.1	LOS B	12.2	85.1	1.00	1.01	1.35	40.4
6	R2	All MCs	101	0.0	101	0.0	0.948	19.7	LOS B	12.2	85.1	1.00	1.01	1.35	46.6
Approach			1208	0.0	1208	0.0	0.948	15.4	LOS B	12.2	85.1	1.00	1.01	1.35	41.2
North: Challenge Drive															
7	L2	All MCs	198	0.0	198	0.0	0.389	8.8	LOS A	1.1	7.7	0.82	0.74	0.82	50.3
8	T1	All MCs	6	0.0	6	0.0	0.389	8.9	LOS A	1.1	7.7	0.82	0.74	0.82	45.1
9	R2	All MCs	79	0.0	79	0.0	0.389	13.6	LOS B	1.1	7.7	0.82	0.74	0.82	45.4
Approach			283	0.0	283	0.0	0.389	10.1	LOS B	1.1	7.7	0.82	0.74	0.82	49.3
West: Marine Way															
10	L2	All MCs	75	0.0	75	0.0	0.566	5.2	LOS A	2.1	14.4	0.58	0.52	0.58	50.1
11	T1	All MCs	528	0.0	528	0.0	0.566	5.4	LOS A	2.1	14.4	0.58	0.52	0.58	50.5
12	R2	All MCs	101	0.0	101	0.0	0.566	10.0	LOS B	2.1	14.4	0.58	0.52	0.58	40.3
Approach			704	0.0	704	0.0	0.566	6.0	LOS A	2.1	14.4	0.58	0.52	0.58	49.6
All Vehicles			2311	0.0	2311	0.0	0.948	11.9	LOS B	12.2	85.1	0.85	0.82	1.03	44.7

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