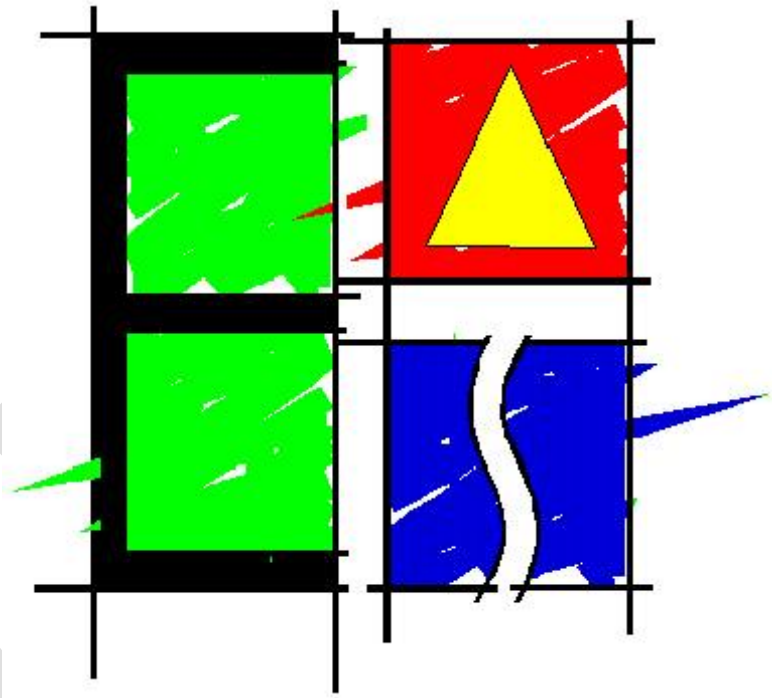
TRAFFIC IMPACT ASSESSMENT

FOR A
PROPOSED RESIDENTIAL DEVELOPMENT
ON PORTION 91 OF FARM MATJES FONTEIN NO. 304,
KEURBOOMSTRAND



December 2023

Prepared for: **Familie Roux Eiendomme (Pty) Ltd**

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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 Familie Roux Eiendomme (Pty) Ltd during November 2023 to prepare a Traffic Impact Assessment for a proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304, situated in Keurboomstrand in the Bitou Local Municipality. The location of the site and proposed development is indicated on **Figure 1** overleaf.

View of the site from Keurboom Road (MR00394)

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 roads 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 junctions 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 junctions 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 Portion 91 of Farm Matjes Fontein No. 304, Keurboomstrand

Drawing No:
2214-P-001

0 80 160 320 480 640
Meters

Scale 1 : 30 000

Drawing Title:
Figure 1: Locality Plan

Drawing Date:
December 2023

Prepared by : EHN

Checked by : CH

1.4 STUDY AREA

Based on the type and extent of the development the study area extended Keurboom Road (Main Road 00394) and its junction with DR01988 as well as the National Road N2 Section 8 junctions with DR01988 and MR00394, as it is considered that trips generated by the proposed development will approach along these roads and through these junctions.

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 N2 / DR01888 junction;
- Any vehicular activity 500m west of the N2 / MR00394 junction;

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 MR00394; 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 used as a horse-riding school, is situated in the Keurboom area northeast of Plettenberg Bay and south of the Crags. The site is located immediately north of MR00394 approximately 1.5km west of the Keurbooms beach village as indicated on **Figure 1**.

The site is bordered by vacant environmentally sensitive forested land to the north, vacant land to the east and west and partly developed residential estates interspersed with vacant land to the south between MR00394 and the coastline, including Milkwood Glen – which comprises 50 group housing sites.

The portion of the site next to MR00394 is relatively flat for approximately 150m before sloping up to the escarpment relatively steeply.

2.2 OVERVIEW OF DEVELOPMENT

The proposed development is a residential development comprising 73 group housing stands with average erf sizes of approximately 375m^2. The stands will be developed on the flat portion of the site between the road edge and the forested slope.

2.3 CURRENT AND PROPOSED LAND –USE RIGHTS

The site measures 17.7251 ha and is currently zoned for Agricultural 1 purposes in terms of the Section 8 Zoning Scheme.

To accommodate the proposed development, it is proposed to rezone the property to “Subdivisional Area” and then subdivide the property into:

- 73 Residential II (Group Housing) erven;
- 1 Open Space II erf (communal open space that will include private streets and services and landscaped gardens);
- 1 Open Space III erf (conservation area which will include the sensitive forest area); and
- 2 Transport II erf (Public road to accommodate the existing divisional road (MR00394) that traverses the southern boundary of the property and the old National road that traverses the northern section of the property).

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 junctions during AM and PM peak periods on Wednesday 29 November 2023.

- N2 - 8 / MR00394
- MR00394 / DR01888
- N2 - 8 / DR01888

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

It is noted that traffic counts were not conducted at the proposed development access (at the exiting Milkwood Glen complex). However, the ratio of residential units at this complex relative to all residential units east of the DR01888/MR00394 junction was determined and applied to the traffic surveyed on the MR00394 leg at the DR01888/MR00394 junction.

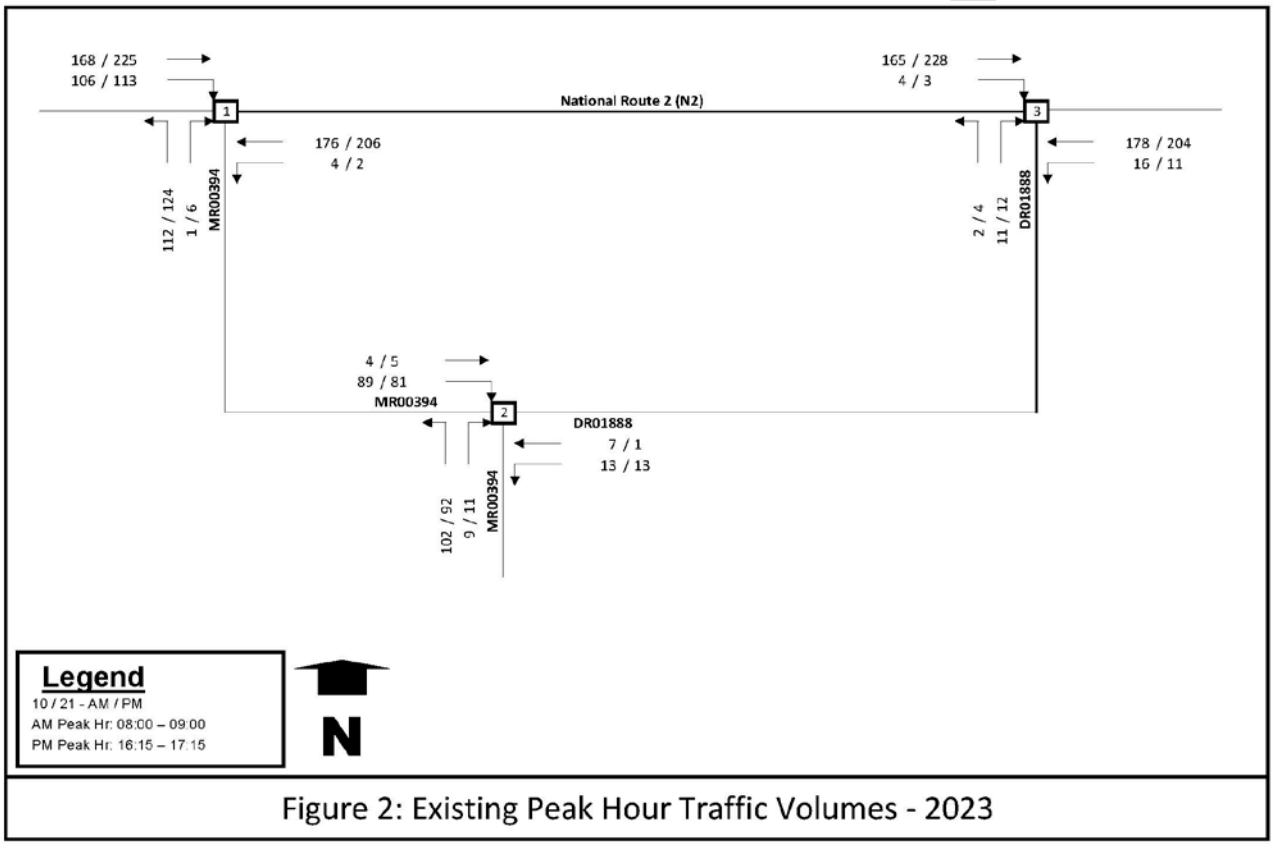

Figure 2: Existing Peak Hour Traffic Volumes - 2023

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 in these horizons.

Historical daily traffic volume data on the adjacent road network was sourced from the Western Cape Government's Road Network Information System (RNIS).

Historical data is available at the MR00394 and DR01888 approaches to the N2 junctions as well as the MR00394 approach to Main Road in Keurbooms Beach village.

The growth trends at each of these count locations are 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 #
MR00394	MR00394 / Main Rd	427	745	3.12%	3.2 %
DR01888	N2 / DR01888	824	1792	3.12%	1.58%
MR00394	N2 / MR00394	105	160	3.12%	2.21%

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

Given that the proposed development is relatively close to the MR00394 station at Main Road, the growth rate of 3.2% per annum will be used to escalated background traffic volumes.

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

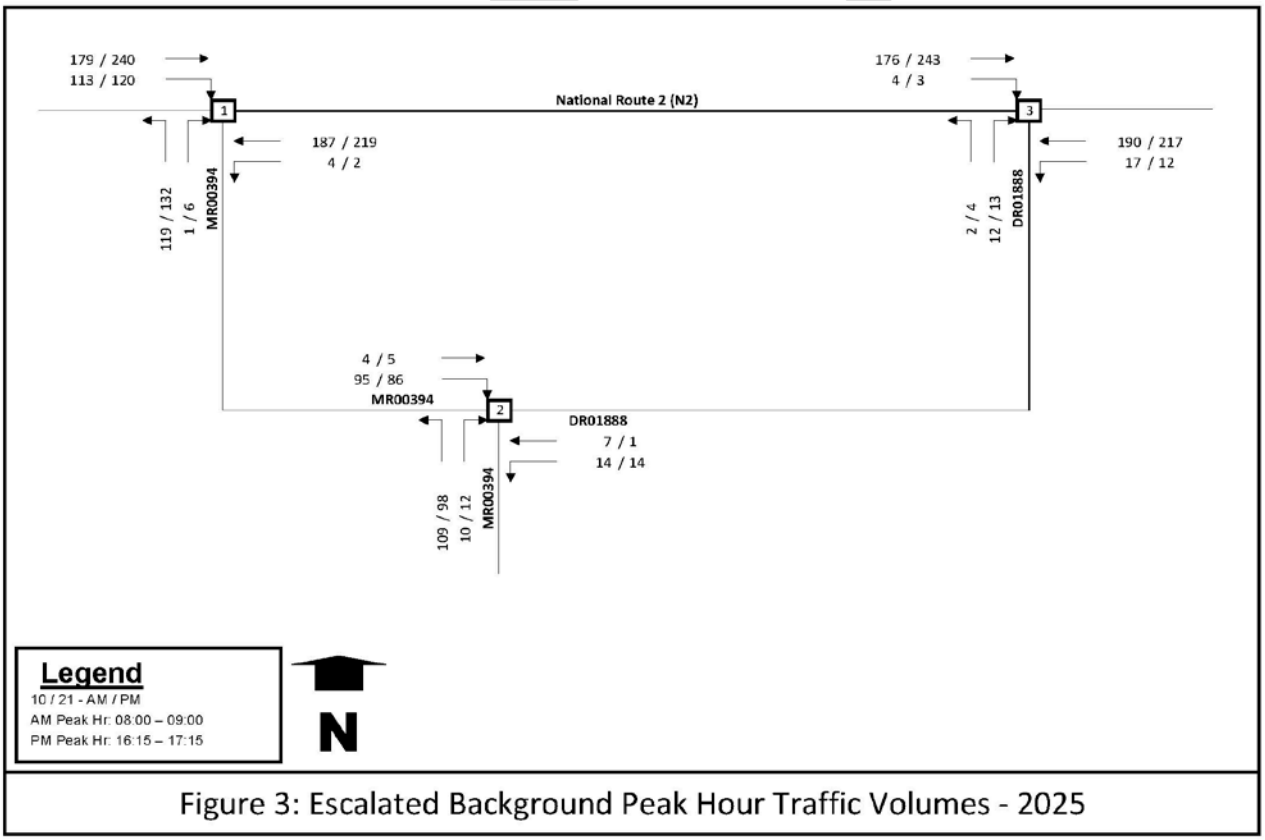

Figure 3: Escalated Background Peak Hour Traffic Volumes - 2025

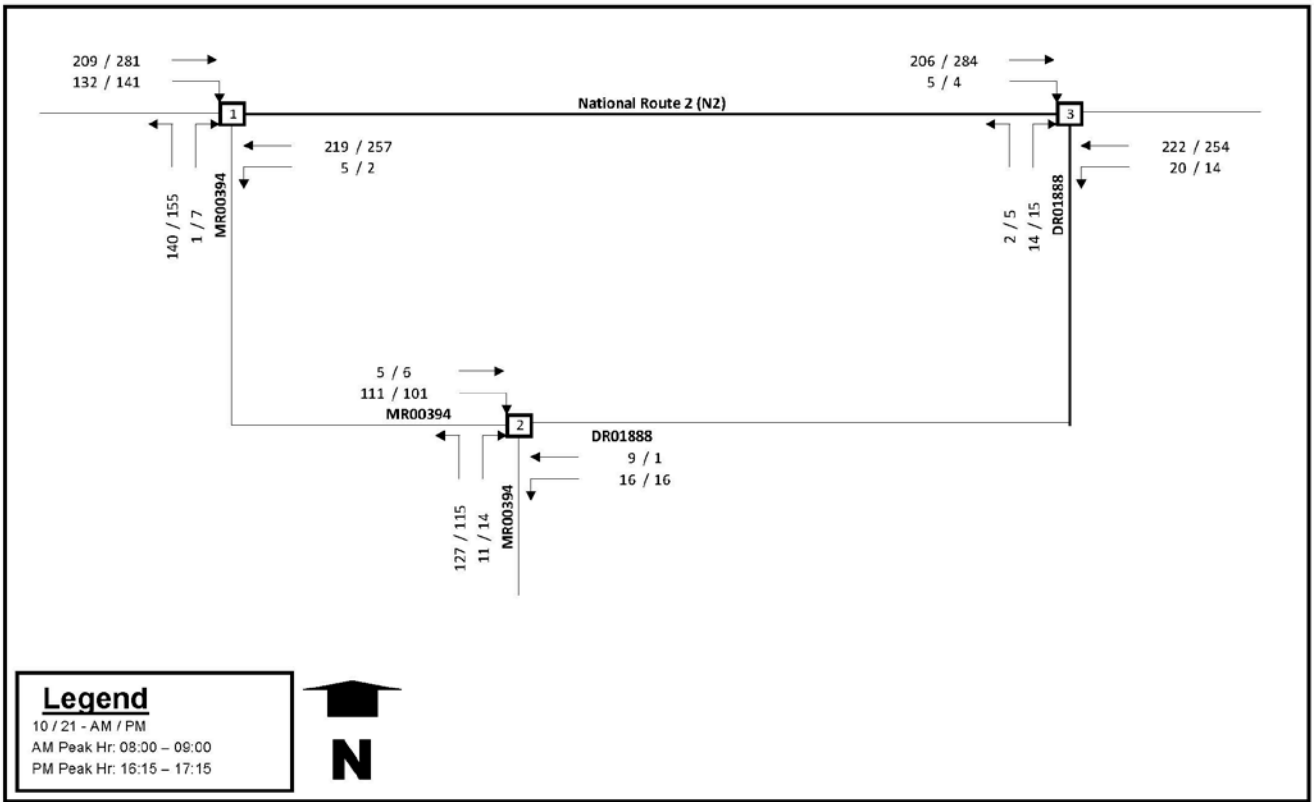

Figure 4: Escalated Background Peak Hour Traffic Volumes - 2030

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 over a weekend during the October school holidays. 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 junctions as soon as possible however, it is necessary to investigate methods to determine traffic growth for future demand during peak holiday periods. The approach taken was to use 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.

A paper entitled **Quantification of the Natural Variation in Traffic Flow on Selected National Roads in South Africa** [(4)] presented at the SA Transport Conference, 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). The relationship between the data at this station on the same day as the peak hour traffic counts conducted in Keurboom Beach (Wednesday 29 November) 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 Keurboom Beach junctions.

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 66%. Average volumes during November based on total monthly volumes are in the order of 62% of the December peak season period.

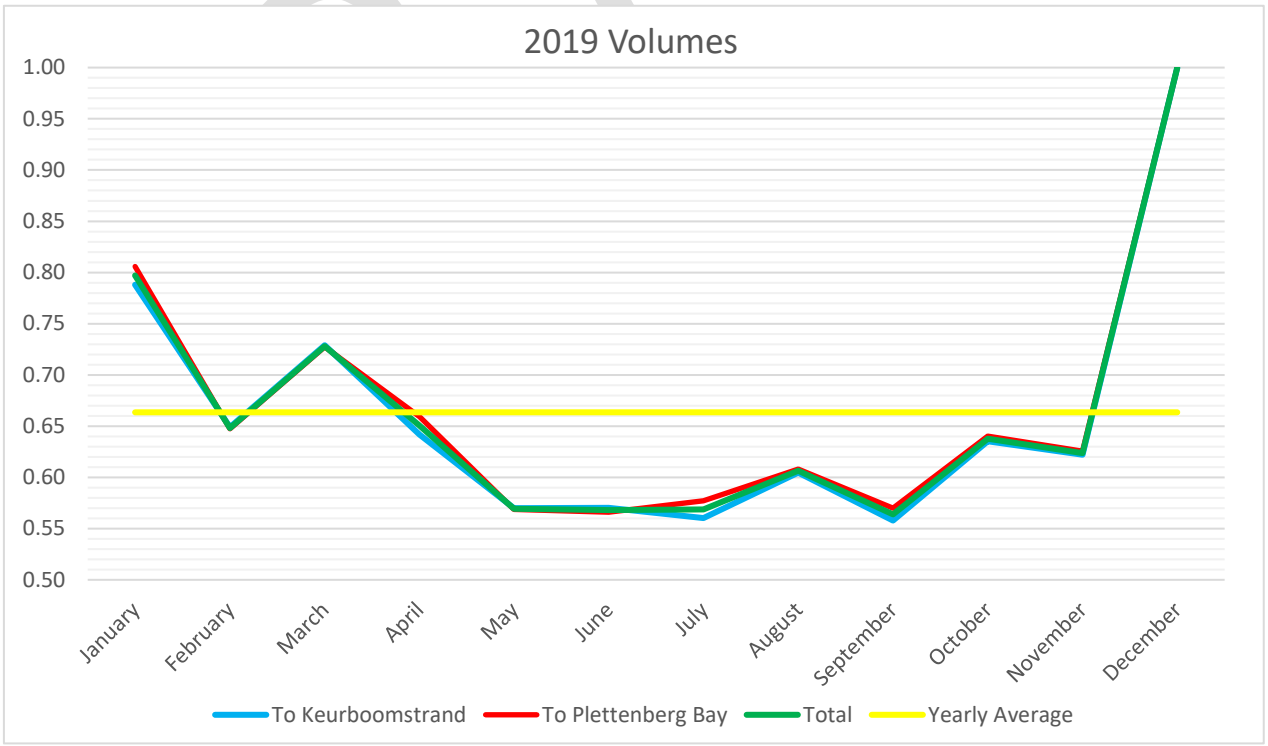

Figure 5: 2019 Traffic Volume Variation (Dec ~ 100%)

Analysis of the N2 data throughout the year indicates that on Wednesday 27 November (which is assumed to equate to Wednesday 29 November 2023) the N2 volume equates to 56% 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 7** 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 2028, where the escalated surveyed background peak hour traffic volumes will be increased by a factor of 1.25 to reflect the December Peak season average. The average peak season volume is considered a more realistic measure.

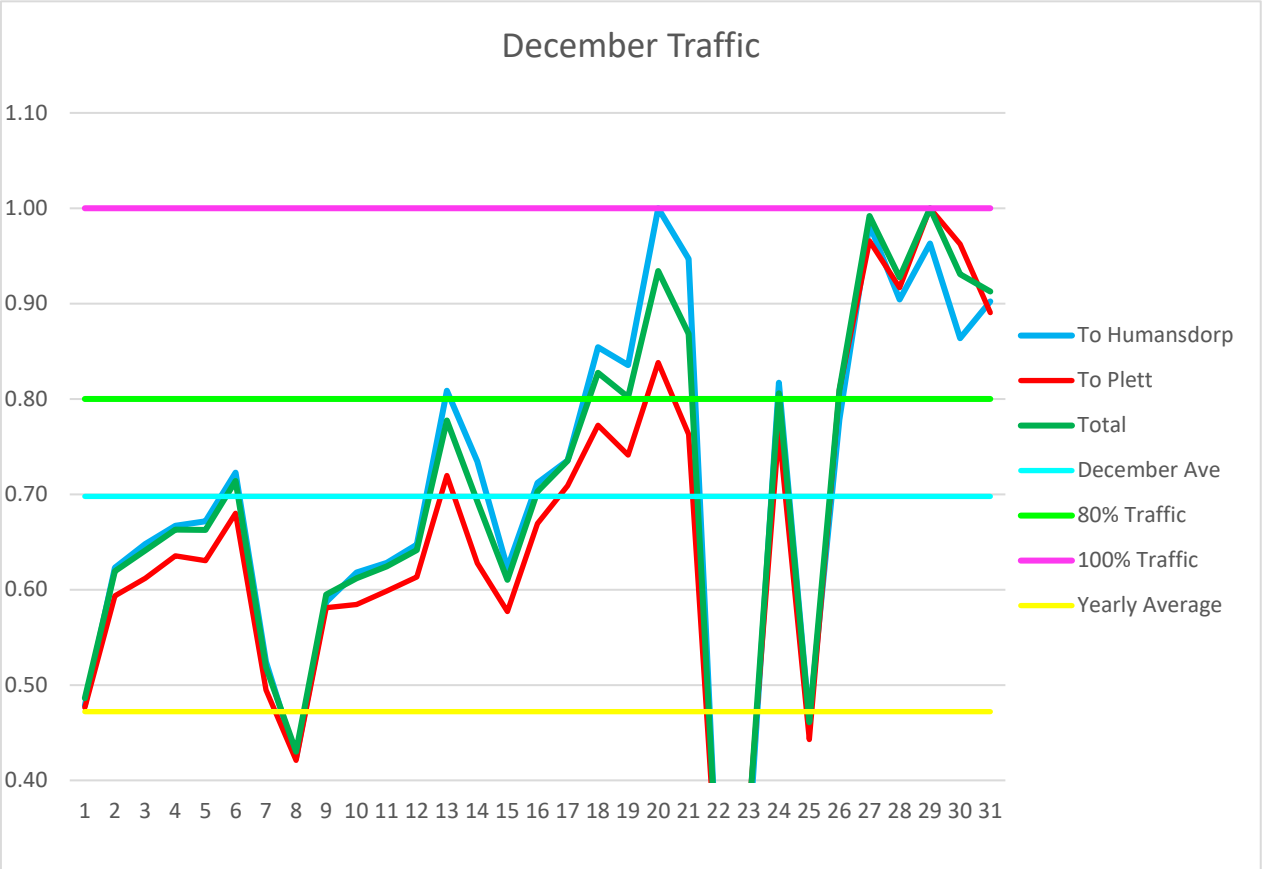

Figure 6: December 2019 Traffic Volume Variation (20 Dec = 100%)

The adjusted peak season escalated background traffic volumes for the 2030 development horizon are indicated on **Figure 7**.

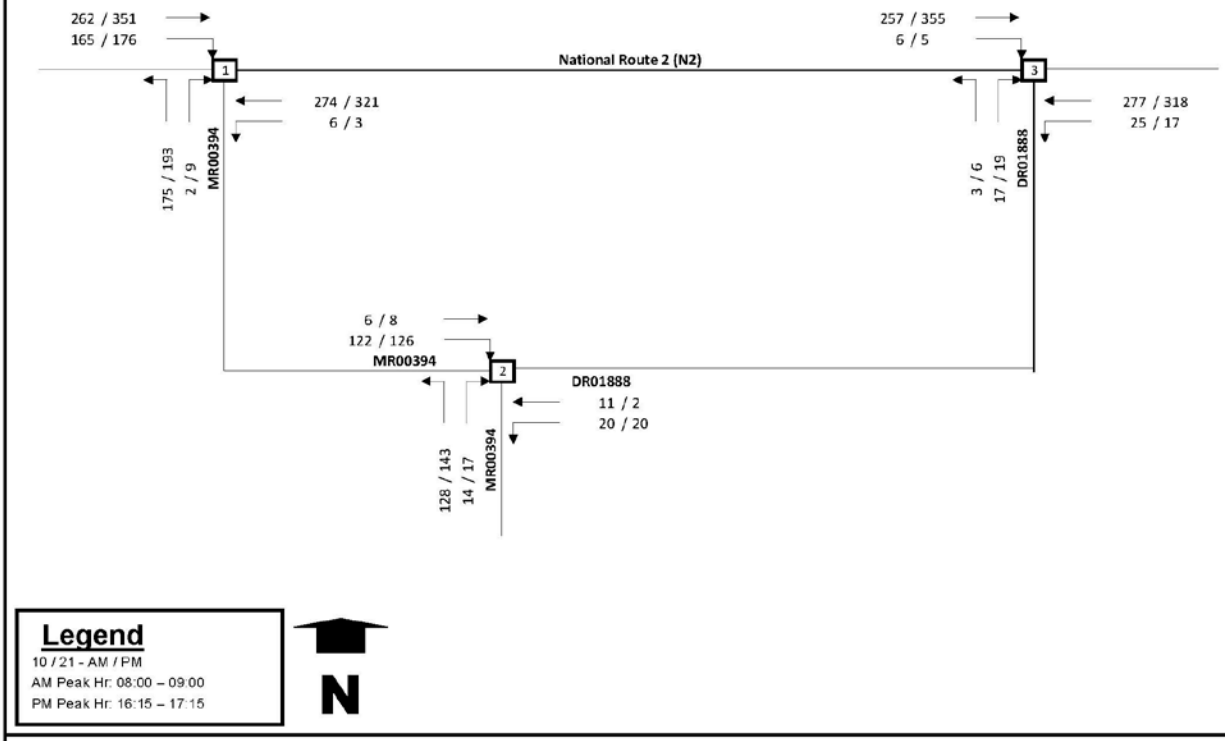

Figure 7: Escalated Background Peak Season Peak Hour Traffic Volumes - 2030

3.4 EXISTING ROAD NETWORK

- **MR00394** (Keurboom Road) is a Class 4 provincial main road which links the Keurbooms Beach village to N2 Section 8 at km 67.78.

  The road consists of a single 3.7m wide lane per direction, sidewalks and is in a good condition from Keurbooms Village to the DR01888 junction based on visual assessments conducted as part of the District Municipality RRAMS programme. The N2 is configured with westbound left-turn and eastbound right-turn lanes on the approaches to MR00394.

  The posted speed limit is 60km/hr.

MR00394 approach to N2

- **DR01888** is a Class 4 provincial road linking MR00394 to N2 Section 8 at km 70.49.

  The road consists of a single 3.7m wide lane per direction, sidewalks and is in a fair condition from the N2 to the MR00394 junction based on visual assessments conducted as part of the District Municipality RRAMS programme.

  The posted speed limit is 60km/h.

WB approach to MR00394 from DR01888

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

'AS BUILT' NOTES

FOR REPORT

AMENDMENTS			
NO.	DATE	DESCRIPTION	APPROVED

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DESIGN	MM
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DATE	DEC 2023

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APPROVED
ENGINEER
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DATE

PROJECT
TRAFFIC IMPACT ASSESSMENT FOR A PROPOSED RESIDENTIAL DEVELOPMENT ON PORTION 91 OF FARM MATJES FONTEIN NO. 304, KEURBOOMSTRAND

CONTRACT NO.

DWG DESCRIPTION
FIGURE 8: EXISTING ROAD AND JUNCTION CONFIGURATION

DWG.NO.
2214-P-008

ISSUE

3.5 SPATIAL DEVELOPMENT FRAMEWORK

Figure 9 below is an extract of the **Bitou Spatial Development Framework** [5] prepared by the Bitou Municipality.

The SDF provides for a balanced approach between development and the protection of natural environmental resources within the Urban Edge.

The Urban Edge has been defined has been defined by the steep slope to the north and the 5m contour line which defines the Estuarine Functional Zone to the south.

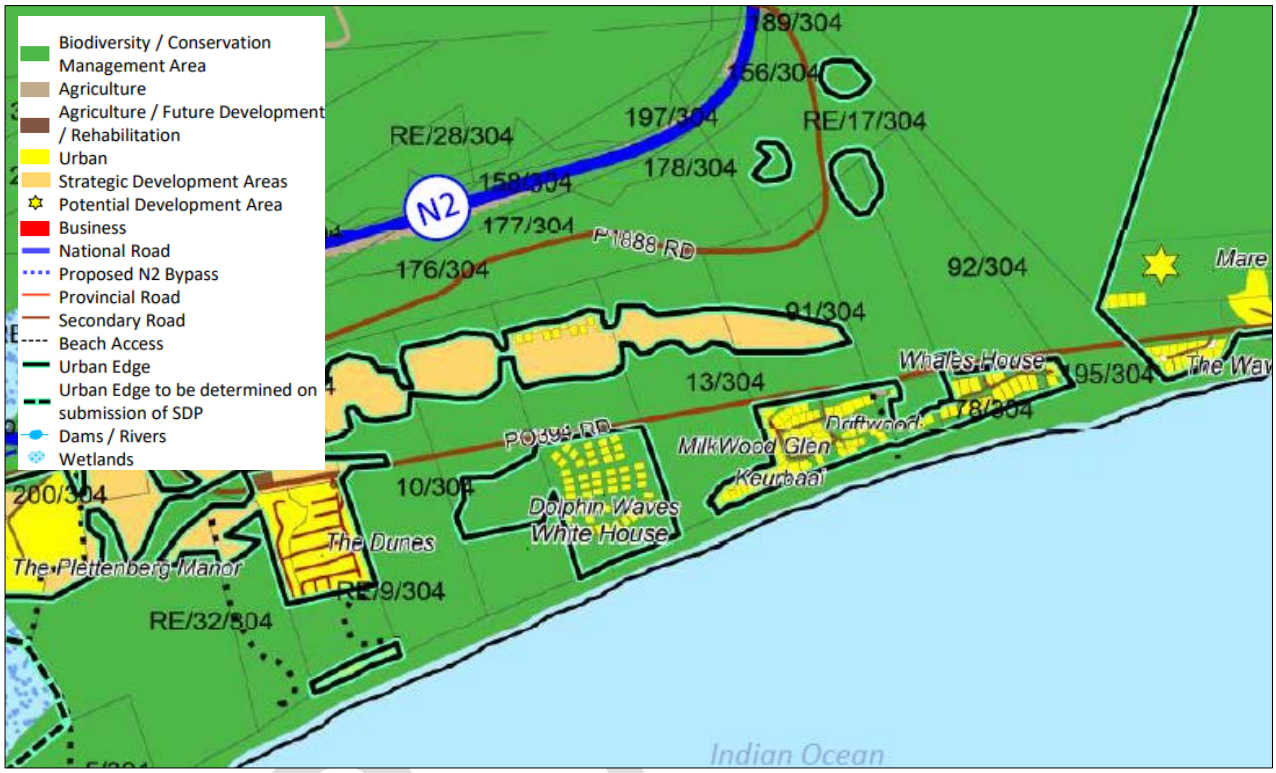


Figure 9: Bitou Spatial Development Framework

3.6 NON-MOTORISED TRANSPORT

A 2m wide paved pedestrian walkway exists on the north side of Keurbooms Road (MR00394) from the junction of DR01888 to Keurbooms Beach village.

Pedestrian walkway along Keurboom Road (MR00394)

3.7 PUBLIC TRANSPORT

Minibus-taxi services currently operate along MR00394 serving Keurbooms Beach village to Plettenberg Bay.

4 CAPACITY ANALYSIS – BEFORE DEVELOPMENT

Level of Service (LOS) is defined as the operating condition that may occur at a junction 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 junctions under various control conditions, as defined in the **Highway Capacity Manual** [6] are indicated in **Table 2** below:

Table 2: Level of Service definitions for Vehicles (Highway Capacity Manual [5] 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 junctions would operate before development occurs for the 2025 development horizon.

The capacity analysis was undertaken using the **SIDRA Intersection 9 Network** [7] capacity analysis method but applying the **Highway Capacity Manual** [6] gap acceptance criteria for unsignalised junctions.

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

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

Configuration	Delay		V/C		LOS*	
	AM	PM	AM	PM	AM	PM
MR00394 / N2	3.1	3.0	0.147	0.186	A*	A*
MR00394 / DR01888	6.5	6.6	0.099	0.092	A*	A*
DR01888 / N2	4.5	4.5	0.002	0.002	A*	A*

* - **SIDRA Intersection Network** [7] does not calculate junction LOS for stop-controlled junctions. The LOS indicated is sourced from the **Highway Capacity Manual** [6] (**Table 2** above).

As can be seen from the results contained in **Table 3**, no capacity problems are experienced at the affected junctions under current winter peak season conditions.

5 TRIP GENERATION AND DISTRIBUTION

5.1 PROPOSED DEVELOPMENT TRIPS

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 a proposed development if 73 units this relates to the following generated trips.

TGR (Weekday AM/PM)	=	0.85 * units
	=	0.85 * 73
	=	**62 trips** (in and out)
Split in / out	=	25 : 75 (AM)
	=	70 : 30 (PM)
TGR (Weekday Daily)	=	3.75 * units
	=	3.75 * 73
	=	**274 trips** (in and out)
Split in / out	=	50 : 50

The trips generated by the proposed development are summarised in **Table 4** below.

Table 4: Peak Hour Trip Generation Summary

COMPONENT	AM		PM		DAILY	
	IN	OUT	IN	OUT	IN	OUT
Town House Complex (231)	16	47	43	19	137	137

5.2 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:

- 90% to and from the west via Keurboom Road (MR00394) and the N2; and
- 10% to and from the east via Keurboom Road (MR00394), DR01888 and the N2.

The generated peak hour trips are indicated on **Figure 10** below and the generated trips added to the weekday AM and PM peak hour volumes for the 2025 and 2030 development horizons are indicated on **Figure 11** and **Figure 12** overleaf.

The generated peak hour trips added to the peak season weekday AM and PM peak hour volumes for the 2030 development horizon is indicated on **Figure 13.**

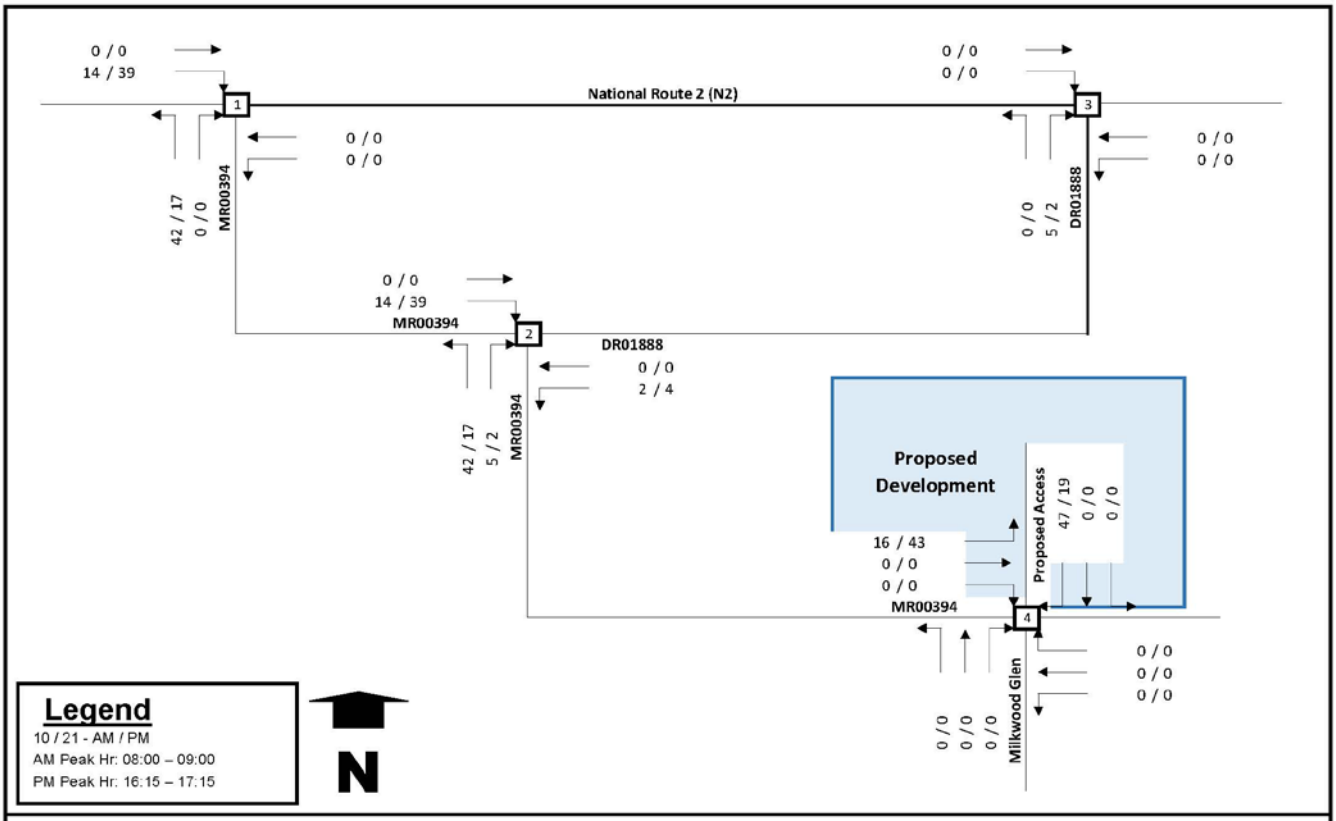


Figure 10: Generated Peak Hour Traffic Volumes

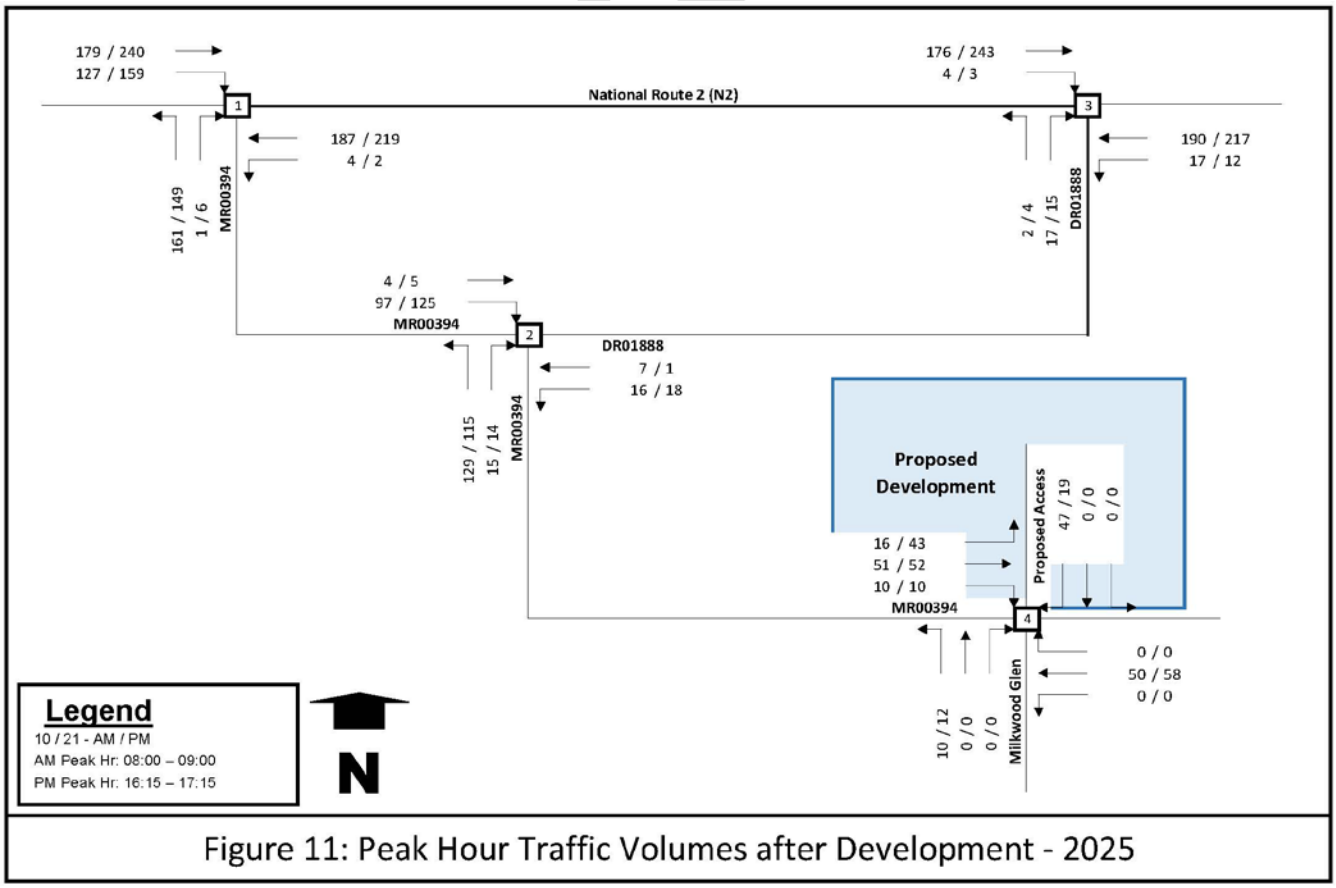


Figure 11: Peak Hour Traffic Volumes after Development - 2025

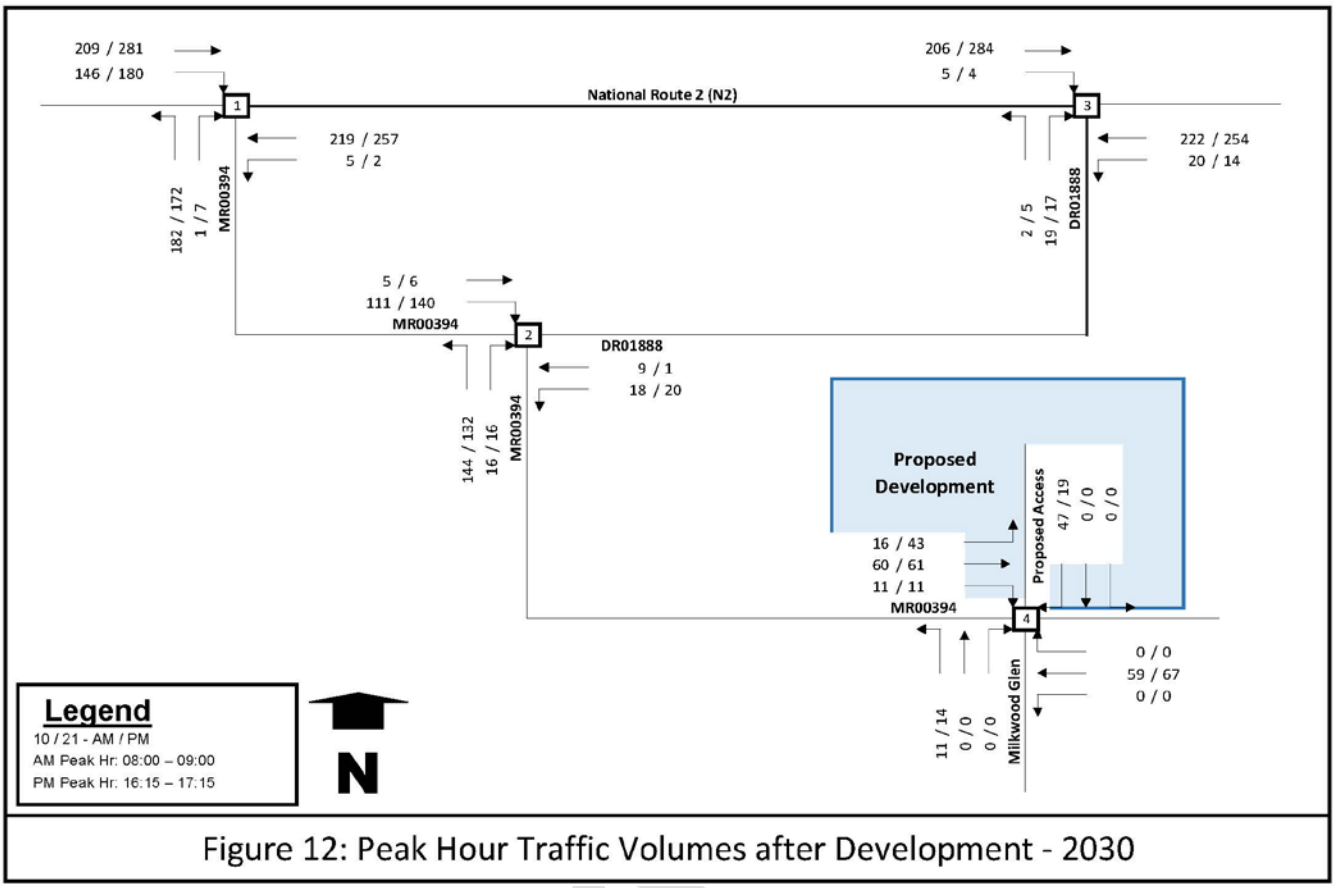


Figure 12: Peak Hour Traffic Volumes after Development - 2030

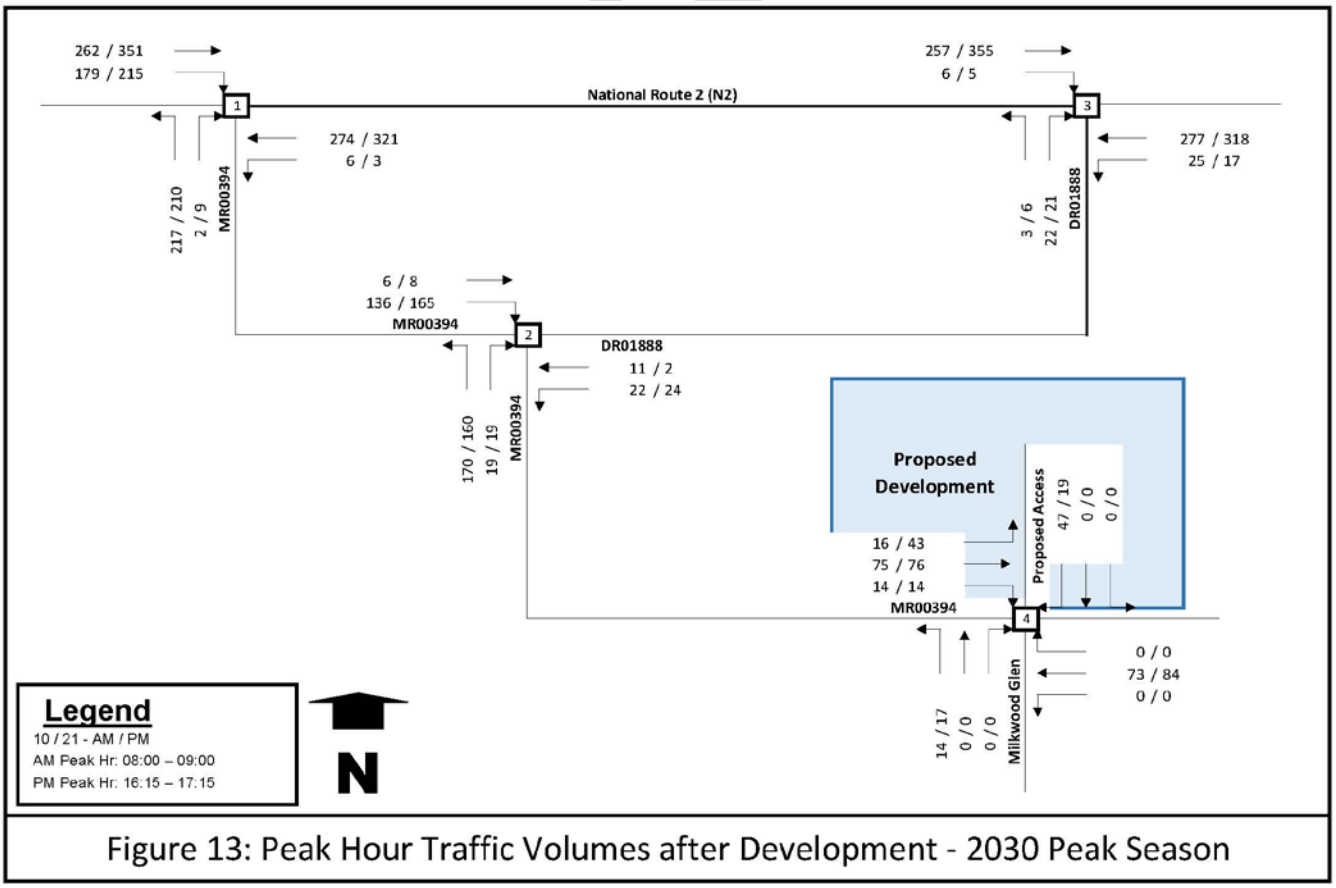


Figure 13: Peak Hour Traffic Volumes after Development - 2030 Peak Season

6 PROPOSED ACCESS ARRANGEMENTS

Access to the proposed development is proposed at the existing access point to Portion 91 of Farm 304 directly opposite the existing access to Milkwood Glen as indicated on **Figure 10**.

Given that the development is in a semi-rural environment and will generate 62 peak hour trips and 274 daily vehicle trips and based on Table 11.1 of the **Access Management Guidelines** [3], the proposed access driveway is categorised as a Class 4 Equivalent Collector Driveway.

As such the driveway should be configured as an unsignalized full junction or roundabout in terms of Table 11.2 of the **Access Management Guidelines** [3].

The permitted minimum spacing for junctions and driveways on Class 4 roads in a semi-rural development environment is 80m.

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 exceeds 200m, given that the alignment is straight and the road is flat to both the east and west.

View from access towards the west

View from access towards the east

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** [7] are indicated in **Table 5** 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 5: 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 6** below (Table 31 in TM16 Vol 2).

Table 6: 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 43 vehicles will enter the site during the PM peak hour (highest entering peak).

Given a peak hour volume of 43 vehicles entering the development the traffic ratios for each control type are indicated in **Table 7** below.

Table 7: Access Control Queue Lengths for Ptn 91 of Farm 304

Peak Hour Trips - IN (PM Peak Hour)	43	Traffic ratio	Q-Length Veh	Lanes Required	Q-Length (m)
Access Control Options	Flow (Vph)				
Swipe Magnetic card	480	23.0	1	1	6.5
Remote controlled gates	450	23.0	1	1	6.5
Ticket Dispenser: Automatic	390	23.0	1	1	6.5
Ticket Dispenser: Pushbutton	220	23.0	1	1	6.5
Pin number operated gates	150	39.0	2	1	13.0
Cell-phone operated gates (opens when call received)	100	49.0	3	1	19.5

As indicated in **Table 7**, 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.

7 CAPACITY ANALYSIS – AFTER DEVELOPMENT

7.1 2025 AFTER DEVELOPMENT

After adding generated peak hour traffic volumes to the background peak hour volumes, the traffic situation was analysed in order to determine the LOS at which the affected junctions and access points would operate during a normal month-end weekend after development occurs.

The results are shown in **Table 8** below and the detailed SIDRA output sheets attached as **Annexure E.**

Table 8: Results of Junction Capacity Analysis – 2025 After Development

Configuration	Delay		V/C		LOS*	
	AM	PM	AM	PM	AM	PM
MR00394 / N2	3.6	3.4	0.213	0.226	A*	A*
MR00394 / DR01888	6.7	6.5	0.149	0.116	A*	A*
DR01888 / N2	0.9	0.7	0.116	0.132	A*	A*
MR00394 / Proposed Access	3.4	3.0	0.065	0.067	A*	A*

* - **SIDRA Intersection Network** [7] does not calculate junction LOS for stop-controlled junctions. The LOS indicated is sourced from the **Highway Capacity Manual** [6] (**Table 2** above).

As can be seen from the results contained in **Table 8**, the additional traffic generated by the development has little or no impact on the operation of the affected junctions in terms of capacity.

7.2 2030 After Development

After adding generated 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 junctions and access points would operate after development occurs for the 2030 development horizon.

The results are shown in **Table 9** below and the detailed SIDRA output sheets attached as **Annexure F.**

Table 9: Results of Junction Capacity Analysis – 2030 After Development – Normal

Configuration	Delay		V/C		LOS*	
	AM	PM	AM	PM	AM	PM
MR00394 / N2	3.7	3.6	0.252	0.281	A*	A*
MR00394 / DR01888	6.7	6.6	0.166	0.133	A*	A*
DR01888 / N2	0.9	0.8	0.135	0.154	A*	A*
MR00394 / Proposed Access	3.2	2.8	0.067	0.073	A*	A*

* - **SIDRA Intersection Network** [7] does not calculate junction LOS for stop-controlled junctions. The LOS indicated is sourced from the **Highway Capacity Manual** [6] (**Table 2** above).

As can be seen from the results contained in **Table 9**, the additional traffic generated by the development has little or no impact on operation of the affected junctions in terms of capacity during a typical peak weekday.

7.3 2030 After Development – Peak Season

After adding generated 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 junctions and access points would operate after development occurs for the 2030 development horizon.

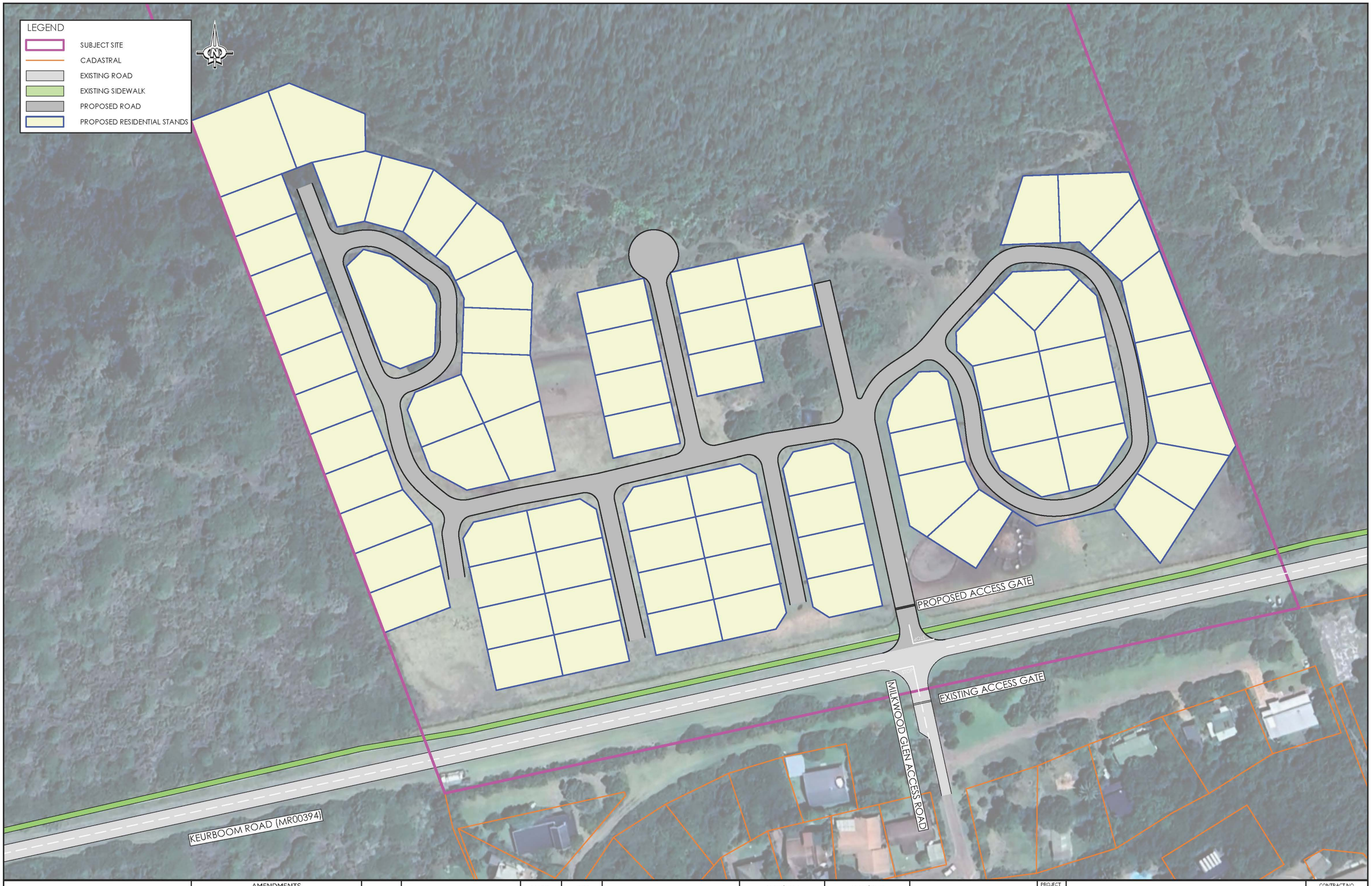
The results are shown in **Table 10** below and the detailed SIDRA output sheets attached as **Annexure G.**

Table 10: Results of Junction Capacity Analysis – 2030 After Development – Peak Season

Configuration	Delay		V/C		LOS*	
	AM	PM	AM	PM	AM	PM
MR00394 / N2	3.9	4.1	0.332	0.398	A*	A*
MR00394 / DR01888	6.6	6.6	0.172	0.162	A*	A*
DR01888 / N2	1.0	0.9	0.168	0.193	A*	A*
MR00394 / Proposed Access	3.0	2.6	0.070	0.085	A*	A*

* - **SIDRA Intersection Network** [7] does not calculate junction LOS for stop-controlled junctions. The LOS indicated is sourced from the **Highway Capacity Manual** [6] (**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 operation of the affected junctions in terms of capacity during a typical peak season weekday.



'AS BUILT' - NOTES

FOR REPORT

AMENDMENTS			
NO.	DATE	DESCRIPTION	APPROVED

SCALE: 1 : 1250

SCALE ON REDUCED DRAWING: 0 6.25 12.5 31.25 m

DESIGN	MM
DRAWN	EHN
APPROVED	CH
DATE	DEC 2023

ENGINEERING ADVICE AND SERVICES associated with ULWAZI
73 Heugh Road, Walmer
P.O. Box 13867
Humewood
Port Elizabeth
6013
tel/fax: (041) 581 2421

APPROVED
ENGINEER
DATE

APPROVED
CLIENT
DATE

PROJECT
TRAFFIC IMPACT ASSESSMENT FOR A PROPOSED RESIDENTIAL DEVELOPMENT ON PORTION 91 OF FARM MATJES FONTEIN NO. 304, KEURBOOMSTRAND

CONTRACT NO.

DWG DESCRIPTION
FIGURE 14: PROPOSED SITE LAYOUT AND ACCESS CONFIGURATION

DWG.NO.
2214-P-014

ISSUE

8 PUBLIC TRANSPORT OPERATIONS AND PEDESTRIAN ARRANGEMENTS

Public transport stops should be marked downstream of the proposed access driveway on both sides of Keurboom Road as indicated on **Figure 14**.

No additional pedestrian facilities are required.

9 PARKING REQUIREMENTS

A total of 2 bays plus a further 0.25 visitor bays per unit will be required in in terms of the requirements of the **Bitou Municipality Zoning Scheme Bylaw** [8] 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.

10 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 junctions in terms of capacity;
- Based on 2019 daily traffic surveys at the N2 Goose Valley counting station volumes on 29 November equate to 56% of the average daily volumes during December. As such the surveyed peak hour volumes have been escalated by 1.25 to provide an indication of the impact of the development during peak season traffic conditions;
- The proposed development generates a total of 62 peak hour vehicle trips during the weekday AM and PM peak hours with a maximum of 43 entering during a peak hour;
- Access to the development can safely be accommodated from Keurboom Road (MR00394) provided the access is configured as indicated on **Figure 14**;
- Access control gates to the development should be configured with a minimum of one entry lane set back a minimum of 6.5m from the road edge;
- When considering the traffic generated by the proposed development added to escalated background traffic, the affected junctions and access points all operate at acceptable Levels of Service in terms of capacity for the 2025 development horizon for normal season traffic conditions;
- When considering the traffic generated by the proposed development added to escalated background traffic, the affected junctions and access points all operate at acceptable Levels of Service in terms of capacity for the 2030 development horizon for normal season traffic conditions;
- When considering the traffic generated by the proposed development added to escalated peak season background traffic, the affected junctions and access points all operate at acceptable Levels of Service in terms of capacity for the 2030 development horizon;
- Public transport stops should be marked downstream of the proposed access driveway on both sides of Keurboom Road as indicated on **Figure 14**.

11 RECOMMENDATIONS

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

- This TIA be approved by the Bitou Local Municipality; and
- Access to the development be provided from Keurboom Road (MR00394) as indicated on **Figure 10** with the cost of access arrangements being met by the developer.

12 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. *F de Jongh & M Bruwer*, **Quantification of the Natural Variation in Traffic Flow on Selected National Roads in South Africa,** 2017.
5. *Bitou Local Municipality*, **Bitou Spatial Development Framework**, Bitou LM, 2021.
6. *Transportation Research Board*, **Highway Capacity Manual**, 2000.
7. *Akcelik & Associates (Pty) Ltd,* **SIDRA Junction Network 9 User Guide**, SIDRA Solutions, April 2019.
8. *Joubert, Sampson, et al,* **TMH 16 Volume 2- South African Traffic Impact and Site Assessment Standards and Requirements Manual**, COTO, September 2013.
9. *Bitou Local Municipality*, **Bitou Local Municipality Zoning Scheme Bylaw**, Bitou LM, 28 July 2023

ANNEXURE A
Town Planning
Report

Portion 91 of the Farm Matjes

Fontein 304

Plettenberg Bay

PRELIMINARY TOWN PLANNING REPORT

(Prepared as part of the Draft Basic Assessment Report)

Planning Space

Town and Regional Planners

11/1/2022

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 (BA) Report 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 development on Portions 91 of the Farm Matjes Rivier No. 304.

The purpose of this document is to report on the existing land use rights, opportunities and constraints on 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 Keurboom area which is situated in the Bitou Municipal Area to the northeast of Plettenberg Bay. (See Diagram 1: Locality Plan). The property can be accessed directly from Keurboom Road (Minor Road PO349 Rd) which connects with the N2 via Divisional Road DR1888. The site is approximately 1.8km west of Keurboomstrand.

This study is presently used for a horse riding centre and is directly opposite the Milkwood Glen Residential Complex, which consists of about 50 Group Housing erven and communal open space.

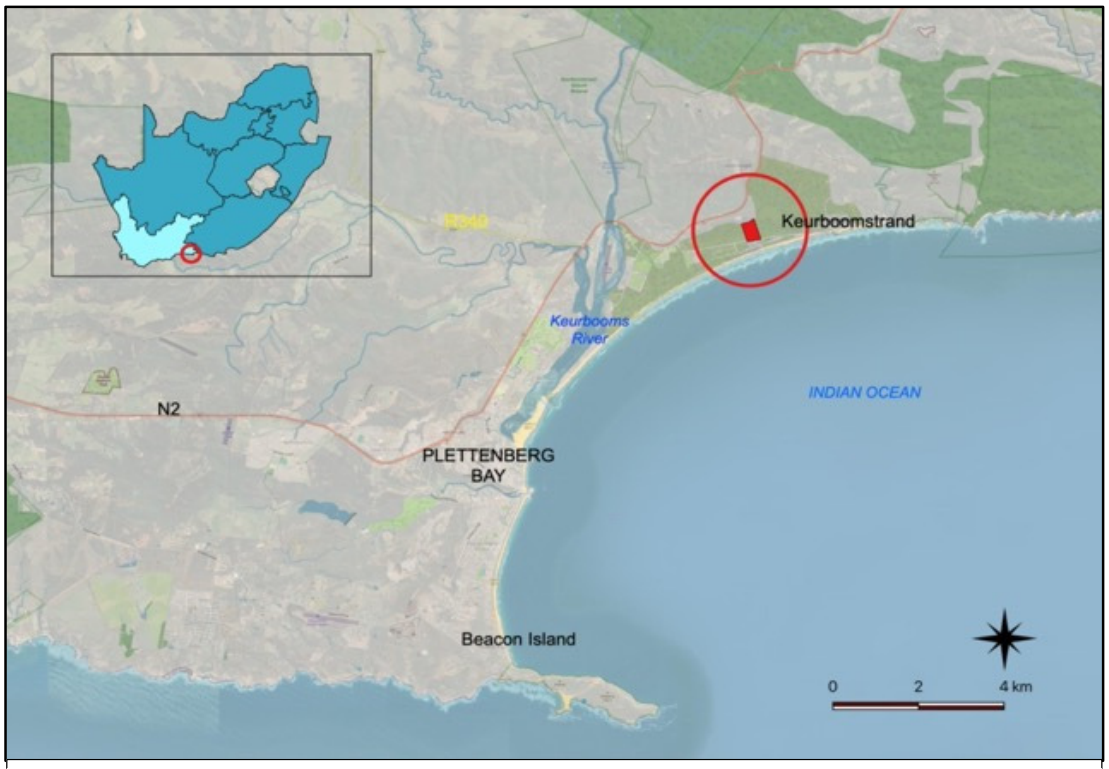


Figure 1: Location of the site (within red circle).

2.2 PROPERTY DESCRIPTION

Title Deed Description:	Portion 91 (a portion of portion 14) of the farm Matjes Fontein 304 in the Bitou Municipality and Administrative District of Knysna, Western Cape Province.
21 Digit code	C03900000000030400091
Title Deed Number:	73549/2000
S.G. Diagram Nr:	S.G 6050/1997
Title Deed Restrictions:	Condition C contains restrictions that required the approval of in terms of Act 21 of 1940 (Provincial Roads Authority)
Servitudes:	None
Property Size:	14.7251ha
Property Owner:	Familie Roux Eiendomme (Pty) Ltd
Bonds:	None
Zoning:	Agriculture 1 in terms of the Section 8 Zoning Scheme
Land Use	Riding School

2.3. BACKGROUND

Portion 91 was created when Portion 14 were subdivided in 1997.

In 1978 approval was granted by the Provincial Administration for the development of a Resort with 100 units on Portion 14. Fifty-one units were approved to the south of the Keurboom Road that bisects the property, and 49 units were approved above the road (See Annexure F). The development was implemented in phases. Phase 1 gained approval in 1978, Phase 2 was approved in 1981 and Phase 3 in 1991. These phases were all implemented below the road and are today known as Milkwood Glen.

In 1997 the remainder of Portion 14 was subdivided to separate the undeveloped portion above the road from the resort. At the time it was recommended that the zoning of Portion 91 reverts to Agriculture 1 and that a new application is submitted for development on the northern portion in the event of the owner deciding to develop it (See Annexure G).

2.4 SITE CHARACTERISTICS

2.4.1 TOPOGRAPHY

The southern portion of the property has a very even gradient and is situated between 3m and 6m above sea level. From here the gradient steeply inclines to about 125m above sea level, forming a steep south-facing ridge. The development is planned on the even southern portion of the site.

A detailed contour plan of the southern section was prepared by VPM Surveys and is attached as Diagram 5.

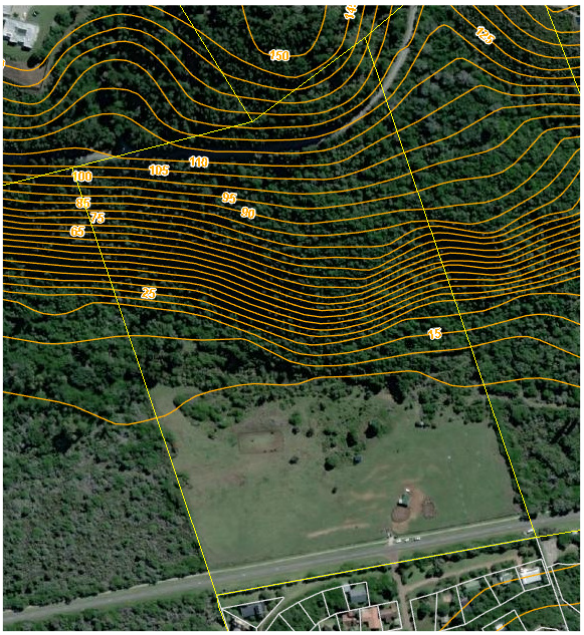


Figure 2: 5m aerial contour of the site

The slope analysis (Diagram 6) indicates that the entire southern section of the site has a gradient of less than 25% and is therefore suitable for development.

2.4.2 ESTUARINE FUNCTIONAL ZONE (EFZ)

The Keurboom Bitou Estuarine Management Plan includes the mapping of an Estuarine Functional Zone. An Estuarine Functional Zone is defined in the NEMA Regulations as "the area in and around an estuary which includes open water areas, estuarine habitats, and the surrounding flood plains.

The mapped Estuarine functional Zone is however identified as any area below the 5m above mean sea-level, which does not accurately identify the Estuarine Functional zone as defined above.
The ground truthing of the site by an Aquatic Specialist (Confluent Aquatic Consulting and Services) confirmed that there are no aquatic features present on the site and no hydromorphic indicators in the soil. Furthermore, according to the Keurboom -Bitou Estuary management Plan the property is located above the 100-year flood line, so there is also no flood risk associated with the property. The Aquatic Assessment Statement is attached as Annexure D.

Figure 3: Position of the site in relation to the Estuary and other developments

2.4.4 VEGETATION

According to scientific literature (Driver et al., 2005; Mucina et al., 2006), the entire site is identified as Garden Route Shale Fynbos which is assessed as Endangered. The Western Cape Biodiversity

Spatial Plan (WCBSP) shows that the entire northern 60% of the site (except the road) is within a CBA1 area, while the rest of the is in a transformed area.

A qualified Botanist, Dr David Hoare was appointed to conduct a Plants, Animals & Terrestrial Biodiversity Assessment to determine whether vegetation of the listed ecosystem occurs on-site or not. The Study is attached as Annexure E.

Based on a field survey to verify conditions on site, a detailed landcover and habitat mapping exercise were undertaken for the site. This identified three main habitats occurring on site, shown in Figure 3 below. These are mapped as **Forests, Secondary vegetation,** and **Pastures**. There are also **transformed areas** associated with roads, localised patches of **alien trees**, and residual individual **milkwood trees.**

Pastures occur in the entire southern part of the site in areas that were historically cultivated. The pastures have a low sensitivity rating and can be developed as they will not be able to recover to a natural state.

The steep-sided southern slopes in the northern half of the site contain indigenous forest that has a high sensitivity and may not be developed. Between the forest and the pastures is an irregularly shaped band of vegetation that contains a mixture of shrubs and weeds that indicates that it is in various stages of post-disturbance development. Historical aerial photographs show that this entire area was once cultivated but has gone through various iterations of being cleared and then recovering somewhat. This area has a medium sensitivity.

The proposed development is entirely within areas mapped as secondary vegetation or pasture that has low biodiversity value and sensitivity. The development is therefore supported by the specialist assessment on condition that steps are taken to protect forest habitats on the remaining parts of the site. The report recommends a buffer area between the forest and the development and that steps should be taken to rehabilitate these areas and encourage the growth of forest species. Ongoing alien clearing will also be a requirement.

The proposed layout makes provision for a 10m buffer along the forest margin and also incorporated portions of the secondary vegetation area to form part of the open space system within the development, which will link up with the forest area.

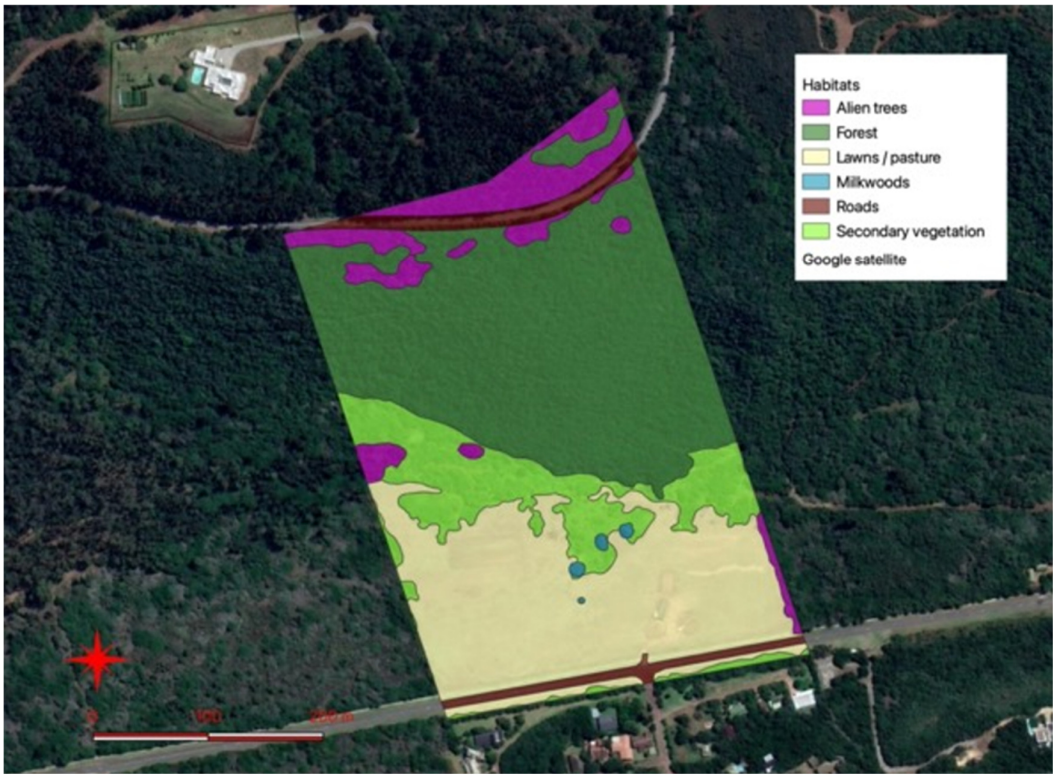


Figure 4: Vegetation Map of the Site

2.4.5 IMPROVEMENTS

The property is presently used as a riding school and some horse paddocks and other informal structures associated with the riding school are present on the site. There are not any permanent buildings on the site.

Figure 5: Horse paddock

2.4.6 SERVITUDES AND OTHER RESTRICTIONS

The property is not encumbered by any servitudes, but 2 public roads traverse the property that will be accommodated in the layout as per requirement from the Provincial Roads Authority.

3. Proposal

3.1 DEVELOPMENT CONCEPT

The Plettenberg Bay area historically has very little housing opportunities for middle-income earners. The recent influx of higher-income families moving to the area has led to a sharp increase in housing prices which has 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 houses 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.

The vision of this development is to create an affordable and sustainable housing product specifically targeting the middle-income group. The aim is to create a pleasant yet affordable residential neighbourhood where the average person can own a home and live with dignity. The architecture will be based on green principles which will include smaller but well-designed houses, which are more cost-efficient, energy-efficient and healthy.

The development concept includes ± 73 group housing stands with average erf sizes of ±375m². The houses will vary in size but will be built in a similar style that will create a harmonious development. Ample open spaces and landscaped streets are incorporated into the design to enhance the quality of the neighbourhood.

3.2 DEVELOPMENT DENSITY

The property is 14.7ha in size and the gross density will calculate at 5 units per ha. The nett density is calculated excluding the undevelopable steep slopes to the north of the site. The identified

development area measures approximately 6ha and 73 units will calculate to a net density of 12 units per ha.

3.3 LAYOUT DESIGN CONSIDERATIONS

The Concept Layout is attached as Diagram 11. The design considerations that informed the layout include:

3.3.1 FINANCIALLY VIABLE DENSITY

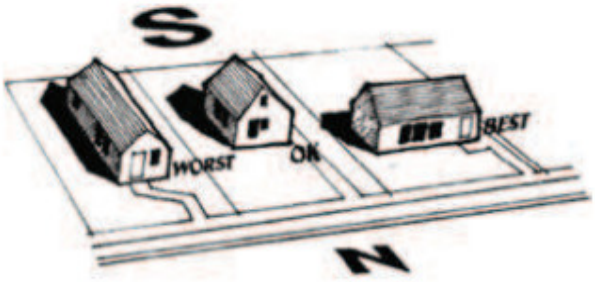
The developer wants to provide a high-quality yet affordable housing product. To make this project financially viable and responsive to the target market, the cost of land, services and build cost need to be limited and in order to do so, a certain economy of scale needs to be attained. The most relevant design aspect to achieve this is through development density. The planned nett residential density is approximately 12 units per ha, which is still regarded as low density. Medium-density housing, defined in terms of dwelling units per hectare (du/ha), is approximately 40–100 du/ha (gross). And would be more cost-effective. However, being situated at the outer edge of town, and not in the centre, too high density will also not be appropriate as it may impact on the character of the area.

The proposed density is high enough to be financially viable, yet low enough to fit into the surrounding area.

3.3.2 ENERGY EFFICIENT ORIENTATION AND DESIGN

The houses will be equipped with solar systems which require maximum exposure to the sun. In the Southern Hemisphere, houses should be orientated to face north. The layout design has as far as possible orientated erven, especially the smaller ones, in such a way that houses can be places with their longer frontages to the north.

House designs will be elaborated on in the Architectural Design Guidelines. Energy efficient guidelines will include elements such as having appropriate areas of glazing, correct orientation, suitable levels of shading, insulation and thermal mass. The use of local building materials and renewable energy applications such as solar water heaters, rainwater harvesting etc. will be encouraged



Orientation of houses

Figure 6: House Orientation

3.3.3 SAFE STREETS

The road network will consist of landscaped lanes. A great neighbourhood has safe and friendly streets where people can walk without fear of crime or being threatened by traffic. The streets in this neighbourhood will be private with low volume and speed and will function more like open spaces than traffic ways. The main road reserves are 12m wide which will allow for enough space to accommodate a road surface, services, sidewalks, and landscaping. All secondary Streets measure 10m in width.

3.3.4 A CONNECTION WITH NATURE

The proposed open space system corresponds to the position of indigenous vegetation. These areas will be part of the landscaping plan of the development and will provide an opportunity for recreational areas such as walking trails, lookout points etc. These facilities will be formally laid out to avoid unnecessary informal path formation in the sensitive forest habitat. A play park and picnic area are planned under the Milkwood trees and the small dam can be equipped with a bird hide or benches where the resident can enjoy the greenery. A great neighbourhood has places for people to meet, talk and be neighbourly.

3.3.5 SECURITY

Crime is a South African reality and must be a consideration in any new development. The development will be a gated security complex. The development will be fenced but special attention will be given to unobtrusive fencing and animal movement. There will only be one gatehouse that will control access.

3.3.6 CLIMATE CHANGE

Although the site has not been subject to any past flooding, low-lying areas below 3m have been avoided and form part of the open system to accommodate possible future flooding scenarios. This will enhance the resilience of the development to climate change in the future. A detailed stormwater plan will be submitted.

3.3.7 VISUAL SENSITIVITY

The Keurboom Road is a scenic route and as such, the visual quality along the way is a relevant consideration. There is a 10m wide open space system proposed along this road. This strip of land will be densely vegetated to obscure the development. This vegetation buffer will allow for a visual barrier between the development and the Road, which will reduce the visual impact of the development, and reduce noise levels emanating from the Road.

3.4 PROPOSED ZONING AND SUBDIVISION

At the time of writing this report, the Section 8 Zoning Scheme Regulations are still applicable to the area. The new Bitou Zoning Scheme Bylaw has been approved by Council but has not yet been promulgated.

The proposal includes rezoning the property to a “Subdivisional Area”. The consolidated stand will then be subdivided into :

- 73 Residential II (Group Housing) erven;
- 1 Open Space II erf (communal open space that will include private streets and services and landscaped gardens);

- 1 Open Space III erf (conservation area which will include the sensitive forest area);
- 2 Transport II erf (Public road to accommodate the existing divisional road that traverses the southern boundary of the property and the old National road that traverses the northern section of the property)

3.5 ENGINEERING SERVICES

The development will aim to be as self-sufficient as possible. There are municipal water sewer and electrical networks available in the area as can be seen on the attached Engineering Services (Diagram 11). An Engineering Report confirming the capacity of bulk services will be required.

3.6 HOME OWNERS ASSOCIATION

The development will be managed by a Homeowners Association that will be responsible for the maintenance of the communal open space and services.

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 Section8 Zoning Scheme applicable to the area. To facilitate the development of the land the property will have to be rezoned to a "Sub-divisional Area".

(ii) **Subdivision in terms of Section 15 (2)d of the said Bylaw:** The current subdivision plan indicates the subdivision of the property into 73 individual Group Housing erven with average erf sizes of ±375m² as well as roads and private open spaces.

3.7.2 NATIONAL HERITAGE RECOURSES ACT 25 OF 1999

The rezoning of more than a hectare of land will require 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.

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 "Recreational" purposes. This means that although the property has farm portion numbers and is zoned for agricultural purposes, it is exempt from the provisions of the Subdivision of Agricultural Land Act (Act 70 of 70). An exemption certificate from the Department of Environmental Affairs and Development Planning will be requested.

Figure 7: Extract from the KWP Guide Plan

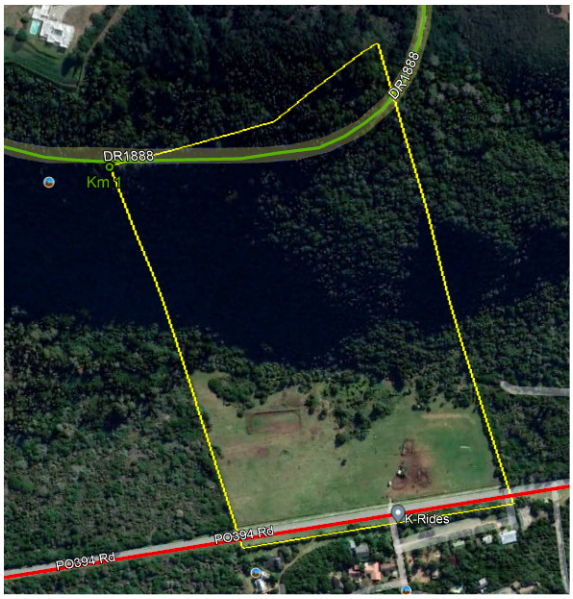
3.7.4 APPLICATION TO SANRAL IN TERMS OF THE SOUTH AFRICAN NATIONAL ROADS AGENCY LIMITED AND NATIONAL ROADS ACT, ACT 7 OF 1998

The property is not 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.

An application to SANRAL is not required.

3.7.5 ADVERTISING ON ROADS AND RIBBON DEVELOPMENT ACT 21 OF 1940

A 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 two Provincial Roads, the PO394 and DR1888 and will therefore require approval from 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.

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 falls 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.

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 Bitou Lm Growth Projections and Land Use Budget, the actual population growth in Bitou LM for the period 2001 –2016 has been about 1999 people per annum and this growth rate has dramatically increased in the last 2 years. 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. Recent unrest and increased crime and violence in Gauteng and Natal will be likely to create an even higher demand for housing in safer areas. This leads to a situation where demand, and therefore property prices, are well above national averages even though affordability is relatively low.

The Plettenberg Bay area historically has very little housing opportunities for middle-income earners. The mentioned influx of higher-income families moving to the area has led to a sharp increase in housing prices which has 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 houses 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.

This development aims to address the housing need of the middle-income earners who lives and work in the area.

4.1.2 SOCIO-ECONOMIC NEED OF THE LARGER COMMUNITY

South Africa has an ever-increasing challenge of high unemployment and skills shortages. With the destructive impact of Covid 19 on the world economy this problem has worsened. 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 cut the unemployment rate to 6% by 2030.

The planned residential estate 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 a period of 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 table below provides a summary of the physical site constraints and opportunities identified to date:

OPPORTUNITIES	CONSTRAINTS
Municipal Infrastructure: Bulk municipal services are available, and access is available through an existing road network. Municipal sewer and water lines are situated along this road, making a cost-efficient connection to this network possible.	There is 2 public road that traverses over the properties, taking away valuable development land. The capacity of the existing infrastructure needs to be further investigated.
Agricultural Value: The property has no agricultural value due to, its small size, and limited irrigation potential.	

For this reason, the property has not been identified for Agricultural purposes in the SDF.	
Low conservation value: The southern side of the property has a low conservation value due to historical agricultural practices.	The northern part of the property is covered with sensitive forest and cannot be developed.
Topography: The site has an even gradient which will allow for cost-effective services and design.	A large part of the property is too steep to develop The low-lying nature of the land (below 5m MSL) results in the property being identified as part of the EFZ
	High visibility: The development area is situated adjacent to Keurboom Road. A Landscape Plan and an architectural design guideline will be a requirement to mitigate the potential visual impact.

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 Keurboom village is a seasonal holiday town with a homogeneous single residential holiday character. The property is about 1.8 km west of the town along a stretch of road that contains several gated residential developments. The Zoning Plan attached hereto indicate that the study area mainly consists of Single residential and Group housing zoned residential estate of varying densities. The proposal is compatible with the existing land uses.

DEVELOPMENT NAME		NR OF UNITS
Dolphin Waves	12/304	64 Group Housing stands
Keurbaai	13/304	11 Group Housing Residential
Milkwood Glen	14/304	51 Group Housing Stands

Driftwood	15/304	5 Single Residential Stands
Whales Haven	16/304	17 Group Housing Stands

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 the 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 Western Cape Biodiversity Spatial Plan 2017

The Western Cape Biodiversity Spatial Plan (WCBSP) was developed by CapeNature, in collaboration with the Department of Environmental Affairs and Development Planning as a spatial tool that comprises the Biodiversity Spatial Plan Map (BSP Map) of biodiversity priority areas, accompanied by contextual information and land-use guidelines.

The Biodiversity Sector Plan simply provides information on biodiversity (i.e., provides only one information layer of the many layers required in land-use planning), and must be used in conjunction with other land-use or town and regional planning application procedures.

In terms of these maps, the northern section of the property is a Critical Biodiversity area, while the southern section is a completely transformed area. Development is not permitted in the CBA area but is generally permitted in transformed areas.

4.2.3.4 Bitou Spatial Development Framework 2021

The Bitou Spatial Development Framework 2021 was approved by 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 can be seen from the extract of the SDF map below, a portion of the property has been identified as a strategic development area within the urban edge. This proposal aligns with the proposed development nodes as identified in the Keurboom local Area Structure Plan, which provides more detail and recommendations (see par4.2.3.5 below). The urban edge has been defined by the steep sloped to the north and the 5m contour line which defines the Estuarine Functional Zone to the south. The proposed development area extends beyond the identified urban edge as the Aquatic Assessment confirmed that the area contains no estuarine habitats and is below the 1:100-year flood line of the estuary.

The SDF states that the urban edge is to be viewed as a conceptual, indicative measure (growth management tool) aimed at illustrating a concept, rather than being in exact line with statutory status. The SDF also explains that the urban edge is a proposed limit for expansion of any urban node beyond which development should not occur unless the land is already provided with or can connect directly to existing municipal services infrastructure. In this case available municipal water and sewer pipelines traverse the south boundary of the property so the development can connect directly to the network (chapter 4.3 action 2.2)

Figure 8: Extract from the Bitou SDF 2021

Furthermore, the SDF confirms that all land development applications for the use of land abutting an urban edge should be considered consistent with the SDF if the land has at any time in the past been used or designated for any urban development, which includes all development of land where the primary use of the land is for the erection of structures. In this case, the land was previously approved for a resort with 50 units, this has also been acknowledged in the Keurboom Local Environs Spatial plan (see table D3).

4.2.3.5 Keurboom and Environs Local Area Spatial Plan

A detailed Local Area Spatial Plan was compiled for the Keurbooms area in 2013 (See Diagram 10 attached).

The area has a fairly homogenous holiday/resort character. The document states that altering its character by permitting commercial and other non-residential development could detract from the area's attraction. The theme should thus be a low-density residential one. The proposal complies with this theme.

The property is situated in the Coastal Corridor which is defined by a number of smaller properties located within an approximate 1km offset from the high watermark extending from the Bitou River in the direction of the Keurboomstrand settlement. The Spatial Plan has identified development nodes for this area. For these nodes, a gross density profile of 12 units per ha of the identified transformed footprint area is proposed. The latter is based on the guideline of 15 units per hectare proposed for smaller rural settlements as contained in the Draft Bitou SDF (2013).

The extent of the proposed development nodes as conceptually indicated on the plan is based on the measured footprint of the identified transformed area. The proposed development nodes are strictly located within areas that have been identified as being transformed with no natural remnants remaining.

The entire southern portion of the site, where the development is planned, is identified as a transformed area, according to the Environmental Sensitivity Map Nr 6 and Biodiversity Map Nr 7 attached to the Keurboom and Environs Local Area Spatial Plan Report. The prosed density of the development is 12 units per ha of the identified transformed footprint, as proposed in the document

The document also determined "no go" development areas based on the various bio-physical constraints which determine that no development should be considered:

- below the 1:50 and 100: year flood lines;
- on any slopes with a gradient steeper than 1:4;
- below the 4,5m coastal setback line;
- within the 100m high water mark setback; and
- within the Tshokwane Wetland system.

The proposed development footprint complies with all the parameters as set out above, except for the 4,5m coastal setback line. Taking the 4.5m contour line into account, only about 1.6ha of the 6ha transformed area has been identified as being suitable for development. This calculates to a maximum of 19 units.

This 4.5m coastal setback recommendation was taken from the 4.5m swash contour and 4.5 m estuary/river flood contour that was a recommendation by the 2010 Eden District Municipality Sea level rise and flood risk model of 2010, commissioned by The Provincial Department of Environmental Affairs and Development Planning. The purpose of this model was to identify areas that are vulnerable to migrating shorelines and tidal reaches, storm associated extreme sea levels and estuary/river flooding. It is submitted that this property is not within 100m of the coastline and is not in the 100-year flood line of the estuary flood plain as defined in the Keurbooms Bitou Estuarine Management Plan 2018 and the reference to the 4.5m inland contour line are therefore less relevant to properties inland of these vulnerable areas.

5. Summary

Portion 91 of the Farm Matjes Rivier No. 304 measures 14.7ha and is zoned for Agricultural purposes. The southern section of the property consists of pastures and has a very even gradient, while the north section has a steep gradient covered in indigenous forest vegetation. It is the vision of the landowner to create an affordable and sustainable housing product specifically targeting the middle-income group.

The development is planned on the southern portion while the northern section will be protected as a nature conservation area. At this stage, the layout proposes 73 group housing erven with a communal open space that will include roads, infrastructure, and parks.

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

Previous development rights allowed for the development of ±50 units on the property but these rights were not implemented and have lapsed. Both the Bitou Spatial Development Framework and the Keurbooms Environ Local Area Structure Plan earmarked a portion of the property for development. The proposal extends beyond the identified development area, based on the aquatic specialist study that confirms that the that has been excluded does not contain any estuarine habitats and is below the demarcated estuarine floodplain.

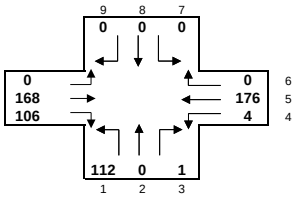
ANNEXURE B
Peak Hour
Traffic Counts

Project : TIA : PROPOSED DEVELOPMENT IN PLETTENBERG BAY
Intersection : N2 / MR00394
NO. 1
Day & date : 29/11/2023
Time period: 06:00 - 09:00

STARTING TIME	MR00394 Northbound				N2 Westbound				- Southbound				N2 Eastbound				INTER-SECTION	
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	Hour
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
06:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
06:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
06:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00	7	0	0	7	0	30	0	30	0	0	0	0	0	18	3	21	58	58
07:15	20	0	0	20	0	62	0	62	0	0	0	0	0	42	10	52	134	192
07:30	14	0	3	17	2	31	0	33	0	0	0	0	0	29	20	49	99	291
07:45	26	0	0	26	0	45	0	45	0	0	0	0	0	30	20	50	121	412
08:00	25	0	1	26	1	38	0	39	0	0	0	0	0	24	23	47	112	466
08:15	28	0	0	28	0	40	0	40	0	0	0	0	0	28	22	50	118	450
08:30	28	0	0	28	1	48	0	49	0	0	0	0	0	50	36	86	163	514
08:45	31	0	0	31	2	50	0	52	0	0	0	0	0	66	25	91	174	567
Total	179	0	4	183	6	344	0	350	0	0	0	0	0	287	159	446	979	
Peak hour	112	0	1	113	4	176	0	180	0	0	0	0	0	168	106	274	567	
Peak 15 min				31				52				0				91	174	
PHF				0.91				0.87				#####				0.75	0.81	

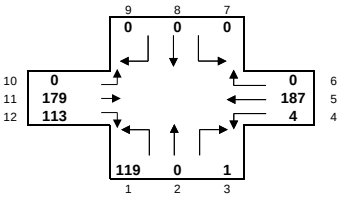
31

AM PEAK HOUR 2023



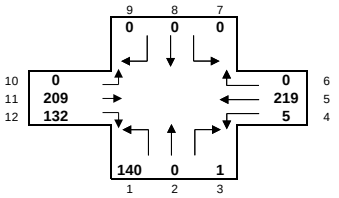
MR00394

AM PEAK HOUR 2025



MR00394

AM PEAK HOUR 2030



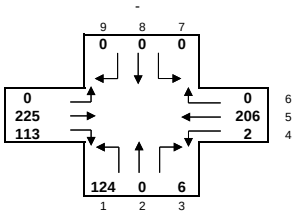
MR00394

Project : TIA : PROPOSED DEVELOPMENT IN PLETTENBERG BAY
Intersection : N2 / MR00394
NO. 1
Day & date : 29/11/2023
Time period: 15:00 - 18:00

STARTING TIME	MR00394 Northbound				N2 Westbound				- Southbound				N2 Eastbound				INTER-SECTION	
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	Hour
15:00	17	0	1	18	2	50	0	52	0	0	0	0	0	62	19	81	151	
15:15	19	0	0	19	1	48	0	49	0	0	0	0	0	49	21	70	138	
15:30	34	0	0	34	2	54	0	56	0	0	0	0	0	57	36	93	183	
15:45	17	0	0	17	0	47	0	47	0	0	0	0	0	40	26	66	130	602
16:00	26	0	1	27	2	51	0	53	0	0	0	0	0	44	24	68	148	599
16:15	30	0	1	31	1	52	0	53	0	0	0	0	0	47	25	72	156	617
16:30	26	0	3	29	0	50	0	50	0	0	0	0	0	47	26	73	152	586
16:45	38	0	1	39	1	41	0	42	0	0	0	0	0	57	38	95	176	632
17:00	30	0	1	31	0	63	0	63	0	0	0	0	0	74	24	98	192	676
17:15	10	0	0	10	1	40	0	41	0	0	0	0	0	35	8	43	94	614
17:30	11	0	0	11	1	40	0	41	0	0	0	0	0	32	14	46	98	560
17:45	15	0	1	16	0	27	0	27	0	0	0	0	0	22	22	44	87	471
Total	273	0	9	282	11	563	0	574	0	0	0	0	0	566	283	849	1618	
Peak hour	124	0	6	130	2	206	0	208	0	0	0	0	0	225	113	338	676	
Peak 15 min				39				63				0				98	192	
PHF				0.83				0.83				#####				0.86	0.88	

N

PM PEAK HOUR 2023



MR00394

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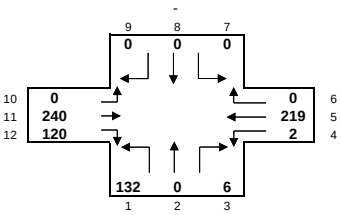
PM PEAK HOUR 2025



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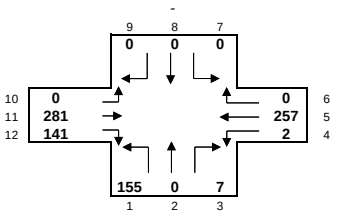


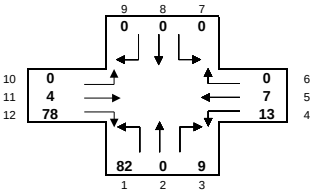
MR00394

Project : TIA : PROPOSED DEVELOPMENT IN PLETTENBERG BAY
Intersection : MR00394 / DR01888
NO. 2
Day & date : 29/11/2023
Time period: 06:00 - 09:00

STARTING TIME	MR00394 Northbound				DR01888 Westbound				- Southbound				MR00394 Eastbound				INTER-SECTION	
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	Hour
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
06:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
06:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
06:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00	7	0	1	8	2	0	0	2	0	0	0	0	0	1	3	4	14	14
07:15	10	0	0	10	0	0	0	0	0	0	0	0	0	1	10	11	21	35
07:30	4	0	0	4	1	0	0	1	0	0	0	0	0	0	9	9	14	49
07:45	20	0	0	20	1	0	0	1	0	0	0	0	0	0	11	11	32	81
08:00	10	0	3	13	6	0	0	6	0	0	0	0	0	0	8	8	27	94
08:15	21	0	2	23	4	5	0	9	0	0	0	0	0	2	20	22	54	127
08:30	24	0	2	26	2	0	0	2	0	0	0	0	0	1	28	29	57	170
08:45	27	0	2	29	1	2	0	3	0	0	0	0	0	1	22	23	55	193
Total	123	0	10	133	17	7	0	24	0	0	0	0	0	6	111	117	274	
Peak hour	82	0	9	91	13	7	0	20	0	0	0	0	0	4	78	82	193	
Peak 15 min				29				9				0				29	57	
PHF				0.78				0.56				#####				0.71	0.85	

29

AM PEAK HOUR 2023



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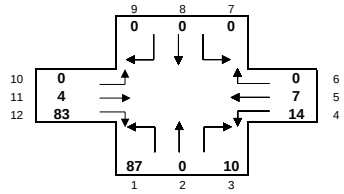

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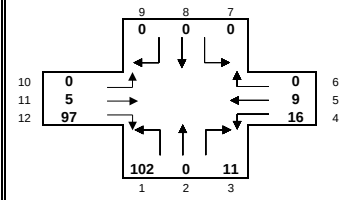


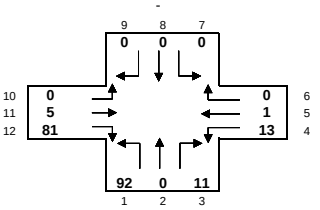
MR00394

Project : TIA : PROPOSED DEVELOPMENT IN PLETTENBERG BAY
Intersection : MR00394 / DR01888
NO. 2
Day & date : 29/11/2023
Time period: 15:00 - 18:00

STARTING TIME	MR00394 Northbound				DR01888 Westbound				- Southbound				MR00394 Eastbound				INTER-SECTION	
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	Hour
15:00	22	0	2	24	1	2	0	3	0	0	0	0	0	0	17	17	44	
15:15	19	0	3	22	2	0	0	2	0	0	0	0	0	1	21	22	46	
15:30	21	0	2	23	4	1	0	5	0	0	0	0	0	4	21	25	53	
15:45	18	0	4	22	3	0	0	3	0	0	0	0	0	0	26	26	51	194
16:00	32	0	0	32	2	0	0	2	0	0	0	0	0	1	20	21	55	205
16:15	25	0	6	31	2	0	0	2	0	0	0	0	0	2	19	21	54	213
16:30	21	0	0	21	5	0	0	5	0	0	0	0	0	0	22	22	48	208
16:45	25	0	3	28	3	1	0	4	0	0	0	0	0	1	22	23	55	212
17:00	21	0	2	23	3	0	0	3	0	0	0	0	0	2	18	20	46	203
17:15	18	0	1	19	6	0	0	6	0	0	0	0	0	1	13	14	39	188
17:30	11	0	2	13	2	1	0	3	0	0	0	0	0	2	8	10	26	166
17:45	18	0	0	18	2	0	0	2	0	0	0	0	0	1	15	16	36	147
Total	251	0	25	276	35	5	0	40	0	0	0	0	0	15	222	237	517	
Peak hour	92	0	11	103	13	1	0	14	0	0	0	0	0	5	81	86	203	
Peak 15 min				31				5				0				23	55	
PHF				0.83				0.70				#####				0.93	0.92	

N

PM PEAK HOUR 2023



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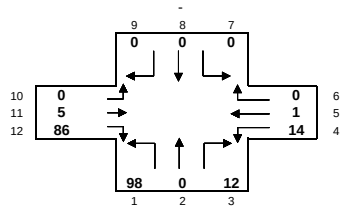

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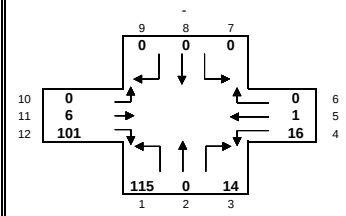
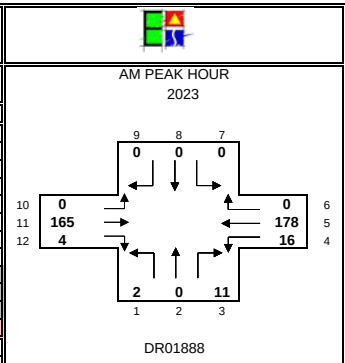


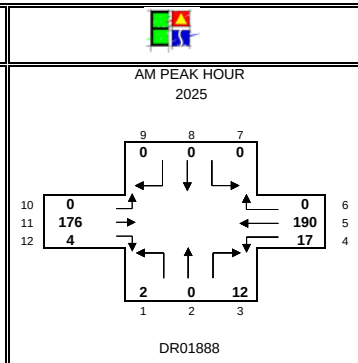
MR00394

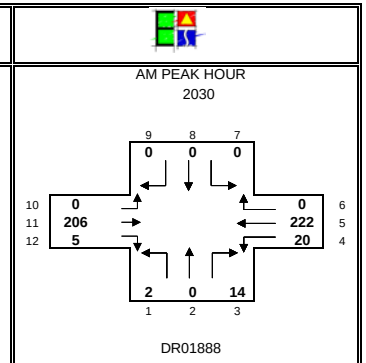
Project : TIA : PROPOSED DEVELOPMENT IN PLETTENBERG BAY
Intersection : N2 / DR01888
NO. 3
Day & date : 29/11/2023
Time period: 06:00 - 09:00

STARTING TIME	DR01888 Northbound				N2 Westbound				- Southbound				N2 Eastbound				INTER-SECTION	
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	Hour
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
06:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
06:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
06:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00	0	0	2	2	2	30	0	32	0	0	0	0	0	18	0	18	52	52
07:15	1	0	0	1	0	61	0	61	0	0	0	0	0	42	0	42	104	156
07:30	0	0	0	0	0	33	0	33	0	0	0	0	0	31	1	32	65	221
07:45	0	0	0	0	1	45	0	46	0	0	0	0	0	30	0	30	76	297
08:00	0	0	3	3	5	39	0	44	0	0	0	0	0	24	1	25	72	317
08:15	1	0	3	4	7	39	0	46	0	0	0	0	0	26	2	28	78	291
08:30	1	0	2	3	2	48	0	50	0	0	0	0	0	50	0	50	103	329
08:45	0	0	3	3	2	52	0	54	0	0	0	0	0	65	1	66	123	376
Total	3	0	13	16	19	347	0	366	0	0	0	0	0	286	5	291	673	
Peak hour	2	0	11	13	16	178	0	194	0	0	0	0	0	165	4	169	376	
Peak 15 min				4				54				0				66	123	
PHF				0.81				0.90				#####				0.64	0.76	

4

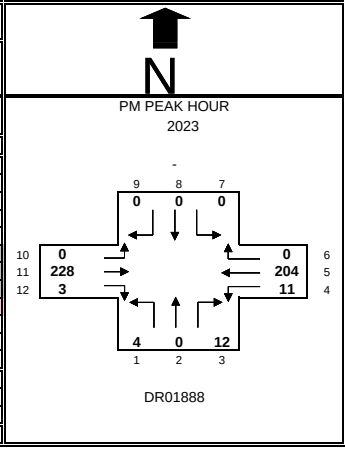


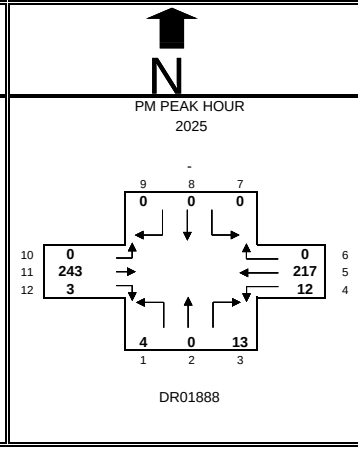


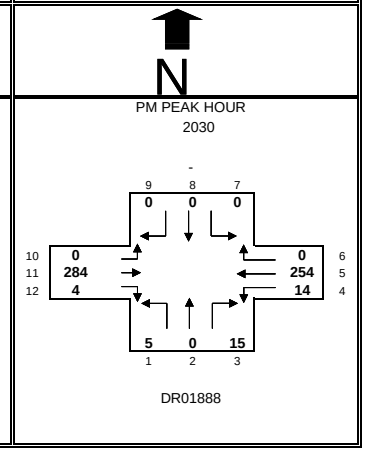


Project : TIA : PROPOSED DEVELOPMENT IN PLETTENBERG BAY
Intersection : N2 / DR01888
NO. 3
Day & date : 29/11/2023
Time period: 15:00 - 18:00

STARTING TIME	DR01888 Northbound				N2 Westbound				- Southbound				N2 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	2	2	2	52	0	54	0	0	0	0	0	62	1	63	119	
15:15	1	0	3	4	2	48	0	50	0	0	0	0	0	49	0	49	103	
15:30	1	0	5	6	4	55	0	59	0	0	0	0	0	56	1	57	122	
15:45	1	0	3	4	2	46	0	48	0	0	0	0	0	39	1	40	92	436
16:00	0	0	1	1	2	53	0	55	0	0	0	0	0	45	0	45	101	418
16:15	2	0	6	8	2	51	0	53	0	0	0	0	0	48	0	48	109	424
16:30	0	0	0	0	4	50	0	54	0	0	0	0	0	49	1	50	104	406
16:45	1	0	3	4	3	41	0	44	0	0	0	0	0	57	1	58	106	420
17:00	1	0	3	4	2	62	0	64	0	0	0	0	0	74	1	75	143	462
17:15	0	0	2	2	5	41	0	46	0	0	0	0	0	34	1	35	83	436
17:30	1	0	3	4	2	40	0	42	0	0	0	0	0	31	1	32	78	410
17:45	0	0	1	1	2	27	0	29	0	0	0	0	0	23	0	23	53	357
Total	8	0	32	40	32	566	0	598	0	0	0	0	0	567	8	575	1160	
Peak hour	4	0	12	16	11	204	0	215	0	0	0	0	0	228	3	231	462	
Peak 15 min				8				64				0				75	143	
PHF				0.50				0.84				#####				0.77	0.81	

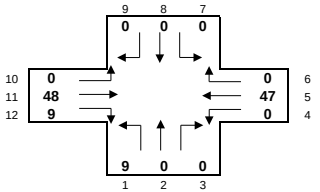






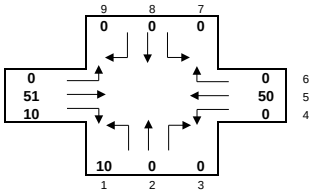
Project :	TIA : PROPOSED DEVELOPMENT IN PLETTENBERG BAY											Day & date :	29/11/2023					
Intersection :	MILKWOOD GLEN / MR00394 / PROPOSED ACCESS				NO. 4							Time period:	06:00 - 09:00					
STARTING TIME	MILKWOOD GLEN Northbound				MR00394 Westbound				Proposed Access Southbound				MR00394 Eastbound				INTER-SECTION	
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	Hour
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
06:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
06:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
06:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00	1	0	0	1	0	4	0	4	0	0	0	0	0	3	1	4	9	9
07:15	1	0	0	1	0	5	0	5	0	0	0	0	0	5	1	6	12	21
07:30	0	0	0	0	0	2	0	2	0	0	0	0	0	5	1	6	8	29
07:45	2	0	0	2	0	11	0	11	0	0	0	0	0	6	1	7	20	49
08:00	2	0	0	2	0	7	0	7	0	0	0	0	0	8	1	9	18	58
08:15	2	0	0	2	0	12	0	12	0	0	0	0	0	12	3	15	29	75
08:30	2	0	0	2	0	13	0	13	0	0	0	0	0	16	3	19	34	101
08:45	3	0	0	3	0	15	0	15	0	0	0	0	0	12	2	14	32	113
Total	13	0	0	13	0	69	0	69	0	0	0	0	0	67	13	80	162	
Peak hour	9	0	0	9	0	47	0	47	0	0	0	0	0	48	9	57	113	
Peak 15 min				3				15				0				19	34	
PHF				0.75				0.78				#####				0.75	0.83	

AM PEAK HOUR 2023



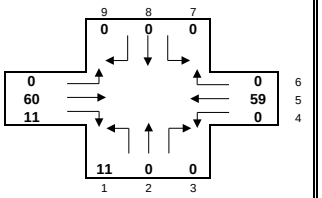
MILKWOOD GLEN

AM PEAK HOUR 2025



MILKWOOD GLEN

AM PEAK HOUR 2030



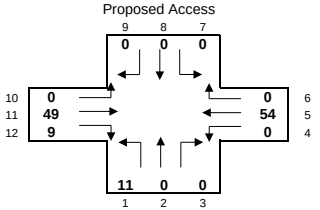
MILKWOOD GLEN

Project :	TIA : PROPOSED DEVELOPMENT IN PLETTENBERG BAY											Day & date :	29/11/2023					
Intersection :	MILKWOOD GLEN / MR00394 / PROPOSED ACCESS				NO. 4							Time period:	15:00 - 18:00					
STARTING TIME	MILKWOOD GLEN Northbound				MR00394 Westbound				Proposed Access Southbound				MR00394 Eastbound				INTER-SECTION	
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	Hour
15:00	2	0	0	2	0	12	0	12	0	0	0	0	0	9	2	11	25	
15:15	3	0	0	3	0	12	0	12	0	0	0	0	0	12	2	14	29	
15:30	2	0	0	2	0	12	0	12	0	0	0	0	0	13	3	16	30	
15:45	2	0	0	2	0	11	0	11	0	0	0	0	0	15	3	18	31	115
16:00	3	0	0	3	0	17	0	17	0	0	0	0	0	12	2	14	34	124
16:15	3	0	0	3	0	16	0	16	0	0	0	0	0	11	2	13	32	127
16:30	3	0	0	3	0	11	0	11	0	0	0	0	0	14	3	17	31	128
16:45	2	0	0	2	0	15	0	15	0	0	0	0	0	13	2	15	32	129
17:00	3	0	0	3	0	12	0	12	0	0	0	0	0	11	2	13	28	123
17:15	2	0	0	2	0	9	0	9	0	0	0	0	0	10	2	12	23	114
17:30	1	0	0	1	0	7	0	7	0	0	0	0	0	5	1	6	14	97
17:45	2	0	0	2	0	10	0	10	0	0	0	0	0	9	2	11	23	88
Total	28	0	0	28	0	144	0	144	0	0	0	0	0	134	26	160	332	
Peak hour	11	0	0	11	0	54	0	54	0	0	0	0	0	49	9	58	123	
Peak 15 min				3				16				0				17	32	
PHF				0.92				0.84				#####				0.85	0.96	

N

PM PEAK HOUR 2023

Proposed Access

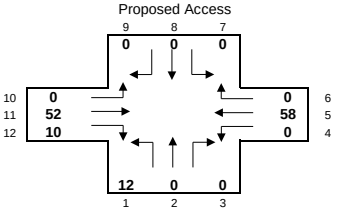


MILKWOOD GLEN

N

PM PEAK HOUR 2025

Proposed Access

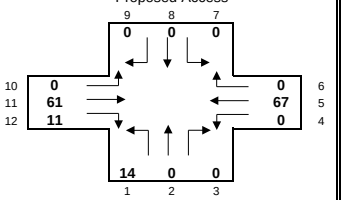


MILKWOOD GLEN

N

PM PEAK HOUR 2030

Proposed Access



MILKWOOD GLEN

ANNEXURE C
Historical
Traffic Data

Western Cape Government

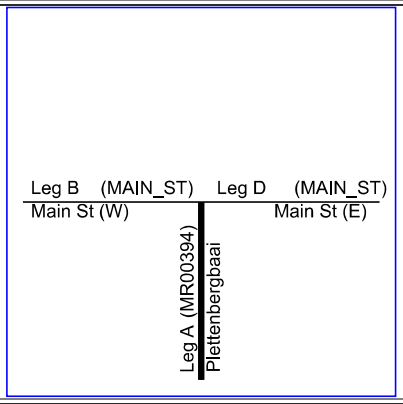
Intersection Diagram

Km per Leg

Node	Leg	Road No	Km
2376	A	MR00394	4.50
2376	B	MAIN_ST	0.00
2376	D	MAIN_ST	0.00

Node- 2376 Leg- B Growth Rate: 3.30 (E)

Date	Light	Heavy	Taxis	Buses	Total
22/08/22	282	7	9	0	298
07/11/18	401	10	1	0	412
19/11/15	184	1	1	0	186
18/03/10	225	2	0	0	227
04/11/04	309	16	1	0	326
19/07/00	143	2	1	0	146



Node- 2376 Leg- D Growth Rate: 3.12 (E)

Date	Light	Heavy	Taxis	Buses	Total
22/08/22	554	32	13	0	599
07/11/18	931	11	21	0	963
19/11/15	614	15	8	0	637
18/03/10	790	28	0	0	818
04/11/04	587	22	2	0	611
19/07/00	332	21	0	0	353

Node- 2376 Leg- A Growth Rate: 3.12 (E)

Date	Light	Heavy	Taxis	Buses	Total
22/08/22	688	37	20	0	745
07/11/18	1096	18	27	0	1141
19/11/15	628	12	9	0	649
18/03/10	872	26	0	0	898
04/11/04	722	19	3	0	744
19/07/00	420	20	1	0	441
03/05/90	507	25			532
11/09/89	380	47			427

Print Exit

Western Cape Government

Growth Rate Chart

Station Data

Road Number:	MR00394
Km Distance:	4.50
Growth Rate: (Based on the last 5 available counts)	3.12 (E)
Recalculated Growth Rate: (Based on Selected Counts)	3.20
Node:	2376
Leg:	A

Count Dates

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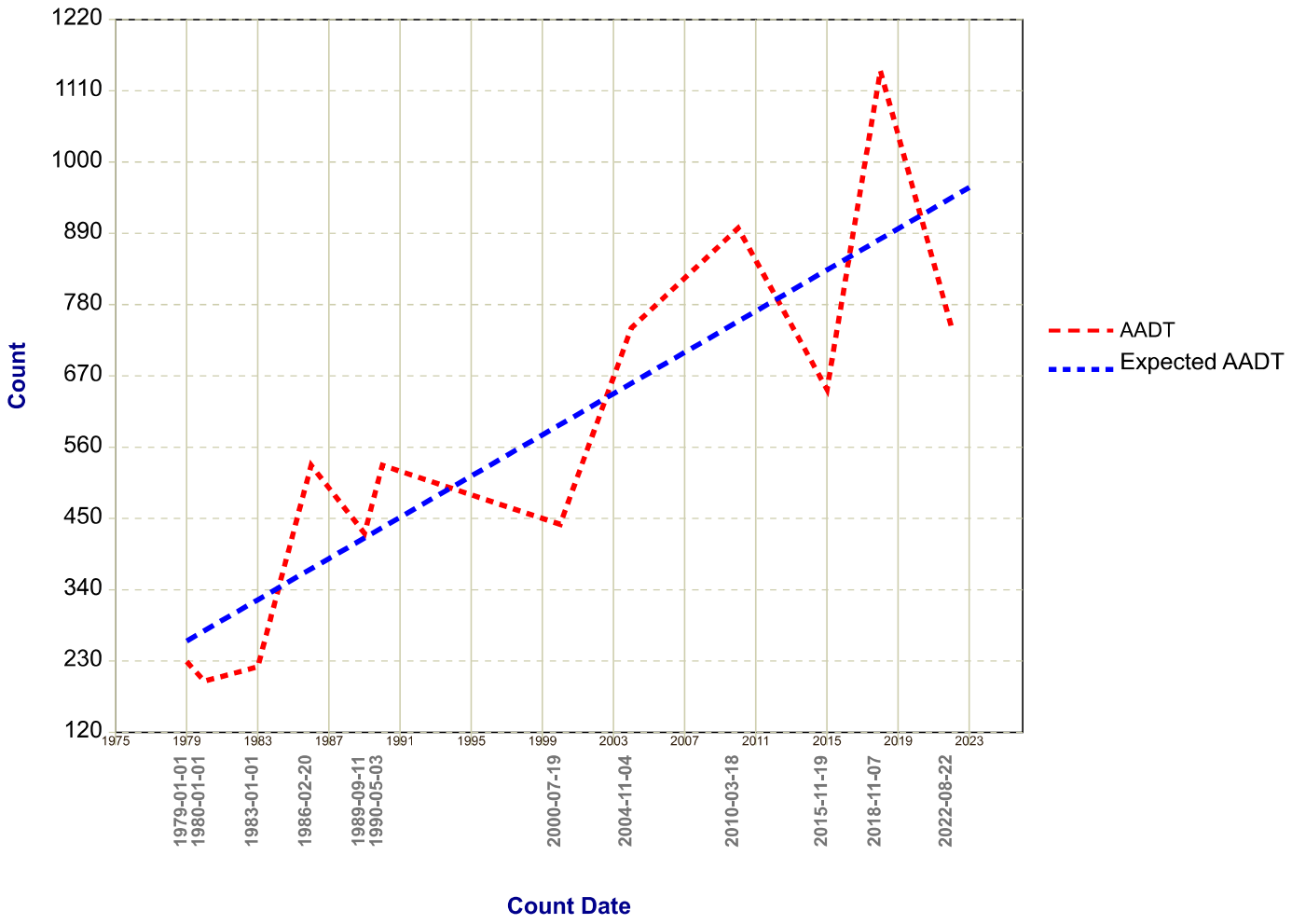
1979-01-01
1980-01-01
1983-01-01
1986-02-20
1989-09-11
1990-05-03
2000-07-19

Print

Exit



Western Cape Government

Intersection Diagram

Node- 2374 Leg- C Growth Rate: 2.20 (C)

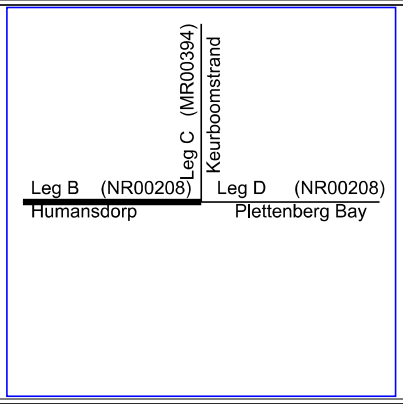
Date	Light	Heavy	Taxis	Buses	Total
22/08/22	1708	46	38	0	1792
07/11/18	1875	84	56	0	2015
19/11/15	1549	93	44	2	1688
13/04/10	1324	38	23	0	1385
03/11/04	1268	41	21	5	1335
01/10/02	1308	40	5	0	1353
19/07/00	788	29	7	0	824

Km per Leg

Node	Leg	Road No	Km
2374	B	NR00208	67.78
2374	C	MR00394	0.00
2374	D	NR00208	67.78

Node- 2374 Leg- B Growth Rate: 3.12 (E)

Date	Light	Heavy	Taxis	Buses	Total
22/08/22	4159	733	68	34	4994
07/11/18	4864	997	94	61	6016
19/11/15	4480	925	69	40	5514
18/03/10	6439	892	177	60	7568
03/11/04	4062	817	84	84	5047
01/10/02	4346	844	64	64	5318
19/07/00	2371	474	44	24	2913



Node- 2374 Leg- D Growth Rate: 1.14 (C)

Date	Light	Heavy	Taxis	Buses	Total
22/08/22	5818	777	106	34	6735
07/11/18	6594	1082	150	61	7887
19/11/15	5687	941	69	40	6737
13/04/10	5255	770	67	35	6127
03/11/04	4950	829	95	82	5956
01/10/02	4631	750	57	55	5493
19/07/00	3054	500	49	24	3627

Print Exit

Western Cape Government

Growth Rate Chart

Station Data

Road Number:	NR00208
Km Distance:	67.78
Growth Rate: (Based on the last 5 available counts)	3.12 (E)
Recalculated Growth Rate: (Based on Selected Counts)	1.58
Node:	2374
Leg:	B

Count Dates

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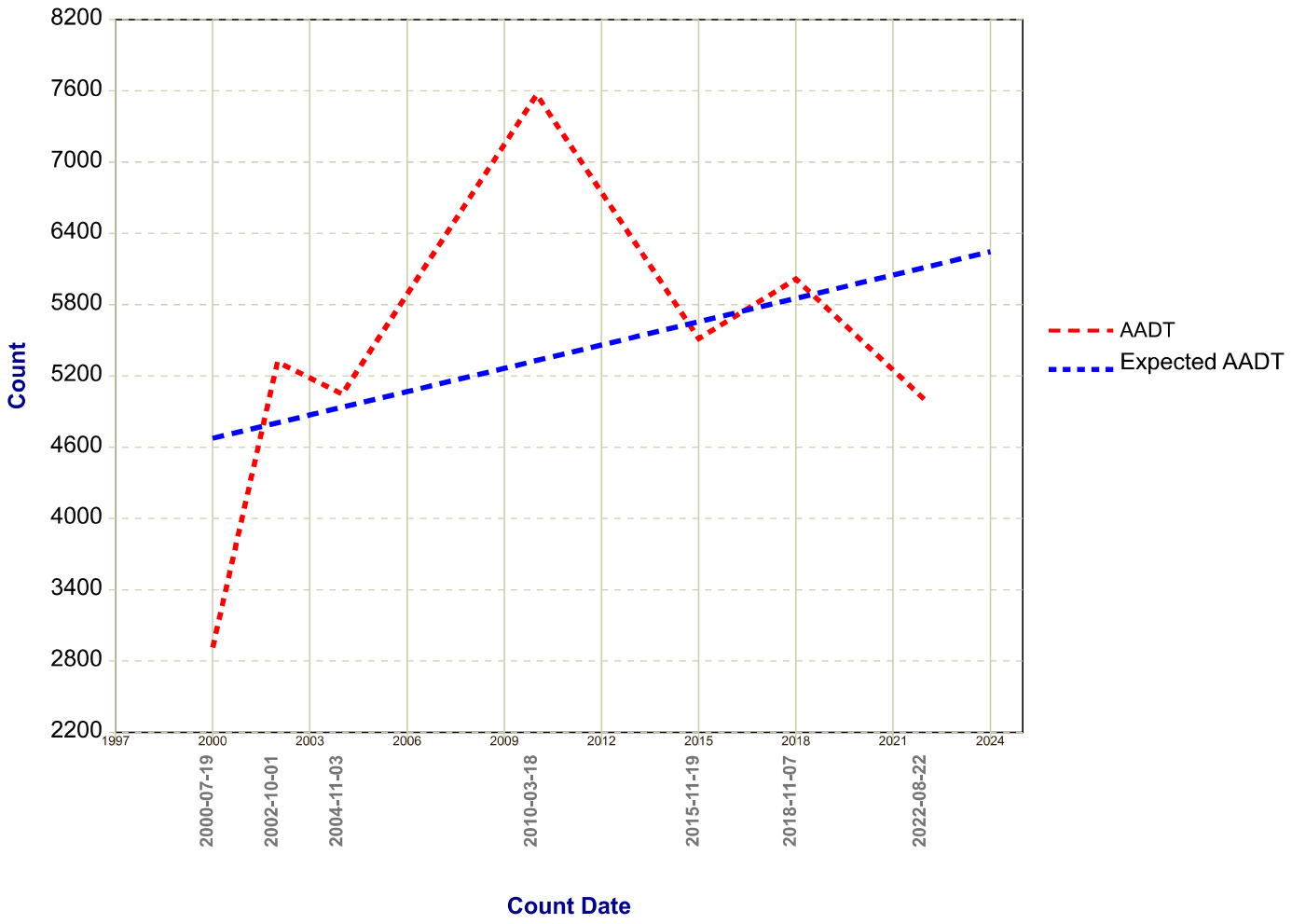
2000-07-19
2002-10-01
2004-11-03
2010-03-18
2015-11-19
2018-11-07
2022-08-22

Print

Exit



Western Cape Government

Intersection Diagram

Node- 2742 Leg- C Growth Rate: 3.30 (E)

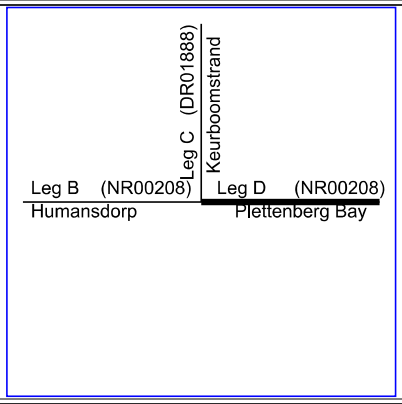
Date	Light	Heavy	Taxis	Buses	Total
17/08/22	154	2	4	0	160
07/11/18	202	5	6	0	213
19/11/15	206	10	0	0	216
18/03/10	181	8	1	4	194
02/11/04	143	7	2	2	154
19/07/00	100	5	0	0	105

Km per Leg

Node	Leg	Road No	Km
2742	B	NR00208	70.49
2742	C	DR01888	0.00
2742	D	NR00208	70.49

Node- 2742 Leg- B Growth Rate: 3.12 (E)

Date	Light	Heavy	Taxis	Buses	Total
17/08/22	4430	1021	72	28	5551
07/11/18	5019	988	114	62	6183
19/11/15	4722	905	27	43	5697
18/03/10	4833	841	62	48	5784
02/11/04	4040	860	90	71	5061
19/07/00	2410	508	52	35	3005



Node- 2742 Leg- D Growth Rate: 3.12 (E)

Date	Light	Heavy	Taxis	Buses	Total
17/08/22	4308	1016	68	28	5420
07/11/18	4952	988	115	62	6117
19/11/15	4401	901	27	43	5372
18/03/10	4659	824	67	49	5599
02/11/04	3942	862	89	70	4963
19/07/00	2506	512	53	35	3106

Print Exit

Western Cape Government

Growth Rate Chart

Station Data

Road Number:	NR00208
Km Distance:	70.49
Growth Rate: (Based on the last 5 available counts)	3.12 (E)
Recalculated Growth Rate: (Based on Selected Counts)	2.21
Node:	2742
Leg:	D

Count Dates

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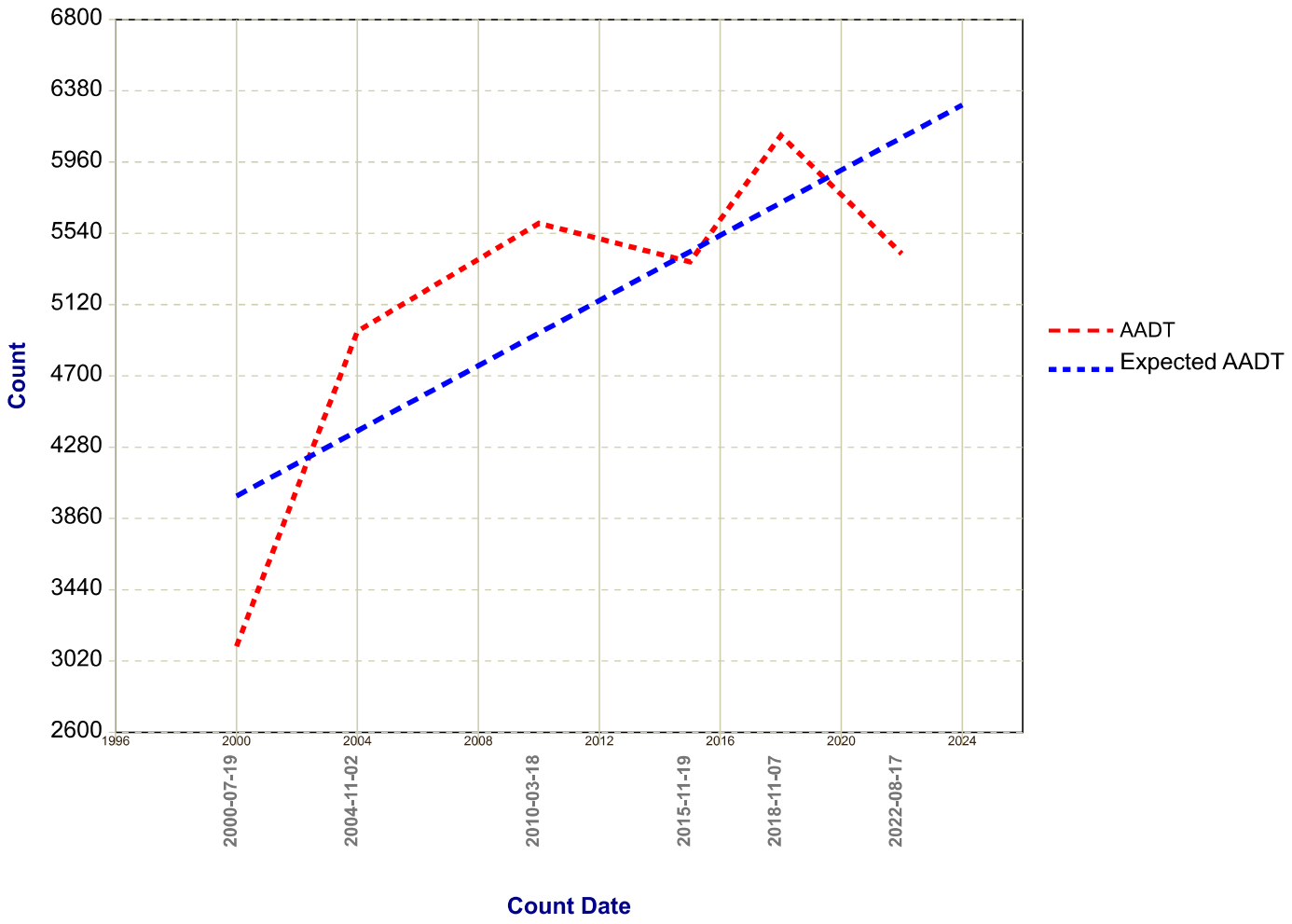
2000-07-19
2004-11-02
2010-03-18
2015-11-19
2018-11-07
2022-08-17

Print

Exit



ANNEXURE D
SIDRA
OUTPUT
SHEETS 2025
Before
Development

MOVEMENT SUMMARY

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

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2025 before Development
Site Category: Base Year
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: MR00394															
1	L2	All MCs	138	0.0	138	0.0	0.147	9.2	LOS A	0.5	3.8	0.34	0.89	0.34	50.7
3	R2	All MCs	1	0.0	1	0.0	0.147	14.1	LOS B	0.5	3.8	0.34	0.89	0.34	50.6
Approach			139	0.0	139	0.0	0.147	9.2	LOS A	0.5	3.8	0.34	0.89	0.34	50.7
East: N2_8															
4	L2	All MCs	5	0.0	5	0.0	0.003	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.9
5	T1	All MCs	217	0.0	217	0.0	0.111	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			222	0.0	222	0.0	0.111	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
West: N2_8															
11	T1	All MCs	207	0.0	207	0.0	0.107	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
12	R2	All MCs	131	0.0	131	0.0	0.113	6.5	LOS A	0.5	3.2	0.34	0.60	0.34	51.8
Approach			338	0.0	338	0.0	0.113	2.5	NA	0.5	3.2	0.13	0.23	0.13	56.5
All Vehicles			699	0.0	699	0.0	0.147	3.1	NA	0.5	3.8	0.13	0.29	0.13	56.2

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)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2025 before Development
Site Category: Base Year
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: MR00394															
1	L2	All MCs	153	0.0	153	0.0	0.186	9.5	LOS A	0.7	5.0	0.40	0.90	0.40	50.4
3	R2	All MCs	7	0.0	7	0.0	0.186	16.6	LOS C	0.7	5.0	0.40	0.90	0.40	50.3
Approach			160	0.0	160	0.0	0.186	9.8	LOS A	0.7	5.0	0.40	0.90	0.40	50.4
East: N2_8															
4	L2	All MCs	2	0.0	2	0.0	0.001	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.9
5	T1	All MCs	254	0.0	254	0.0	0.129	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			256	0.0	256	0.0	0.129	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.9
West: N2_8															
11	T1	All MCs	277	0.0	277	0.0	0.143	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
12	R2	All MCs	139	0.0	139	0.0	0.125	6.7	LOS A	0.5	3.6	0.37	0.62	0.37	51.7
Approach			416	0.0	416	0.0	0.143	2.2	NA	0.5	3.6	0.12	0.21	0.12	56.9
All Vehicles			833	0.0	833	0.0	0.186	3.0	NA	0.7	5.0	0.14	0.28	0.14	56.4

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] 02 am nd (Site Folder: 2025 Before)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2025 before Development
Site Category: Base Year
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: MR00394															
1	L2	All MCs	126	0.0	126	0.0	0.099	8.0	LOS A	0.4	2.8	0.05	0.96	0.05	51.1
3	R2	All MCs	11	0.0	11	0.0	0.099	7.7	LOS A	0.4	2.8	0.05	0.96	0.05	50.9
Approach			137	0.0	137	0.0	0.099	8.0	LOS A	0.4	2.8	0.05	0.96	0.05	51.1
East: DR01888															
4	L2	All MCs	16	0.0	16	0.0	0.013	5.5	LOS A	0.0	0.0	0.00	0.38	0.00	54.4
5	T1	All MCs	9	0.0	9	0.0	0.013	0.0	LOS A	0.0	0.0	0.00	0.38	0.00	56.6
Approach			25	0.0	25	0.0	0.013	3.6	NA	0.0	0.0	0.00	0.38	0.00	55.2
West: MR00394															
11	T1	All MCs	5	0.0	5	0.0	0.065	0.1	LOS A	0.3	2.1	0.09	0.54	0.09	55.0
12	R2	All MCs	110	0.0	110	0.0	0.065	5.5	LOS A	0.3	2.1	0.09	0.54	0.09	52.6
Approach			115	0.0	115	0.0	0.065	5.3	NA	0.3	2.1	0.09	0.54	0.09	52.7
All Vehicles			276	0.0	276	0.0	0.099	6.5	NA	0.4	2.8	0.06	0.73	0.06	52.1

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] 02 pm nd (Site Folder: 2025 Before)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2025 before Development
Site Category: Base Year
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: MR00394															
1	L2	All MCs	113	0.0	113	0.0	0.092	8.0	LOS A	0.4	2.6	0.02	0.98	0.02	51.1
3	R2	All MCs	14	0.0	14	0.0	0.092	7.5	LOS A	0.4	2.6	0.02	0.98	0.02	50.9
Approach			127	0.0	127	0.0	0.092	8.0	LOS A	0.4	2.6	0.02	0.98	0.02	51.1
East: DR01888															
4	L2	All MCs	16	0.0	16	0.0	0.009	5.5	LOS A	0.0	0.0	0.00	0.54	0.00	53.2
5	T1	All MCs	1	0.0	1	0.0	0.009	0.0	LOS A	0.0	0.0	0.00	0.54	0.00	55.3
Approach			17	0.0	17	0.0	0.009	5.1	NA	0.0	0.0	0.00	0.54	0.00	53.3
West: MR00394(W)															
11	T1	All MCs	6	0.0	6	0.0	0.060	0.0	LOS A	0.3	2.0	0.07	0.54	0.07	55.1
12	R2	All MCs	100	0.0	100	0.0	0.060	5.5	LOS A	0.3	2.0	0.07	0.54	0.07	52.7
Approach			106	0.0	106	0.0	0.060	5.2	NA	0.3	2.0	0.07	0.54	0.07	52.8
All Vehicles			250	0.0	250	0.0	0.092	6.6	NA	0.4	2.6	0.04	0.77	0.04	52.0

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] 03 am nd (Site Folder: 2025 Before)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2025 before Development
Site Category: Base Year
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: N2_8															
2	T1	All MCs	1	0.0	1	0.0	0.001	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
3	R2	All MCs	1	0.0	1	0.0	0.001	5.5	LOS A	0.0	0.0	0.02	0.57	0.02	52.7
Approach			2	0.0	2	0.0	0.001	2.8	NA	0.0	0.0	0.01	0.30	0.01	56.0
East: DR01888															
4	L2	All MCs	1	0.0	1	0.0	0.002	8.0	LOS A	0.0	0.1	0.02	0.98	0.02	51.1
6	R2	All MCs	1	0.0	1	0.0	0.002	7.8	LOS A	0.0	0.1	0.02	0.98	0.02	51.0
Approach			2	0.0	2	0.0	0.002	7.9	LOS A	0.0	0.1	0.02	0.98	0.02	51.1
North: N2_8															
7	L2	All MCs	1	0.0	1	0.0	0.001	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.9
8	T1	All MCs	1	0.0	1	0.0	0.001	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			2	0.0	2	0.0	0.001	2.8	NA	0.0	0.0	0.00	0.29	0.00	56.2
All Vehicles			7	0.0	7	0.0	0.002	4.5	NA	0.0	0.1	0.01	0.52	0.01	54.3

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] 03 pm nd (Site Folder: 2025 Before)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2025 before Development
Site Category: Base Year
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: N2_8															
2	T1	All MCs	1	0.0	1	0.0	0.001	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
3	R2	All MCs	1	0.0	1	0.0	0.001	5.5	LOS A	0.0	0.0	0.02	0.57	0.02	52.7
Approach			2	0.0	2	0.0	0.001	2.8	NA	0.0	0.0	0.01	0.30	0.01	56.0
East: DR01888															
4	L2	All MCs	1	0.0	1	0.0	0.002	8.0	LOS A	0.0	0.1	0.02	0.98	0.02	51.1
6	R2	All MCs	1	0.0	1	0.0	0.002	7.8	LOS A	0.0	0.1	0.02	0.98	0.02	51.0
Approach			2	0.0	2	0.0	0.002	7.9	LOS A	0.0	0.1	0.02	0.98	0.02	51.1
North: N2_8															
7	L2	All MCs	1	0.0	1	0.0	0.001	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.9
8	T1	All MCs	1	0.0	1	0.0	0.001	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			2	0.0	2	0.0	0.001	2.8	NA	0.0	0.0	0.00	0.29	0.00	56.2
All Vehicles			7	0.0	7	0.0	0.002	4.5	NA	0.0	0.1	0.01	0.52	0.01	54.3

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.

ANNEXURE E
SIDRA
OUTPUT
SHEETS 2025
After
Development

MOVEMENT SUMMARY

Site: 101 [[02] 01 am ad (Site Folder: 2025 After)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2025 after Development
Site Category: Proposed Design 1
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: MR00394															
1	L2	All MCs	198	0.0	198	0.0	0.213	9.4	LOS A	0.8	5.9	0.37	0.89	0.37	50.6
3	R2	All MCs	1	0.0	1	0.0	0.213	15.6	LOS C	0.8	5.9	0.37	0.89	0.37	50.5
Approach			200	0.0	200	0.0	0.213	9.4	LOS A	0.8	5.9	0.37	0.89	0.37	50.6
East: N2_8															
4	L2	All MCs	5	0.0	5	0.0	0.003	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.9
5	T1	All MCs	230	0.0	230	0.0	0.118	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			235	0.0	235	0.0	0.118	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
West: N2_8															
11	T1	All MCs	221	0.0	221	0.0	0.114	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
12	R2	All MCs	156	0.0	156	0.0	0.137	6.6	LOS A	0.6	4.0	0.35	0.61	0.35	51.8
Approach			377	0.0	377	0.0	0.137	2.7	NA	0.6	4.0	0.15	0.25	0.15	56.3
All Vehicles			812	0.0	812	0.0	0.213	3.6	NA	0.8	5.9	0.16	0.34	0.16	55.7

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 [[02] 01 pm ad (Site Folder: 2025 After)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2025 after Development
Site Category: Proposed Design 1
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: MR00394															
1	L2	All MCs	184	0.0	184	0.0	0.226	9.6	LOS A	0.9	6.2	0.42	0.90	0.42	50.3
3	R2	All MCs	7	0.0	7	0.0	0.226	19.1	LOS C	0.9	6.2	0.42	0.90	0.42	50.2
Approach			191	0.0	191	0.0	0.226	10.0	LOS B	0.9	6.2	0.42	0.90	0.42	50.3
East: N2_8															
4	L2	All MCs	2	0.0	2	0.0	0.001	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.9
5	T1	All MCs	270	0.0	270	0.0	0.138	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			272	0.0	272	0.0	0.138	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.9
West: N2_8															
11	T1	All MCs	296	0.0	296	0.0	0.152	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
12	R2	All MCs	196	0.0	196	0.0	0.179	6.8	LOS A	0.8	5.3	0.39	0.63	0.39	51.7
Approach			492	0.0	492	0.0	0.179	2.7	NA	0.8	5.3	0.16	0.25	0.16	56.3
All Vehicles			955	0.0	955	0.0	0.226	3.4	NA	0.9	6.2	0.17	0.31	0.17	55.9

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

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2025 after Development
Site Category: Proposed Design 1
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: MR00394															
1	L2	All MCs	186	0.0	186	0.0	0.149	8.0	LOS A	0.6	4.4	0.05	0.96	0.05	51.1
3	R2	All MCs	18	0.0	18	0.0	0.149	7.8	LOS A	0.6	4.4	0.05	0.96	0.05	50.9
Approach			205	0.0	205	0.0	0.149	8.0	LOS A	0.6	4.4	0.05	0.96	0.05	51.1
East: DR01888															
4	L2	All MCs	20	0.0	20	0.0	0.015	5.5	LOS A	0.0	0.0	0.00	0.41	0.00	54.2
5	T1	All MCs	9	0.0	9	0.0	0.015	0.0	LOS A	0.0	0.0	0.00	0.41	0.00	56.4
Approach			28	0.0	28	0.0	0.015	3.9	NA	0.0	0.0	0.00	0.41	0.00	54.9
West: MR00394															
11	T1	All MCs	5	0.0	5	0.0	0.079	0.1	LOS A	0.4	2.6	0.10	0.55	0.10	54.9
12	R2	All MCs	134	0.0	134	0.0	0.079	5.5	LOS A	0.4	2.6	0.10	0.55	0.10	52.5
Approach			139	0.0	139	0.0	0.079	5.3	NA	0.4	2.6	0.10	0.55	0.10	52.6
All Vehicles			372	0.0	372	0.0	0.149	6.7	NA	0.6	4.4	0.07	0.76	0.07	51.9

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

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2025 after Development
Site Category: Proposed Design 1
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: MR00394															
1	L2	All MCs	142	0.0	142	0.0	0.116	8.0	LOS A	0.5	3.3	0.02	0.98	0.02	51.1
3	R2	All MCs	17	0.0	17	0.0	0.116	7.5	LOS A	0.5	3.3	0.02	0.98	0.02	50.9
Approach			159	0.0	159	0.0	0.116	8.0	LOS A	0.5	3.3	0.02	0.98	0.02	51.1
East: DR01888															
4	L2	All MCs	22	0.0	22	0.0	0.013	5.5	LOS A	0.0	0.0	0.00	0.55	0.00	53.1
5	T1	All MCs	1	0.0	1	0.0	0.013	0.0	LOS A	0.0	0.0	0.00	0.55	0.00	55.2
Approach			23	0.0	23	0.0	0.013	5.3	NA	0.0	0.0	0.00	0.55	0.00	53.2
West: MR00394(W)															
11	T1	All MCs	6	0.0	6	0.0	0.091	0.1	LOS A	0.4	3.1	0.09	0.55	0.09	55.0
12	R2	All MCs	154	0.0	154	0.0	0.091	5.5	LOS A	0.4	3.1	0.09	0.55	0.09	52.6
Approach			160	0.0	160	0.0	0.091	5.3	NA	0.4	3.1	0.09	0.55	0.09	52.7
All Vehicles			343	0.0	343	0.0	0.116	6.5	NA	0.5	3.3	0.05	0.75	0.05	52.0

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

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2025 after Development
Site Category: Proposed Design 1
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: N2_8															
2	T1	All MCs	205	0.0	205	0.0	0.055	0.0	LOS A	0.0	0.3	0.02	0.02	0.02	59.8
3	R2	All MCs	5	0.0	5	0.0	0.055	6.5	LOS A	0.0	0.3	0.04	0.05	0.04	57.0
Approach			209	0.0	209	0.0	0.055	0.2	NA	0.0	0.3	0.02	0.03	0.02	59.7
East: DR01888															
4	L2	All MCs	2	0.0	2	0.0	0.042	9.3	LOS A	0.2	1.1	0.54	0.88	0.54	48.9
6	R2	All MCs	20	0.0	20	0.0	0.042	12.6	LOS B	0.2	1.1	0.54	0.88	0.54	48.8
Approach			22	0.0	22	0.0	0.042	12.3	LOS B	0.2	1.1	0.54	0.88	0.54	48.8
North: N2_8															
7	L2	All MCs	20	0.0	20	0.0	0.011	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.9
8	T1	All MCs	221	0.0	221	0.0	0.116	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			241	0.0	241	0.0	0.116	0.5	NA	0.0	0.0	0.00	0.05	0.00	59.3
All Vehicles			472	0.0	472	0.0	0.116	0.9	NA	0.2	1.1	0.04	0.08	0.04	58.9

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

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2025 after Development
Site Category: Proposed Design 1
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: N2_8															
2	T1	All MCs	282	0.0	282	0.0	0.075	0.0	LOS A	0.0	0.2	0.01	0.01	0.01	59.9
3	R2	All MCs	4	0.0	4	0.0	0.075	6.4	LOS A	0.0	0.2	0.03	0.03	0.03	57.1
Approach			286	0.0	286	0.0	0.075	0.1	NA	0.0	0.2	0.01	0.01	0.01	59.8
East: DR01888															
4	L2	All MCs	5	0.0	5	0.0	0.047	9.6	LOS A	0.2	1.3	0.57	0.90	0.57	48.2
6	R2	All MCs	17	0.0	17	0.0	0.047	14.4	LOS B	0.2	1.3	0.57	0.90	0.57	48.1
Approach			22	0.0	22	0.0	0.047	13.4	LOS B	0.2	1.3	0.57	0.90	0.57	48.2
North: N2_8															
7	L2	All MCs	14	0.0	14	0.0	0.008	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.9
8	T1	All MCs	252	0.0	252	0.0	0.132	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			266	0.0	266	0.0	0.132	0.3	NA	0.0	0.0	0.00	0.03	0.00	59.5
All Vehicles			575	0.0	575	0.0	0.132	0.7	NA	0.2	1.3	0.03	0.06	0.03	59.1

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 [[02] 04 am ad (Site Folder: 2025 After)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2025 after Development
Site Category: Proposed Design 1
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: Milkwood Glen															
1	L2	All MCs	1	0.0	1	0.0	0.014	8.2	LOS A	0.0	0.3	0.24	0.92	0.24	46.7
2	T1	All MCs	12	0.0	12	0.0	0.014	8.4	LOS A	0.0	0.3	0.24	0.92	0.24	32.9
3	R2	All MCs	1	0.0	1	0.0	0.014	8.2	LOS A	0.0	0.3	0.24	0.92	0.24	46.4
Approach			14	0.0	14	0.0	0.014	8.3	LOS A	0.0	0.3	0.24	0.92	0.24	37.0
East: MR00394															
4	L2	All MCs	1	0.0	1	0.0	0.033	5.6	LOS A	0.0	0.1	0.01	0.02	0.01	55.6
5	T1	All MCs	62	0.0	62	0.0	0.033	0.0	LOS A	0.0	0.1	0.01	0.02	0.01	59.8
6	R2	All MCs	1	0.0	1	0.0	0.033	5.5	LOS A	0.0	0.1	0.01	0.02	0.01	55.1
Approach			64	0.0	64	0.0	0.033	0.2	NA	0.0	0.1	0.01	0.02	0.01	59.6
North: Access															
7	L2	All MCs	1	0.0	1	0.0	0.065	8.2	LOS A	0.2	1.6	0.27	0.89	0.27	46.6
8	T1	All MCs	1	0.0	1	0.0	0.065	8.4	LOS A	0.2	1.6	0.27	0.89	0.27	32.7
9	R2	All MCs	55	0.0	55	0.0	0.065	8.4	LOS A	0.2	1.6	0.27	0.89	0.27	46.3
Approach			57	0.0	57	0.0	0.065	8.4	LOS A	0.2	1.6	0.27	0.89	0.27	46.1
West: MR00394															
10	L2	All MCs	19	0.0	19	0.0	0.049	5.6	LOS A	0.1	0.6	0.06	0.20	0.06	30.8
11	T1	All MCs	63	0.0	63	0.0	0.049	0.0	LOS A	0.1	0.6	0.06	0.20	0.06	58.0
12	R2	All MCs	12	0.0	12	0.0	0.049	5.6	LOS A	0.1	0.6	0.06	0.20	0.06	52.8
Approach			94	0.0	94	0.0	0.049	1.9	NA	0.1	0.6	0.06	0.20	0.06	51.3
All Vehicles			229	0.0	229	0.0	0.065	3.4	NA	0.2	1.6	0.11	0.37	0.11	52.3

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 [[03] 04 pm ad (Site Folder: 2030 After)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2030 after Development
Site Category: Future Conditions 1
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: Milkwood Glen															
1	L2	All MCs	17	0.0	17	0.0	0.016	8.3	LOS A	0.1	0.4	0.19	0.89	0.19	46.6
2	T1	All MCs	1	0.0	1	0.0	0.016	8.7	LOS A	0.1	0.4	0.19	0.89	0.19	32.9
3	R2	All MCs	1	0.0	1	0.0	0.016	8.4	LOS A	0.1	0.4	0.19	0.89	0.19	46.3
Approach			20	0.0	20	0.0	0.016	8.3	LOS A	0.1	0.4	0.19	0.89	0.19	46.2
East: MR00394															
4	L2	All MCs	1	0.0	1	0.0	0.044	5.6	LOS A	0.0	0.1	0.01	0.02	0.01	55.7
5	T1	All MCs	83	0.0	83	0.0	0.044	0.0	LOS A	0.0	0.1	0.01	0.02	0.01	59.8
6	R2	All MCs	1	0.0	1	0.0	0.044	5.5	LOS A	0.0	0.1	0.01	0.02	0.01	55.2
Approach			85	0.0	85	0.0	0.044	0.2	NA	0.0	0.1	0.01	0.02	0.01	59.7
North: Access															
7	L2	All MCs	1	0.0	1	0.0	0.029	8.3	LOS A	0.1	0.7	0.30	0.88	0.30	46.4
8	T1	All MCs	1	0.0	1	0.0	0.029	8.6	LOS A	0.1	0.7	0.30	0.88	0.30	32.4
9	R2	All MCs	22	0.0	22	0.0	0.029	8.7	LOS A	0.1	0.7	0.30	0.88	0.30	46.1
Approach			24	0.0	24	0.0	0.029	8.7	LOS A	0.1	0.7	0.30	0.88	0.30	45.7
West: MR00394															
10	L2	All MCs	50	0.0	50	0.0	0.073	5.6	LOS A	0.1	0.8	0.06	0.28	0.06	30.6
11	T1	All MCs	75	0.0	75	0.0	0.073	0.0	LOS A	0.1	0.8	0.06	0.28	0.06	57.4
12	R2	All MCs	14	0.0	14	0.0	0.073	5.7	LOS A	0.1	0.8	0.06	0.28	0.06	51.9
Approach			139	0.0	139	0.0	0.073	2.6	NA	0.1	0.8	0.06	0.28	0.06	46.2
All Vehicles			268	0.0	268	0.0	0.073	2.8	NA	0.1	0.8	0.07	0.29	0.07	50.5

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.

ANNEXURE F
SIDRA
OUTPUT
SHEETS 2030
After
Development

MOVEMENT SUMMARY

Site: 101 [[03] 01 am ad (Site Folder: 2030 After)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2030 after Development
Site Category: Future Conditions 1
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: MR00394															
1	L2	All MCs	224	0.0	224	0.0	0.252	9.7	LOS A	1.0	7.1	0.41	0.90	0.41	50.5
3	R2	All MCs	1	0.0	1	0.0	0.252	18.1	LOS C	1.0	7.1	0.41	0.90	0.41	50.4
Approach			225	0.0	225	0.0	0.252	9.7	LOS A	1.0	7.1	0.41	0.90	0.41	50.5
East: N2_8															
4	L2	All MCs	6	0.0	6	0.0	0.003	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.9
5	T1	All MCs	270	0.0	270	0.0	0.138	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			276	0.0	276	0.0	0.138	0.2	NA	0.0	0.0	0.00	0.01	0.00	59.8
West: N2_8															
11	T1	All MCs	258	0.0	258	0.0	0.133	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
12	R2	All MCs	180	0.0	180	0.0	0.165	6.8	LOS A	0.7	4.9	0.39	0.63	0.39	51.7
Approach			437	0.0	437	0.0	0.165	2.8	NA	0.7	4.9	0.16	0.26	0.16	56.2
All Vehicles			939	0.0	939	0.0	0.252	3.7	NA	1.0	7.1	0.17	0.34	0.17	55.7

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 [[03] 01 pm ad (Site Folder: 2030 After)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2030 after Development
Site Category: Future Conditions 1
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: MR00394															
1	L2	All MCs	212	0.0	212	0.0	0.281	10.1	LOS B	1.1	7.9	0.48	0.91	0.48	50.0
3	R2	All MCs	9	0.0	9	0.0	0.281	23.4	LOS C	1.1	7.9	0.48	0.91	0.48	49.9
Approach			221	0.0	221	0.0	0.281	10.6	LOS B	1.1	7.9	0.48	0.91	0.48	49.9
East: N2_8															
4	L2	All MCs	2	0.0	2	0.0	0.001	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.9
5	T1	All MCs	317	0.0	317	0.0	0.162	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			319	0.0	319	0.0	0.162	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: N2_8															
11	T1	All MCs	346	0.0	346	0.0	0.178	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
12	R2	All MCs	222	0.0	222	0.0	0.213	7.1	LOS A	0.9	6.4	0.44	0.66	0.44	51.5
Approach			568	0.0	568	0.0	0.213	2.8	NA	0.9	6.4	0.17	0.26	0.17	56.3
All Vehicles			1108	0.0	1108	0.0	0.281	3.6	NA	1.1	7.9	0.18	0.31	0.18	55.9

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 [[03] 02 am ad (Site Folder: 2030 After)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2030 after Development
Site Category: Future Conditions 1
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: MR00394															
1	L2	All MCs	208	0.0	208	0.0	0.166	8.0	LOS A	0.7	5.0	0.06	0.95	0.06	51.1
3	R2	All MCs	20	0.0	20	0.0	0.166	8.0	LOS A	0.7	5.0	0.06	0.95	0.06	50.9
Approach			228	0.0	228	0.0	0.166	8.0	LOS A	0.7	5.0	0.06	0.95	0.06	51.1
East: DR01888															
4	L2	All MCs	22	0.0	22	0.0	0.018	5.5	LOS A	0.0	0.0	0.00	0.39	0.00	54.3
5	T1	All MCs	11	0.0	11	0.0	0.018	0.0	LOS A	0.0	0.0	0.00	0.39	0.00	56.6
Approach			33	0.0	33	0.0	0.018	3.7	NA	0.0	0.0	0.00	0.39	0.00	55.1
West: MR00394															
11	T1	All MCs	6	0.0	6	0.0	0.091	0.1	LOS A	0.4	3.1	0.11	0.54	0.11	54.9
12	R2	All MCs	154	0.0	154	0.0	0.091	5.6	LOS A	0.4	3.1	0.11	0.54	0.11	52.5
Approach			160	0.0	160	0.0	0.091	5.3	NA	0.4	3.1	0.11	0.54	0.11	52.6
All Vehicles			421	0.0	421	0.0	0.166	6.7	NA	0.7	5.0	0.08	0.75	0.08	52.0

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 [[03] 02 pm ad (Site Folder: 2030 After)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2030 after Development
Site Category: Future Conditions 1
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: MR00394															
1	L2	All MCs	163	0.0	163	0.0	0.133	8.0	LOS A	0.6	3.9	0.02	0.98	0.02	51.1
3	R2	All MCs	20	0.0	20	0.0	0.133	7.5	LOS A	0.6	3.9	0.02	0.98	0.02	50.9
Approach			182	0.0	182	0.0	0.133	8.0	LOS A	0.6	3.9	0.02	0.98	0.02	51.1
East: DR01888															
4	L2	All MCs	25	0.0	25	0.0	0.014	5.5	LOS A	0.0	0.0	0.00	0.55	0.00	53.1
5	T1	All MCs	1	0.0	1	0.0	0.014	0.0	LOS A	0.0	0.0	0.00	0.55	0.00	55.2
Approach			26	0.0	26	0.0	0.014	5.3	NA	0.0	0.0	0.00	0.55	0.00	53.2
West: MR00394(W)															
11	T1	All MCs	7	0.0	7	0.0	0.102	0.1	LOS A	0.5	3.5	0.10	0.54	0.10	54.9
12	R2	All MCs	173	0.0	173	0.0	0.102	5.5	LOS A	0.5	3.5	0.10	0.54	0.10	52.6
Approach			180	0.0	180	0.0	0.102	5.3	NA	0.5	3.5	0.10	0.54	0.10	52.7
All Vehicles			388	0.0	388	0.0	0.133	6.6	NA	0.6	3.9	0.05	0.75	0.05	51.9

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

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2030 after Development
Site Category: Future Conditions 1
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: N2_8															
2	T1	All MCs	239	0.0	239	0.0	0.065	0.1	LOS A	0.1	0.4	0.03	0.03	0.03	59.7
3	R2	All MCs	6	0.0	6	0.0	0.065	6.7	LOS A	0.1	0.4	0.05	0.06	0.05	56.9
Approach			246	0.0	246	0.0	0.065	0.2	NA	0.1	0.4	0.03	0.03	0.03	59.7
East: DR01888															
4	L2	All MCs	2	0.0	2	0.0	0.052	9.6	LOS A	0.2	1.4	0.58	0.92	0.58	48.1
6	R2	All MCs	22	0.0	22	0.0	0.052	14.0	LOS B	0.2	1.4	0.58	0.92	0.58	48.0
Approach			25	0.0	25	0.0	0.052	13.5	LOS B	0.2	1.4	0.58	0.92	0.58	48.0
North: N2_8															
7	L2	All MCs	23	0.0	23	0.0	0.013	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.9
8	T1	All MCs	258	0.0	258	0.0	0.135	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			281	0.0	281	0.0	0.135	0.5	NA	0.0	0.0	0.00	0.05	0.00	59.3
All Vehicles			551	0.0	551	0.0	0.135	0.9	NA	0.2	1.4	0.04	0.08	0.04	58.8

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

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2030 after Development
Site Category: Future Conditions 1
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: N2_8															
2	T1	All MCs	330	0.0	330	0.0	0.088	0.0	LOS A	0.0	0.3	0.02	0.02	0.02	59.8
3	R2	All MCs	5	0.0	5	0.0	0.088	6.9	LOS A	0.0	0.3	0.03	0.04	0.03	57.1
Approach			335	0.0	335	0.0	0.088	0.1	NA	0.0	0.3	0.02	0.02	0.02	59.8
East: DR01888															
4	L2	All MCs	6	0.0	6	0.0	0.063	9.9	LOS A	0.2	1.7	0.62	0.93	0.62	47.3
6	R2	All MCs	20	0.0	20	0.0	0.063	16.4	LOS C	0.2	1.7	0.62	0.93	0.62	47.2
Approach			26	0.0	26	0.0	0.063	14.9	LOS B	0.2	1.7	0.62	0.93	0.62	47.3
North: N2_8															
7	L2	All MCs	16	0.0	16	0.0	0.009	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.9
8	T1	All MCs	295	0.0	295	0.0	0.154	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			311	0.0	311	0.0	0.154	0.3	NA	0.0	0.0	0.00	0.03	0.00	59.5
All Vehicles			672	0.0	672	0.0	0.154	0.8	NA	0.2	1.7	0.03	0.06	0.03	59.1

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 [[03] 04 am ad (Site Folder: 2030 After)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2030 after Development
Site Category: Future Conditions 1
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: Milkwood Glen															
1	L2	All MCs	14	0.0	14	0.0	0.013	8.3	LOS A	0.0	0.3	0.17	0.89	0.17	46.6
2	T1	All MCs	1	0.0	1	0.0	0.013	8.5	LOS A	0.0	0.3	0.17	0.89	0.17	32.9
3	R2	All MCs	1	0.0	1	0.0	0.013	8.4	LOS A	0.0	0.3	0.17	0.89	0.17	46.3
Approach			16	0.0	16	0.0	0.013	8.3	LOS A	0.0	0.3	0.17	0.89	0.17	46.1
East: MR00394															
4	L2	All MCs	1	0.0	1	0.0	0.038	5.6	LOS A	0.0	0.1	0.01	0.02	0.01	55.7
5	T1	All MCs	73	0.0	73	0.0	0.038	0.0	LOS A	0.0	0.1	0.01	0.02	0.01	59.8
6	R2	All MCs	1	0.0	1	0.0	0.038	5.5	LOS A	0.0	0.1	0.01	0.02	0.01	55.2
Approach			75	0.0	75	0.0	0.038	0.2	NA	0.0	0.1	0.01	0.02	0.01	59.7
North: Access															
7	L2	All MCs	1	0.0	1	0.0	0.067	8.3	LOS A	0.2	1.6	0.29	0.89	0.29	46.5
8	T1	All MCs	1	0.0	1	0.0	0.067	8.5	LOS A	0.2	1.6	0.29	0.89	0.29	32.5
9	R2	All MCs	55	0.0	55	0.0	0.067	8.6	LOS A	0.2	1.6	0.29	0.89	0.29	46.1
Approach			57	0.0	57	0.0	0.067	8.6	LOS A	0.2	1.6	0.29	0.89	0.29	46.0
West: MR00394															
10	L2	All MCs	19	0.0	19	0.0	0.056	5.6	LOS A	0.1	0.7	0.06	0.19	0.06	30.9
11	T1	All MCs	74	0.0	74	0.0	0.056	0.0	LOS A	0.1	0.7	0.06	0.19	0.06	58.1
12	R2	All MCs	14	0.0	14	0.0	0.056	5.7	LOS A	0.1	0.7	0.06	0.19	0.06	52.9
Approach			106	0.0	106	0.0	0.056	1.7	NA	0.1	0.7	0.06	0.19	0.06	52.2
All Vehicles			254	0.0	254	0.0	0.067	3.2	NA	0.2	1.6	0.10	0.34	0.10	53.1

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 [[03] 04 pm ad (Site Folder: 2030 After)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2030 after Development
Site Category: Future Conditions 1
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: Milkwood Glen															
1	L2	All MCs	1	0.0	1	0.0	0.019	8.3	LOS A	0.1	0.5	0.30	0.91	0.30	46.5
2	T1	All MCs	16	0.0	16	0.0	0.019	8.7	LOS A	0.1	0.5	0.30	0.91	0.30	32.6
3	R2	All MCs	1	0.0	1	0.0	0.019	8.4	LOS A	0.1	0.5	0.30	0.91	0.30	46.2
Approach			19	0.0	19	0.0	0.019	8.7	LOS A	0.1	0.5	0.30	0.91	0.30	35.8
East: MR00394															
4	L2	All MCs	1	0.0	1	0.0	0.044	5.6	LOS A	0.0	0.1	0.01	0.02	0.01	55.7
5	T1	All MCs	83	0.0	83	0.0	0.044	0.0	LOS A	0.0	0.1	0.01	0.02	0.01	59.8
6	R2	All MCs	1	0.0	1	0.0	0.044	5.5	LOS A	0.0	0.1	0.01	0.02	0.01	55.2
Approach			85	0.0	85	0.0	0.044	0.2	NA	0.0	0.1	0.01	0.02	0.01	59.7
North: Access															
7	L2	All MCs	1	0.0	1	0.0	0.029	8.3	LOS A	0.1	0.7	0.30	0.88	0.30	46.4
8	T1	All MCs	1	0.0	1	0.0	0.029	8.6	LOS A	0.1	0.7	0.30	0.88	0.30	32.4
9	R2	All MCs	22	0.0	22	0.0	0.029	8.7	LOS A	0.1	0.7	0.30	0.88	0.30	46.1
Approach			24	0.0	24	0.0	0.029	8.7	LOS A	0.1	0.7	0.30	0.88	0.30	45.7
West: MR00394															
10	L2	All MCs	50	0.0	50	0.0	0.073	5.6	LOS A	0.1	0.8	0.06	0.28	0.06	30.6
11	T1	All MCs	75	0.0	75	0.0	0.073	0.0	LOS A	0.1	0.8	0.06	0.28	0.06	57.4
12	R2	All MCs	14	0.0	14	0.0	0.073	5.7	LOS A	0.1	0.8	0.06	0.28	0.06	51.9
Approach			139	0.0	139	0.0	0.073	2.6	NA	0.1	0.8	0.06	0.28	0.06	46.2
All Vehicles			267	0.0	267	0.0	0.073	2.8	NA	0.1	0.8	0.08	0.29	0.08	50.3

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.

ANNEXURE G
SIDRA
OUTPUT
SHEETS 2030
After
Development:
Peak Season

MOVEMENT SUMMARY

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

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2030 after Development - Peak Season
Site Category: Future Conditions 2
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: MR00394															
1	L2	All MCs	267	0.0	267	0.0	0.332	10.6	LOS B	1.5	10.7	0.49	0.93	0.54	49.9
3	R2	All MCs	2	0.0	2	0.0	0.332	24.3	LOS C	1.5	10.7	0.49	0.93	0.54	49.8
Approach			270	0.0	270	0.0	0.332	10.7	LOS B	1.5	10.7	0.49	0.93	0.54	49.9
East: N2_8															
4	L2	All MCs	7	0.0	7	0.0	0.004	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.9
5	T1	All MCs	338	0.0	338	0.0	0.172	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			345	0.0	345	0.0	0.172	0.2	NA	0.0	0.0	0.00	0.01	0.00	59.7
West: N2_8															
11	T1	All MCs	323	0.0	323	0.0	0.166	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
12	R2	All MCs	221	0.0	221	0.0	0.219	7.3	LOS A	0.9	6.6	0.46	0.67	0.46	51.5
Approach			543	0.0	543	0.0	0.219	3.0	NA	0.9	6.6	0.19	0.27	0.19	56.2
All Vehicles			1158	0.0	1158	0.0	0.332	3.9	NA	1.5	10.7	0.20	0.35	0.21	55.5

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

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2030 after Development - Peak Season
Site Category: Future Conditions 2
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: MR00394															
1	L2	All MCs	259	0.0	259	0.0	0.398	11.8	LOS B	2.1	14.5	0.58	1.00	0.75	48.7
3	R2	All MCs	11	0.0	11	0.0	0.398	35.0	LOS D	2.1	14.5	0.58	1.00	0.75	48.6
Approach			270	0.0	270	0.0	0.398	12.7	LOS B	2.1	14.5	0.58	1.00	0.75	48.7
East: N2_8															
4	L2	All MCs	4	0.0	4	0.0	0.002	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.9
5	T1	All MCs	396	0.0	396	0.0	0.202	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			399	0.0	399	0.0	0.202	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
West: N2_8															
11	T1	All MCs	432	0.0	432	0.0	0.223	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
12	R2	All MCs	265	0.0	265	0.0	0.281	7.8	LOS A	1.2	8.6	0.51	0.71	0.51	51.1
Approach			697	0.0	697	0.0	0.281	3.0	NA	1.2	8.6	0.19	0.27	0.19	56.2
All Vehicles			1366	0.0	1366	0.0	0.398	4.1	NA	2.1	14.5	0.21	0.34	0.25	55.5

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 [[04] 02 am ad (Site Folder: 2030 After - Peak Season)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2030 after Development - Peak Season
Site Category: Future Conditions 2
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: MR00394															
1	L2	All MCs	209	0.0	209	0.0	0.172	8.1	LOS A	0.7	5.2	0.07	0.94	0.07	51.1
3	R2	All MCs	23	0.0	23	0.0	0.172	8.2	LOS A	0.7	5.2	0.07	0.94	0.07	50.9
Approach			233	0.0	233	0.0	0.172	8.1	LOS A	0.7	5.2	0.07	0.94	0.07	51.1
East: DR01888															
4	L2	All MCs	27	0.0	27	0.0	0.021	5.5	LOS A	0.0	0.0	0.00	0.39	0.00	54.3
5	T1	All MCs	14	0.0	14	0.0	0.021	0.0	LOS A	0.0	0.0	0.00	0.39	0.00	56.6
Approach			41	0.0	41	0.0	0.021	3.7	NA	0.0	0.0	0.00	0.39	0.00	55.1
West: MR00394															
11	T1	All MCs	7	0.0	7	0.0	0.100	0.1	LOS A	0.5	3.4	0.13	0.54	0.13	54.9
12	R2	All MCs	168	0.0	168	0.0	0.100	5.6	LOS A	0.5	3.4	0.13	0.54	0.13	52.5
Approach			175	0.0	175	0.0	0.100	5.3	NA	0.5	3.4	0.13	0.54	0.13	52.6
All Vehicles			449	0.0	449	0.0	0.172	6.6	NA	0.7	5.2	0.09	0.74	0.09	52.0

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 [[04] 02 pm ad (Site Folder: 2030 After - Peak Season)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2030 after Development - Peak Season
Site Category: Future Conditions 2
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: MR00394															
1	L2	All MCs	197	0.0	197	0.0	0.162	8.0	LOS A	0.7	4.8	0.03	0.98	0.03	51.1
3	R2	All MCs	23	0.0	23	0.0	0.162	7.6	LOS A	0.7	4.8	0.03	0.98	0.03	50.9
Approach			221	0.0	221	0.0	0.162	8.0	LOS A	0.7	4.8	0.03	0.98	0.03	51.1
East: DR01888															
4	L2	All MCs	30	0.0	30	0.0	0.017	5.5	LOS A	0.0	0.0	0.00	0.53	0.00	53.2
5	T1	All MCs	2	0.0	2	0.0	0.017	0.0	LOS A	0.0	0.0	0.00	0.53	0.00	55.3
Approach			32	0.0	32	0.0	0.017	5.1	NA	0.0	0.0	0.00	0.53	0.00	53.4
West: MR00394(W)															
11	T1	All MCs	10	0.0	10	0.0	0.121	0.1	LOS A	0.6	4.2	0.11	0.54	0.11	54.9
12	R2	All MCs	203	0.0	203	0.0	0.121	5.6	LOS A	0.6	4.2	0.11	0.54	0.11	52.6
Approach			213	0.0	213	0.0	0.121	5.3	NA	0.6	4.2	0.11	0.54	0.11	52.7
All Vehicles			466	0.0	466	0.0	0.162	6.6	NA	0.7	4.8	0.06	0.75	0.06	51.9

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

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2030 after Development - Peak Season
Site Category: Future Conditions 2
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: N2_8															
2	T1	All MCs	299	0.0	299	0.0	0.081	0.1	LOS A	0.1	0.5	0.03	0.03	0.03	59.7
3	R2	All MCs	7	0.0	7	0.0	0.081	7.1	LOS A	0.1	0.5	0.06	0.07	0.06	56.9
Approach			306	0.0	306	0.0	0.081	0.2	NA	0.1	0.5	0.03	0.03	0.03	59.7
East: DR01888															
4	L2	All MCs	4	0.0	4	0.0	0.077	10.2	LOS B	0.3	2.0	0.63	0.97	0.63	46.7
6	R2	All MCs	26	0.0	26	0.0	0.077	16.7	LOS C	0.3	2.0	0.63	0.97	0.63	46.7
Approach			29	0.0	29	0.0	0.077	15.9	LOS C	0.3	2.0	0.63	0.97	0.63	46.7
North: N2_8															
7	L2	All MCs	29	0.0	29	0.0	0.016	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.9
8	T1	All MCs	322	0.0	322	0.0	0.168	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			351	0.0	351	0.0	0.168	0.5	NA	0.0	0.0	0.00	0.05	0.00	59.3
All Vehicles			686	0.0	686	0.0	0.168	1.0	NA	0.3	2.0	0.04	0.08	0.04	58.8

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

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2030 after Development - Peak Season
Site Category: Future Conditions 2
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: N2_8															
2	T1	All MCs	413	0.0	413	0.0	0.111	0.1	LOS A	0.1	0.5	0.02	0.02	0.02	59.8
3	R2	All MCs	6	0.0	6	0.0	0.111	7.4	LOS A	0.1	0.5	0.04	0.05	0.04	57.1
Approach			419	0.0	419	0.0	0.111	0.2	NA	0.1	0.5	0.02	0.02	0.02	59.8
East: DR01888															
4	L2	All MCs	7	0.0	7	0.0	0.102	10.6	LOS B	0.4	2.6	0.70	1.00	0.70	45.3
6	R2	All MCs	24	0.0	24	0.0	0.102	21.0	LOS C	0.4	2.6	0.70	1.00	0.70	45.2
Approach			32	0.0	32	0.0	0.102	18.6	LOS C	0.4	2.6	0.70	1.00	0.70	45.2
North: N2_8															
7	L2	All MCs	20	0.0	20	0.0	0.011	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.9
8	T1	All MCs	370	0.0	370	0.0	0.193	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			389	0.0	389	0.0	0.193	0.3	NA	0.0	0.0	0.00	0.03	0.00	59.5
All Vehicles			840	0.0	840	0.0	0.193	0.9	NA	0.4	2.6	0.04	0.06	0.04	58.9

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 [[04] 04 am ad (Site Folder: 2030 After - Peak Season)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2030 after Development - Peak Season
Site Category: Future Conditions 2
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: Milkwood Glen															
1	L2	All MCs	17	0.0	17	0.0	0.016	8.3	LOS A	0.1	0.4	0.20	0.88	0.20	46.6
2	T1	All MCs	1	0.0	1	0.0	0.016	8.7	LOS A	0.1	0.4	0.20	0.88	0.20	32.9
3	R2	All MCs	1	0.0	1	0.0	0.016	8.6	LOS A	0.1	0.4	0.20	0.88	0.20	46.3
Approach			20	0.0	20	0.0	0.016	8.4	LOS A	0.1	0.4	0.20	0.88	0.20	46.2
East: MR00394															
4	L2	All MCs	1	0.0	1	0.0	0.047	5.6	LOS A	0.0	0.1	0.01	0.02	0.01	55.7
5	T1	All MCs	90	0.0	90	0.0	0.047	0.0	LOS A	0.0	0.1	0.01	0.02	0.01	59.8
6	R2	All MCs	1	0.0	1	0.0	0.047	5.5	LOS A	0.0	0.1	0.01	0.02	0.01	55.2
Approach			92	0.0	92	0.0	0.047	0.1	NA	0.0	0.1	0.01	0.02	0.01	59.7
North: Access															
7	L2	All MCs	1	0.0	1	0.0	0.070	8.4	LOS A	0.2	1.7	0.33	0.89	0.33	46.3
8	T1	All MCs	1	0.0	1	0.0	0.070	8.7	LOS A	0.2	1.7	0.33	0.89	0.33	32.2
9	R2	All MCs	55	0.0	55	0.0	0.070	8.9	LOS A	0.2	1.7	0.33	0.89	0.33	45.9
Approach			57	0.0	57	0.0	0.070	8.8	LOS A	0.2	1.7	0.33	0.89	0.33	45.8
West: MR00394															
10	L2	All MCs	19	0.0	19	0.0	0.068	5.7	LOS A	0.1	0.9	0.07	0.18	0.07	30.9
11	T1	All MCs	92	0.0	92	0.0	0.068	0.1	LOS A	0.1	0.9	0.07	0.18	0.07	58.2
12	R2	All MCs	17	0.0	17	0.0	0.068	5.7	LOS A	0.1	0.9	0.07	0.18	0.07	53.0
Approach			128	0.0	128	0.0	0.068	1.6	NA	0.1	0.9	0.07	0.18	0.07	53.1
All Vehicles			297	0.0	297	0.0	0.070	3.0	NA	0.2	1.7	0.11	0.31	0.11	53.8

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 [[04] 04 pm ad (Site Folder: 2030 After - Peak Season)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Traffic Impact Assessment for proposed residential (Group Housing) Development on portion 91 of Farm Matjes Fontein No. 304
2030 after Development - Peak Season
Site Category: Future Conditions 2
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 5 years

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: Milkwood Glen															
1	L2	All MCs	21	0.0	21	0.0	0.019	8.4	LOS A	0.1	0.5	0.21	0.88	0.21	46.6
2	T1	All MCs	1	0.0	1	0.0	0.019	8.9	LOS A	0.1	0.5	0.21	0.88	0.21	32.9
3	R2	All MCs	1	0.0	1	0.0	0.019	8.7	LOS A	0.1	0.5	0.21	0.88	0.21	46.3
Approach			23	0.0	23	0.0	0.019	8.4	LOS A	0.1	0.5	0.21	0.88	0.21	46.2
East: MR00394															
4	L2	All MCs	1	0.0	1	0.0	0.054	5.6	LOS A	0.0	0.1	0.01	0.01	0.01	55.8
5	T1	All MCs	104	0.0	104	0.0	0.054	0.0	LOS A	0.0	0.1	0.01	0.01	0.01	59.8
6	R2	All MCs	1	0.0	1	0.0	0.054	5.5	LOS A	0.0	0.1	0.01	0.01	0.01	55.3
Approach			106	0.0	106	0.0	0.054	0.1	NA	0.0	0.1	0.01	0.01	0.01	59.8
North: Access															
7	L2	All MCs	1	0.0	1	0.0	0.031	8.3	LOS A	0.1	0.7	0.34	0.88	0.34	46.2
8	T1	All MCs	1	0.0	1	0.0	0.031	8.8	LOS A	0.1	0.7	0.34	0.88	0.34	32.1
9	R2	All MCs	22	0.0	22	0.0	0.031	9.0	LOS A	0.1	0.7	0.34	0.88	0.34	45.8
Approach			24	0.0	24	0.0	0.031	9.0	LOS A	0.1	0.7	0.34	0.88	0.34	45.5
West: MR00394															
10	L2	All MCs	50	0.0	50	0.0	0.085	5.6	LOS A	0.1	1.0	0.07	0.26	0.07	30.6
11	T1	All MCs	94	0.0	94	0.0	0.085	0.1	LOS A	0.1	1.0	0.07	0.26	0.07	57.5
12	R2	All MCs	17	0.0	17	0.0	0.085	5.8	LOS A	0.1	1.0	0.07	0.26	0.07	52.1
Approach			161	0.0	161	0.0	0.085	2.4	NA	0.1	1.0	0.07	0.26	0.07	47.7
All Vehicles			315	0.0	315	0.0	0.085	2.6	NA	0.1	1.0	0.08	0.27	0.08	51.6

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.