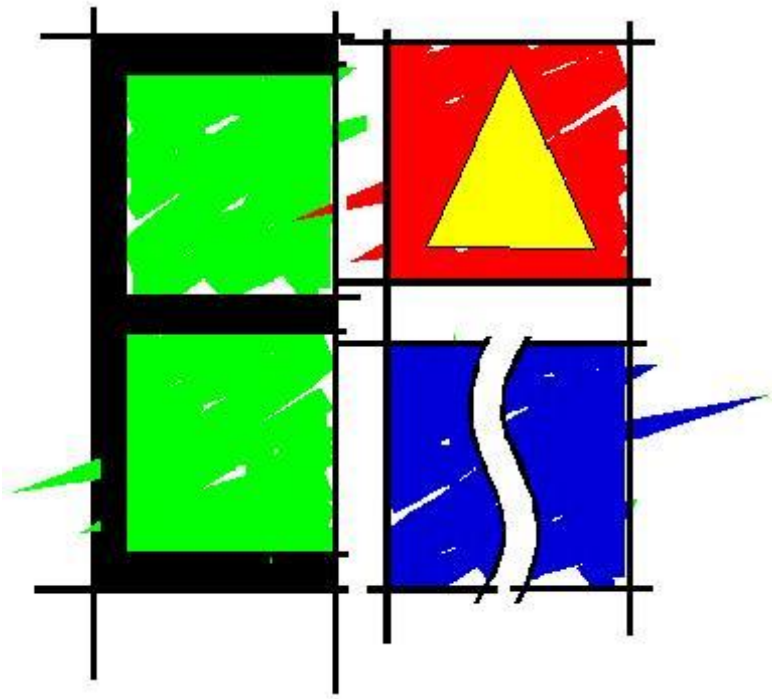
TRAFFIC IMPACT ASSESSMENT

FOR THE

PROPOSED SUBDIVISION AND REZONING OF PTN 9 OF THE FARM KRANSHOEK NO. 432, KNYSNA ROAD



February 2020

Prepared for: **The Home Market**
Obo **Status Homes Property Developers (Pty) Ltd**

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1 INTRODUCTION

1.1 BACKGROUND

Engineering Advice & Services (Pty) Ltd was appointed by The Home Market on behalf of Status Homes Property Developers (Pty) Ltd during January 2019 to prepare a Traffic Impact Assessment for the proposed subdivision and rezoning of portion 9 of the Farm Kranshoek No. 432, Knysna Road situated in the Bitou Local Municipality. In addition, EAS will submit an application to the Western Cape Department of Transport and Public Works for access onto provincial road OP07207 (Trekker Road).

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 Transport and Public Works of the Province of the Western Cape 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 these authorities.

1.3 METHODOLOGY

The approach followed in conducting the traffic impact assessment 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 large-sized development and this assessment should thus consider impact for the development (assumed to be 2020) and development plus five-year (2025) horizons.

The methodology used was as follows:

- Present traffic flow patterns were obtained and the affected intersections and proposed access point analysed in terms of capacity, where after recommendations were made on the present need for road upgrading, without taking the proposed development into account.
- Given the extent of the development, the expected trips that will be generated by the development were determined by using applicable trip generation rates specified in **TMH 17 Volume 1 - South African Trip Data Manual** [(2)].
- The distribution of the generated trips was estimated where after the generated traffic was assigned to the surrounding road network.
- The operation of the affected intersections and proposed access point was analysed to ensure that they operate at acceptable levels of service and recommendations made on the need for road upgrading taking cognisance of the proposed development for the 2020 and 2025 planning horizons.
- Non-motorised and public transport requirements were also assessed and considered in terms of operation and safety.
- By 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.

Engineering Advice and Services

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N

LEGEND

- Site Location
- Road Network
- National Roads
- Main Roads

Project Title: Proposed Subdivision of Portion 9 of Farm 432 Kranshoek	*Drawing No:* 1629-P-001
Drawing Title: Locality Map	*Drawing Date:* February 2019

0 0.125 0.25 0.5 0.75 1 Kilometers

Scale : 1 : 55 000

Prepared by : SS

Checked by : CH

1.4 STUDY AREA

Based on the type and extent of the development the study area extended to the intersections along Trekker Road with Du Plessis Street (proposed access point) and with the Airport Road as well as the N2 / Airport Road (DR01770) and Robberg Road / Robberg Access road junctions, as it is considered that trips generated by the proposed development will approach along these roads and through these intersections.

2 LAND USE RIGHTS, DEVELOPMENT AND ENVIRONS

2.1 CURRENT AND PROPOSED LAND –USE RIGHTS

The site, measuring approximately 25.53 ha in extent, is currently zoned for Agricultural use in terms of Section 8 of the Land Use Planning Ordinance Scheme.

A **Motivation Report for the Rezoning and Subdivision of Portion 9 of Farm Kranshoek No. 432, Knysna Road** [(3)] into 559 Residential Zone 1 land portions, one Residential Zone IV portion accommodating approximately 316 units for social housing, two business sites (1.46 ha in extent), two places of worship, a school, creche and a clinic, has been submitted to the Bitou Municipality for consideration. The motivation report is attached as **Annexure A**.

An application for subdivision in terms of the Agricultural Land Act will also be submitted to the Department of Agriculture if required.

Subsequent to the original submission, the subdivision layout of Portion 9 has been amended to accommodate a wetland and buffer-zone along the wetland.

This has resulted in an amended layout accommodating 479 Residential Zone 1 portions, one Residential Zone IV portion accommodating approximately 419 units for social housing, two business sites (1.46 ha in extent), two places of worship, two creches and a clinic. The proposed amended subdivision is indicated on **Figure 11**.

It is noted that the rezoning and subdivision of Ptn 9 should not be considered in isolation and in this regard the Motivation report includes a Framework Plan for Ptns 7, 8 and 9 of Farm 432, that will enable the area to be developed in an integrated manner.

2.2 DEVELOPMENT ENVIRONS

The site is situated on the north-eastern edge of the existing Kranshoek township area to the east of Trekker Road as indicated on **Figure 1** approximately 8km west of the Plettenberg Bay Town Centre.

The land immediately to the west is predominantly residential in nature.

The Kranshoek Primary School is situated directly across Trekker Road to the west.

A small industrial area, which is not yet fully developed, is located to the north of the site.

The site is mostly vacant with agricultural land to the south and east.

View of Site from north

2.3 OVERVIEW OF DEVELOPMENT

The proposed development will comprise of 479 Residential Zone 1 land portions, one Residential Zone IV portion accommodating approximately 419 units for social housing, two business sites (1.45 ha in extent), two places of worship, two creches and a clinic. Thus, provision for 898 additional households.

Access to the site is proposed from Trekker Road at a point 65m north of Du Plessis Street and 85m south of Du Plessis Street.

3 DATA COLLECTION

3.1 PEAK HOUR TRAFFIC VOLUMES

Peak hour traffic turning movement counts were conducted during AM and PM peak periods on Wednesday 27 February 2019 at the following intersections:

- Robberg Road / Robberg Reserve access road
- Airport Road / Trekker Road (OP07207)
- Trekker Road / Du Plessis Street
- Airport Road (DR02770) / National Route 2

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

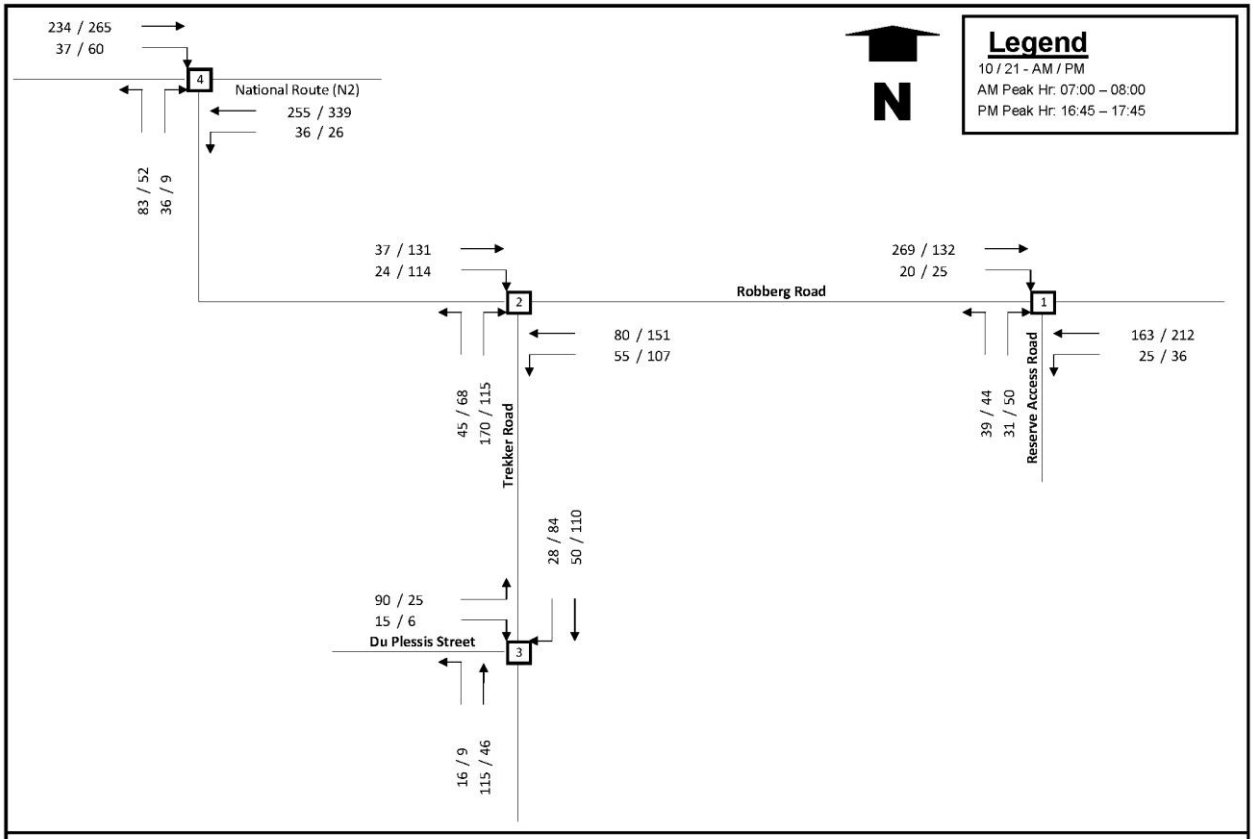


Figure 2: Existing Peak Hour Traffic Volumes - 2019

3.2 DAILY TRAFFIC VOLUMES

As this study will also analyse the impact of the development in 2020 and 2025, current background traffic volumes should be escalated to reflect traffic growth as a result of increased development in the area.

In the absence of historical traffic volumes, it is proposed that background traffic volumes be escalated by 3% per annum. The 2020 and 2025 escalated traffic volumes are indicated on **Figure 3** and **4** overleaf, respectively.

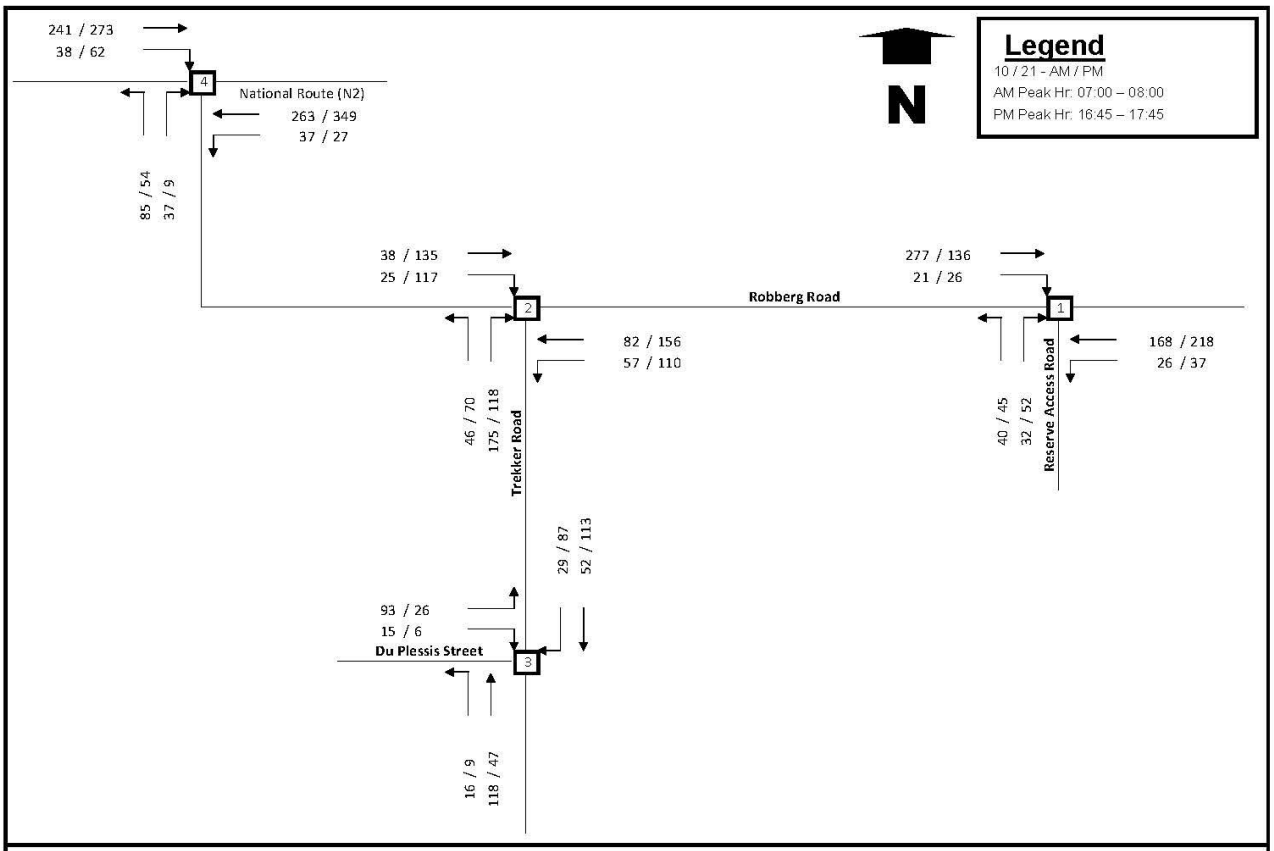


Figure 3: Escalated Peak Hour Traffic Volumes - 2020

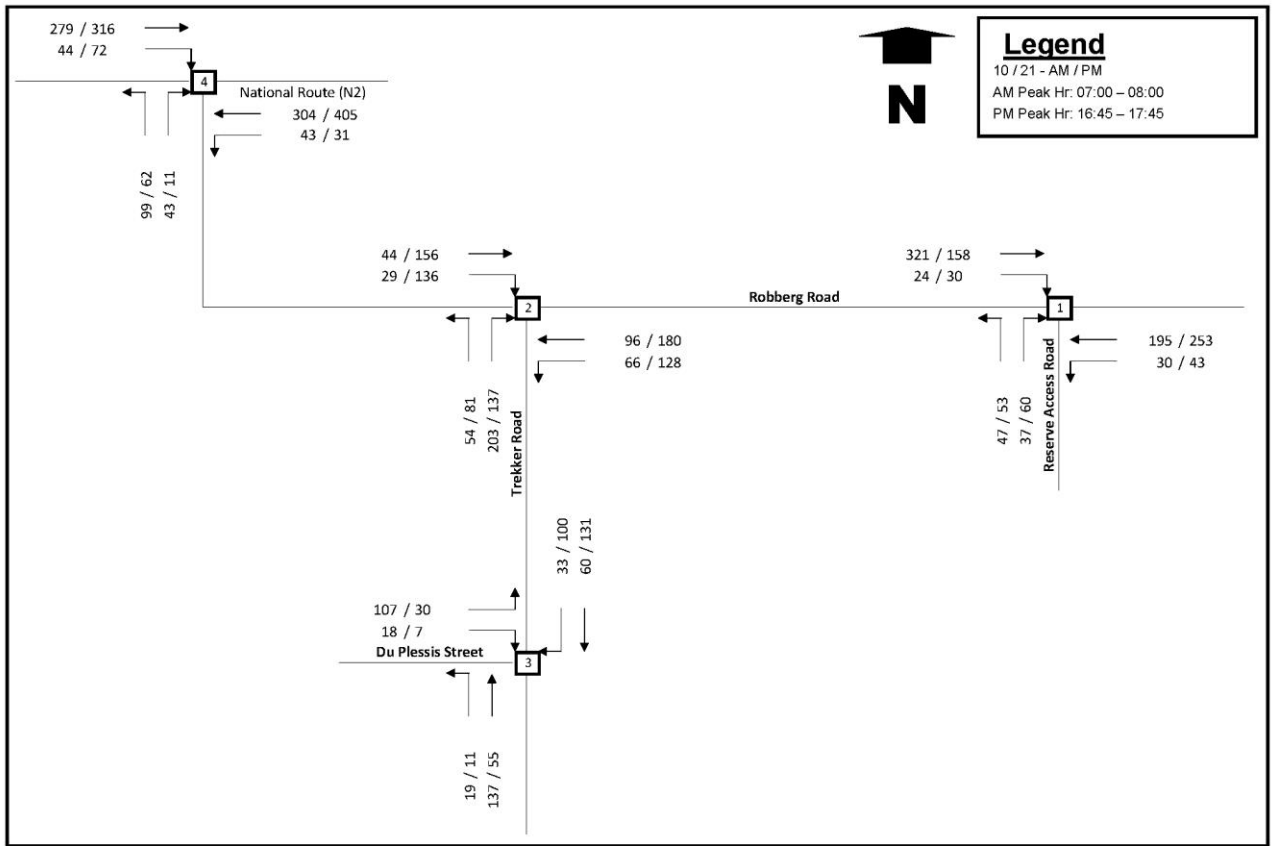
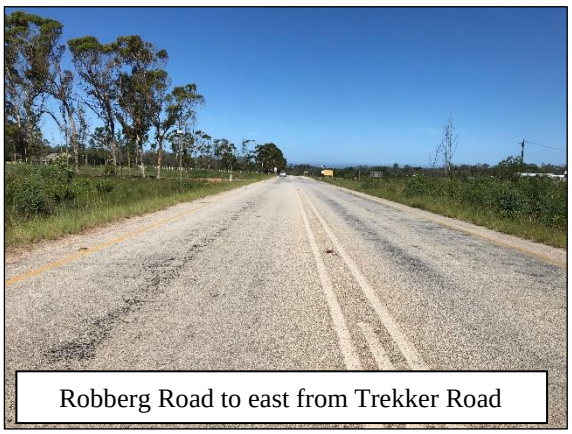


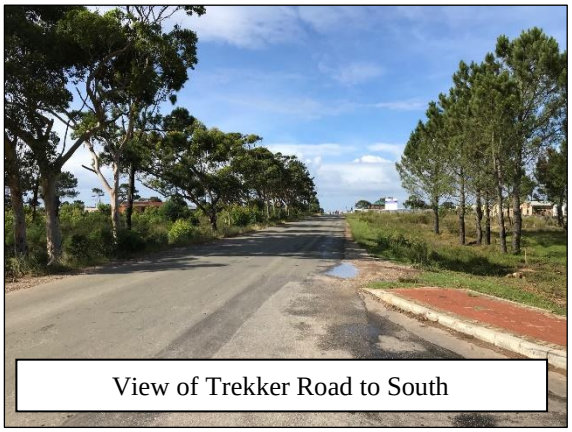
Figure 4: Escalated Peak Hour Traffic Volumes - 2025

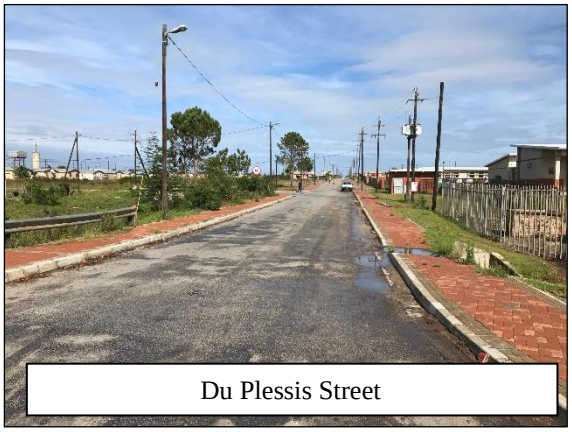
3.3 ROAD NETWORK

3.3.1 Existing Road Network

- **Robberg Road (DR02770)** is a provincial divisional road (class 3/4) road linking Plettenberg Bay in the east with the N2 in the west. Towards Plettenberg Bay the road consists of a single lane per direction with a narrow shoulder and is in a fair condition. Towards the west, the road is in a good condition with a slightly wider shoulder. The posted speed limit is 80km/h.
- **Trekker Road** (DR07207) is a provincial access (class 4) road which currently links the Kranshoek residential area to Robberg Road and thence to Plettenberg Bay to the east and the N2 to the west. The road comprises of a single 3,5m wide surfaced traffic lane in each direction with no shoulder. The road is in a poor condition possibly as a result of a lack of drainage.
- **Du Plessis Street** is a surfaced class 5 residential street serving the northern portion of Kranshoek. The road comprises of a single 3.4m lane per direction and is kerbed along both sides with a paved pedestrian walkway on either side. The road is in a good condition with a posted speed limit of 60km/h.
- **National Route 2** is a 7.4m wide surfaced class 1 national road linking Cape Town with the Mozambique border via Knysna, Port Elizabeth and Durban.


Robberg Road to east from Trekker Road


View of Trekker Road to South


Du Plessis Street

The existing road network configuration is indicated on **Figure 5** overleaf.

3.3.2 Future Road Network

The **Local Integrated Transport Plan for the Bitou Local Municipality – 2016-2021** [(4)] indicates that there are no additional road network elements required in the Kranshoek area.

The LITP does however note the need to upgrade or surface Trekker Road (DR7207).

3.4 PUBLIC TRANSPORT

At present, public transport services in the form of informal minibus taxi modes operate between the main taxi rank in Plettenberg Bay and Kranshoek. The route is serviced by both taxi associations operating in the Bitou Local Municipality.

A small taxi rank is located approximately 650m south of the Du Plessis Street intersection (next to the Kranshoek Multi-purpose Centre).

In addition, learner transport services convey approximately 300 mainly secondary school learners to Plettenberg Bay Secondary School. Primary school learners are catered for at the Kranshoek Primary School.

Based on surveys conducted, the current **Integrated Transport Plan** [(4)] indicates that there is sufficient capacity during the morning peak period but that additional operating licences may be required during the evening peak period.

LEGEND

- EXISTING ROADS
- PROPOSED SITE
- EXISTING SIDEWALKS

UNKNOWN STREET
UNKNOWN STREET
UNKNOWN STREET
UNKNOWN STREET
UNKNOWN STREET
UNKNOWN STREET
UNKNOWN STREET
UNKNOWN STREET
DU PLESSIS STREET
TREKKERS ROAD (DR07207)
ELANDSDRIFT WAY
EUREKA STREET
EUREKA STREET
COOPER STREET
VAN ROOYEN STREET
VAN ROOYEN STREET
KERSHOUT CRES
TREKKERS ROAD
GERICKE STREET
ROBBERG ROAD (DR02770)
TREKKERS ROAD (DR07207)

"UMMKELO" "AS BUILT" - NOTES

FOR REPORT

UTSHINTSHO / AMENDMENTS

INANI NO.	UMHLA DATE	INKCAZA DESCRIPTION	IVUNYELWE APPROVED

UMLINGANISELO SCALE: 1 : 500

UMLINGANISELO WOMZOBO OHLISIWEYO SCALE ON REDUCED DRAWING
50mm KUMZOBO WANGAPHAMBILI
50mm ON ORIGINAL DRAWING

UMENZI DESIGN	JC
UMZOBI DRAWN	TF
IVUNYELWE APPROVED	CH
UMHLA DATE	MARCH 2019

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Humewood
Port Elizabeth
6013
tel: (041) 581 2421

IVUNYELWE APPROVED	IVUNYELWE APPROVED
INJINELI/ENG.	UMENZELWA / CLIENT
UMHLA / DATE	UMHLA / DATE

IPROJETI / PROJECT
TIA FOR A PROPOSED SUBDIVISION AND REZONING OF PTN 9 OF THE FARM KRAMSHOEK NO.432, KNYSNA ROAD

UMZOBONKCAZA / DWG DESCRIPTION
FIGURE 5: EXISTING ROAD INTERSECTION CONFIGURATION

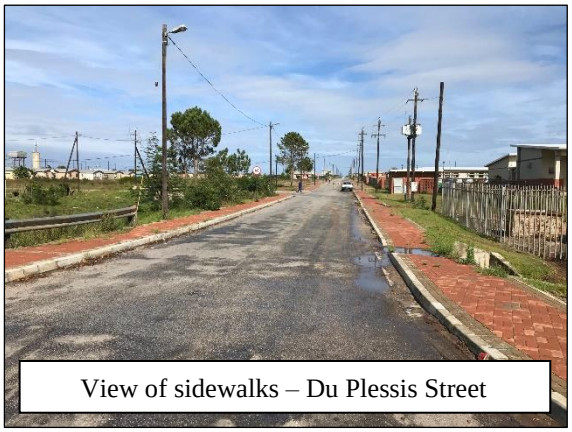
INANI LESIVUMELWANO CONTRACT NO.

INANI LOMZOBO DWG.NO.
1629-P-005

UMKHOLO (SIZE)

3.5 PEDESTRIAN FACILITIES

Paved pedestrian sidewalks are provided in Kranshoek alongside roads that have recently been upgraded.



View of sidewalks – Du Plessis Street

3.6 SPATIAL DEVELOPMENT FRAMEWORK

Figure 6 below is an extract of the **Review of the Bitou Local Municipality Spatial Development Framework** [5] prepared by WM de Kock Associates on behalf of the Bitou Local Municipality that depicts the land use proposals for the Kranshoek area. Ptn 9 of Farm 432 is located in a Strategic Development Area set aside for IRDP and social housing development.

The LSDF further proposes that a business node (13) be located along the western end of Van Rooyen Street with a taxi rank incorporated into this facility. An alternative location would be in the south-western corner of the proposed development area (14) to the southeast of the existing Primary School.

Within the broad framework provided for in the Bitou LM Spatial Development Framework, the rezoning and subdivision proposal for Ptn 9 provides for business, residential and institutional uses.

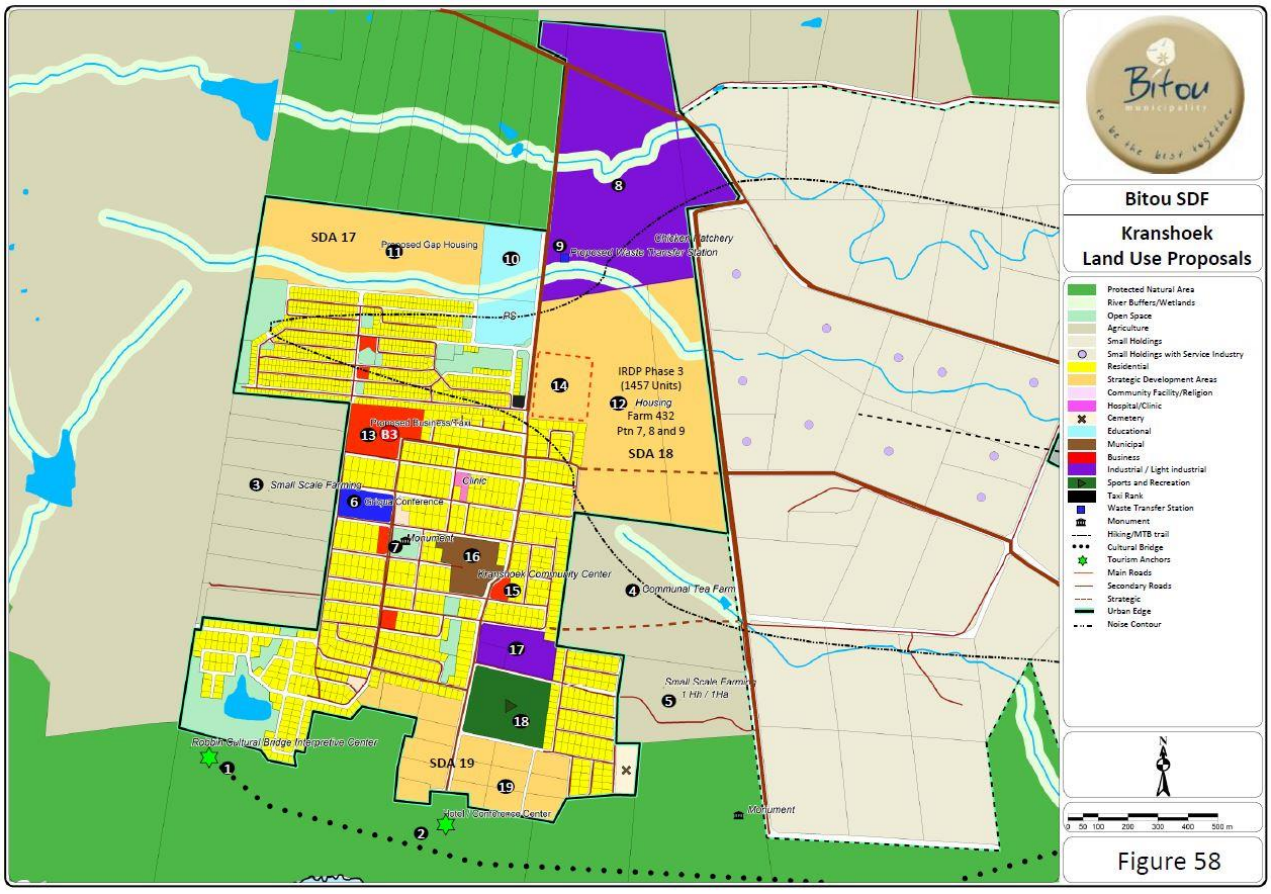


Figure 6: Extract of Bitou Local Municipality Spatial Development Framework

4 CAPACITY ANALYSIS – EXISTING SITUATION

Level of Service (LOS) is defined as the operating condition that may occur at an intersection when it accommodates various traffic volumes. LOS is a qualitative measure of the effect of speed, travel time, traffic interruptions, freedom to manoeuvre, safety, driving comfort and convenience, and operating costs. **LOS C** is considered an acceptable design standard for SANRAL roads. The LOS applicable to intersections under various control conditions, as defined in the **Highway Capacity Manual** [7] are indicated in **Table 1** below:

Table 1: Level of Service definitions for Vehicles (Highway Capacity Manual [6] method)

Level of Service	Control delay per vehicle in seconds (d) (*including geometric delay*)	
	Signals and Roundabouts	Stop Signs and Yield Signs
A	d ≤ 10	d ≤ 10
B	10 < d ≤ 20	10 < d ≤ 15
C	20 < d ≤ 35	15 < d ≤ 25
D	35 < d ≤ 55	25 < d ≤ 35
E	55 < d ≤ 80	35 < d ≤ 50
F	80 < d	50 < d

The traffic situation was analysed in order to determine the Level of Service at which the affected intersections would operate before development occurs for the 2020 development horizon.

The capacity analysis was undertaken using the **SIDRA Intersection Network 8** [7] capacity analysis method and applying the **Highway Capacity Manual** [6] gap acceptance criteria for unsignalised intersections where applicable.

The results are shown in **Table 2** below and the detailed SIDRA output sheets attached as **Annexure C.**

Table 2: Results of Intersection Capacity Analysis – 2020 Before Development

Configuration	Delay		V/C		LOS*	
	AM	PM	AM	PM	AM	PM
Robberg Road / Robberg Reserve Rd	1.7	2.6	0.165	0.139	A*	A*
Robberg Road / Trekker Road	5.5	4.7	0.225	0.238	A*	A*
Trekker Road / Du Plessis Street	3.7	2.8	0.093	0.116	A*	A*
National Route 2 / Airport Road	2.6	1.7	0.142	0.188	A*	A*

* - **SIDRA Intersection Network** [7] does not calculate intersection LOS for stop-controlled intersections. The LOS indicated is sourced from the **Highway Capacity Manual** [6] (**Table 1** above).

As can be seen from the results contained in **Table 2**, no capacity problems are experienced at the affected intersections under current conditions.

5 ACCESS ARRANGEMENTS

The access to Phases 1 and 2 from Trekker Road are dictated by the position of the wetland and its buffer zones. As a result, it is not possible to gain access at a point opposite Du Plessis Street.

Access to the Phase 1 is thus proposed from Trekker Road (DR07207) at a point approximately 65m north of Du Plessis Street. At a later stage, once Phases 2, 3 4 and 5 are developed, additional access is proposed from Trekker Road (DR07207) at a point approximately 85m south of Du Plessis Street and via the existing residential streets (Kiewit Avenue) which already intersect with Trekker Road.

In the long-term as further development occurs to the east of Kranshoek, the **Bitou LM Spatial Development Framework** [(5)] indicates linkages to these areas, possibly via Eureka Street (see **Figure 6**).

Although traffic volumes passing through this junction are relatively low (303 and 415 during the AM and PM peak hours respectively), it is the intersection through which all vehicular traffic entering and exiting the Kranshoek area passes. The proposed intersection is also in close proximity to the primary school and learners from the new development area are likely to be accommodated in this school and would thus need to cross Trekker Road.

Given the close proximity to the Du Plessis Street intersection, its location along the main road into Kranshoek and nature of this phase it is proposed that an exclusive northbound right-turn lane be provided on Trekker Road to allow the northbound through movement to be uninterrupted by traffic waiting to turn right into the proposed development.

In addition, provision must be made to ensure children are able to cross Trekker Road safely, in the form of dedicated raised pedestrian crossings.

The additional development area will initially accommodate a further 419 households and as such traffic flow along Trekker Road will increase accordingly. In the longer-term traffic will likely increase further as future expansion into the remaining phases proceeds (accommodating an additional 479 households) and until such time as new road linkages are constructed to the east into the airport area.

It is therefore of utmost importance that the junction is able to accommodate both current and development traffic as well as cater for future anticipated growth.

The locations and configuration of the access points on Trekker Road are indicated on **Figure 12**.

The residential roads in the development shall be designed in terms of municipal standards, with the proposed collector roads constructed to a minimum width of 7.4m excluding channels and kerbs (thus 8m width from kerbface to kerbface).

6 TRIP GENERATION AND DISTRIBUTION

6.1 TRIP GENERATION

6.1.1 Development Trips – TMH17

TMH 17 Volume 1 - South African Trip Data Manual [(2)] recommends peak hour trip generation rates for the proposed uses as indicated in **Table 3** below:

TMH17 further provides for a reduction in peak hour vehicle trips based on a range of factors, namely car-ownership (low -30% and very low -70%), location on a public transport route (-15%) and whether part of a mixed-use development (-10%).

Given that the development and Kranshoek is served by a registered public transport route, the low to very low car ownership as well as the mixed use, the projected peak hour trips can be reduced by between 40.5% and 77% depending on the use.

Table 3: TM17 Trip Generation Rates

USE	RATE			REDUCTION (%)		
	AM	PM	SAT AM	Mixed	Low Vehicle Ownership	PT Node
Retail*/ 100m^2	0.6	3.4	4.5	10	40	15
Single Residential / unit	1.0	1.0	0.5	10	40	15
Residential Apartments / unit	0.65	0.65	0.35	15	50	15
Creche / child	1	0.8	0.30**	5	50	15

* The following size adjustment factor (SAF) is applied to the retail rate depending on the size of the development.

$$SAF = 1 + \left[{}^{6}/_{\left(1 + {}^{GLA}/_{3500}\right)} \right]$$

** Midday trip generation rate

It is generally also accepted that during the PM peak hour only 57% of the trips generated by retail / shopping centre developments are considered to be primary (i.e. new) trips with the remaining trips being made up of pass-by trips (13%) and diverted trips (30%). Given the nature of this proposed development as a suburban shopping centre, 57% of the trips generated by the development are thus assumed to be primary trips. During the Saturday peak hour, 50% of trips are assumed to be primary trips.
Applying these rates and reductions to the proposed development results in generated trips as follows:

Single Residential units

TGR (Weekday AM/PM)	=	1 trip /unit * no of units
	=	1 trips / unit * 479 units
	=	479 trips (in and out)
Less 54.1% (combined reduction)	=	- 259 trips
	=	**220 trips** (0.46 trips / unit)
Split (in / out)	=	25 : 75 (AM) / 70 : 30 (PM)

Apartments (Social)

TGR (Weekday AM/PM)	=	0.65 trips /unit * no of units
	=	0.65 trips / unit * 419 units
	=	272 trips (in and out)
Less 63.875% (combined reduction)	=	- 272 trips
	=	**98 trips** (0.23 trips / unit)
Split (in / out)	=	25 : 75 (AM) / 70 : 30 (PM)

Day Care Centre (100 children)

TGR (Weekday AM)	=	1 trip /child * no of children
	=	1 trip / unit * 100 children
	=	100 trips (in and out)
Less 59.625% (combined reduction)	=	- 60 trips
	=	**40 trips** (0.40 trips / unit)
TGR (Weekday PM)	=	0.8 trip /child * no of children
	=	0.8 trip / unit * 100 children
	=	80 trips (in and out)
Less 59.625% (combined reduction)	=	- 48 trips
	=	**32 trips** (0.32 trips / unit)
Split (in / out)	=	50 : 50 (AM / PM)

Business site

Applying the rates and reductions listed in **TMH 17 Volume 1 - South African Trip Data Manual** [(2)] to the proposed retail development of 4 000m^2 results in generated trips as follows:

TGR (Weekday AM)	=	0.6 * [1+ (6/(1+(GLA/3500)))] * GLA/100
	=	0.6 * [1+ (6/(1+(4000/3500)))] * 40.0
	=	0.6 * 3.80 * 40.0
	=	2.28 * 40.0
	=	**91 trips** (in and out)
Less 54.1% (combined reduction)	=	- 49 trips
	=	**42 trips** (in and out)
TGR (Weekday PM)	=	3.4 * [1+ (6/(1+(GLA/3500)))] * GLA/100
	=	3.4 * [1+ (6/(1+(4000/3500)))] * 40.0
	=	3.4 * 3.80 * 40.0
	=	12.92 * 40.0
	=	**517 trips** (in and out)
Less 54.1% (combined reduction)	=	- 263 trips
	=	**280 trips** (in and out)
Split (in / out)	=	65 : 35 / 50 : 50 (AM / PM)

Summary of Generated Trips

Table 4 below summarizes the generated trips for each component of the development area.

Table 4: Peak Hour Trip Generation Summary

Component	TRIPS IN			TRIPS OUT		
	AM	PM	SAT AM	AM	PM	SAT AM
Retail	27 (0)*	30 (89)*	78 (78)*	15 (0)*	30 (89)*	78 (78)*
Single Residential	55	154	55	165	66	55
Apartments	25	69	26	74	30	26
Creche (Day care)	20	16	6**	20	16	6**
Total	**127 (0)***	**269 (89)***	**165 (78)***	**274 (0)***	**142 (89)***	**165 (78)***

*Primary Trips (Pass-By Trips)

** Midday trips

6.1.2 Development Trips based on Households

The results of Census 2011 and the Community survey of 2106 conducted by Stats SA show that population growth in Bitou LM between 2011 and 2016 was 3.8% (average of approximately 0.75% per annum. This is indicated in **Figure 7** alongside.

Assuming the number of households has increased at the same rate and applying this annual growth to the number of households (1442) recorded in Kranshoek in the 2011 Census indicates that currently there would be approximately 1519 households.

The proposed development on Ptn 9 provides for 479 single residential and 419 social housing units.

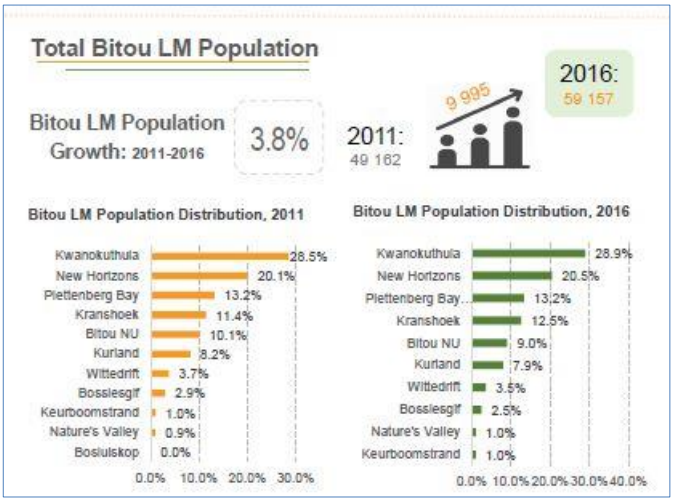


Figure 7: Population Growth

Applying the ratio of existing traffic volumes passing through the intersection to the current households provides a vehicle trip generation rate of 0.19 and 0.18 trips per household during the AM and PM peak hours respectively

Realistically, the trips generated by the proposed development are likely to be the same as that generated by the current Kranshoek area.

As such applying this rate / household to the additional households (898) realizes an additional 170 peak hour trips during the AM and PM peak hours.

6.1.3 Proposed Trip Development Rate

It is noted that utilising the rates related to households may be a simplistic approach as the proposed business area and secondary school may contribute to a higher ratio of trips per household than is currently the case.

It is argued however that while this may be the case there is likely to be a high level of pedestrian and public transport trips within Kranshoek given low car ownership. Trips into and out of the suburb are likely to be in the same ratio per household than is currently the case.

The trip generation rate reductions allowed in terms of TMH 17 have only taken into account low car ownership. It is submitted that this is extremely conservative when considering actual traffic volumes relative to the current population and number of households.

It is therefore proposed that the trip generation rates to be used be those related to households. **The actual recorded rates of approximately 0.2 trips per household will be increased to 0.3 to allow for a more conservative approach**.

Thus 898 households will generate 269 peak hour trips. It is further assumed that the trips generated by the creche, clinic and places of worship will be predominantly internal trips. The trips generated by the business development will likely be shared with the trips generated by the household trips and the existing households adjacent to the proposed development, given the location of this component at the entrance to the Phase 1 component of the development, these trips are likely to be pedestrian and public transport in nature.

6.2 TRIP DISTRIBUTION

The following distribution has been assumed for trips generated for the 2020 and 2025 development horizons.

Phase 1:

- 60% to and from the east via Robberg Road and Trekker Road;
- 20% to and from the northwest via the N2, Robberg Road and Trekker Road;
- 10% to and from the east via the N2, Robberg Road and Trekker Road;
- 5% to and from the south via Trekker Road; and
- 5% to and from the west via Du Plessis Street and Trekker Road.

Phase2, 3, 4 &5:

- 60% to and from the east via Robberg Road and Trekker Road; of which
  - 60% via Trekker Road; and
  - 40% via Loop Street
- 20% to and from the northwest via the N2, Robberg Road and Trekker Road; of which
  - 60% via Trekker Road; and
  - 40% via Loop Street
- 10% to and from the east via the N2, Robberg Road and trekker Road; of which
  - 60% via Trekker Road; and
  - 40% via Loop Street
- 5% to and from the south via Trekker Road; and
- 5% to and from the west via Du Plessis Street and Trekker Road.

The generated peak hour trips are indicated on **Figure 8** overleaf and the generated trips added to the weekday AM and PM peak hour volumes are indicated on **Figure 9** and **10** overleaf.

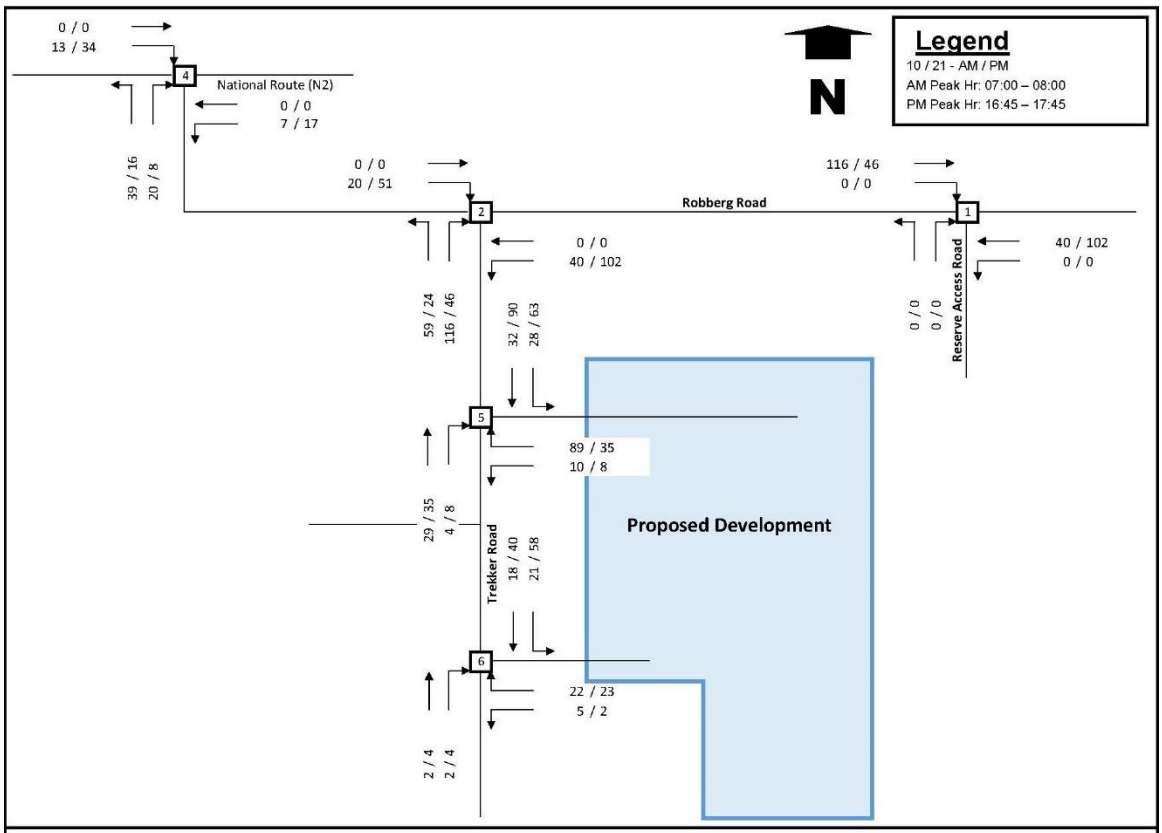


Figure 8: Generated Peak Hour Traffic Volumes

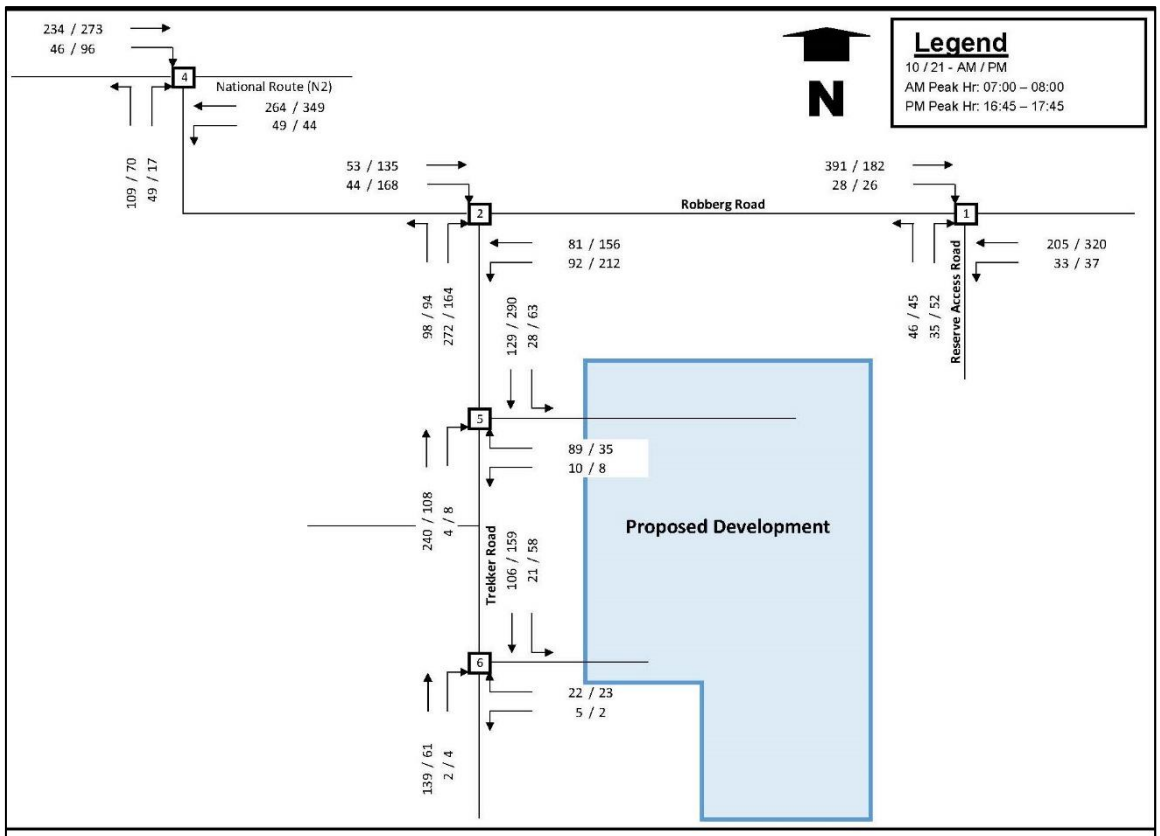


Figure 9: Peak Hour Traffic Volumes after Development - 2020

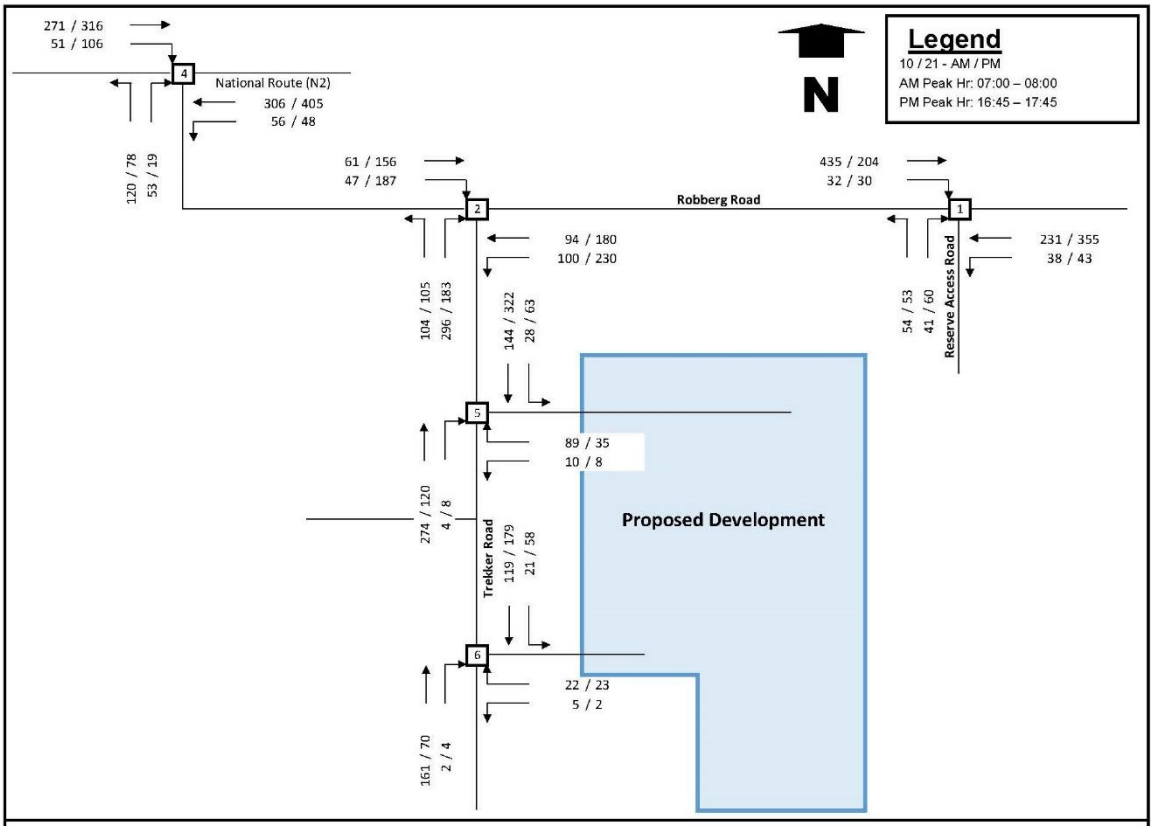


Figure 10: Peak Hour Traffic Volumes after Development - 2025

7 CAPACITY ANALYSIS – AFTER DEVELOPMENT

7.1 2020 DEVELOPMENT HORIZON

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 intersections and access points would operate after development occurs.

The results are shown in **Table 5** below and the detailed SIDRA output sheets attached as **Annexure D.**

Table 5: Results of Intersection Capacity Analysis – 2020 After Development - Development Only

Configuration	Delay		V/C		LOS*	
	AM	PM	AM	PM	AM	PM
Robberg Road / Robberg Reserve Rd	1.7	2.2	0.232	0.194	A*	A*
Robberg Road / Trekker Road	6.4	5.9	0.387	0.363	A*	A*
Trekker Road / Du Plessis Street	3.3	2.2	0.107	0.168	A*	A*
National Route 2 / Airport Road	3.1	2.4	0.143	0.188	A*	A*
Trekker Road / North Access	2.3	1.7	0.132	0.192	A*	A*
Trekker Road / South Access	1.2	1.9	0.076	0.119	A*	A*

* - **SIDRA Intersection Network** [7] does not calculate intersection LOS for stop-controlled intersections. The LOS indicated is sourced from the **Highway Capacity Manual** [6] (**Table 1** above).

As can be seen from the results contained in **Table 5**, the additional traffic generated by the development has minimal impact on operation of the affected intersections in terms of capacity.

7.2 2025 DEVELOPMENT HORIZON

After adding the generated traffic volumes to the **escalated background peak hour volumes**, the traffic situation was analysed in order to determine the LOS at which the affected intersections would operate after development occurs for the 2025 development horizon.

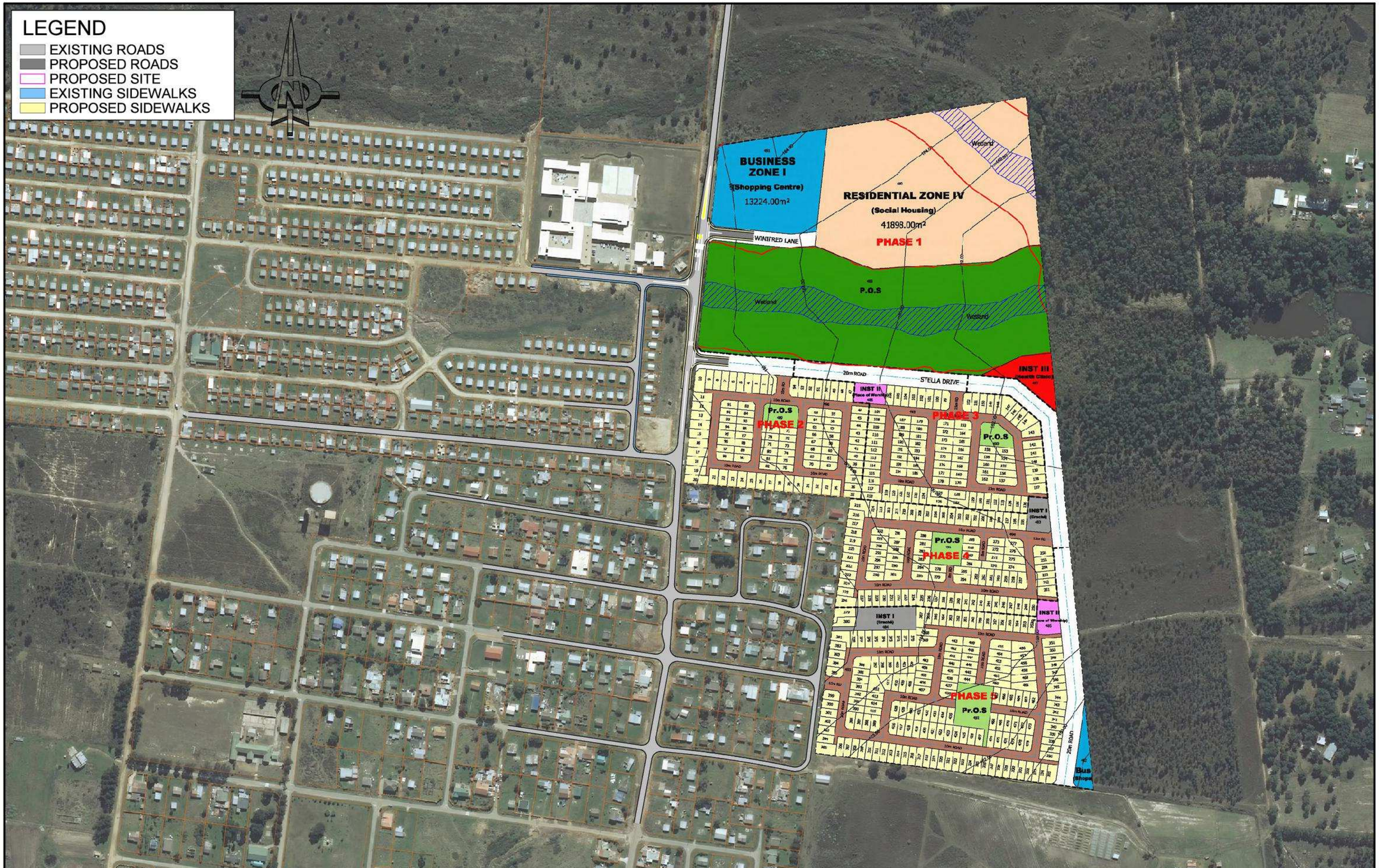
The results are shown in **Table 6** below and the detailed SIDRA output sheets attached as **Annexure E.**

Table 6: Results of Intersection Capacity Analysis – 2024 After Development - Development Only

Configuration	Delay		V/C		LOS*	
	AM	PM	AM	PM	AM	PM
Robberg Road / Robberg Reserve Rd	1.8	2.4	0.260	0.216	A*	A*
Robberg Road / Trekker Road	6.6	6.3	0.431	0.441	A*	A*
Trekker Road / Du Plessis Street	3.4	2.3	0.131	0.190	A*	A*
National Route 2 / Airport Road	3.2	2.4	0.165	0219	A*	A*
Trekker Road / North Access	2.1	1.6	0.151	0.210	A*	A*
Trekker Road / South Access	1.1	1.7	0.088	0.130	A*	A*

* - **SIDRA Intersection Network** [7] does not calculate intersection LOS for stop-controlled intersections. The LOS indicated is sourced from the **Highway Capacity Manual** [6] (**Table 1** above).

As can be seen from the results contained in **Table 6**, when considering the traffic generated by the proposed development added to the escalated background traffic volumes, no capacity problems are experienced at the intersections.



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						IVUNYELWE APPROVED	CH				FIGURE 12: PROPOSED DEVELOPMENT LAYOUT	1629-P-011
						UMHLA DATE	FEB 2020					UMNKELO ISSUE

"UMNKELO" "AS BUILT" - NOTES

FOR REPORT

"UMNIKELO" "AS BUILT" - NOTES

FOR REPORT

UTSHINTSHO / AMENDMENTS			
INAN NO.	UMHLA DATE	INKCAZA DESCRIPTION	IVUNYELWE APPROVED

UMLINGAN-ISELO SCALE: 1 : 2000

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50mm KUMZOBO WANGAPHAMBILI

50mm ON ORIGINAL DRAWING

UMENZI DESIGN	JC
UMZOBI DRAWN	EHN
IVUNYELWE APPROVED	CH
UMHLA DATE	FEB 2020

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IVUNYELWE APPROVED

INJINELI/ENG.

UMHLA / DATE

IVUNYELWE APPROVED

UMENZELWA / CLIENT

UMHLA / DATE

IPROJETI / PROJECT

TIA FOR A PROPOSED SUBDIVISION AND REZONING OF PTN 9 OF THE FARM KRAMSHOEK NO.432, KNYSNA ROAD

UMZOBONKCAZA / DWG DESCRIPTION

FIGURE 12: PROPOSED ACCESS CONFIGURATION

INANI LESIVUMELWANO

CONTRACT NO.

INANI LOMZOBO DWG.NO.

1629-P-012

UMNIKELO ISSUE

8 PUBLIC TRANSPORT OPERATIONS AND PEDESTRIAN ARRANGEMENTS

8.1 PUBLIC TRANSPORT

The **Local Integrated Transport Plan for the Bitou Local Municipality 2016 – 2021** [4] indicates that the minibus taxi route serving Kranshoek follows Trekker Road to the existing taxi rank.

The proposed development of Phases 2, 3, 4 and 5 may result in an adjustment to this route so that it follows the proposed 20m South Access Road so creating a loop linking back into Trekker Road via Kiewiet Street.

Subject to agreement by the Operating License Board, the taxi route should be adjusted if required.

8.2 PEDESTRIAN ARRANGEMENTS

Given that walking is likely to be one of the key transport modes in the area, pedestrian sidewalks must be provided along the proposed 20m collector roads entering the northern and southern access roads and provision made for crossings over Trekker Road.

9 PARKING REQUIREMENTS

The parking demand shall be provided on each site in terms of the requirements of Section 8 of the LUPO Scheme Regulations.

10 CONCLUSIONS

The following conclusions can be drawn from the study:

- Under current traffic conditions no problems are experienced at the affected intersections in terms of capacity;
- Based on traffic generated by the existing households in Kranshoek, it is anticipated that peak hour traffic generated by the additional households will result in the doubling of traffic volumes along Trekker Road;
- Access to Portion 9 is dictated by the wetland and buffer zones which span the site from Du Plessis Street eastwards;
- Access to phase 1 of the proposed development can be accommodated from Trekker Road 65m north of Du Plessis Street as indicated on **Figure 12**;
- Access to future phases of the development can be accommodated from Trekker Road 85m south of Du Plessis Street as indicated on **Figure 12**;
- The access junction to Phase 1 north of Du Plessis Street must be configured as indicated on **Figure 12** and include provision for safe pedestrian movement across Trekker Road;
- The results of the intersection capacity analysis after development indicate that traffic generated by the proposed development has minimal impact on operation of the affected intersections for the 2020 and the 2025 development horizons.

11 RECOMMENDATIONS

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

- This TIA be approved by the Bitou Local Municipality;
- Access to Portion 9 be approved from Trekker Road (North and South Access Road) and configured as indicated on **Figure 12**, with the cost of all road adjustments being met by the developer;
- The North and South Access Roads with Trekker Road be upgraded as indicated on **Figure 12,** including provision for safe pedestrian movement across Trekker Road;
- The proposed collector roads be constructed to a 7,4m surfaced width excluding kerb and channel, with sidewalks provided along both sides.

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. *Metroplan,* **Proposed Subdivision and Rezoning of Portion 9 of the Farm Kranshoek No. 432, Knysna Road**, Status Homes Property Developers (Pty) Ltd, September 2018.

4. *Ace Consulting & Sturgeon Consulting*, **Local Integrated Transport Plan for the Bitou Local Municipality 2016 – 2021**, Eden District Municipality, March 2016.

5. *WM De Kock Associates*, **Review of the Bitou Local Municipality Spatial Development Framework,** Bitou Local Municipality, November 2018.

6. *Transportation Research Board*, **Highway Capacity Manual**, 2000.

7. *Akcelik & Associates (Pty) Ltd*, **SIDRA Intersection Network 8 User Guide**, SIDRA Solutions, April 2018.

8. *Statistics South Africa*, **2011 Census – Main Place Data - Bitou – Kranshoek**, www.statssa.gov.za;

9. *Western Cape Government*, **Access Management Guidelines**, Transport and Public Works, Draft July 2016.

10. *Bruinette Kruger Stoffberg Inc*, **Parking Standards (Second Edition)**, Department of Transport, November 1985.

ANNEXURE A
Rezoning Application – Motivation Report

PROPOSED SUBDIVISION AND REZONING OF PORTION 9 OF THE FARM KRANSHOEK NO. 432, KNYSNA ROAD

APPLICATION FOR:

The Proposed Subdivision and Rezoning of Portion 9 of the Farm Kranshoek No. 432, Knysna Road

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METROPLAN REF.:

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DATE:

September 2018

FILE REF.:

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APPLICATION FOR THE SUBDIVISION AND REZONING OF PORTION 9 OF THE FARM KRANSHOEK NO. 432, KNYSNA ROAD

MOTIVATION

1 BACKGROUND

1.1 Appointment

Status Homes Property Developers (Pty) Ltd has commissioned Metroplan Town Planners to Submit land use applications to the Bitou Municipality to obtain the appropriate land use rights for the development of Portion 9 of the Farm Kranshoek No. 432. The authorisation to submit an application was obtained through a Power of Attorney signed between the Land Owner, Stella Winifred Olivier and Metroplan Town Planners on 17th August 2018, and a Deed of Sale signed on 24 March 2017, between the Land Owner, Stella Winifred Olivier and Status Homes Property Developers (Pty) Ltd. (Refer to **Annexure A** for the Power of Attorney, and **Annexure B** for Deed of Sale.)

Appropriate land use rights will be obtained within the provision of the Land Use Planning By Law of the Bitou Municipality under the LUPO Scheme Regulations of Section 8.

1.2 Integrated Development Process

Status Homes intends acquiring the adjacent land portions, 7 and 8, as part of a larger integrated development. However, this application comprises, at this stage, only portion 9. As will be seen later in the report, a Framework Plan showing the planning intent for all three portions is presented to contextualise the proposals on portion 9.

1.3 Position of the Site Within Context of Plettenberg Bay

Kranshoek is situated approximately 8km by road from the Town Centre of Plettenberg Bay off the Robberg Road which connects western portions of Plettenberg Bay through the Robberg Road to the N2 further west. (Refer to **Plan 1**.)

Kranshoek itself comprises a number of township extensions linked together by a network of tar and gravel roads set back at approximately 1km from Robberg Road.

The three land portions incorporated with the Urban Edge, approximately 65,77ha in total, would in future accommodate a significant amount of the housing backlog. Preliminary planning of the three portions recorded approximately 1 720 housing units.

Although Kranshoek is 8km from Plettenberg Bay, it is viewed as a node and despite the limitation and the friction of distance, i.e. not within 10-minute walking distance from critical economic and social infrastructure nodes, it is within walking distance of a growing public transport system which still is within 15-minute driving distance from the main economic and social nodes.

1.4 Locality of the Site

The farm portion (Portion 9) is positioned to the east of the town of Kranshoek and abuts Trekkerspad where urban development starts. Urban development consisting of affordable housing and a school can be found to the west of the site with mostly vacant land to the north and agricultural farm portions (Portions 7 and 8) to the east and south. (Refer to **Plan 2**.)

2 EXISTING SITUATION

2.1 Cadastral Details and Extent of Area

The original total extent of Portion 9 of the Farm Kranshoek No. 432 was 25,9487Ha. Approval was grated in terms of Act 70 of 1970 for the subdivision, rezoning and departure on a portion (0,46Ha) of Portion 9 of the Farm Kranshoek No. 432 reducing the size of the remainder of the land to approximately 25,58Ha. (Refer to **Annexure C**.) This was approved on 6 September 2016.

2.2 Current Zoning

The subject erf is currently zoned “Agriculture” in terms of Section 8 of the LUPO Scheme Regulations. Application will simultaneously be made for the subdivision of Agricultural Land Act, 1970 (Act 70 of 1970) if required.

The Agricultural zoning does not permit the mix of uses envisaged in the proposed development. The rezoning will enable a variety of uses on the subject site thereby maximising its development potential.

Plan 3 depicts the approximate zoning status of the surrounding properties, which are predominately zoned Residential.

2.3 Existing Land Use

Portion 9 of the Farm Kranshoek No. 432 is not completely undeveloped and in fact has numerous residential buildings situated on it. Abutting erven are mostly residential buildings or vacant land. (Refer to **Plan 4**.)

A small Industrial area is situated north of the site. Other land uses indicate business facilities (shops), a community centre and library, clinic and a school.

The Developer intends to demolish all existing buildings to accommodate the new Layout Plan.

2.4 Physical Environmental Situation

2.4.1 Topography and Drainage

The site slopes gently to the east and south-east, with one non-perennial water course traversing the site with a west to east, and west to south-east flow pattern. (Refer to **Plan 5**.)

2.4.2 Geology and Soils

The site is situated mostly on Arenite with soils depth of between 450mm and 750mm. Arenite is a sedimentary rock with sand grains of medium nature. Provision may have to be made for special founding bases due to the high clay context in the soils around Kranshoek. (Refer to **Plan 6**.)

2.5 Biophysical Environment

2.5.1 Flora

The north-eastern tip of Portion 9 falls within an area classified by SANPARKS in terms of their Critical Biodiversity Areas Map of the Garden Route, as an Ecological Support Area (ESA). The ESA are supporting zones or areas which must be safeguarded as they are needed to prevent degradation of Critical Biodiversity Areas and formal Protected Areas. (Refer to **Plan 7**.)

The rest of Portion 9 was used for Extensive Agriculture (stock farming) and consists mainly of a mixture of non-indigenous trees such as Pines, Bluegums and Wattle interspersed with grassland (grazing) and areas of Fynbos. No crop farming is evident on the site. (Refer to **Annexure D**.)

SANBI in 2006 classified the vegetation status of the area around Kranshoek as vulnerable. (Refer to **Plan 8**.) The ENPAT report of 2003 classifies the area to the east of Kranshoek and which incorporates Portion 9 as Grass and Shrub.

2.6 Engineering Utilities

Information on Civil Engineering Services was extracted from a Preliminary Civil Engineering Services Statement prepared by Bau-Afrika, Consulting Engineers and Project Managers. (Refer to **Annexure H**.) Although only Portion 9 is the subject of this application, the Statement also covers Portions 7 and 8 of the Farm Kranshoek No. 432.

2.6.1 Existing Civil Engineering Services

An investigation into the existing civil engineering services and roads has been partially completed in the vicinity of the site and some information was obtained from the Bitou Municipality. Existing services around the site include the following:

- A sewer rising main that runs along the Northern boundary of the site that turns and runs along the Western boundary of the site into the Kranshoek residential development.
- A bulk water main that runs parallel to the sewer rising main mentioned above and turns into the Kranshoek residential development west of the site.

2.6.2 Proposed Civil Engineering Services

2.6.2.1 Stormwater

- New stormwater system to discharge overland into a new regional detention pond situated in the top North Eastern public open space adjacent to the institutional zone which will then be discharged into the existing pond to the east.
- New stormwater system to discharge overland into a new regional detention pond situated in the bottom South Eastern public open space adjacent to the institutional zone.
- Two new areas have been proposed for "services servitudes" to allow for the drainage of low points.
- An internal stormwater system will be further investigated and designed to discharge the stormwater run-off adequately as per the "***Guidelines for Provision of Engineering Services and Amenities in Residential Developments***" as published by the CSIR.

2.6.2.2 Sewer

- The new internal sewer system will connect to the existing sewer system mentioned above in Section 2.6.1 and will consist of a uPVC sewer reticulation system of various sizes.
- A new sewer servitude is proposed to run along the Northern border of the site.
- With the further full capacity analysis done with the application for rezoning and subdivision it will be determined what the impact of the proposed development on the existing external reticulation system will be and what upgrades will need to be implemented.
- The following design flow criteria will be applicable to the internal sewer reticulation system requirements:

DOMESTIC SEWER DEMAND RESULTS			
LAND USE	**NO OF UNITS**	**DISCHARGE AADD**	**SEWER AADD (l/day)**
Dwelling Houses	1361	500	680 500
Flats	361	315	99 540
Shopping Centre	18 662m²	2.8	52 254
School & Crèche	4.13ha	4000	16 520
Place of Worship	4	1400	5600
Health Clinic & Community Hall	26621m²	3.5	93 174
TOTAL			**947 587**

The domestic sewer demands will be designed for as per the "Guidelines for Provision of Engineering Services and Amenities in Residential Development" as published by the CSIR using 70% of the domestic water demands.

2.6.2.3 Water

- The new internal water system will consist of a uPVC water reticulation system of various sizes.
- Installation of water meters will be done as per the regulations of the Bitou Municipality.
- With the further full capacity analysis done with the application for rezoning and subdivision it will be determined what the impact of the proposed development on the existing external reticulation system will be and what upgrades will need to be implemented.
- The following design flow criteria will be applicable to the internal water reticulation system requirements:

DOMESTIC SEWER DEMAND RESULTS			
LAND USE	**NO OF UNITS**	**DISCHARGE AADD**	**SEWER AADD (l/day)**
Dwelling Houses	1361	600	816 600
Flats	361	450	142 200
Shopping Centre	18 662m²	4	74 648
School & Crèche	4.13ha	5715	23 600
Place of Worship	4	2000	8 000
Health Clinic & Community Hall	26621m²	5	133 105
Public Parks	10.986ha	4286	47 083
TOTAL			**1 245 236**

The domestic water demands will be designed for as per the "***Guidelines for Provision of Engineering Services and Amenities in Residential Developments***" as published by the CSIR.

2.6.2.4 Roads and Access

- Access to the development will be provided off Trekkers Road which runs on the top Western boundary of the site.
- A transport Impact Study to determine the transport related constraints and appropriate mitigation measures within the Kranshoek area will be done in due course.

- The geometric design, cross section and structural design of the roads will be based on the accepted standards for the class of roads proposed.
- Road layer works requirements will be finalised during the detail design stage.

2.6.2.5 Telecommunication and Data

- New Telkom and Data ducting sleeves are to be installed in accordance with the requirements of SABS 1200LC.

2.6.2.6 Electrical

- Electrical service assessment was done by Clinkscales Maughan-Brown. (Refer to **Annexure H**.)
- The electrical supply authority for the area is Eskom therefore the distribution network will have to comply with their requirements and standards.
- It has been assumed that the existing Eskom 22kV overhead line across the site will be relocated to follow the road reserves and that the network will be extended and augmented to accommodate the planned development.
- The electrical demand is at this stage estimated as follows:

a)	559 Dwelling houses @ 6.9kVA each x 0.3df	=	1 157 kVA
b)	316 Flats @ 6.9kVA each x 0.3df	=	654 kVA
c)	Shops @ 500kVA x 0.7df	=	350 kVA
d)	School / creche @ 100kVA x 0.7df	=	70 kVA
e)	Place of worship @ 40kVA x 0.7df	=	28 kVA
f)	Health Clinic @ 40kVA x 0.7df	=	28 kVA
	TOTAL		**2 287 kVA**

2.6.3 Conclusion

Based on the above findings, suitable civil engineering services and road access can be provided to the proposed development. At this stage we do not foresee any engineering constraints which would make the proposed town planning framework unsuitable for development.

3 POLICY FRAMEWORK

3.1 Bitou Municipal Spatial Development Framework (2017) (BMSDF)

3.1.1 Housing demand and land required

In order to understand the overall Future Land Use Policy Framework of the Bitou Municipality, the BMSDF was used as a reference. The proposals around the Kranshoek area in particular have been used to inform the planning proposals on Portion 9. Whereas the majority of the population resides in Plettenberg Bay, Kranshoek is a significant node of population concentration and growth, consistent with the trend in Bitou as a whole. With a growing population, improvement in infrastructure will be necessary together with increasing pressure for housing.

Kranshoek houses some of the lowest income levels and future demand for housing will therefore concentrate at the entry level of housing, making use predominantly of Government Housing Subsidy instruments. According to the report entitled "Affordable Rental Housing Strategy and Plan" prepared for the Bitou Municipality in 2017, Bitou experience a population growth of 5,4% with 33% of the households housing incomes between R1 983 to R7 928 and a further 14% housing incomes between R7 929 to R15 850.

Housing supply in Kranshoek would need to cover all these income groups in addition to those who fall outside of the Government Subsidized income bands. However, "real demand" from Government Assisted Housing is difficult to determine on census and other available figures and in terms of this report to test the "real demand" requires the practical delivery of actual projects to cover the lowest number in the continuum and then allow the response to these to indicate further assessment of "real demand".

Although the "Affordable Rental Housing Strategy and Plan" report concentrates on the demand for "Social Housing" the demographic statistics are applicable to all housing tenures and types. The demand for those earning between R1 983 – R15 856 is estimated to be anything between 500 - 2 000 units with the highest demand for those earning between R1 983 – R3 964 per month.

The BMSDF of 2017 states that the current housing backlog at Kranshoek is 486 housing units with a future forecast of 1 007 to the year 2030, making a total of 1 493 units. (Refer to **Annexure G** for Table 5.3.10 – Housing and Land Need.) The Framework Plan of the three portions would adequately provide for this demand. In order to accommodate the total, 44,66Ha will be required.

3.1.2 Kranshoek's importance in the greater Plettenberg Bay

The land development objectives as it applies to Kranshoek through the BMSDF proposes that Kranshoek develops as a future growth node (development occurring backwards to Plettenberg Bay along the airport road corridor) with growth commencing from the Kranshoek node eventually linking Kranshoek with Plettenberg Bay. The BMSDF further suggests that residential development around Kranshoek should be on land continuous with Kranshoek with development upwards of 1 000 units at a maximum density of 25u/Ha gross.

Kranshoek should be promoted as a balanced, self sufficient settlement with commercial and retail frontages on the main road and a possible resort onto the coast to the south. Some of the principles to give effect to this broad objective would be the need to develop an economic base in Kranshoek itself, improve accessibility into the larger system between Plettenberg Bay and balance the constraints and opportunities created by the airport which is seen as an economic catalyst half way between the two settlements.

3.2 The Urban Edge

During October 2016 an amendment to the BMSDF of 2013 was initiated by the Bitou Municipality which involved adjusting of the Urban Edge to incorporate Portions 7, 8 and 9 of the Farm Kranshoek No. 432. This was prompted by the ever-increasing demand for housing in Bitou in general and Kranshoek in particular. These three land portions now incorporated within the Urban Edge, have a particularly high residential development potential because of their proximity, accessibility and level topography suited for the development of affordable housing. (Refer to **Plan 9**.) In the Report on Amendment of the BMSDF of October 2016 compiled by W. M. De Kock and Associates, emphasis was placed on the need to promote higher residential densities with the planning of sites within the Urban Edge aimed at higher residential densities. The number of units planned in terms of this report is stated as being 1 400 for Kranshoek. (Refer to **Annexure G** for the Tables on pg. 8 of the report which shows present and future need.)

The three land portions now included within the Urban Edge 65,8Ha, will be able to accommodate 1 645 units at a density of 25 units per Ha. Portion 9 will, theoretically at least, be able to accommodate upwards of 640 units, however every attempt should be made to increase this density to above 25 units per hectare.

4 PROPOSED LAYOUT OF THE DEVELOPMENT

4.1 Proposed Framework Plan for the Development of Portion 7, 8 and 9 of the Farm Kranshoek No. 432

Reference should be made to **Plan 10**. In order to place Portion 9 into the context of the broader development, a Framework Plan has been compiled to better understand the direction and nature of the entire potential development, now within the Urban Edge. This Framework Plan also derives information from a plan compiled by W. M. De Kock and Associates which provides a broad framework of land uses required in the planning of the entire area. (Refer to **Plan 11**.) The combined portions make up 65,75Ha of which portion 9 (subject of this application) is 25,58Ha.

Provision is made for the following in the Framework Plan:

- **Residential**
  - Approximately 1 361 residential units are provided at a gross residential density of 21 units per hectare and an average erf size of 208m². These will be registered to potential beneficiaries under Free Hold Title, making use of both Government Housing Subsidies such as BNG, FLISP, and Social Housing and non-subsidised commercial affordable housing.

  - Provision is also made for an erf for Social (Rental Housing) with approximately 316 walk up rental apartments for both subsidised and non-subsidised development. This site is adjacent to the business site and provides an intensification of the node along Trekkerspad.

- **Business**
  - A business site to house a shopping centre is located in Portion 9 on Trekkerspad to accommodate the expanding demand for retail.
  - Four other lower level business sites are strategically positioned within the Framework.

- **Institutional Sites**
  - Twelve institutional sites provide for Places of Worship, a Health Clinic, Crèches and other unanticipated community social facilities.
  - Provision is also made for a school closely associated with a large open space and adjacent to the Social Housing (Rental) Site.

- **Open Space**
  - Provision has been made for parks within eight definable residential clusters.
  - Open spaces are also created to accommodate non-perennial water courses and the Ecological Support Area to the north.
  - Provision is also made for a sports field associated with a large Community Facility positioned on Portion 7.
  - Open Space accounts for 16,7% of the total area.

- **Road Network**
  - The area is traversed by a main spine road intersecting with Du Plessis Street and running due south providing access to all the residential clusters.
  - Other main roads running west-east intersect with road reserves to the east and in the direction of Plettenberg Bay. This provides greater connectivity to the surrounding area.
  - Internal road systems giving direct access to the residential clusters consist of closed loops and short stub roads.
  - Restricted access is placed along all the major roads to prevent traffic conflict.
  - Road reserves account for 21,55% of the total area.

4.2 Proposed Subdivision and Rezoning of Portion 9 of the Farm Kranshoek No. 432

Refer to **Plan 12** when reading this section. The CSIR Guidelines for the Provision of Social Facilities in South African Settlements was used as a reference document for the supply of appropriate land uses.

4.2.1 Residential Development

Provision is made for 559 Residential Zone I erven. It is proposed that a range of housing typological options will be made available within is area. The predominant mix will be:

- Single and double storey, free standing and semi-detached houses.
- Single and double storey, row houses (Refer to **Annexure E**.)

Provision is also made for one Residential Zone IV site, which will be able to accommodate up to 316, three storey walk up apartments at a maximum density of 110 units per hectare nett. (Refer to **Annexure E**.) This proposal is consistent with higher densities being placed near to social (school) and economic (shopping centre) amenities.

The gross residential density of all the potential residential units is 31,2 units per hectare. The Residential Zone I units have a gross residential density of 21,9 units per hectare, with an average erf size of 184m². No Residential 1 Zone erf is smaller than 8m x 20m (160m²).

The following income groups are to be catered for:

Monthly Income	Funding Instrument	Tenure
R1 500 – R15 000	SOCIAL HOUSING CAPITAL GRANT	RENTAL
R3 501 – R22 000	FLISP GRANT	OWNERSHIP
> R9 000	BONDED NON-SUBSIDISED	OWNERSHIP

The Residential Zone 1 erven are divided into 3 Phases, with Phase 1 encompassing also a business site, a site for social housing, and a school site. This is in keeping with the philosophy of developing incrementally and in keeping with a dynamic market where “real demand” is difficult to predict over the long term.

4.2.2 Business

Provision is made for one Business Zone I site of 13 437m². This site situated on the main road from Robberg Road to Kranshoek is at the intersection of Du Plessis Street and Trekkerspad, making it accessible to both the existing and future growing population. Within the complex provision will also be made for Institutional Uses. A site for a corner shop is provided at the intersection of the 20m spine road on the southern boundary of the site.

4.2.3 Open Space System

A hierarchy of Public Open Spaces is envisaged to make provision for play fields and play parks situated in strategic positions to serve the residential community with three smaller housing clusters served by small parks.

Provision is made within the Framework Plan encompassing Portions 7, 8 and 9 for larger open spaces and sports fields. The three residential portions are interconnected and are easily accessible from all three phases of development.

4.2.4 Roads

The layout of the road network is based on a hierarchy of roads. These range from the arterials to the local access roads.

Provision is made for a 20m wide road reserve which will serve as the main access road to the three phases of development. In terms of the Framework Pan, it will also provide access to the Portions 7 and 8. The road system internal to the various phases, provides direct access to residential erven which will be by way of 10m road reserves.

Stub roads of 8 – 10m reserve width provide access to clusters of units of not more than 50m in length. Entrance to the three clusters is provided with 16m wider reserves to accommodate refuse and security infrastructure, should the communities wish to be gated at a later stage.

4.2.5 Community Facilities (Public and Social)

Within Portion 9 an Institution Zone 1 site of 3,86Ha is planned to house a school. The school site is strategically positioned to take advantage of an adjacent open space aimed at accommodating the Ecological Support Area (ESA) providing also an opportunity for the creation of sports facilities on the non-affected areas. A site for a Health Clinic is also envisaged under Institution III Zone.

A further two Institutional sites to house Places of Worship are strategically placed along the spine route. Apart from the existing Crèche resulting from a minor subdivision of Portion 9, an additional crèche site is provided centrally and associated with a Public Open Space.

4.3 Spatial Budget

Table 2 shows the spatial budget for the proposed development on Portion 9. It depicts the land uses for the proposed zoning and their percentage in terms of the whole development. The following Spatial Budget is applicable to the application:

ZONING	LAND USE	ERVEN	AREA (HA)	DENSITY	RESIDENTIAL UNITS	% ALLOCATION
Residential Zone I	Dwelling Units	559	10, 3114	54,21 u / ha NETT	559	40,31%
Residential Zone II	Flats	1	2,8681	110,00 u / ha NETT	316	11,21%
Business Zone I	Shops / Shopping Centre	2	1,4682	-	-	5,74%
Institutional Zone I	School Crèche	2	3,9372	-	-	15,39%
Institutional Zone II	Place of Worship	2	0,1457	-	-	0,76%
Institutional Zone III	Health Clinic	1	0,19420	-	-	0,76%
Open Space Zone I	Public Parks	3	1,3389	-	-	5,23%
Transport Zone I	Roads	-	5,3163	-	-	20,78%
TOTAL		**570**	**25,5800**	**34,21 u / ha GROSS**	**875**	**100,00%**

5 PROPOSED APPLICATION

Application is made to:

1. Subdivide Portion 9 of the Farm Kranshoek No. 432 into 885 portions and roads.
2. Rezone Portion 9 of the Farm Kranshoek No. 432, in terms of Section 8 of the LUPO Scheme Regulations, from Agricultural to Residential Zone I, Residential Zone IV, Business Zone I, Institutional Zone 1, Institutional Zone II, Institutional Zone III, Open Space Zone I, and Transport Zone 1, as depicted on **Plan 12**.
3. Road and Public Open Spaces will vest in the Bitou Municipality on confirmation of the Plan and the registration of the first erf.
4. Application is also being made for the relaxation of the side Building Lines on all Residential Zone I erven to provide for the construction of semi-detached and row houses with party walls.

6 PROPOSED APPLICATION

6.1 Character of the Surrounding Area

Greater demand for a variety of housing options in the area is contained in the BMSDF, its amendments (2017) and information contained in the Affordable Rental Housing Strategy and Plan of 2017. Although the latter document concentrates on Social (Rental) Housing, the population statistics are still applicable to all housing types and tenures facilitated by a number of Government Housing Subsidy Instruments.

The proposed development is in keeping with the character of the surrounding area which is largely residential. the added facilities such as a Shopping Centre, School, Places of Worship and a Crèche will help in achieving the aim of promoting a balanced, self sufficient settlement with commercial and retail frontages on the main street providing a stronger sense of place.

6.2 Location and Accessibility

Kranshoek is 8km from the Centre of Plettenberg Bay and its location requires the improvement of accessibility as expounded in the BMSDF. It finds itself as a node at the end of a corridor which will be linked into the Plettenberg Bay system. Road access (Robberg Road) is good despite the distance between the two nodes.

However, vehicle travel time ought not to be more than 15 minutes to the main economic centres to make further expansion of Kranshoek viable. The subject site connects directly to the access road and onto Robberg Road.

6.3 Development Potential

Portion 9 is unique in its development potential being relatively flat and immediately adjacent to the existing development of Kranshoek. Most of Portion 9 can be utilised for development rendering a reasonable amount of residential opportunities.

6.4 Functional Integration

The proposal extends the notion of creating integrated environments as advocated by the BMSDF through the creation of a mixed-use area. The development has a mixed-use component incorporating a residential, recreational and retail component. This provides a functionally integrated environment that enables the interaction of the living, working and recreational areas which are all accessible to the residents.

The mixed-use component of the development also creates a higher density environment which is in line with the principles of densification forwarded by the BMSDF to create a compact settlement, although it is believed that 25 units per hectare is a relatively low density.

6.5 Residential Market

A significant increase in housing demand over the past years and the subsequent focus on affordable housing at National and Local levels has led to neglect of lower / middle income groups. Thus, the development seeks to cater for this neglected group whose demand for houses has also increased over the years.

6.6 Consistency with SPLUMA Principles

6.6.1 Spatial Justice

The principle of spatial justice promotes the equitable access to land through land use management and spatial planning policies. It emphasises the redress of past imbalances and promotes the inclusion of persons and communities previously excluded from development opportunities.

The proposed rezoning and subdivision promote spatial justice through the provision of a variety of housing tenures and typologies for residents of the municipality, thus, providing access to land to a majority of people who otherwise might not have been able to buy homes. Access to land is also made available to a majority of previously excluded individuals.

The Bitou Municipality has a housing backlog of over 8 800 units, and partnership with the private sector is needed to address this need. The proposed development will assist in reducing the backlog by providing much needed housing for the Gap market who cannot access fully subsidised government housing.

6.6.2 Spatial Sustainability

The principle of spatial sustainability promotes the harmonious interaction between the built and natural environments. It ensures the protection of sustainable use of natural resources.

A small portion of the subject site falls within an area known as an Ecological Support Area (ESA) as outlined in the BMSDF (2017). An Environmental Impact Assessment will be undertaken to determine environmental impact and care will be taken to preserve existing indigenous vegetation and natural environment. The development of the site will be guided by environmental policies and will be in line with the outcomes of the Environmental Authorisation where applicable.

The inclusion of Business Use and Open Space is aimed at creating an integrated sustainable human settlement. The proposed subdivision and rezoning will not impact negatively on the natural environment, it however promotes the integration of the natural and built environment.

6.6.3 Efficiency

The principle of efficiency highlights the need for optimal utilisation of existing resources and infrastructure. The proposed layout provides a road network that promotes internal circulation and linkages to the existing road network. The area is accessible from Robberg Road via Trekkerspad.

The proposed development is easily accessible and will efficiently utilise existing resources.

The proposed infrastructure and services will enable the development of a sustainable settlement. Provision will be made for access to municipal bulk services. Substations will be identified for bulk electricity connections.

6.6.4 Spatial Resilience

Spatial resilience ensures the development of the area is within the existing policy guidelines. The proposed development is in line with existing policy and structure plans which propose housing and community development on the eastern side of Kranshoek. A potential density of 34 units per hectare is proposed for the area which is 25,58Ha, the impact will therefore be minimal.

7 PROPOSED APPLICATION

The proposed development will address the ever-increasing demand for residential accommodation in the Bitou. It is also in line with Bitou's future plans for the residential development on the subject site and surrounding areas in Kranshoek.

The development is also desirable as it is accessible from existing and proposed arterial roads. The intensification of Kranshoek through the proposed development not only on Portion 9, will provide impetus to the plan to provide an elevated level of self sufficiency also linking the node to Plettenberg Bay along a corridor of mixed use and increased residential density making a viable and efficient public transport system possible. This to a large extent will overcome the friction of distance that Kranshoek currently experiences.

PLANS

PLAN 1 LOCALITY PLAN WITHIN BITOU

PLAN 2 LOCALITY WITHIN LOCAL CONTEXT

PLAN 3 CURRENT ZONING STATUS

PLAN 4 LAND USE PLAN (PHOTO AND USES)

PLAN 5 TOPOGRAPHY AND DRAINAGE (BMSDF)

PLAN 6 GEOLOGY

PLAN 7 BIO DIVERSITY

PLAN 8 VEGETATION STATUS - SANBI CLASSIFICATION (BMSDF)

PLAN 9 URBAN EDGE PLAN – W. M. DE KOCK

PLAN 10 OVERALL FRAMEWORK PLAN

PLAN 11 W. M. DE KOCK FRAMEWORK PLAN

PLAN 12 PROPOSED SUBDIVISION PORTION 9 OF FARM KRANSHOEK NO. 432

ANNEXURES

ANNEXURE A	POWER OF ATTORNEY
ANNEXURE B	DEED OF SALE
ANNEXURE C	CADASTRALS
ANNEXURE D	PHOTOS OF SITE
ANNEXURE E	HOUSE PLANS
ANNEXURE F	TITLE DEED T23292/1991
ANNEXURE G	HOUSING AND LAND NEED
ANNEXURE H	PRELIMINARY CIVIL ENGINEERING SERVICES STATEMENT

APPLICATION FORM

1. APPLICATION IN TERMS OF THE LAND USE PLANNING APPLICATION FORM - BITOU MUNICIPALITY: LAND USE PLANNING BY-LAW

REFERENCE DOCUMENTS

1. BITOU MUNICIPAL SPATIAL DEVELOPMENT FRAMEWORK 2017 – STATUS QUO REPORT – CNdV AFRICA (PTY) LTD

2. AMENDMENT TO THE BITOU SPATIAL DEVELOPMENT FRAMEWORK – REPORT ON AMENDMENT OF THE URBAN EDGE FOR PLETTENBERG BAY, KRANSHOEK, WITTEDRIFT AND KURLAND – OCTOBER 2016 – W.M. DE KOCK ASSOCIATES

3. AFFORDABLE RENTAL HOUSING STRATEGY AND PLAN – "CREATING INCLUSIVE URBAN ENVIRONS IN BITOU THROUGH AFFORDABLE RENTAL HOUSING" – BITOU MUNICIPALITY - CIRCA 2017

4. BITOU MUNICIPALITY – INTEGRATED DEVELOPMENT PLAN – 2017 – 2022 – BITOU MUNICIPALITY

5. DRAFT WARD PLAN OF WARD 4 (KRANSHOEK)

6. CSIR GUIDELINES FOR THE PROVISION OF SOCIAL FACILITIES IN SOUTH AFRICAN SETTLEMENTS AUGUST 2012 EDITION – CSIR

7. KRANSHOEK PRELIMINARY FRAMEWORK AND REZONING JANUARY 2017 – W. M. DE KOCK ASSOCIATES

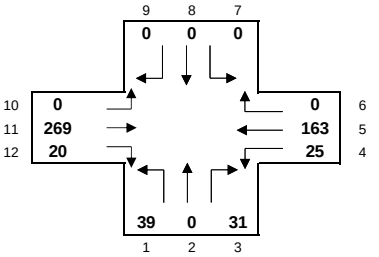
ANNEXURE B
Peak Hour
Traffic Counts

Project :	TIA: SUBDIVISION AND REZONING OF PORTION OF THE FARM KRANSHOEK NO. 432, KNY	Day & date :	27/02/2019
Intersection :	ROBBERG ROAD / ROBBERG RESERVE ACCESS NO. 1	Time period:	06:00 - 09:00

STARTING TIME	RESERVE ACCESS Northbound				ROBBERG ROAD Westbound				- Southbound				ROBBERG ROAD Eastbound				INTER-SECTION	
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	Hour
6:00	0	0	1	1	0	10	0	10	0	0	0	0	0	10	0	10	21	
6:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:45	3	0	3	6	6	22	0	28	0	0	0	0	0	59	3	62	96	117
7:00	3	0	3	6	7	33	0	40	0	0	0	0	0	58	1	59	105	201
7:15	12	0	7	19	6	41	0	47	0	0	0	0	0	65	6	71	137	338
7:30	10	0	10	20	5	49	0	54	0	0	0	0	0	69	3	72	146	484
7:45	14	0	11	25	7	40	0	47	0	0	0	0	0	77	10	87	159	547
8:00	9	0	6	15	14	30	0	44	0	0	0	0	0	56	8	64	123	565
8:15	9	0	13	22	5	23	0	28	0	0	0	0	0	38	4	42	92	520
8:30	8	0	8	16	9	31	0	40	0	0	0	0	0	46	9	55	111	485
8:45	6	0	12	18	11	32	0	43	0	0	0	0	0	25	9	34	95	421
Total	74	0	74	148	70	311	0	381	0	0	0	0	0	503	53	556	1085	
Peak hour	39	0	31	70	25	163	0	188	0	0	0	0	0	269	20	289	547	
Peak 15 min				25				54				0				87	159	
PHF				0.70				0.87				#####				0.83	0.86	

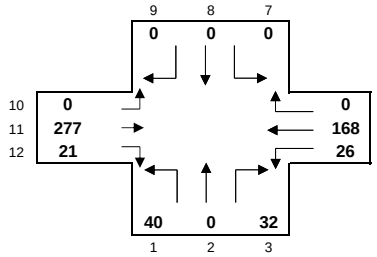
25

PM PEAK HOUR 2019



RESERVE ACCESS

PM PEAK HOUR 2020



RESERVE ACCESS

Project :	TIA: SUBDIVISION AND REZONING OF PORTION OF THE FARM KRANSHOEK NO. 432, KNY	Day & date :	27/02/2019
Intersection :	ROBBERG ROAD / ROBBERG RESERVE ACCESS NO. 1	Time period:	15:00 - 18:00

STARTING TIME	RESERVE ACCESS Northbound				ROBBERG ROAD Westbound				- Southbound				ROBBERG ROAD Eastbound				INTER-SECTION	
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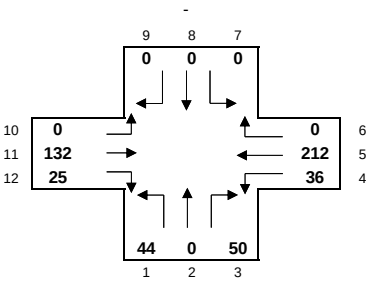
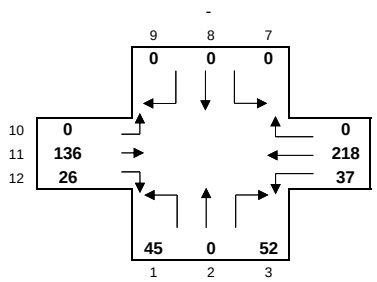
15:15	8	0	10	18	4	39	0	43	0	0	0	0	0	20	5	25	86	
15:30	8	0	15	23	11	27	0	38	0	0	0	0	0	31	8	39	100	
15:45	9	0	8	17	8	24	0	32	0	0	0	0	0	28	10	38	87	368
16:00	10	0	11	21	15	32	0	47	0	0	0	0	0	31	10	41	109	382
16:15	11	0	5	16	12	49	0	61	0	0	0	0	0	30	3	33	110	406
16:30	11	0	17	28	7	41	0	48	0	0	0	0	0	21	12	33	109	415
16:45	15	0	18	33	9	38	0	47	0	0	0	0	0	30	7	37	117	445
17:00	13	0	21	34	13	77	0	90	0	0	0	0	0	43	8	51	175	511
17:15	6	0	8	14	4	57	0	61	0	0	0	0	0	33	3	36	111	512
17:30	10	0	3	13	10	40	0	50	0	0	0	0	0	26	7	33	96	499
17:45	5	0	12	17	6	40	0	46	0	0	0	0	0	20	4	24	87	469
Total	116	0	142	258	107	490	0	597	0	0	0	0	0	346	81	427	1195	
Peak hour	44	0	50	94	36	212	0	248	0	0	0	0	0	132	25	157	499	
Peak 15 min				34				90				0				51	175	
PHF				0.69				0.69				#####				0.77	0.71	

SAT AM PEAK HOUR 2019



RESERVE ACCESS

SAT AM PEAK HOUR 2020

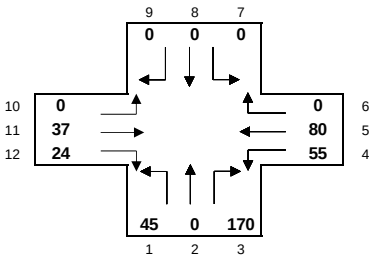


RESERVE ACCESS

Project : TIA: SUBDIVISION AND REZONING OF PORTION OF THE FARM KRANSHOEK NO. 432, KNY Day & date : 27/02/2019
Intersection : ROBBERG ROAD / TREKKER ROAD NO. 2 Time period: 06:00 - 09:00

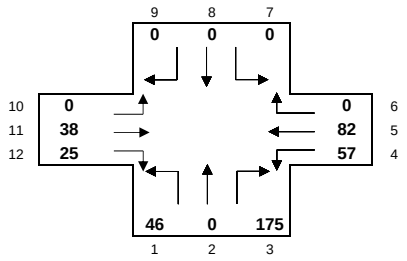
STARTING TIME	TREKKER ROAD Northbound				ROBBERG ROAD Westbound				- Southbound				ROBBERG ROAD Eastbound				INTER-SECTION	
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	Hour
6:00	3	0	6	9	0	2	0	2	0	0	0	0	0	1	2	3	14	
6:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:30	10	0	3	13	13	5	0	18	0	0	0	0	0	7	4	11	42	
6:45	7	0	39	46	0	8	0	8	0	0	0	0	0	11	1	12	66	122
7:00	10	0	45	55	13	16	0	29	0	0	0	0	0	2	3	5	89	197
7:15	18	0	56	74	15	18	0	33	0	0	0	0	0	12	8	20	127	324
7:30	10	0	42	52	17	22	0	39	0	0	0	0	0	14	10	24	115	397
7:45	7	0	27	34	10	24	0	34	0	0	0	0	0	9	3	12	80	411
8:00	3	0	26	29	8	15	0	23	0	0	0	0	0	16	2	18	70	392
8:15	2	0	16	18	8	16	0	24	0	0	0	0	0	11	3	14	56	321
8:30	2	0	17	19	9	21	0	30	0	0	0	0	0	17	4	21	70	276
8:45	1	0	12	13	11	14	0	25	0	0	0	0	0	15	1	16	54	250
Total	73	0	289	362	104	161	0	265	0	0	0	0	0	115	41	156	783	
Peak hour	45	0	170	215	55	80	0	135	0	0	0	0	0	37	24	61	411	
Peak 15 min				74				39				0				24	127	
PHF				0.73				0.87				#####				0.64	0.81	

PM PEAK HOUR 2019



TREKKER ROAD

PM PEAK HOUR 2020



TREKKER ROAD

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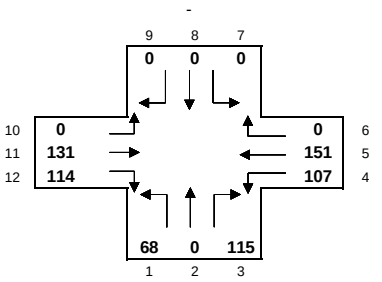
N

Project : TIA: SUBDIVISION AND REZONING OF PORTION OF THE FARM KRANSHOEK NO. 432, KNY Day & date : 27/02/2019
Intersection : ROBBERG ROAD / TREKKER ROAD NO. 2 Time period: 15:00 - 18:00

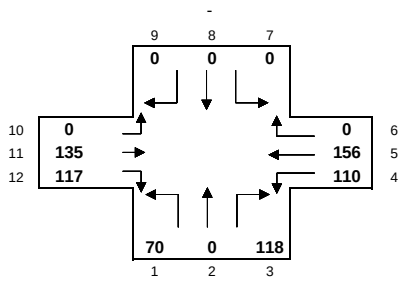
STARTING TIME	TREKKER ROAD Northbound				ROBBERG ROAD Westbound				- Southbound				ROBBERG ROAD Eastbound				INTER-SECTION	
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	Hour
15:00	3	0	18	21	20	26	0	46	0	0	0	0	0	13	6	19	86	
15:15	3	0	11	14	15	24	0	39	0	0	0	0	0	16	4	20	73	
15:30	7	0	26	33	32	31	0	63	0	0	0	0	0	48	11	59	155	
15:45	6	0	31	37	20	35	0	55	0	0	0	0	0	33	7	40	132	446
16:00	8	0	22	30	45	24	0	69	0	0	0	0	0	54	15	69	168	528
16:15	2	0	11	13	24	11	0	35	0	0	0	0	0	21	8	29	77	532
16:30	20	0	57	77	14	16	0	30	0	0	0	0	0	16	25	41	148	525
16:45	20	0	42	62	41	23	0	64	0	0	0	0	0	12	14	26	152	545
17:00	8	0	36	44	33	44	0	77	0	0	0	0	0	40	32	72	193	570
17:15	25	0	23	48	10	32	0	42	0	0	0	0	0	30	27	57	147	640
17:30	15	0	14	29	23	52	0	75	0	0	0	0	0	49	41	90	194	686
17:45	24	0	34	58	64	45	0	109	0	0	0	0	0	59	35	94	261	795
Total	141	0	325	466	341	363	0	704	0	0	0	0	0	391	225	616	1700	
Peak hour	68	0	115	183	107	151	0	258	0	0	0	0	0	131	114	245	686	
Peak 15 min				62				77				0				90	194	
PHF				0.74				0.84				#####				0.68	0.88	

SAT AM PEAK HOUR 2019



TREKKER ROAD

SAT AM PEAK HOUR 2020

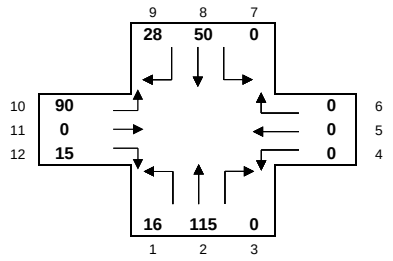


TREKKER ROAD

Project : TIA: SUBDIVISION AND REZONING OF PORTION OF THE FARM KRANSHOEK NO. 432, KNYS Day & date : 27/02/2019
Intersection : TREKKER ROAD / DU PLESSIS STREET NO. 3 Time period: 06:00 - 09:00

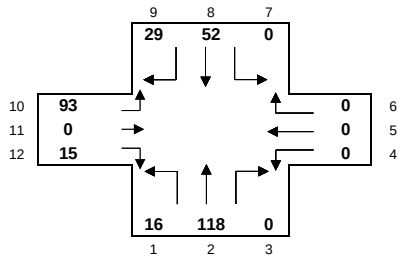
STARTING TIME	TREKKER ROAD Northbound				- Westbound				TREKKER ROAD Southbound				DU PLESSIS STREET Eastbound				INTER-SECTION	
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	Hour
6:00	1	7	0	8	0	0	0	0	0	1	2	3	2	0	0	2	13	
6:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:30	3	9	0	12	0	0	0	0	0	5	1	6	4	0	2	6	24	
6:45	3	25	0	28	0	0	0	0	0	11	4	15	15	0	0	15	58	95
7:00	2	35	0	37	0	0	0	0	0	9	8	17	19	0	2	21	75	157
7:15	1	27	0	28	0	0	0	0	0	6	5	11	17	0	6	23	62	219
7:30	6	36	0	42	0	0	0	0	0	16	5	21	29	0	4	33	96	291
7:45	7	17	0	24	0	0	0	0	0	19	10	29	25	0	3	28	81	314
8:00	9	30	0	39	0	0	0	0	0	25	8	33	24	0	6	30	102	341
8:15	0	22	0	22	0	0	0	0	0	17	5	22	6	0	3	9	53	332
8:30	1	18	0	19	0	0	0	0	0	12	2	14	9	0	1	10	43	279
8:45	2	8	0	10	0	0	0	0	0	14	3	17	3	0	2	5	32	230
Total	35	234	0	269	0	0	0	0	0	135	53	188	153	0	29	182	639	
Peak hour	16	115	0	131	0	0	0	0	0	50	28	78	90	0	15	105	314	
Peak 15 min				42				0				29				33	96	
PHF				0.78				#DIV/0!				0.67				0.80	0.82	

PM PEAK HOUR 2019



TREKKER ROAD

PM PEAK HOUR 2020



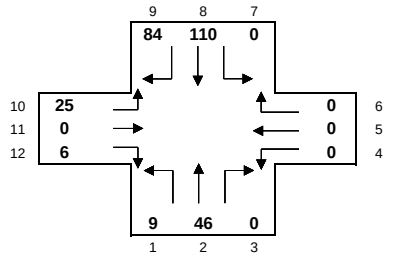
TREKKER ROAD

Project : TIA: SUBDIVISION AND REZONING OF PORTION OF THE FARM KRANSHOEK NO. 432, KNYS Day & date : 27/02/2019
Intersection : TREKKER ROAD / DU PLESSIS STREET NO. 3 Time period: 15:00 - 18:00

STARTING TIME	TREKKER ROAD Northbound				- Westbound				TREKKER ROAD Southbound				DU PLESSIS STREET Eastbound				INTER-SECTION	
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	Hour
15:00	1	19	0	20	0	0	0	0	0	22	6	28	7	0	0	7	55	
15:15	1	14	0	15	0	0	0	0	0	17	4	21	1	0	1	2	38	
15:30	4	8	0	12	0	0	0	0	0	10	4	14	5	0	1	6	32	
15:45	3	8	0	11	0	0	0	0	0	8	6	14	3	0	2	5	30	155
16:00	1	4	0	5	0	0	0	0	0	14	5	19	4	0	1	5	29	129
16:15	1	8	0	9	0	0	0	0	0	16	13	29	6	0	2	8	46	137
16:30	1	8	0	9	0	0	0	0	0	26	10	36	4	0	1	5	50	155
16:45	1	15	0	16	0	0	0	0	0	27	15	42	11	0	1	12	70	195
17:00	3	7	0	10	0	0	0	0	0	26	24	50	6	0	1	7	67	233
17:15	2	12	0	14	0	0	0	0	0	31	29	60	6	0	2	8	82	269
17:30	3	12	0	15	0	0	0	0	0	26	16	42	2	0	2	4	61	280
17:45	2	11	0	13	0	0	0	0	0	19	15	34	5	0	6	11	58	268
Total	23	126	0	149	0	0	0	0	0	242	147	389	60	0	20	80	618	
Peak hour	9	46	0	55	0	0	0	0	0	110	84	194	25	0	6	31	280	
Peak 15 min				16				0				60				12	82	
PHF				0.86				#DIV/0!				0.81				0.65	0.85	

SAT AM PEAK HOUR 2019

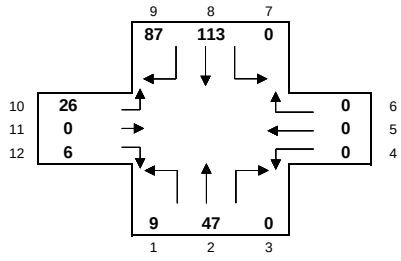
TREKKER ROAD



TREKKER ROAD

SAT AM PEAK HOUR 2020

TREKKER ROAD

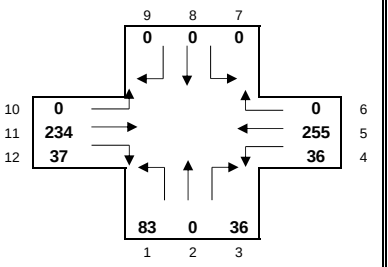


TREKKER ROAD

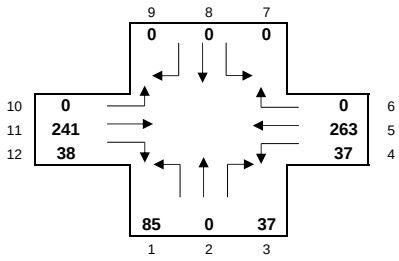
Project :	TIA: SUBDIVISION AND REZONING OF PORTION OF THE FARM KRANSHOEK NO. 432, KNY	Day & date :	27/02/2019
Intersection :	AIRPORT ROAD / N2 NO. 4	Time period:	06:00 - 09:00

STARTING TIME	AIRPORT ROAD 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
6:00	11	0	2	13	1	49	0	50	0	0	0	0	0	44	7	51	114	
6:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:45	6	0	3	9	1	38	0	39	0	0	0	0	0	44	3	47	95	209
7:00	27	0	12	39	6	77	0	83	0	0	0	0	0	58	7	65	187	282
7:15	16	0	11	27	8	55	0	63	0	0	0	0	0	37	14	51	141	423
7:30	20	0	9	29	11	71	0	82	0	0	0	0	0	83	6	89	200	623
7:45	20	0	4	24	11	52	0	63	0	0	0	0	0	56	10	66	153	681
8:00	12	0	4	16	11	78	0	89	0	0	0	0	0	51	2	53	158	652
8:15	13	0	5	18	1	41	0	42	0	0	0	0	0	61	6	67	127	638
8:30	11	0	3	14	3	40	0	43	0	0	0	0	0	69	12	81	138	576
8:45	13	0	2	15	0	54	0	54	0	0	0	0	0	85	10	95	164	587
Total	149	0	55	204	53	555	0	608	0	0	0	0	0	588	77	665	1477	
Peak hour	83	0	36	119	36	255	0	291	0	0	0	0	0	234	37	271	681	
Peak 15 min				39				83				0				89	200	
PHF				0.76				0.88				#####				0.76	0.85	

PM PEAK HOUR 2019



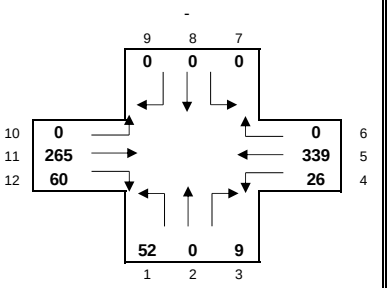
PM PEAK HOUR 2020



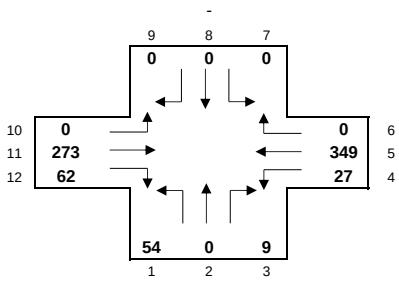
Project :	TIA: SUBDIVISION AND REZONING OF PORTION OF THE FARM KRANSHOEK NO. 432, KNY	Day & date :	27/02/2019
Intersection :	AIRPORT ROAD / N2 NO. 4	Time period:	15:00 - 18:00

STARTING TIME	AIRPORT ROAD 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	11	0	1	12	3	80	0	83	0	0	0	0	0	43	11	54	149	
15:15	15	0	3	18	2	77	0	79	0	0	0	0	0	69	20	89	186	
15:30	11	0	4	15	2	79	0	81	0	0	0	0	0	60	22	82	178	
15:45	9	0	1	10	3	80	0	83	0	0	0	0	0	60	14	74	167	680
16:00	10	0	2	12	2	69	0	71	0	0	0	0	0	77	19	96	179	710
16:15	10	0	3	13	2	82	0	84	0	0	0	0	0	69	17	86	183	707
16:30	13	0	0	13	4	64	0	68	0	0	0	0	0	73	15	88	169	698
16:45	18	0	3	21	4	96	0	100	0	0	0	0	0	84	12	96	217	748
17:00	15	0	2	17	11	78	0	89	0	0	0	0	0	57	16	73	179	748
17:15	9	0	1	10	4	89	0	93	0	0	0	0	0	60	13	73	176	741
17:30	10	0	3	13	7	76	0	83	0	0	0	0	0	64	19	83	179	751
17:45	7	0	5	12	4	59	0	63	0	0	0	0	0	59	12	71	146	680
Total	138	0	28	166	48	929	0	977	0	0	0	0	0	775	190	965	2108	
Peak hour	52	0	9	61	26	339	0	365	0	0	0	0	0	265	60	325	751	
Peak 15 min				21				100				0				96	217	
PHF				0.73				0.91				#####				0.85	0.87	

SAT AM PEAK HOUR 2019



SAT AM PEAK HOUR 2020



ANNEXURE C
SIDRA
OUTPUT
SHEETS 2020
Before
Development

MOVEMENT SUMMARY

Site: 01 [01 AM ND]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2020 Before Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Robberg Reserve Road												
1	L2	42	0,0	0,084	8,7	LOS A	0,3	2,1	0,33	0,90	0,33	51,2
3	R2	34	0,0	0,084	10,4	LOS B	0,3	2,1	0,33	0,90	0,33	50,7
Approach		76	0,0	0,084	9,4	LOS A	0,3	2,1	0,33	0,90	0,33	50,9
NorthEast: Robberg Road												
4	L2	27	0,0	0,105	5,6	LOS A	0,0	0,0	0,00	0,08	0,00	57,7
5	T1	177	0,0	0,105	0,0	LOS A	0,0	0,0	0,00	0,08	0,00	59,3
Approach		204	0,0	0,105	0,8	NA	0,0	0,0	0,00	0,08	0,00	59,0
SouthWest: Robberg Road												
11	T1	292	0,0	0,165	0,1	LOS A	0,2	1,2	0,06	0,04	0,06	59,4
12	R2	22	0,0	0,165	6,2	LOS A	0,2	1,2	0,06	0,04	0,06	57,2
Approach		314	0,0	0,165	0,5	NA	0,2	1,2	0,06	0,04	0,06	59,2
All Vehicles		594	0,0	0,165	1,7	NA	0,3	2,1	0,07	0,17	0,07	58,0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 01 [01 PM ND]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2020 Before Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Robberg Reserve Road												
1	L2	47	0,0	0,114	9,0	LOS A	0,4	2,9	0,38	0,91	0,38	51,2
3	R2	55	0,0	0,114	9,8	LOS A	0,4	2,9	0,38	0,91	0,38	50,8
Approach		102	0,0	0,114	9,4	LOS A	0,4	2,9	0,38	0,91	0,38	51,0
NorthEast: Robberg Road												
4	L2	39	0,0	0,139	5,6	LOS A	0,0	0,0	0,00	0,09	0,00	57,6
5	T1	229	0,0	0,139	0,0	LOS A	0,0	0,0	0,00	0,09	0,00	59,2
Approach		268	0,0	0,139	0,8	NA	0,0	0,0	0,00	0,09	0,00	59,0
SouthWest: Robberg Road												
11	T1	143	0,0	0,093	0,2	LOS A	0,2	1,4	0,14	0,10	0,14	58,6
12	R2	27	0,0	0,093	6,4	LOS A	0,2	1,4	0,14	0,10	0,14	56,4
Approach		171	0,0	0,093	1,2	NA	0,2	1,4	0,14	0,10	0,14	58,2
All Vehicles		541	0,0	0,139	2,6	NA	0,4	2,9	0,12	0,25	0,12	57,0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 02 [02 AM ND]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2020 Before Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Trekker Road												
1	L2	48	0,0	0,225	8,4	LOS A	0,9	6,2	0,27	0,90	0,27	51,8
3	R2	184	0,0	0,225	8,4	LOS A	0,9	6,2	0,27	0,90	0,27	51,3
Approach		233	0,0	0,225	8,4	LOS A	0,9	6,2	0,27	0,90	0,27	51,4
East: Robberg Road												
4	L2	60	0,0	0,077	5,5	LOS A	0,0	0,0	0,00	0,24	0,00	56,3
5	T1	86	0,0	0,077	0,0	LOS A	0,0	0,0	0,00	0,24	0,00	57,8
Approach		146	0,0	0,077	2,3	NA	0,0	0,0	0,00	0,24	0,00	57,2
West: Robberg Road												
11	T1	40	0,0	0,038	0,3	LOS A	0,1	1,0	0,19	0,23	0,19	57,2
12	R2	26	0,0	0,038	5,9	LOS A	0,1	1,0	0,19	0,23	0,19	55,2
Approach		66	0,0	0,038	2,5	NA	0,1	1,0	0,19	0,23	0,19	56,4
All Vehicles		445	0,0	0,225	5,5	NA	0,9	6,2	0,17	0,58	0,17	53,9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 02 [02 PM ND]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2020 Before Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Trekker Road												
1	L2	74	0,0	0,238	8,8	LOS A	0,9	6,4	0,39	0,93	0,39	50,9
3	R2	124	0,0	0,238	10,6	LOS B	0,9	6,4	0,39	0,93	0,39	50,4
Approach		198	0,0	0,238	9,9	LOS A	0,9	6,4	0,39	0,93	0,39	50,6
East: Robberg Road												
4	L2	116	0,0	0,147	5,6	LOS A	0,0	0,0	0,00	0,25	0,00	56,3
5	T1	164	0,0	0,147	0,0	LOS A	0,0	0,0	0,00	0,25	0,00	57,8
Approach		280	0,0	0,147	2,3	NA	0,0	0,0	0,00	0,25	0,00	57,2
West: Robberg Road												
11	T1	142	0,0	0,163	0,8	LOS A	0,8	5,5	0,34	0,29	0,34	56,4
12	R2	123	0,0	0,163	6,5	LOS A	0,8	5,5	0,34	0,29	0,34	54,4
Approach		265	0,0	0,163	3,4	NA	0,8	5,5	0,34	0,29	0,34	55,4
All Vehicles		743	0,0	0,238	4,7	NA	0,9	6,4	0,22	0,45	0,22	54,7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 03 [03 AM ND]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2020 Before Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Trekker Road												
4	L2	17	0,0	0,073	5,5	LOS A	0,0	0,0	0,00	0,07	0,00	57,7
5	T1	124	0,0	0,073	0,0	LOS A	0,0	0,0	0,00	0,07	0,00	59,3
Approach		141	0,0	0,073	0,7	NA	0,0	0,0	0,00	0,07	0,00	59,1
North: Trekker Road												
11	T1	55	0,0	0,048	0,2	LOS A	0,2	1,2	0,18	0,21	0,18	57,5
12	R2	31	0,0	0,048	5,9	LOS A	0,2	1,2	0,18	0,21	0,18	55,4
Approach		85	0,0	0,048	2,2	NA	0,2	1,2	0,18	0,21	0,18	56,7
West: Du Plessis Street												
1	L2	98	0,0	0,093	8,5	LOS A	0,4	2,6	0,24	0,88	0,24	51,7
3	R2	16	0,0	0,093	8,5	LOS A	0,4	2,6	0,24	0,88	0,24	51,3
Approach		114	0,0	0,093	8,5	LOS A	0,4	2,6	0,24	0,88	0,24	51,7
All Vehicles		340	0,0	0,093	3,7	NA	0,4	2,6	0,12	0,38	0,12	55,8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 03 [03 PM ND]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2020 Before Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Trekker Road												
4	L2	9	0,0	0,030	5,5	LOS A	0,0	0,0	0,00	0,10	0,00	57,5
5	T1	49	0,0	0,030	0,0	LOS A	0,0	0,0	0,00	0,10	0,00	59,1
Approach		59	0,0	0,030	0,9	NA	0,0	0,0	0,00	0,10	0,00	58,9
North: Trekker Road												
11	T1	119	0,0	0,116	0,1	LOS A	0,5	3,4	0,13	0,25	0,13	57,3
12	R2	92	0,0	0,116	5,6	LOS A	0,5	3,4	0,13	0,25	0,13	55,2
Approach		211	0,0	0,116	2,5	NA	0,5	3,4	0,13	0,25	0,13	56,4
West: Du Plessis Street												
1	L2	27	0,0	0,027	8,2	LOS A	0,1	0,7	0,12	0,92	0,12	51,7
3	R2	6	0,0	0,027	8,6	LOS A	0,1	0,7	0,12	0,92	0,12	51,2
Approach		34	0,0	0,027	8,3	LOS A	0,1	0,7	0,12	0,92	0,12	51,6
All Vehicles		303	0,0	0,116	2,8	NA	0,5	3,4	0,10	0,30	0,10	56,3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 04 [04 AM ND]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2020 Before Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Airport Road												
1	L2	89	0,0	0,101	9,6	LOS A	0,4	2,6	0,38	0,90	0,38	51,2
3	R2	39	0,0	0,092	14,3	LOS B	0,3	2,3	0,60	0,99	0,60	48,0
Approach		128	0,0	0,101	11,0	LOS B	0,4	2,6	0,45	0,92	0,45	50,2
East: National Route (N2)												
4	L2	39	0,0	0,021	5,5	LOS A	0,0	0,0	0,00	0,58	0,00	53,6
5	T1	277	0,0	0,142	0,0	LOS A	0,0	0,0	0,00	0,00	0,00	60,0
Approach		316	0,0	0,142	0,7	NA	0,0	0,0	0,00	0,07	0,00	59,1
West: National Route (N2)												
11	T1	254	0,0	0,131	0,0	LOS A	0,0	0,0	0,00	0,00	0,00	60,0
12	R2	40	0,0	0,038	6,9	LOS A	0,1	1,0	0,39	0,60	0,39	52,4
Approach		294	0,0	0,131	0,9	NA	0,1	1,0	0,05	0,08	0,05	58,8
All Vehicles		738	0,0	0,142	2,6	NA	0,4	2,6	0,10	0,22	0,10	57,2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 04 [04 PM ND]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2020 Before Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Airport Road												
1	L2	57	0,0	0,072	10,2	LOS B	0,3	1,8	0,43	0,91	0,43	50,9
3	R2	9	0,0	0,029	16,7	LOS C	0,1	0,7	0,68	0,96	0,68	46,7
Approach		66	0,0	0,072	11,1	LOS B	0,3	1,8	0,47	0,92	0,47	50,2
East: National Route (N2)												
4	L2	28	0,0	0,015	5,5	LOS A	0,0	0,0	0,00	0,58	0,00	53,6
5	T1	367	0,0	0,188	0,0	LOS A	0,0	0,0	0,00	0,00	0,00	60,0
Approach		396	0,0	0,188	0,4	NA	0,0	0,0	0,00	0,04	0,00	59,5
West: National Route (N2)												
11	T1	287	0,0	0,148	0,0	LOS A	0,0	0,0	0,00	0,00	0,00	60,0
12	R2	65	0,0	0,068	7,4	LOS A	0,3	1,8	0,44	0,65	0,44	52,2
Approach		353	0,0	0,148	1,4	NA	0,3	1,8	0,08	0,12	0,08	58,4
All Vehicles		815	0,0	0,188	1,7	NA	0,3	1,8	0,07	0,15	0,07	58,1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

ANNEXURE D
SIDRA
OUTPUT
SHEETS 2020
After
Development

MOVEMENT SUMMARY

Site: 01 [01 AM AD]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2020 After Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Robberg Reserve Road												
1	L2	48	0.0	0.110	8.9	LOS A	0.4	2.7	0.38	0.92	0.38	50.7
3	R2	37	0.0	0.110	12.1	LOS B	0.4	2.7	0.38	0.92	0.38	50.2
Approach		85	0.0	0.110	10.3	LOS B	0.4	2.7	0.38	0.92	0.38	50.4
NorthEast: Robberg Road												
4	L2	35	0.0	0.129	5.6	LOS A	0.0	0.0	0.00	0.08	0.00	57.6
5	T1	216	0.0	0.129	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	59.2
Approach		251	0.0	0.129	0.8	NA	0.0	0.0	0.00	0.08	0.00	59.0
SouthWest: Robberg Road												
11	T1	412	0.0	0.232	0.1	LOS A	0.3	1.8	0.07	0.04	0.07	59.4
12	R2	29	0.0	0.232	6.5	LOS A	0.3	1.8	0.07	0.04	0.07	57.1
Approach		441	0.0	0.232	0.5	NA	0.3	1.8	0.07	0.04	0.07	59.2
All Vehicles		777	0.0	0.232	1.7	NA	0.4	2.7	0.08	0.15	0.08	58.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 01 [01 PM AD]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2020 After Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Robberg Reserve Road												
1	L2	47	0.0	0.135	9.6	LOS A	0.5	3.4	0.47	0.94	0.47	50.7
3	R2	55	0.0	0.135	11.1	LOS B	0.5	3.4	0.47	0.94	0.47	50.2
Approach		102	0.0	0.135	10.4	LOS B	0.5	3.4	0.47	0.94	0.47	50.4
NorthEast: Robberg Road												
4	L2	39	0.0	0.194	5.6	LOS A	0.0	0.0	0.00	0.06	0.00	57.8
5	T1	337	0.0	0.194	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	59.4
Approach		376	0.0	0.194	0.6	NA	0.0	0.0	0.00	0.06	0.00	59.2
SouthWest: Robberg Road												
11	T1	192	0.0	0.121	0.3	LOS A	0.2	1.7	0.14	0.08	0.14	58.7
12	R2	27	0.0	0.121	6.9	LOS A	0.2	1.7	0.14	0.08	0.14	56.6
Approach		219	0.0	0.121	1.1	NA	0.2	1.7	0.14	0.08	0.14	58.5
All Vehicles		697	0.0	0.194	2.2	NA	0.5	3.4	0.11	0.20	0.11	57.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 02 [02 AM AD]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2020 After Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Trekker Road												
1	L2	103	0.0	0.387	8.5	LOS A	1.8	12.6	0.32	0.90	0.32	51.5
3	R2	286	0.0	0.387	9.1	LOS A	1.8	12.6	0.32	0.90	0.32	51.0
Approach		389	0.0	0.387	8.9	LOS A	1.8	12.6	0.32	0.90	0.32	51.2
East: Robberg Road												
4	L2	97	0.0	0.096	5.5	LOS A	0.0	0.0	0.00	0.31	0.00	55.7
5	T1	85	0.0	0.096	0.0	LOS A	0.0	0.0	0.00	0.31	0.00	57.2
Approach		182	0.0	0.096	3.0	NA	0.0	0.0	0.00	0.31	0.00	56.4
West: Robberg Road												
11	T1	56	0.0	0.060	0.4	LOS A	0.3	1.8	0.24	0.27	0.24	56.8
12	R2	46	0.0	0.060	6.0	LOS A	0.3	1.8	0.24	0.27	0.24	54.7
Approach		102	0.0	0.060	2.9	NA	0.3	1.8	0.24	0.27	0.24	55.8
All Vehicles		674	0.0	0.387	6.4	NA	1.8	12.6	0.22	0.65	0.22	53.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 02 [02 PM AD]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2020 After Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Trekker Road												
1	L2	99	0.0	0.363	9.3	LOS A	1.8	12.3	0.43	0.97	0.52	49.9
3	R2	173	0.0	0.363	12.5	LOS B	1.8	12.3	0.43	0.97	0.52	49.5
Approach		272	0.0	0.363	11.4	LOS B	1.8	12.3	0.43	0.97	0.52	49.7
East: Robberg Road												
4	L2	223	0.0	0.204	5.6	LOS A	0.0	0.0	0.00	0.34	0.00	55.5
5	T1	164	0.0	0.204	0.0	LOS A	0.0	0.0	0.00	0.34	0.00	57.0
Approach		387	0.0	0.204	3.2	NA	0.0	0.0	0.00	0.34	0.00	56.1
West: Robberg Road												
11	T1	142	0.0	0.218	1.4	LOS A	1.2	8.1	0.46	0.38	0.46	55.6
12	R2	177	0.0	0.218	7.1	LOS A	1.2	8.1	0.46	0.38	0.46	53.6
Approach		319	0.0	0.218	4.6	NA	1.2	8.1	0.46	0.38	0.46	54.5
All Vehicles		978	0.0	0.363	5.9	NA	1.8	12.3	0.27	0.53	0.30	53.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 03 [03 AM AD]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2020 After Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Trekker Road												
4	L2	29	0.0	0.092	5.5	LOS A	0.0	0.0	0.00	0.10	0.00	57.5
5	T1	148	0.0	0.092	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	59.1
Approach		178	0.0	0.092	0.9	NA	0.0	0.0	0.00	0.10	0.00	58.8
North: Trekker Road												
11	T1	108	0.0	0.075	0.2	LOS A	0.2	1.4	0.14	0.13	0.14	58.3
12	R2	29	0.0	0.075	6.0	LOS A	0.2	1.4	0.14	0.13	0.14	56.2
Approach		138	0.0	0.075	1.4	NA	0.2	1.4	0.14	0.13	0.14	57.8
West: Du Plessis Street												
1	L2	102	0.0	0.107	8.6	LOS A	0.4	3.0	0.27	0.88	0.27	51.7
3	R2	22	0.0	0.107	9.0	LOS A	0.4	3.0	0.27	0.88	0.27	51.2
Approach		124	0.0	0.107	8.7	LOS A	0.4	3.0	0.27	0.88	0.27	51.6
All Vehicles		440	0.0	0.107	3.3	NA	0.4	3.0	0.12	0.33	0.12	56.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 03 [03 PM AD]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2020 After Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Trekker Road												
4	L2	12	0.0	0.052	5.5	LOS A	0.0	0.0	0.00	0.07	0.00	57.8
5	T1	89	0.0	0.052	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	59.4
Approach		101	0.0	0.052	0.6	NA	0.0	0.0	0.00	0.07	0.00	59.2
North: Trekker Road												
11	T1	215	0.0	0.168	0.2	LOS A	0.6	4.1	0.14	0.18	0.14	57.9
12	R2	93	0.0	0.168	5.8	LOS A	0.6	4.1	0.14	0.18	0.14	55.8
Approach		307	0.0	0.168	1.9	NA	0.6	4.1	0.14	0.18	0.14	57.2
West: Du Plessis Street												
1	L2	31	0.0	0.037	8.3	LOS A	0.1	0.9	0.19	0.90	0.19	51.6
3	R2	11	0.0	0.037	9.5	LOS A	0.1	0.9	0.19	0.90	0.19	51.1
Approach		41	0.0	0.037	8.6	LOS A	0.1	0.9	0.19	0.90	0.19	51.4
All Vehicles		449	0.0	0.168	2.2	NA	0.6	4.1	0.11	0.22	0.11	57.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 04 [04 AM AD]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2020 After Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Airport Road												
1	L2	115	0.0	0.130	9.6	LOS A	0.5	3.4	0.39	0.90	0.39	51.2
3	R2	52	0.0	0.123	14.6	LOS B	0.4	3.1	0.61	1.00	0.61	47.9
Approach		166	0.0	0.130	11.2	LOS B	0.5	3.4	0.46	0.93	0.46	50.1
East: National Route (N2)												
4	L2	52	0.0	0.028	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	53.6
5	T1	278	0.0	0.143	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		329	0.0	0.143	0.9	NA	0.0	0.0	0.00	0.09	0.00	58.9
West: National Route (N2)												
11	T1	246	0.0	0.127	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
12	R2	48	0.0	0.047	6.9	LOS A	0.2	1.3	0.40	0.61	0.40	52.4
Approach		295	0.0	0.127	1.2	NA	0.2	1.3	0.07	0.10	0.07	58.6
All Vehicles		791	0.0	0.143	3.1	NA	0.5	3.4	0.12	0.27	0.12	56.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 04 [04 PM AD]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2020 After Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Airport Road												
1	L2	74	0.0	0.094	10.2	LOS B	0.3	2.3	0.44	0.92	0.44	50.8
3	R2	18	0.0	0.058	17.9	LOS C	0.2	1.4	0.71	1.00	0.71	46.0
Approach		92	0.0	0.094	11.7	LOS B	0.3	2.3	0.49	0.93	0.49	49.8
East: National Route (N2)												
4	L2	46	0.0	0.025	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	53.6
5	T1	367	0.0	0.188	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		414	0.0	0.188	0.6	NA	0.0	0.0	0.00	0.06	0.00	59.2
West: National Route (N2)												
11	T1	287	0.0	0.149	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
12	R2	101	0.0	0.108	7.5	LOS A	0.4	3.0	0.46	0.68	0.46	52.1
Approach		388	0.0	0.149	2.0	NA	0.4	3.0	0.12	0.18	0.12	57.7
All Vehicles		894	0.0	0.188	2.4	NA	0.4	3.0	0.10	0.20	0.10	57.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 05 [05 AM AD]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2020 After Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Trekker Road												
5	T1	253	0.0	0.132	0.0	LOS A	0.0	0.2	0.01	0.01	0.01	59.9
3	R2	4	0.0	0.132	6.0	LOS A	0.0	0.2	0.01	0.01	0.01	56.4
Approach		257	0.0	0.132	0.1	NA	0.0	0.2	0.01	0.01	0.01	59.8
East: North Access												
4	L2	11	0.0	0.131	8.6	LOS A	0.5	3.2	0.39	0.93	0.39	47.4
6	R2	94	0.0	0.131	9.7	LOS A	0.5	3.2	0.39	0.93	0.39	46.7
Approach		104	0.0	0.131	9.6	LOS A	0.5	3.2	0.39	0.93	0.39	46.8
North: Trekker Road												
7	L2	29	0.0	0.086	5.5	LOS A	0.0	0.0	0.00	0.11	0.00	56.2
11	T1	136	0.0	0.086	0.0	LOS A	0.0	0.0	0.00	0.11	0.00	59.0
Approach		165	0.0	0.086	1.0	NA	0.0	0.0	0.00	0.11	0.00	58.7
All Vehicles		526	0.0	0.132	2.3	NA	0.5	3.2	0.08	0.22	0.08	57.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 05 [05 PM AD]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2020 After Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Trekker Road												
5	T1	114	0.0	0.065	0.1	LOS A	0.1	0.5	0.08	0.04	0.08	59.3
3	R2	8	0.0	0.065	6.8	LOS A	0.1	0.5	0.08	0.04	0.08	55.7
Approach		122	0.0	0.065	0.6	NA	0.1	0.5	0.08	0.04	0.08	59.1
East: North Access												
4	L2	8	0.0	0.060	9.3	LOS A	0.2	1.4	0.43	0.92	0.43	47.2
6	R2	37	0.0	0.060	10.0	LOS A	0.2	1.4	0.43	0.92	0.43	46.6
Approach		45	0.0	0.060	9.8	LOS A	0.2	1.4	0.43	0.92	0.43	46.7
North: Trekker Road												
7	L2	66	0.0	0.192	5.6	LOS A	0.0	0.0	0.00	0.11	0.00	56.2
11	T1	305	0.0	0.192	0.0	LOS A	0.0	0.0	0.00	0.11	0.00	59.0
Approach		372	0.0	0.192	1.0	NA	0.0	0.0	0.00	0.11	0.00	58.6
All Vehicles		539	0.0	0.192	1.7	NA	0.2	1.4	0.05	0.16	0.05	57.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 06 [06 AM AD]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2020 After Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Trekker Road												
5	T1	146	0.0	0.076	0.0	LOS A	0.0	0.1	0.01	0.01	0.01	59.9
3	R2	2	0.0	0.076	5.9	LOS A	0.0	0.1	0.01	0.01	0.01	56.4
Approach		148	0.0	0.076	0.1	NA	0.0	0.1	0.01	0.01	0.01	59.9
East: South Access												
4	L2	5	0.0	0.030	8.4	LOS A	0.1	0.7	0.28	0.88	0.28	48.1
6	R2	23	0.0	0.030	8.7	LOS A	0.1	0.7	0.28	0.88	0.28	47.5
Approach		28	0.0	0.030	8.6	LOS A	0.1	0.7	0.28	0.88	0.28	47.6
North: Trekker Road												
7	L2	22	0.0	0.069	5.5	LOS A	0.0	0.0	0.00	0.10	0.00	56.3
11	T1	112	0.0	0.069	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	59.1
Approach		134	0.0	0.069	0.9	NA	0.0	0.0	0.00	0.10	0.00	58.8
All Vehicles		311	0.0	0.076	1.2	NA	0.1	0.7	0.03	0.13	0.03	58.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 06 [06 PM AD]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2020 After Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Trekker Road												
5	T1	64	0.0	0.036	0.1	LOS A	0.0	0.2	0.05	0.04	0.05	59.5
3	R2	4	0.0	0.036	6.2	LOS A	0.0	0.2	0.05	0.04	0.05	55.9
Approach		68	0.0	0.036	0.4	NA	0.0	0.2	0.05	0.04	0.05	59.3
East: South Access												
4	L2	2	0.0	0.029	8.6	LOS A	0.1	0.7	0.32	0.88	0.32	48.1
6	R2	24	0.0	0.029	8.6	LOS A	0.1	0.7	0.32	0.88	0.32	47.5
Approach		26	0.0	0.029	8.6	LOS A	0.1	0.7	0.32	0.88	0.32	47.5
North: Trekker Road												
7	L2	61	0.0	0.119	5.6	LOS A	0.0	0.0	0.00	0.16	0.00	55.5
11	T1	167	0.0	0.119	0.0	LOS A	0.0	0.0	0.00	0.16	0.00	58.5
Approach		228	0.0	0.119	1.5	NA	0.0	0.0	0.00	0.16	0.00	57.9
All Vehicles		323	0.0	0.119	1.9	NA	0.1	0.7	0.04	0.19	0.04	57.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

ANNEXURE E
SIDRA
OUTPUT
SHEETS 2025
After
Development

MOVEMENT SUMMARY

Site: 01 [01 AM AD]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2025 After Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Robberg Reserve Road												
1	L2	57	0.0	0.140	9.1	LOS A	0.5	3.5	0.42	0.92	0.42	50.3
3	R2	43	0.0	0.140	13.2	LOS B	0.5	3.5	0.42	0.92	0.42	49.9
Approach		100	0.0	0.140	10.8	LOS B	0.5	3.5	0.42	0.92	0.42	50.1
NorthEast: Robberg Road												
4	L2	40	0.0	0.146	5.6	LOS A	0.0	0.0	0.00	0.08	0.00	57.6
5	T1	243	0.0	0.146	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	59.2
Approach		283	0.0	0.146	0.8	NA	0.0	0.0	0.00	0.08	0.00	59.0
SouthWest: Robberg Road												
11	T1	458	0.0	0.260	0.1	LOS A	0.3	2.2	0.07	0.04	0.07	59.3
12	R2	34	0.0	0.260	6.7	LOS A	0.3	2.2	0.07	0.04	0.07	57.1
Approach		492	0.0	0.260	0.6	NA	0.3	2.2	0.07	0.04	0.07	59.2
All Vehicles		875	0.0	0.260	1.8	NA	0.5	3.5	0.09	0.16	0.09	57.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 01 [01 PM AD]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2025 After Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Robberg Reserve Road												
1	L2	56	0.0	0.169	9.9	LOS A	0.6	4.2	0.50	0.95	0.50	50.3
3	R2	63	0.0	0.169	11.9	LOS B	0.6	4.2	0.50	0.95	0.50	49.9
Approach		119	0.0	0.169	10.9	LOS B	0.6	4.2	0.50	0.95	0.50	50.1
NorthEast: Robberg Road												
4	L2	45	0.0	0.216	5.6	LOS A	0.0	0.0	0.00	0.06	0.00	57.8
5	T1	374	0.0	0.216	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	59.4
Approach		419	0.0	0.216	0.6	NA	0.0	0.0	0.00	0.06	0.00	59.2
SouthWest: Robberg Road												
11	T1	215	0.0	0.137	0.4	LOS A	0.3	2.1	0.16	0.08	0.16	58.7
12	R2	32	0.0	0.137	7.2	LOS A	0.3	2.1	0.16	0.08	0.16	56.5
Approach		246	0.0	0.137	1.2	NA	0.3	2.1	0.16	0.08	0.16	58.4
All Vehicles		784	0.0	0.216	2.4	NA	0.6	4.2	0.13	0.21	0.13	57.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 02 [02 AM AD]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2025 After Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Trekker Road												
1	L2	109	0.0	0.431	8.9	LOS A	2.4	17.0	0.36	0.92	0.40	51.2
3	R2	312	0.0	0.431	9.7	LOS A	2.4	17.0	0.36	0.92	0.40	50.7
Approach		421	0.0	0.431	9.4	LOS A	2.4	17.0	0.36	0.92	0.40	50.8
East: Robberg Road												
4	L2	105	0.0	0.107	5.6	LOS A	0.0	0.0	0.00	0.30	0.00	55.8
5	T1	99	0.0	0.107	0.0	LOS A	0.0	0.0	0.00	0.30	0.00	57.3
Approach		204	0.0	0.107	2.9	NA	0.0	0.0	0.00	0.30	0.00	56.5
West: Robberg Road												
11	T1	64	0.0	0.067	0.4	LOS A	0.3	2.0	0.25	0.26	0.25	56.8
12	R2	49	0.0	0.067	6.1	LOS A	0.3	2.0	0.25	0.26	0.25	54.8
Approach		114	0.0	0.067	2.9	NA	0.3	2.0	0.25	0.26	0.25	55.9
All Vehicles		739	0.0	0.431	6.6	NA	2.4	17.0	0.25	0.65	0.27	53.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 02 [02 PM AD]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2025 After Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Trekker Road												
1	L2	111	0.0	0.441	10.0	LOS B	2.4	16.8	0.49	1.00	0.68	49.1
3	R2	193	0.0	0.441	14.2	LOS B	2.4	16.8	0.49	1.00	0.68	48.7
Approach		303	0.0	0.441	12.7	LOS B	2.4	16.8	0.49	1.00	0.68	48.8
East: Robberg Road												
4	L2	242	0.0	0.228	5.6	LOS A	0.0	0.0	0.00	0.33	0.00	55.6
5	T1	189	0.0	0.228	0.0	LOS A	0.0	0.0	0.00	0.33	0.00	57.0
Approach		432	0.0	0.228	3.1	NA	0.0	0.0	0.00	0.33	0.00	56.2
West: Robberg Road												
11	T1	164	0.0	0.254	1.7	LOS A	1.4	9.8	0.50	0.39	0.50	55.4
12	R2	197	0.0	0.254	7.4	LOS A	1.4	9.8	0.50	0.39	0.50	53.5
Approach		361	0.0	0.254	4.8	NA	1.4	9.8	0.50	0.39	0.50	54.4
All Vehicles		1096	0.0	0.441	6.3	NA	2.4	16.8	0.30	0.54	0.35	53.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 03 [03 AM AD]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2025 After Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Trekker Road												
4	L2	34	0.0	0.106	5.6	LOS A	0.0	0.0	0.00	0.10	0.00	57.5
5	T1	171	0.0	0.106	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	59.1
Approach		204	0.0	0.106	0.9	NA	0.0	0.0	0.00	0.10	0.00	58.8
North: Trekker Road												
11	T1	122	0.0	0.087	0.2	LOS A	0.2	1.6	0.15	0.13	0.15	58.2
12	R2	35	0.0	0.087	6.1	LOS A	0.2	1.6	0.15	0.13	0.15	56.1
Approach		157	0.0	0.087	1.5	NA	0.2	1.6	0.15	0.13	0.15	57.7
West: Du Plessis Street												
1	L2	121	0.0	0.131	8.7	LOS A	0.5	3.7	0.30	0.88	0.30	51.6
3	R2	26	0.0	0.131	9.3	LOS A	0.5	3.7	0.30	0.88	0.30	51.1
Approach		147	0.0	0.131	8.8	LOS A	0.5	3.7	0.30	0.88	0.30	51.5
All Vehicles		508	0.0	0.131	3.4	NA	0.5	3.7	0.13	0.34	0.13	56.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 03 [03 PM AD]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2025 After Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Trekker Road												
4	L2	14	0.0	0.058	5.5	LOS A	0.0	0.0	0.00	0.07	0.00	57.7
5	T1	99	0.0	0.058	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	59.3
Approach		113	0.0	0.058	0.7	NA	0.0	0.0	0.00	0.07	0.00	59.1
North: Trekker Road												
11	T1	237	0.0	0.190	0.2	LOS A	0.7	4.9	0.16	0.19	0.16	57.7
12	R2	109	0.0	0.190	5.8	LOS A	0.7	4.9	0.16	0.19	0.16	55.6
Approach		346	0.0	0.190	2.0	NA	0.7	4.9	0.16	0.19	0.16	57.1
West: Du Plessis Street												
1	L2	36	0.0	0.043	8.4	LOS A	0.2	1.1	0.20	0.90	0.20	51.5
3	R2	12	0.0	0.043	9.9	LOS A	0.2	1.1	0.20	0.90	0.20	51.0
Approach		47	0.0	0.043	8.7	LOS A	0.2	1.1	0.20	0.90	0.20	51.4
All Vehicles		506	0.0	0.190	2.3	NA	0.7	4.9	0.13	0.23	0.13	56.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 04 [04 AM AD]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2025 After Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Airport Road												
1	L2	126	0.0	0.151	10.0	LOS A	0.6	4.0	0.43	0.92	0.43	51.0
3	R2	56	0.0	0.156	16.5	LOS C	0.6	3.9	0.68	1.00	0.68	46.8
Approach		182	0.0	0.156	12.0	LOS B	0.6	4.0	0.50	0.94	0.50	49.6
East: National Route (N2)												
4	L2	59	0.0	0.032	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	53.6
5	T1	322	0.0	0.165	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		381	0.0	0.165	0.9	NA	0.0	0.0	0.00	0.09	0.00	58.9
West: National Route (N2)												
11	T1	285	0.0	0.147	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
12	R2	54	0.0	0.055	7.2	LOS A	0.2	1.5	0.43	0.64	0.43	52.3
Approach		339	0.0	0.147	1.2	NA	0.2	1.5	0.07	0.10	0.07	58.6
All Vehicles		902	0.0	0.165	3.2	NA	0.6	4.0	0.13	0.27	0.13	56.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 04 [04 PM AD]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2025 After Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Airport Road												
1	L2	82	0.0	0.113	10.8	LOS B	0.4	2.8	0.48	0.94	0.48	50.5
3	R2	20	0.0	0.081	21.2	LOS C	0.3	1.9	0.77	1.00	0.77	44.2
Approach		102	0.0	0.113	12.8	LOS B	0.4	2.8	0.54	0.95	0.54	49.1
East: National Route (N2)												
4	L2	51	0.0	0.027	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	53.6
5	T1	426	0.0	0.219	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		477	0.0	0.219	0.6	NA	0.0	0.0	0.00	0.06	0.00	59.2
West: National Route (N2)												
11	T1	333	0.0	0.171	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
12	R2	112	0.0	0.129	8.0	LOS A	0.5	3.5	0.50	0.72	0.50	51.7
Approach		444	0.0	0.171	2.0	NA	0.5	3.5	0.13	0.18	0.13	57.7
All Vehicles		1023	0.0	0.219	2.4	NA	0.5	3.5	0.11	0.20	0.11	57.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 05 [05 AM AD]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2025 After Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Trekker Road												
5	T1	288	0.0	0.151	0.0	LOS A	0.0	0.2	0.01	0.01	0.01	59.9
3	R2	4	0.0	0.151	6.1	LOS A	0.0	0.2	0.01	0.01	0.01	56.4
Approach		293	0.0	0.151	0.1	NA	0.0	0.2	0.01	0.01	0.01	59.8
East: North Access												
4	L2	11	0.0	0.139	8.6	LOS A	0.5	3.4	0.42	0.94	0.42	47.1
6	R2	94	0.0	0.139	10.1	LOS B	0.5	3.4	0.42	0.94	0.42	46.5
Approach		104	0.0	0.139	10.0	LOS A	0.5	3.4	0.42	0.94	0.42	46.5
North: Trekker Road												
7	L2	29	0.0	0.094	5.5	LOS A	0.0	0.0	0.00	0.10	0.00	56.3
11	T1	152	0.0	0.094	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	59.1
Approach		181	0.0	0.094	0.9	NA	0.0	0.0	0.00	0.10	0.00	58.8
All Vehicles		578	0.0	0.151	2.1	NA	0.5	3.4	0.08	0.21	0.08	57.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 05 [05 PM AD]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2025 After Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Trekker Road												
5	T1	126	0.0	0.072	0.2	LOS A	0.1	0.5	0.07	0.04	0.07	59.3
3	R2	8	0.0	0.072	7.0	LOS A	0.1	0.5	0.07	0.04	0.07	55.7
Approach		135	0.0	0.072	0.6	NA	0.1	0.5	0.07	0.04	0.07	59.2
East: North Access												
4	L2	8	0.0	0.063	9.5	LOS A	0.2	1.5	0.46	0.93	0.46	47.0
6	R2	37	0.0	0.063	10.3	LOS B	0.2	1.5	0.46	0.93	0.46	46.3
Approach		45	0.0	0.063	10.2	LOS B	0.2	1.5	0.46	0.93	0.46	46.5
North: Trekker Road												
7	L2	66	0.0	0.210	5.6	LOS A	0.0	0.0	0.00	0.10	0.00	56.3
11	T1	339	0.0	0.210	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	59.1
Approach		405	0.0	0.210	0.9	NA	0.0	0.0	0.00	0.10	0.00	58.7
All Vehicles		585	0.0	0.210	1.6	NA	0.2	1.5	0.05	0.15	0.05	58.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 06 [06 AM AD]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2025 After Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Trekker Road												
5	T1	169	0.0	0.088	0.0	LOS A	0.0	0.1	0.01	0.01	0.01	59.9
3	R2	2	0.0	0.088	5.9	LOS A	0.0	0.1	0.01	0.01	0.01	56.5
Approach		172	0.0	0.088	0.1	NA	0.0	0.1	0.01	0.01	0.01	59.9
East: South Access												
4	L2	5	0.0	0.031	8.5	LOS A	0.1	0.7	0.31	0.89	0.31	48.0
6	R2	23	0.0	0.031	8.9	LOS A	0.1	0.7	0.31	0.89	0.31	47.4
Approach		28	0.0	0.031	8.8	LOS A	0.1	0.7	0.31	0.89	0.31	47.5
North: Trekker Road												
7	L2	22	0.0	0.076	5.5	LOS A	0.0	0.0	0.00	0.09	0.00	56.4
11	T1	125	0.0	0.076	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	59.2
Approach		147	0.0	0.076	0.8	NA	0.0	0.0	0.00	0.09	0.00	58.9
All Vehicles		347	0.0	0.088	1.1	NA	0.1	0.7	0.03	0.11	0.03	58.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 06 [06 PM AD]

Traffic Impact Assessment for the Subdivision and Rezoning
of Portion of the the Farm Kranshoek No. 432, Knysna
2025 After Development
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Trekker Road												
5	T1	74	0.0	0.041	0.1	LOS A	0.0	0.2	0.05	0.03	0.05	59.5
3	R2	4	0.0	0.041	6.2	LOS A	0.0	0.2	0.05	0.03	0.05	55.9
Approach		78	0.0	0.041	0.4	NA	0.0	0.2	0.05	0.03	0.05	59.4
East: South Access												
4	L2	2	0.0	0.030	8.7	LOS A	0.1	0.7	0.34	0.88	0.34	48.0
6	R2	24	0.0	0.030	8.8	LOS A	0.1	0.7	0.34	0.88	0.34	47.4
Approach		26	0.0	0.030	8.8	LOS A	0.1	0.7	0.34	0.88	0.34	47.4
North: Trekker Road												
7	L2	61	0.0	0.130	5.6	LOS A	0.0	0.0	0.00	0.15	0.00	55.7
11	T1	188	0.0	0.130	0.0	LOS A	0.0	0.0	0.00	0.15	0.00	58.7
Approach		249	0.0	0.130	1.4	NA	0.0	0.0	0.00	0.15	0.00	58.1
All Vehicles		354	0.0	0.130	1.7	NA	0.1	0.7	0.04	0.18	0.04	57.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.