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Traffic Impact Assessment

Pieter Koen Development, 195/21, Kraaibosch

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1 Introduction

SMEC South Africa (Pty) Ltd was appointed by Kantey and Templer (Pty) Ltd to conduct a Traffic Impact Assessment for the proposed Pieter Koen Development on Portion 21 of the Farm Kraaibosch 195, George. The site is situated within the Kraaibosch development area to the north of Knysna Road (N12). A locality plan is shown in **Figure 1-1**.

Figure 1-1: Locality Plan (Source: OpenStreetMap)

The subject site measures approximately 17 hectares in extent and will comprise of 137 apartments and flats, 100 townhouses, 79 single dwelling units, a health and fitness centre, a preschool, offices, shopping centre and a restaurant. The development layout and phasing plan are shown in **Figure 1-2.**

The purpose of this Traffic Impact Assessment is to quantify the anticipated impact of the development traffic, and recommend remedial measures as required. The study was conducted in accordance with the Committee of Transport Officials South African Traffic Impact and Site Traffic Assessment Manual (COTO, TMH 16 Volume 1).

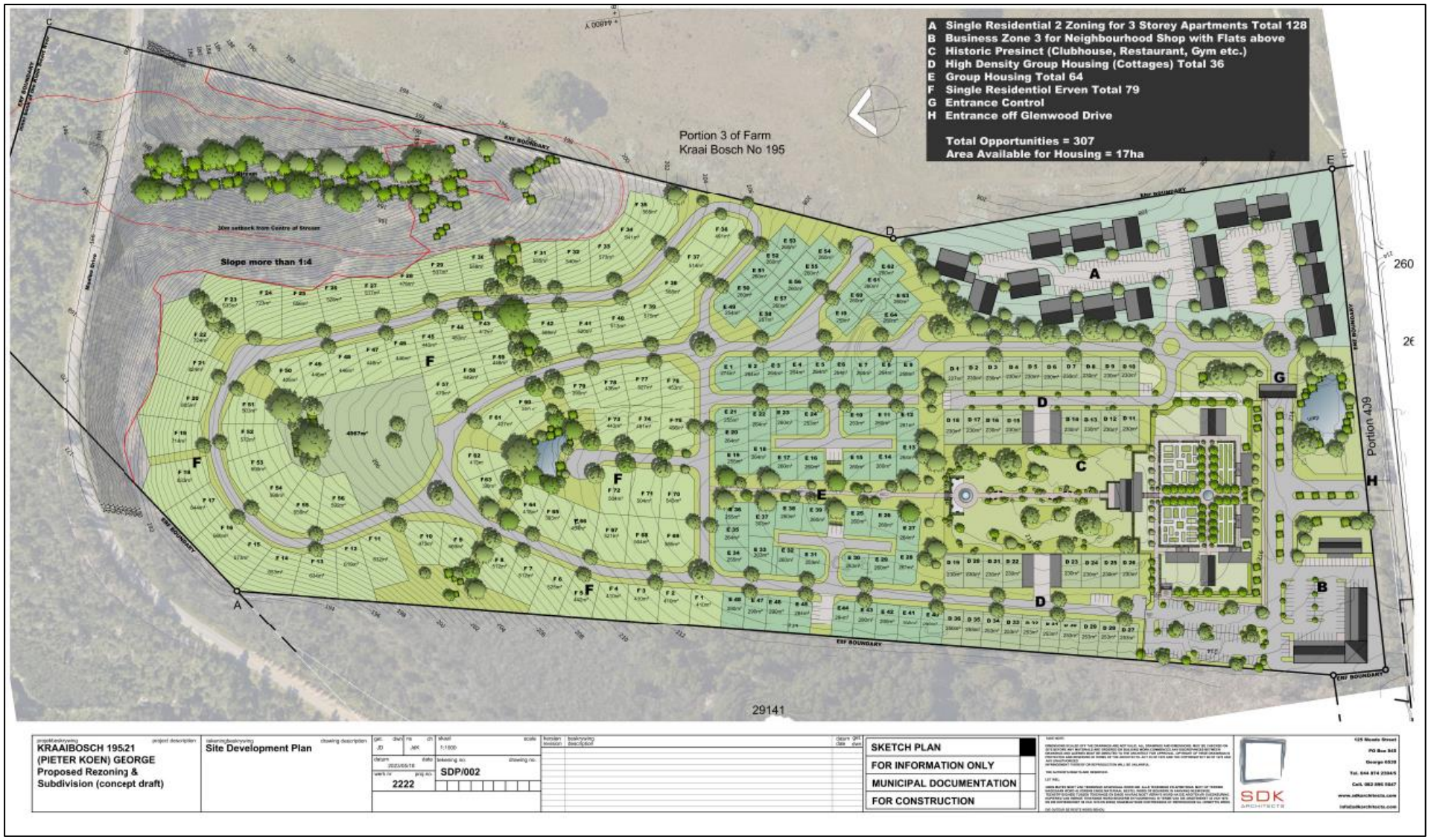

Figure 1-2: Site Development Plan (Source: SDK Architects)

2 Background Information

2.1 Land Use

SMEC South Africa published the latest Kraaibosch Cost Apportionment Model Report in April 2022. The updated report incorporated the latest land use plans of planned developments forming part of the Kraaibosch development area. A density of 15 dwelling units per hectare was assumed for undeveloped areas for which no planning layouts were available at the time, which normally equates to middle income single residential or group housing development specifications. At the time of publication of the Kraaibosch Cost Apportionment Model, the development particulars for Erf 195/21 Kraaibosch comprised 20 ha High Income Units at 15 dwelling units per hectare.

2.2 Road Network

The trip generation potential associated with the planned developments informed changes to the Kraaibosch Roads Master Plan, also included in the Kraaibosch Cost Apportionment Model Report. The planned road network would include the following (refer to **Figure 2-1**):

- **Road 1** comprises of a single carriageway road with one lane per direction up to Road 2. Should the Dam Development proceed, there might be a need to extend Road 1 northward up to Madiba Drive as a dual carriageway road with two lanes per direction.
- **Road 2** comprises of a half-width of the planned single carriageway road with one lane per direction.
- **Planned Road 3** would comprise of a single carriageway road with one lane per direction.
- **Road 4A** comprises of a single carriageway road with one lane per direction.
- **Planned Road 4B** would comprise of a single carriageway road with one lane per direction.
- **Planned Road 5** would comprise of a single carriageway road with one lane per direction.
- **Future Road Link** (between Knysna Rd (N12) and Nelson Mandela Blvd) would comprise of a dual carriageway road with two lanes per direction.

Figure 2-1: 2022 Kraaibosch Roads Master Plan

2.3 Road Classification

The road classification requirements were derived from the Western Cape Government (WCG) Access Management Guidelines (2020). Equivalent driveways within a Suburban Roadside Development Environment are defined as follows:

- Low Volume Driveway 5 – 30 vehicles per hour (peak direction)
- High Volume Driveway 30 – 60 vehicles per hour (peak direction)
- Equivalent Collector 60 – 500 vehicles per hour (peak direction)
- Equivalent Minor Arterial 500 – 1 000 vehicles per hour (peak direction)
- Equivalent Major Arterial > 1 000 vehicles per hour (peak direction)

Taking the anticipated traffic flows into consideration, the road network elements in the vicinity of the subject site are classified as follows:

- Road 1 - Blue Mountain Boulevard Equivalent Major Arterial (Class 2)
- Road 2 Equivalent Minor Arterial (Class 3)
- Road 3 Equivalent Minor Arterial (Class 3)
- Road 5 Equivalent Collector (Class 4)
- Knysna Road - National Route (N9) Major Arterial (Class 2)
- Madiba/ Saasveld Drive Equivalent Minor Arterial (Class 3)
- Glenwood Drive Equivalent Minor Arterial (Class 3)
- Development Access Equivalent Collector (Class 4)

2.4 Site Access

The access spacing requirements were derived from the Western Cape Government (WCG) Access Management Guidelines (2020). The minimum spacing requirement for a Class 3 Road within an intermediate roadside development environment is as follows:

- 180 m from a high-volume driveway to an unsignalised full intersection
- 180 m from a high-volume driveway to a high-volume driveway

It is planned for the development to be served by a single access along Road 2 ~180 metres downstream of Cape Estates Development Access and 250 metres upstream of Groenekloof Avenue (Road 4A). Refer to **Figure 2-2**.

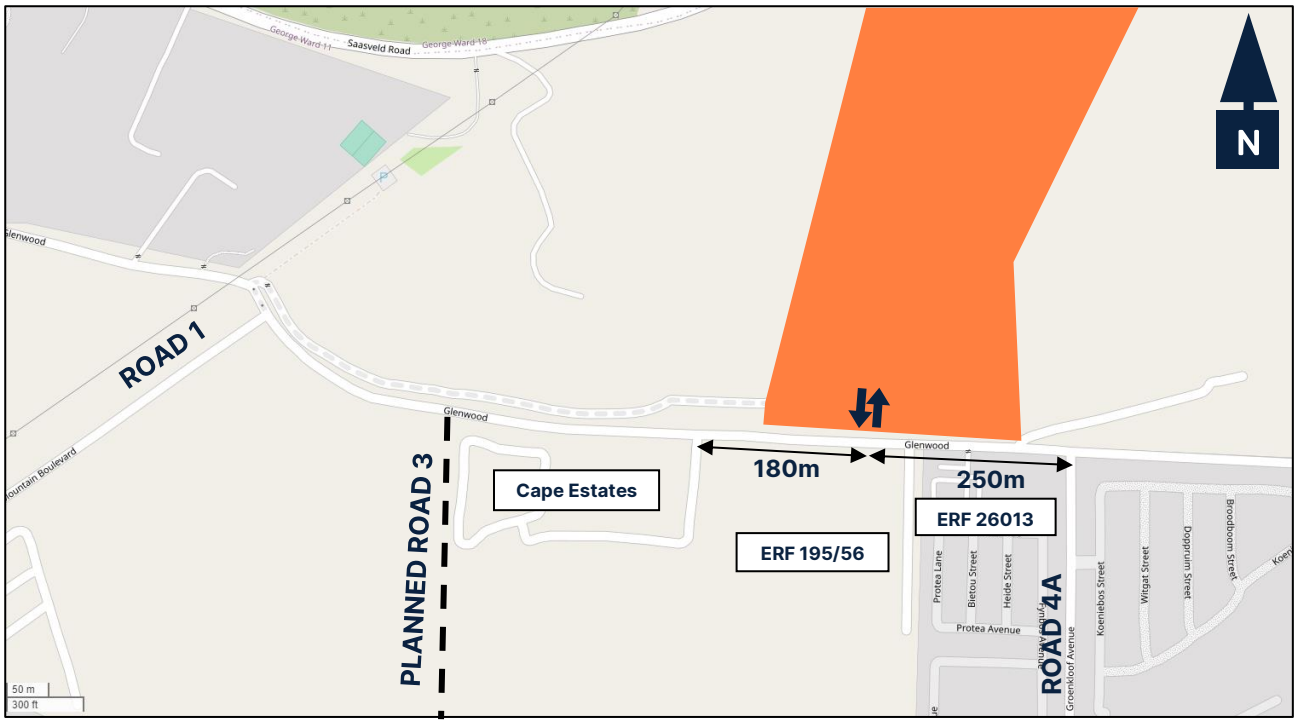

Figure 2-2 Proposed Site Access

It is our submission that the proposed development access conforms to the WCG access spacing requirements.

It should however be noted that there are two existing sub-standard access spacings on the southern edge of Road 2 in the vicinity of the proposed development access, that of ERF 195/56 and ERF 26013. It is recommended that upon the development of ERF 195/56, the existing access along Road 2 should be relocated to a point directly opposite the proposed ERF 195/21 development access. The George Municipality should evaluate whether they want to impose any changes to the substandard access to ERF 26013.

3 Traffic Demand Estimation

3.1 Proposed Development

Pieter Koen Development is planned to comprise of 137 apartments and flats, 100 townhouses, 79 single dwelling units, a health and fitness centre, a preschool, offices, shopping centre and a restaurant. This is in contrast to the initially anticipated 20 ha High Income Units at 15 dwelling units per hectare, forthcoming from the 2022 Kraaibosch Cost Apportionment Model Report. Taking the increased development potential of the subject site into account, it would be required to update the Kraaibosch Cost Apportionment Model and assess the capacity and operations of planned transport infrastructure in the vicinity of the site.

3.2 Assessment Scenarios

With reference to the 2022 Kraaibosch Cost Apportionment Model Report, it was deemed appropriate to assess the same forecast scenarios which informed the development of the associated Roads Master Plan. As such, a 2031 Weekday AM and Weekday PM Peak Hour scenario was analysed as part of this project.

3.3 Trip Generation

The Trip Generation Rates for the land use types forming part of the development were obtained from the COTO TMH 17 South African Trip Data Manual, dated September 2012. The trip generation potential of the planned development is shown in **Table 3-1**.

Table 3-1: Trip Generation

Land Use	Quantity	Trip Generation Rate		Traffic Generation (vph)			
		Weekday		Weekday AM		Weekday PM	
		AM	PM	IN	OUT	IN	OUT
Single Dwelling Units	79 units	1.0	1.0	20	59	55	24
Apartments and Flats	137 units	0.65	0.25	22	67	62	27
Townhouses	100 units	0.85	0.25	21	64	60	26
Health & Fitness Centre	420 sqm GLA	5	9.5	11	11	24	16
Pre-School (Day Care)	25 students	1	0.8	13	13	10	10
Offices	895 sqm GLA	2.1	2.1	16	3	4	15
Shopping Centre	900 sqm GLA	0.6	3.4	20	11	88	88
Restaurant, Quality (Sit-down)	165 sqm GLA	0.75	11.8	1	0	8	12
Total New Trips				**123**	**227**	**311**	**217**
				350		**528**	

It is anticipated that the planned development would generate 350 and 528 new vehicular trips during the Weekday AM and PM Peak Hours respectively.

3.4 Adjusted Trip Generation

Taking into consideration the planned public transport initiatives for the Kraaibosch Development Area, and the route alignment of Go George Bus Service, a 15% trip generation adjustment factor was applied to development traffic in the 2022 Kraaibosch Cost Apportionment Model Report. The adjusted trip generation potential of the planned development is shown in **Table 3-2**.

Table 3-2: Adjusted Trip Generation

Land Use	Trip Adjustment Factor	Trip Generation Rate		Traffic Generation (vph)			
		Weekday		Weekday AM		Weekday PM	
		AM	PM	IN	OUT	IN	OUT
Single Dwelling Units	15%	1.0	1.0	17	50	47	20
Apartments and Flats		0.65	0.25	19	57	53	23
Townhouses		0.85	0.25	18	54	51	22
Health & Fitness Centre		5	9.5	9	9	20	13
Pre-School (Day Care)		1	0.8	11	11	9	9
Offices		2.1	2.1	14	2	3	12
Shopping Centre		0.6	3.4	17	9	75	75
Restaurant, Quality (Sit-down)		0.75	11.8	1	0	7	10
Total New Trips				**106**	**192**	**265**	**184**
				298		**449**	

Taking into consideration suitable trip generation adjustment factors, the planned development is anticipated to generate 298 and 449 new vehicular trips during the Weekday AM and PM Peak Hours.

3.5 Traffic Modelling

The Visum mesoscopic transport model developed as part of the 2022 Kraaibosch Cost Apportionment Model was used to assess the traffic-related impact associated with the revised trip generation potential of the subject site, while still considering the compound effect of all development land in and around the Kraaibosch Development Area.

3.5.1 2031 Forecast Year

The 2031 Forecast Year model scenario considers full build-out of the Kraaibosch Development Area as well as implementation of the planned Kraaibosch Roads Master Plan, as defined in the 2022 Kraaibosch Cost Apportionment Model Report.

Taking into consideration the addition of proposed Pieter Koen Development trips to the Kraaibosch Meso Model, the 2031 AM Peak Hour modelled flows are shown in **Figure 3-1**.

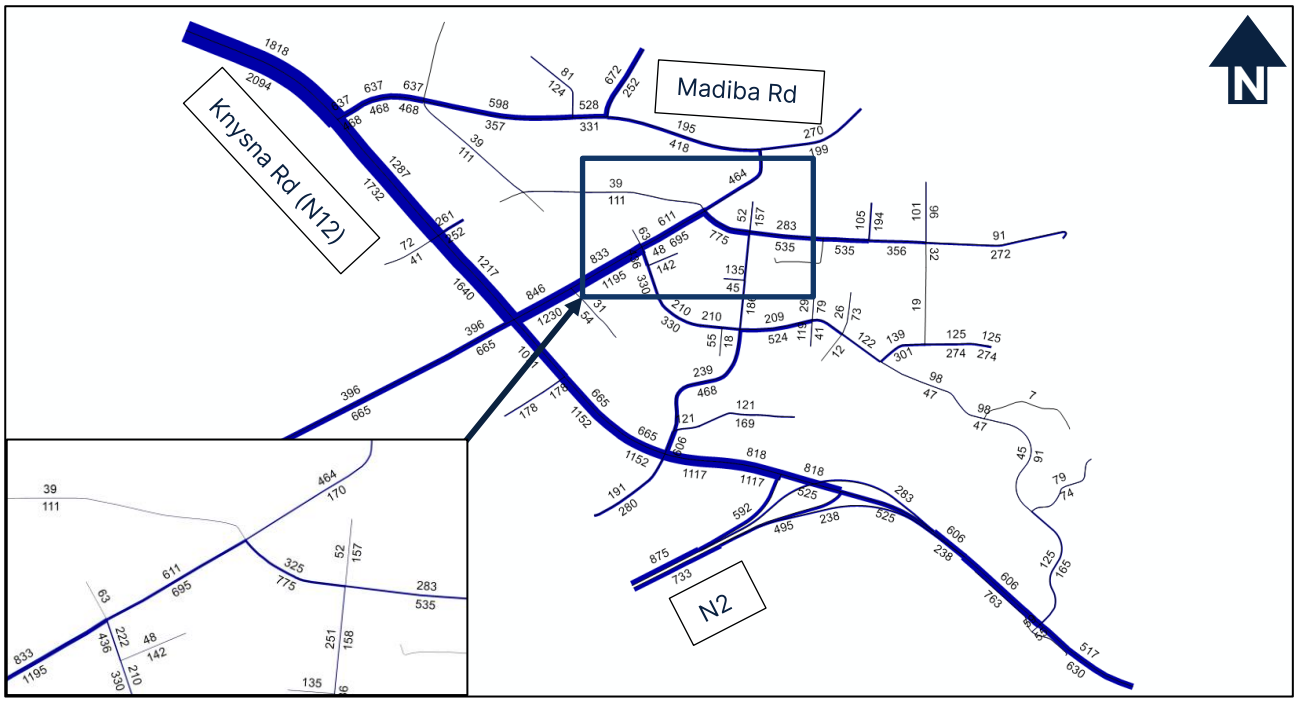

Figure 3-1: 2031 AM Peak Hour Modelled Flows

It is our submission that the addition of Pieter Koen Development trips would have an insignificant impact on the 2031 forecast year traffic flows of the Kraaibosch planned road network.

Figure 3-2 illustrates the associated 2031 AM Peak Hour degree of saturation.

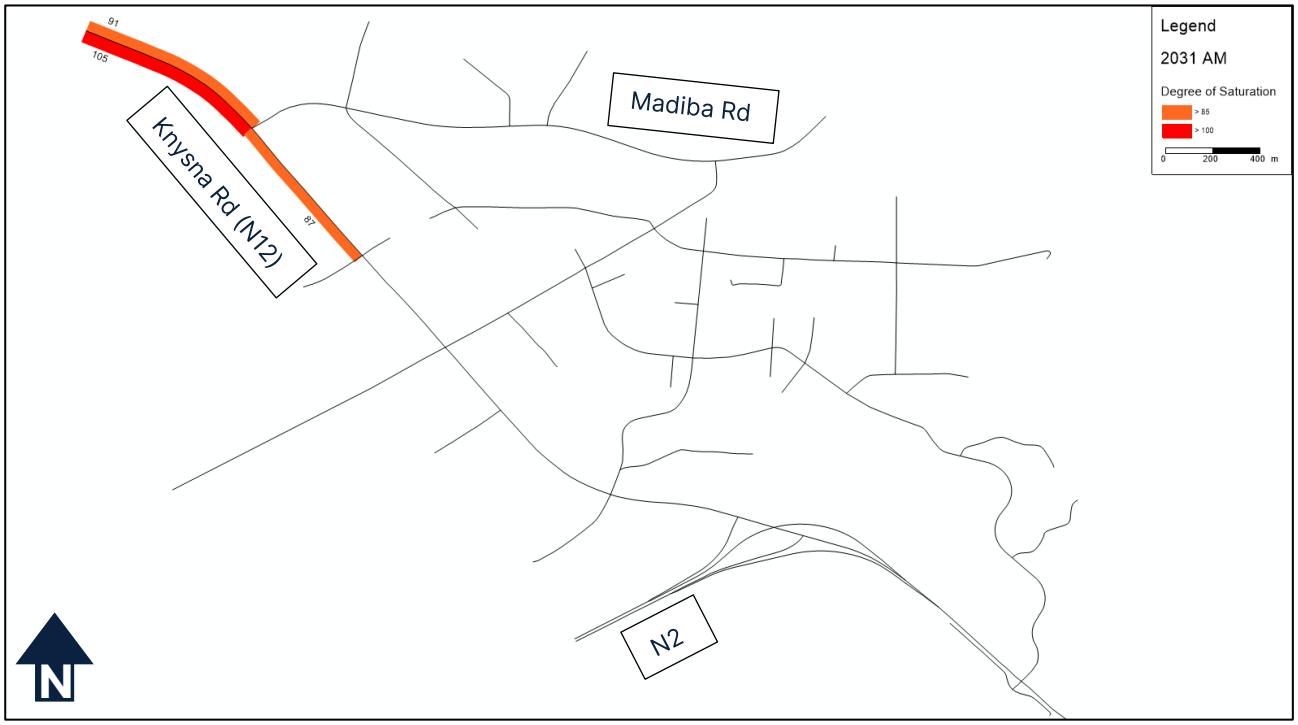

Figure 3-2: 22031 AM Peak Hour Degree of Saturation

It is concluded that the road network would be sufficient to accommodate the anticipated 2031 Weekday AM Peak Hour traffic demand at acceptable levels of service.

Taking into consideration the addition of Pieter Koen Development trips to the Kraaibosch Meso Model, the 2031 PM Peak Hour modelled flows is shown in **Figure 3-3**.

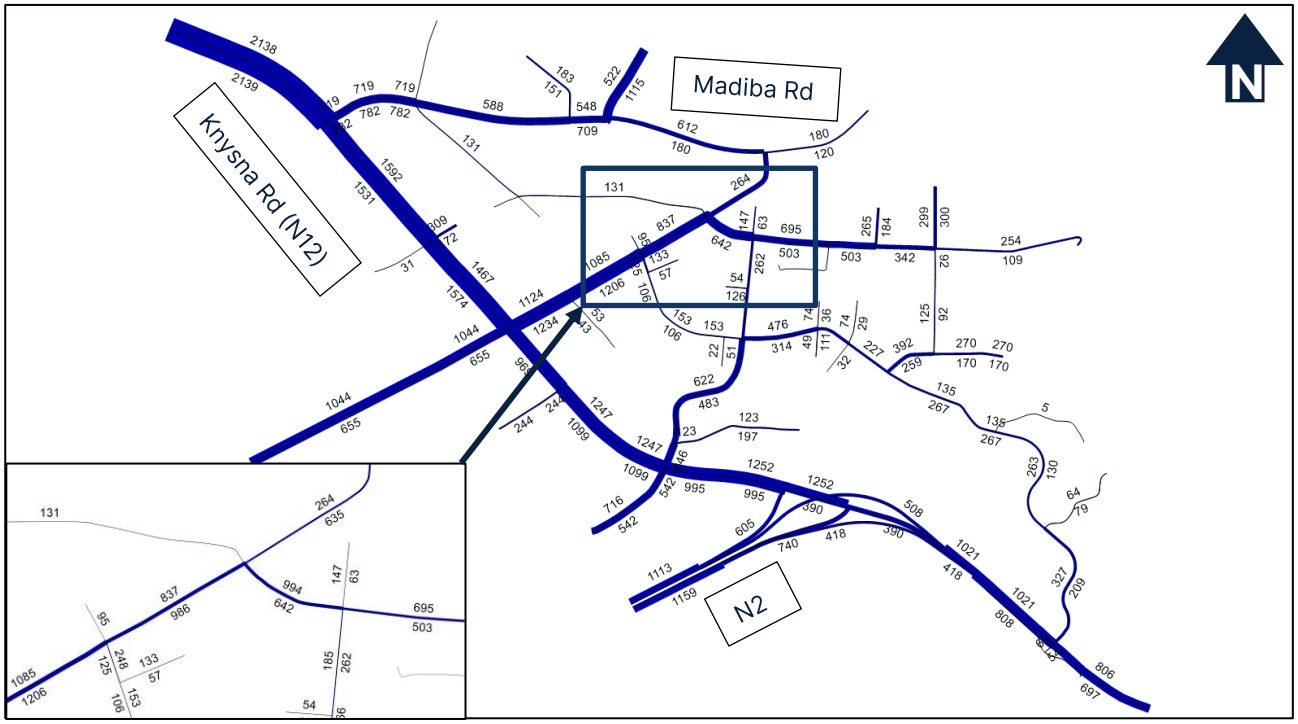

Figure 3-3: 2031 PM Peak Hour Modelled Flows

It is our submission that the addition of Pieter Koen Development trips would have an insignificant impact on the 2031 forecast year traffic flows of the Kraaibosch planned road network.

Figure 3-4 illustrates the associated 2031 PM Peak Hour degree of saturation.

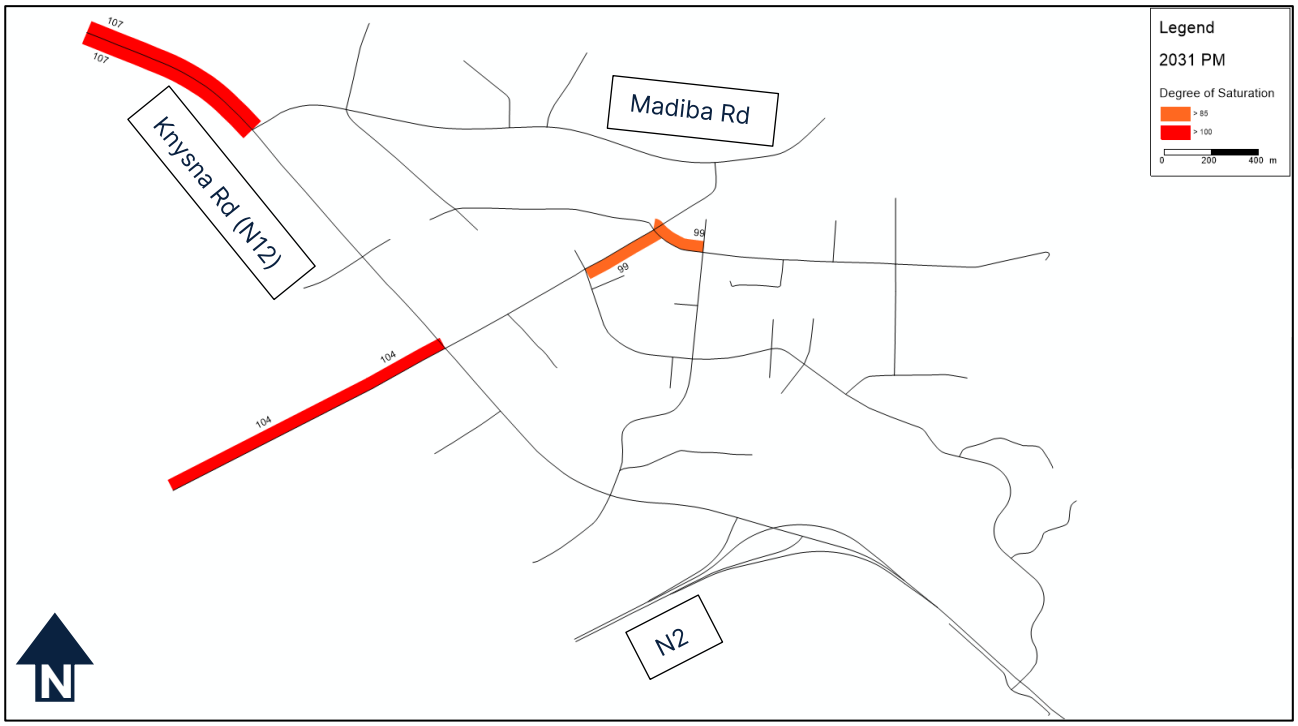

Figure 3-4: 2031 PM Peak Hour Degree of Saturation

It is concluded that the road network would be sufficient to accommodate the anticipated 2031 Weekday PM Peak Hour traffic demand at acceptable levels of service.

4 Intersection Operation Analysis

Intersection capacity analyses were undertaken to determine the anticipated operational performance of the site accesses and surrounding road network, taking into consideration the implementation of the development and associated development trips. The state-of-the-art traffic engineering software package, SIDRA Intersection 9.0 software, was used.

The operational performance of an intersection is typically quantified in terms of Level of Service as defined by the SIDRA Intersection User Guide Ver. 8 (2018). These definitions relate average delays at intersections (for individual turning movements, for each approach and for the overall intersection) to a level of service ranging from A to F, as are shown in **Table 4-1**.

Table 4-1: Intersection-Based Level of Service Criteria

Level of Service	Control Delay per Vehicle in Seconds (d)			LOS for V/C Ratio
	Signals and	Roundabouts	Stop Signs and Yield Signs	V/C > 1
A	d ≤ 10	d ≤ 10	d ≤ 10	F
B	10 <d ≤ 20	10 < d ≤ 20	10 <d ≤ 15	F
C	20 < d ≤ 35	20 < d ≤ 35	15 < d ≤ 25	F
D	35 < d ≤ 55	35 < d ≤ 50	25 < d ≤ 35	F
E	55 < d ≤ 80	50 < d ≤ 70	35 < d ≤ 50	F
F	80 < d	70 < d	50 < d	F

The intersection analyses forming part of the project assignment are listed below:

- Knysna Road and Kraaibosch Road intersection
- Road 1 and Road 5 intersection
- Road 1 and Glenwood Avenue intersection
- Road 2 and Road 3 intersection
- Development Access along Road 2

The following scenarios were analysed:

- 2031 Background + Development Traffic

Detailed SIDRA outputs are contained in **Annexure A**.

4.1 Knysna Road and Kraaibosch Road Intersection

The planned intersection of N9 Knysna Street and Kraaibosch Road is a signal-controlled intersection. The north approach will comprise of a short left-slip lane, two through-lanes and two short right-turn lanes. The east approach will comprise of a short left-slip lane, a through lane, a shared through-and-right-turn lane and a short right-turn lane. The south approach will comprise of a short left-slip lane, two through-lanes and two short right-turn lanes. The west approach will comprise of a short left-slip lane, a through lane, a shared through-and-right-turn lane and a short right-turn lane. Refer to **Figure 4-1**.

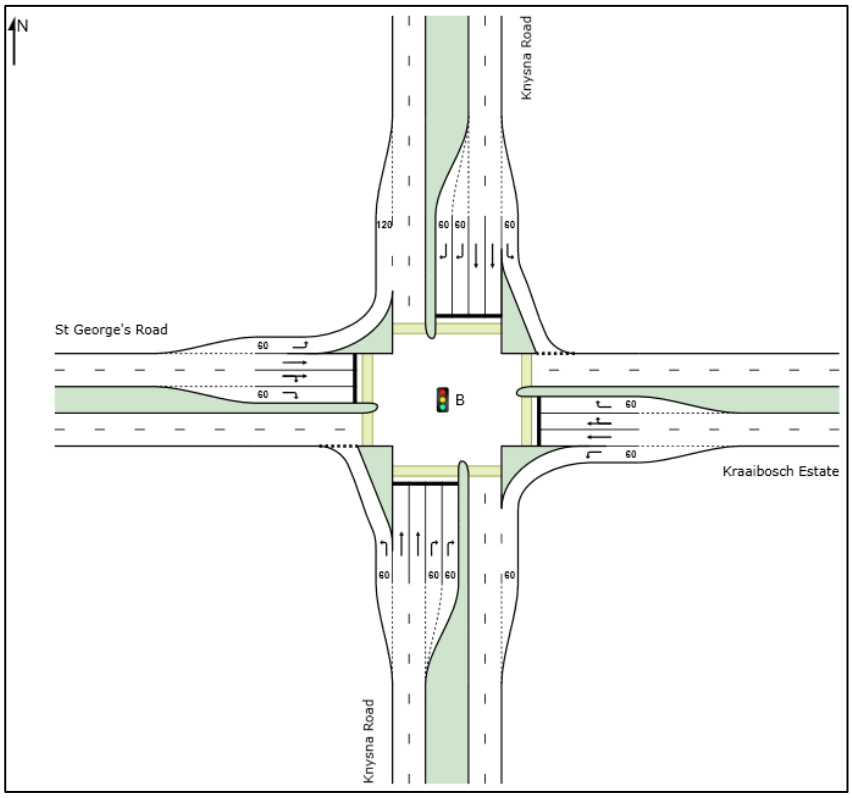

Figure 4-1: Intersection Layout: Knysna Road and Saint George's Road

2031 Background + Development Traffic

Taking into consideration the planned intersection layout as well as the 2031 Background Traffic plus the anticipated development traffic flows, the intersection is anticipated to operate at an overall Level of Service B for both the Weekday AM and PM Peak Hours, with an average delay of approximately 16 and 14 seconds respectively.

It is concluded that the planned access layout would be able to accommodate the 2031 Background plus Development Traffic at an acceptable Level of Service.

4.2 Road 1 and Road 5 Intersection

The planned intersection of Road 1 and Road 5 would be a signal-controlled full intersection. The north approach will comprise of one lane serving all movements. The east approach will comprise of a shared left-and-through lane and a shared right-and-through lane. The south approach will comprise of one lane serving all movements. The west approach will comprise of a shared left-and-through lane, a through lane and a short right-turn lane. Refer to **Figure 4-2**.

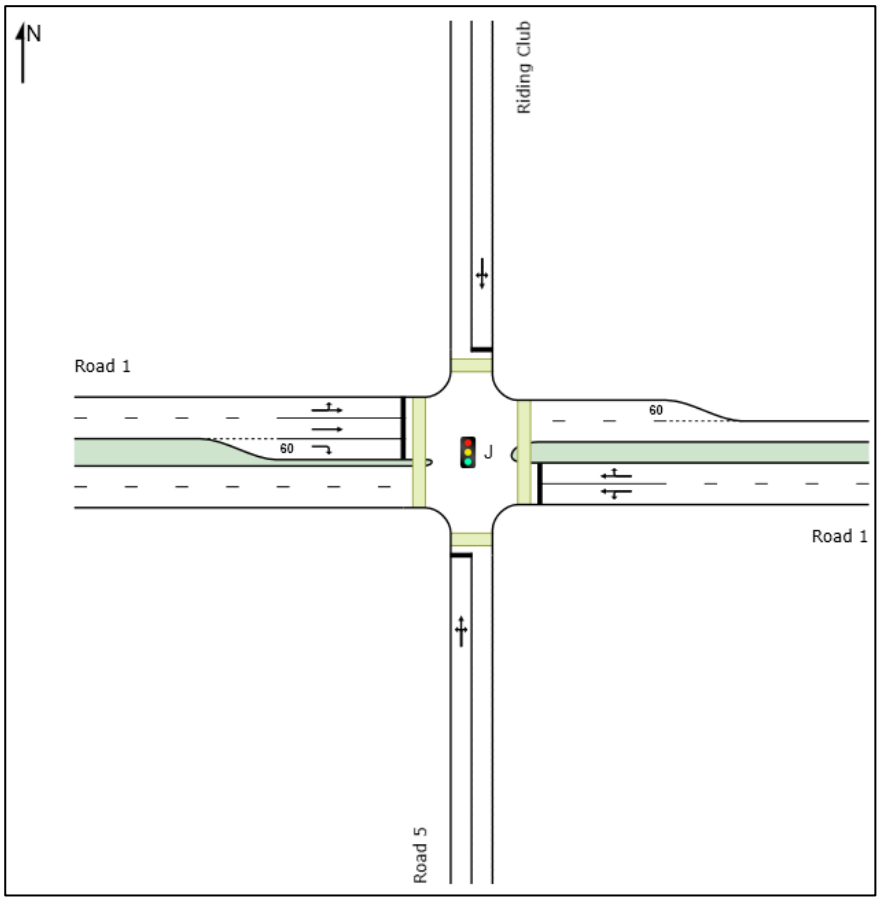

Figure 4-2: Intersection Layout: Road 1 and Road 5

2031 Background + Development Traffic

Taking into consideration the planned intersection layout as well as the 2031 Background Traffic plus the anticipated development traffic flows, the intersection is anticipated to operate at an overall Level of Service C and B during the Weekday AM and PM Peak Hours, with an average delay of approximately 22 and 14 seconds respectively.

It is concluded that the planned intersection configuration would be able to accommodate the 2031 Background plus Development Traffic at an acceptable Level of Service.

4.3 Road 1 and Glenwood Intersection

The planned intersection of Road 1 and Glenwood Avenue would take the form of a roundabout. All approaches will comprise of one lane serving all movements. Refer to **Figure 4-3**.

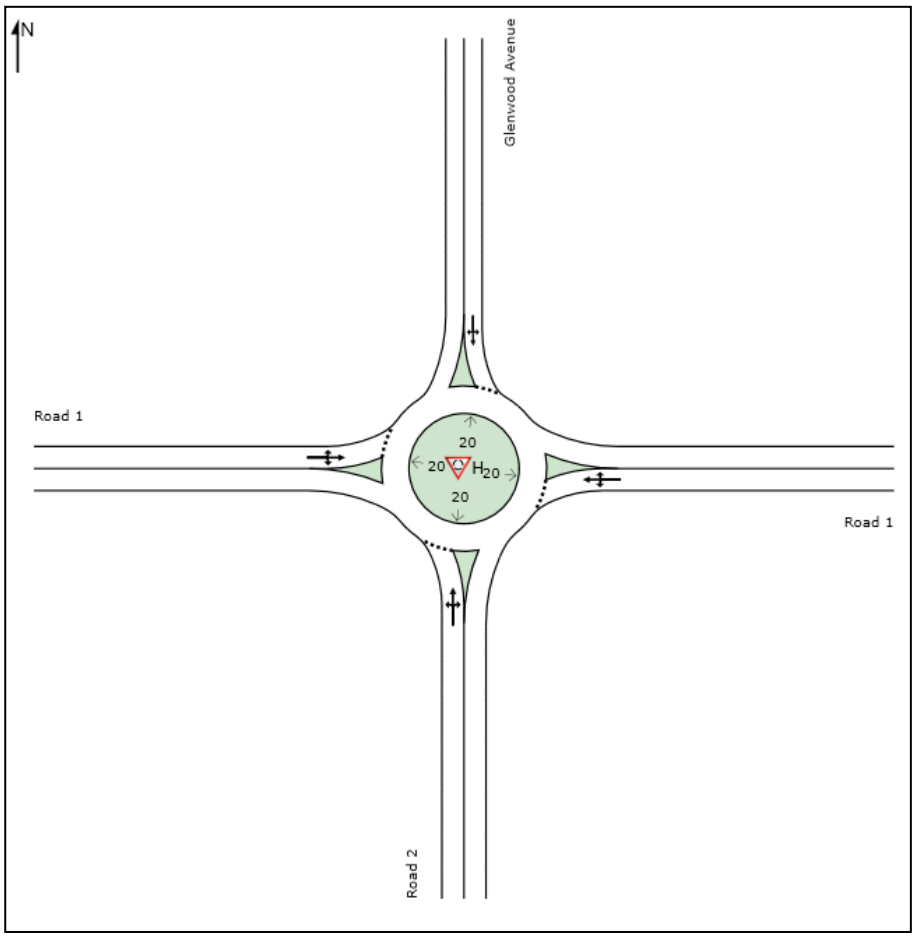

Figure 4-3: Intersection Layout: Road 1 and Glenwood Avenue

2031 Background + Development Traffic

Taking into consideration the planned intersection layout as well as the 2031 Background Traffic plus the anticipated development traffic flows, the worst approach is anticipated to operate at Level of Service A and F during the Weekday AM and PM Peak hours, with an average delay of approximately 9 and 70 seconds for the Weekday AM and PM Peak Hours, respectively.

It is concluded that the planned intersection layout would not be able to accommodate the 2031 Background plus Development Traffic at an acceptable Level of Service. This is as a result of an increase in the development trip generation compared to what was included in 2022 Kraaibosch Cost Apportionment Model Report. In addition, more developments are taking access off Road 2 than previously planned, which has led to increased demand and associated capacity requirements at the intersection of Road 1 and Glenwood Avenue.

Taking the above into consideration, one would ideally propose upgrades to this intersection however this is not achievable in this instance. It is therefore our submission that one of the following measures be taken to reduce the possibility for this intersection to become oversaturated:

- Developments to obtain access from Road 5 instead of Road 2
- Provide secondary access to the Kraaibosch Development Area, i.e. Road 5.1

4.4 Road 2 and Road 3 Intersection

The intersection of Road 2 and Road 3 is planned to take the form of a roundabout. All approaches will comprise of one lane serving all movements. Refer to **Figure 4-4**.

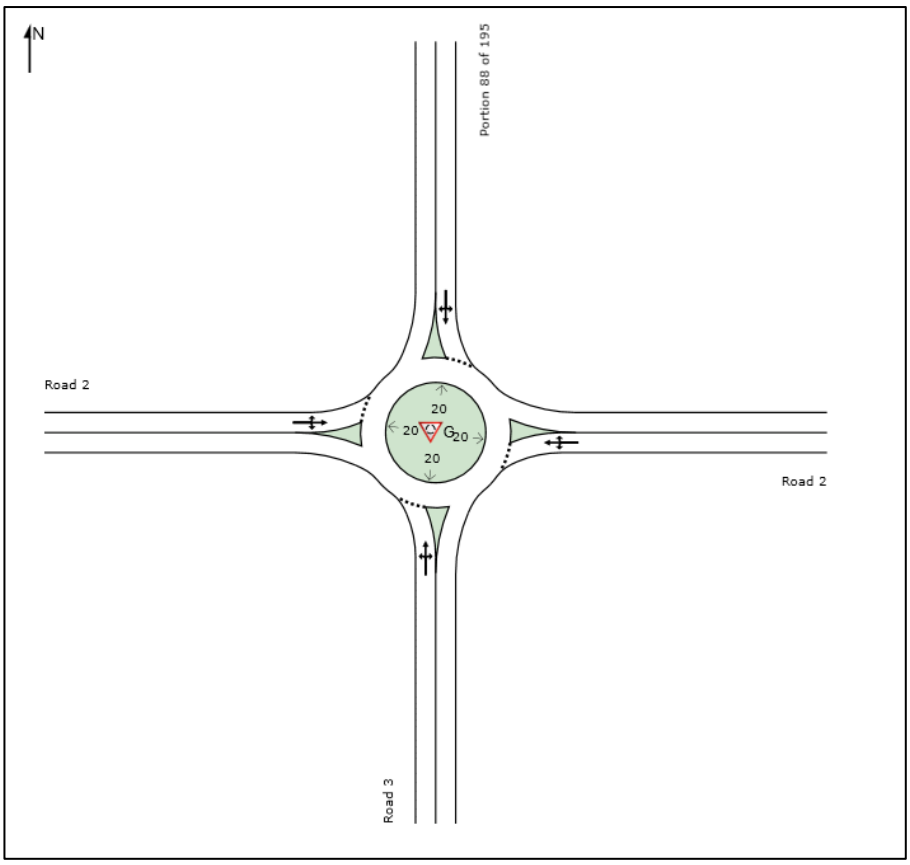

Figure 4-4: Intersection Layout: Road 2 and Road 3

2031 Background + Development Traffic

Taking into consideration the planned intersection layout as well as the 2031 Background Traffic plus the anticipated development traffic flows, the worst approach is anticipated to operate at Level of Service A and B during the Weekday AM and PM Peak hours, with an average delay of approximately 10 and 15 seconds for the Weekday AM and PM Peak Hours.

It is concluded that the planned intersection configuration would be able to accommodate the 2031 Background plus Development Traffic at an acceptable Level of Service.

4.5 Development Access along Road 2

2031 Background + Development Traffic

The Development Access along Road 2 is planned to take the form of a priority-controlled T-junction, with the development access under stop control. All approaches will comprise of one lane serving all turning movements. Refer to **Figure 4-5**.

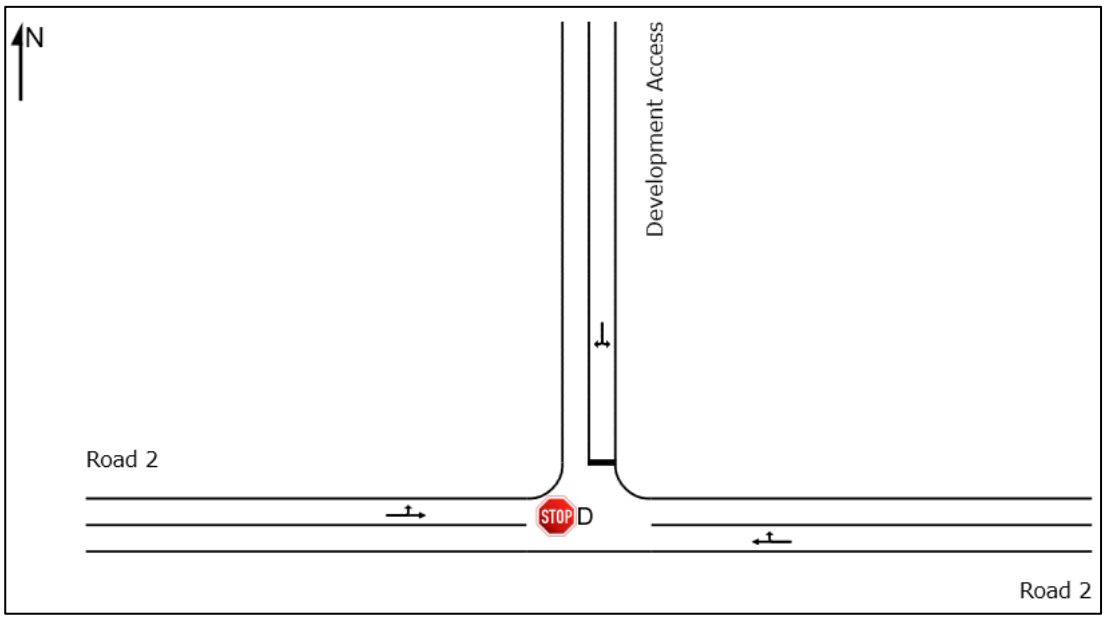

Figure 4-5: Development Access Layout

Taking into consideration the planned access layout as well as the 2031 Background Traffic plus the anticipated development traffic flows, the worst approach is anticipated to operate at Level of Service B and C during the Weekday AM and PM Peak Hours, with an average delay of approximately 13 and 21 seconds respectively.

It is concluded that the planned access layout would be able to accommodate the 2031 Background plus Development Traffic at an acceptable Level of Service.

4.6 Analysis Summary

A summary of the analysis outputs is provided in **Table 4-2**.

Table 4-2: Intersection Analysis Summary

Intersection	Level of Service	
	Weekday AM	Weekday PM
Knysna Road and Kraaibosch Road	B	B
Road 1 and Road 5 Intersection	C	B
Road 1 and Glenwood Intersection	A*	F*
Road 2 and Road 3 Intersection	A*	B*
Development Access along Road 2	B*	C*

*Worst Priority Controlled Approach LOS

5 Site Traffic Assessment

This report does not include a Site Traffic Assessment, as the building plans are not yet finalised. Reference is however made to general design criteria to be considered in compilation of the site development plan.

5.1 Internal Operations

The internal layout of the planned development should be designed in such a way to promote ease of movement. A minimum 12-metre bellmouth radius is recommended for use along at least all circulating roads, but ideally at all internal road junctions. The access and internal road layout should be such to allow for the swept path of fire trucks. Should the internal road network not be designed to cater for moving company vehicles, suitable provision should be made outside the development, in the direct vicinity of the access.

5.2 Parking

Parking provision is an important consideration of any development and would ultimately ensure that vehicular traffic is accommodated on-site in its entirety. Insufficient parking provision would have dire consequences on the operational performance of the site and surrounding public roads, as well as on road safety.

The George Integrated Zoning Scheme By-Law (2017) was used to ascertain the applicable parking requirements. For the purpose of determining parking requirements, Pieter Koen Development is taken to fall within a Normal Area.

With regard to residential land uses, it was assumed that parking would be provided on single residential and townhouse erven. Visitors' bays would however still need to be provided for townhouses. Taking this into consideration, parking requirements for the residential component of the development are stipulated in **Table 5-1**.

Table 5-1: Residential Land Use Parking Requirements

Land Use	Quantity	Minimum Parking Ratio	Parking Requirement (bays)
Apartments and Flats	137 units	1.75 bays per dwelling 0.25 bays/unit for visitors	240 for residents 35 for visitors
Townhouse	100 units	0.25 bays/unit for visitors	25 for visitors
Total			**300**

It is concluded that 300 parking bays would need to be provided for the residential component of the development.

The parking requirements of the remaining land uses are provided in **Table 5-2**.

Table 5-2: Remaining Land Uses' Parking Requirements

Land Use	Quantity	Minimum Parking Ratio	Parking Requirement (bays)
Restaurant	6 bays per 100 m² GLA	165 m²	10
Offices	4 bays per 100 m² GLA	895 m²	36
Shopping Centre	4 bays per 100 m² GLA	900 m²	36
Day Care (preschool)	1 bay per 10 children plus 1 stop & drop facility	25 children	3
Spa / Relaxation	10 bays per 100m² GLA	420 m²	42
Total			**127**

It is concluded that 127 parking bays would need to be provided for the remaining components of the development, of which 3 parking bays would need to be accessible to the physically disabled. The school would also be required to provide a stop & drop facility.

5.3 Loading

The George Integrated Zoning Scheme By-Law (2017) was used to ascertain the loading bay requirements to be adhered to. Taking into consideration the planned floor area of the shopping centre land use, 2 loading bays would be required for a supermarket between 500 and 1000 square metres GLA.

5.4 Throat Length

Adequate throat length provision is essential in ensuring sufficient operation of a development access and preventing possible spill-back onto the surrounding public road. The throat length requirements were derived from the Committee of Transport Officials South African Traffic Impact and Site Traffic Assessment Standards and Requirements Manual (COTO, TMH 16 Volume 2).

Considering the gated access control from a Class 3 Equivalent Minor Arterial Street, the minimum requirement for ingress throat lengths is 75 metres and egress throat lengths is 25 metres. It is our submission that the required throat lengths are accommodated on the site development plan. Refer to **Figure 5-1.**

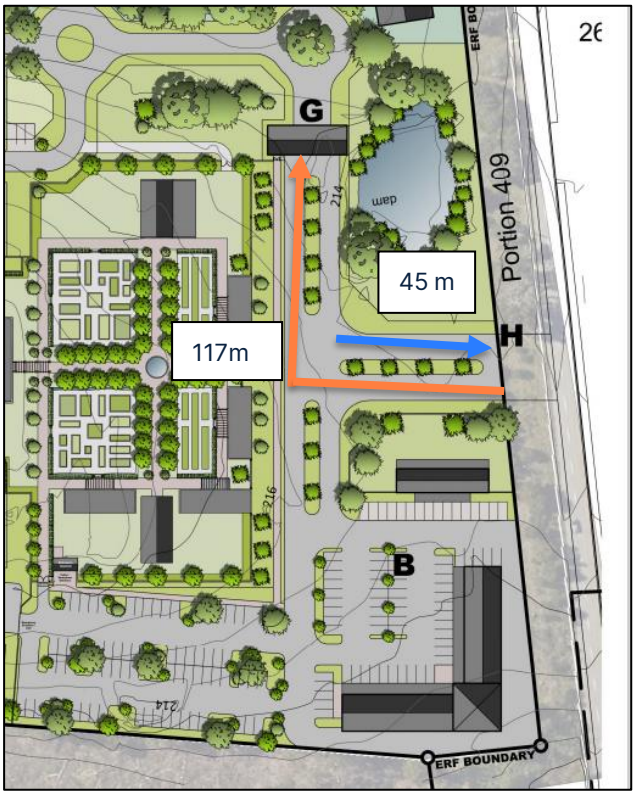

Figure 5-1: Throat Length Measurements

Taking into consideration the planned security-controlled access, a queue length analysis was undertaken to assess the operational performance thereof. The following assumptions were made:

- A service rate of 360 and 240 vehicles per hour for residents and visitor's lanes respectively
- 20% of vehicles arriving during the critical Weekday PM Peak Hour would be visitors

Taking the above into consideration, the queue length analysis results are provided in **Table 5-3**.

Table 5-3: Queue Length Analysis Results

Intersection	Units	Access	
		Residents	Visitors
Number of service lanes	lanes	1	1
Service rate	veh/h/lane	360	240
Arrival distribution per lane	%	80%	20%
Arrival rate per lane	veh/h/lane	212	53
95th percentile number of vehicles in system	veh	5.1	1.8
95th percentile queue length	metres	12	12

It is our submission that the throat length provided would be sufficient to accommodate the anticipated demand. The access road should be designed in such a way to ensure that both access lanes are accessible with consideration of the anticipated queue lengths.

6 Proposed Improvements

The transport improvements defined within the latest Kraaibosch Cost Apportionment Model Report of April 2022 still apply.

No further road capacity improvements would be required as part of the proposed development.

7 Conclusion and Recommendations

SMEC South Africa (Pty) Ltd was appointed by Kantey and Templer (Pty) Ltd to conduct a Traffic Impact Assessment for the proposed Pieter Koen Development on Portion 21 of the Farm Kraaibosch 195, George. The site is situated within the Kraaibosch development area to the north of Knysna Road (N12).

The subject site measures approximately 17 hectares in extent and will comprise of 137 apartments and flats, 100 townhouses, 79 single dwelling units, a health and fitness centre, a preschool, offices, shopping centre and a restaurant. Taking into consideration the planned public transport initiatives for the Kraaibosch Development Area, and the route alignment of Go George Bus Service, the planned development is anticipated to generate 298 and 449 new vehicular trips during the Weekday AM and PM Peak Hours.

It is planned for the development to be served by a single access along Road 2 ~180 metres downstream of Cape Estates Development Access and 250 metres upstream of Groenekloof Avenue (Road 4A). It is our submission that the proposed development access conforms to the WCG access spacing requirements.

It should however be noted that there are two existing sub-standard access spacings on the southern edge of Road 2 in the vicinity of the proposed development access, that of ERF 195/56 and ERF 26013. It is recommended that upon the development of ERF 195/56, the existing access along Road 2 should be relocated to a point directly opposite the proposed ERF 195/21 development access. The George Municipality should evaluate whether they want to impose any changes to the substandard access to ERF 26013.

It is concluded that the planned intersection layout of Road 1 and Glenwood Avenue would not be able to accommodate the 2031 Background plus Development Traffic at an acceptable Level of Service. This is as a result of an increase in the development trip generation compared to what was included in 2022 Kraaibosch Cost Apportionment Model Report. In addition, more developments are taking access off Road 2 than previously planned, which has led to increased demand and associated capacity requirements at the intersection of Road 1 and Glenwood Avenue.

Taking the above into consideration, one would ideally propose upgrades to this intersection however this is not achievable in this instance. It is therefore our submission that one of the following measures be taken to reduce the possibility for this intersection to become oversaturated:

- Developments to obtain access from Road 5 instead of Road 2
- Provide secondary access to the Kraaibosch Development Area, i.e. Road 5.1

It is concluded that 300 parking bays would need to be provided for the residential component of the development. 127 parking bays would need to be provided for the remaining components of the development, of which 3 parking bays would need to be accessible to the physically disabled. The school would also be required to provide a stop & drop facility.

Taking into consideration the planned floor area of the shopping centre land use, 2 loading bays would be required for a supermarket between 500 and 100 square meters GLA.

Considering the gated access control from a Class 3 Equivalent Minor Arterial Street, the minimum requirement for ingress throat lengths is 75 metres and egress throat lengths is 25 metres. It is our submission that the required throat lengths are accommodated on the site development plan.

The transport improvements defined within the latest Kraaibosch Cost Apportionment Model Report of April 2022 still apply. No further road capacity improvements would be required as part of the proposed development.

Taking the above into consideration, it is concluded that this development is supported from a traffic engineering perspective, provided that the site-specific requirements are implemented as per the applicable design standards.

Annexure A Detailed SIDRA Outputs

Knysna Road and Kraaibosch Road Intersection

MOVEMENT SUMMARY

Site: B [Knysna/St George's 2031 PM +195/21 + 60m RHT (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 40 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Knysna Road															
1	L2	96	3.0	101	3.0		0.106	8.6	LOS A	0.7	5.3	0.50	0.67	0.50	51.7
2	T1	748	3.0	787	3.0		0.653	14.3	LOS B	7.2	51.8	0.92	0.81	0.98	48.7
3	R2	125	3.0	132	3.0		0.310	24.6	LOS C	1.3	9.3	0.95	0.74	0.95	42.4
Approach		969	3.0	1020	3.0		0.653	15.1	LOS B	7.2	51.8	0.88	0.79	0.93	48.0
East: Kraaibosch Estate															
4	L2	177	3.0	186	3.0		0.097	7.0	LOS A	0.0	0.0	0.00	0.53	0.00	54.8
5	T1	512	3.0	539	3.0		0.595	9.2	LOS A	8.1	58.5	0.80	0.70	0.80	52.2
6	R2	545	3.0	574	3.0	*	0.595	15.5	LOS B	4.0	29.1	0.94	0.81	0.97	47.4
Approach		1234	3.0	1299	3.0		0.595	11.7	LOS B	8.1	58.5	0.75	0.72	0.76	50.3
North: Knysna Road															
7	L2	519	3.0	546	3.0		0.460	7.9	LOS A	3.3	23.8	0.52	0.70	0.52	52.2
8	T1	901	3.0	948	3.0	*	0.786	11.9	LOS B	8.6	61.5	0.88	0.81	1.00	50.3
9	R2	47	3.0	49	3.0		0.109	22.8	LOS C	0.5	3.2	0.89	0.70	0.89	43.3
Approach		1467	3.0	1544	3.0		0.786	10.8	LOS B	8.6	61.5	0.75	0.77	0.83	50.7
West: St George's Road															
10	L2	281	3.0	296	3.0		0.155	7.7	LOS A	0.0	0.0	0.00	0.53	0.00	54.8
11	T1	480	3.0	505	3.0	*	0.970	36.6	LOS D	10.3	74.0	1.00	1.23	2.00	37.4
12	R2	283	3.0	298	3.0		0.970	41.6	LOS D	7.7	55.4	1.00	1.18	2.08	35.9
Approach		1044	3.0	1099	3.0		0.970	30.2	LOS C	10.3	74.0	0.73	1.02	1.49	40.4
All Vehicles		4714	3.0	4962	3.0		0.970	16.2	LOS B	10.3	74.0	0.77	0.82	0.98	47.4

MOVEMENT SUMMARY

Site: B [Knysna/St George's 2031 AM +195/21 + 60m RHT (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 60 seconds (Site Optimum Cycle Time - Minimum Degree of Saturation)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Knysna Road															
1	L2	218	3.0	229	3.0		0.225	7.6	LOS A	1.4	10.0	0.40	0.66	0.40	52.6
2	T1	778	3.0	819	3.0	*	0.509	8.2	LOS A	6.1	44.1	0.54	0.46	0.54	52.9
3	R2	75	3.0	79	3.0		0.107	21.8	LOS C	0.8	6.1	0.74	0.71	0.74	43.8
Approach		1071	3.0	1127	3.0		0.509	9.1	LOS A	6.1	44.1	0.52	0.52	0.52	52.1
East: Kraaibosch Estate															
4	L2	196	3.0	206	3.0		0.108	6.2	LOS A	0.0	0.0	0.00	0.53	0.00	54.8
5	T1	274	3.0	288	3.0		0.331	12.2	LOS B	5.6	40.5	0.70	0.59	0.70	50.1
6	R2	759	3.0	799	3.0	*	0.680	20.7	LOS C	9.0	64.4	0.93	0.85	0.97	44.4
Approach		1229	3.0	1294	3.0		0.680	16.5	LOS B	9.0	64.4	0.73	0.74	0.76	47.0
North: Knysna Road															
7	L2	537	3.0	565	3.0		0.446	7.0	LOS A	3.3	23.4	0.35	0.65	0.35	52.9
8	T1	508	3.0	535	3.0		0.332	13.6	LOS B	5.5	39.4	0.73	0.62	0.73	49.1
9	R2	173	3.0	182	3.0		0.347	24.5	LOS C	2.2	16.0	0.82	0.76	0.82	42.4
Approach		1218	3.0	1282	3.0		0.446	12.2	LOS B	5.5	39.4	0.58	0.65	0.58	49.6
West: St George's Road															
10	L2	103	3.0	108	3.0		0.057	7.9	LOS A	0.0	0.0	0.00	0.53	0.00	54.8
11	T1	235	3.0	247	3.0	*	0.527	28.8	LOS C	3.7	26.2	0.98	0.77	0.99	40.9
12	R2	58	3.0	61	3.0		0.308	33.8	LOS C	1.8	12.6	0.95	0.75	0.95	38.4
Approach		396	3.0	417	3.0		0.527	24.1	LOS C	3.7	26.2	0.72	0.70	0.72	43.4
All Vehicles		3914	3.0	4120	3.0		0.680	13.9	LOS B	9.0	64.4	0.63	0.65	0.63	48.7

Road 1 and Road 5 Intersection

MOVEMENT SUMMARY

Site: J [Road 1/Riding Club 2031 AM + 195/21 (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Road 5															
1	L2	436	0.0	459	0.0		0.612	24.4	LOS C	12.8	89.8	0.86	0.83	0.86	42.0
2	T1	1	0.0	1	0.0	*	0.612	18.9	LOS B	12.8	89.8	0.86	0.83	0.86	42.9
3	R2	1	0.0	1	0.0		0.612	24.4	LOS C	12.8	89.8	0.86	0.83	0.86	41.9
Approach		438	0.0	461	0.0		0.612	24.4	LOS C	12.8	89.8	0.86	0.83	0.86	42.0
East: Road 1															
4	L2	1	0.0	1	0.0		0.599	28.5	LOS C	10.9	76.6	0.91	0.77	0.91	42.6
5	T1	695	0.0	732	0.0		0.599	22.9	LOS C	10.9	76.6	0.91	0.77	0.91	43.5
6	R2	1	0.0	1	0.0	*	0.599	28.5	LOS C	10.9	76.0	0.91	0.77	0.91	42.5
Approach		697	0.0	734	0.0		0.599	23.0	LOS C	10.9	76.6	0.91	0.77	0.91	43.5
North: Riding Club															
7	L2	1	0.0	1	0.0		0.279	32.7	LOS C	2.1	14.5	0.87	0.76	0.87	38.8
8	T1	1	0.0	1	0.0		0.279	26.2	LOS C	2.1	14.5	0.87	0.76	0.87	39.5
9	R2	63	0.0	66	0.0		0.279	31.7	LOS C	2.1	14.5	0.87	0.76	0.87	38.8
Approach		65	0.0	68	0.0		0.279	31.6	LOS C	2.1	14.5	0.87	0.76	0.87	38.8
West: Road 1															
10	L2	1	0.0	1	0.0		0.169	16.9	LOS B	3.2	22.4	0.61	0.50	0.61	49.3
11	T1	611	0.0	643	0.0		0.497	13.4	LOS B	11.4	79.6	0.71	0.61	0.71	49.3
12	R2	222	0.0	234	0.0	*	0.626	30.0	LOS C	7.3	51.4	0.97	0.86	1.00	39.3
Approach		834	0.0	878	0.0		0.626	17.8	LOS B	11.4	79.6	0.78	0.68	0.78	46.2
All Vehicles		2034	0.0	2141	0.0		0.626	21.5	LOS C	12.8	89.8	0.84	0.75	0.84	44.0

MOVEMENT SUMMARY

Site: J [Road 1/Riding Club 2031 PM + 195/21 (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Road 5															
1	L2	125	0.0	132	0.0		0.400	34.4	LOS C	4.2	29.6	0.93	0.78	0.93	37.7
2	T1	1	0.0	1	0.0		0.400	28.9	LOS C	4.2	29.6	0.93	0.78	0.93	38.4
3	R2	1	0.0	1	0.0		0.400	34.4	LOS C	4.2	29.6	0.93	0.78	0.93	37.6
Approach		127	0.0	134	0.0		0.400	34.4	LOS C	4.2	29.6	0.93	0.78	0.93	37.7
East: Road 1															
4	L2	1	0.0	1	0.0		0.540	19.7	LOS B	12.7	88.7	0.76	0.67	0.76	47.5
5	T1	986	0.0	1038	0.0		0.540	14.2	LOS B	12.7	88.7	0.76	0.67	0.76	48.6
6	R2	1	0.0	1	0.0	*	0.540	19.7	LOS B	12.6	88.2	0.76	0.67	0.76	47.4
Approach		988	0.0	1040	0.0		0.540	14.2	LOS B	12.7	88.7	0.76	0.67	0.76	48.6
North: Riding Club															
7	L2	1	0.0	1	0.0		0.519	40.2	LOS D	3.5	24.5	0.98	0.78	0.98	36.2
8	T1	1	0.0	1	0.0	*	0.519	32.9	LOS C	3.5	24.5	0.98	0.78	0.98	36.8
9	R2	95	0.0	100	0.0		0.519	38.5	LOS D	3.5	24.5	0.98	0.78	0.98	36.2
Approach		97	0.0	102	0.0		0.519	38.4	LOS D	3.5	24.5	0.98	0.78	0.98	36.2
West: Road 1															
10	L2	1	0.0	1	0.0		0.160	9.7	LOS A	2.7	18.7	0.37	0.32	0.37	54.7
11	T1	837	0.0	881	0.0		0.468	5.5	LOS A	10.3	72.2	0.47	0.41	0.47	55.3
12	R2	248	0.0	261	0.0	*	0.530	21.1	LOS C	7.5	52.3	0.90	0.84	0.90	43.4
Approach		1086	0.0	1143	0.0		0.530	9.1	LOS A	10.3	72.2	0.57	0.51	0.57	52.1
All Vehicles		2298	0.0	2419	0.0		0.540	13.9	LOS B	12.7	88.7	0.69	0.61	0.69	48.7

Road 1 and Glenwood Intersection

MOVEMENT SUMMARY

Site: H [Glenwood/Road 1 2031 AM + 195/21 (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Road 2														
1	L2	535	0.0	563	0.0	0.629	5.4	LOS A	6.2	43.4	0.61	0.59	0.61	52.8
2	T1	111	0.0	117	0.0	0.629	5.7	LOS A	6.2	43.4	0.61	0.59	0.61	54.1
3	R2	129	0.0	136	0.0	0.629	10.2	LOS B	6.2	43.4	0.61	0.59	0.61	54.1
Approach		775	0.0	816	0.0	0.629	6.3	LOS A	6.2	43.4	0.61	0.59	0.61	53.2
East: Road 1														
4	L2	10	0.0	11	0.0	0.171	5.4	LOS A	1.0	7.1	0.53	0.57	0.53	53.2
5	T1	160	0.0	168	0.0	0.171	5.8	LOS A	1.0	7.1	0.53	0.57	0.53	54.4
6	R2	1	0.0	1	0.0	0.171	10.4	LOS B	1.0	7.1	0.53	0.57	0.53	54.4
Approach		171	0.0	180	0.0	0.171	5.8	LOS A	1.0	7.1	0.53	0.57	0.53	54.4
North: Glenwood Avenue														
7	L2	1	0.0	1	0.0	0.067	9.1	LOS A	0.4	3.1	0.80	0.71	0.80	51.6
8	T1	39	0.0	41	0.0	0.067	9.3	LOS A	0.4	3.1	0.80	0.71	0.80	52.8
9	R2	1	0.0	1	0.0	0.067	14.1	LOS B	0.4	3.1	0.80	0.71	0.80	52.8
Approach		41	0.0	43	0.0	0.067	9.4	LOS A	0.4	3.1	0.80	0.71	0.80	52.8
West: Road 1														
10	L2	1	0.0	1	0.0	0.553	5.9	LOS A	4.7	33.0	0.65	0.65	0.65	51.6
11	T1	335	0.0	353	0.0	0.553	6.0	LOS A	4.7	33.0	0.65	0.65	0.65	52.9
12	R2	276	0.0	291	0.0	0.553	10.6	LOS B	4.7	33.0	0.65	0.65	0.65	52.9
Approach		612	0.0	644	0.0	0.553	8.1	LOS A	4.7	33.0	0.65	0.65	0.65	52.9
All Vehicles		1599	0.0	1683	0.0	0.629	7.0	LOS A	6.2	43.4	0.62	0.61	0.62	53.2

MOVEMENT SUMMARY

Site: H [Glenwood/Road 1 2031 PM + 195/21 (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Road 2														
1	L2	524	0.0	552	0.0	0.766	12.4	LOS B	10.8	75.5	1.00	1.04	1.33	48.8
2	T1	1	0.0	1	0.0	0.766	12.7	LOS B	10.8	75.5	1.00	1.04	1.33	49.9
3	R2	118	0.0	124	0.0	0.766	17.2	LOS B	10.8	75.5	1.00	1.04	1.33	49.8
Approach		643	0.0	677	0.0	0.766	13.3	LOS B	10.8	75.5	1.00	1.04	1.33	49.0
East: Road 1														
4	L2	172	0.0	181	0.0	1.057	70.0	LOS F	36.3	253.8	1.00	2.13	3.90	27.8
5	T1	462	0.0	486	0.0	1.057	70.4	LOS F	36.3	253.8	1.00	2.13	3.90	28.1
6	R2	1	0.0	1	0.0	1.057	75.0	LOS F	36.3	253.8	1.00	2.13	3.90	28.1
Approach		635	0.0	668	0.0	1.057	70.3	LOS F	36.3	253.8	1.00	2.13	3.90	28.1
North: Glenwood Ave														
7	L2	1	0.0	1	0.0	0.289	13.3	LOS B	2.2	15.2	0.96	0.92	0.96	48.8
8	T1	131	0.0	138	0.0	0.289	13.5	LOS B	2.2	15.2	0.96	0.92	0.96	49.9
9	R2	1	0.0	1	0.0	0.289	18.3	LOS B	2.2	15.2	0.96	0.92	0.96	49.9
Approach		133	0.0	140	0.0	0.289	13.5	LOS B	2.2	15.2	0.96	0.92	0.96	49.9
West: Road 1														
10	L2	1	0.0	1	0.0	0.653	5.1	LOS A	7.7	54.0	0.62	0.60	0.62	50.7
11	T1	146	0.0	154	0.0	0.653	5.2	LOS A	7.7	54.0	0.62	0.60	0.62	52.0
12	R2	691	0.0	727	0.0	0.653	9.9	LOS A	7.7	54.0	0.62	0.60	0.62	52.0
Approach		838	0.0	882	0.0	0.653	9.1	LOS A	7.7	54.0	0.62	0.60	0.62	52.0
All Vehicles		2249	0.0	2367	0.0	1.057	27.8	LOS C	36.3	253.8	0.85	1.18	1.77	41.3

Road 2 and Road 3 Intersection

MOVEMENT SUMMARY

Site: G [Road 2/Road 3 2031 AM +195/21 (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Road 3														
1	L2	197	1.0	207	1.0	0.321	7.8	LOS A	2.1	14.9	0.74	0.79	0.74	51.9
2	T1	10	1.0	11	1.0	0.321	8.0	LOS A	2.1	14.9	0.74	0.79	0.74	53.1
3	R2	44	1.0	46	1.0	0.321	12.7	LOS B	2.1	14.9	0.74	0.79	0.74	53.1
Approach		251	1.0	264	1.0	0.321	8.7	LOS A	2.1	14.9	0.74	0.79	0.74	52.1
East: Road 2														
4	L2	83	1.0	87	1.0	0.469	5.3	LOS A	3.5	25.0	0.54	0.56	0.54	53.1
5	T1	452	1.0	476	1.0	0.469	5.6	LOS A	3.5	25.0	0.54	0.56	0.54	54.4
6	R2	1	1.0	1	1.0	0.469	10.2	LOS B	3.5	25.0	0.54	0.56	0.54	54.3
Approach		536	1.0	564	1.0	0.469	5.5	LOS A	3.5	25.0	0.54	0.56	0.54	54.2
North: Portion 88 of 195														
7	L2	1	1.0	1	1.0	0.158	5.7	LOS A	0.9	6.1	0.50	0.67	0.50	51.2
8	T1	31	1.0	33	1.0	0.158	5.9	LOS A	0.9	6.1	0.50	0.67	0.50	52.4
9	R2	126	1.0	133	1.0	0.158	10.5	LOS B	0.9	6.1	0.50	0.67	0.50	52.3
Approach		158	1.0	166	1.0	0.158	9.6	LOS A	0.9	6.1	0.50	0.67	0.50	52.3
West: Road 2														
10	L2	42	1.0	44	1.0	0.240	4.2	LOS A	1.6	11.6	0.24	0.45	0.24	54.0
11	T1	239	1.0	252	1.0	0.240	4.4	LOS A	1.6	11.6	0.24	0.45	0.24	55.3
12	R2	44	1.0	46	1.0	0.240	9.0	LOS A	1.6	11.6	0.24	0.45	0.24	55.3
Approach		325	1.0	342	1.0	0.240	5.0	LOS A	1.6	11.6	0.24	0.45	0.24	55.1
All Vehicles		1270	1.0	1337	1.0	0.469	6.5	LOS A	3.5	25.0	0.50	0.59	0.50	53.8

MOVEMENT SUMMARY

Site: G [Road 2/Road 3 2031 PM +195/21 (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Road 3														
1	L2	116	1.0	122	1.0	0.231	7.1	LOS A	1.5	10.4	0.70	0.74	0.70	52.2
2	T1	29	1.0	31	1.0	0.231	7.4	LOS A	1.5	10.4	0.70	0.74	0.70	53.4
3	R2	40	1.0	42	1.0	0.231	12.0	LOS B	1.5	10.4	0.70	0.74	0.70	53.4
Approach		185	1.0	195	1.0	0.231	8.2	LOS A	1.5	10.4	0.70	0.74	0.70	52.6
East: Road 2														
4	L2	28	1.0	29	1.0	0.487	6.0	LOS A	3.6	25.6	0.63	0.62	0.63	52.6
5	T1	476	1.0	501	1.0	0.487	6.2	LOS A	3.6	25.6	0.63	0.62	0.63	53.9
6	R2	1	1.0	1	1.0	0.487	10.9	LOS B	3.6	25.6	0.63	0.62	0.63	53.8
Approach		505	1.0	532	1.0	0.487	6.2	LOS A	3.6	25.6	0.63	0.62	0.63	53.8
North: Portion 88 of 195														
7	L2	1	1.0	1	1.0	0.123	11.1	LOS B	0.8	5.8	0.86	0.84	0.86	48.0
8	T1	13	1.0	14	1.0	0.123	11.3	LOS B	0.8	5.8	0.86	0.84	0.86	49.0
9	R2	50	1.0	53	1.0	0.123	15.9	LOS B	0.8	5.8	0.86	0.84	0.86	48.9
Approach		64	1.0	67	1.0	0.123	14.9	LOS B	0.8	5.8	0.86	0.84	0.86	48.9
West: Road 2														
10	L2	117	1.0	123	1.0	0.712	4.7	LOS A	9.6	68.1	0.52	0.48	0.52	52.7
11	T1	655	1.0	689	1.0	0.712	4.9	LOS A	9.6	68.1	0.52	0.48	0.52	53.9
12	R2	222	1.0	234	1.0	0.712	9.5	LOS A	9.6	68.1	0.52	0.48	0.52	53.9
Approach		994	1.0	1046	1.0	0.712	5.9	LOS A	9.6	68.1	0.52	0.48	0.52	53.8
All Vehicles		1748	1.0	1840	1.0	0.712	6.6	LOS A	9.6	68.1	0.58	0.56	0.58	53.5

Development Access along Road 2

MOVEMENT SUMMARY

Site: D [2031 AM Planned Road 2/ Pieter Koen Dev Access (Site Folder: General)]

New Site
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Road 2														
5	T1	351	3.0	369	3.0	0.188	0.0	LOS A	0.0	0.4	0.02	0.01	0.02	59.9
6	R2	5	0.0	5	0.0	0.188	6.7	LOS A	0.0	0.4	0.02	0.01	0.02	57.6
Approach		356	3.0	375	3.0	0.188	0.1	NA	0.0	0.4	0.02	0.01	0.02	59.8
North: Development Access														
7	L2	10	0.0	11	0.0	0.344	9.6	LOS A	1.5	10.4	0.57	1.03	0.71	49.2
9	R2	185	0.0	195	0.0	0.344	12.8	LOS B	1.5	10.4	0.57	1.03	0.71	48.8
Approach		195	0.0	205	0.0	0.344	12.7	LOS B	1.5	10.4	0.57	1.03	0.71	48.8
West: Road 2														
10	L2	100	0.0	105	0.0	0.157	5.6	LOS A	0.0	0.0	0.00	0.21	0.00	56.5
11	T1	183	3.0	193	3.0	0.157	0.0	LOS A	0.0	0.0	0.00	0.21	0.00	58.0
Approach		283	1.9	298	1.9	0.157	2.0	NA	0.0	0.0	0.00	0.21	0.00	57.5
All Vehicles		834	1.9	878	1.9	0.344	3.7	NA	1.5	10.4	0.14	0.32	0.17	56.1

MOVEMENT SUMMARY

Site: D [2031 PM Planned Road 2/ Pieter Koen Dev Access (Site Folder: General)]

New Site
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Road 2														
5	T1	329	3.0	346	3.0	0.190	0.4	LOS A	0.2	1.7	0.08	0.02	0.08	59.3
6	R2	13	0.0	14	0.0	0.190	10.0	LOS B	0.2	1.7	0.08	0.02	0.08	57.1
Approach		342	2.9	360	2.9	0.190	0.7	NA	0.2	1.7	0.08	0.02	0.08	59.2
North: Development Access														
7	L2	9	0.0	9	0.0	0.545	14.1	LOS B	2.5	17.4	0.83	1.13	1.29	44.5
9	R2	175	0.0	184	0.0	0.545	21.2	LOS C	2.5	17.4	0.83	1.13	1.29	44.2
Approach		184	0.0	194	0.0	0.545	20.9	LOS C	2.5	17.4	0.83	1.13	1.29	44.2
West: Road 2														
10	L2	252	0.0	265	0.0	0.387	5.7	LOS A	0.0	0.0	0.00	0.21	0.00	56.3
11	T1	443	3.0	466	3.0	0.387	0.1	LOS A	0.0	0.0	0.00	0.21	0.00	57.8
Approach		695	1.9	732	1.9	0.387	2.1	NA	0.0	0.0	0.00	0.21	0.00	57.3
All Vehicles		1221	1.9	1285	1.9	0.545	4.6	NA	2.5	17.4	0.15	0.30	0.22	55.3