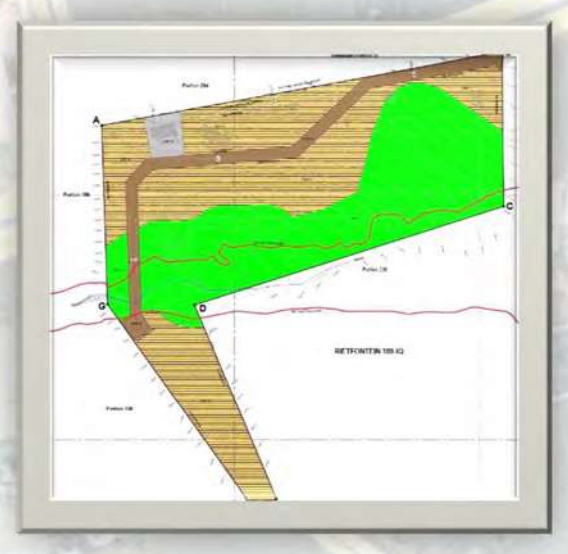
SYNCHRONICITY DEVELOPMENT PLANNERS



TRAFFIC IMPACT STUDY

(MAY 2025)

MIXED USE DEVELOPMENT:

GREENGATE 140

addendum 5

PREPARED BY:

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Hamatino Consulting Engineers	**TITLE OF REPORT:** **TRAFFIC IMPACT STUDY: MIXED USE DEVELOPMENTS, GREENGATE EXTENSION 140**

Report File Name:	P18_25/TIA/Greengate 140
Client:	Synchronicity Development Planners

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DESCRIPTION OF REVISIONS	REVISION	DATE

EXECUTIVE SUMMARY

ABSTRACT

Synchronicity Development Planners submitted on behalf of the client (herein after referred to as the developer) a township application on Portion 268 of the Farm Rietfontein. The town will be known as Greengate Extension 140.

The township will consist of the following land uses.

- Residential 4 units: 306 units @ 80 units / ha;
- Funeral undertaker (office)

The above-mentioned roads sorts under jurisdiction of the Mogale City.

The compilation of a traffic impact study is a requirement in accordance with TMH 16 (South African Traffic Impact and Site Traffic Assessment Manual), hence this study.

RECOMMENDATIONS

Based on the conclusions that have been derived from this study (refer section 11), the following are recommended:

- That the development be supported from a traffic engineering point of view;

- That the Beyers Naude / Drift Boulevard intersection be upgraded by Gautrans / Municipality as follow:
  - Convert the existing intersection control to a signalised intersection as soon as possible by the municipality / Gautrans.
  - The signal shall be a vehicle actuated system.
  - The traffic signals shall be designed by a traffic engineer in accordance with the South African Road Traffic Signs Manual 3rd Edition, Volume 3 Traffic Signal Design
  - The movement along Beyers Naude shall rest in the green phase until a vehicle from Drift Boulevard is detected.
  - The signal shall be synchronised with the proposed signal at Beyers Naude / R114 East.

- That access to the proposed town be provided in accordance with the submitted township application.

- A 10m wide servitude be made available in the township along the northern boundary for the purpose of the future Roads Master Plan Class 4 road. Once the owners of Portions 294 and Remainder of Portion 57 submit a township application, they should also provide a 10m wide reserve along their southern boundary with a resultant 20m wide road reserve available in future for the Road Master Plan road.

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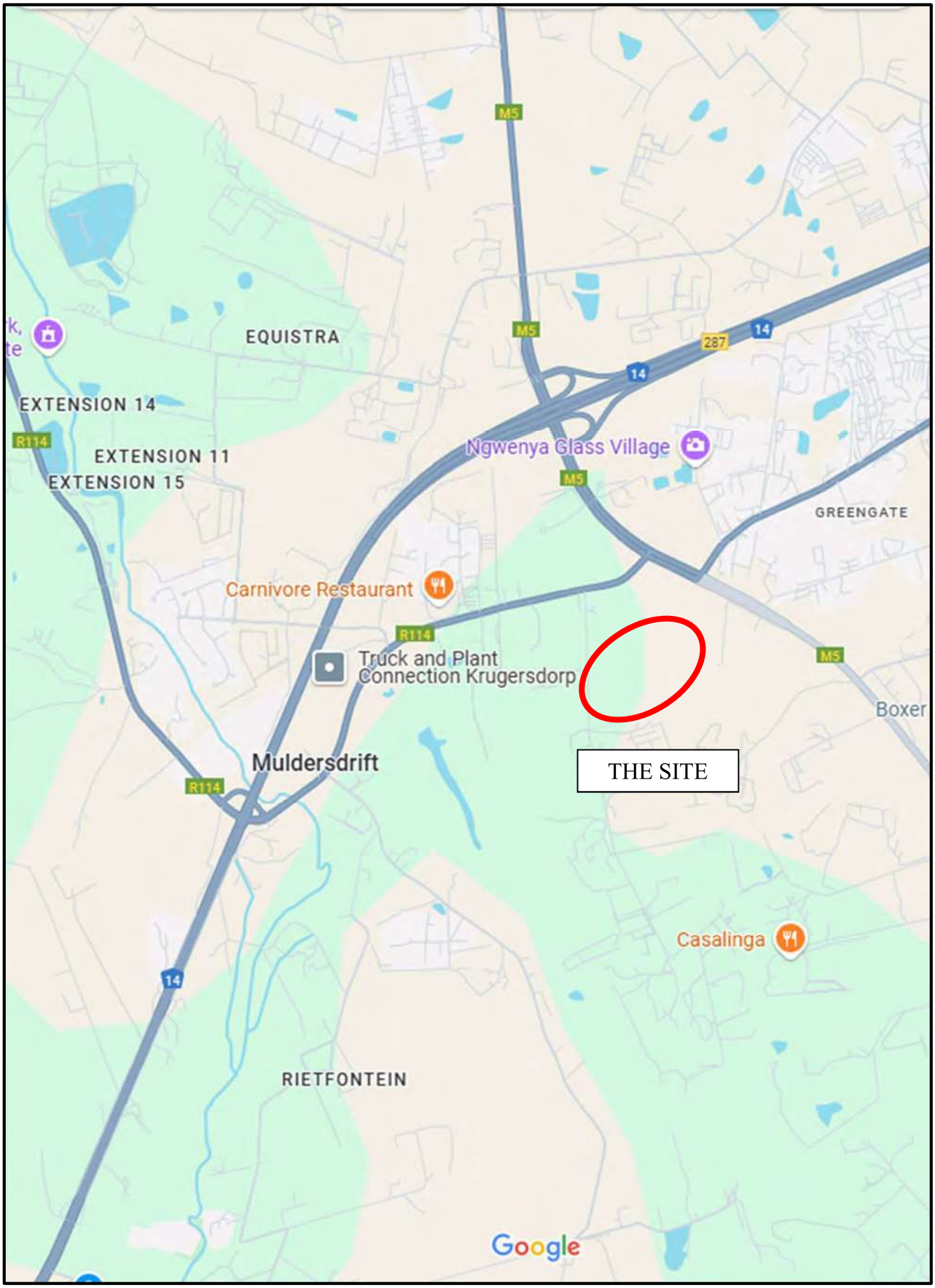


1. INTRODUCTION

1.1 BACKGROUND

Synchronicity Development Planners submitted on behalf of the client (herein after referred to as the developer) a township application on Portion 268 of the Farm Rietfontein. The town will be known as Greengate Extension 140.

The township will consist of the following land uses.

- Residential 4 units: 306 units @ 80 units / ha;
- Funeral undertaker (office)

Access to the development will be provided from Larsens Road via R114 and in accordance with the latest Mogale Roads Master Plan of this area. Larsens Road abuts the development along the eastern boundary.

The above-mentioned roads sorts under jurisdiction of the Mogale City.

The compilation of a traffic impact study is a requirement in accordance with TMH 16 (South African Traffic Impact and Site Traffic Assessment Manual), hence this study.

1.2 PURPOSE OF THIS STUDY

The primarily purpose of this study is to ensure that accessibility to the development is appropriate and will be able to accommodate the anticipated traffic demand in a safe and efficient manner.

1.3 STUDY AREA

The study area is limited to an analysis of the following intersections:

- Beyers Naude / College Road;
- Beyers Naude / R114 (west).
- R114 / St Antonios Rd

1.4 TRAFFIC NOMENCLATURE

Traffic nomenclature used in this report includes the following:

Vph	:	Vehicles per hour
Pcu	:	Passenger car unit
Kph	:	Kilometres per hour

V/C : Volume to capacity ratio

LOS : Level of service

According to the Highway Capacity Manual, the LOS is defined according to the following table:

TABLE 1: LEVEL OF SERVICE

LEVEL-OF-SERVICE CRITERIA FOR PRIORITY INTERSECTIONS & ROUNDABOUTS

Level of Service	Average Control Delay (S/veh)
A	0-10
B	>10-15
C	>15-25
D	>25-35
E	>35-50
F	>50

LOS CRITERIA FOR SIGNALIZED INTERSECTIONS

LOS	Control Delay per Vehicle (s/veh)
A	0-10
B	>10-20
C	>20-35
D	>35-55
E	>55-80
F	>80

Table 1 indicates the levels of services as A to F, of which A is the best and F is the worst level of service.

An explanation of the respective levels of services is as follows:
Level of Service A: Free flowing traffic with a volume to capacity ratio between 0 to 0.1

Level of Service B: Low stable flow with a volume to capacity ratio between 0.1 to 0.3

Level of Service C: High stable flow with a volume to capacity ratio between 0.3 to 0.7

Level of Service D: Approaching unstable flow with a volume to capacity ratio between 0.7 to 1.0

Level of Service E: Unstable flow with a volume to capacity ratio of 1.0

Level of Service F: Forced flow

Intersections or lanes with a Level of Service E or F should be upgraded as soon as possible.

2. METHODOLOGY

The methodology undertaken in conducting this study was as follow:

- Discussion of the project with the Client / planner;
- Sourcing of information (locality, site development plan);
- Conduct weekday morning 06h00 to 09h00am and afternoon 15h00 to 18h00 peak hour traffic counts in order to determine the existing background traffic volumes. Traffic counts has been conducted as follow:
    - 3 leg intersections consist of 6 movements through the intersection;
    - 4 leg intersections consist of 12 movements through the intersection;
    - Volumes are classified into light vehicles (LV) and heavy vehicles (HV)
    - Light vehicles are passenger cars, light delivery vehicles, bakkies, kombis and motorcycles;
    - Heavy vehicles all others.
- Analyse the existing intersection levels of service;
- Determine the number of trips that will be generated by the mixed-use development. Trip generation was calculated by using trip generation rates for typical land uses, with specific reference to the the South African Trip Data Manual (TMH 17);
- Determine the trip distribution, using the existing trip distribution pattern of the area;
- Determine the impact of the proposed development on the adjacent road network during peak traffic hour periods;
- Analyse existing intersection safety and sight distances;
- All of the above to be included in a single volume report, for approval by the local authority.

3. TRAFFIC STATUS QUO

3.1 EXISTING PEAK HOUR TRAFFIC VOLUMES

Traffic surveys were conducted on Tuesday 12 and Wednesday 13 November 2024 from 6:00am to 9:00am and 15:00pm to 18:00pm and in order to determine the typical weekday am & pm peak hour traffic volumes and traffic flow phenomena.

Traffic surveys were conducted during the following times:

- Morning: 06h00 to 09h00 am – Wednesday 13 November 2024;
- Weekday afternoon: 15:00 – 18:00pm- Tuesday 12 November 2024;

Normal traffic flow phenomena were observed during all of counting days.

The following information was deduced from the traffic counts:

TABLE 2: PEAK HOUR TRAFFIC COUNTS

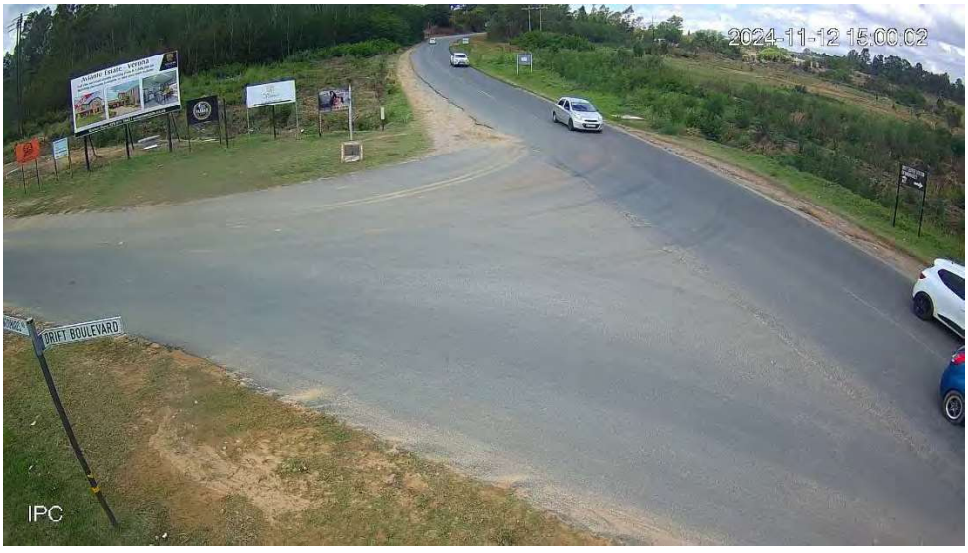
Intersection	2025 Count	Peak hour	Peak hour Factor
AM TRAFFIC			
Beyers Naude / College	1605	07:00 – 08:00	0.92
Beyers Naude / R114 West	2027	07:00 – 08:00	0.90
R114 / St Antonios Rd	788	07:00 – 08:00	0.88
PM TRAFFIC			
Beyers Naude / College	1484	16:30 – 17:30	0.96
Beyers Naude / R114 West	1833	16:30 – 17:30	0.94
R114 / St Antonios Rd	754	16:45 – 17:45	0.89

The observed traffic volumes are shown in Appendix A to this report.

FIGURE 1: BEYERS NAUDE / COLLEGE ROAD INTERSECTION

FIGURE 2: BEYERS NAUDE / R114 WEST

FIGURE 3: R114 / ST ANTONIOS ROAD



4. ANALYSIS: EXISTING SCENARIO 2025

4.1 AM AND PM: PEAK ANALYSIS

The Traffix for Windows as well as Sidra Intersection 5.0 software package was used to determine the existing levels of service, V/C ratios and the total delay experienced at the analysed intersections. Analysis performed by is based on the method dictated in the Highway Capacity Manual.

Note that Beyers Naude Drive is currently under construction. The Beyers Naude Drive / College Road intersection has therefore been analysed in accordance with the final design layout of this intersection.

It is evident from table 3 below that the Beyers Naude / R114 (Drift Blv) is currently (2025) operating at an unacceptable level of service. This intersection needs to be upgraded by Gautrans in order to accommodate the existing 2025 background traffic demand.

TABLE 3: PEAK HOUR EXISTING LEVELS OF SERVICE (2025)

INTER-SECTION	LEVELS OF SERVICE AND DELAY (s)												
	Northbound			Southbound			Eastbound			Westbound			Int
	L	S	R	L	S	R	L	S	R	L	S	R	LOS
WEEKDAY AM													
Beyers Naude / College (S)	A	A	A	A	A	A	n/a	n/a	n/a	D	D	D	A
	1.2	1.2	1.2	1.2	1.2	1.2	n/a	n/a	n/a	46.2	46.2	46.2	1.9
Beyers Naude / R114 West	A	A	A	A	A	B	F	F	F	n/a	n/a	n/a	F
	0	0	0	0	0	11.9	62	62	62	n/a	n/a	n/a	62
R114 / St Antonios	n/a	n/a	n/a	C	C	C	A	A	A	A	A	A	C
	n/a	n/a	n/a	16.6	16.6	16.6	0	0	0	0	0	8.3	16.6
WEEKDAY PM													
Beyers Naude / College (S)	A	A	A	A	A	A	n/a	n/a	n/a	D	D	D	A
	3.1	3.1	3.1	2.9	2.9	2.9	n/a	n/a	n/a	38.6	38.6	38.6	4.5
Beyers Naude / R114 West	A	A	A	A	A	B	D	D	D	n/a	n/a	n/a	D
	0	0	0	0	0	12	33.8	33.8	33.8	n/a	n/a	n/a	33.8
R114 / St Antonios	n/a	n/a	n/a	C	C	C	A	A	A	A	A	A	C
	n/a	n/a	n/a	15.1	15.1	15.1	0	0	0	0	0	7.9	15.1

5. TRIP GENERATION & TRIP DISTRIBUTION

The trip generation and distribution of the proposed Greengate Extension 140 township is discussed and tabled in section 5.1 below.

5.1 DEVELOPMENT TRIP GENERATION, DISTRIBUTION AND ASSIGNMENT TO THE ROAD NETWORK

5.1.1 TRIP GENERATION GREENGATE EXTENSION 140

The typical trip generation for the applicable land uses were taken from the South African Trip Data Manual Version 1.0 (TMH 17) and adjusted in accordance with table 3.2 of the TMH 17 where applicable. The anticipated trip generation of the proposed development is depicted in table 4 below.

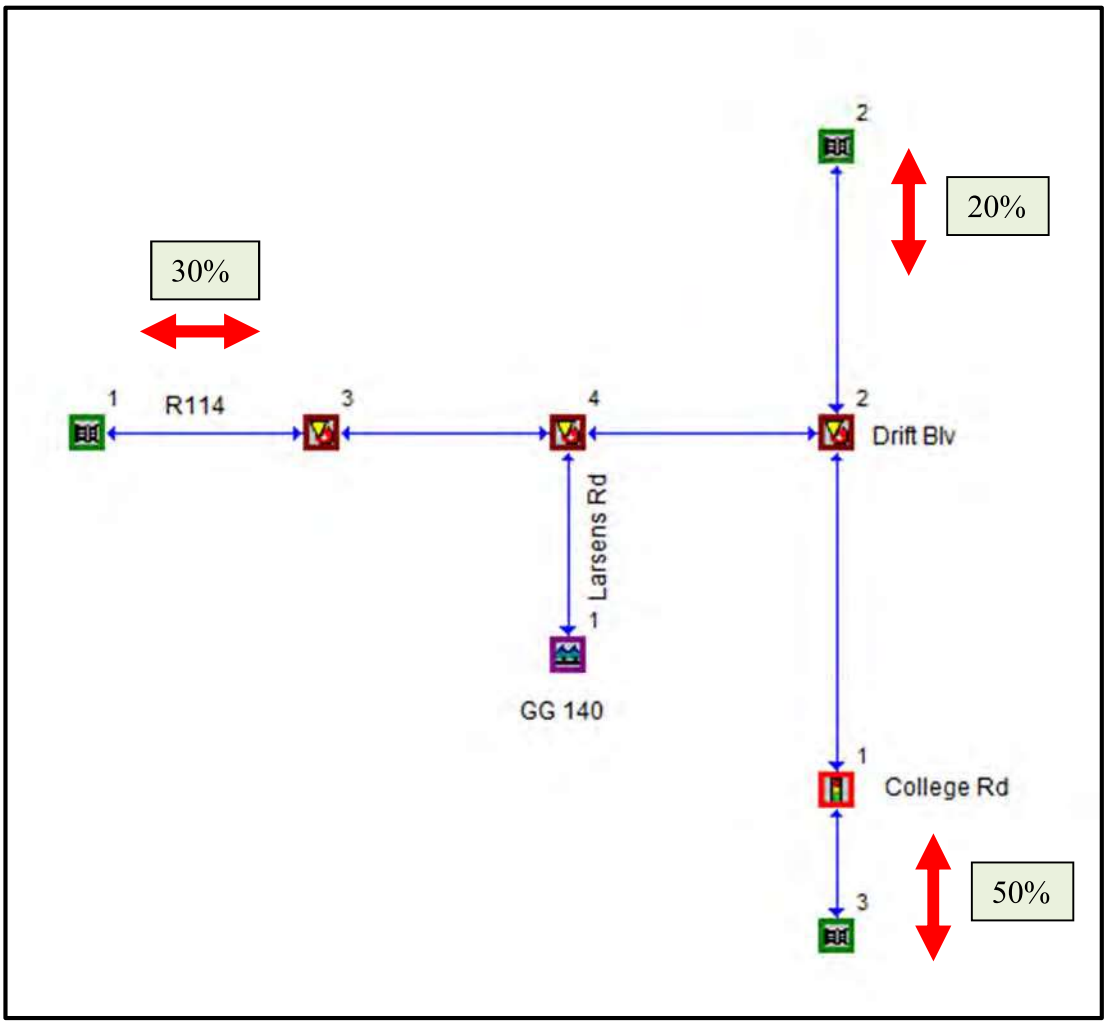
TABLE 4: DEVELOPMENT TRIP GENERATION- GREENGATE 140

Land Use	Unit	Quant	Rate	Trips	Low veh owner red	Mixed use dev	Red. Trips	Directional Split	
								IN	OUT
WEEKDAY AM TRIP GENERATION									
Res 4 (Flats)	Units	310	0.65	202	20%	0%	161	40	121
Funeral (office)	Area	628	2.1	13	0%	0%	13	11	2
TOTAL				**215**			**174**	**52**	**123**
WEEKDAY PM TRIP GENERATION									
Res 4 (Flats)	Units	310	0.65	202	20%	0%	161	113	48
Funeral (office)	Area	628	2.1	13	0%	0%	13	3	11
TOTAL				**215**			**174**	**115**	**59**

5.1.2 TRIP DISTRIBUTION

The trip distribution was deduced from the existing traffic counts. The development trips are expected to distribute in accordance with figure 4 below.

FIGURE 4: TRAFFIX ROAD NETWORK & TRIP DISTRIBUTION



The anticipated trip generation and distribution as per this section was added to the existing background traffic (as per section 3) and analysed as such. The aforesaid analysis is included in sections 6 & 7 of this report.

6. BASE YEAR ANALYSIS WITH DEVELOPMENT (2025)

The trips that are expected to be generated by the proposed development of Greengate 140 (refer paragraph 5.1.1) was assigned to the existing background traffic and distributed in accordance with paragraph 5.1.2 and analysed as such. A peak hour factor of 0.90 has been used in the analysis.

It is evident from table 5 below that the Beyers Naude / R114 (Drift Blv) is currently (2025) operating at an unacceptable level of service. This intersection needs to be upgraded by Gautrans in order to accommodate the existing 2025 background traffic demand.

Intersection upgrading is discussed in the ensuing section of this report.

TABLE 5 : PEAK HOUR LEVELS OF SERVICE WITH DEVELOPMENT (2025)

INTER-SECTION	LEVELS OF SERVICE AND DELAY (s)												
	Northbound			Southbound			Eastbound			Westbound			Int
	L	S	R	L	S	R	L	S	R	L	S	R	LOS
WEEKDAY AM													
Beyers Naude / College (S)	A	A	A	A	A	A	n/a	n/a	n/a	D	D	D	A
	1.2	1.2	1.2	1.2	1.2	1.2	n/a	n/a	n/a	46.2	46.2	46.2	1.9
Beyers Naude / R114 West	A	A	A	A	A	B	F	F	F	n/a	n/a	n/a	F
	0	0	0	0	0	12.2	151	151	151	n/a	n/a	n/a	151
R114 / St Antonios	n/a	n/a	n/a	C	C	C	A	A	A	A	A	A	C
	n/a	n/a	n/a	17.8	17.8	17.8	0	0	0	0	0	8.3	17.8
WEEKDAY PM													
Beyers Naude / College (S)	A	A	A	A	A	A	n/a	n/a	n/a	D	D	D	A
	3.1	3.1	3.1	2.9	2.9	2.9	n/a	n/a	n/a	38.6	38.6	38.6	4.5
Beyers Naude / R114 West	A	A	A	A	A	B	F	F	F	n/a	n/a	n/a	F
	0	0	0	0	0	12.9	54.9	54.9	54.9	n/a	n/a	n/a	54.9
R114 / St Antonios	n/a	n/a	n/a	C	C	C	A	A	A	A	A	A	C
	n/a	n/a	n/a	16.1	16.1	16.1	0	0	0	0	0	8.1	16.1

7. INTERSECTION UPGRADING (2025 - 2030)

It was found in the preceding section 6 that the following intersections need to be upgraded to be able to accommodate the existing background traffic demand.

- Beyers Naude / R114 (Drift Blv);

Note further that the upgrading as proposed below has been designed in order to be sustainable for a period of at least 5 years. The upgrading has therefore been designed to accommodate the horizon year 2030 and will therefore be able background traffic growth (at a rate of 3.5% per annum compounded) with latent rights included.

7.1 BEYERS NAUDE / R114 (DRIFT BOULEVARD)

This intersection is currently a priority-controlled intersection with priority of movement along Beyers Naude Drive.

This intersection is currently operating at an un-acceptable level of service F during the am peak period, prior to the addition of development trips.

The intersection needs therefore to be upgraded as soon as possible by the Gautrans / Municipality in order to be able to accommodate the existing 2025 background traffic demand.

7.1.1 Upgrading prior to development completion (immediate upgrading)

It is advised that this intersection be upgraded as follow:

- Convert the existing intersection control to a signalised intersection as soon as possible by the municipality / Gautrans.
- The signal shall be a vehicle actuated system.
- The traffic signals shall be designed by a traffic engineer in accordance with the South African Road Traffic Signs Manual 3rd Edition, Volume 3 Traffic Signal Design
- The movement along Beyers Naude shall rest in the green phase until a vehicle from Drift Boulevard is detected.
- The signal shall be synchronised with the proposed signal at Beyers Naude / R114 East.

7.1.2 Upgrading by horizon year 2030

No Additional upgrading other than the above is required in order to accommodate the horizon year 2030. Note that the intersection will be relocated in the distance future in accordance with the Mogale

Roads Master Plan. Drift Boulevard and R114 East of Beyers Naude will be re-aligned to form one intersection with Beyers Naude Drive.

8. HORIZON YEAR ANALYSIS (2030)

A five-year horizon analysis has been conducted in order to determine the longer-term sustainability of the road's infrastructure. A 3% traffic background growth has been assumed in order to allow for background traffic growth as well as other latent rights that may impact on the study area.

8.1 LATENT RIGHTS

The following development latent rights has been included in this future year analysis:

- Greengate Extension 109;
- Greengate Extension 110;
- Greengate Extension 114.

Apart from the above, a further 3% background traffic growth has been added to the road network for the purposes of the horizon year analysis, which is considered conservative.

The trip generation of the above-mentioned developments are tabled in tables 6-8 below for ease of reference.

TABLE 6 : DEVELOPMENT TRIP GENERATION- GREENGATE 109

Land Use	Unit	Quant	FAR / Density	Devel. Area	Rate /100m²	Trips	Mixed Use/veh ownership	Red Trips	DIRECTIONAL SPLIT	
									IN	OUT
WEEKDAY AM TRIP GENERATION										
Special (Res / Comm	Area	4618	0.5	2309	2.8/100	64.652	0%	65	42.02	22.63
Res 1	No	225	n/a	n/a	1	225	0%	225	56.25	168.75
Res 4	Units	8713	80/ha	69.704	0.85	59.248	20%	47	11.85	35.55
TOTAL								**337**	**110**	**227**
WEEKDAY PM TRIP GENERATION										
Special (Res / Comm	Area	4618	0.50	2309	5.5/100	127.00	0%	127	57.15	69.85
Res 1	No	225	n/a	n/a	1.00	225	0%	225	157.50	67.50
Res 4	Units	8713	80/ha	70	0.85	59.25	20%	47	33.18	14.22
TOTAL								**399**	**248**	**152**

TABLE 7 : DEVELOPMENT TRIP GENERATION- GREENGATE 110

Land Use	Unit	Quant	FAR / Density	Devel. Area	Rate /100m²	Trips	Mixed Use/veh ownership	Red Trips	DIRECTIONAL SPLIT	
									IN	OUT
WEEKDAY AM TRIP GENERATION										
Ind. 3	Area	31547	0.4	12619	0.8/100	100.95	0%	101	70.67	30.29
TOTAL								**101**	**71**	**30**
WEEKDAY PM TRIP GENERATION										
Ind. 3	Area	31547	0.40	12619	0.8/100	100.95	0%	101	25.24	75.71
TOTAL								**101**	**25**	**76**

TABLE 8 : DEVELOPMENT TRIP GENERATION- GREENGATE 114

Land Use	Unit	Quant	FAR / Density	Devel. Area	Rate /100 m²	Trips	Mixed Use/veh ownership	Red Trips	DIRECTIONAL SPLIT	
									IN	OUT
WEEKDAY AM TRIP GENERATION										
Bus 2 -Ret	GLA	12449	1	12449	1.15	143	45%	79	19.68	59.05
Res 4	Units	1.8176	120/ha	218	0.85	185	45%	102	25.49	76.48
TOTAL								**181**	**45**	**136**
WEEKDAY PM TRIP GENERATION										
Bus 2 -Ret	GLA	12449	1.00	12449	7.88	981	45%	539	269.66	269.66
Res 4	Units	1.8176	120/ha	218	0.85	185	45%	102	71.38	30.59
TOTAL								**641**	**341**	**300**
SATURDAY TRIP GENERATION										
Bus 2 -Ret	GLA	12449	1.00	12449	10.43	1298	45%	714	356.90	356.90
Res 4	Units	1.8176	120/ha	218	0.45	98	45%	54	37.79	16.19
TOTAL								**768**	**395**	**373**

8.2 HORIZON YEAR (2030) INTERSECTION ANALYSIS

It is evident from table 9 below that all of the analysed intersections will be operating at an acceptable level of service by the horizon year 2030, provided that the intersections be upgraded in accordance with the previous section 7.

It is advised accordingly that the above intersections be upgraded by Gautrans / the developer from the services contributions payable to the municipality.

Intersection upgrading is discussed in the ensuing section 8 of this report.

TABLE 9: HORIZON YEAR 2030 LEVELS OF SERVICE

INTER-SECTION	LEVELS OF SERVICE AND DELAY (s)												
	Northbound			Southbound			Eastbound			Westbound			Int
	L	S	R	L	S	R	L	S	R	L	S	R	LOS
WEEKDAY AM													
Beyers Naude / College (S)	B	B	B	A	B	B	n/a	n/a	n/a	C	C	C	B
	12.7	12.7	11.6	9.3	13	13	n/a	n/a	n/a	26.6	26.6	26.6	14.2
Beyers Naude / R114 West (s)	B	B	B	A	B	B	B	A	C	n/a	n/a	n/a	B
	14.2	15.9	0	0	15.4	17.6	14.9	0	24.3	n/a	n/a	n/a	16.7
R114 / St Antonios	n/a	n/a	n/a	C	C	C	A	A	A	A	A	A	C
	n/a	n/a	n/a	19.9	19.9	19.9	0	0	0	0	0	8.4	19.9
WEEKDAY PM													
Beyers Naude / College (S)	B	B	B	A	B	A	n/a	n/a	n/a	C	C	C	B
	10.6	10.6	12.2	8.2	10	0	n/a	n/a	n/a	28.5	28.5	28.5	12.1
Beyers Naude / R114 West (s)	B	B	B	A	B	B	C	A	C	n/a	n/a	n/a	B
	12.8	12	0	0	11.9	13.6	23	0	27.1	n/a	n/a	n/a	13.8
R114 / St Antonios	n/a	n/a	n/a	C	C	C	A	A	A	A	A	A	C
	n/a	n/a	n/a	17.5	17.5	17.5	0	0	0	0	0	8.1	17.5

9. ACCESS INTERSECTIONS

9.1 ACCESS TO DEVELOPMENT

Access to the applicable development will be provided from Larsens Road and in accordance with the latest Roads Master Plan of the Muldersdrift area.

Larsens road abuts the development along the eastern boundary.

The above-mentioned access intersections are depicted in figure 5 below for discussion purposes.

FIGURE 5 : DEVELOPMENT ACCESS INTERSECTIONS

Access will be provided at the locality of the future Class 4 Road locality for the interim period until such time as and when the Future Class 4 road has been constructed.

A 10m wide area are made available in the township along the northern boundary for the purpose of the above mentioned future Class 4 road.

Once the owners of Portions 294 and Remainder of Portion 57 submit a township application, they should also provide a 10m wide reserve along their southern boundary with a resultant 20m wide road reserve available in future for the Road Master Plan road.

9.2 ACCESS INTERSECTION CAPACITY ANALYSIS

Larsens Road is currently subject to low traffic volumes with an insignificant movement and total intersection delay. The access intersection will have sufficient capacity to accommodate the development.

10. PUBLIC TRANSPORTATION

Public transport is this area is mainly provided by means of mini-bus taxis and private transportation companies.

The development access gate is located approximately 750m from Beyers Naude Drive.
It is advised that provision be made for a taxi drop and turn facility at the development access gate.
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11. CONCLUSIONS & RECOMMENDATIONS

11.1 CONCLUSIONS

It has been found that:

- The Beyers Naude / R114 (Drift Blv) is currently (2025) operating at an unacceptable level of service. This intersection needs to be upgraded by Gautrans in order to accommodate the existing 2025 background traffic demand.

- The development trip generation is expected to be as follow:
  - AM: 174 (52 in; 123 out);
  - PM: 174 (115 in; 59 out).

- All of the analysed intersections, except for the above mentioned Beyers Naude / R114 (Drift Blv) will still be operating at acceptable levels of service with the addition of the development traffic demand.

- Note that the intersection of Beyers Naude / Drift Boulevard will be relocated in the distance future in accordance with the Mogale Roads Master Plan. Drift Boulevard and R114 East of Beyers Naude will be re-aligned to form one intersection with Beyers Naude Drive.

- The following development latent rights has been included in this future year analysis:
  - Greengate Extension 109;
  - Greengate Extension 110;
  - Greengate Extension 114.

- The signalisation of the above intersections by Gautrans / Municipality will yield sufficient capacity to accommodate the future year 2030 traffic demand.

- Access to the applicable development will be provided from Larsens Road and in accordance with the latest Roads Master Plan of the Muldersdrift area.

- The development access gate is located approximately 750m from Beyers Naude Drive. It is advised that provision be made for a taxi drop and turn facility at the development access gate.

11.2 RECOMMENDATIONS

Based on the conclusions that have been derived from this study, the following are recommended:

- That the development be supported from a traffic engineering point of view;

- That the Beyers Naude / Drift Boulevard intersection be upgraded by Gautrans / Municipality as follow:
  - Convert the existing intersection control to a signalised intersection as soon as possible by the municipality / Gautrans.
  - The signal shall be a vehicle actuated system.
  - The traffic signals shall be designed by a traffic engineer in accordance with the South African Road Traffic Signs Manual 3rd Edition, Volume 3 Traffic Signal Design
  - The movement along Beyers Naude shall rest in the green phase until a vehicle from Drift Boulevard is detected.
  - The signal shall be synchronised with the proposed signal at Beyers Naude / R114 East.

- That access to the proposed town be provided in accordance with the submitted township application;

- A 10m wide servitude be made available in the township along the northern boundary for the purpose of the future Roads Master Plan Class 4 road. Once the owners of Portions 294 and Remainder of Portion 57 submit a township application, they should also provide a 10m wide reserve along their southern boundary with a resultant 20m wide road reserve available in future for the Road Master Plan road.

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4. Dowling Associates Inc, 1997, **Traffic for Windows Version 8.0**

5. National Department of Transport, 1995, **Manual for Traffic Impact Studies,** Research Report PR 93/635, BKS (Pty) Ltd, Pretoria.

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ANNEXURE A: TRAFFIC VOLUMES

ANNEXURE B: ANALYIS