

# Traffic Impact & Access Study

Tigane Ext 7 & 8

*November 2019*



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# 1 PURPOSE AND OVERVIEW

## 1.1 Introduction

Route<sup>2</sup> – Transport Strategies have been appointed by Maxim Planning Solutions to undertake a Traffic Impact & Access Study for the proposed **Tigane Ext 7 & 8 Townships on a Portion of the Remaining Portion of the Farm Uraan 295 IP & a Portion of the Remaining Portion of the Farm Vogelstruisfontein 273 IP.**

The Traffic Impact Study is submitted in support of the Township Establishment on the sites to the relevant municipal-, transport- and planning authorities.

The application is mainly for Residential uses but also includes very small Business Erven, a School, a Cemetery and Community Facilities.



*Part of the Site*

## **1.2 Objectives of the Traffic Impact Study**

The objectives of the study are as follow:

- To determine the impact of the additional traffic generated by the proposed development on the existing road network;
- To propose measures that could be put in place to mitigate the impact that the proposed development will have on the existing traffic and road conditions;
- To determine a suitable access regime for the proposed development; and
- To provide sufficient information for the approval of the proposed development.

## 2 SCOPE OF THE REPORT

The purpose of this report is to identify the potential traffic impact of the proposed Township Establishment. The study area, development trip generation, trip distribution, capacity analysis and site access requirements are assessed in the rest of this report.

### 2.1 Study Area & Application

The extent of the study area is driven by an estimation of the traffic generated by the proposed development of Tigane Ext 7 & 8 and the intersections likely to be affected by the additional traffic.

This study therefore assesses the worst-case scenario which will be the full extent of the Development. All other land uses and subservient uses will have internal traffic generation.

The study includes the following external intersections which is in line with the 1,5km study area as defined in the COTO Manual TMH16 and the study area for Tigane Ext 7 & 8 (see **Annexure C**):

1. *R503 and Road to Geduld – priority controlled.*
2. *Road to Geduld and Access Road 1 – proposed priority controlled intersection.*
3. *Road to Geduld and Access Road 2 – proposed priority controlled intersection.*

### 2.2 Peak Hours Analysed

The peak morning and afternoon traffic counts were conducted on Wednesday 02 October 2019 at the intersection of R 503 and the Road to Geduld.

The existing weekday AM (07:00 – 08:00) and PM (17:00 – 18:00) peak hours' traffic volumes are summarised in **Figures 2 & 3**.

## 2.3 Assessment Scenarios

To determine the likely impact of the additional traffic on the external road network, the following scenarios were analysed:

- **Scenario 1: Existing 2019** peak hour flows.
- **Scenario 2: Base 2019** peak hour flows with the Development Traffic; and.
- **Scenario 3: Future 2024** peak hour flows with Development Traffic.



### 3 SURROUNDING ROAD NETWORK

#### **R503:**

The R503 is a Provincial Class 2 road.



#### **Road to Geduld**

The road to Geduld is also a Provincial Road and surfaced up to just past the proposed Access Road 1.



## 4 PROPOSED DEVELOPMENT

The ultimate plan is to have mostly Residential use on the site with subservient uses. The Township layout is attached in **Annexure B**.

The following development controls are applied for as per **Table 1** below.

**Table 1: Development Controls**

Land Use	Area GLA
Residential 1	3 052 stands
Business 1	3 689m <sup>2</sup> (3 stands)
Primary School	2.87 hectares
Places of Worship	6 435m <sup>2</sup> (4 stands)
Pre-school (crèches)	5 644m <sup>2</sup> (4 stands)
Cemetery	11.08 hectares
Subservient Uses	Community and Municipal

## 5 TRAFFIC FLOWS & TRIP GENERATION

### 5.1 Trip Generation (Private Trips)

The COTO *Trip Generation Manual (September 2012 TMH 17 Volume 1)* recommends a peak hour trip rate of 1,0 trips per unit for Residential 1 which is the primary land use although the following trip rates as per the EMM for low cost housing and what SANRAL allows countrywide was used. A reduction of 40% for low vehicle ownership was also applied.

- Public primary school: 0,072 and 0,026 trip / student during the AM and PM peak period respectively.
- Public secondary school: 0,034 and 0,021 trip / student during the AM and PM peak period respectively.
- Combined primary and secondary school: 0,068 and 0.023 trip / student for the AM and PM peak periods respectively.
- Shopping centre: 0,451 and 2,558 trips /100m<sup>2</sup> for AM and PM peak periods respectively. (these are base rates for formula as per COTO manual)
- Residential 1: 0,306 trips /unit for both AM and PM peak periods.
- Residential 4: 0, 251 trips / units for both AM and PM peak periods.

The predicted peak hour traffic to and from the site is summarised in **Tables 2 & 3** below.

**Table 2: AM Peak Hour Trip Generation**

Land use	Extend	Units	Trip Rate	Split		Trips		External Total in & out
				In	Out	In	Out	
Residential 1	3 052	Stands	0.31	25%	75%	142	426	568

**Table 3: PM Peak Hour Trip Generation**

Land use	Extend	Units	Trip Rate	Split		Trips		External Total in & out
				In	Out	In	Out	
Residential 1	3 052	Stands	0.31	70%	30%	398	170	568

## 5.2 Expected Trip Distribution

The trip distribution is determined from the existing traffic volumes to and from the area, other existing or latent rights developments and potential new developments in the area. There are no other Latent Rights developments in the area.

The following distribution was used as summarised in **Figures 4 & 5** determined from the existing peak hour traffic volumes:

- 100% from the south along the R503 from Hartbeesfontein.

**Figures 8 & 9** illustrates the **Base 2019** traffic including the development traffic, while **Figures 10 & 11** shows the potential **Future 2024** traffic including the development. **An expected 3% growth in background traffic was applied per annum.**

## **6 TRAFFIC IMPACT & CAPACITY ANALYSES**

### **6.1 Assessment Criteria**

The affected intersections have been analysed for the full development potential using aaSIDRA traffic analysis software. SIDRA is a computer software program that provides several performance measures including v/c ratios, delays, level of service (LOS), etc.

When elements of a road network such as intersections are analyzed, their operating conditions are described in terms of LOS. The six letters from A to F are used to indicate different LOS. LOS A indicates very light traffic with correspondingly low delays. LOS E reflects capacity conditions, with high delays and unstable flow. LOS F reflects conditions where traffic demand exceeds capacity and traffic experiences congestion and delays. Generally, LOS A to D is considered acceptable in accordance with international standards. LOS E and F on the other hand are deemed unacceptable.

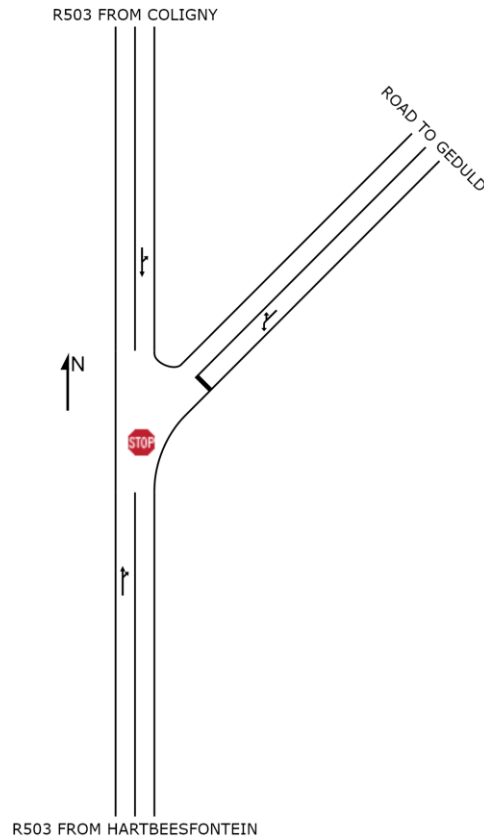
A further measure of the operating conditions prevailing at any one point in a road network is the volume to capacity ratio (v/c). As the name implies it is the traffic demand volume divided by the available capacity of the roadway element. Generally, ratios of up to approximately 0.9 are internationally deemed acceptable.

Results of the aaSIDRA capacity analyses at the intersections are discussed in the following sub sections, with details of the outputs enclosed in **Annexure A**.

### **6.2 Future 2024 Traffic**

The 2019 traffic volumes were grown with a compound of 3% per annum to calculate the future traffic demand.

### 6.3 R503 and Road to Geduld (Intersection No: 1)



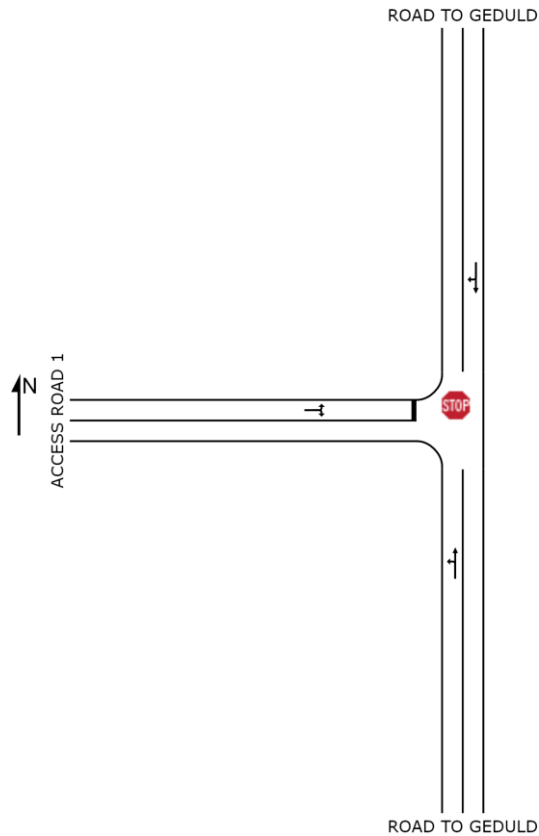
#### Existing Layout

#### Results of Analysis:

Scenario	AM Peak Hour					PM Peak Hour				
	NB	WB	SB	EB	TOTAL	NB	WB	SB	EB	TOTAL
Existing 2019	N/A {0.13}	A {0.02}	N/A {0.11}		N/A {0.13}	N/A {0.14}	A {0.09}	N/A {0.11}		N/A {0.14}
Base 2019 + Development Traffic	N/A {0.23}	A {0.39}	N/A {0.11}		N/A {0.39}	N/A {0.41}	A {0.17}	N/A {0.09}		N/A {0.41}
Future 2024	N/A {0.24}	A {0.41}	N/A {0.12}		N/A {0.41}	N/A {0.44}	A {0.18}	N/A {0.11}		N/A {0.44}
<b>Legend</b>										
A					Level of Service					
{0.95}					Volume / Capacity					

For all of the scenarios the intersection operates at acceptable LOS with ample spare capacity. No upgrades will therefore be required.

## 6.4 Road to Geduld and Access Road 1 (Intersection No: 2)



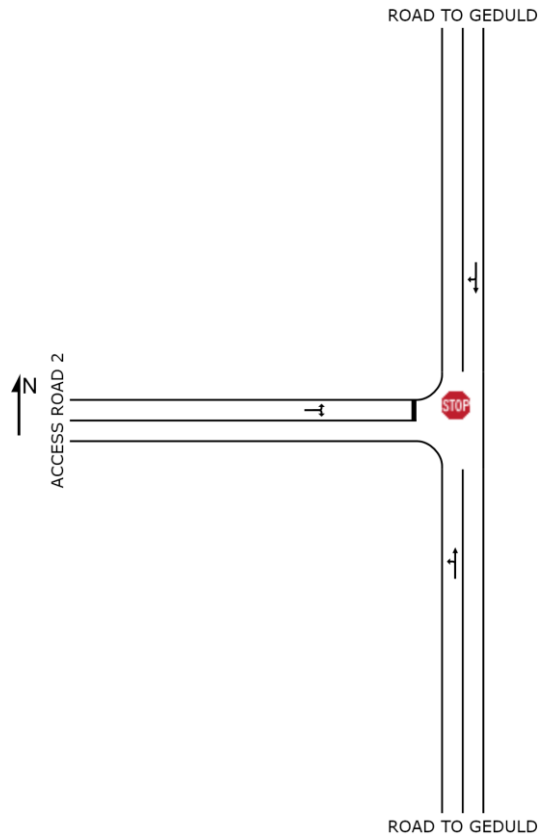
### Proposed Layout

#### Results of Analysis:

Scenario	AM Peak Hour					PM Peak Hour				
	NB	WB	SB	EB	TOTAL	NB	WB	SB	EB	TOTAL
Existing 2019										
Base 2019 + Development Traffic	N/A {0.08}		N/A {0.12}	A {0.27}	N/A {0.27}	N/A {0.22}		N/A {0.05}	A {0.12}	N/A {0.22}
Future 2024	N/A {0.08}		N/A {0.13}	A {0.29}	N/A {0.29}	N/A {0.24}		N/A {0.05}	B {0.13}	N/A {0.24}
Legend										
A					Level of Service					
{0.95}					Volume / Capacity					

For all of the scenarios the proposed intersection will operate at acceptable LOS with ample spare capacity.

## 6.5 Road to Geduld and Access Road 2 (Intersection No: 3)



### Proposed Layout

#### Results of Analysis:

Scenario	AM Peak Hour					PM Peak Hour				
	NB	WB	SB	EB	TOTAL	NB	WB	SB	EB	TOTAL
Existing 2019										
Base 2019 + Development Traffic	N/A {0.04}		N/A {0.01}	A {0.20}	N/A {0.20}	N/A {0.11}		N/A {0.01}	A {0.09}	N/A {0.11}
Future 2024	N/A {0.04}		N/A {0.01}	A {0.20}	N/A {0.20}	N/A {0.11}		N/A {0.01}	A {0.09}	N/A {0.11}
Legend										
A					Level of Service					
{0.95}					Volume / Capacity					

For all of the scenarios the proposed intersection will operate at acceptable LOS with ample spare capacity.



## **7 INTERNAL ROADS & ACCESS TO PROPERTIES**

### **7.1 Internal Roads**

The following road hierarchy is proposed:

- **Class 5a:** 16m wide road reserves.
- **Class 5b:** 13m wide road reserves.

### **7.2 Access to properties**

The following should apply:

- **Class 5a:** Access to Residential 1, Business 1, Primary School, Cemetery & Community Facilities.
- **Class 5b:** Access to Residential 1, Crèches and Places of Worship.

### **7.3 School Site Proposals**

The following should apply:

- All parking and drop-off should occur on the site.
- Traffic calming along school site roads should be provided.
- Separate pedestrian gates at the school.
- Pedestrian sidewalks should be provided along the school frontages.

## 8 PUBLIC TRANSPORT & NON-MOTORISED TRANSPORT

### 8.1 Background

In terms of the “National Land Transport Act” (NLTA) (Act No.5 of 2009), it is required that an assessment of public transport be included in traffic impact studies.

### 8.2 Estimated Public Transport Trips

The following modal splits determined from other studies and Statistics South Africa was assumed:

- Private Vehicles 35%
- Minibus-Taxis 50%
- Busses 5%
- Cycling & Walking 10%

It should be noted that the trip generation as used in the analysis should still be seen as the worst case scenario.

The expected number of vehicles per public transport and non-motorised transport modes to and from the development during the peak hours has been calculated and is presented in **Table 4** below:

**Table 6: Modal Split AM & PM Peak Hour**

<b>Mode AM Peak</b>	<b>Modal Split</b>	<b>Occupancy</b>	<b>Number of Vehicle Trips</b>
Minibus-taxi	50%	13	37
Bus	5%	48	1
Cycling & Walking	10%	N/A	N/A
<b>Mode PM Peak</b>	<b>Modal Split</b>	<b>Occupancy</b>	<b>Number of Vehicle Trips</b>
Minibus-taxi	50%	13	37
Bus	5%	48	1
Cycling & Walking	10%	N/A	N/A

## 9 CONCLUSION & RECOMMENDATIONS

The Traffic Impact & Access Study investigated the expected transport related impacts of the proposed Tigane Ext 7 & 8 Townships. The Township Application is for the departure from “Agricultural” use to various land uses of which Residential is mainly the use, but also includes subservient uses. This study investigates the worst case potential impact of the Townships on the external road network.

Based on our site observations, the existing and base traffic volumes shown in the figures, as well as the capacity analysis, it is concluded that the proposed development will have little impact on the external road network.

It is proposed and can be concluded:

- ***No external road and/or intersection upgrades will be required.***
- ***It is proposed that the Road to Geduld is surfaced from where it ends up in gravel up to the proposed Access Road 2.***
- ***It is recommended that provision is made for sidewalks along the Primary School frontages.***



## 10 REFERENCES

- COTO, September 2012, TMH 17 Volume 1, “South African Trip Data Manual”.
- Institute of Transportation Engineers. “Trip Generation, 8<sup>th</sup> Edition, 2008”.
- Transportation Research Board. “Highway Capacity Manual, 2010”.
- COTO, December 2011, TMH 26, “South African Road Classification and Access Management Manual”.
- National Land Transport Act (NLTA) (Act No. 5 of 2009).


# Figures



**SITE**


**PROPOSED TOWNSHIPS:  
TIGANE EXTENSION 7 & 8**

**Proposed Tigane Extension 7  
1497 Stands**

**LEGEND**  
 Tigane Ext 7&7

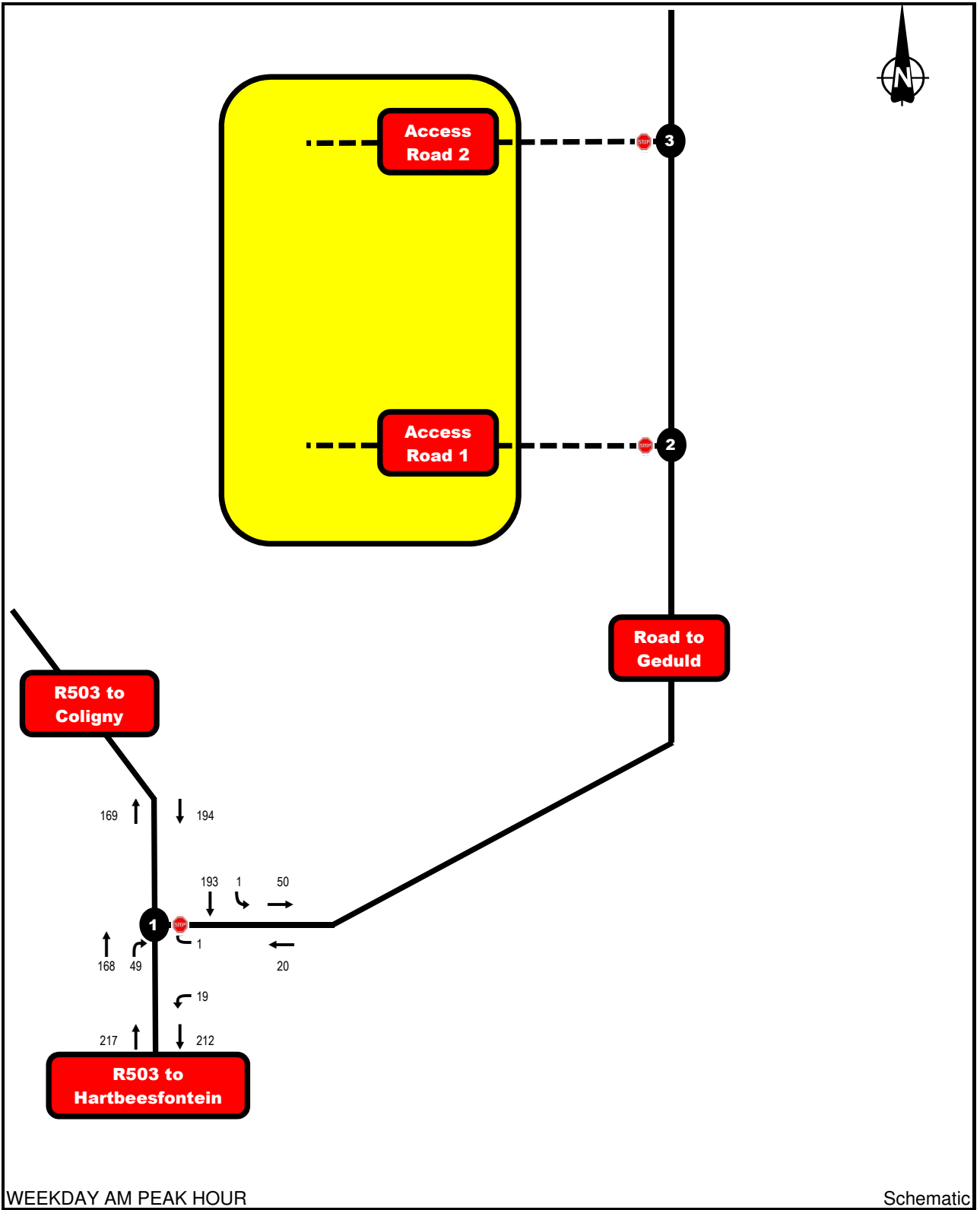
**WARREN G PAYNE**  
 ARCHITECTURAL DRAUGHTSMAN

Tigane Ext 7&8	
Locality Plan	
Revision:	
Paper Size A3	TIG 002

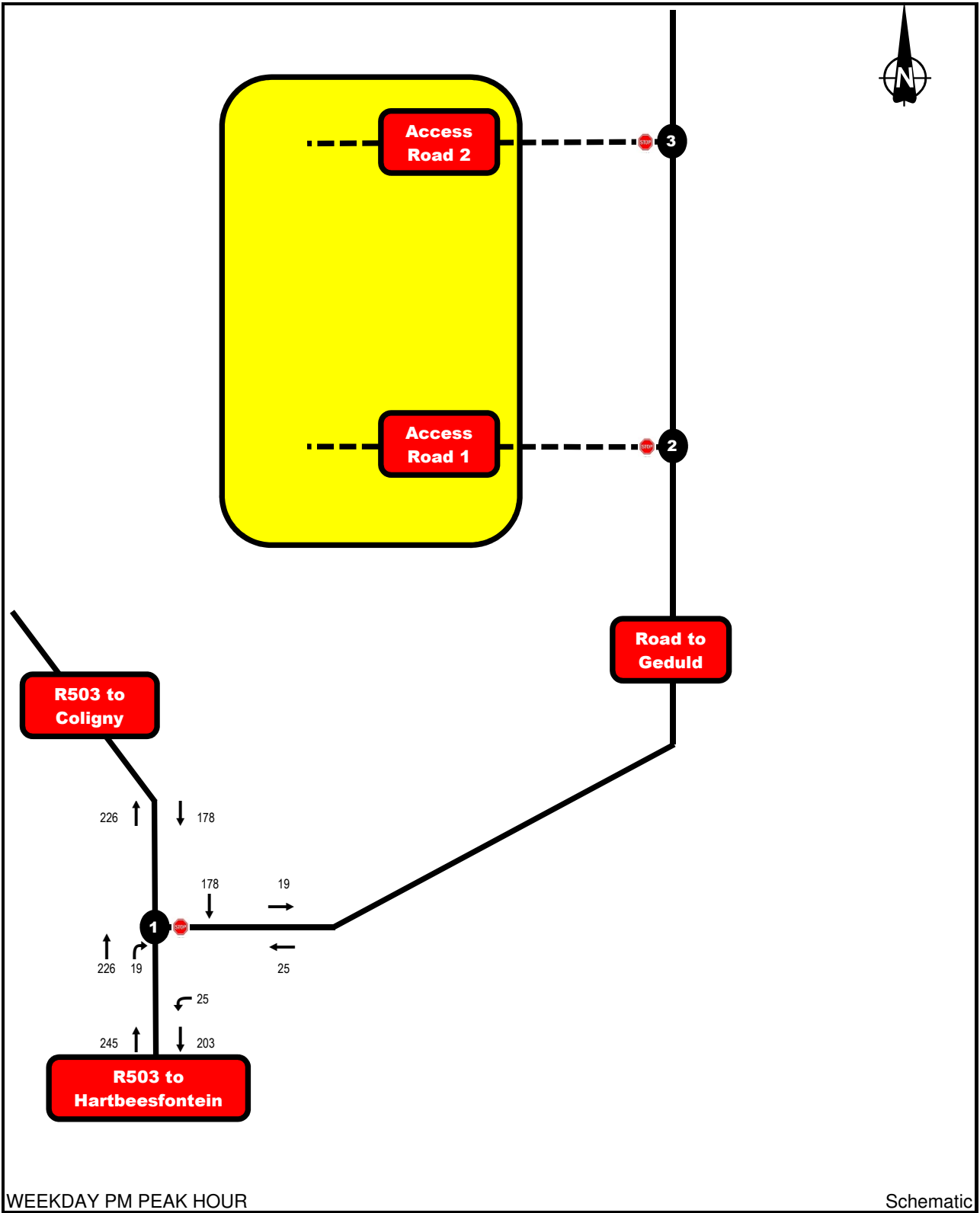
				Contant Person. Warren G Payne
Scale	Date	Drawn	Verified	E-mail: warren.payne1@gmail.com
As Indicated	2019-11-30	Warren Payne		
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**1** **Locality Plan**  
 Scale: 1:12 000

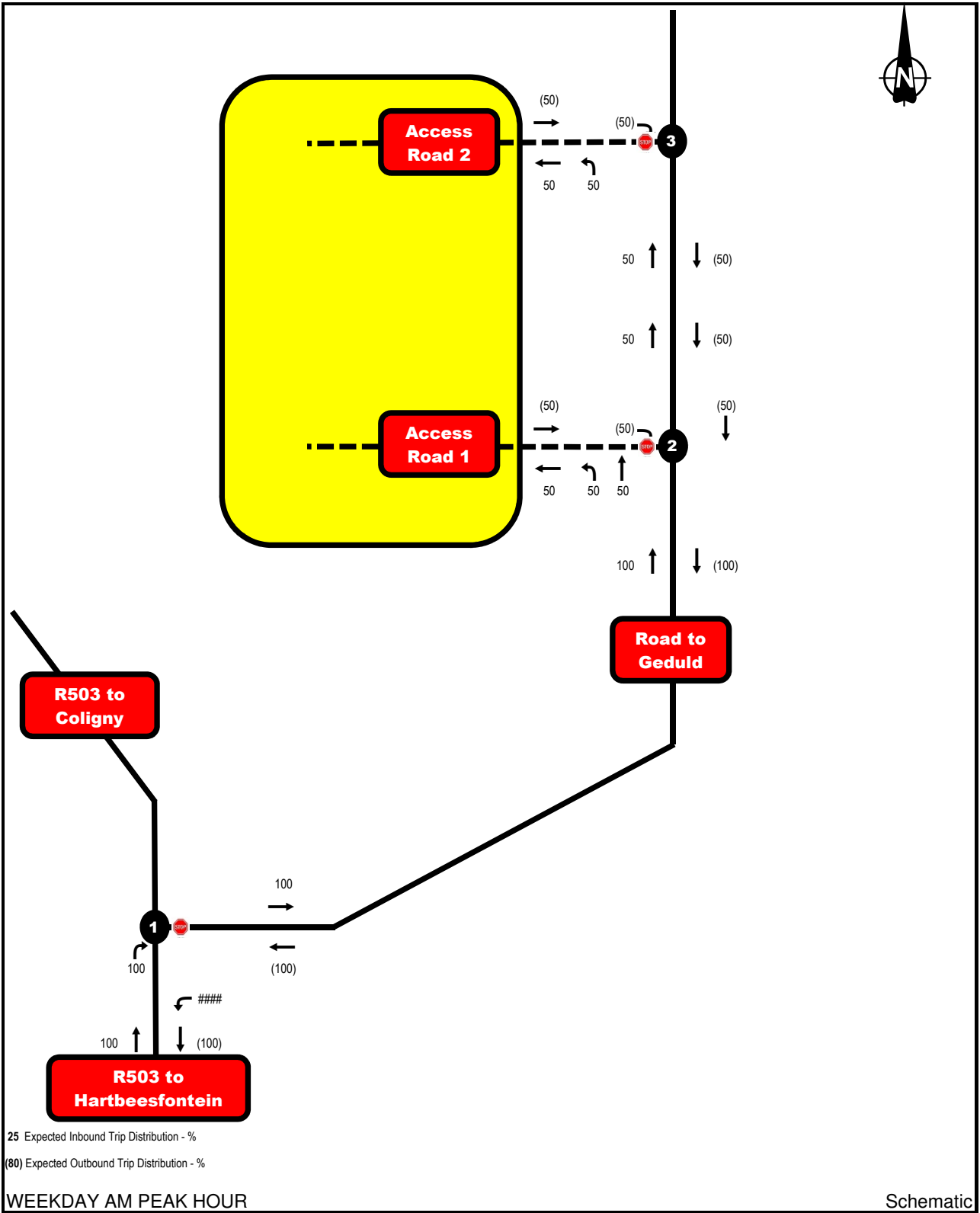


	Tigane Ext 7 & 8	Job Ref No: <b>TRAF 1529</b>
	<b>Present Traffic Demand (2019)</b>	Fig: <b>2</b>

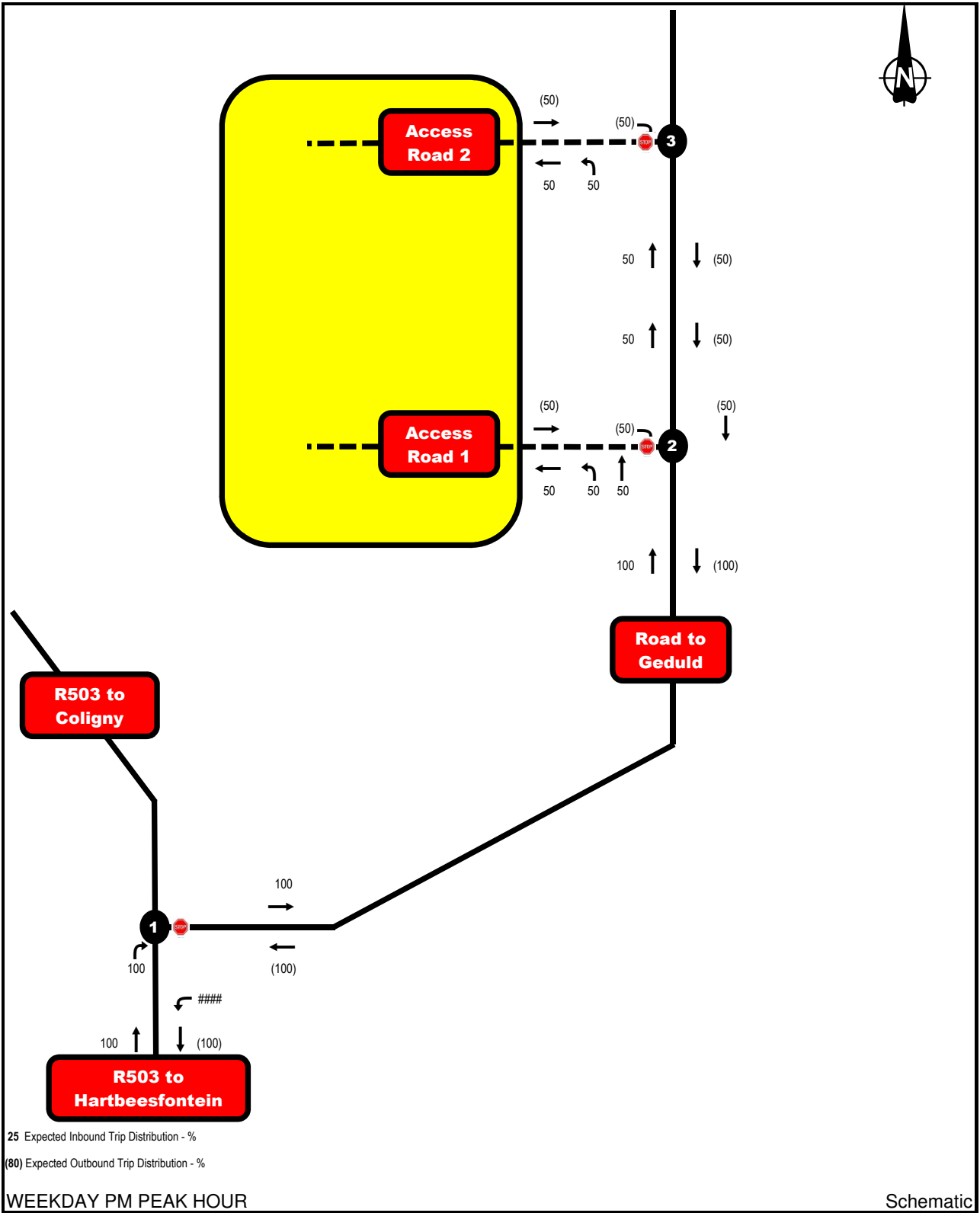


	Tigane Ext 7 & 8	Job Ref No: <b>TRAF 1529</b>
	<b>Present Traffic Demand (2019)</b>	Fig: <b>3</b>

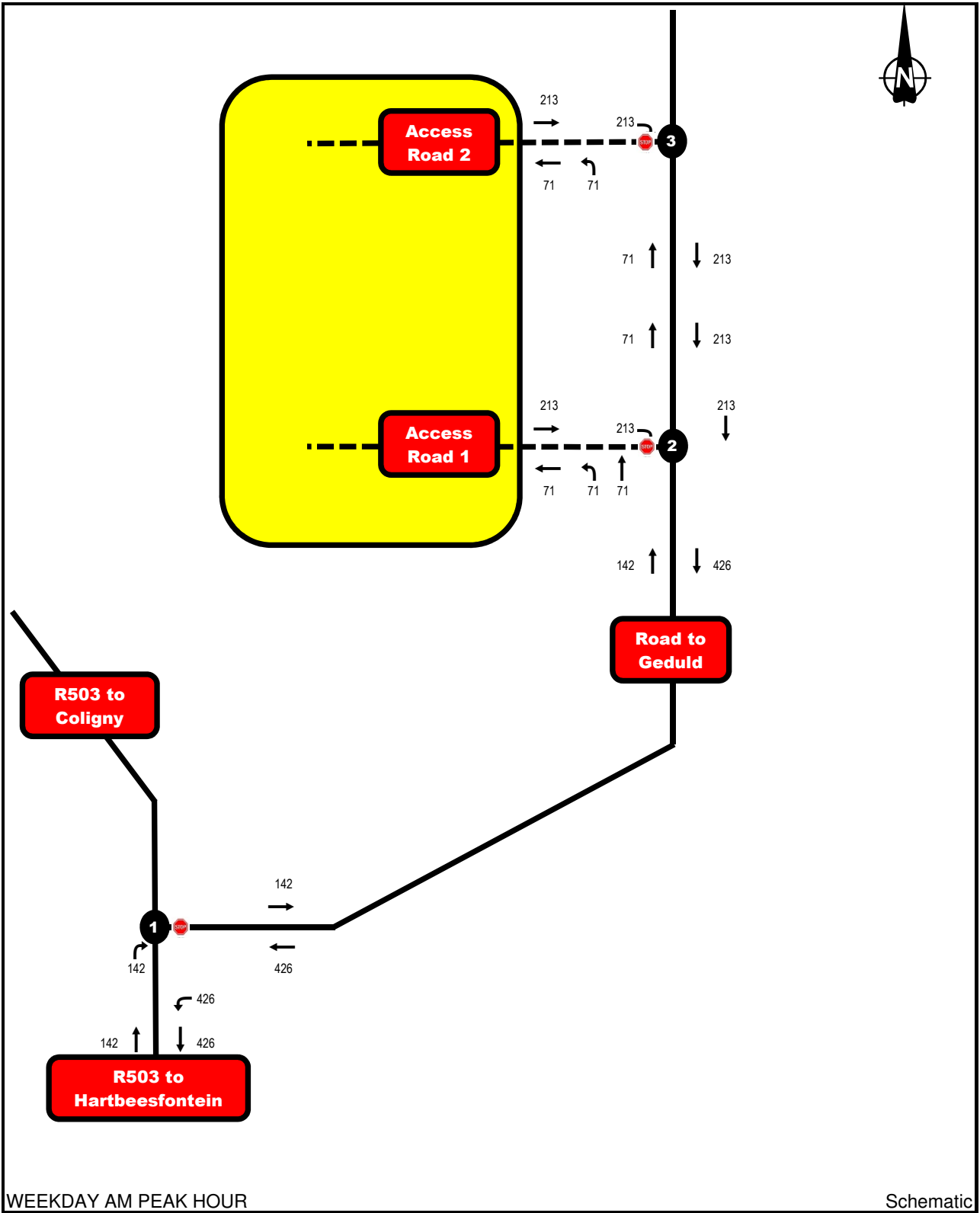




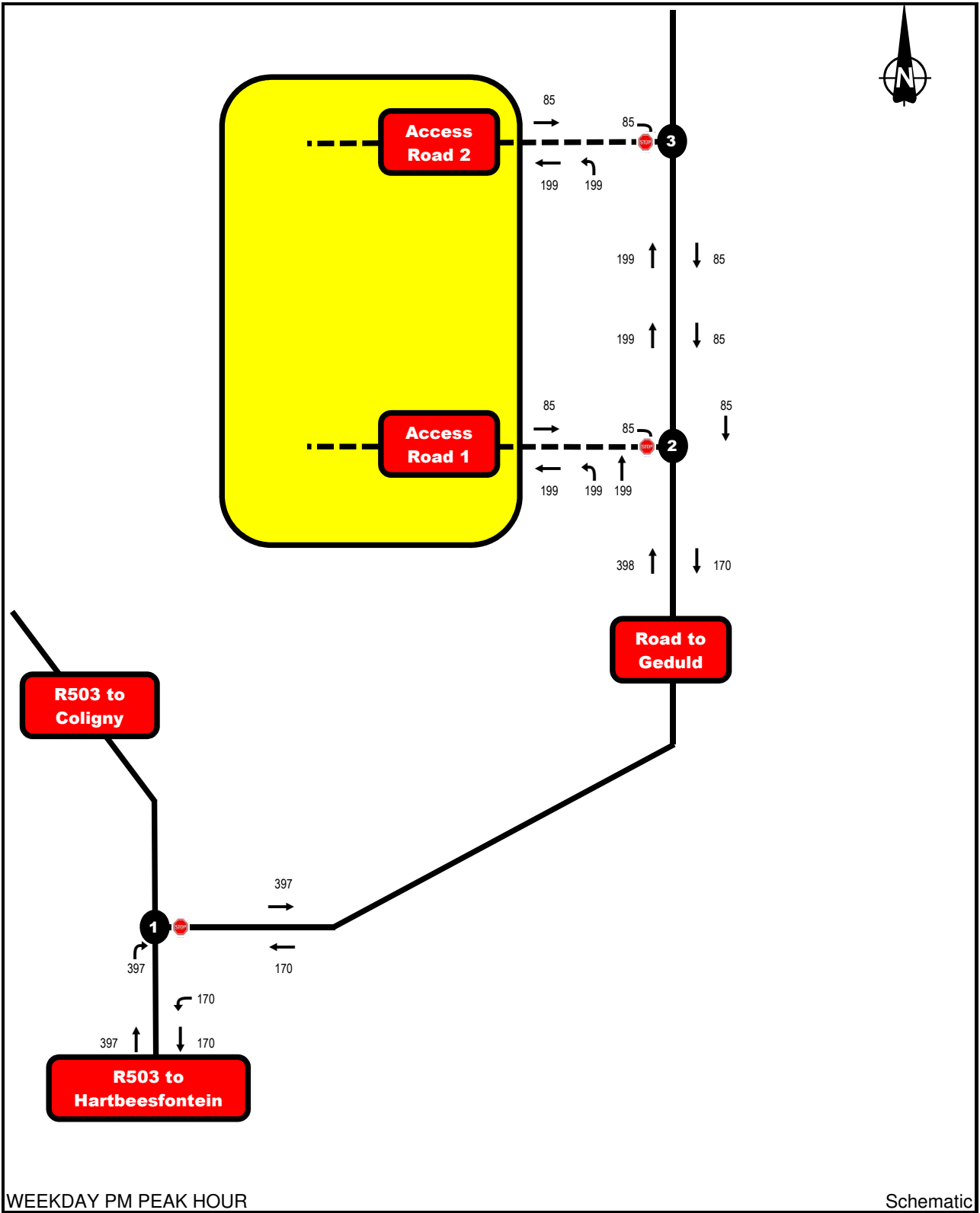
	Tigane Ext 7 & 8	Job Ref No: <b>TRAF 1529</b>
	<b>Expected Trip Distribution</b>	Fig: <b>4</b>



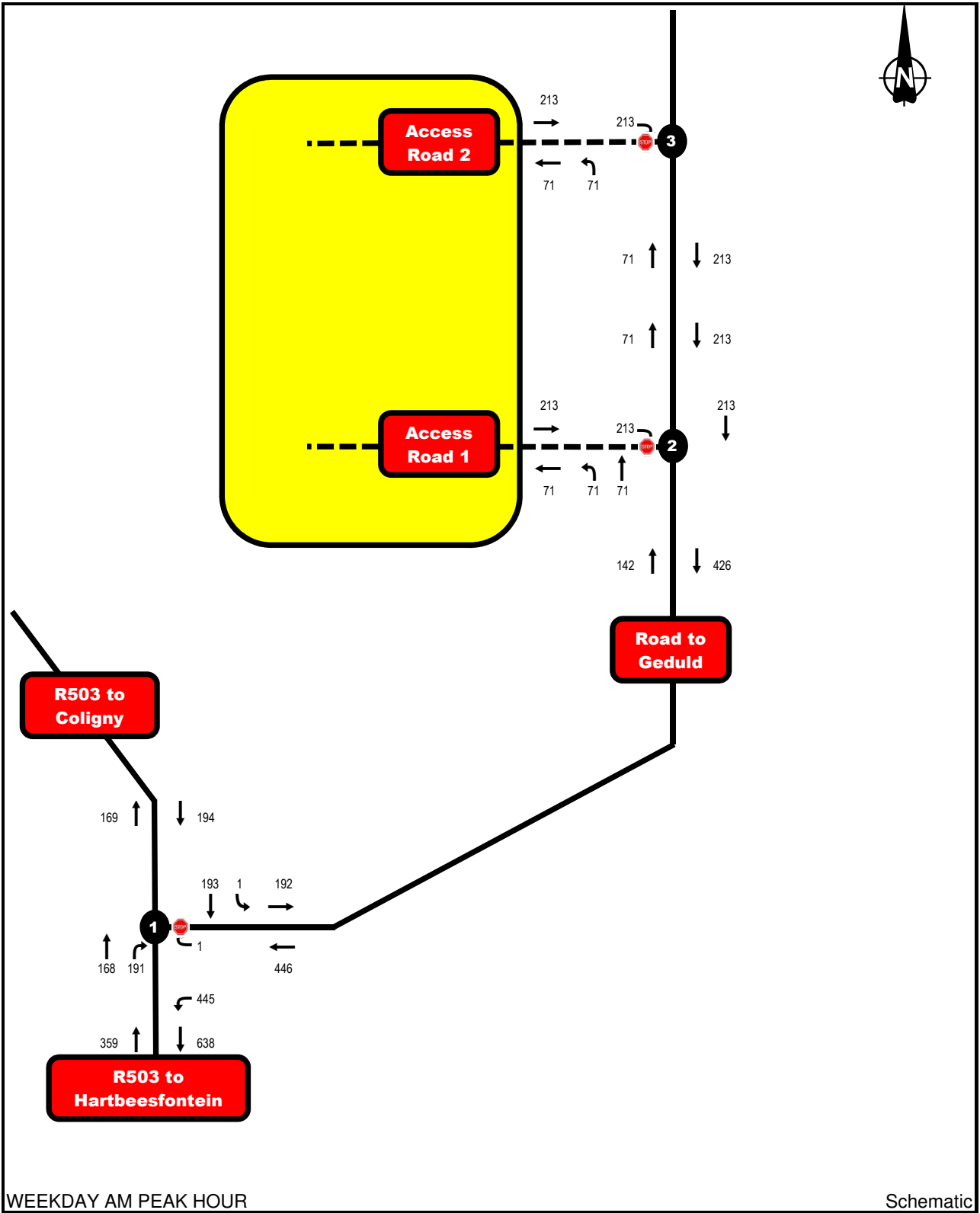
	Tigane Ext 7 & 8	Job Ref No: <b>TRAF 1529</b>
	<b>Expected Trip Distribution</b>	Fig: <b>5</b>



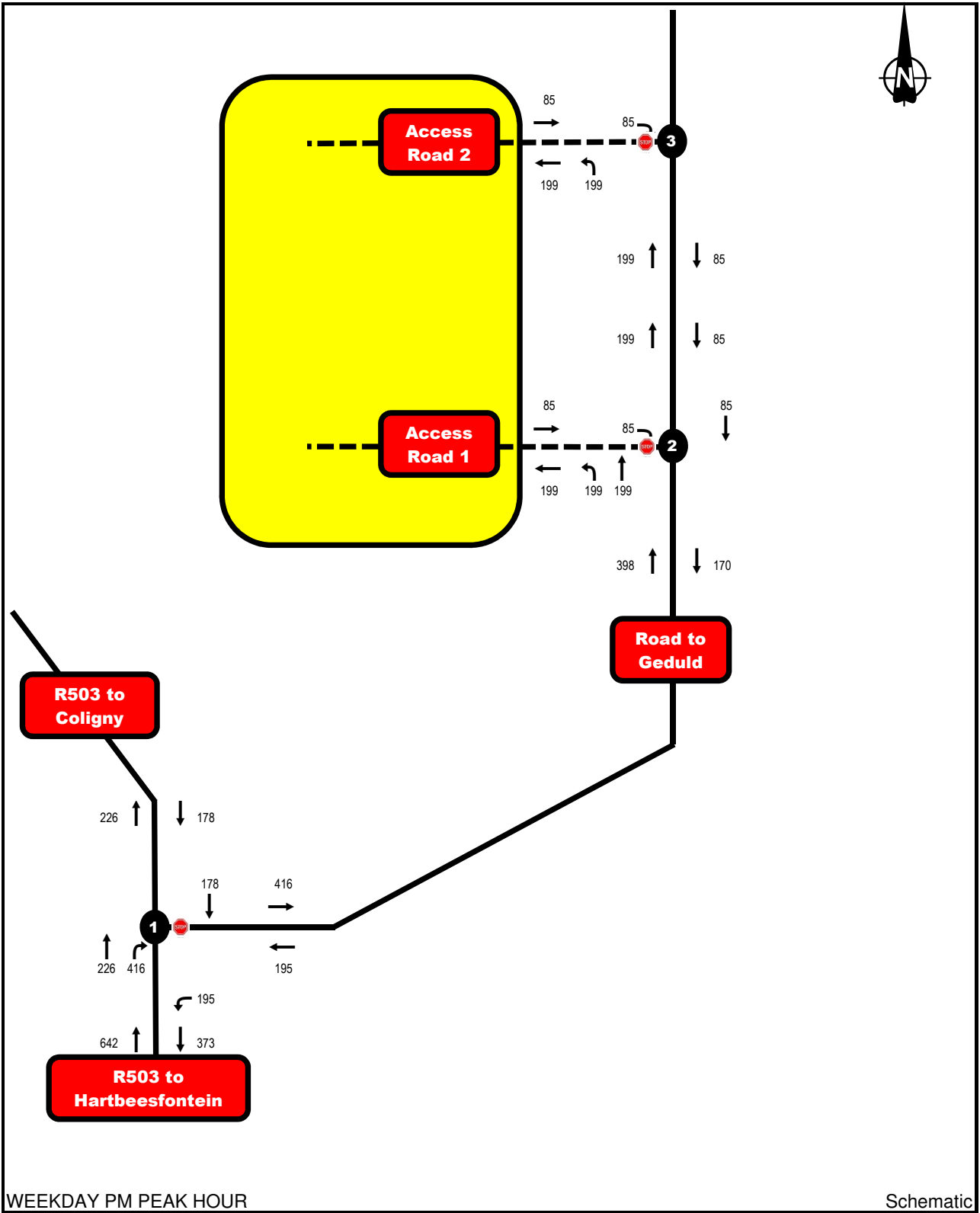
	Tigane Ext 7 & 8	Job Ref No: <b>TRAF 1529</b>
	<b>Development Traffic</b>	Fig: <b>6</b>



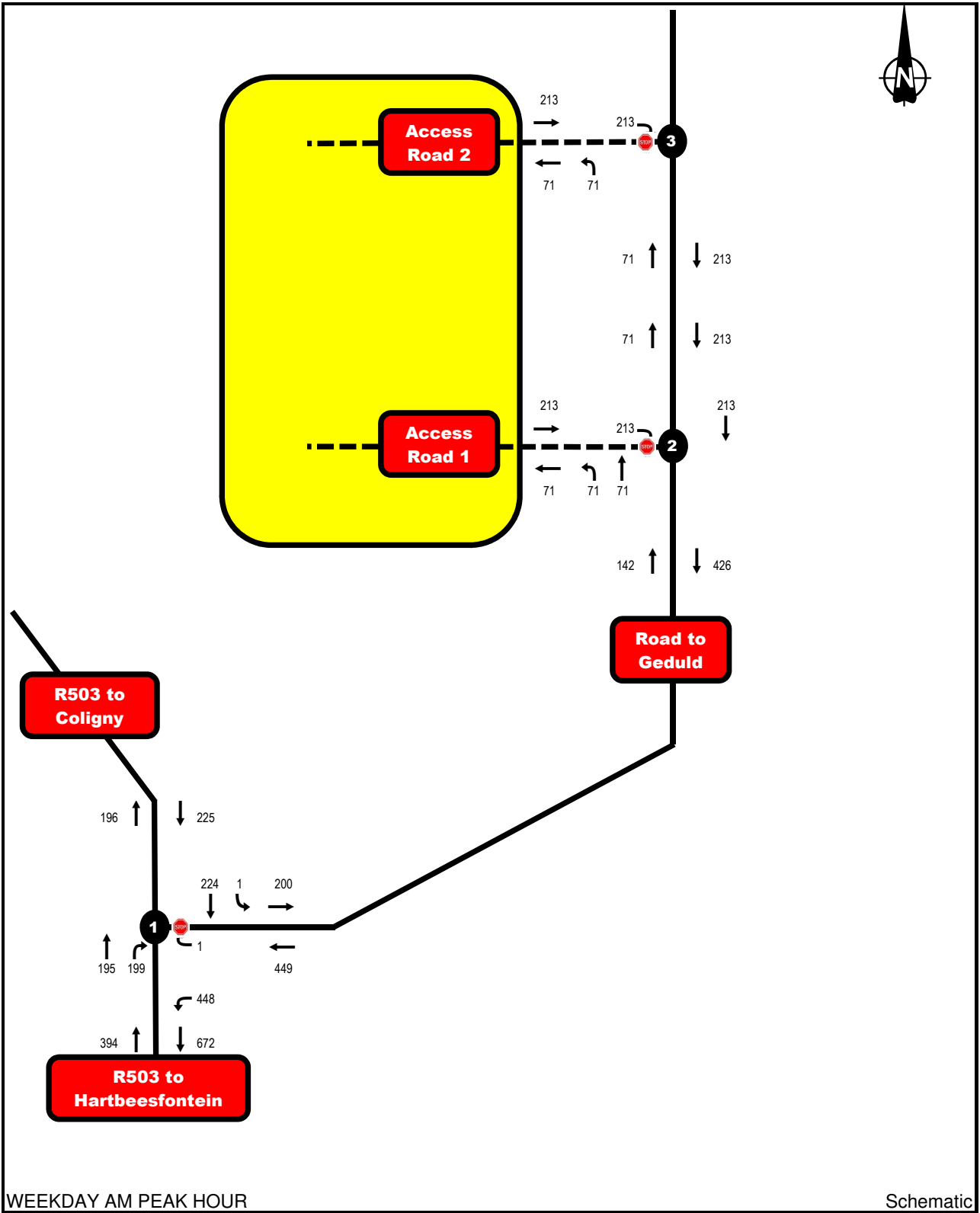
	Tigane Ext 7 & 8	Job Ref No: <b>TRAF 1529</b>
	<b>Development Traffic</b>	Fig: <b>7</b>



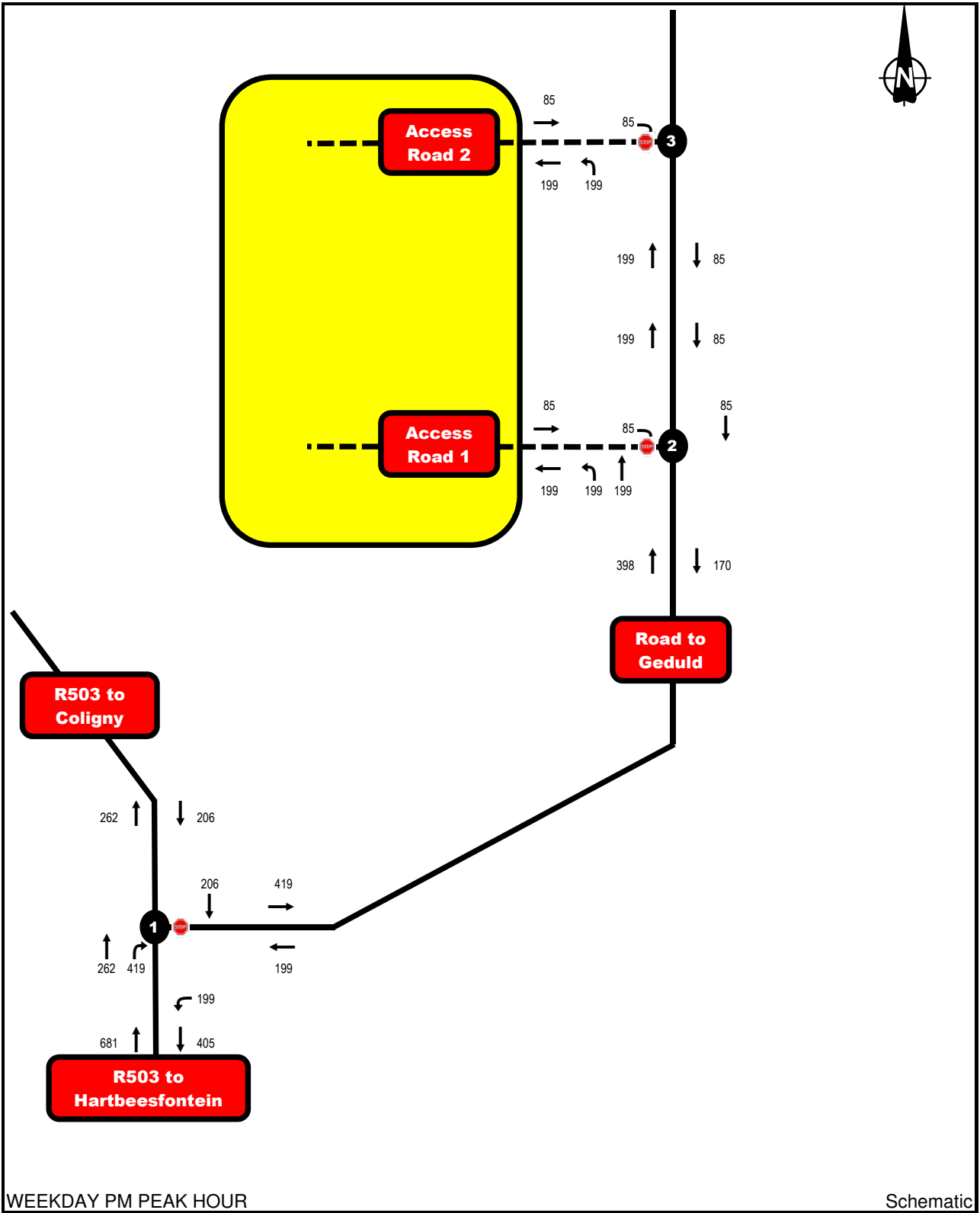
	Tigane Ext 7 & 8	Job Ref No: <b>TRAF 1529</b>
	<b>Present Traffic Demand plus Development</b>	Fig: <b>8</b>



	Tigane Ext 7 & 8	Job Ref No: <b>TRAF 1529</b>
	<b>Present Traffic Demand plus Development</b>	Fig: <b>9</b>



	Tigane Ext 7 & 8	Job Ref No: <b>TRAF 1529</b>
	<b>Expected 2024 Traffic Demand plus Development</b>	Fig: <b>10</b>



	Tigane Ext 7 & 8	Job Ref No: <b>TRAF 1529</b>
	<b>Expected 2024 Traffic Demand plus Development</b>	Fig: <b>11</b>



# **Annexure A**

## **OUTPUTS OF aaSIDRA INTERSECTION ANALYSES**

# MOVEMENT SUMMARY

**STOP** Site: 2019AM1

R503 / GEDULD ROAD  
Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMo v	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m			
South: R503 FROM HARTBEEFONTEIN											
2	T1	177	0,0	0,126	0,2	LOS A	0,4	2,5	0,16	0,12	58,3
3a	R1	52	0,0	0,126	5,3	LOS A	0,4	2,5	0,16	0,12	56,8
Approach		228	0,0	0,126	1,4	NA	0,4	2,5	0,16	0,12	58,0
NorthEast: ROAD TO GEDULD											
24a	L1	20	0,0	0,018	8,1	LOS A	0,1	0,5	0,30	0,86	51,5
26b	R3	1	0,0	0,018	9,9	LOS A	0,1	0,5	0,30	0,86	51,4
Approach		21	0,0	0,018	8,2	LOS A	0,1	0,5	0,30	0,86	51,5
North: R503 FROM COLIGNY											
7b	L3	1	0,0	0,105	6,5	LOS A	0,0	0,0	0,00	0,00	58,8
8	T1	203	0,0	0,105	0,0	LOS A	0,0	0,0	0,00	0,00	59,9
Approach		204	0,0	0,105	0,0	NA	0,0	0,0	0,00	0,00	59,9
All Vehicles		454	0,0	0,126	1,1	NA	0,4	2,5	0,10	0,10	58,5

# MOVEMENT SUMMARY

 Site: 2019PM1

R503 / GEDULD ROAD  
Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMo v	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m			
South: R503 FROM HARTBEEFONTEIN											
2	T1	238	0,0	0,135	0,1	LOS A	0,2	1,1	0,06	0,04	59,4
3a	R1	20	0,0	0,135	5,2	LOS A	0,2	1,1	0,06	0,04	57,8
Approach		258	0,0	0,135	0,5	NA	0,2	1,1	0,06	0,04	59,3
NorthEast: ROAD TO GEDULD											
24a	L1	26	0,0	0,023	8,1	LOS A	0,1	0,6	0,29	0,86	51,5
26b	R3	1	0,0	0,023	10,1	LOS B	0,1	0,6	0,29	0,86	51,4
Approach		27	0,0	0,023	8,2	LOS A	0,1	0,6	0,29	0,86	51,5
North: R503 FROM COLIGNY											
7b	L3	1	0,0	0,097	6,5	LOS A	0,0	0,0	0,00	0,00	58,8
8	T1	187	0,0	0,097	0,0	LOS A	0,0	0,0	0,00	0,00	59,9
Approach		188	0,0	0,097	0,0	NA	0,0	0,0	0,00	0,00	59,9
All Vehicles		474	0,0	0,135	0,7	NA	0,2	1,1	0,05	0,07	59,0

# MOVEMENT SUMMARY

**STOP** Site: 2019AM1 + Development

R503 / GEDULD ROAD  
Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMo v	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m			
South: R503 FROM HARTBEEFONTEIN											
2	T1	177	0,0	0,226	0,6	LOS A	1,2	8,3	0,32	0,30	56,5
3a	R1	201	0,0	0,226	5,3	LOS A	1,2	8,3	0,32	0,30	55,0
Approach		378	0,0	0,226	3,1	NA	1,2	8,3	0,32	0,30	55,7
NorthEast: ROAD TO GEDULD											
24a	L1	468	0,0	0,399	8,6	LOS A	2,1	14,9	0,41	0,87	51,4
26b	R3	1	0,0	0,399	13,1	LOS B	2,1	14,9	0,41	0,87	51,3
Approach		469	0,0	0,399	8,6	LOS A	2,1	14,9	0,41	0,87	51,4
North: R503 FROM COLIGNY											
7b	L3	1	0,0	0,105	6,5	LOS A	0,0	0,0	0,00	0,00	58,8
8	T1	203	0,0	0,105	0,0	LOS A	0,0	0,0	0,00	0,00	59,9
Approach		204	0,0	0,105	0,0	NA	0,0	0,0	0,00	0,00	59,9
All Vehicles		1052	0,0	0,399	5,0	NA	2,1	14,9	0,30	0,50	54,4

# MOVEMENT SUMMARY

 Site: 2019PM1 + Development

R503 / GEDULD ROAD

Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMo v	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m			
South: R503 FROM HARTBEEFONTEIN											
2	T1	238	0,0	0,411	0,8	LOS A	2,7	18,9	0,39	0,37	55,8
3a	R1	438	0,0	0,411	5,5	LOS A	2,7	18,9	0,39	0,37	54,4
Approach		676	0,0	0,411	3,8	NA	2,7	18,9	0,39	0,37	54,9
NorthEast: ROAD TO GEDULD											
24a	L1	205	0,0	0,174	8,2	LOS A	0,8	5,3	0,32	0,88	51,5
26b	R3	1	0,0	0,174	16,3	LOS C	0,8	5,3	0,32	0,88	51,4
Approach		206	0,0	0,174	8,3	LOS A	0,8	5,3	0,32	0,88	51,5
North: R503 FROM COLIGNY											
7b	L3	1	0,0	0,097	6,5	LOS A	0,0	0,0	0,00	0,00	58,8
8	T1	187	0,0	0,097	0,0	LOS A	0,0	0,0	0,00	0,00	59,9
Approach		188	0,0	0,097	0,0	NA	0,0	0,0	0,00	0,00	59,9
All Vehicles		1071	0,0	0,411	4,0	NA	2,7	18,9	0,31	0,40	55,0

# MOVEMENT SUMMARY

**STOP** Site: 2024AM1 + Development

R503 / GEDULD ROAD  
Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMo v	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m			
South: R503 FROM HARTBEEFONTEIN											
2	T1	203	0,0	0,244	0,7	LOS A	1,3	9,0	0,34	0,29	56,6
3a	R1	201	0,0	0,244	5,5	LOS A	1,3	9,0	0,34	0,29	55,1
Approach		404	0,0	0,244	3,1	NA	1,3	9,0	0,34	0,29	55,8
NorthEast: ROAD TO GEDULD											
24a	L1	468	0,0	0,412	9,0	LOS A	2,4	16,8	0,45	0,89	51,1
26b	R3	1	0,0	0,412	14,1	LOS B	2,4	16,8	0,45	0,89	51,0
Approach		469	0,0	0,412	9,0	LOS A	2,4	16,8	0,45	0,89	51,1
North: R503 FROM COLIGNY											
7b	L3	1	0,0	0,120	6,5	LOS A	0,0	0,0	0,00	0,00	58,8
8	T1	234	0,0	0,120	0,0	LOS A	0,0	0,0	0,00	0,00	59,9
Approach		235	0,0	0,120	0,0	NA	0,0	0,0	0,00	0,00	59,9
All Vehicles		1109	0,0	0,412	4,9	NA	2,4	16,8	0,31	0,48	54,5

# MOVEMENT SUMMARY

**STOP** Site: 2024PM1 + Development

R503 / GEDULD ROAD  
Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMo v	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m			
South: R503 FROM HARTBEEFONTEIN											
2	T1	274	0,0	0,438	1,0	LOS A	2,9	20,6	0,43	0,37	55,8
3a	R1	438	0,0	0,438	5,7	LOS A	2,9	20,6	0,43	0,37	54,4
Approach		711	0,0	0,438	3,9	NA	2,9	20,6	0,43	0,37	54,9
NorthEast: ROAD TO GEDULD											
24a	L1	205	0,0	0,179	8,4	LOS A	0,8	5,4	0,35	0,88	51,4
26b	R3	1	0,0	0,179	17,6	LOS C	0,8	5,4	0,35	0,88	51,3
Approach		206	0,0	0,179	8,4	LOS A	0,8	5,4	0,35	0,88	51,4
North: R503 FROM COLIGNY											
7b	L3	1	0,0	0,111	6,5	LOS A	0,0	0,0	0,00	0,00	58,8
8	T1	215	0,0	0,111	0,0	LOS A	0,0	0,0	0,00	0,00	59,9
Approach		217	0,0	0,111	0,0	NA	0,0	0,0	0,00	0,00	59,9
All Vehicles		1134	0,0	0,438	4,0	NA	2,9	20,6	0,33	0,39	55,1

# MOVEMENT SUMMARY

**STOP** Site: 2019AM2 + Development

ROAD TO GEDULD / ACCESS ROAD 1  
Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMo v	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m			
South: ROAD TO GEDULD											
1	L2	75	0,0	0,079	5,5	LOS A	0,0	0,0	0,00	0,30	55,9
2	T1	75	0,0	0,079	0,0	LOS A	0,0	0,0	0,00	0,30	57,4
Approach		149	0,0	0,079	2,8	NA	0,0	0,0	0,00	0,30	56,6
North: ROAD TO GEDULD											
8	T1	224	0,0	0,116	0,0	LOS A	0,0	0,1	0,00	0,00	60,0
9	R2	1	0,0	0,116	5,9	LOS A	0,0	0,1	0,00	0,00	57,7
Approach		225	0,0	0,116	0,0	NA	0,0	0,1	0,00	0,00	60,0
West: ACCESS ROAD 1											
10	L2	1	0,0	0,272	8,3	LOS A	1,0	7,3	0,43	0,94	51,2
12	R2	224	0,0	0,272	9,5	LOS A	1,0	7,3	0,43	0,94	50,7
Approach		225	0,0	0,272	9,5	LOS A	1,0	7,3	0,43	0,94	50,7
All Vehicles		600	0,0	0,272	4,3	NA	1,0	7,3	0,16	0,43	55,4



## MOVEMENT SUMMARY

**STOP** Site: 2019PM2 + Development

ROAD TO GEDULD / ACCESS ROAD 1  
Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMo	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
	v	Total	HV		sec		Vehicles	Distance		per veh	km/h
		veh/h	%	v/c			veh	m			
South: ROAD TO GEDULD											
1	L2	209	0,0	0,220	5,6	LOS A	0,0	0,0	0,00	0,30	55,9
2	T1	209	0,0	0,220	0,0	LOS A	0,0	0,0	0,00	0,30	57,3
Approach		419	0,0	0,220	2,8	NA	0,0	0,0	0,00	0,30	56,6
North: ROAD TO GEDULD											
8	T1	89	0,0	0,047	0,0	LOS A	0,0	0,1	0,01	0,01	59,9
9	R2	1	0,0	0,047	7,0	LOS A	0,0	0,1	0,01	0,01	57,6
Approach		91	0,0	0,047	0,1	NA	0,0	0,1	0,01	0,01	59,8
West: ACCESS ROAD 1											
10	L2	1	0,0	0,118	8,9	LOS A	0,4	2,8	0,43	0,94	51,1
12	R2	89	0,0	0,118	9,7	LOS A	0,4	2,8	0,43	0,94	50,6
Approach		91	0,0	0,118	9,7	LOS A	0,4	2,8	0,43	0,94	50,6
All Vehicles		600	0,0	0,220	3,4	NA	0,4	2,8	0,07	0,35	56,0

# MOVEMENT SUMMARY

**STOP** Site: 2024AM2 + Development

ROAD TO GEDULD / ACCESS ROAD 1  
Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMo	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
	v	Total	HV		sec		Vehicles	Distance		per veh	km/h
		veh/h	%	v/c			veh	m			
South: ROAD TO GEDULD											
1	L2	75	0,0	0,084	5,5	LOS A	0,0	0,0	0,00	0,28	56,0
2	T1	86	0,0	0,084	0,0	LOS A	0,0	0,0	0,00	0,28	57,5
Approach		161	0,0	0,084	2,6	NA	0,0	0,0	0,00	0,28	56,8
North: ROAD TO GEDULD											
8	T1	258	0,0	0,133	0,0	LOS A	0,0	0,1	0,00	0,00	60,0
9	R2	1	0,0	0,133	6,0	LOS A	0,0	0,1	0,00	0,00	57,7
Approach		259	0,0	0,133	0,0	NA	0,0	0,1	0,00	0,00	60,0
West: ACCESS ROAD 1											
10	L2	1	0,0	0,286	8,5	LOS A	1,1	7,9	0,47	0,96	50,9
12	R2	224	0,0	0,286	10,0	LOS A	1,1	7,9	0,47	0,96	50,5
Approach		225	0,0	0,286	9,9	LOS A	1,1	7,9	0,47	0,96	50,5
All Vehicles		645	0,0	0,286	4,1	NA	1,1	7,9	0,16	0,41	55,5

# MOVEMENT SUMMARY

**STOP** Site: 2024PM2 + Development

ROAD TO GEDULD / ACCESS ROAD 1  
Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMo	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
	v	Total	HV		sec		Vehicles	Distance		per veh	km/h
		veh/h	%	v/c			veh	m			
South: ROAD TO GEDULD											
1	L2	209	0,0	0,236	5,6	LOS A	0,0	0,0	0,00	0,28	56,0
2	T1	241	0,0	0,236	0,0	LOS A	0,0	0,0	0,00	0,28	57,5
Approach		450	0,0	0,236	2,6	NA	0,0	0,0	0,00	0,28	56,8
North: ROAD TO GEDULD											
8	T1	103	0,0	0,054	0,0	LOS A	0,0	0,1	0,01	0,01	59,9
9	R2	1	0,0	0,054	7,2	LOS A	0,0	0,1	0,01	0,01	57,6
Approach		104	0,0	0,054	0,1	NA	0,0	0,1	0,01	0,01	59,9
West: ACCESS ROAD 1											
10	L2	1	0,0	0,125	9,1	LOS A	0,4	2,9	0,46	0,95	50,9
12	R2	89	0,0	0,125	10,0	LOS B	0,4	2,9	0,46	0,95	50,4
Approach		91	0,0	0,125	10,0	LOS B	0,4	2,9	0,46	0,95	50,4
All Vehicles		645	0,0	0,236	3,2	NA	0,4	2,9	0,07	0,33	56,3

# MOVEMENT SUMMARY

**STOP** Site: 2019AM3 + Development

ROAD TO GEDULD / ACCESS ROAD 2  
Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMo v	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m			
South: ROAD TO GEDULD											
1	L2	75	0,0	0,041	5,5	LOS A	0,0	0,0	0,00	0,57	53,7
2	T1	1	0,0	0,041	0,0	LOS A	0,0	0,0	0,00	0,57	55,1
Approach		76	0,0	0,041	5,5	NA	0,0	0,0	0,00	0,57	53,7
North: ROAD TO GEDULD											
8	T1	1	0,0	0,001	0,1	LOS A	0,0	0,0	0,14	0,28	56,9
9	R2	1	0,0	0,001	5,6	LOS A	0,0	0,0	0,14	0,28	54,9
Approach		2	0,0	0,001	2,9	NA	0,0	0,0	0,14	0,28	55,9
West: ACCESS ROAD 2											
10	L2	1	0,0	0,201	8,0	LOS A	0,8	5,4	0,11	0,93	52,1
12	R2	224	0,0	0,201	7,6	LOS A	0,8	5,4	0,11	0,93	51,6
Approach		225	0,0	0,201	7,6	LOS A	0,8	5,4	0,11	0,93	51,6
All Vehicles		303	0,0	0,201	7,1	NA	0,8	5,4	0,08	0,84	52,2

# MOVEMENT SUMMARY

**STOP** Site: 2019PM3 + Development

ROAD TO GEDULD / ACCESS ROAD 2  
Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMo v	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m			
South: ROAD TO GEDULD											
1	L2	209	0,0	0,113	5,6	LOS A	0,0	0,0	0,00	0,57	53,6
2	T1	1	0,0	0,113	0,0	LOS A	0,0	0,0	0,00	0,57	55,0
Approach		211	0,0	0,113	5,5	NA	0,0	0,0	0,00	0,57	53,6
North: ROAD TO GEDULD											
8	T1	1	0,0	0,001	0,4	LOS A	0,0	0,0	0,27	0,27	56,5
9	R2	1	0,0	0,001	6,0	LOS A	0,0	0,0	0,27	0,27	54,5
Approach		2	0,0	0,001	3,2	NA	0,0	0,0	0,27	0,27	55,5
West: ACCESS ROAD 2											
10	L2	1	0,0	0,086	8,0	LOS A	0,3	2,0	0,10	0,95	51,9
12	R2	89	0,0	0,086	7,9	LOS A	0,3	2,0	0,10	0,95	51,4
Approach		91	0,0	0,086	7,9	LOS A	0,3	2,0	0,10	0,95	51,4
All Vehicles		303	0,0	0,113	6,2	NA	0,3	2,0	0,03	0,68	53,0

# MOVEMENT SUMMARY

**STOP** Site: 2024AM3 + Development

ROAD TO GEDULD / ACCESS ROAD 2  
Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMo v	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m			
South: ROAD TO GEDULD											
1	L2	75	0,0	0,041	5,5	LOS A	0,0	0,0	0,00	0,57	53,7
2	T1	1	0,0	0,041	0,0	LOS A	0,0	0,0	0,00	0,57	55,1
Approach		76	0,0	0,041	5,5	NA	0,0	0,0	0,00	0,57	53,7
North: ROAD TO GEDULD											
8	T1	1	0,0	0,001	0,1	LOS A	0,0	0,0	0,14	0,26	57,1
9	R2	1	0,0	0,001	5,6	LOS A	0,0	0,0	0,14	0,26	55,0
Approach		2	0,0	0,001	2,7	NA	0,0	0,0	0,14	0,26	56,1
West: ACCESS ROAD 2											
10	L2	1	0,0	0,201	8,0	LOS A	0,8	5,4	0,11	0,93	52,1
12	R2	224	0,0	0,201	7,6	LOS A	0,8	5,4	0,11	0,93	51,6
Approach		225	0,0	0,201	7,7	LOS A	0,8	5,4	0,11	0,93	51,6
All Vehicles		303	0,0	0,201	7,1	NA	0,8	5,4	0,08	0,83	52,2

# MOVEMENT SUMMARY

**STOP** Site: 2024PM3 + Development

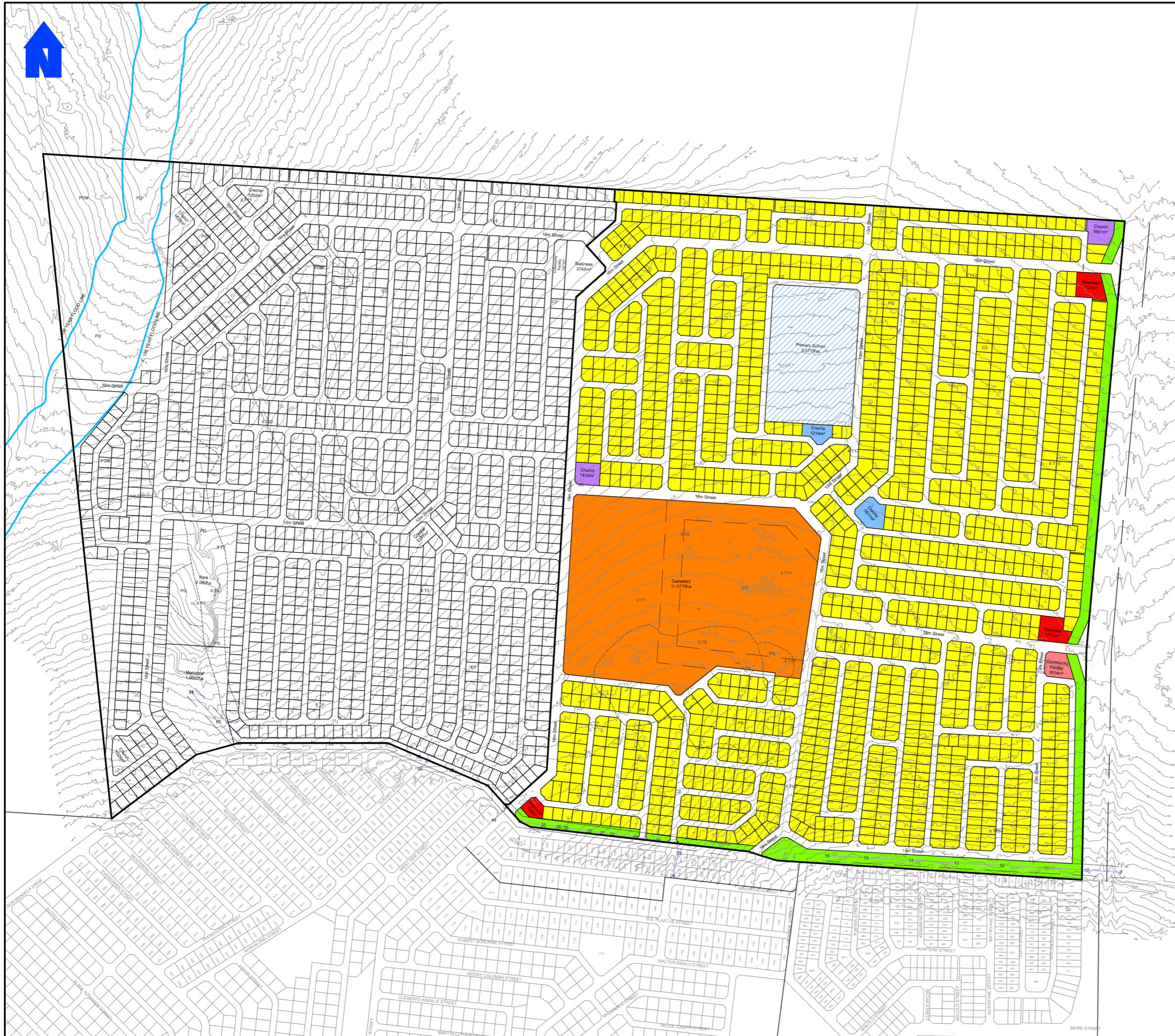
ROAD TO GEDULD / ACCESS ROAD 2  
Stop (Two-Way)


Movement Performance - Vehicles											
Mov ID	ODMo v	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m			
South: ROAD TO GEDULD											
1	L2	209	0,0	0,113	5,6	LOS A	0,0	0,0	0,00	0,57	53,6
2	T1	1	0,0	0,113	0,0	LOS A	0,0	0,0	0,00	0,57	55,0
Approach		211	0,0	0,113	5,5	NA	0,0	0,0	0,00	0,57	53,6
North: ROAD TO GEDULD											
8	T1	1	0,0	0,001	0,4	LOS A	0,0	0,0	0,26	0,26	56,7
9	R2	1	0,0	0,001	6,0	LOS A	0,0	0,0	0,26	0,26	54,6
Approach		2	0,0	0,001	3,0	NA	0,0	0,0	0,26	0,26	55,7
West: ACCESS ROAD 2											
10	L2	1	0,0	0,086	8,0	LOS A	0,3	2,0	0,11	0,95	51,9
12	R2	89	0,0	0,086	7,9	LOS A	0,3	2,0	0,11	0,95	51,4
Approach		91	0,0	0,086	7,9	LOS A	0,3	2,0	0,11	0,95	51,4
All Vehicles		303	0,0	0,113	6,2	NA	0,3	2,0	0,03	0,68	53,0

# **Annexure B**

## **DEVELOPMENT LAYOUT PLAN**







SCALE 1 : 100 000

**PROPOSED TOWN**

LEGEND				
Land Use	Number of Erven	Erf Number	Area in Ha	% of Area
Residential 1	1583	*	51.5731ha	%
Business 1	3	*	0.4452ha	%
Church	2	*	0.3073ha	%
Creche	2	*	0.3025ha	%
Primary School	1	*	3.0775ha	%
Cemetery	1	*	11.0775ha	%
Community Facility	1	*	0.1614ha	%
Park	6	*	3.3415ha	%
Street			20.2118ha	%
<b>TOTAL</b>	<b>1599</b>	<b>*</b>	<b>90.4978ha</b>	<b>100%</b>

STREETS		
Reserve Width	Length in Metre	% of Street Length
16metre	3231m	%
13metre	1336m	%
10metre	13522m	%
<b>TOTAL</b>	<b>18088m</b>	<b>100%</b>

**NOTES:**

Erf sizes and dimensions subject to final survey.

**1 : 100 YEAR FLOODLINE**  
 It is hereby certified in terms of the provisions of Section 144 of the National Water Act 1998 (Act No.36 of 1998) that the lines shown on this drawing indicate the maximum extent of inundation likely on an average every hundred years by the flood waters from the natural catchment (as determined using present topography).

**PR ENGINEER**  
 It is hereby certified that the town layout complies with the conditions and recommendations as stated in the Geological Report.

**PR ENGINEER**

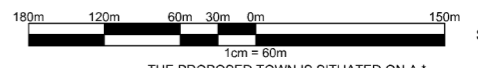
**STREETS:**  
 Maximum slope 1 :  
 Minimum slope 1 :

**DESIGN OF TOWN LAYOUT**  
 Maxim Planning Solutions (Pty) Ltd  
 K. Raubenheimer Pr. Pin A/924/1996  
 Tel. (018) 468 6366

**CONTOURS**  
 The contour survey is in accordance with the standards laid down by the Regulations relating to Township Establishment and Land Use.

**CONTOUR SURVEY DONE BY:**



## PROPOSED TOWN TIGANE EXTENSION 7



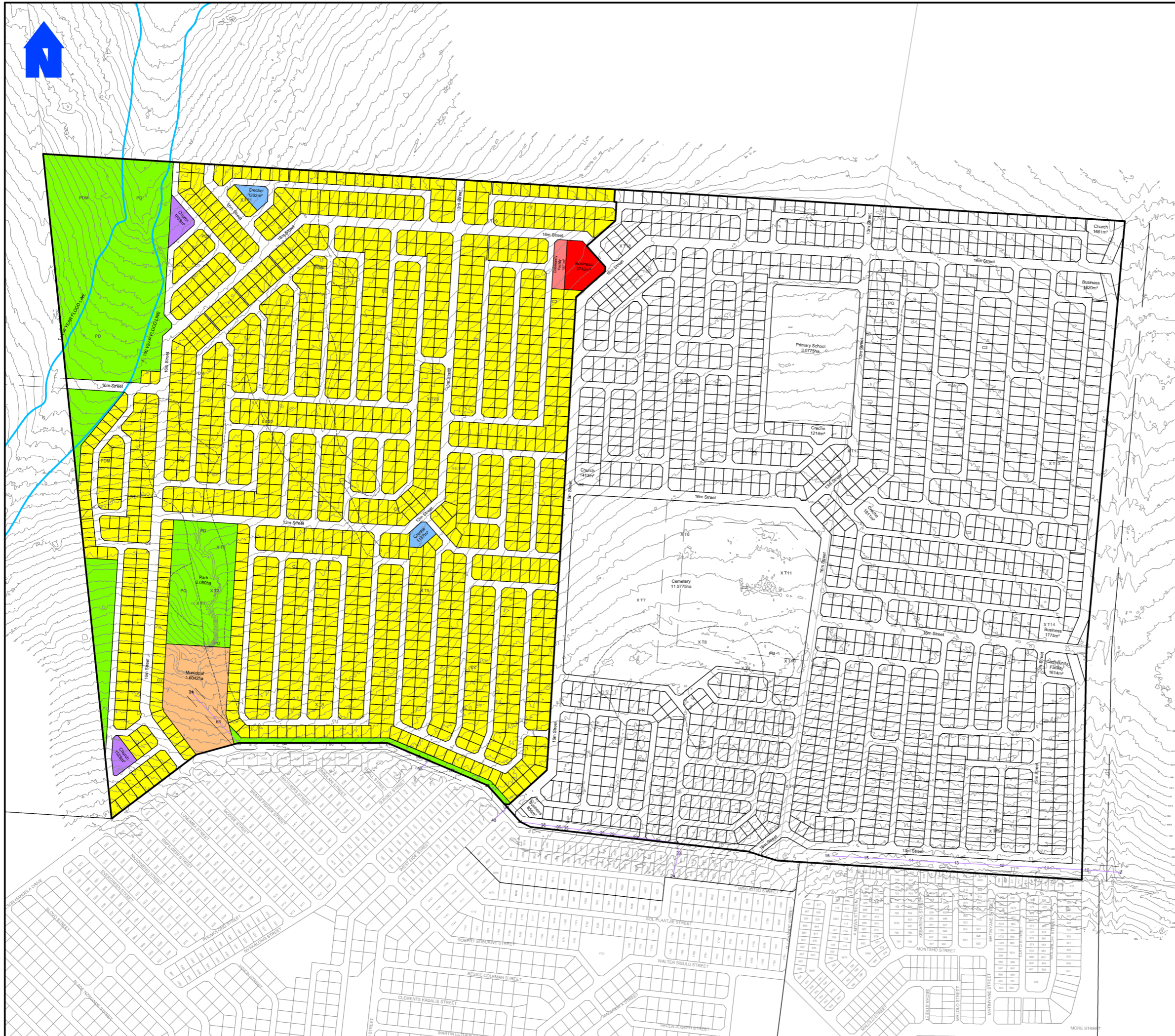
SCALE 1 : 6 000

THE PROPOSED TOWN IS SITUATED ON A \*

CITY OF MATLOSANA NORTH WEST PROVINCE

Drawing Compiled by : A. Rossouw	Tel (018) 468-6366 Fax (018) 468-6378 adelize@maxim.co.za
Drawings Nr. : 8/5/15	 <p>ACCREDITED TOWN AND REGIONAL PLANNERS</p>
Date : 2020/05/25	
Revision : 	

Caddie File : Z:\8-PROJECTS\8-5-15-K-T Tigane Extension 7\Maps\CAD



PROPOSED TOWN

SCALE 1 : 100 000

**LEGEND**

Land Use	Number of Erfen	Erf Number	Area in Ha	% of Area
Residential 1	1494	*	46.7749ha	%
Business 1	1	*	0.3742ha	%
Church	2	*	0.3361ha	%
Creche	2	*	0.2419ha	%
Municipal	1	*	1.6042ha	%
Community Facility	1	*	0.1571ha	%
Park	5	*	10.2376ha	%
Street			15.9013ha	%
<b>TOTAL</b>	<b>1506</b>	<b>*</b>	<b>75.6273ha</b>	<b>100%</b>

**STREETS**

Reserve Width	Length in Metre	% of Street Length
16metre	1793m	%
13metre	990m	%
10metre	11911m	%
<b>TOTAL</b>	<b>14964m</b>	<b>100%</b>

**NOTES:**

Erf sizes and dimensions subject to final survey.

**STREETS:**

Maximum slope 1 :  
Minimum slope 1 :

**1 : 100 YEAR FLOODLINE**

It is hereby certified in terms of the provisions of Section 144 of the National Water Act 1998 (Act No.36 of 1998) that the lines shown on this drawing indicate the maximum extent of inundation likely on an average every hundred years by the flood waters from the natural catchment (as determined using present topography).

**DESIGN OF TOWN LAYOUT**

Maxim Planning Solutions (Pty) Ltd  
K. Raubenheimer Pr. Pin A/924/1996  
Tel. (018) 468 6366

**CONTOURS**

The contour survey is in accordance with the standards laid down by the Regulations relating to Township Establishment and Land Use.

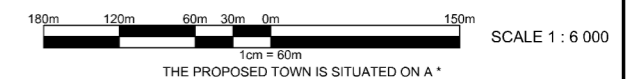
**PR ENGINEER**

It is hereby certified that the town layout complies with the conditions and recommendations as stated in the Geological Report.

**CONTOUR SURVEY DONE BY:**

**PR ENGINEER**

**PROPOSED TOWN  
TIGANE EXTENSION 8**



CITY OF MATLOSANA

NORTH WEST PROVINCE

Drawing  
Compiled by : A. Rossouw

Tel (018) 468-6366  
Fax (018) 468-6378  
adelize@maxim.co.za

Drawings Nr. : 8/5/15

Date : 2020/05/25

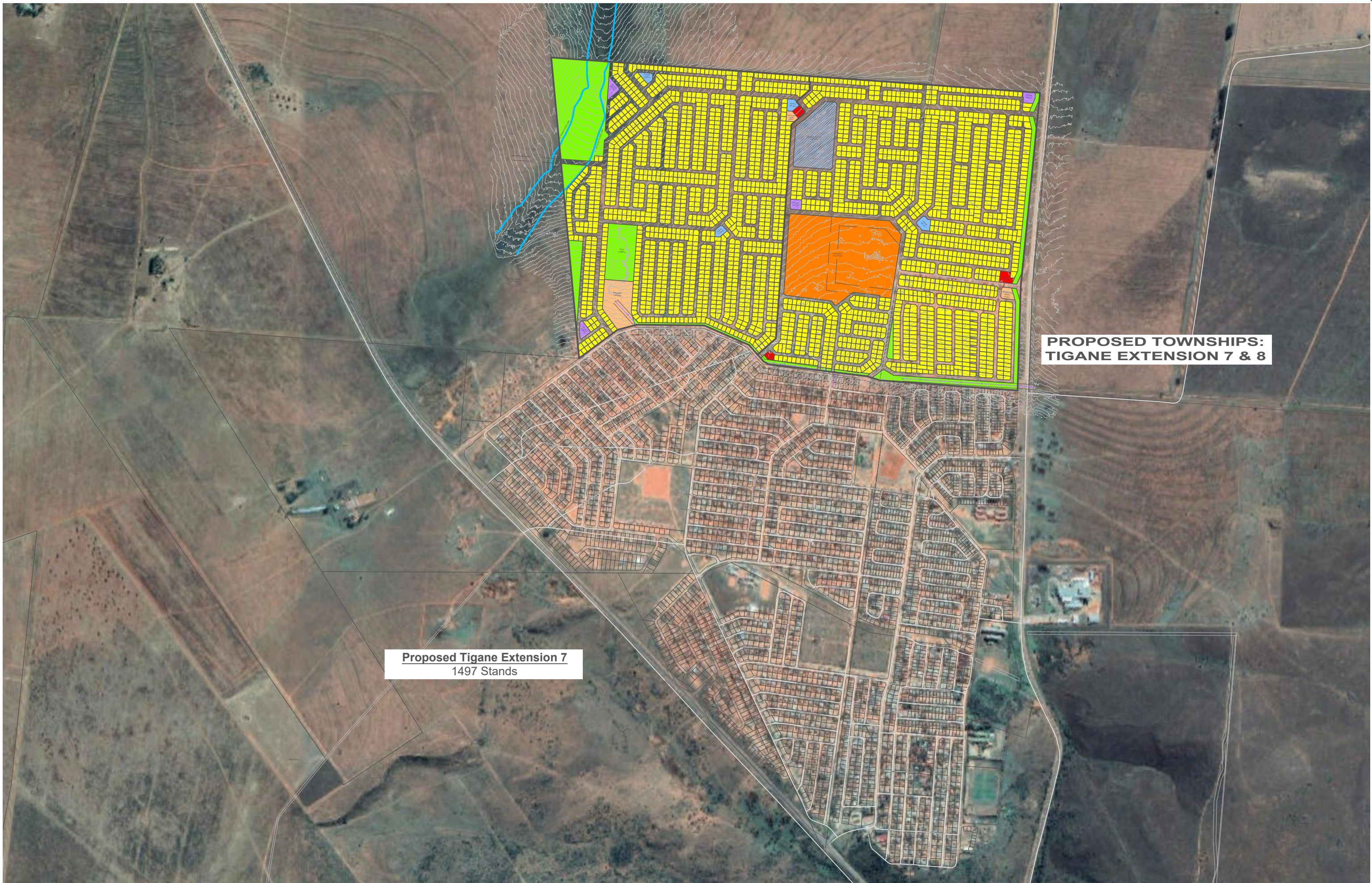
Revision :

Caddie File : Z:\8-PROJECTS\  
8-5-15-K-T Tigane Extension 7\Maps\CAD



# **Annexure C**

## **AERIAL OVERLAY**



**Proposed Tigane Extension 7**  
1497 Stands

**PROPOSED TOWNSHIPS:**  
TIGANE EXTENSION 7 & 8

1 2 3 4 5 6 7 8 9				Contant Person. Warren G Payne
Scale	Date	Drawn	Verified	E-mail: warren.payne1@gmail.com
As Indicated	2019-11-30	Warren Payne		
© Copyright protected				
<small>All specifications, designs, diagrams and information contained herein are the copyright and remain the property of Warren G Payne and may not be copied or transmitted, whether physically, electronically, or by any other means without the express permission of Warren G Payne. All such specifications and information are subject to the particular project concerned and may be used for no other purpose save that for which it is intended. All dimensions and levels are to be verified on site, prior to the commencement of setting out. Workshop drawings or construction drawings are not to be scaled. Figured dimensions only are to be used. Any discrepancies, errors and omissions are to be reported to the designer immediately before commencing with any work. All shop drawings are to be submitted for designer's approval prior to manufacture or installation. All work is to be strict accordance with the bye-laws and regulations of the local authority. Where required, designer's drawings are to be read in conjunction with the engineers drawings. Each contractor shall be responsible for ensuring the structural stability of all components of his work and ascertain that the main structure is capable of supporting all loads applied there.</small>				