

TRAFFIC IMPACT ASSESSMENT - ACCESS STUDY

TRAFFIC STUDY REPORT

Draft Version 1

Prepared for:

Sol Plaatje Local Municipality

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QUALITY MANAGEMENT

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1 PURPOSE AND OVERVIEW

1.1 Introduction

Route 2 Transport Strategies cc was appointed to undertake a Traffic Impact Study for the proposed establishment of the **Lethabo Park Township** in **Kimberley Northern Cape**. The site is located to the northwest of Kimberley (see **Figure 1**).

The Traffic Impact Study is submitted in support of the Township establishment to the relevant municipal-, transport- and planning authorities. The Township will be mostly Residential but will also have other uses like **Schools, Places of Worship, Crèche's, Business and Community Facilities & Services**.



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.

1.3 Report Structure

The remainder of the report is structured as follows:

- The scope of the report, study area and roads affected are provided in **Chapter 2**.
 - The surrounding road network is provided in **Chapter 3**.
 - The development and site access is discussed in **Chapter 4**.
 - The additional development traffic and distribution are provided in **Chapter 5**.
 - The traffic impact and capacity analysis are provided in **Chapter 6**.
 - The access arrangement and analysis are provided in **Chapter 7**.
 - Provision for public transport and pedestrians are discussed in **Chapter 8**.
 - The summary and recommendations are provided in **Chapter 9**.
-

2 SCOPE OF THE REPORT

The purpose of this report is to identify the traffic impact of the proposed Township Establishment of Lethabo Park Township that would be generated by the proposed development on the surrounding road network. 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

The extent of the study area is driven by an estimation of the traffic generated by the proposed development and the intersections likely to be affected by the additional traffic. The development is expected to generate in the order of **500 peak hour trips** as a worst case, although a traffic impact study is required. The study includes the intersections of:

1. Barkley Road and Unknown Road – priority controlled.
2. Barkley Road and Midlands Road – priority.
3. Midlands Road and Eagle Street – 3-way stop controlled.

2.2 Peak Hours Analysed

Peak morning, midday and afternoon traffic counts were conducted on Wednesday 24 April 2019 at the intersections mentioned above.

The existing AM (07:00 – 08:00) and PM (16:00 – 17:00) peak hour traffic are summarised in **Figures 2 & 3**. The peak hours were derived from the highest peak hour traffic that was counted during the morning and afternoon peak periods.

2.3 Assessment Scenarios

To determine the likely impact of the additional traffic on the network the following three scenarios were analysed:

- **Scenario 1: Existing 2019** AM and PM peak hour flows;
 - **Scenario 2: Base 2019** AM and PM peak hour flows with development traffic;
and
 - **Scenario 3: Future 2024** AM and PM peak hour with development traffic.
-

3 SURROUNDING ROAD NETWORK

Midlands Road

Midlands Road is a Class 3 road.



Barkley Road

Barkley Road is also a Class 3 road.



4 PROPOSED DEVELOPMENT

It is proposed to establish a township with the land uses as per **Table 1** below.

Table 1: Development Controls

Land Use	Area GLA or units
Residential	1 711
Institutional, Special, Government & Community Facilities	N/A

5 TRAFFIC FLOWS & TRIP GENERATION

5.1 Trip Generation

The COTO *Trip Generation Manual (September 2012 TMH 17 Volume 1)* recommends the peak hour trip rates as per in **Tables 2 & 3** below. A reduction of 70% for very low vehicle ownership was allowed.

Table 2: Proposed Development AM Peak Hour Trip Generation

Land use	Extend	Units	Trip Rate	Split		Trips		Adjusted Total in & out
				In	Out	In	Out	
Residential	1 711	Units	1.00	25%	75%	128	385	513

Table 3: Proposed Development PM Peak Hour Trip Generation

Land use	Extend	Units	Trip Rate	Split		Trips		Adjusted Total in & out
				In	Out	In	Out	
Residential	1 711	Units	1.00	70%	30%	359	154	513

5.2 Expected Trip Distribution

The assumed trip distribution is illustrated on **Figures 4 & 5**.

Figures 6 & 7 illustrates the assumed trip distribution for the development traffic while **Figures 8 & 9** illustrates the **Base 2019** traffic with the additional development traffic and an expected 3% growth in background traffic. The **Future 2024** with development traffic can be seen on **Figures 10 & 11**.

6 TRAFFIC IMPACT & CAPACITY ANALYSES

6.1 Assessment Criteria

The intersections have been analysed using aaSIDRA traffic analysis software. SIDRA is a computer software program that provides many 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.

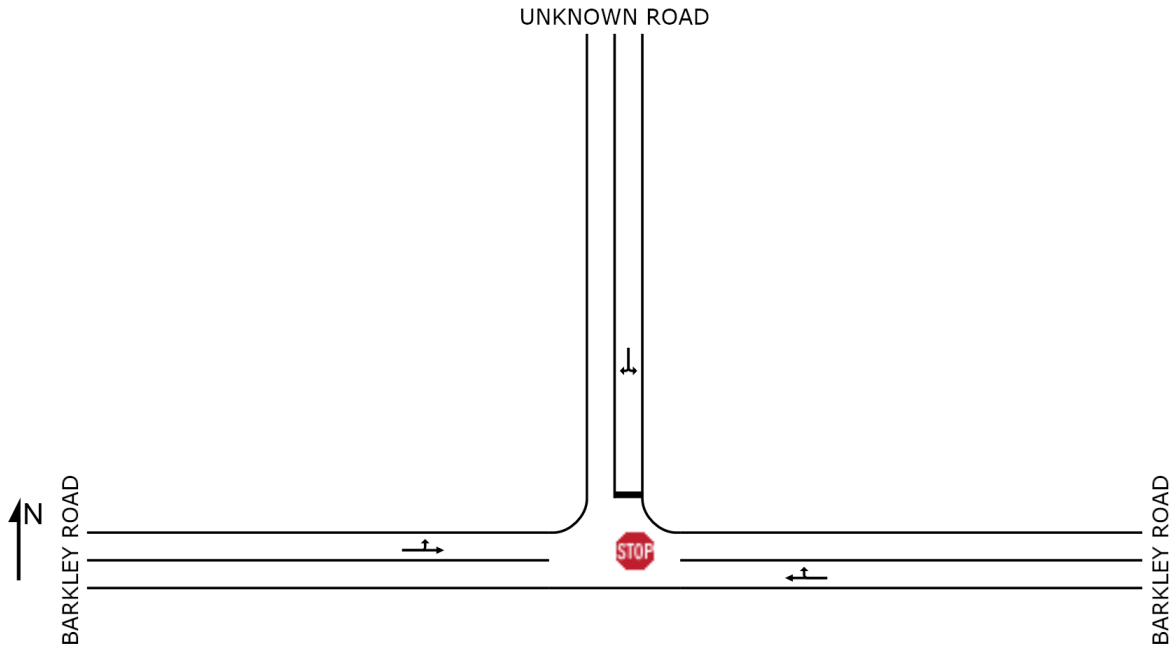
A further measure of the operating conditions prevailing at any one point in a road network is the volume to capacity ratio (v/c). As the name implies it is the traffic demand volume divided by the available capacity of the roadway element. Generally, ratios of up to approximately 0.9 are internationally 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 background traffic volumes were grown with 3% per annum to calculate the 2024 demand. No latent traffic was applied for the area.

6.3 Barkley Road and Unknown Street Intersection



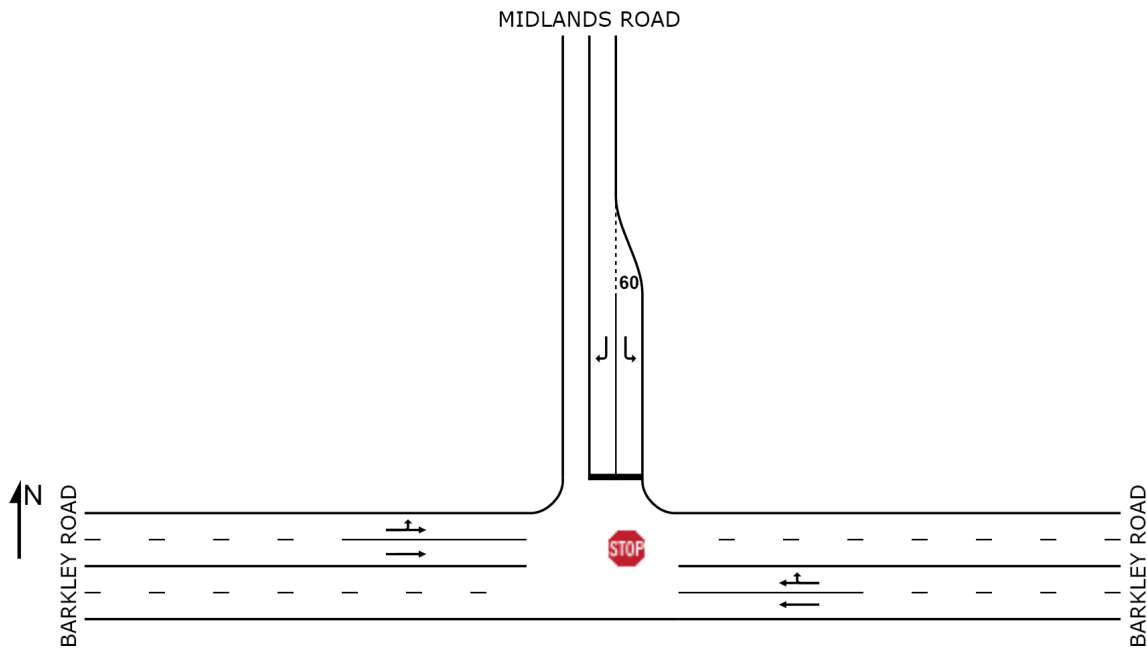
Existing Layout

Results of Analysis:

Scenario	AM Peak Hour					PM Peak Hour				
	NB	WB	SB	EB	TOTAL	NB	WB	SB	EB	TOTAL
Existing 2019		N/A {0.08}	A {0.09}	N/A {0.03}	N/A {0.09}		N/A {0.09}	A {0.05}	N/A {0.04}	N/A {0.09}
Base 2019 + Development		N/A {0.08}	A {0.17}	N/A {0.05}	N/A {0.17}		N/A {0.09}	A {0.08}	N/A {0.08}	N/A {0.09}
Future 2024 + Development		N/A {0.09}	A {0.17}	N/A {0.05}	N/A {0.17}		N/A {0.09}	A {0.08}	N/A {0.09}	N/A {0.09}
Legend										
A					Level of Service					
{0.95}					Volume / Capacity					

For the **Existing 2019 & Future 2024** scenarios the analysis indicates that the intersection operates with acceptable LOS and spare capacity therefore no upgrades are proposed.

6.4 Barkley Road and Midlands Road Intersection



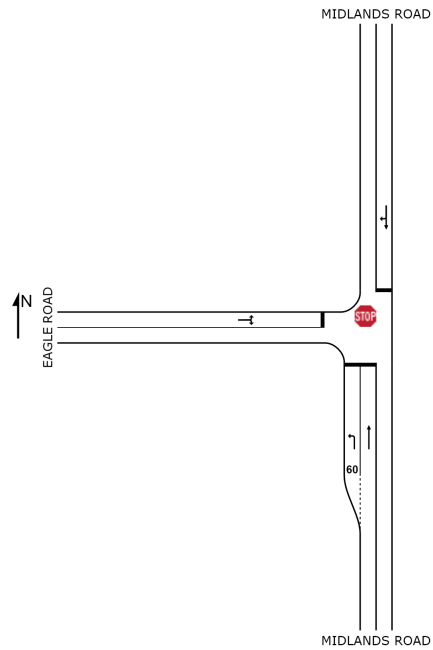
Existing Layout

Results of Analysis:

Scenario	AM Peak Hour					PM Peak Hour				
	NB	WB	SB	EB	TOTAL	NB	WB	SB	EB	TOTAL
Existing 2019		N/A {0.11}	A {0.18}	N/A {0.07}	N/A {0.18}		N/A {0.23}	C {0.53}	N/A {0.07}	N/A {0.53}
Base 2019 + Development		N/A {0.19}	A {0.47}	N/A {0.07}	N/A {0.47}		N/A {0.50}	C {0.64}	N/A {0.08}	N/A {0.64}
Future 2024 + Development		N/A {0.19}	A {0.48}	N/A {0.08}	N/A {0.48}		N/A {0.52}	C {0.69}	N/A {0.08}	N/A {0.69}
Legend										
A					Level of Service					
{0.95}					Volume / Capacity					

For the **Existing 2019 & Future 2024** scenarios the analysis indicates that the intersection operates with acceptable LOS and spare capacity therefore no upgrades are proposed.

6.5 Midlands Road and Eagle Street Intersection



Existing Layout

Results of Analysis:

Scenario	AM Peak Hour					PM Peak Hour				
	NB	WB	SB	EB	TOTAL	NB	WB	SB	EB	TOTAL
Existing 2019	E {0.53}		E {0.21}	B {0.37}	C {0.53}	F {0.77}		C {0.08}	B {0.28}	D {0.77}
Base 2019 + Development	F {0.92}		E {0.11}	B {0.39}	E {0.92}	F {>1.0}		B {0.05}	B {0.26}	F {>1.0}
Future 2024 + Development	F {0.88}		E {0.12}	B {0.40}	E {0.88}	F {>1.0}		B {0.05}	B {0.27}	F {>1.0}
Legend										
A					Level of Service					
{0.95}					Volume / Capacity					

For the **Existing 2019 & Future 2024** scenarios the analysis indicates that the intersection currently operates with capacity problems which may in future be mitigated by either traffic signals and/or a roundabout.

7 INTERNAL ROADS & ACCESS TO PROPERTIES

7.1 Internal Roads

The following road hierarchy was proposed:

- **Class 3:** 32m wide road reserves.
- **Class 4:** 25m wide road reserves.
- **Class 5a:** 20m wide road reserves.
- **Class 5b:** 16m wide road reserves.

7.2 Access to properties

The following should apply:

- **Class 3:** No access allowed.
- **Class 4:** Access to Residential 1, Schools & Industrial.
- **Class 5a:** Access to Residential 1 & Community Facilities.
- **Class 5b:** Access to Residential 1 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 sites should be provided.
 - Separate pedestrian gates to schools.
 - 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 Public Transport

As part of public transport, the following is provided:

- Minibus-taxi and bus lay-bys along the Class 4 roads.

8.3 Non-motorised Transport (NMT)

- Pedestrian sidewalks should be provided along the Class 4 roads within the development and at the schools or Institutional & Community facility uses.
-

9 CONCLUSION & RECOMMENDATIONS

The Traffic Impact Study investigated the expected transport related impacts of the establishment the **Lethabo Park Township** with various land uses and Community Facilities.

With regards to traffic generation and impact, it is estimated that the development will generate in the order of 500 AM and PM peak hour trips (total in and out), although since there are informal Townships I the area this can probably be seen as a worst case for additional external traffic.

It is proposed and can be concluded:

- ***Provision of pedestrian sidewalks along the Class 4 roads and if schools within the Township.***
- ***Minibus-taxi and bus lay-bys along the Class 4 roads.***

10 REFERENCES

- COTO, September 2012, TMH 17 Volume 1, "South African Trip Data Manual".
- Institute of Transportation Engineers. "Trip Generation, 8th 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

Annexure A

OUTPUTS OF aaSIDRA INTERSECTION ANALYSES

MOVEMENT SUMMARY

 Site: 2019AM1

BARKLEY ROAD / UNKNOWN ROAD
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			
East: BARKLEY ROAD											
5	T1	77	0,0	0,079	0,1	LOS A	0,3	2,3	0,13	0,26	57,1
6	R2	65	0,0	0,079	5,6	LOS A	0,3	2,3	0,13	0,26	55,1
Approach		142	0,0	0,079	2,7	NA	0,3	2,3	0,13	0,26	56,2
North: UNKNOWN ROAD											
7	L2	100	0,0	0,085	8,2	LOS A	0,3	2,4	0,14	0,91	51,8
9	R2	12	0,0	0,085	8,4	LOS A	0,3	2,4	0,14	0,91	51,3
Approach		112	0,0	0,085	8,2	LOS A	0,3	2,4	0,14	0,91	51,7
West: BARKLEY ROAD											
10	L2	7	0,0	0,033	5,5	LOS A	0,0	0,0	0,00	0,07	57,8
11	T1	56	0,0	0,033	0,0	LOS A	0,0	0,0	0,00	0,07	59,4
Approach		63	0,0	0,033	0,6	NA	0,0	0,0	0,00	0,07	59,2
All Vehicles		317	0,0	0,085	4,2	NA	0,3	2,4	0,11	0,45	55,1

MOVEMENT SUMMARY

 Site: 2019PM1

BARKLEY ROAD / UNKNOWN ROAD
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			
East: BARKLEY ROAD											
5	T1	87	0,0	0,086	0,1	LOS A	0,4	2,5	0,14	0,25	57,2
6	R2	68	0,0	0,086	5,7	LOS A	0,4	2,5	0,14	0,25	55,2
Approach		156	0,0	0,086	2,6	NA	0,4	2,5	0,14	0,25	56,3
North: UNKNOWN ROAD											
7	L2	57	0,0	0,045	8,2	LOS A	0,2	1,2	0,15	0,90	51,8
9	R2	3	0,0	0,045	8,4	LOS A	0,2	1,2	0,15	0,90	51,3
Approach		60	0,0	0,045	8,2	LOS A	0,2	1,2	0,15	0,90	51,7
West: BARKLEY ROAD											
10	L2	7	0,0	0,036	5,5	LOS A	0,0	0,0	0,00	0,06	57,8
11	T1	62	0,0	0,036	0,0	LOS A	0,0	0,0	0,00	0,06	59,4
Approach		69	0,0	0,036	0,6	NA	0,0	0,0	0,00	0,06	59,2
All Vehicles		285	0,0	0,086	3,3	NA	0,4	2,5	0,11	0,34	55,9

MOVEMENT SUMMARY

STOP Site: 2019AM1 + Development

BARKLEY ROAD / UNKNOWN ROAD
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			
East: BARKLEY ROAD											
5	T1	77	0,0	0,080	0,2	LOS A	0,3	2,3	0,16	0,26	57,0
6	R2	65	0,0	0,080	5,7	LOS A	0,3	2,3	0,16	0,26	55,0
Approach		142	0,0	0,080	2,7	NA	0,3	2,3	0,16	0,26	56,1
North: UNKNOWN ROAD											
7	L2	100	0,0	0,171	8,2	LOS A	0,7	4,8	0,17	0,92	51,7
9	R2	93	0,0	0,171	8,6	LOS A	0,7	4,8	0,17	0,92	51,2
Approach		193	0,0	0,171	8,4	LOS A	0,7	4,8	0,17	0,92	51,5
West: BARKLEY ROAD											
10	L2	35	0,0	0,047	5,5	LOS A	0,0	0,0	0,00	0,23	56,4
11	T1	56	0,0	0,047	0,0	LOS A	0,0	0,0	0,00	0,23	58,0
Approach		91	0,0	0,047	2,1	NA	0,0	0,0	0,00	0,23	57,4
All Vehicles		425	0,0	0,171	5,2	NA	0,7	4,8	0,13	0,55	54,1

MOVEMENT SUMMARY

STOP Site: 2019PM1 + Development

BARKLEY ROAD / UNKNOWN ROAD
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			
East: BARKLEY ROAD											
5	T1	87	0,0	0,089	0,3	LOS A	0,4	2,6	0,21	0,26	56,9
6	R2	68	0,0	0,089	5,9	LOS A	0,4	2,6	0,21	0,26	54,9
Approach		156	0,0	0,089	2,8	NA	0,4	2,6	0,21	0,26	56,0
North: UNKNOWN ROAD											
7	L2	57	0,0	0,082	8,2	LOS A	0,3	2,1	0,16	0,92	51,7
9	R2	36	0,0	0,082	8,7	LOS A	0,3	2,1	0,16	0,92	51,2
Approach		93	0,0	0,082	8,4	LOS A	0,3	2,1	0,16	0,92	51,5
West: BARKLEY ROAD											
10	L2	83	0,0	0,077	5,5	LOS A	0,0	0,0	0,00	0,34	55,5
11	T1	62	0,0	0,077	0,0	LOS A	0,0	0,0	0,00	0,34	57,0
Approach		145	0,0	0,077	3,2	NA	0,0	0,0	0,00	0,34	56,2
All Vehicles		394	0,0	0,089	4,2	NA	0,4	2,6	0,12	0,44	54,9

MOVEMENT SUMMARY

STOP Site: 2024AM1 + Development

BARKLEY ROAD / UNKNOWN ROAD
 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			
East: BARKLEY ROAD											
5	T1	88	0,0	0,086	0,2	LOS A	0,3	2,4	0,17	0,25	57,2
6	R2	65	0,0	0,086	5,7	LOS A	0,3	2,4	0,17	0,25	55,1
Approach		154	0,0	0,086	2,6	NA	0,3	2,4	0,17	0,25	56,3
North: UNKNOWN ROAD											
7	L2	100	0,0	0,174	8,3	LOS A	0,7	4,8	0,19	0,91	51,7
9	R2	93	0,0	0,174	8,7	LOS A	0,7	4,8	0,19	0,91	51,2
Approach		193	0,0	0,174	8,5	LOS A	0,7	4,8	0,19	0,91	51,4
West: BARKLEY ROAD											
10	L2	35	0,0	0,052	5,5	LOS A	0,0	0,0	0,00	0,21	56,6
11	T1	64	0,0	0,052	0,0	LOS A	0,0	0,0	0,00	0,21	58,1
Approach		99	0,0	0,052	2,0	NA	0,0	0,0	0,00	0,21	57,6
All Vehicles		445	0,0	0,174	5,0	NA	0,7	4,8	0,14	0,53	54,3

MOVEMENT SUMMARY

STOP Site: 2024PM1 + Development

BARKLEY ROAD / UNKNOWN ROAD
 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			
East: BARKLEY ROAD											
5	T1	100	0,0	0,096	0,3	LOS A	0,4	2,7	0,21	0,24	57,1
6	R2	68	0,0	0,096	5,9	LOS A	0,4	2,7	0,21	0,24	55,1
Approach		169	0,0	0,096	2,6	NA	0,4	2,7	0,21	0,24	56,3
North: UNKNOWN ROAD											
7	L2	57	0,0	0,083	8,3	LOS A	0,3	2,2	0,18	0,91	51,6
9	R2	36	0,0	0,083	8,8	LOS A	0,3	2,2	0,18	0,91	51,2
Approach		93	0,0	0,083	8,5	LOS A	0,3	2,2	0,18	0,91	51,5
West: BARKLEY ROAD											
10	L2	83	0,0	0,081	5,5	LOS A	0,0	0,0	0,00	0,32	55,7
11	T1	71	0,0	0,081	0,0	LOS A	0,0	0,0	0,00	0,32	57,2
Approach		155	0,0	0,081	3,0	NA	0,0	0,0	0,00	0,32	56,4
All Vehicles		416	0,0	0,096	4,1	NA	0,4	2,7	0,13	0,42	55,2

MOVEMENT SUMMARY

 Site: 2019AM2

BARKLEY ROAD / MIDLANDS ROAD
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			
East: BARKLEY ROAD											
5	T1	236	0,0	0,107	0,1	LOS A	0,5	3,4	0,04	0,05	59,3
6	R2	104	0,0	0,107	6,7	LOS A	0,5	3,4	0,36	0,49	53,3
Approach		340	0,0	0,107	2,1	NA	0,5	3,4	0,14	0,19	57,4
North: MIDLANDS ROAD											
7	L2	205	0,0	0,183	8,4	LOS A	0,8	5,3	0,18	0,90	51,8
9	R2	69	0,0	0,158	14,2	LOS B	0,6	4,1	0,60	1,00	48,1
Approach		275	0,0	0,183	9,9	LOS A	0,8	5,3	0,29	0,92	50,8
West: BARKLEY ROAD											
10	L2	63	0,0	0,069	5,5	LOS A	0,0	0,0	0,00	0,28	56,0
11	T1	203	0,0	0,069	0,0	LOS A	0,0	0,0	0,00	0,10	59,1
Approach		266	0,0	0,069	1,3	NA	0,0	0,0	0,00	0,14	58,3
All Vehicles		881	0,0	0,183	4,3	NA	0,8	5,3	0,14	0,40	55,4

MOVEMENT SUMMARY

STOP Site: 2019PM2

BARKLEY ROAD / MIDLANDS ROAD
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			
East: BARKLEY ROAD											
5	T1	240	0,0	0,123	0,0	LOS A	0,0	0,0	0,00	0,00	60,0
6	R2	261	0,0	0,233	6,8	LOS A	1,1	7,4	0,40	0,63	52,4
Approach		501	0,0	0,233	3,6	NA	1,1	7,4	0,21	0,33	55,8
North: MIDLANDS ROAD											
7	L2	96	0,0	0,088	8,5	LOS A	0,3	2,3	0,21	0,89	51,7
9	R2	175	0,0	0,528	23,3	LOS C	2,8	19,8	0,81	1,13	43,2
Approach		271	0,0	0,528	18,1	LOS C	2,8	19,8	0,60	1,05	45,9
West: BARKLEY ROAD											
10	L2	31	0,0	0,067	5,5	LOS A	0,0	0,0	0,00	0,14	57,2
11	T1	229	0,0	0,067	0,0	LOS A	0,0	0,0	0,00	0,06	59,4
Approach		260	0,0	0,067	0,7	NA	0,0	0,0	0,00	0,07	59,2
All Vehicles		1032	0,0	0,528	6,6	NA	2,8	19,8	0,26	0,45	53,5

MOVEMENT SUMMARY

STOP Site: 2019AM2 + Development

BARKLEY ROAD / MIDLANDS ROAD
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			
East: BARKLEY ROAD											
5	T1	236	0,0	0,121	0,0	LOS A	0,0	0,0	0,00	0,00	60,0
6	R2	213	0,0	0,191	6,8	LOS A	0,8	5,8	0,39	0,62	52,4
Approach		448	0,0	0,191	3,2	NA	0,8	5,8	0,18	0,30	56,1
North: MIDLANDS ROAD											
7	L2	529	0,0	0,472	8,6	LOS A	2,8	19,4	0,26	0,87	51,7
9	R2	69	0,0	0,188	16,3	LOS C	0,7	4,8	0,68	1,00	46,9
Approach		599	0,0	0,472	9,5	LOS A	2,8	19,4	0,31	0,88	51,1
West: BARKLEY ROAD											
10	L2	63	0,0	0,069	5,5	LOS A	0,0	0,0	0,00	0,28	56,0
11	T1	203	0,0	0,069	0,0	LOS A	0,0	0,0	0,00	0,10	59,1
Approach		266	0,0	0,069	1,3	NA	0,0	0,0	0,00	0,14	58,3
All Vehicles		1314	0,0	0,472	5,7	NA	2,8	19,4	0,20	0,53	54,1

MOVEMENT SUMMARY

STOP Site: 2019PM2 + Development

BARKLEY ROAD / MIDLANDS ROAD
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			
East: BARKLEY ROAD											
5	T1	240	0,0	0,123	0,0	LOS A	0,0	0,0	0,00	0,00	60,0
6	R2	563	0,0	0,502	7,9	LOS A	4,0	27,8	0,51	0,72	51,8
Approach		803	0,0	0,502	5,6	NA	4,0	27,8	0,36	0,50	54,0
North: MIDLANDS ROAD											
7	L2	225	0,0	0,207	8,6	LOS A	0,9	6,1	0,23	0,89	51,7
9	R2	175	0,0	1,013	118,8	LOS F	12,4	87,1	1,00	1,89	20,3
Approach		400	0,0	1,013	56,7	LOS F	12,4	87,1	0,57	1,33	30,9
West: BARKLEY ROAD											
10	L2	31	0,0	0,067	5,5	LOS A	0,0	0,0	0,00	0,14	57,2
11	T1	229	0,0	0,067	0,0	LOS A	0,0	0,0	0,00	0,06	59,4
Approach		260	0,0	0,067	0,7	NA	0,0	0,0	0,00	0,07	59,2
All Vehicles		1463	0,0	1,013	18,7	NA	12,4	87,1	0,35	0,65	45,4

MOVEMENT SUMMARY

STOP Site: 2024AM2 + Development

BARKLEY ROAD / MIDLANDS ROAD
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			
East: BARKLEY ROAD											
5	T1	271	0,0	0,139	0,0	LOS A	0,0	0,0	0,00	0,00	60,0
6	R2	213	0,0	0,197	7,0	LOS A	0,9	6,0	0,41	0,64	52,3
Approach		484	0,0	0,197	3,1	NA	0,9	6,0	0,18	0,28	56,3
North: MIDLANDS ROAD											
7	L2	529	0,0	0,480	8,7	LOS A	2,8	19,7	0,29	0,86	51,7
9	R2	69	0,0	0,211	18,1	LOS C	0,8	5,5	0,72	1,01	45,9
Approach		599	0,0	0,480	9,8	LOS A	2,8	19,7	0,34	0,88	50,9
West: BARKLEY ROAD											
10	L2	63	0,0	0,077	5,5	LOS A	0,0	0,0	0,00	0,25	56,2
11	T1	234	0,0	0,077	0,0	LOS A	0,0	0,0	0,00	0,09	59,2
Approach		297	0,0	0,077	1,2	NA	0,0	0,0	0,00	0,13	58,5
All Vehicles		1380	0,0	0,480	5,6	NA	2,8	19,7	0,21	0,51	54,3

MOVEMENT SUMMARY

STOP Site: 2024PM2 + Development

BARKLEY ROAD / MIDLANDS ROAD
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			
East: BARKLEY ROAD											
5	T1	276	0,0	0,142	0,0	LOS A	0,0	0,0	0,00	0,00	60,0
6	R2	563	0,0	0,521	8,4	LOS A	4,3	30,1	0,55	0,77	51,4
Approach		839	0,0	0,521	5,7	NA	4,3	30,1	0,37	0,51	54,0
North: MIDLANDS ROAD											
7	L2	225	0,0	0,211	8,7	LOS A	0,9	6,2	0,26	0,89	51,7
9	R2	105	0,0	0,697	53,3	LOS F	3,3	23,1	0,95	1,18	31,9
Approach		330	0,0	0,697	22,8	LOS C	3,3	23,1	0,48	0,98	43,2
West: BARKLEY ROAD											
10	L2	31	0,0	0,076	5,5	LOS A	0,0	0,0	0,00	0,12	57,3
11	T1	264	0,0	0,076	0,0	LOS A	0,0	0,0	0,00	0,05	59,5
Approach		294	0,0	0,076	0,6	NA	0,0	0,0	0,00	0,06	59,3
All Vehicles		1464	0,0	0,697	8,5	NA	4,3	30,1	0,32	0,53	52,0

MOVEMENT SUMMARY

 Site: 2019AM3

MIDLANDS ROAD / EAGLE ROAD
Stop (All-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: MIDLANDS ROAD											
1	L2	73	0,0	0,528	47,3	LOS E	2,7	18,8	1,00	1,45	33,9
2	T1	63	0,0	0,517	49,1	LOS E	2,6	18,2	1,00	1,44	33,3
Approach		136	0,0	0,528	48,2	LOS E	2,7	18,8	1,00	1,45	33,6
North: MIDLANDS ROAD											
8	T1	16	0,0	0,205	39,5	LOS E	0,8	5,5	1,00	1,28	36,4
9	R2	12	0,0	0,205	39,3	LOS E	0,8	5,5	1,00	1,28	36,3
Approach		27	0,0	0,205	39,4	LOS E	0,8	5,5	1,00	1,28	36,3
West: EAGLE ROAD											
10	L2	63	0,0	0,374	11,7	LOS B	1,4	9,6	0,61	1,36	50,1
12	R2	315	0,0	0,374	11,5	LOS B	1,4	9,6	0,61	1,36	49,9
Approach		378	0,0	0,374	11,5	LOS B	1,4	9,6	0,61	1,36	50,0
All Vehicles		541	0,0	0,528	22,1	LOS C	2,7	18,8	0,73	1,38	43,8

MOVEMENT SUMMARY

 Site: 2019PM3

MIDLANDS ROAD / EAGLE ROAD
Stop (All-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: MIDLANDS ROAD											
1	L2	159	0,0	0,773	63,3	LOS F	6,0	41,8	1,00	1,81	29,5
2	T1	43	0,0	0,230	20,5	LOS C	0,9	6,2	1,00	1,29	45,0
Approach		202	0,0	0,773	54,1	LOS F	6,0	41,8	1,00	1,70	31,9
North: MIDLANDS ROAD											
8	T1	12	0,0	0,076	20,4	LOS C	0,3	1,8	0,95	1,25	44,9
9	R2	8	0,0	0,076	20,2	LOS C	0,3	1,8	0,95	1,25	44,8
Approach		20	0,0	0,076	20,3	LOS C	0,3	1,8	0,95	1,25	44,9
West: EAGLE ROAD											
10	L2	32	0,0	0,277	11,3	LOS B	0,9	6,4	0,61	1,31	50,4
12	R2	229	0,0	0,277	11,0	LOS B	0,9	6,4	0,61	1,31	50,2
Approach		261	0,0	0,277	11,1	LOS B	0,9	6,4	0,61	1,31	50,2
All Vehicles		483	0,0	0,773	29,5	LOS D	6,0	41,8	0,79	1,47	40,3

MOVEMENT SUMMARY

 **Site: 2019AM3 + Development**

MIDLANDS ROAD / EAGLE ROAD

Stop (All-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: MIDLANDS ROAD											
1	L2	181	0,0	0,921	108,3	LOS F	10,1	71,0	1,00	2,25	21,7
2	T1	63	0,0	0,355	26,2	LOS D	1,5	10,6	1,00	1,35	42,1
Approach		244	0,0	0,921	87,1	LOS F	10,1	71,0	1,00	2,01	24,7
North: MIDLANDS ROAD											
8	T1	16	0,0	0,109	21,8	LOS C	0,4	2,7	0,96	1,26	44,2
9	R2	12	0,0	0,109	21,6	LOS C	0,4	2,7	0,96	1,26	44,0
Approach		27	0,0	0,109	21,7	LOS C	0,4	2,7	0,96	1,26	44,1
West: EAGLE ROAD											
10	L2	63	0,0	0,394	12,1	LOS B	1,5	10,5	0,64	1,37	49,9
12	R2	319	0,0	0,394	11,9	LOS B	1,5	10,5	0,64	1,37	49,7
Approach		383	0,0	0,394	11,9	LOS B	1,5	10,5	0,64	1,37	49,7
All Vehicles		654	0,0	0,921	40,4	LOS E	10,1	71,0	0,79	1,61	36,0

MOVEMENT SUMMARY

 Site: 2019PM3 + Development

MIDLANDS ROAD / EAGLE ROAD

Stop (All-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: MIDLANDS ROAD											
1	L2	310	0,0	1,016	123,6	LOS F	17,7	123,7	1,00	3,11	19,9
2	T1	43	0,0	0,150	14,0	LOS B	0,5	3,7	0,95	1,27	48,9
Approach		353	0,0	1,016	110,2	LOS F	17,7	123,7	0,99	2,89	21,4
North: MIDLANDS ROAD											
8	T1	12	0,0	0,047	14,6	LOS B	0,2	1,1	0,85	1,25	48,3
9	R2	8	0,0	0,047	14,4	LOS B	0,2	1,1	0,85	1,25	48,1
Approach		20	0,0	0,047	14,5	LOS B	0,2	1,1	0,85	1,25	48,2
West: EAGLE ROAD											
10	L2	32	0,0	0,263	12,1	LOS B	0,9	6,3	0,69	1,31	50,0
12	R2	179	0,0	0,263	11,8	LOS B	0,9	6,3	0,69	1,31	49,8
Approach		211	0,0	0,263	11,9	LOS B	0,9	6,3	0,69	1,31	49,8
All Vehicles		584	0,0	1,016	71,4	LOS F	17,7	123,7	0,88	2,26	27,6

MOVEMENT SUMMARY

STOP Site: 2024AM3 + Development

MIDLANDS ROAD / EAGLE ROAD
Stop (All-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: MIDLANDS ROAD											
1	L2	181	0,0	0,876	89,0	LOS F	8,7	60,7	1,00	2,10	24,5
2	T1	73	0,0	0,387	26,7	LOS D	1,7	11,9	1,00	1,36	41,8
Approach		254	0,0	0,876	71,1	LOS F	8,7	60,7	1,00	1,89	27,7
North: MIDLANDS ROAD											
8	T1	18	0,0	0,118	21,8	LOS C	0,4	2,9	0,96	1,26	44,2
9	R2	12	0,0	0,118	21,6	LOS C	0,4	2,9	0,96	1,26	44,0
Approach		30	0,0	0,118	21,7	LOS C	0,4	2,9	0,96	1,26	44,1
West: EAGLE ROAD											
10	L2	63	0,0	0,401	12,3	LOS B	1,6	10,9	0,66	1,38	49,8
12	R2	319	0,0	0,401	12,1	LOS B	1,6	10,9	0,66	1,38	49,6
Approach		383	0,0	0,401	12,1	LOS B	1,6	10,9	0,66	1,38	49,6
All Vehicles		666	0,0	0,876	35,0	LOS E	8,7	60,7	0,80	1,57	38,0

MOVEMENT SUMMARY

 Site: 2024PM3 + Development

MIDLANDS ROAD / EAGLE ROAD

Stop (All-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: MIDLANDS ROAD											
1	L2	310	0,0	0,992	110,1	LOS F	16,1	112,4	1,00	2,95	21,4
2	T1	50	0,0	0,169	14,1	LOS B	0,6	4,2	0,95	1,28	48,8
Approach		360	0,0	0,992	96,8	LOS F	16,1	112,4	0,99	2,72	23,2
North: MIDLANDS ROAD											
8	T1	13	0,0	0,051	14,6	LOS B	0,2	1,1	0,85	1,25	48,3
9	R2	8	0,0	0,051	14,4	LOS B	0,2	1,1	0,85	1,25	48,1
Approach		22	0,0	0,051	14,5	LOS B	0,2	1,1	0,85	1,25	48,2
West: EAGLE ROAD											
10	L2	32	0,0	0,266	12,2	LOS B	0,9	6,4	0,70	1,31	49,9
12	R2	179	0,0	0,266	11,9	LOS B	0,9	6,4	0,70	1,31	49,7
Approach		211	0,0	0,266	12,0	LOS B	0,9	6,4	0,70	1,31	49,7
All Vehicles		592	0,0	0,992	63,6	LOS F	16,1	112,4	0,88	2,16	29,3

Annexure B

TRIP GENERATION CALCULATIONS

TRIP GENERATION TABLE: Lethabo Park Kimberley

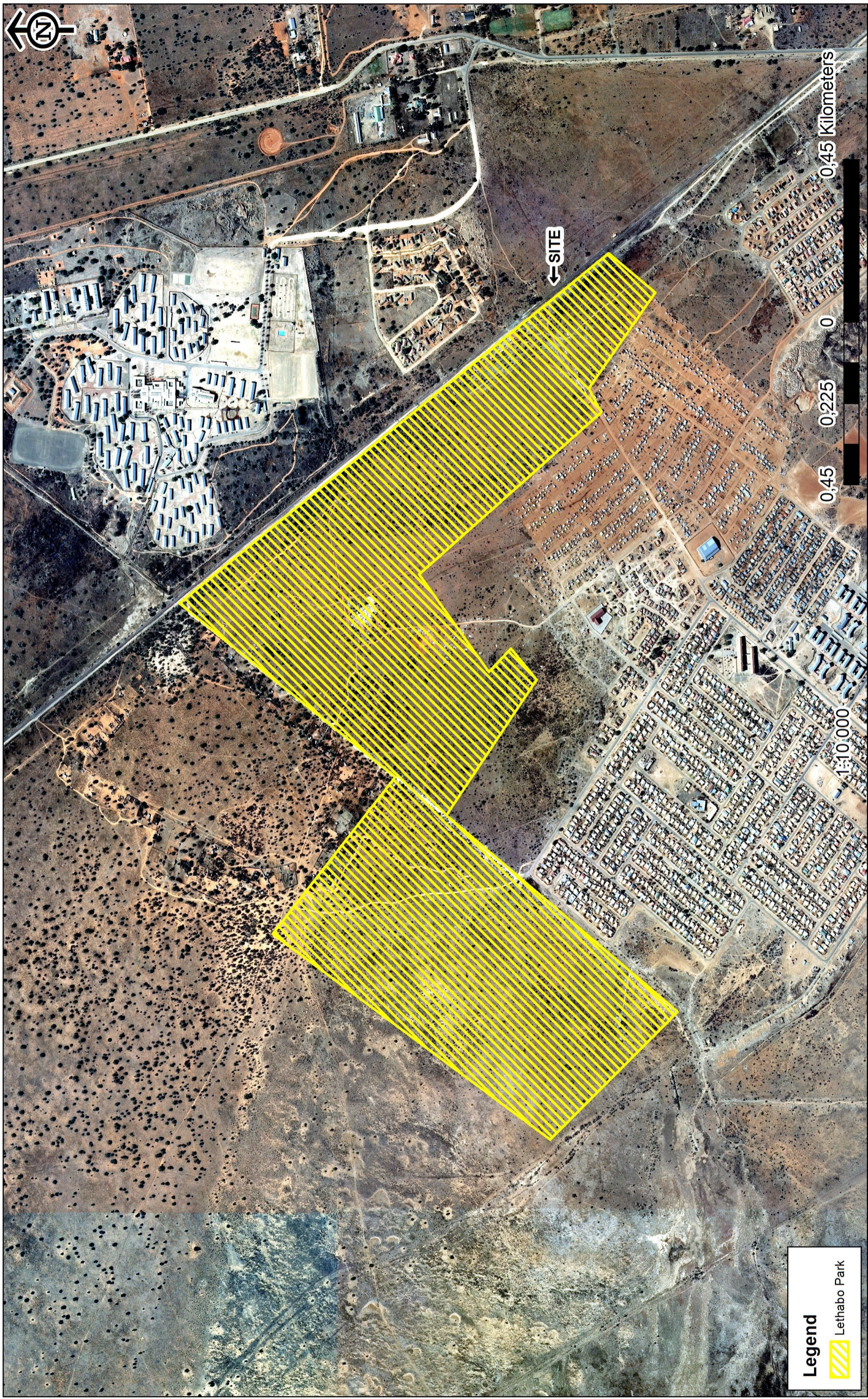
PROJECT NO: TRAF 1439

TMH17: Ver 1.01 September 2013
AM PEAK HOUR

Land-Use	Extent Phase 1	Unit	Trip Rate	Total Trips Phase 1	% Reduction Very Low Vehicle Ownership	AM Split (%)		Phase 1	
						In	Out	AM Trips (vph)	AM Total (vph)
Single Dwelling Units	1 711	D/Unit	1.00	1 711	70%	25%	75%	128	385
Totals				1 711				128	385

PM PEAK HOUR

Land-Use	Extent Phase 1	Unit	Trip Rate	Total Trips Phase 1	% Reduction Very Low Vehicle Ownership	PM Split (%)		Phase 1	
						In	Out	PM Trips (vph)	PM Total (vph)
Single Dwelling Units	1 711	D/Unit	1.00	1 711	70%	70%	30%	359	154
Totals				1 711				359	154



Project:

Lethabo Park, Kimberley

route **2**
transport strategies

Figure:

Site Location

No.

1

MOVEMENT SUMMARY

 Site: 2019AM1

BARKLEY ROAD / UNKNOWN ROAD
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			
East: BARKLEY ROAD											
5	T1	77	0,0	0,079	0,1	LOS A	0,3	2,3	0,13	0,26	57,1
6	R2	65	0,0	0,079	5,6	LOS A	0,3	2,3	0,13	0,26	55,1
Approach		142	0,0	0,079	2,7	NA	0,3	2,3	0,13	0,26	56,2
North: UNKNOWN ROAD											
7	L2	100	0,0	0,085	8,2	LOS A	0,3	2,4	0,14	0,91	51,8
9	R2	12	0,0	0,085	8,4	LOS A	0,3	2,4	0,14	0,91	51,3
Approach		112	0,0	0,085	8,2	LOS A	0,3	2,4	0,14	0,91	51,7
West: BARKLEY ROAD											
10	L2	7	0,0	0,033	5,5	LOS A	0,0	0,0	0,00	0,07	57,8
11	T1	56	0,0	0,033	0,0	LOS A	0,0	0,0	0,00	0,07	59,4
Approach		63	0,0	0,033	0,6	NA	0,0	0,0	0,00	0,07	59,2
All Vehicles		317	0,0	0,085	4,2	NA	0,3	2,4	0,11	0,45	55,1

MOVEMENT SUMMARY

 Site: 2019PM1

BARKLEY ROAD / UNKNOWN ROAD
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			
East: BARKLEY ROAD											
5	T1	87	0,0	0,086	0,1	LOS A	0,4	2,5	0,14	0,25	57,2
6	R2	68	0,0	0,086	5,7	LOS A	0,4	2,5	0,14	0,25	55,2
Approach		156	0,0	0,086	2,6	NA	0,4	2,5	0,14	0,25	56,3
North: UNKNOWN ROAD											
7	L2	57	0,0	0,045	8,2	LOS A	0,2	1,2	0,15	0,90	51,8
9	R2	3	0,0	0,045	8,4	LOS A	0,2	1,2	0,15	0,90	51,3
Approach		60	0,0	0,045	8,2	LOS A	0,2	1,2	0,15	0,90	51,7
West: BARKLEY ROAD											
10	L2	7	0,0	0,036	5,5	LOS A	0,0	0,0	0,00	0,06	57,8
11	T1	62	0,0	0,036	0,0	LOS A	0,0	0,0	0,00	0,06	59,4
Approach		69	0,0	0,036	0,6	NA	0,0	0,0	0,00	0,06	59,2
All Vehicles		285	0,0	0,086	3,3	NA	0,4	2,5	0,11	0,34	55,9

MOVEMENT SUMMARY

STOP Site: 2019AM1 + Development

BARKLEY ROAD / UNKNOWN ROAD
Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	ODMo v	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
		Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m		per veh	km/h
East: BARKLEY ROAD											
5	T1	77	0,0	0,080	0,2	LOS A	0,3	2,3	0,16	0,26	57,0
6	R2	65	0,0	0,080	5,7	LOS A	0,3	2,3	0,16	0,26	55,0
Approach		142	0,0	0,080	2,7	NA	0,3	2,3	0,16	0,26	56,1
North: UNKNOWN ROAD											
7	L2	100	0,0	0,171	8,2	LOS A	0,7	4,8	0,17	0,92	51,7
9	R2	93	0,0	0,171	8,6	LOS A	0,7	4,8	0,17	0,92	51,2
Approach		193	0,0	0,171	8,4	LOS A	0,7	4,8	0,17	0,92	51,5
West: BARKLEY ROAD											
10	L2	35	0,0	0,047	5,5	LOS A	0,0	0,0	0,00	0,23	56,4
11	T1	56	0,0	0,047	0,0	LOS A	0,0	0,0	0,00	0,23	58,0
Approach		91	0,0	0,047	2,1	NA	0,0	0,0	0,00	0,23	57,4
All Vehicles		425	0,0	0,171	5,2	NA	0,7	4,8	0,13	0,55	54,1

MOVEMENT SUMMARY

STOP Site: 2019PM1 + Development

BARKLEY ROAD / UNKNOWN ROAD
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			
East: BARKLEY ROAD											
5	T1	87	0,0	0,089	0,3	LOS A	0,4	2,6	0,21	0,26	56,9
6	R2	68	0,0	0,089	5,9	LOS A	0,4	2,6	0,21	0,26	54,9
Approach		156	0,0	0,089	2,8	NA	0,4	2,6	0,21	0,26	56,0
North: UNKNOWN ROAD											
7	L2	57	0,0	0,082	8,2	LOS A	0,3	2,1	0,16	0,92	51,7
9	R2	36	0,0	0,082	8,7	LOS A	0,3	2,1	0,16	0,92	51,2
Approach		93	0,0	0,082	8,4	LOS A	0,3	2,1	0,16	0,92	51,5
West: BARKLEY ROAD											
10	L2	83	0,0	0,077	5,5	LOS A	0,0	0,0	0,00	0,34	55,5
11	T1	62	0,0	0,077	0,0	LOS A	0,0	0,0	0,00	0,34	57,0
Approach		145	0,0	0,077	3,2	NA	0,0	0,0	0,00	0,34	56,2
All Vehicles		394	0,0	0,089	4,2	NA	0,4	2,6	0,12	0,44	54,9

MOVEMENT SUMMARY

STOP Site: 2024AM1 + Development

BARKLEY ROAD / UNKNOWN ROAD
 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			
East: BARKLEY ROAD											
5	T1	88	0,0	0,086	0,2	LOS A	0,3	2,4	0,17	0,25	57,2
6	R2	65	0,0	0,086	5,7	LOS A	0,3	2,4	0,17	0,25	55,1
Approach		154	0,0	0,086	2,6	NA	0,3	2,4	0,17	0,25	56,3
North: UNKNOWN ROAD											
7	L2	100	0,0	0,174	8,3	LOS A	0,7	4,8	0,19	0,91	51,7
9	R2	93	0,0	0,174	8,7	LOS A	0,7	4,8	0,19	0,91	51,2
Approach		193	0,0	0,174	8,5	LOS A	0,7	4,8	0,19	0,91	51,4
West: BARKLEY ROAD											
10	L2	35	0,0	0,052	5,5	LOS A	0,0	0,0	0,00	0,21	56,6
11	T1	64	0,0	0,052	0,0	LOS A	0,0	0,0	0,00	0,21	58,1
Approach		99	0,0	0,052	2,0	NA	0,0	0,0	0,00	0,21	57,6
All Vehicles		445	0,0	0,174	5,0	NA	0,7	4,8	0,14	0,53	54,3

MOVEMENT SUMMARY

STOP Site: 2024PM1 + Development

BARKLEY ROAD / UNKNOWN ROAD
 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			
East: BARKLEY ROAD											
5	T1	100	0,0	0,096	0,3	LOS A	0,4	2,7	0,21	0,24	57,1
6	R2	68	0,0	0,096	5,9	LOS A	0,4	2,7	0,21	0,24	55,1
Approach		169	0,0	0,096	2,6	NA	0,4	2,7	0,21	0,24	56,3
North: UNKNOWN ROAD											
7	L2	57	0,0	0,083	8,3	LOS A	0,3	2,2	0,18	0,91	51,6
9	R2	36	0,0	0,083	8,8	LOS A	0,3	2,2	0,18	0,91	51,2
Approach		93	0,0	0,083	8,5	LOS A	0,3	2,2	0,18	0,91	51,5
West: BARKLEY ROAD											
10	L2	83	0,0	0,081	5,5	LOS A	0,0	0,0	0,00	0,32	55,7
11	T1	71	0,0	0,081	0,0	LOS A	0,0	0,0	0,00	0,32	57,2
Approach		155	0,0	0,081	3,0	NA	0,0	0,0	0,00	0,32	56,4
All Vehicles		416	0,0	0,096	4,1	NA	0,4	2,7	0,13	0,42	55,2

MOVEMENT SUMMARY

 Site: 2019AM2

BARKLEY ROAD / MIDLANDS ROAD
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			
East: BARKLEY ROAD											
5	T1	236	0,0	0,107	0,1	LOS A	0,5	3,4	0,04	0,05	59,3
6	R2	104	0,0	0,107	6,7	LOS A	0,5	3,4	0,36	0,49	53,3
Approach		340	0,0	0,107	2,1	NA	0,5	3,4	0,14	0,19	57,4
North: MIDLANDS ROAD											
7	L2	205	0,0	0,183	8,4	LOS A	0,8	5,3	0,18	0,90	51,8
9	R2	69	0,0	0,158	14,2	LOS B	0,6	4,1	0,60	1,00	48,1
Approach		275	0,0	0,183	9,9	LOS A	0,8	5,3	0,29	0,92	50,8
West: BARKLEY ROAD											
10	L2	63	0,0	0,069	5,5	LOS A	0,0	0,0	0,00	0,28	56,0
11	T1	203	0,0	0,069	0,0	LOS A	0,0	0,0	0,00	0,10	59,1
Approach		266	0,0	0,069	1,3	NA	0,0	0,0	0,00	0,14	58,3
All Vehicles		881	0,0	0,183	4,3	NA	0,8	5,3	0,14	0,40	55,4

MOVEMENT SUMMARY

STOP Site: 2019PM2

BARKLEY ROAD / MIDLANDS ROAD
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			
East: BARKLEY ROAD											
5	T1	240	0,0	0,123	0,0	LOS A	0,0	0,0	0,00	0,00	60,0
6	R2	261	0,0	0,233	6,8	LOS A	1,1	7,4	0,40	0,63	52,4
Approach		501	0,0	0,233	3,6	NA	1,1	7,4	0,21	0,33	55,8
North: MIDLANDS ROAD											
7	L2	96	0,0	0,088	8,5	LOS A	0,3	2,3	0,21	0,89	51,7
9	R2	175	0,0	0,528	23,3	LOS C	2,8	19,8	0,81	1,13	43,2
Approach		271	0,0	0,528	18,1	LOS C	2,8	19,8	0,60	1,05	45,9
West: BARKLEY ROAD											
10	L2	31	0,0	0,067	5,5	LOS A	0,0	0,0	0,00	0,14	57,2
11	T1	229	0,0	0,067	0,0	LOS A	0,0	0,0	0,00	0,06	59,4
Approach		260	0,0	0,067	0,7	NA	0,0	0,0	0,00	0,07	59,2
All Vehicles		1032	0,0	0,528	6,6	NA	2,8	19,8	0,26	0,45	53,5

MOVEMENT SUMMARY

STOP Site: 2019AM2 + Development

BARKLEY ROAD / MIDLANDS ROAD
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			
East: BARKLEY ROAD											
5	T1	236	0,0	0,121	0,0	LOS A	0,0	0,0	0,00	0,00	60,0
6	R2	213	0,0	0,191	6,8	LOS A	0,8	5,8	0,39	0,62	52,4
Approach		448	0,0	0,191	3,2	NA	0,8	5,8	0,18	0,30	56,1
North: MIDLANDS ROAD											
7	L2	529	0,0	0,472	8,6	LOS A	2,8	19,4	0,26	0,87	51,7
9	R2	69	0,0	0,188	16,3	LOS C	0,7	4,8	0,68	1,00	46,9
Approach		599	0,0	0,472	9,5	LOS A	2,8	19,4	0,31	0,88	51,1
West: BARKLEY ROAD											
10	L2	63	0,0	0,069	5,5	LOS A	0,0	0,0	0,00	0,28	56,0
11	T1	203	0,0	0,069	0,0	LOS A	0,0	0,0	0,00	0,10	59,1
Approach		266	0,0	0,069	1,3	NA	0,0	0,0	0,00	0,14	58,3
All Vehicles		1314	0,0	0,472	5,7	NA	2,8	19,4	0,20	0,53	54,1

MOVEMENT SUMMARY

STOP Site: 2019PM2 + Development

BARKLEY ROAD / MIDLANDS ROAD
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			
East: BARKLEY ROAD											
5	T1	240	0,0	0,123	0,0	LOS A	0,0	0,0	0,00	0,00	60,0
6	R2	563	0,0	0,502	7,9	LOS A	4,0	27,8	0,51	0,72	51,8
Approach		803	0,0	0,502	5,6	NA	4,0	27,8	0,36	0,50	54,0
North: MIDLANDS ROAD											
7	L2	225	0,0	0,207	8,6	LOS A	0,9	6,1	0,23	0,89	51,7
9	R2	175	0,0	1,013	118,8	LOS F	12,4	87,1	1,00	1,89	20,3
Approach		400	0,0	1,013	56,7	LOS F	12,4	87,1	0,57	1,33	30,9
West: BARKLEY ROAD											
10	L2	31	0,0	0,067	5,5	LOS A	0,0	0,0	0,00	0,14	57,2
11	T1	229	0,0	0,067	0,0	LOS A	0,0	0,0	0,00	0,06	59,4
Approach		260	0,0	0,067	0,7	NA	0,0	0,0	0,00	0,07	59,2
All Vehicles		1463	0,0	1,013	18,7	NA	12,4	87,1	0,35	0,65	45,4

MOVEMENT SUMMARY

STOP Site: 2024AM2 + Development

BARKLEY ROAD / MIDLANDS ROAD
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			
East: BARKLEY ROAD											
5	T1	271	0,0	0,139	0,0	LOS A	0,0	0,0	0,00	0,00	60,0
6	R2	213	0,0	0,197	7,0	LOS A	0,9	6,0	0,41	0,64	52,3
Approach		484	0,0	0,197	3,1	NA	0,9	6,0	0,18	0,28	56,3
North: MIDLANDS ROAD											
7	L2	529	0,0	0,480	8,7	LOS A	2,8	19,7	0,29	0,86	51,7
9	R2	69	0,0	0,211	18,1	LOS C	0,8	5,5	0,72	1,01	45,9
Approach		599	0,0	0,480	9,8	LOS A	2,8	19,7	0,34	0,88	50,9
West: BARKLEY ROAD											
10	L2	63	0,0	0,077	5,5	LOS A	0,0	0,0	0,00	0,25	56,2
11	T1	234	0,0	0,077	0,0	LOS A	0,0	0,0	0,00	0,09	59,2
Approach		297	0,0	0,077	1,2	NA	0,0	0,0	0,00	0,13	58,5
All Vehicles		1380	0,0	0,480	5,6	NA	2,8	19,7	0,21	0,51	54,3

MOVEMENT SUMMARY

STOP Site: 2024PM2 + Development

BARKLEY ROAD / MIDLANDS ROAD
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			
East: BARKLEY ROAD											
5	T1	276	0,0	0,142	0,0	LOS A	0,0	0,0	0,00	0,00	60,0
6	R2	563	0,0	0,521	8,4	LOS A	4,3	30,1	0,55	0,77	51,4
Approach		839	0,0	0,521	5,7	NA	4,3	30,1	0,37	0,51	54,0
North: MIDLANDS ROAD											
7	L2	225	0,0	0,211	8,7	LOS A	0,9	6,2	0,26	0,89	51,7
9	R2	105	0,0	0,697	53,3	LOS F	3,3	23,1	0,95	1,18	31,9
Approach		330	0,0	0,697	22,8	LOS C	3,3	23,1	0,48	0,98	43,2
West: BARKLEY ROAD											
10	L2	31	0,0	0,076	5,5	LOS A	0,0	0,0	0,00	0,12	57,3
11	T1	264	0,0	0,076	0,0	LOS A	0,0	0,0	0,00	0,05	59,5
Approach		294	0,0	0,076	0,6	NA	0,0	0,0	0,00	0,06	59,3
All Vehicles		1464	0,0	0,697	8,5	NA	4,3	30,1	0,32	0,53	52,0

MOVEMENT SUMMARY

 Site: 2019AM3

MIDLANDS ROAD / EAGLE ROAD
Stop (All-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: MIDLANDS ROAD											
1	L2	73	0,0	0,528	47,3	LOS E	2,7	18,8	1,00	1,45	33,9
2	T1	63	0,0	0,517	49,1	LOS E	2,6	18,2	1,00	1,44	33,3
Approach		136	0,0	0,528	48,2	LOS E	2,7	18,8	1,00	1,45	33,6
North: MIDLANDS ROAD											
8	T1	16	0,0	0,205	39,5	LOS E	0,8	5,5	1,00	1,28	36,4
9	R2	12	0,0	0,205	39,3	LOS E	0,8	5,5	1,00	1,28	36,3
Approach		27	0,0	0,205	39,4	LOS E	0,8	5,5	1,00	1,28	36,3
West: EAGLE ROAD											
10	L2	63	0,0	0,374	11,7	LOS B	1,4	9,6	0,61	1,36	50,1
12	R2	315	0,0	0,374	11,5	LOS B	1,4	9,6	0,61	1,36	49,9
Approach		378	0,0	0,374	11,5	LOS B	1,4	9,6	0,61	1,36	50,0
All Vehicles		541	0,0	0,528	22,1	LOS C	2,7	18,8	0,73	1,38	43,8

MOVEMENT SUMMARY

 Site: 2019PM3

MIDLANDS ROAD / EAGLE ROAD
Stop (All-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: MIDLANDS ROAD											
1	L2	159	0,0	0,773	63,3	LOS F	6,0	41,8	1,00	1,81	29,5
2	T1	43	0,0	0,230	20,5	LOS C	0,9	6,2	1,00	1,29	45,0
Approach		202	0,0	0,773	54,1	LOS F	6,0	41,8	1,00	1,70	31,9
North: MIDLANDS ROAD											
8	T1	12	0,0	0,076	20,4	LOS C	0,3	1,8	0,95	1,25	44,9
9	R2	8	0,0	0,076	20,2	LOS C	0,3	1,8	0,95	1,25	44,8
Approach		20	0,0	0,076	20,3	LOS C	0,3	1,8	0,95	1,25	44,9
West: EAGLE ROAD											
10	L2	32	0,0	0,277	11,3	LOS B	0,9	6,4	0,61	1,31	50,4
12	R2	229	0,0	0,277	11,0	LOS B	0,9	6,4	0,61	1,31	50,2
Approach		261	0,0	0,277	11,1	LOS B	0,9	6,4	0,61	1,31	50,2
All Vehicles		483	0,0	0,773	29,5	LOS D	6,0	41,8	0,79	1,47	40,3

MOVEMENT SUMMARY

 **Site: 2019AM3 + Development**

MIDLANDS ROAD / EAGLE ROAD

Stop (All-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: MIDLANDS ROAD											
1	L2	181	0,0	0,921	108,3	LOS F	10,1	71,0	1,00	2,25	21,7
2	T1	63	0,0	0,355	26,2	LOS D	1,5	10,6	1,00	1,35	42,1
Approach		244	0,0	0,921	87,1	LOS F	10,1	71,0	1,00	2,01	24,7
North: MIDLANDS ROAD											
8	T1	16	0,0	0,109	21,8	LOS C	0,4	2,7	0,96	1,26	44,2
9	R2	12	0,0	0,109	21,6	LOS C	0,4	2,7	0,96	1,26	44,0
Approach		27	0,0	0,109	21,7	LOS C	0,4	2,7	0,96	1,26	44,1
West: EAGLE ROAD											
10	L2	63	0,0	0,394	12,1	LOS B	1,5	10,5	0,64	1,37	49,9
12	R2	319	0,0	0,394	11,9	LOS B	1,5	10,5	0,64	1,37	49,7
Approach		383	0,0	0,394	11,9	LOS B	1,5	10,5	0,64	1,37	49,7
All Vehicles		654	0,0	0,921	40,4	LOS E	10,1	71,0	0,79	1,61	36,0

MOVEMENT SUMMARY

 Site: 2019PM3 + Development

MIDLANDS ROAD / EAGLE ROAD

Stop (All-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: MIDLANDS ROAD											
1	L2	310	0,0	1,016	123,6	LOS F	17,7	123,7	1,00	3,11	19,9
2	T1	43	0,0	0,150	14,0	LOS B	0,5	3,7	0,95	1,27	48,9
Approach		353	0,0	1,016	110,2	LOS F	17,7	123,7	0,99	2,89	21,4
North: MIDLANDS ROAD											
8	T1	12	0,0	0,047	14,6	LOS B	0,2	1,1	0,85	1,25	48,3
9	R2	8	0,0	0,047	14,4	LOS B	0,2	1,1	0,85	1,25	48,1
Approach		20	0,0	0,047	14,5	LOS B	0,2	1,1	0,85	1,25	48,2
West: EAGLE ROAD											
10	L2	32	0,0	0,263	12,1	LOS B	0,9	6,3	0,69	1,31	50,0
12	R2	179	0,0	0,263	11,8	LOS B	0,9	6,3	0,69	1,31	49,8
Approach		211	0,0	0,263	11,9	LOS B	0,9	6,3	0,69	1,31	49,8
All Vehicles		584	0,0	1,016	71,4	LOS F	17,7	123,7	0,88	2,26	27,6

MOVEMENT SUMMARY

STOP Site: 2024AM3 + Development

MIDLANDS ROAD / EAGLE ROAD
Stop (All-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: MIDLANDS ROAD											
1	L2	181	0,0	0,876	89,0	LOS F	8,7	60,7	1,00	2,10	24,5
2	T1	73	0,0	0,387	26,7	LOS D	1,7	11,9	1,00	1,36	41,8
Approach		254	0,0	0,876	71,1	LOS F	8,7	60,7	1,00	1,89	27,7
North: MIDLANDS ROAD											
8	T1	18	0,0	0,118	21,8	LOS C	0,4	2,9	0,96	1,26	44,2
9	R2	12	0,0	0,118	21,6	LOS C	0,4	2,9	0,96	1,26	44,0
Approach		30	0,0	0,118	21,7	LOS C	0,4	2,9	0,96	1,26	44,1
West: EAGLE ROAD											
10	L2	63	0,0	0,401	12,3	LOS B	1,6	10,9	0,66	1,38	49,8
12	R2	319	0,0	0,401	12,1	LOS B	1,6	10,9	0,66	1,38	49,6
Approach		383	0,0	0,401	12,1	LOS B	1,6	10,9	0,66	1,38	49,6
All Vehicles		666	0,0	0,876	35,0	LOS E	8,7	60,7	0,80	1,57	38,0

MOVEMENT SUMMARY

 Site: 2024PM3 + Development

MIDLANDS ROAD / EAGLE ROAD
Stop (All-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: MIDLANDS ROAD											
1	L2	310	0,0	0,992	110,1	LOS F	16,1	112,4	1,00	2,95	21,4
2	T1	50	0,0	0,169	14,1	LOS B	0,6	4,2	0,95	1,28	48,8
Approach		360	0,0	0,992	96,8	LOS F	16,1	112,4	0,99	2,72	23,2
North: MIDLANDS ROAD											
8	T1	13	0,0	0,051	14,6	LOS B	0,2	1,1	0,85	1,25	48,3
9	R2	8	0,0	0,051	14,4	LOS B	0,2	1,1	0,85	1,25	48,1
Approach		22	0,0	0,051	14,5	LOS B	0,2	1,1	0,85	1,25	48,2
West: EAGLE ROAD											
10	L2	32	0,0	0,266	12,2	LOS B	0,9	6,4	0,70	1,31	49,9
12	R2	179	0,0	0,266	11,9	LOS B	0,9	6,4	0,70	1,31	49,7
Approach		211	0,0	0,266	12,0	LOS B	0,9	6,4	0,70	1,31	49,7
All Vehicles		592	0,0	0,992	63,6	LOS F	16,1	112,4	0,88	2,16	29,3

TRIP GENERATION TABLE: Lethabo Park Kimberley

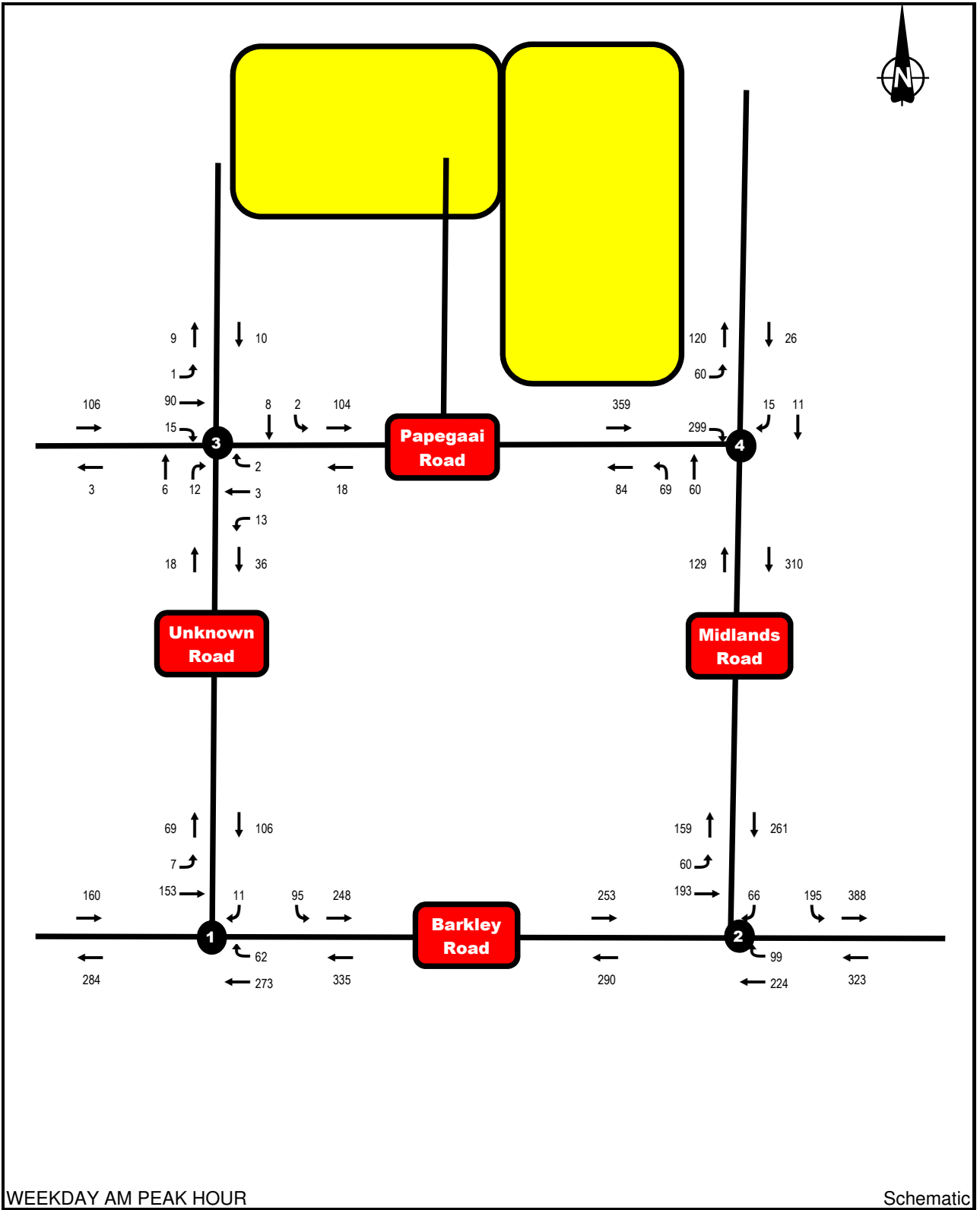
PROJECT NO: TRAF 1439

TMH17: Ver 1.01 September 2013
AM PEAK HOUR

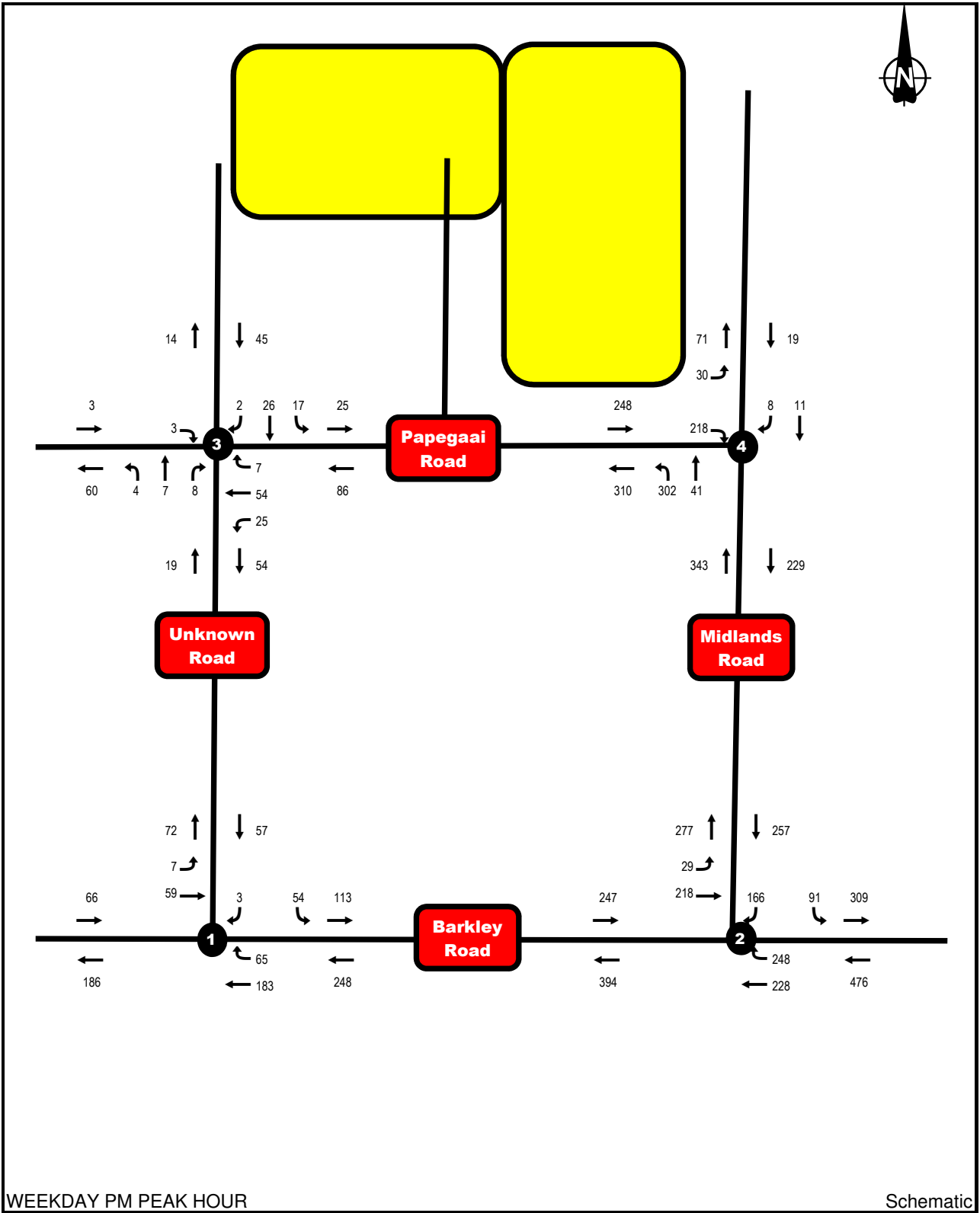
Land-Use	Extent Phase 1	Unit	Trip Rate	Total Trips Phase 1	% Reduction Very Low Vehicle Ownership	AM Split (%)		Phase 1	
						In	Out	AM Trips (vph)	AM Total (vph)
Single Dwelling Units	1 711 D/Unit		1.00 1 D/Unit	1 711	70%	25%	75%	128	385
Totals				1 711				128	385
									513

PM PEAK HOUR

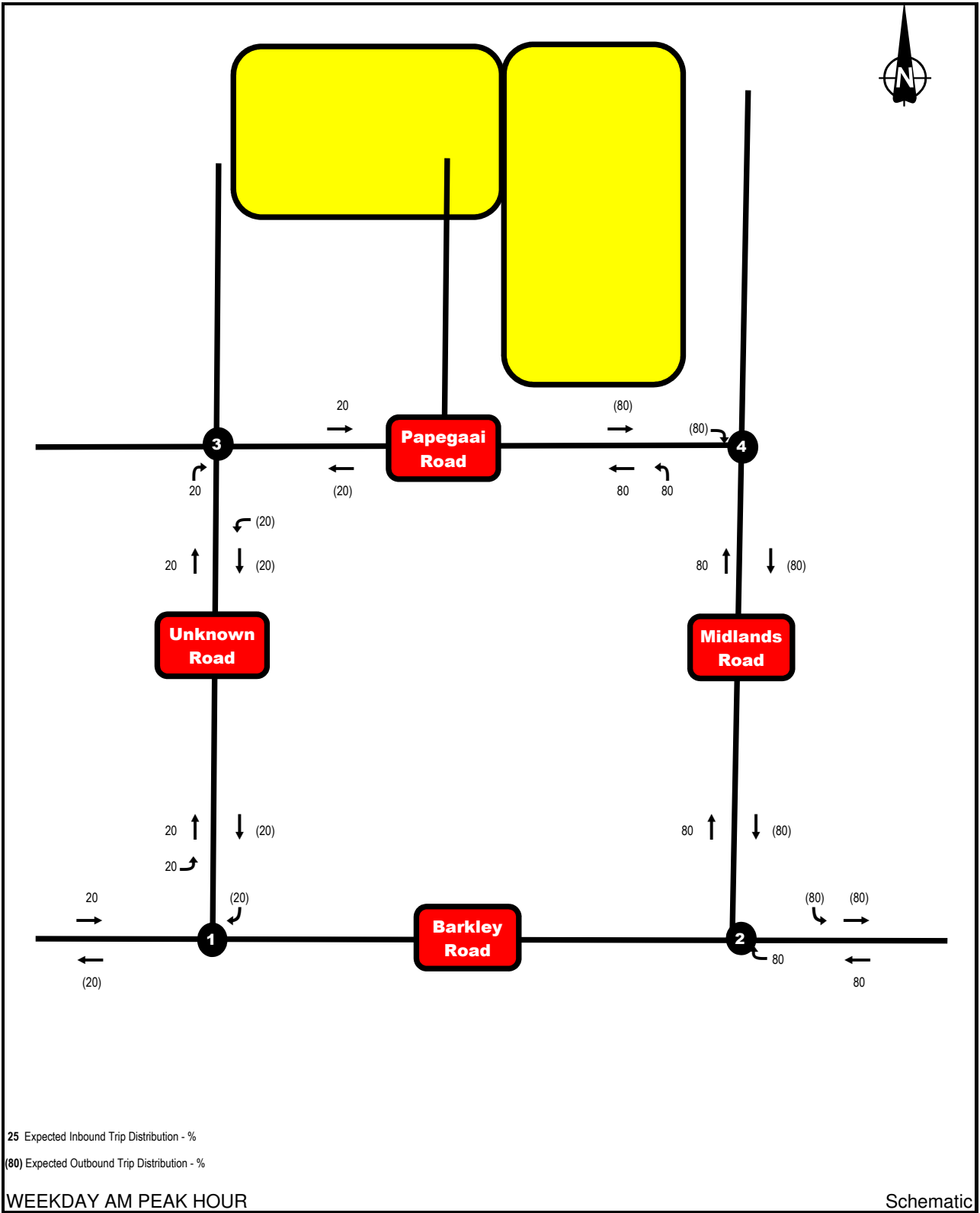
Land-Use	Extent Phase 1	Unit	Trip Rate	Total Trips Phase 1	% Reduction Very Low Vehicle Ownership	PM Split (%)		Phase 1	
						In	Out	PM Trips (vph)	PM Total (vph)
Single Dwelling Units	1 711 D/Unit		1.00 1 D/Unit	1 711	70%	70%	30%	359	154
Totals				1 711				359	154
									513



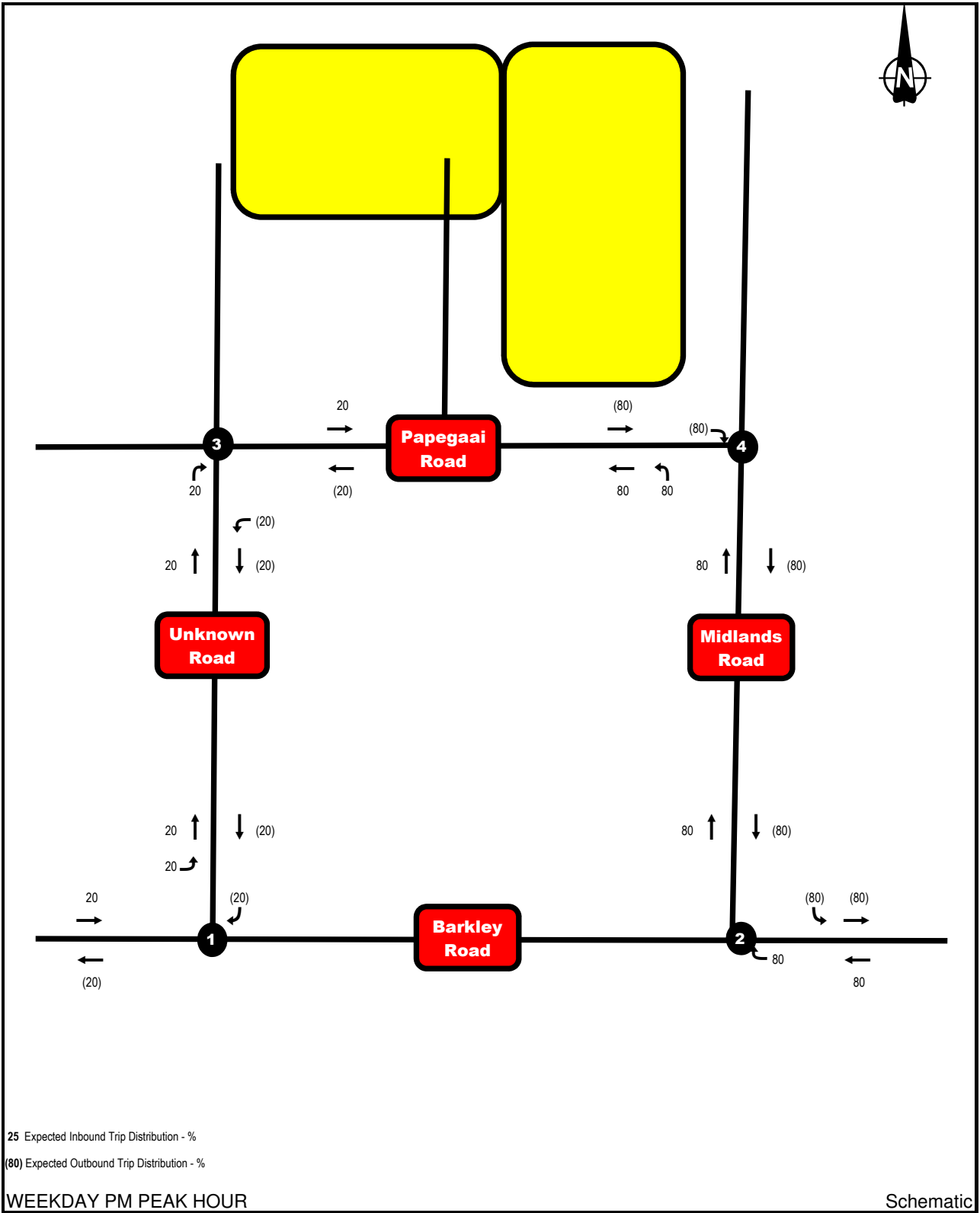
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	Present Traffic Demand (2019)	Fig: 2



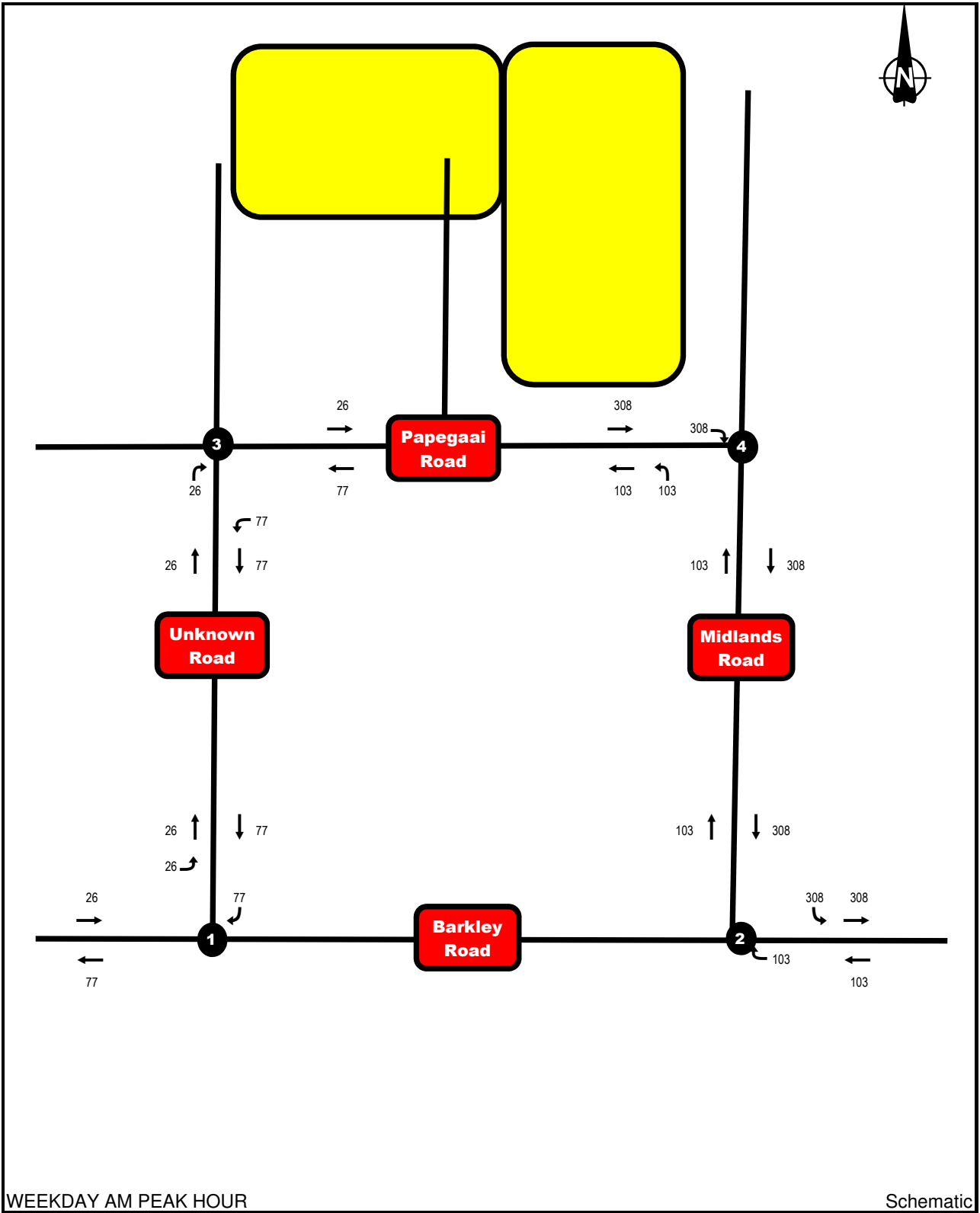
	Lethabo Park Kimberley	Job Ref No: TRAF 1439
	Present Traffic Demand (2019)	Fig: 3



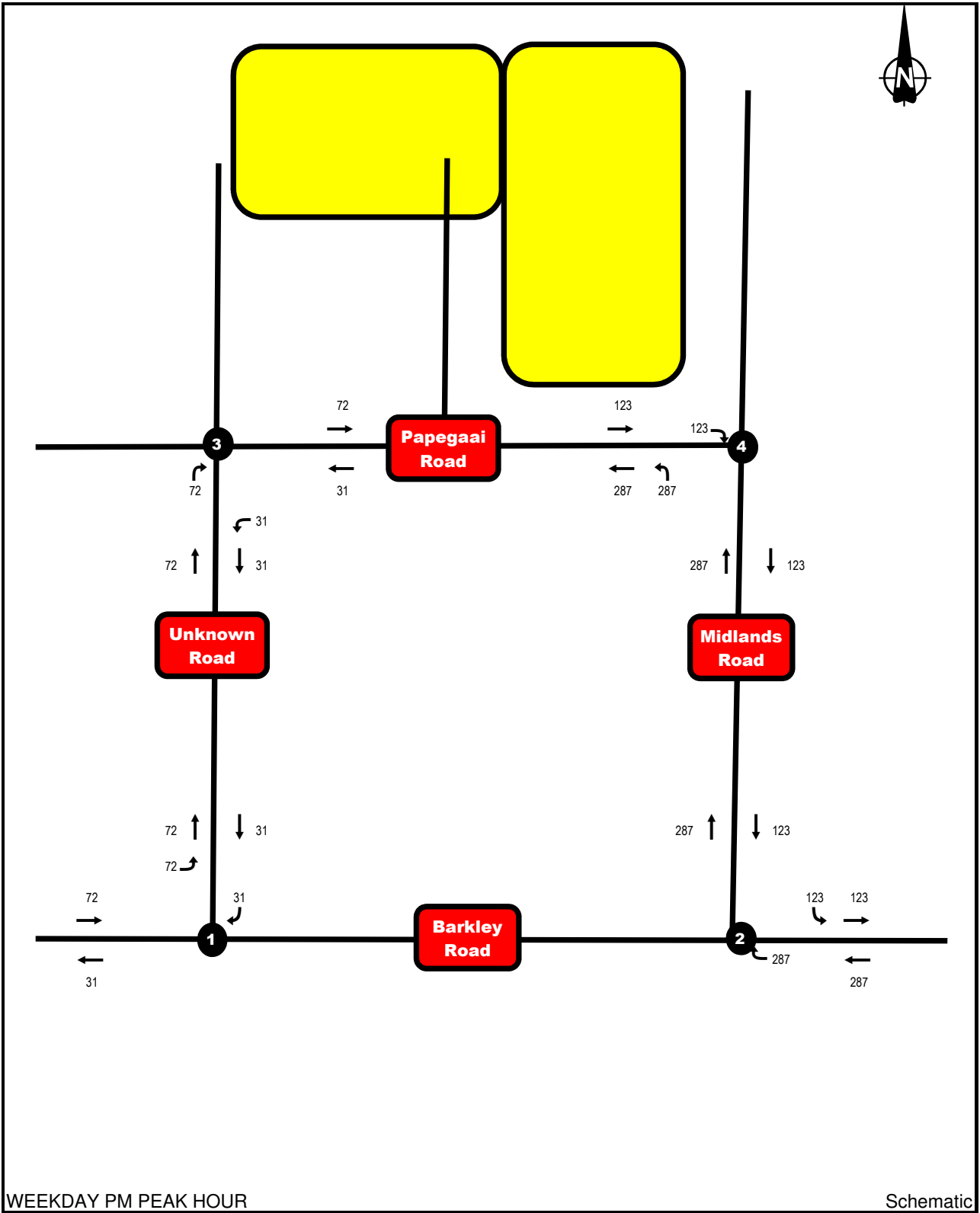
	Lethabo Park Kimberley	Job Ref No: TRAF 1439
	Expected Trip Distribution	Fig: 4



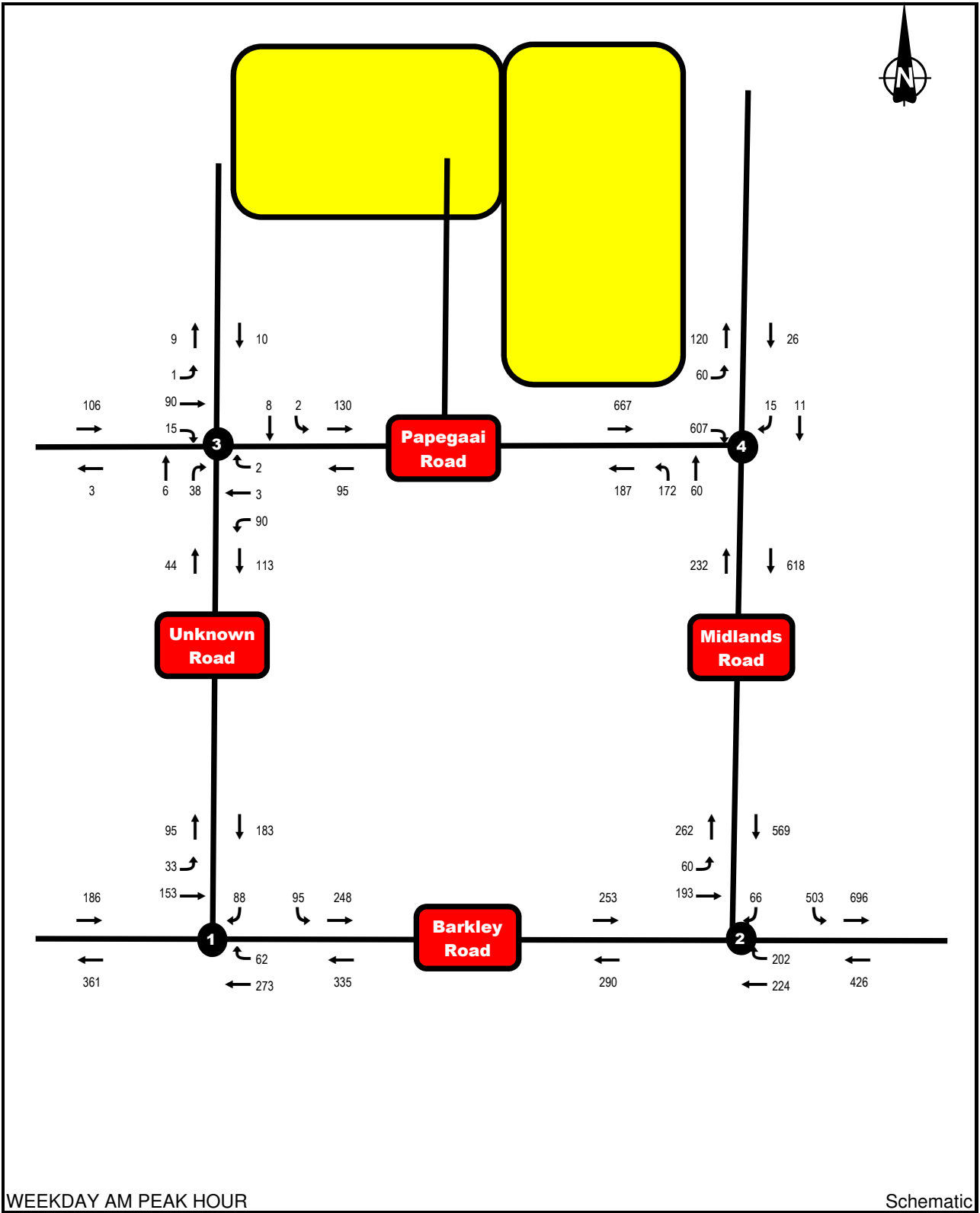
	Lethabo Park Kimberley	Job Ref No: TRAF 1439
	Expected Trip Distribution	Fig: 5



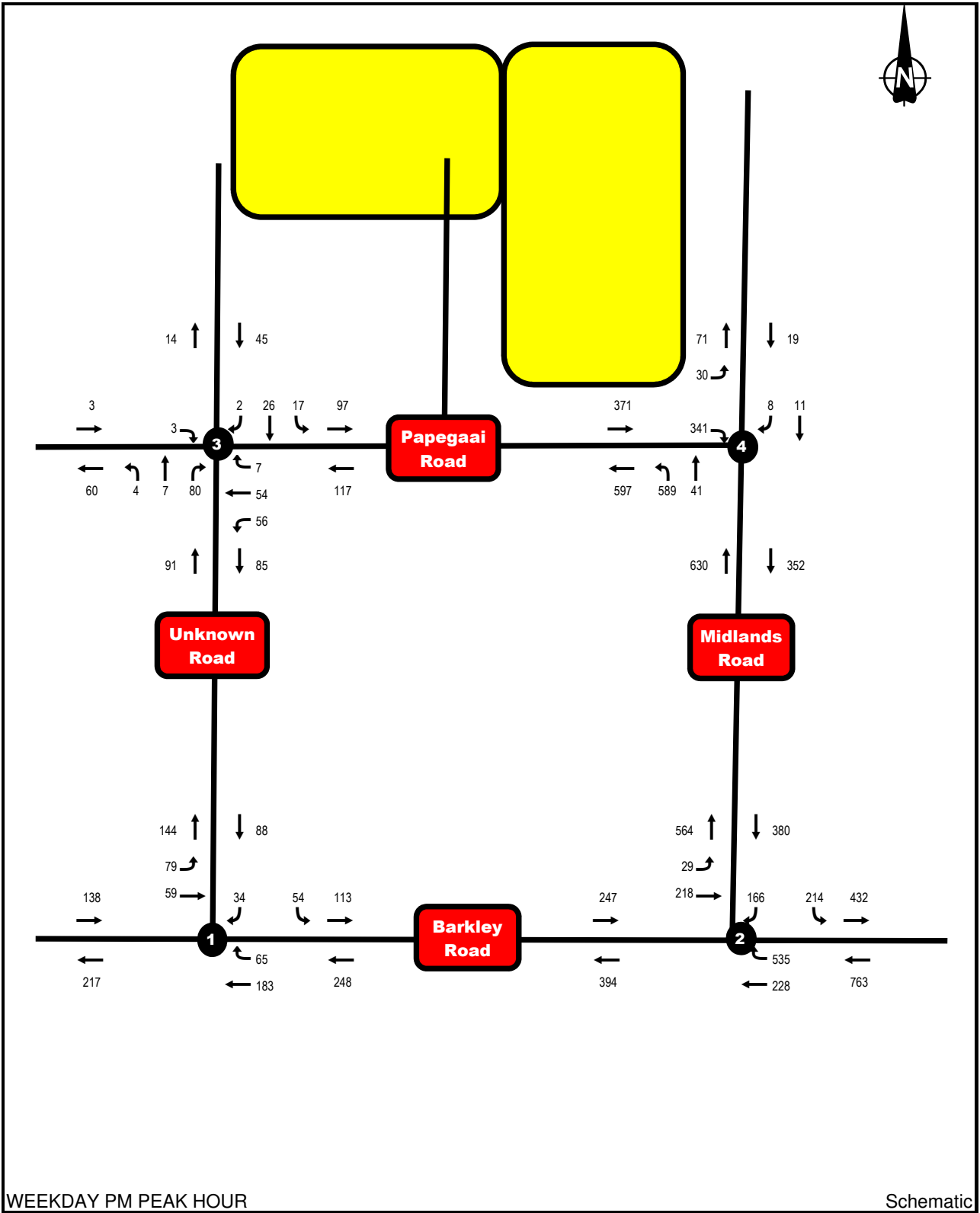
	Lethabo Park Kimberley	Job Ref No: TRAF 1439
	Development Traffic	Fig: 6



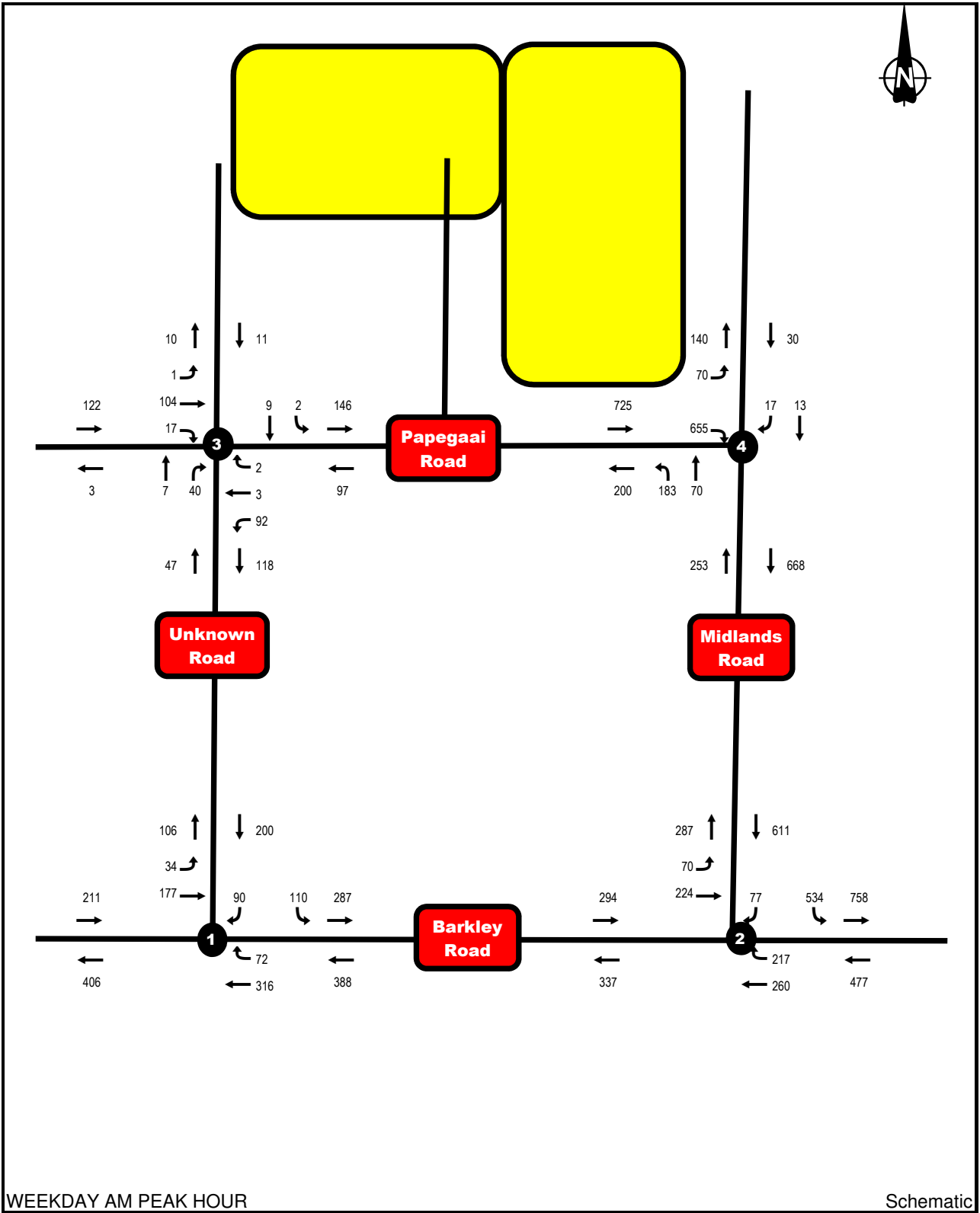
	Lethabo Park Kimberley	Job Ref No: TRAF 1439
	Development Traffic	Fig: 7



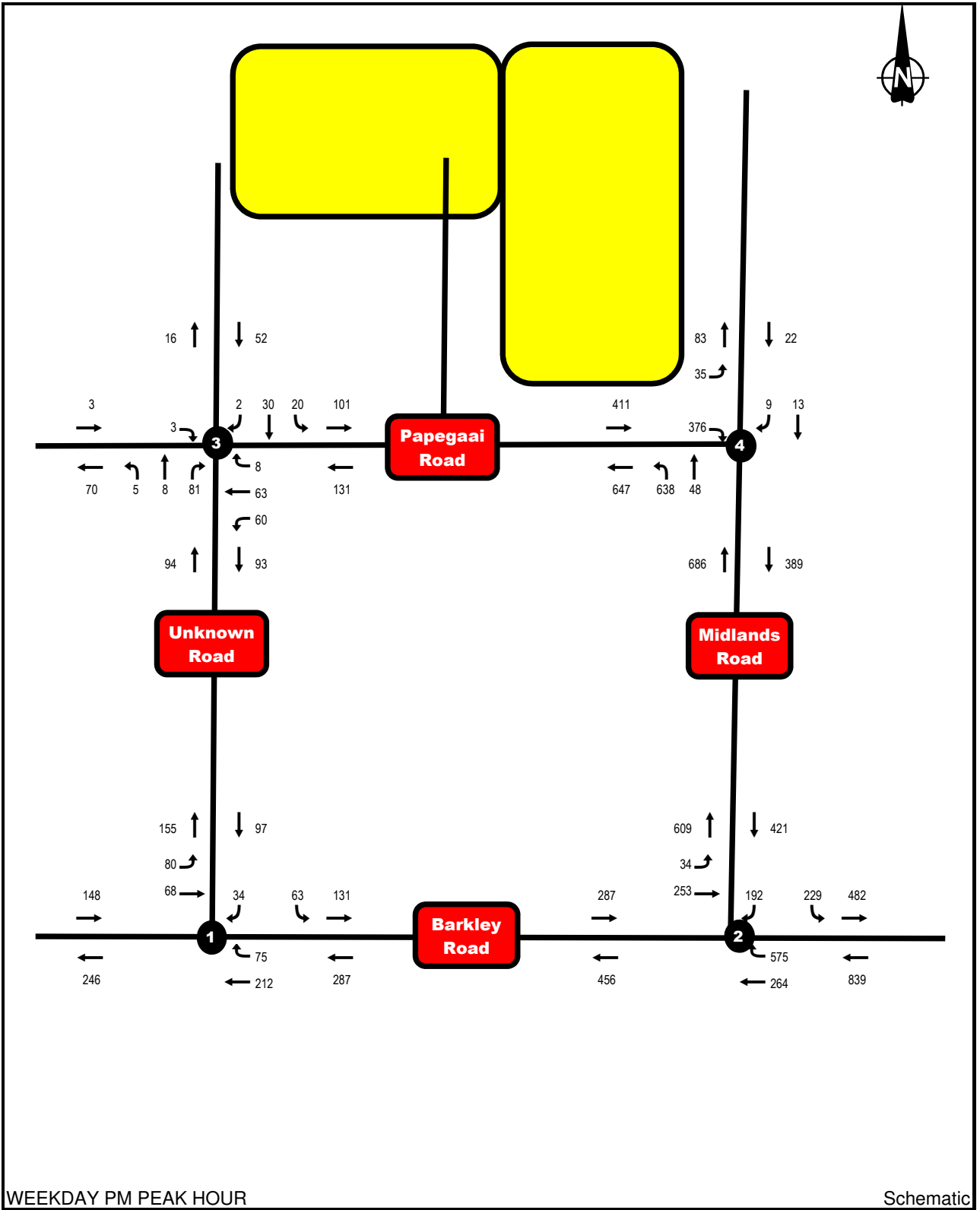
	Lethabo Park Kimberley	Job Ref No: TRAF 1439
	Present Traffic Demand plus Development	Fig: 8



	Lethabo Park Kimberley	Job Ref No: TRAF 1439
	Present Traffic Demand plus Development	Fig: 9



	Lethabo Park Kimberley	Job Ref No: TRAF 1439
	Expected 2024 Traffic Demand plus Development	Fig: 10



	Lethabo Park Kimberley	Job Ref No: TRAF 1439
	Expected 2024 Traffic Demand plus Development	Fig: 11