

APPENDIX L

Traffic Assessment



EXXARO TURFVLAKTE FARM 463-LQ LEPHALALE (Proposed Coal Mining Establishment)

TRAFFIC IMPACT ASSESSMENT (TIA)

REPORT 2017-125

OCTOBER 2018

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Traffic Impact Assessment Information Sheet

Local authority : Lephalale Local Municipality
Property description : Turfvlakte Farm 463-LQ Lephalale
Development type : Mining

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EXXARO TURFVLAKTE FARM 463-LQ LEPHALALE

Traffic Impact Assessment (TIA)

Chapter	Description	Page
1	INTRODUCTION	5
	1.1 Background	5
	1.2 Site Location	5
	1.3 Methodology	9
2	PROPOSED DEVELOPMENT & ACCESS	10
	2.1 Proposed Development	10
	2.3 Site Access	11
	2.4 Latent Right Development	11
3	DATA COLLECTION	13
	3.1 Traffic Counts	13
	3.2 Geometric Layout of the Intersections	13
4	TRIP GENERATION	17
	4.1 General	17
	4.2 Envisaged Mining Operation	17
	4.3 Development Trip Generation	17
	4.4 Trip Distribution & Assignment	18
5	TRAFFIC DEMAND	21
	5.1 Future Background Traffic Demand	21
	5.2 Latent Traffic Demand	21
	5.3 Total Future Traffic Demand	21
6	DEFINITIONS RELEVANT TO CAPACITY ANALYSIS	30
7	TRAFFIC IMPACT & CAPACITY ANALYSIS	31
	7.1 Capacity Analyses	31

	7.2	Traffic Impact & Intersections Improvements	31
8	NON-MOTORISED & PUBLIC TRANSPORT		38
9	CONCLUSIONS AND RECOMMENDATIONS		39
10	REFERENCES		41

Figures

Figures	Description
Figure 1.1: Locality Plan – Regional Context	
Figure 1.2: Locality Plan - Local Context	
Figure 1.3: Extract of the RAL Road Management Systems (Dated 08-04-2009)	
Figure 2.1: Location of The Latent Development Relative To The Subject Site	
Figure 3.1: Positions of Intersections Counted	
Figure 3.2: Existing 2018 AM Peak Hour Traffic Volumes	
Figure 3.3: Existing 2018 PM Peak Hour Traffic Volumes	
Figure 4.1: Estimated Development Trip Assignment – AM Peak	
Figure 4.2: Estimated Development Trip Assignment – PM Peak	
Figure 5.1: Future 2023 AM Peak Hour Traffic Volumes	
Figure 5.2: Future 2023 PM Peak Hour Traffic Volumes	
Figure 5.3: Estimated Latent Trip Assignment – AM Peak	
Figure 5.4: Estimated Latent Trip Assignment – PM Peak	
Figure 5.5: Existing 2018 AM Peak Hour Traffic With Development	
Figure 5.6: Existing 2018 PM Peak Hour Traffic With Development	
Figure 5.7: Total Future 2023 Traffic Demand – AM Peak	
Figure 5.8: Total Future 2023 Traffic Demand – PM Peak	
Figure 7.1: Intersection Geometry: D2001 / Exxaro Warehouse Deliveries	
Figure 7.2: Intersection Geometry: D2001 / Grootgeluk Mine Access	
Figure 7.3: Intersection Geometry: D2001 / Matimba Power Station Access	
Figure 7.4: Intersection Geometry: D2001 / D1675 Intersection	
Figure 7.5: Intersection Geometry: D1675 / D2649 Intersection	

Annexure

Annexure	Description
Annexure A:	Proposed Site Layout Plan
Annexure B:	Outputs of the SIDRA 7 Intersection Capacity Analyses

1 INTRODUCTION

1.1 Background

EDS Engineering Design Services (Pty) Ltd were appointed by Golder Associates Africa (Pty) Ltd to undertake a Traffic Impact Assessment (TIA) Report in support of the proposed mining development as part of the environmental impact assessment (EIA).

The proposed Turfvlakte Mining operations will be situated within the current Exxaro Coal (Pty) Ltd - Grootgeluk mining rights area. The proposed Turfvlakte mining operations will be an expansion of the current Grootgeluk mining operations. Grootgeluk Coal Mine is situated approximately 20km to the west of Lephalale / Ellisras. The proposed development of these additional opencast pits and associated infrastructure will be situated on the eastern portion of the Turfvlakte Farm. Access routes, pipelines and power lines will run through remaining Grootgeluk Mining Rights area, so as to link up to the existing mine infrastructure.

This TIA considers the worst case from a traffic impact point of view. The TIA considered the construction, operation and rehabilitation phases in terms of the anticipated traffic impact on the surrounding external roads network.

Exxaro intends to develop Turfvlakte for the mining of coal and to beneficiate coal on-site. The coal will be transported via railway system to Richards Bay Coal Terminal. The coal mining and haulage activities will take place within the site.

This traffic impact assessment investigates and reports on the following;

- ✓ Assessment of existing and required roads infrastructure for the mine
- ✓ Anticipated trip generation and assignment
- ✓ Need to implement road and/or intersections improvements required to mitigate the anticipated traffic impact

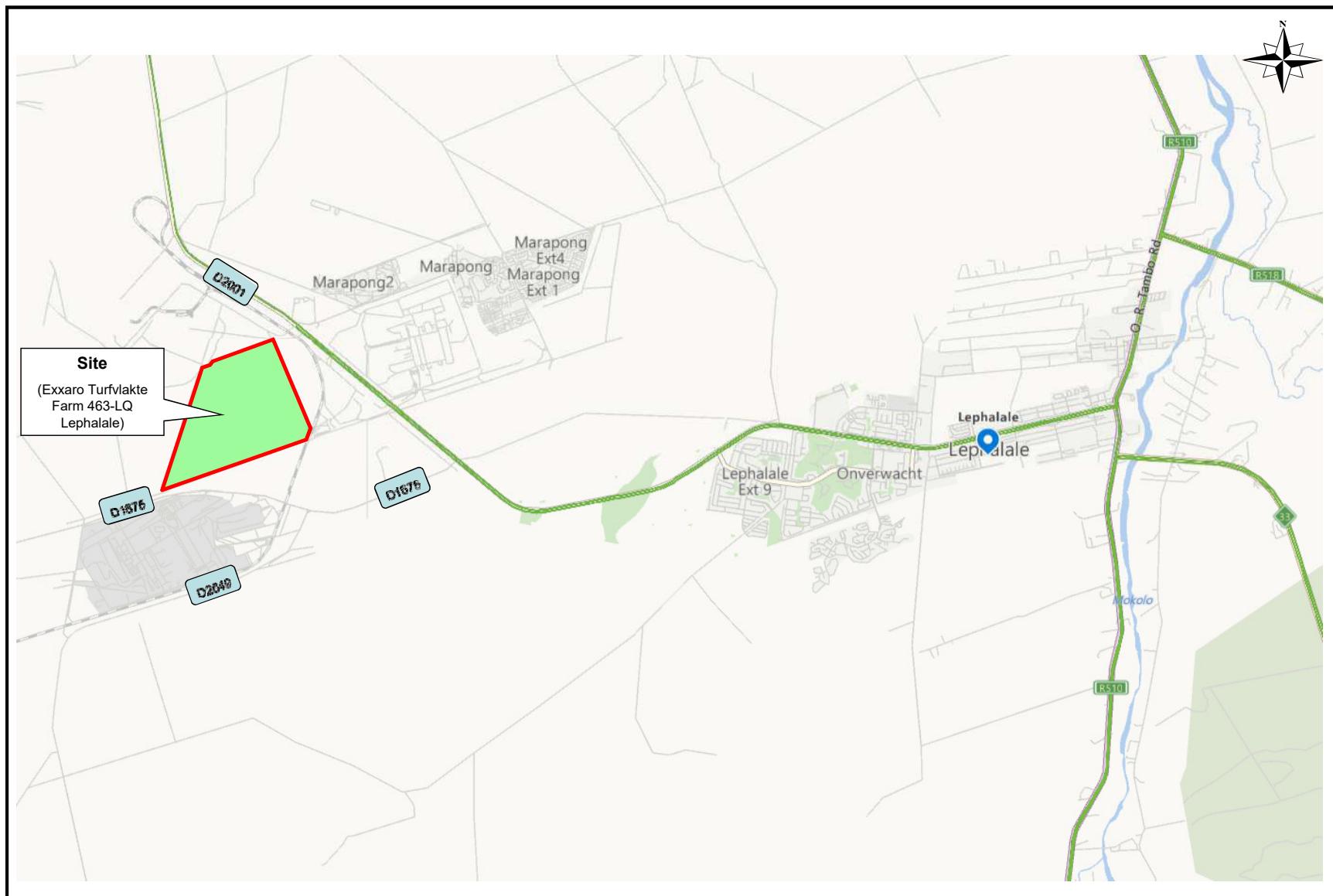
Comments are also made in respect of the site access as well as the non-motorised & public transport in this study.

This TIA has been undertaken in accordance with the requirements and guidelines as set out in the *TMH 16 Volume 2 (South African Traffic Impact and Site Impact Assessment Standards and Requirements Manual)*, COTO, Version 1 dated August 2012.

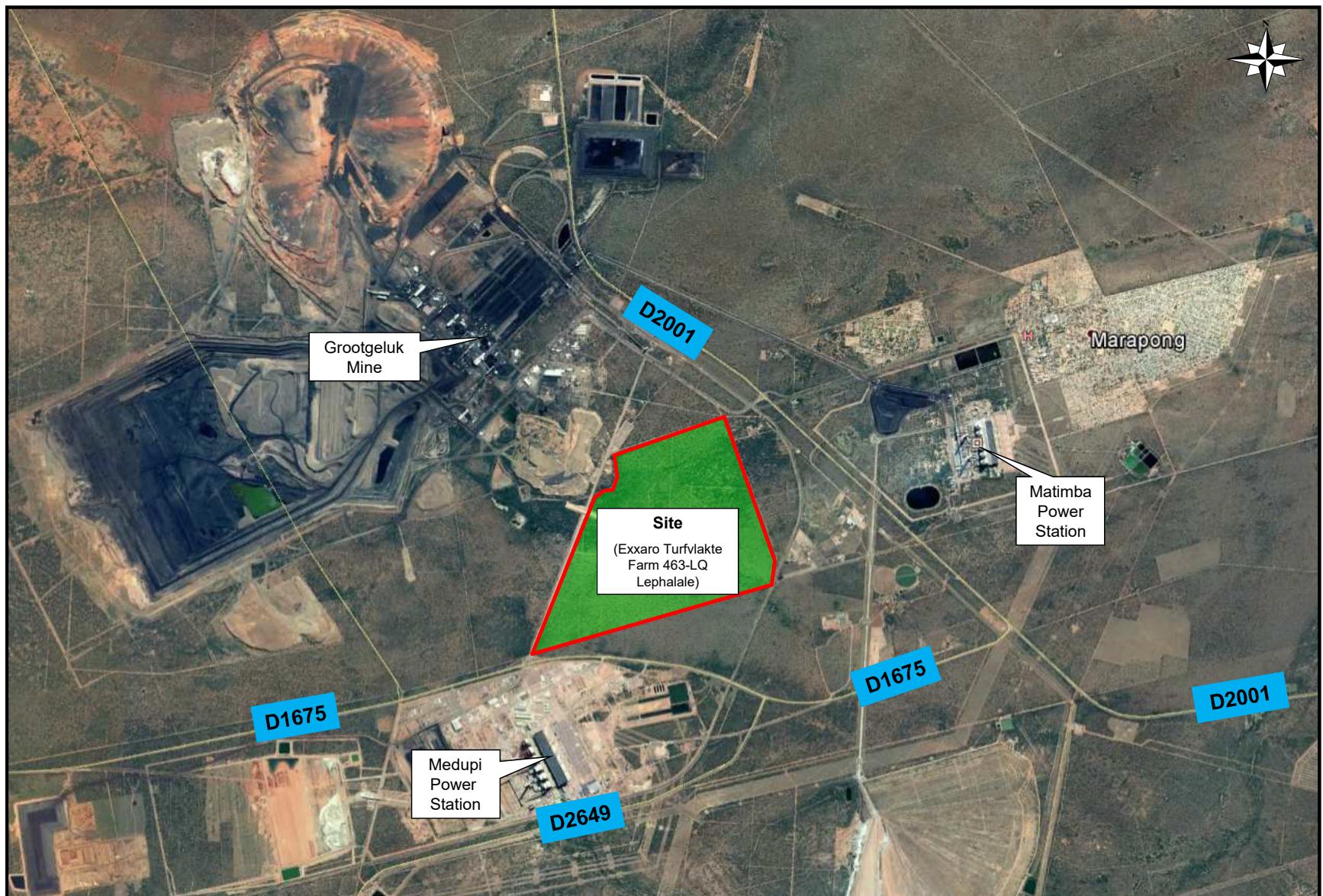
1.2 Site Location

The site is located some 20km to the west of Lephalale CBD (see **Figure 1.1**). In terms of local context, the site may be described as being located to the north of Medupi Power Station and to the east of Grootgeluk Mine (see **Figure 1.2**).

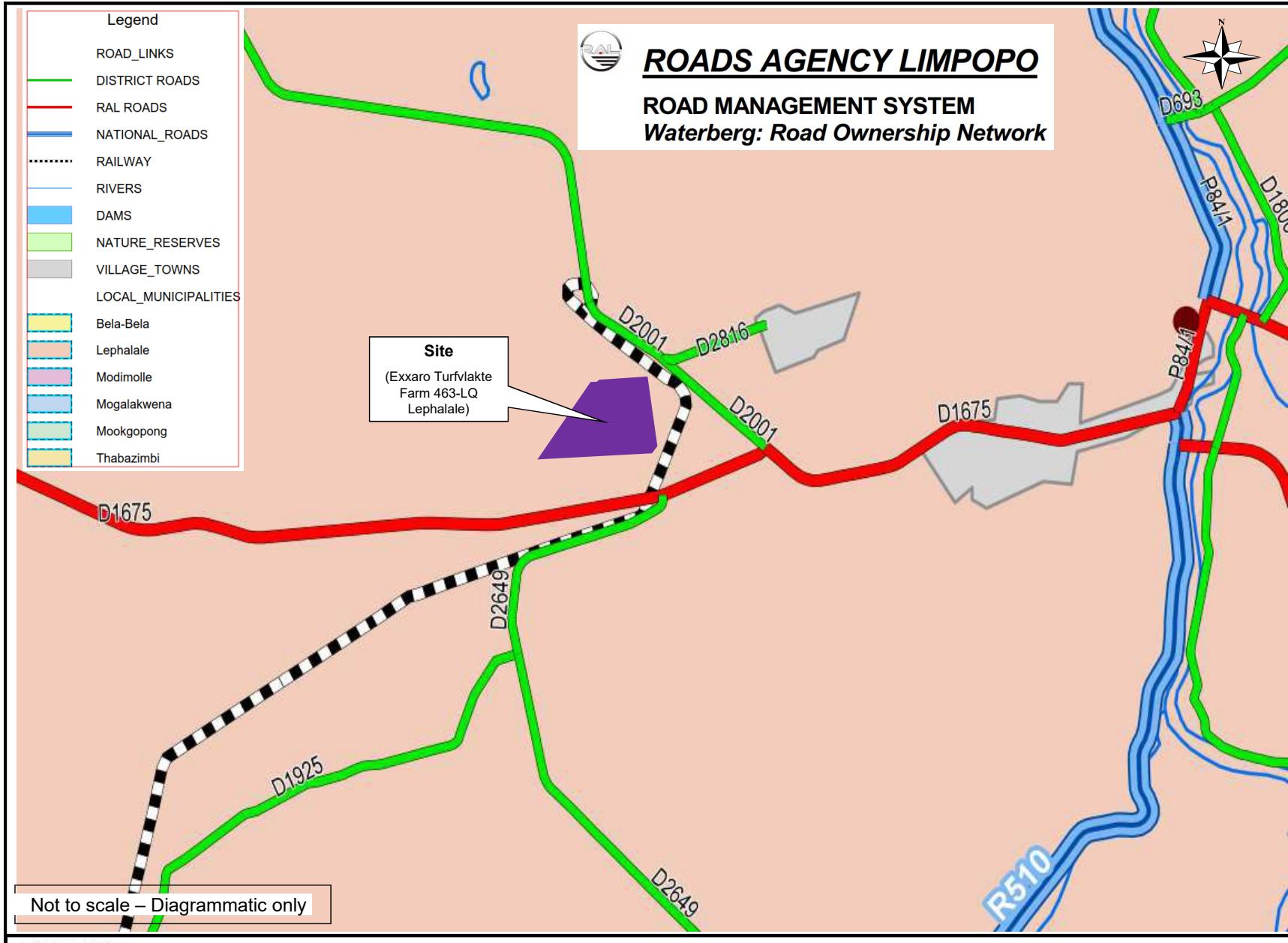
According to the road management system (dated 08-04-2009) issued by the Limpopo Roads Agency (RAL), Road D2001 is a district road whilst Road D1675 falls within the jurisdiction of the RAL (see **Figure 1.3**).



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1.3 Methodology

Methodology for this report included the following:

- Client meeting to gain an understanding of the operation of the plant.
- A site visit to observe current travel patterns and to gain an understanding of the area, access routes and existing issues on surrounding roads.
- Traffic counts at various intersections over a 12-hour period (6am to 6pm) on a typical week day.
- Consideration of any appropriate latent rights and future committed development planning and road planning – as far as possible and if information is available.
- Analysis of the current and expected future traffic flows at the intersections;
- Consider relevant roads authority road network planning where applicable
- Trip generation estimations, distribution and assignment
- Site access investigation (high level).
- Consideration of the appropriate horizon year for the analysis (with and without project traffic) where applicable.
- Comment on proposed on-site linkage and circulation.
- Consideration of workers and public transport requirements and facilities required (such as lay-byes and bus turning facilities and pedestrian pathways).
- Preparation of conceptual layouts indicating access requirements and intersection upgrades.
- Technical reporting and capturing of all the findings, conclusions and recommendations

2 PROPOSED DEVELOPMENT & ACCESS

2.1 Proposed Development

It is envisaged to establish coal mining operations within the current Exxaro Coal (Pty) Ltd - Grootegeluk mining rights area, in the Lephalale District, Limpopo Province. Existing Grootegeluk Coal Mine is situated approximately 20km to the west of Lephalale / Ellisras. The proposed mining operations will result in expansion of the existing Grootegeluk Coal Mine.

The proposed development consists of additional opencast pits and associated infrastructure and will be situated on the eastern portion of the Turfvlakte Farm. Production rates will be determined by the maximum production of three million tonnes per annum.

Access routes, pipelines and power lines will run through remaining Grootegeluk Mining Rights area, so as to link up to the existing mine infrastructure.

Exxaro intends to develop Turfvlakte for the mining of coal and to beneficiate coal on-site. The coal will be transported via railway system to Richards Bay Coal Terminal. So, the coal mining and haulage activities will take place within the site.

Appended in **Annexure A** of this study is the proposed site layout plan indicating location of the existing (Grootegeluk Coal Mine) and proposed (Turfvlakte Farm) mining operations.

2.2 Envisaged Mining Operation

Trip generation expected from the proposed mine is dependent on the envisaged operations of the mine. The following information, describes how the proposed mine will operate and it is regarded as the basis of estimating development trip generation of the proposed development;

- Total number of personnel = 120 employees
- Total number of management = 10 of total 120 employees
- Total number of skilled and semi-skilled labour = 15 of total 120 employees
- Total number of unskilled labour = 95 of total 120 employees
- The mine will be operated 24 hours a day, in 2 X 12-hour shifts
- Mined coal will be transported by railway to Richards Bay Coal Terminal
- The 100-ton trucks will be used internally (for coal and overburden operations)
- Exxaro will provide bus transport for commuting purposes of unskilled labour
- Coal haulage truck trips will take place on-site and not on the external roads

Note: The project is still in the concept phase, the information provided above includes reasonable, maximum potential assumptions for the purpose of this traffic impact assessment.

2.3 Site Access

In terms of access, the existing Grootegeluk Mine is currently accessible from Road D2001, whereby access road to Marapong Township intersects with D2001. The intersection of D2001, access to Marapong and access to existing Grootegeluk Mine is currently signalised.

The proposed operations on the Turfvlakte Farm will share the existing access (to the external roads network) with the existing Grootegeluk Mine, at the signalised intersection.

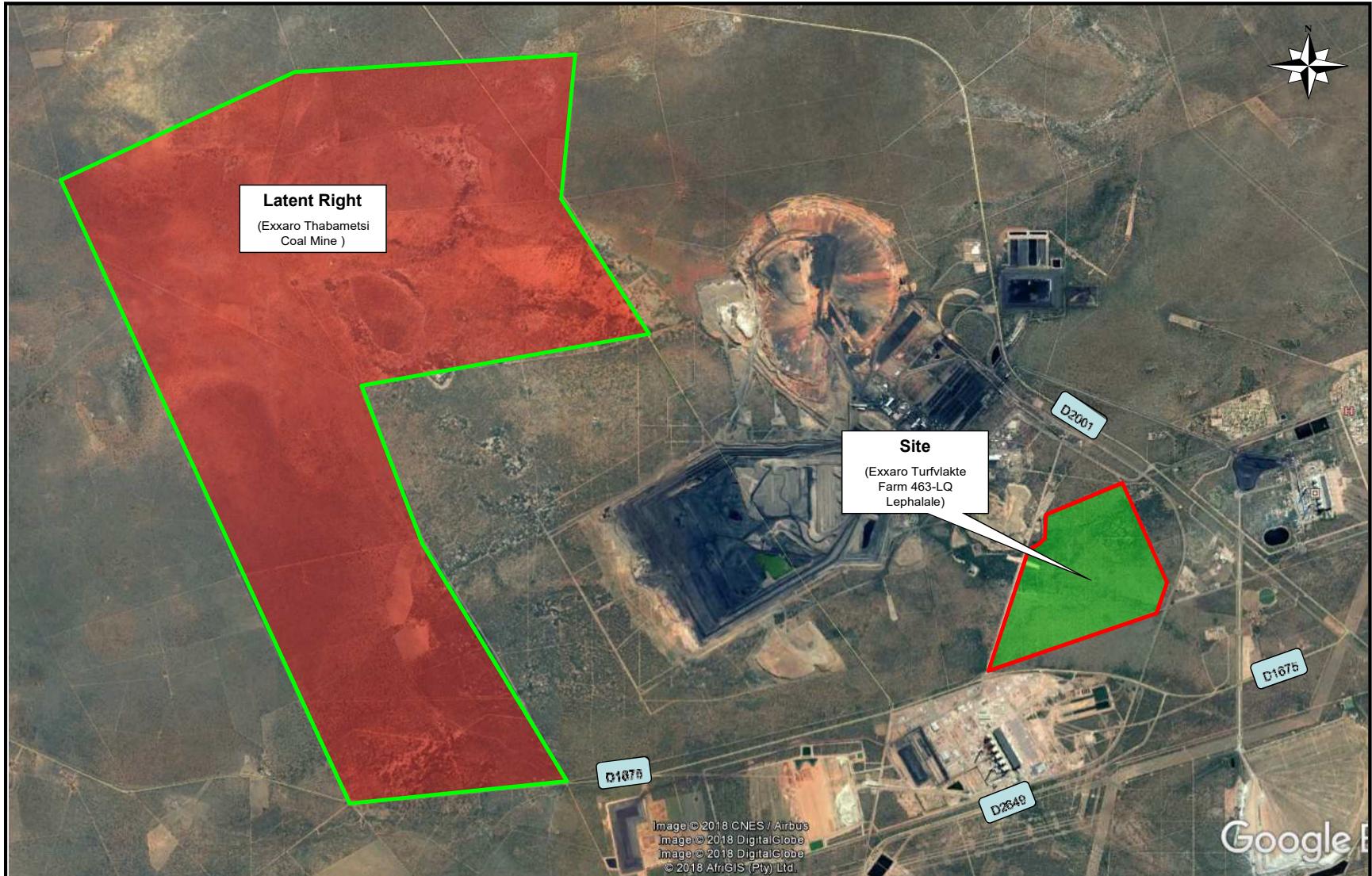
Location of the site access intersection is shown as Intersection 2 in **Figure 3.1** later in this study.

2.4 Latent Right Development

A latent right development to be situated on Farms McCabesvley 311 LQ, Jackalsvley 309 LQ, Zaagput 307 LQ, Vanderwaltspan 310 LQ and Vaalpensloop 313 LQ and known as Exxaro Thabametsi Coal Mine has been accounted for in this study.

Location of this development relative to the subject site is shown schematically in **Figure 2.1** of this study.

A traffic impact assessment (TIA) for this mining development was undertaken by ITS Engineers in the year 2012.



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3 DATA COLLECTION

3.1 Traffic Counts

Traffic counts were conducted during the weekday, from 06:00am to 18:00pm on the 24th of March 2017 at the following key intersections:

- D2001 / Exxaro Warehouse Deliveries Intersection
- D2001 / Grootgeluk Mine Access Intersection
- D2001 / Matimba Power Station Access Intersection
- D2001 / D1675 Intersection
- D1675 / D2649 Intersection

Positions of the above-mentioned key intersections are depicted in **Figure 3.1**.

Traffic counts undertaken in 2017 have been escalated to the current year 2018 as an annual traffic growth rate of 3% per annum for the propose of this study.

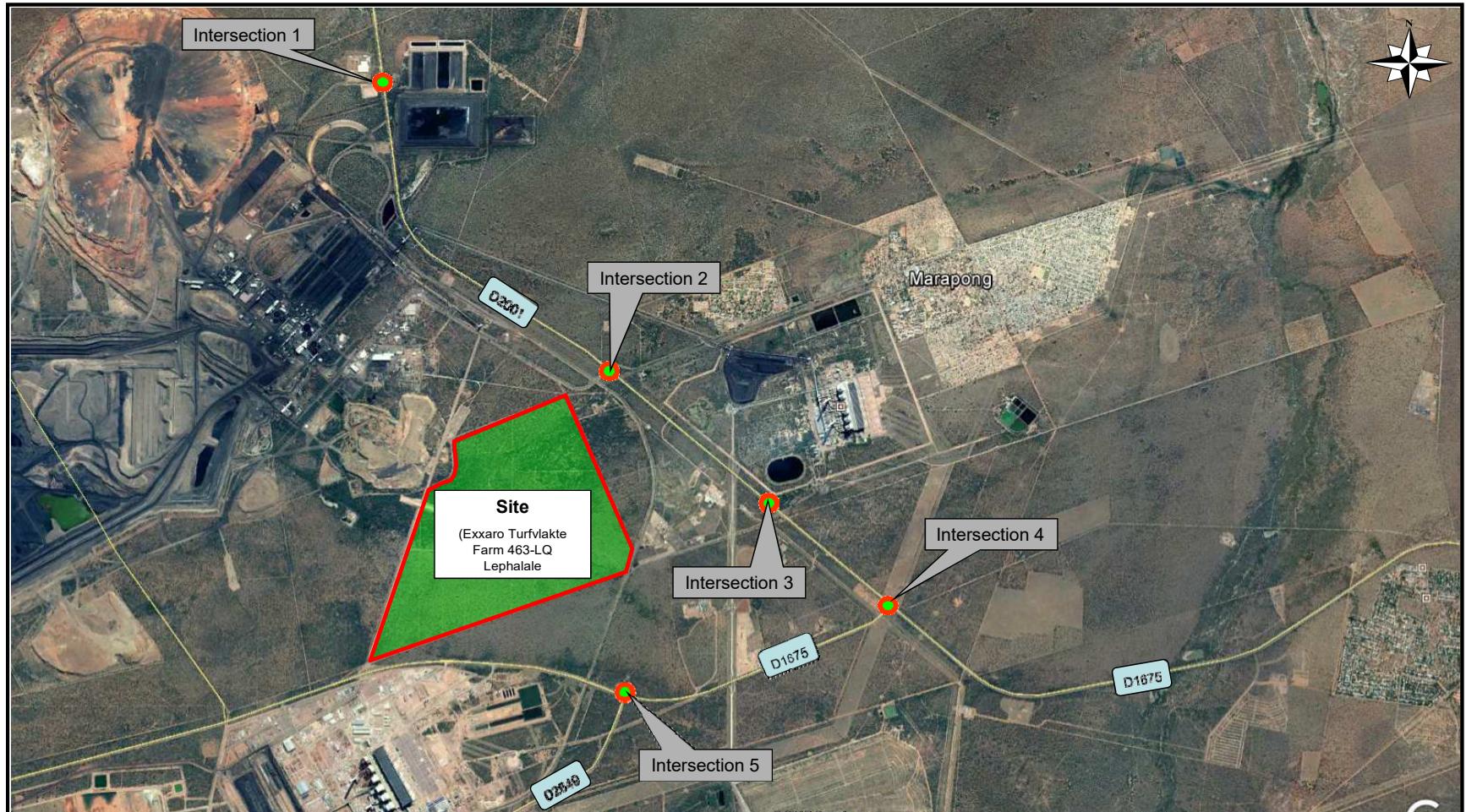
From the traffic counts undertaken, a common peak hour (the busiest hour) was determined for each peak period and was found to be:

- Weekday AM 06:00 – 07:00
- Weekday PM 16:15 – 17:15

The existing weekday AM and PM peak hour traffic volumes at the counted intersections are shown on **Figures 3.2** and **3.3** respectively

3.2 Geometric Layout of the Intersections

Existing geometric layouts of the key intersections were obtained on site during the site visit and were used for base case analyses purposes.

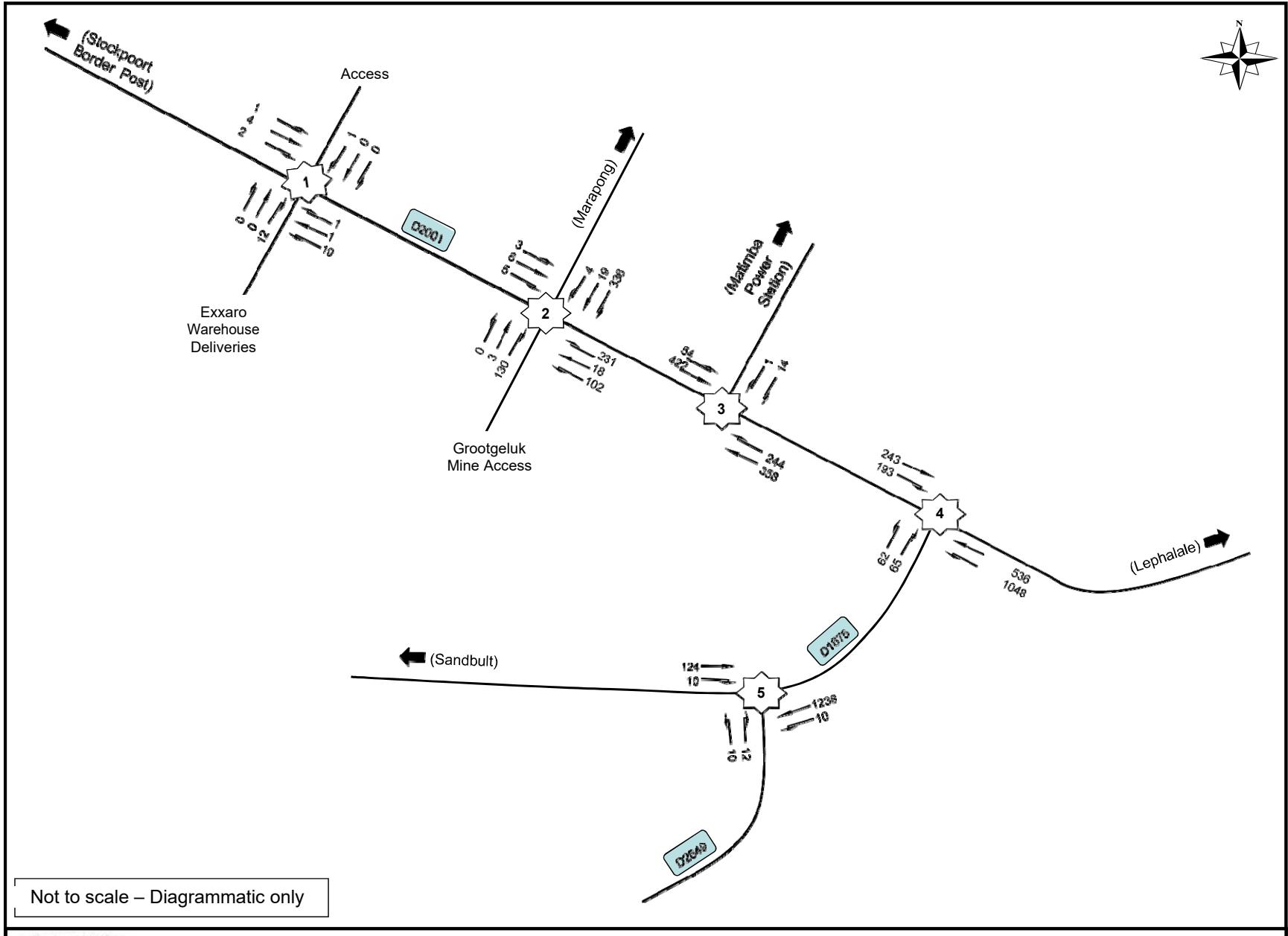


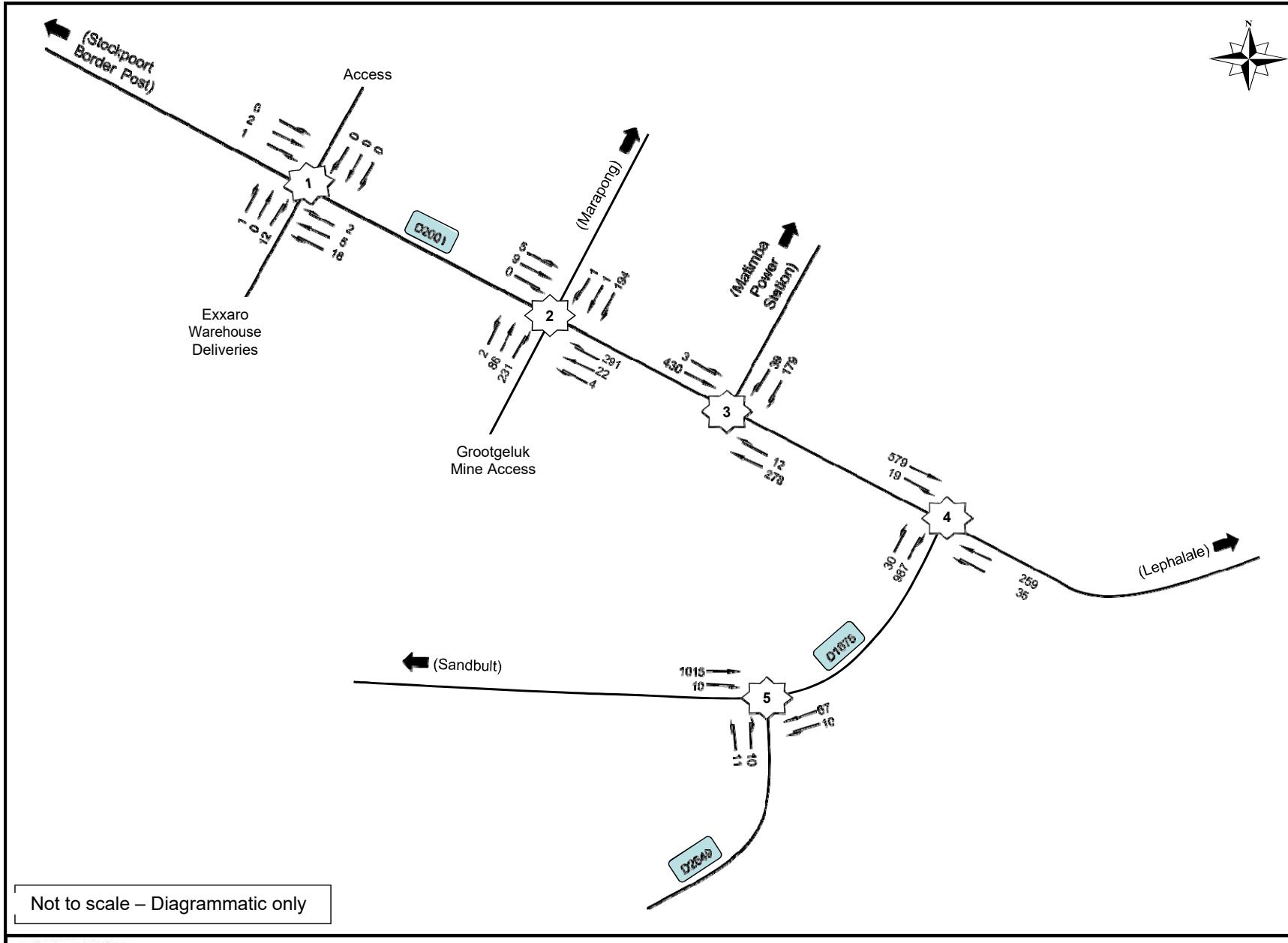
LEGEND:

TRAFFIC COUNT POSITION - ●

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Intersection 1 (GPS Coordinates: 23° 38' 09.00" S 27° 33' 42.87" E)
 Intersection 2 (GPS Coordinates: 23° 39' 52.69" S 27° 35' 12.43" E)
 Intersection 3 (GPS Coordinates: 23° 40' 40.61" S 27° 36' 15.21" E)
 Intersection 4 (GPS Coordinates: 23° 41' 16.12" S 27° 37' 01.39" E)
 Intersection 5 (GPS Coordinates: 23° 41' 47.98" S 27° 35' 20.12" E)





4 TRIP GENERATION

4.1 General

The *South African Trip Generation Rate Manual* issued by the Department of Transport, as well as the *TMH17* issued by the Committee of Transport Officials (COTO) do not make provision for mining types of developments in terms of trip generation rates.

It was therefore considered appropriate to rather determine the expected trip generation estimations based on the envisaged operation of the proposed mine.

4.2 Envisaged Mining Operation

Trip generation expected from the proposed mine is dependent on the envisaged operation of the mine. The following information, *inter alia*, describes how the proposed mine will operate and it is regarded as the key basis of the expected development trip generation;

- Total number of personnel = 120 employees
 - Total number of management = 10 of total 120 employees
 - Total number of skilled and semi-skilled labour = 15 of total 120 employees
 - Total number of unskilled labour = 95 of total 120 employees
 - The mine will be operated 24 hours a day, in 2 X 12-hour shifts
 - Mined coal will be transported by railway to Richards Bay Coal Terminal
 - The 100-ton trucks will be used internally (for coal and overburden operations)
 - Exxaro will provide bus transport for commuting purposes of unskilled labour
 - Coal haulage truck trips will take place on-site and not on the external roads
-

4.3 Development Trip Generation

Understanding of the envisaged mining operation plays a significant role in trip generation estimation of the proposed development. This information together with the following appropriate assumptions has been translated into expected development peak hourly trips;

- 100% of management, skilled and semi-skilled labour would commute using their own / company vehicles (see **Table 4.1**) – occupancy of 1 person per vehicle is assumed.
- 100% of unskilled labour would commute using staff / public transport (Bus / Minibus Taxi) - see **Table 4.1**.

- Capacity of the staff transport (bus / minibus taxi) is estimated at 14 seated passengers (14 seater) – 100% vehicle occupancy assumed.
- 0% of the coal haulage trucks will be generated on the external roads network (coal mined will be exported to Richards Bay).
- The split percentages of 85/15 (AM) and 20/80 (PM) recommended in the TMH17 for Office land uses has been used.
- It has been assumed for the worst-case analysis (for the purpose of this study) that change of shifts will occur during the critical weekday peak periods.
- The maximum development trip generation will take place during the 1-hour period (for the worst-case scenario analyses of this study).

Table 4.1: Conversion of personnel to number of vehicular trips

Personnel		Mode of Transport & Number of People				Total Vehicle Trips Expected	
Category	No. of People	Light Vehicles		Bus / Minibus Taxi			
		People	Vehicles	People	Vehicles		
Management	10	10	10	-	-	10	
Skilled & semi-skilled labour	15	15	15	-	-	15	
Unskilled labour	95	-	-	95	14	14	
Total	120	-				39	

Using the parameters and assumptions made above, it is estimated that the mining personnel would generate a total (in plus out) of 39 trips during the respective weekday AM and PM peak periods. This excludes the truck trips which will be generated within the site.

Table 4.2 summarises the expected development trip generation.

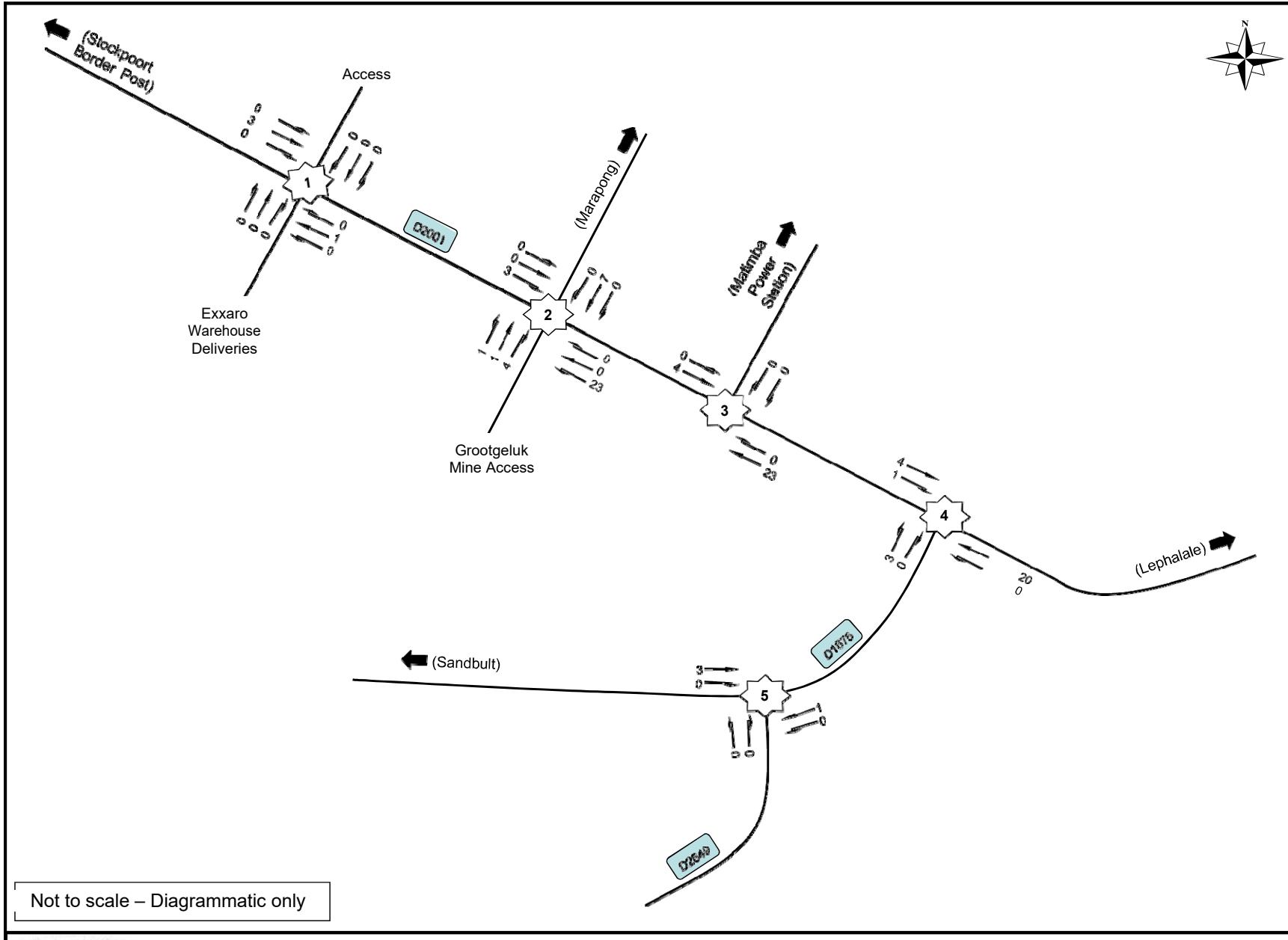
Table 4.2: Summary of estimated development trip generation

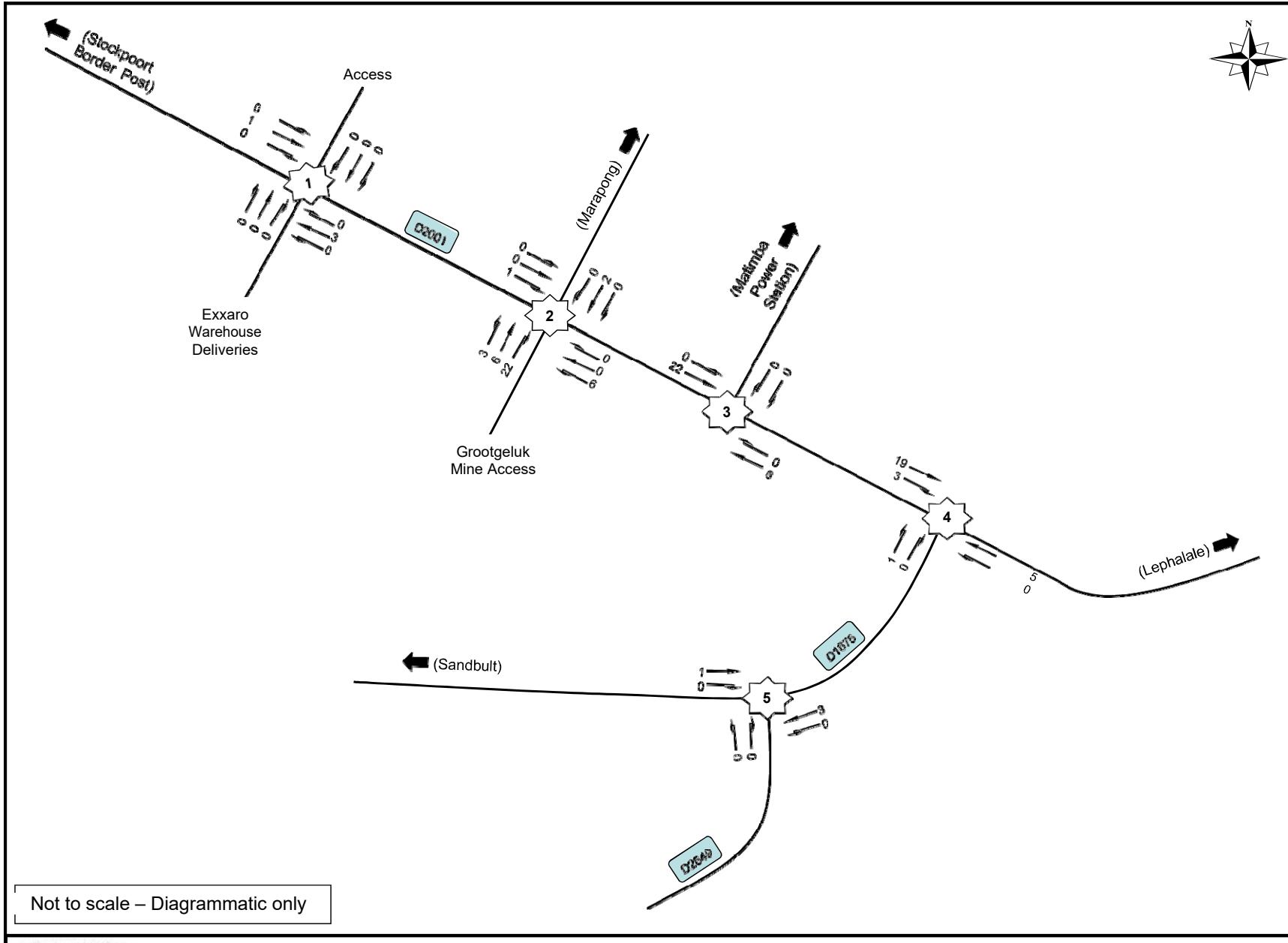
Type of vehicles	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
	85%	15%	100%	20%	80%	100%
Management, skilled & semi-skilled labour	21	4	25	5	20	25
Unskilled labour	12	2	14	3	11	14
Total	33	6	39	8	31	39

4.4 Trip Distribution & Assignment

Assumptions on the expected trip distribution and assignment were based on the type of the development, location of its access point relative to the surrounding roads network, anticipated origin and destination of trips as well as the existing traffic volumes and patterns in the area.

Figures 4.1 and 4.2 depict summary of the expected development trip assignment.





5 TRAFFIC DEMAND

5.1 Future Background Traffic Demand

The expected background traffic growth rate has been estimated in accordance with the guidelines of the following documents;

- ✓ *Traffic TMH 16 Volume 2 (South African Traffic Impact and Site Impact Assessment Standards and Requirements Manual), COTO, Version 1 dated August 2012.*
- ✓ *The South African Trip Data Manual (TMH 17 – Volume 1 Dated September 2012)*

It is anticipated that the 2018 background traffic would escalate at an estimated annual growth rate of 3,0% to the future 2023 base year (i.e. a 5-year horizon).

Figures 5.1 and 5.2 depict the estimated future 2023 background peak hour traffic demand.

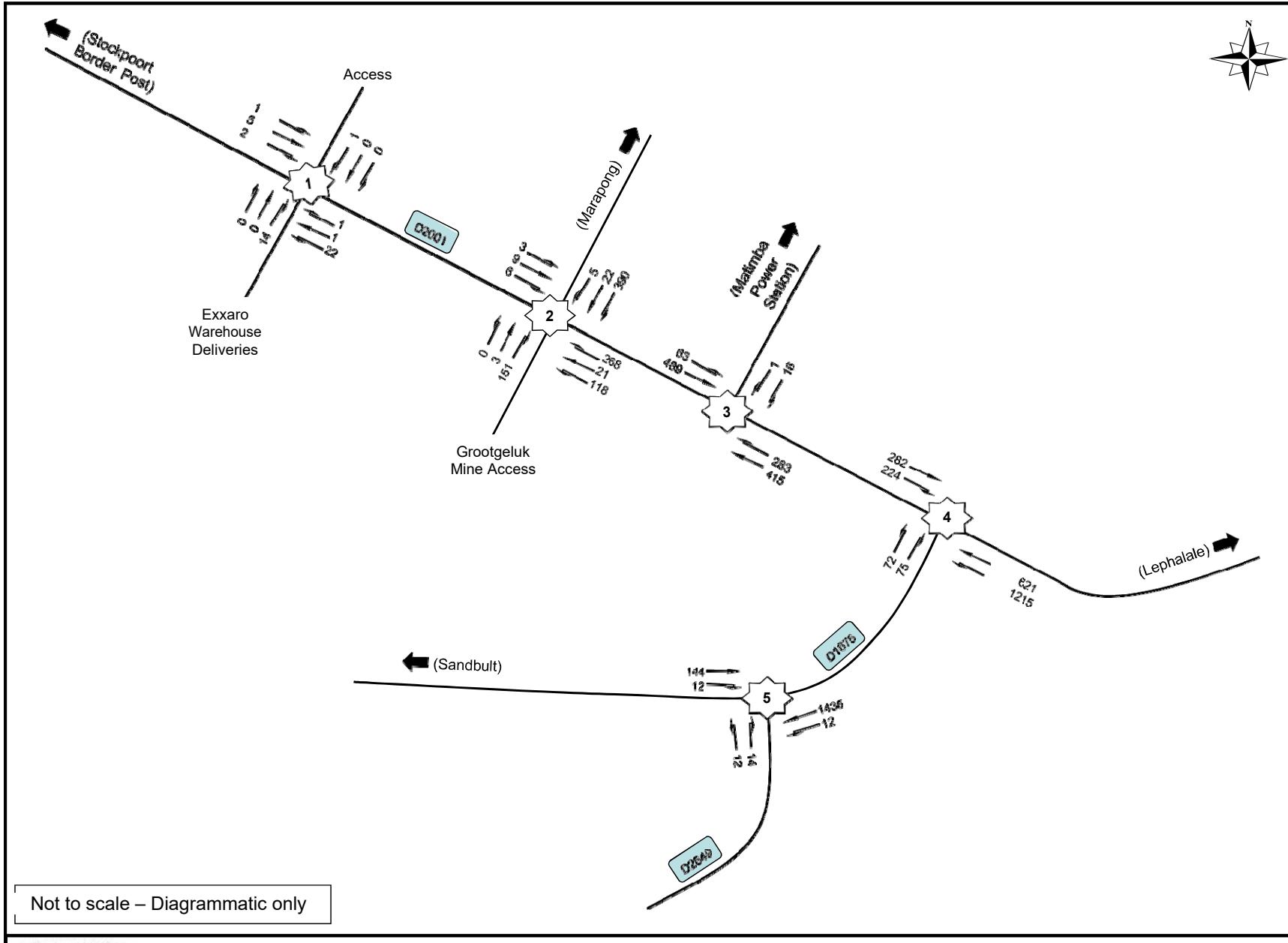
5.2 Latent Traffic Demand

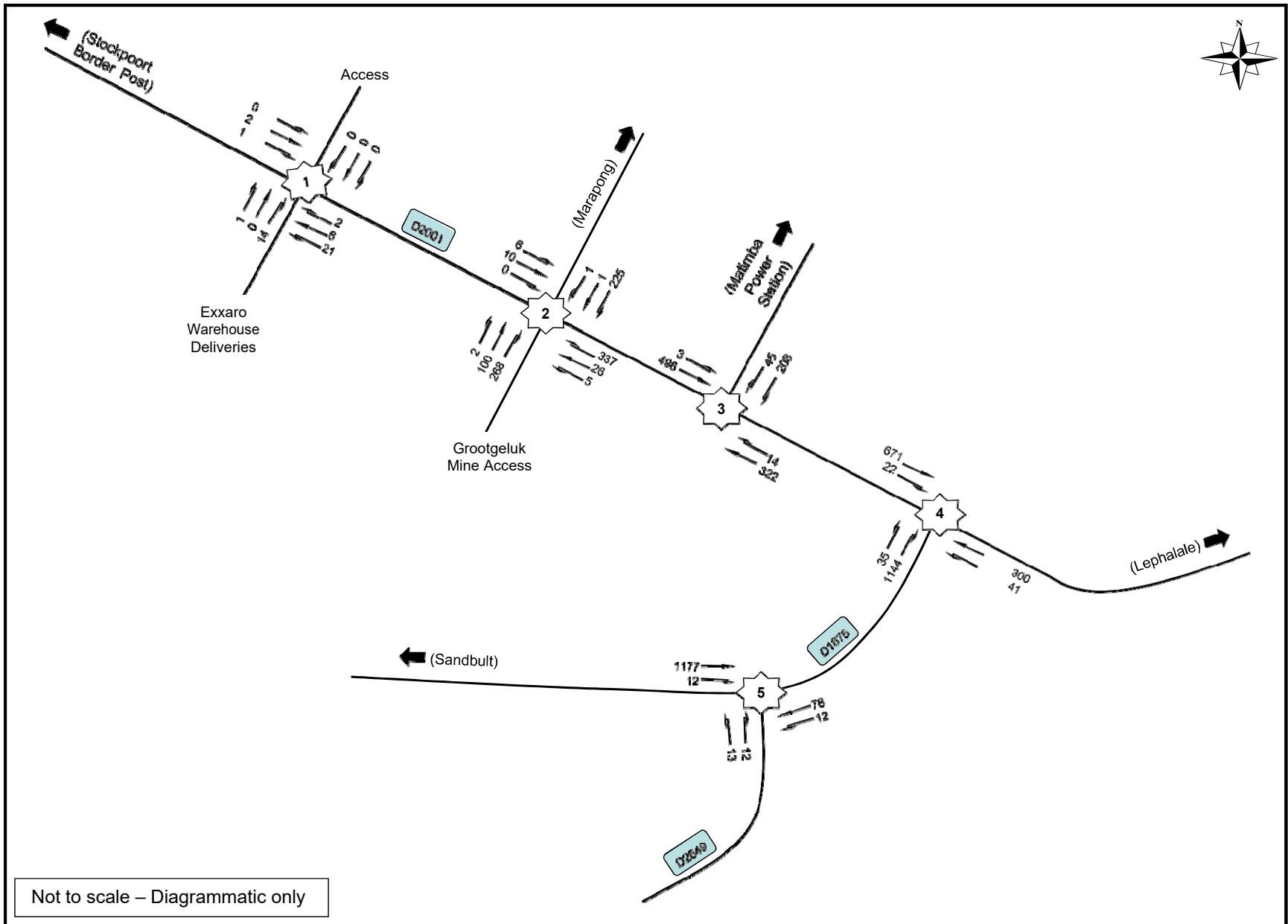
The anticipated trip assignment for the latent right development known as Exxaro Thabametsi Coal Mine is depicted on **Figures 5.3 and 5.4**.

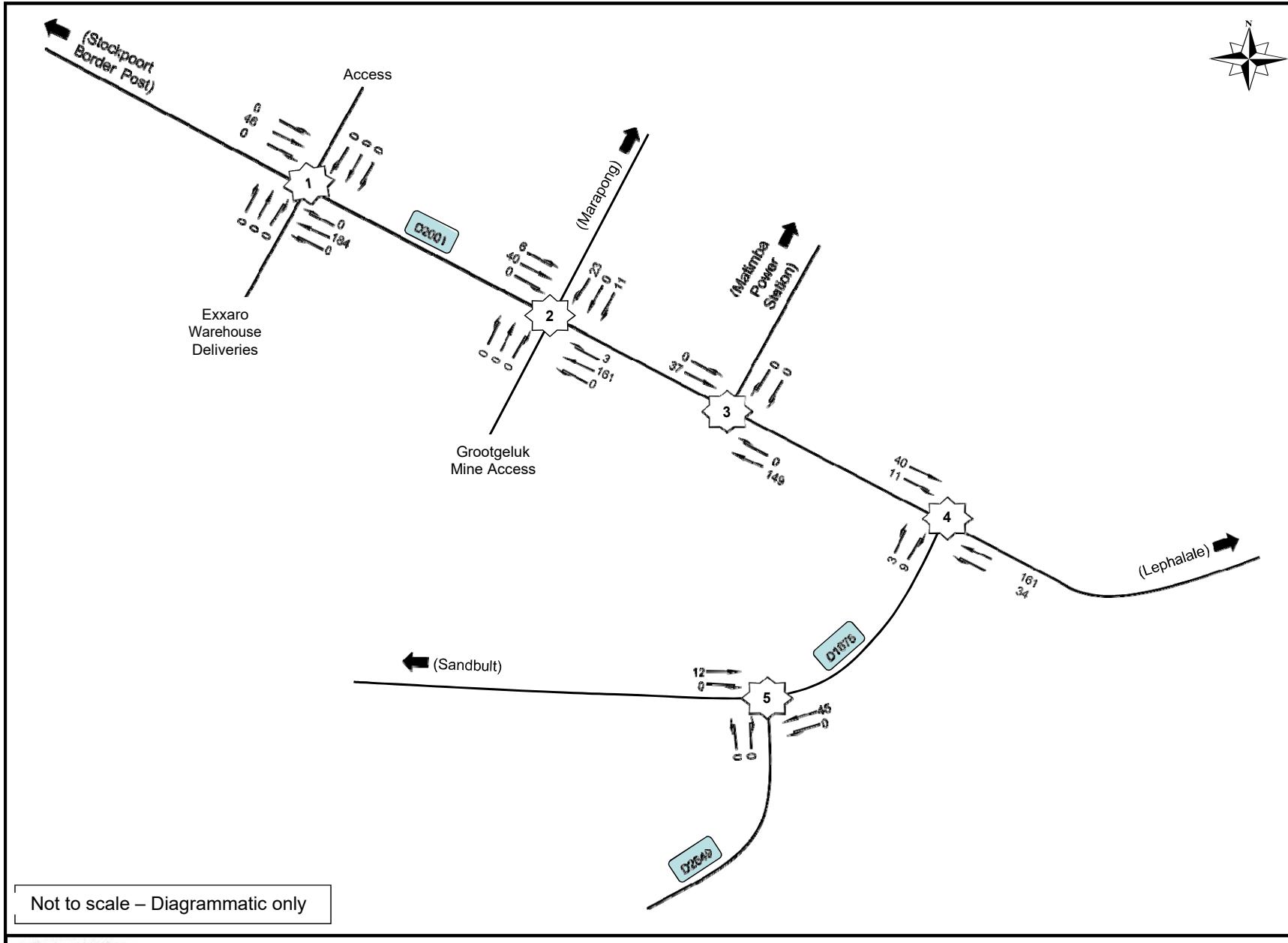
5.3 Total Future Traffic Demand

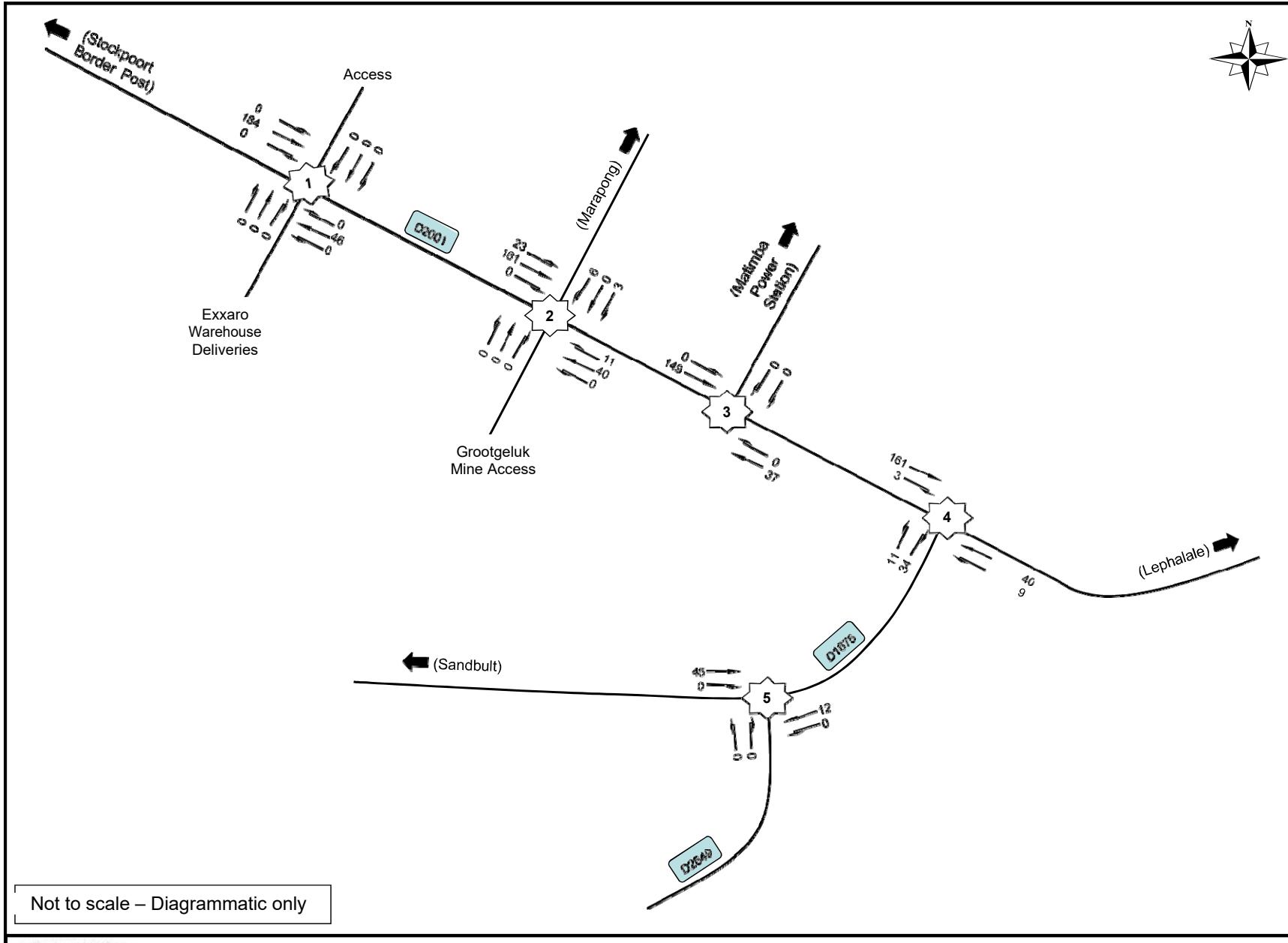
Figures 5.5 and 5.6 depict the existing 2018 traffic demand with development trips.

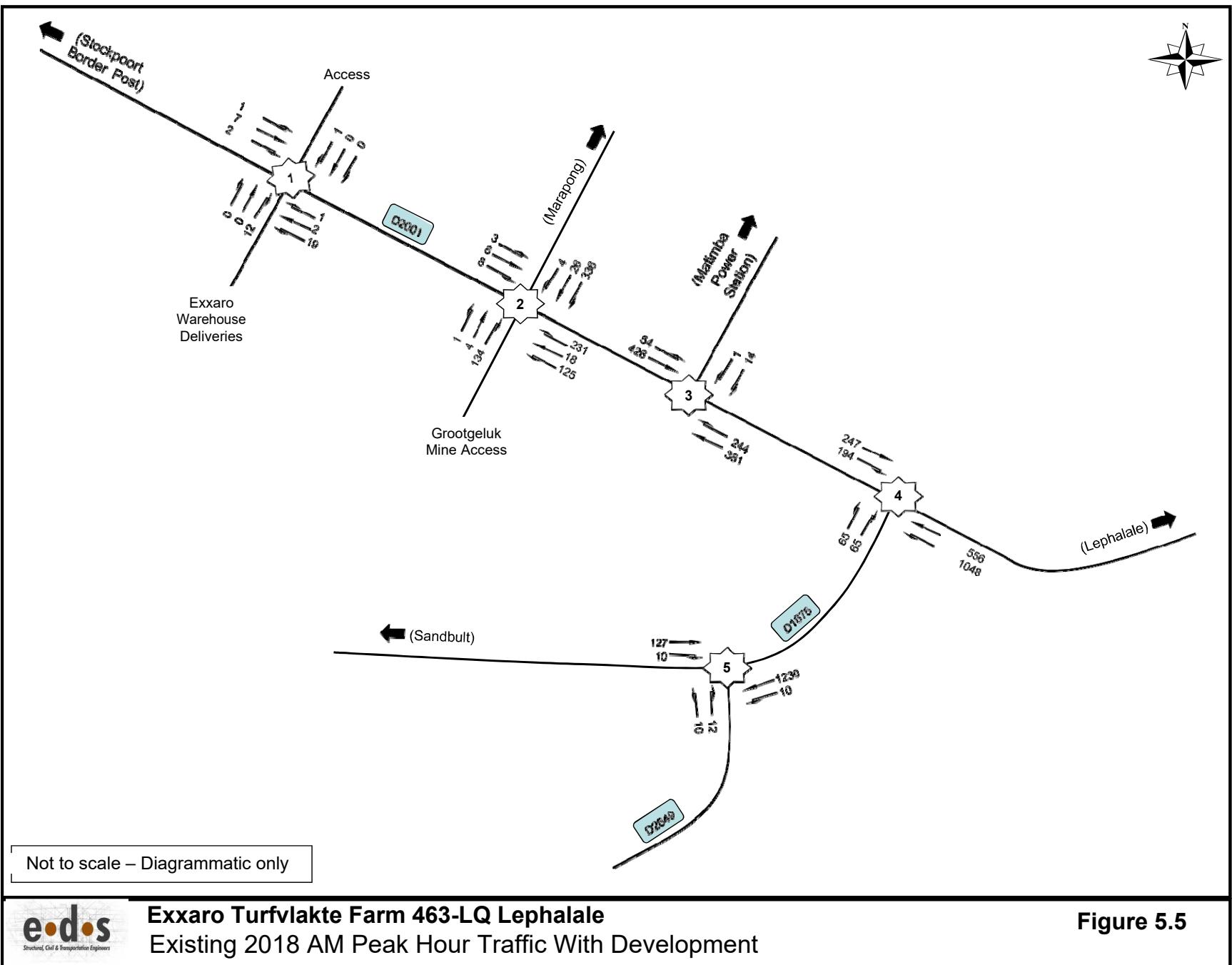
Figures 5.7 and 5.8 depict the total future 2023 traffic demand, which is the estimated future 2023 background traffic plus the latent traffic demand plus the estimated development trips.

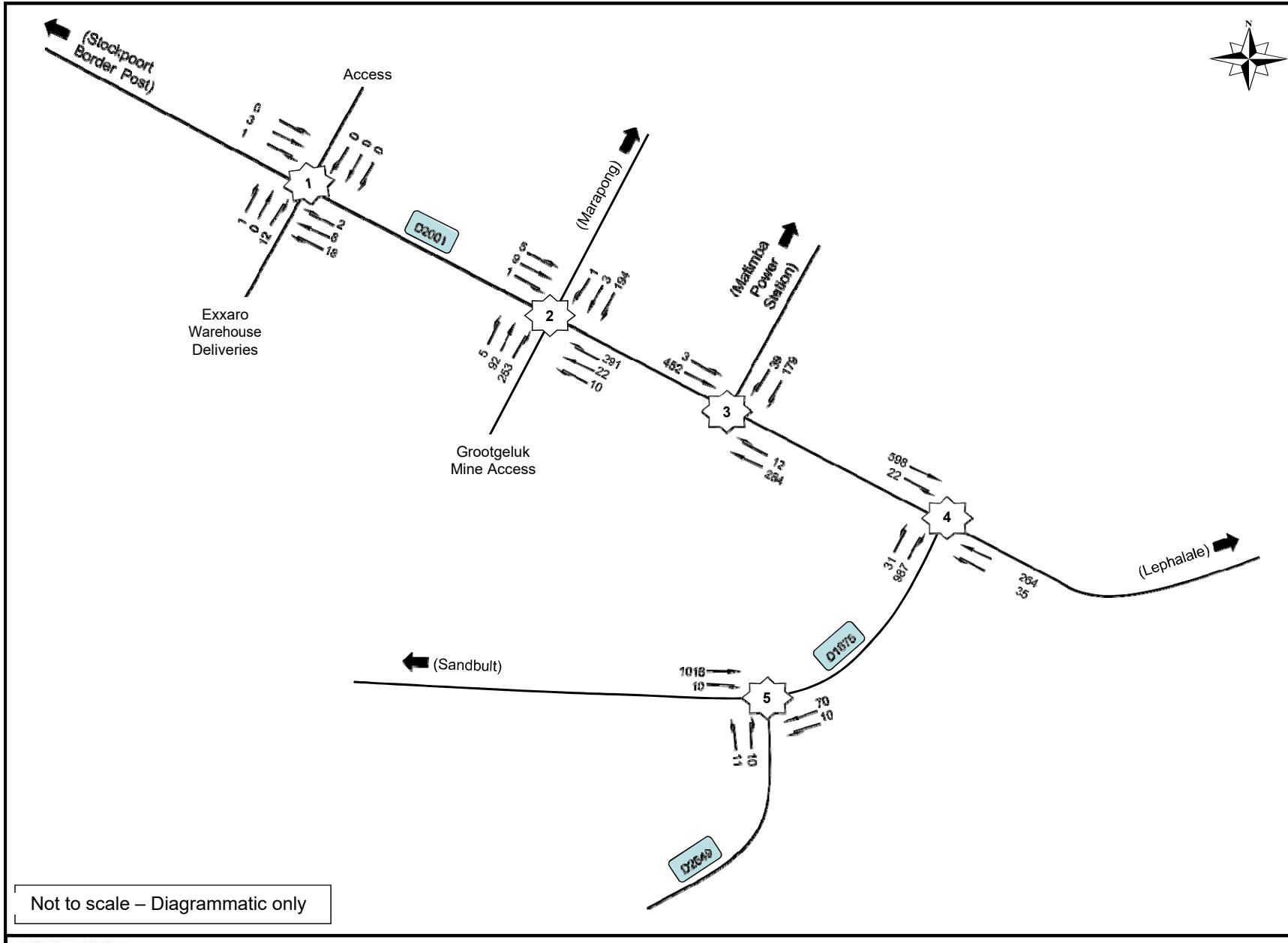


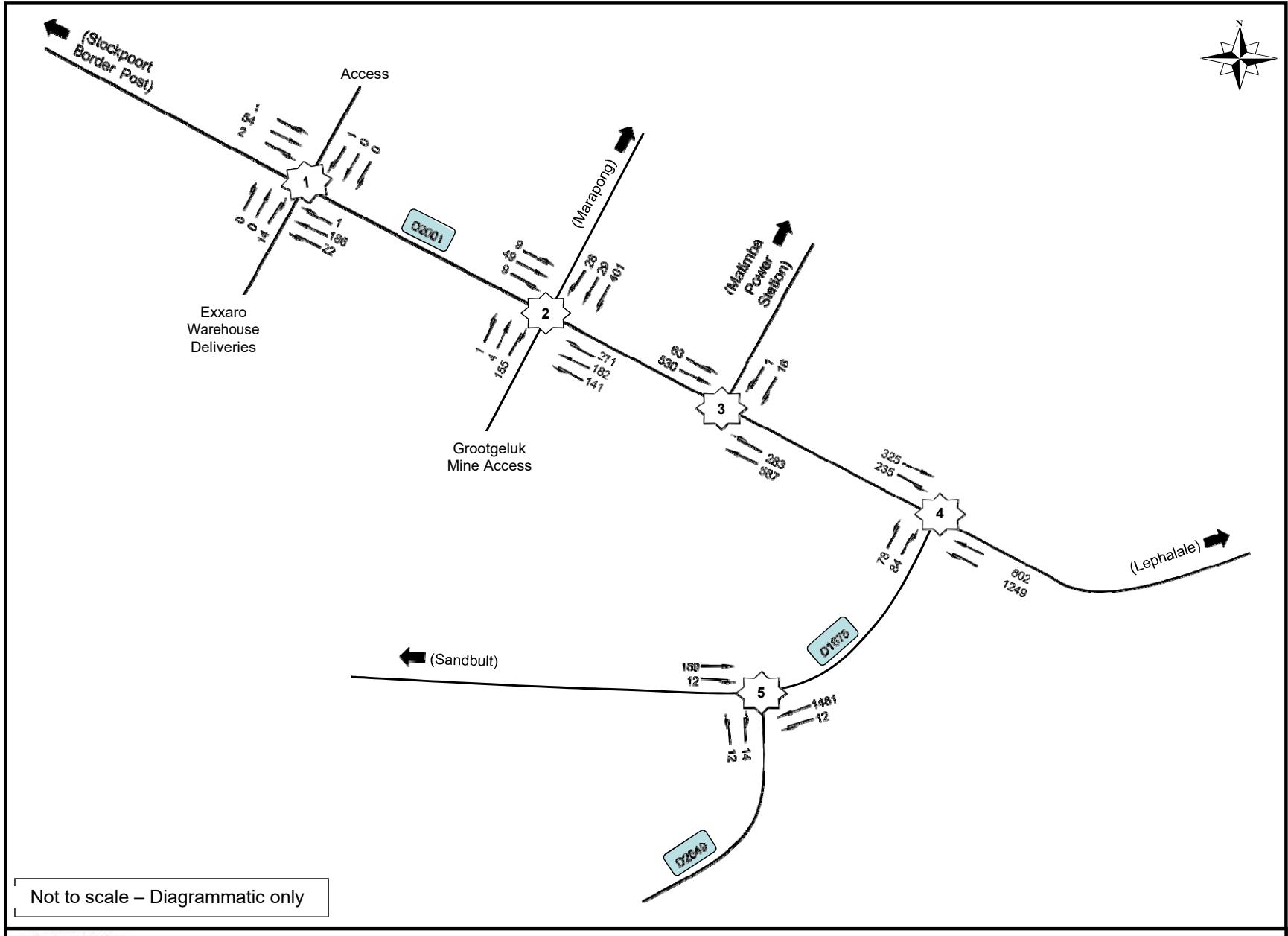


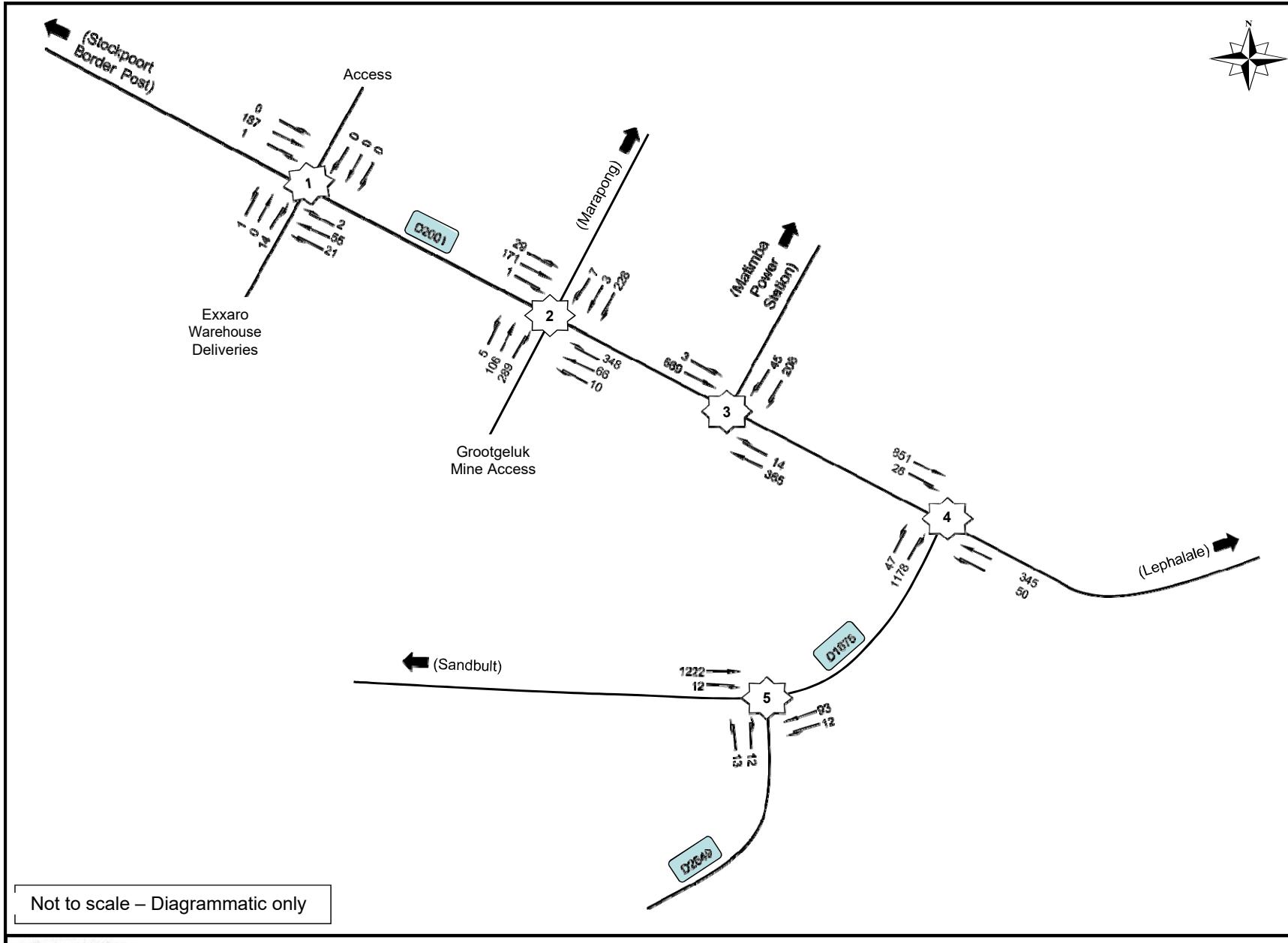












6 DEFINITIONS RELEVANT TO CAPACITY ANALYSIS

The following definitions from the 2000 Highway Capacity Manual are used in this report. A revised LOS method for vehicles were introduced in HCM 2010 (TRB 2010). It offers an important variation on the Delay (HCM 2000) method in using both the average control delay and the v/c (demand volume / capacity) ratio, or degree of saturation for LOS determination.

Capacity

The maximum hourly rate at which vehicles can reasonably be expected to traverse a lane or roadway during a given period under prevailing traffic and control conditions.

Volume

The hourly rate of vehicle arrivals at an intersection.

Volume to capacity ratio (v/c)

Is the ratio of volume to capacity.

Level of service

Level of service is defined in terms of delay. Delay is a measure of driver discomfort, frustration, fuel consumption and lost travel time. The levels of service for signalised and unsignalised intersections as defined in the Highway Capacity Manual are tabulated in **Table 6.1** below.

Table 6.1: Delay & v/c (HCM 2010) definitions for LOS Based on delay and v/c ratio

Level of Service for $v/c \leq 1.0$	Rating	Average delay per vehicle in seconds (d)			Level of Service for for $v/c > 1.0$
		Signals	“SIDRA Roundabout LOS” option	Priority Control (HCM2010 default for roundabouts)	
A	Excellent	$d \leq 10$	$d \leq 10$	$d \leq 10$	F
B	Very Good	$10 < d \leq 20$	$10 < d \leq 20$	$10 < d \leq 15$	F
C	Good	$20 < d \leq 35$	$20 < d \leq 35$	$15 < d \leq 25$	F
D	Acceptable	$35 < d \leq 55$	$35 < d \leq 50$	$25 < d \leq 35$	F
E	Poor	$55 < d \leq 80$	$50 < d \leq 70$	$35 < d \leq 50$	F
F	Very Poor	$80 < d$	$70 < d$	$50 < d$	F

Note: v/c (demand volume / capacity) ratio, or degree of saturation: $v/c > 1.0$ represents oversaturated conditions.

An intersection is deemed to be operating acceptably at levels of service A to D. If an intersection operates at a level of service E or F or has a volume to capacity ratio higher than 0.95 the intersection is considered to be operating at capacity.

7 TRAFFIC IMPACT & CAPACITY ANALYSIS

7.1 Capacity Analyses

In order to determine the expected traffic impact of the proposed development at the key intersections within the study area, the capacity analysis was carried out using **Sidra Intersection 7**, a traffic engineering software package. The following key intersections (see **Figure 3.1**) were analysed:

- D2001 / Exxaro Warehouse Deliveries Intersection
- D2001 / Grootgeluk Mine Access Intersection
- D2001 / Matimba Power Station Access Intersection
- D2001 / D1675 Intersection
- D1675 / D2649 Intersection

The weekday AM and PM peak hours are considered the most critical peaks to analyse. The critical peak hour analyses were considered for the following two scenarios;

- Scenario 1: The existing 2018 background peak hour traffic flows without development – as per **Figures 3.2 and 3.3**. From this scenario one can tell if the intersection currently operates at acceptable or congested levels of service during the peak periods.
- Scenario 2: The existing 2018 background peak hour traffic flows with development – as per **Figures 5.5 and 5.6**. From this scenario one can tell if the intersection has ample spare capacity to accommodate the anticipated development trips or upgrades will be required to mitigate the anticipated traffic impact of the proposed development.
- Scenario 3: Future 2023 background peak hour traffic flows without development – as per **Figures 5.1 and 5.2**.
- Scenario 4: Total future 2023 peak hour traffic demand - as per **Figures 5.7 and 5.8**. This includes the future background traffic demand, estimated latent trips as well as the estimated development trips.

Detailed results of Sidra Intersection Capacity Analysis for each scenario are appended in **Annexure B**.

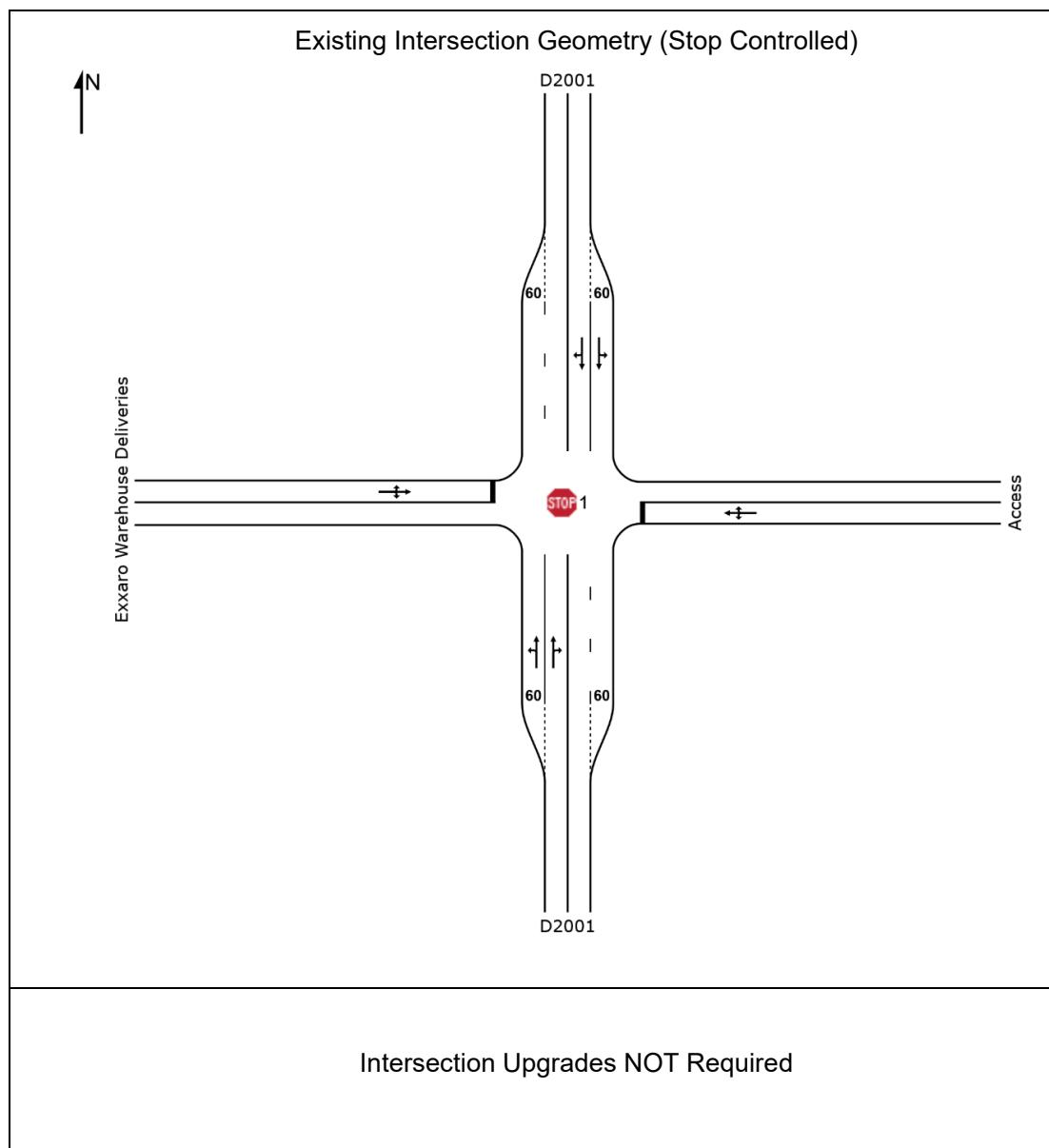
7.2 Traffic Impact & Intersections Improvements

The results of Sidra Intersection Capacity Analyses (see **Annexure B**) and traffic impact at each analysed intersection may be briefly described as follows;

D2001 / Exxaro Warehouse Deliveries Intersection: - This intersection currently operates at acceptable levels of service during the critical weekday peak periods and it has ample spare capacity to continue operating acceptably with the total future traffic demand. The proposed development would have negligible traffic impact at this intersection.

Figure 7.1 depicts the existing intersection geometry.

Figure 7.1: Intersection Geometry: D2001 / Exxaro Warehouse Deliveries Intersection



D2001 / Grootgeluk Mine Access Intersection: - This intersection currently operates at acceptable levels of service during the critical weekday peak periods and it has ample spare capacity to continue operating acceptably with the total future traffic demand. The proposed development would have negligible traffic impact at this intersection.

Figure 7.2 depicts the existing intersection geometry.

D2001 / Matimba Power Station Access Intersection: - This intersection currently operates at acceptable levels of service during the critical weekday peak periods and it has ample spare capacity to continue operating acceptably with the total future traffic demand. The proposed development would have negligible traffic impact at this intersection. The intersection will approach its capacity during the critical weekday morning (AM) peak period in the future with the total future traffic demand.

Figure 7.3 depicts the existing intersection geometry.

D2001 / D1675 Intersection: - This intersection already operates at congested levels of service during both critical weekday peak periods. A TIA undertaken for the latent right development allowed for in this study (namely: Exxaro Thabametsi Coal Mine) has identified a need to upgrade this intersection as per the layout shown in **Figure 7.4** of this study. The proposed development would have negligible traffic impact at this intersection.

This latent intersection upgrade would suffice to accommodate the total future traffic demand and thus additional upgrades would not be required.

Figure 7.4 depicts the existing and latent intersection geometry.

D1675 / D2649 Intersection: - This intersection already operates at congested levels of service during the critical weekday peak periods. It is recommended that the Roads Agency Limpopo (RAL) consider upgrading of this intersection to a “butterfly” configuration, whereby traffic travelling along the D1675 towards D2001 flows freely past the intersection. Traffic on the D2649, entering D1675 and heading towards D2001 will have a dedicated, protected exit / receiving lane (unopposed traffic) which will then merge with the freely flowing traffic through the intersection. This type of intersection improves the capacity and safety of the right movements from the side of the road by allowing two stage gag acceptance by providing an acceleration lane in the middle of the road. A layout similar to the one described above has been constructed at the D2001 / Walter Sisulu Drive Intersection, where Onverwacht residential area is accessible to/from the D2001. The proposed development would have negligible traffic impact at this intersection.

Figure 7.5 depicts the existing intersection geometry.

Figure 7.2: Intersection Geometry: D2001 / Grootgeluk Mine Access Intersection

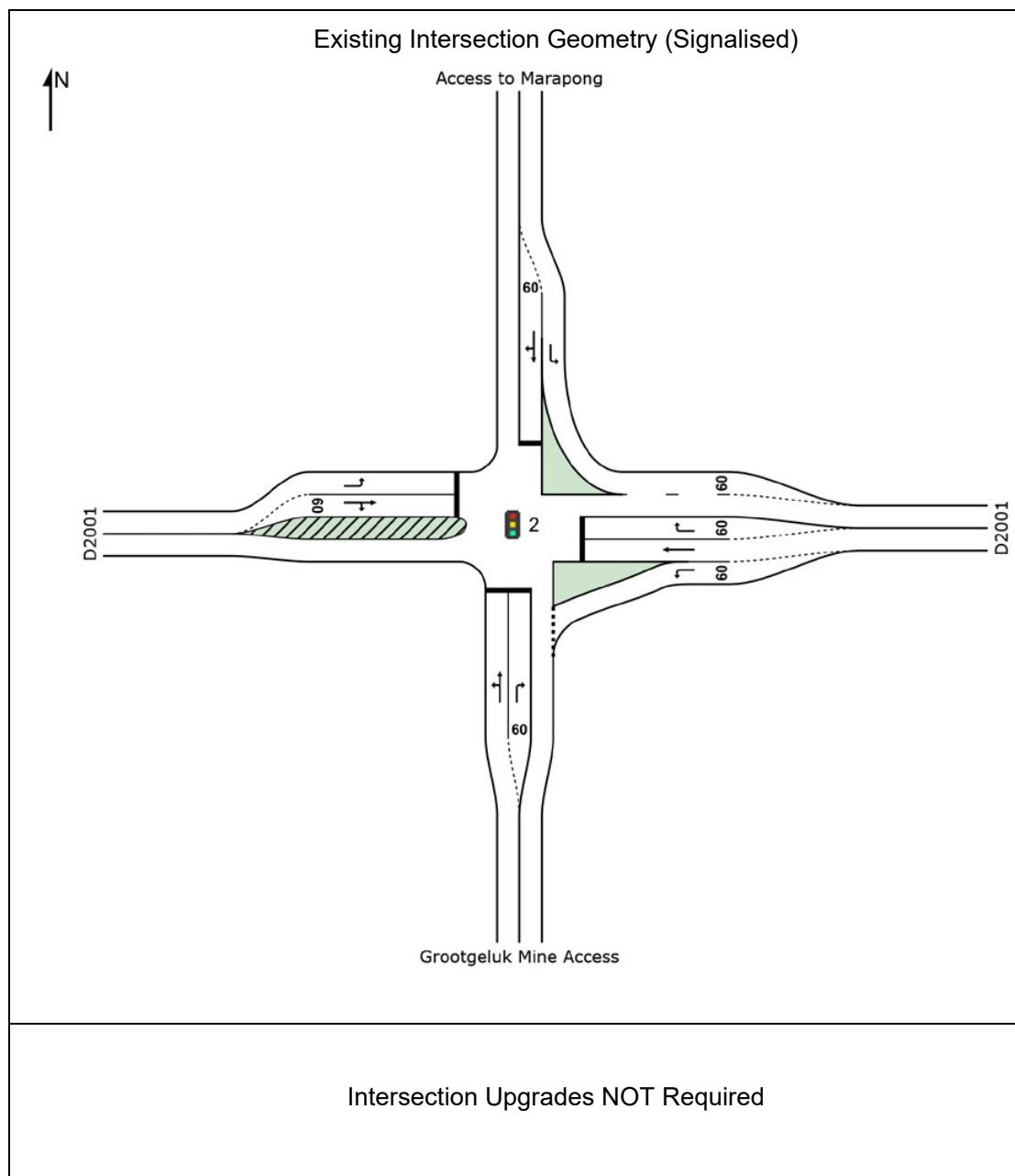


Figure 7.3: Intersection Geometry: D2001 / Matimba Power Station Access Intersection

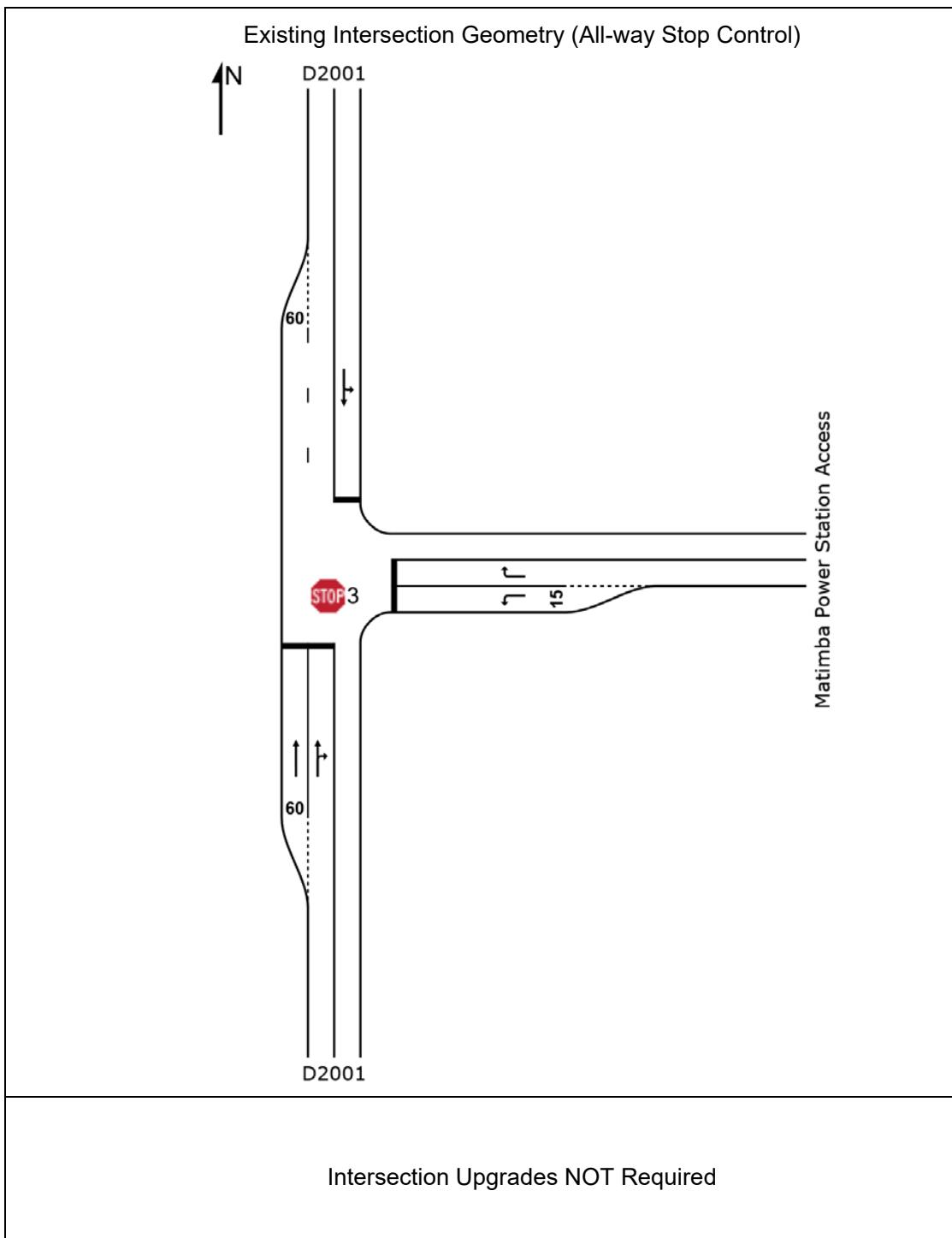


Figure 7.4: Intersection Geometry: D2001 / D1675 Intersection

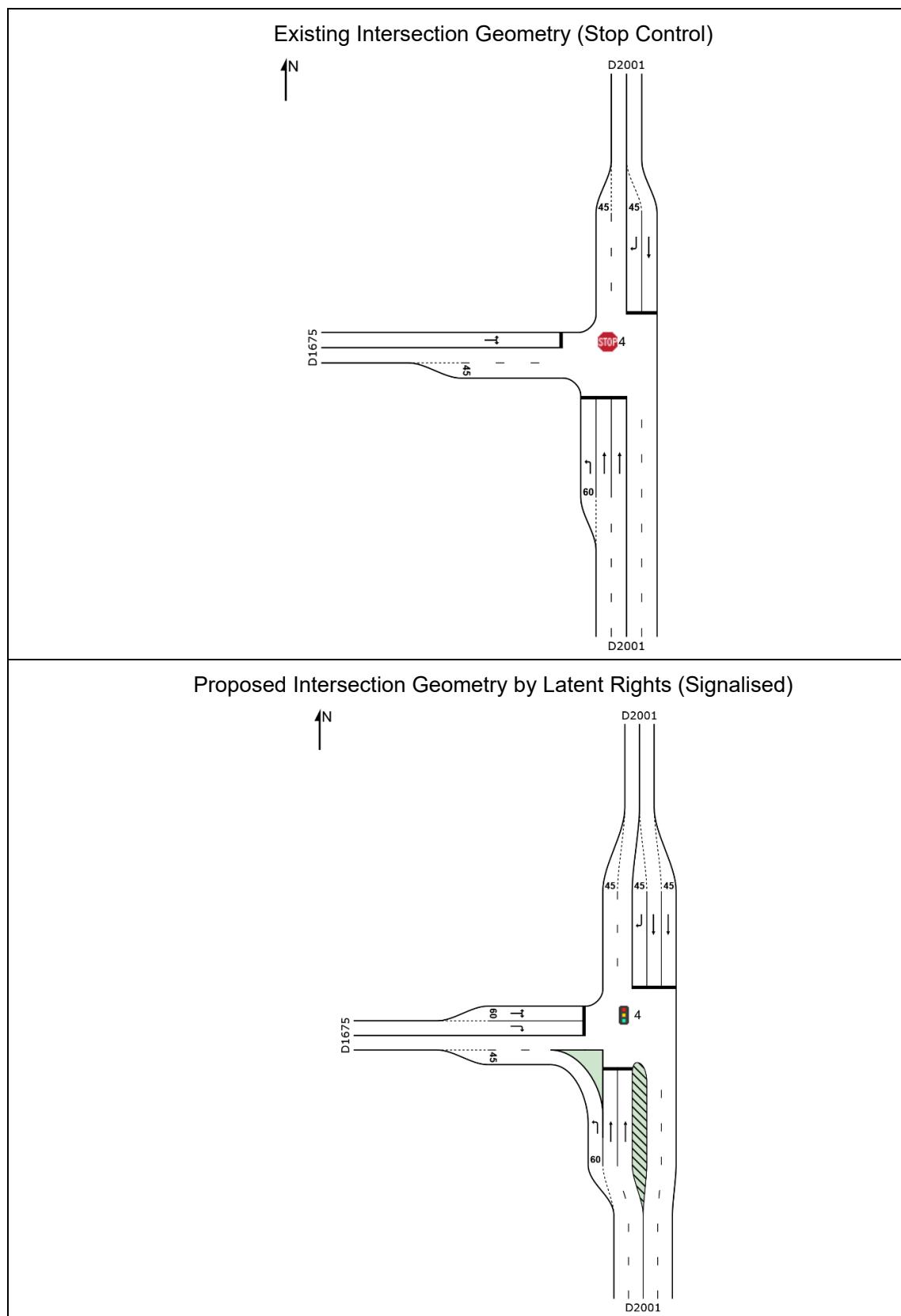
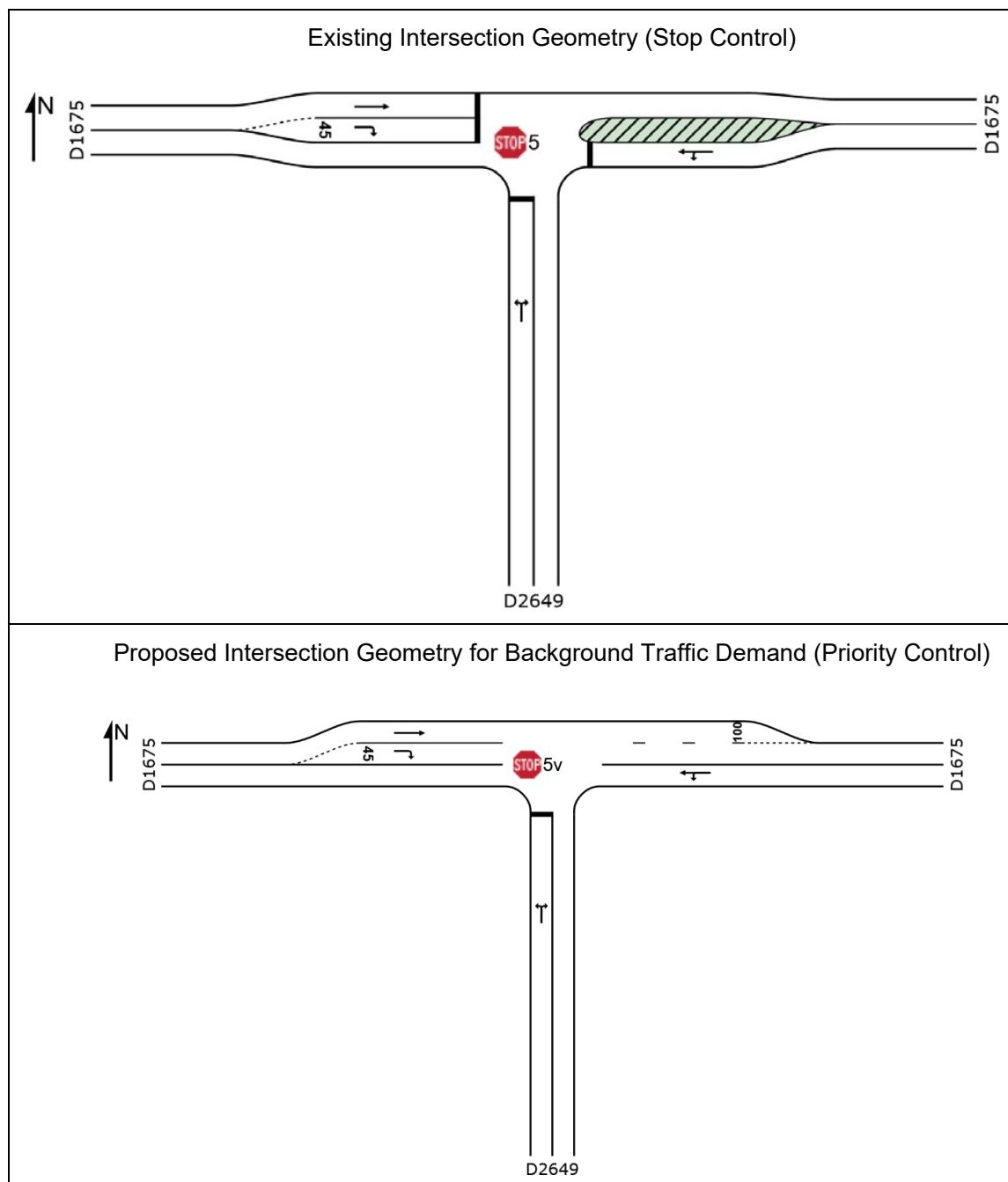


Figure 7.5: Intersection Geometry: D1675 / D2649 Intersection



8 NON-MOTORISED & PUBLIC TRANSPORT

Given that the proposed mining operation would create job opportunities, it is thus important to note that this would stimulate demand for public transport. The expectation is that some of the mine workers would make use of the public transport service for commuting purposes.

It is expected that public transport in the form of bus or minibus taxis will be provided by the mine to serve the commuting needs of the labour and some staff personnel. Possibility also exists for some or a group of workers to arrange themselves a transport.

It is recommended, given the location of the proposed mine relative to the residential areas in the surroundings (Marapong and Lephalale) that the proposed mining development provides commuting transport to those workers who would be in need of such a service.

The proposed mining development is supported from non-motorised and public transport needs perspective.

9 CONCLUSIONS AND RECOMMENDATIONS

It is concluded from the investigations that;

- This TIA was undertaken in support of the proposed Turfvlakte Mining Pits to be situated within the current Exxaro Coal (Pty) Ltd - Grootegeluk mining rights area, in the Lephalale District, Limpopo Province.
- Exxaro intends to develop Turfvlakte for the mining of coal and to beneficiate coal on-site. The coal will be transported via railway system to Richards Bay Coal Terminal.
- This traffic study investigates and reports on the following;
 - o Assessment of existing and required roads infrastructure for the mine
 - o Anticipated trip generation and assignment
 - o Need to implement road and/or intersections improvements required to mitigate the anticipated traffic impact
- This study was conducted in terms of the requirements of the *TMH 16 Volume 2 (South African Traffic Impact and Site Impact Assessment Standards and Requirements Manual)*, COTO, Version 1 dated August 2012.
- Manual traffic surveys were undertaken at the key intersections within the study area.
- According to the road management system (dated 08-04-2009) issued by the Limpopo Roads Agency (RAL), Road D2001 is a district road whilst Road D1675 falls within the jurisdiction of the RAL (see **Figure 1.3**).
- The proposed mining development is estimated to generate a total (inbound plus outbound) at most 39 peak hour trips during the critical weekday AM and PM peaks. This excludes the truck trips which will be generated within the site.
- The proposed new mining (Turfvlakte Farm) will use the existing access currently serving the existing mining (Grootegeluk).
- The results of the capacity analyses indicated that the existing access to Grootegeluk Mine has ample spare capacity to accommodate the expected development (Turfvlakte Farm) trips.
- The results of the capacity analyses further indicated the following intersections upgrades requirements;
 - o D2001 / D1675 Intersection: - Already congested LOS F, latent right development proposed to signalise.
 - o D1675 / D2649 Intersection: - Already congested LOS F, upgrading required from Roads Agency Limpopo (RAL) to restore the acceptable LOS.
- The proposed mining development is supported from non-motorised and public transport needs perspective.

It is recommended that:

- The intersections currently operating at congested levels of service, be upgraded by Roads Agency Limpopo (RAL) to restore the acceptable performance during the critical weekday peak periods.

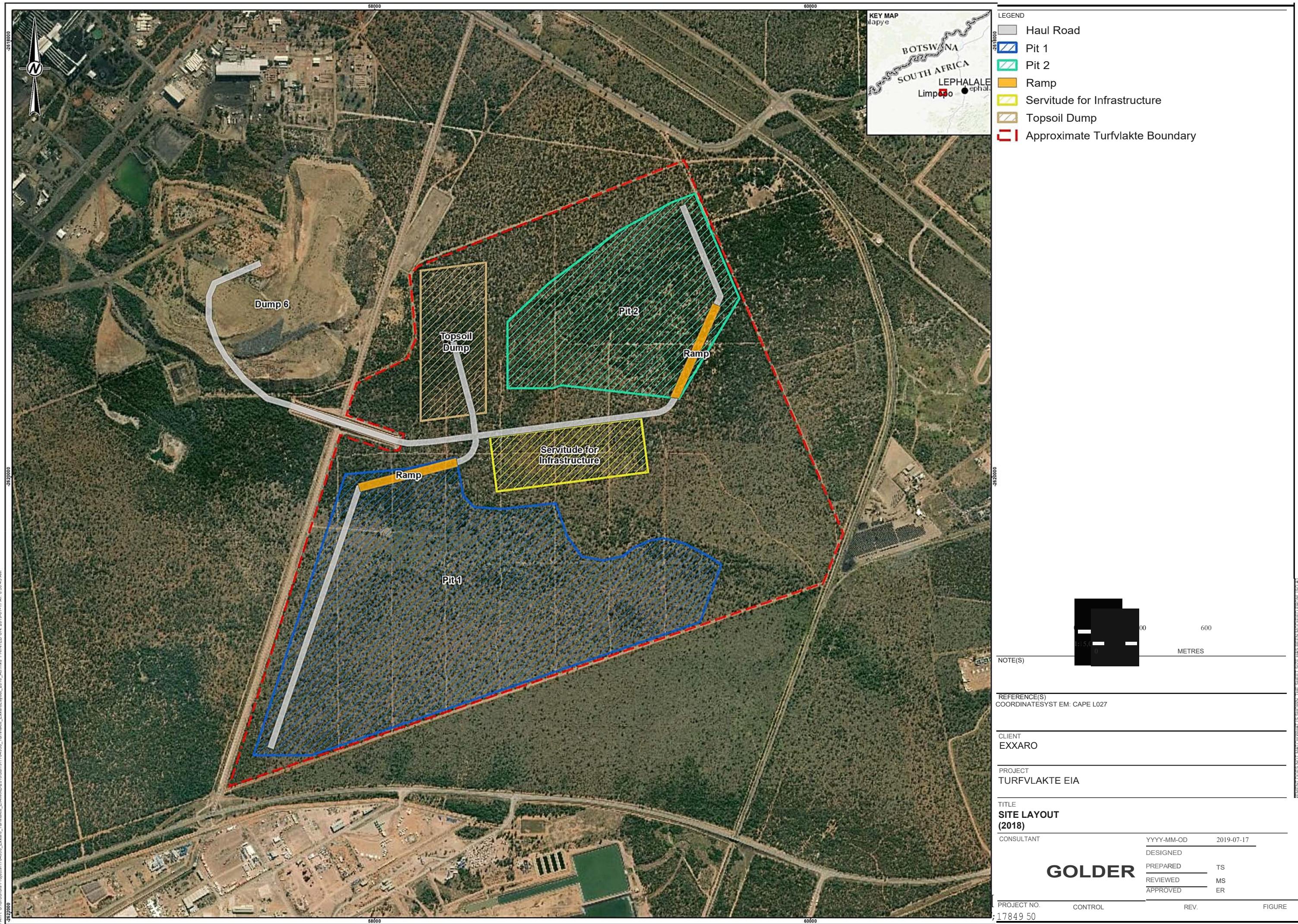
- The intersection of D1675 / D2649 should be upgraded to a so called "butterfly" configuration to allow two stage gap acceptance for right turning vehicles from the side of the road. The cost of this is for the road authorities as the issue is an existing issue and not as a result of the proposed development.
- The proposed mining establishment be supported from traffic and transportation engineering perspectives and therefore be approved by the affected roads authorities.

10 REFERENCES

1. Committee of Transport Officials (COTO) - *TMH16 Vol. 1 South African Traffic Impact and Site Impact Assessment Manual*, August 2012.
2. Committee of Transport Officials (COTO) - *TMH16 Vol. 2 South African Traffic Impact and Site Impact Assessment Standards and Requirements Manual*, August 2012.
3. Exxaro Thabametsi Coal Mine, *Traffic Impact Assessment (TIA)*, ITS Engineers, December 2012.

Annexure A

Proposed Site Layout Plan



Annexure B

Outputs of the SIDRA 7 Intersection Capacity Analyses at the following

- ✓ D2001 / Exxaro Warehouse Deliveries Intersection
- ✓ D2001 / Grootgeluk Mine Access Intersection
- ✓ D2001 / Matimba Power Station Access Intersection
- ✓ D2001 / D1675 Intersection
- ✓ D1675 / D2649 Intersection

MOVEMENT SUMMARY

Site: 1 [Existing 2018 AM Peak Hour Traffic]

D2001 / Exxaro Warehouse Deliveries
Stop (Two-Way)

1	L2	20	2,0	0,011	5,6	LOS A	0,0	0,0	0,00	0,58	53,5
2	T1	1	2,0	0,001	0,0	LOS A	0,0	0,0	0,03	0,29	57,3
3	R2	1	2,0	0,001	5,6	LOS A	0,0	0,0	0,03	0,29	55,5
Approach		22	2,0	0,011	5,3	NA	0,0	0,0	0,00	0,55	53,8
4	L2	1	2,0	0,003	8,1	LOS A	0,0	0,1	0,02	0,99	51,6
5	T1	1	2,0	0,003	8,5	LOS A	0,0	0,1	0,02	0,99	51,7
6	R2	1	2,0	0,003	8,0	LOS A	0,0	0,1	0,02	0,99	51,4
Approach		3	2,0	0,003	8,2	LOS A	0,0	0,1	0,02	0,99	51,6
7	L2	1	2,0	0,001	5,6	LOS A	0,0	0,0	0,00	0,28	55,9
8	T1	4	2,0	0,003	0,0	LOS A	0,0	0,1	0,04	0,25	57,6
9	R2	2	2,0	0,003	5,6	LOS A	0,0	0,1	0,06	0,23	55,8
Approach		7	2,0	0,003	2,4	NA	0,0	0,1	0,04	0,25	56,8
10	L2	1	2,0	0,013	8,1	LOS A	0,0	0,3	0,00	1,00	51,7
11	T1	1	2,0	0,013	8,4	LOS A	0,0	0,3	0,00	1,00	51,8
12	R2	13	2,0	0,013	8,0	LOS A	0,0	0,3	0,00	1,00	51,5
Approach		15	2,0	0,013	8,1	LOS A	0,0	0,3	0,00	1,00	51,6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1 [Existing 2018 PM Peak Hour Traffic]

D2001 / Exxaro Warehouse Deliveries
Stop (Two-Way)

1	L2	19	2,0	0,010	5,6	LOS A	0,0	0,0	0,00	0,58	53,5
2	T1	5	2,0	0,004	0,0	LOS A	0,0	0,1	0,01	0,17	58,4
3	R2	2	2,0	0,004	5,5	LOS A	0,0	0,1	0,01	0,17	56,6
Approach		26	2,0	0,010	4,5	NA	0,0	0,1	0,00	0,46	54,7
4	L2	1	2,0	0,003	8,1	LOS A	0,0	0,1	0,00	1,00	51,6
5	T1	1	2,0	0,003	8,5	LOS A	0,0	0,1	0,00	1,00	51,7
6	R2	1	2,0	0,003	8,0	LOS A	0,0	0,1	0,00	1,00	51,4
Approach		3	2,0	0,003	8,2	LOS A	0,0	0,1	0,00	1,00	51,6
7	L2	1	2,0	0,001	5,6	LOS A	0,0	0,0	0,00	0,50	54,1
8	T1	2	2,0	0,002	0,0	LOS A	0,0	0,0	0,06	0,23	57,7
9	R2	1	2,0	0,002	5,6	LOS A	0,0	0,0	0,06	0,20	56,1
Approach		4	2,0	0,002	2,8	NA	0,0	0,0	0,04	0,29	56,4
10	L2	1	2,0	0,013	8,1	LOS A	0,0	0,3	0,00	1,00	51,7
11	T1	1	2,0	0,013	8,4	LOS A	0,0	0,3	0,00	1,00	51,7
12	R2	13	2,0	0,013	8,0	LOS A	0,0	0,3	0,00	1,00	51,5
Approach		15	2,0	0,013	8,1	LOS A	0,0	0,3	0,00	1,00	51,6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 1 [Existing 2018 AM Peak Hour Traffic WITH Development]

D2001 / Exxaro Warehouse Deliveries
Stop (Two-Way)

1	L2	20	2,0	0,011	5,6	LOS A	0,0	0,0	0,00	0,58	53,5
2	T1	2	2,0	0,002	0,0	LOS A	0,0	0,0	0,03	0,20	58,1
3	R2	1	2,0	0,002	5,6	LOS A	0,0	0,0	0,03	0,20	56,3
Approach		23	2,0	0,011	5,1	NA	0,0	0,0	0,00	0,52	54,0
4	L2	1	2,0	0,003	8,1	LOS A	0,0	0,1	0,02	0,98	51,6
5	T1	1	2,0	0,003	8,5	LOS A	0,0	0,1	0,02	0,98	51,7
6	R2	1	2,0	0,003	8,0	LOS A	0,0	0,1	0,02	0,98	51,4
Approach		3	2,0	0,003	8,2	LOS A	0,0	0,1	0,02	0,98	51,6
7	L2	1	2,0	0,002	5,6	LOS A	0,0	0,0	0,00	0,21	56,5
8	T1	7	2,0	0,005	0,0	LOS A	0,0	0,1	0,04	0,17	58,3
9	R2	2	2,0	0,005	5,6	LOS A	0,0	0,1	0,05	0,16	56,5
Approach		11	2,0	0,005	1,7	NA	0,0	0,1	0,03	0,18	57,7
10	L2	1	2,0	0,013	8,1	LOS A	0,0	0,3	0,00	1,00	51,7
11	T1	1	2,0	0,013	8,5	LOS A	0,0	0,3	0,00	1,00	51,7
12	R2	13	2,0	0,013	8,0	LOS A	0,0	0,3	0,00	1,00	51,5
Approach		15	2,0	0,013	8,1	LOS A	0,0	0,3	0,00	1,00	51,6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 1 [Existing 2018 PM Peak Hour Traffic WITH Development]

D2001 / Exxaro Warehouse Deliveries
Stop (Two-Way)

1	L2	19	2,0	0,010	5,6	LOS A	0,0	0,0	0,00	0,58	53,5
2	T1	8	2,0	0,006	0,0	LOS A	0,0	0,1	0,01	0,12	58,9
3	R2	2	2,0	0,006	5,6	LOS A	0,0	0,1	0,01	0,12	57,0
Approach		29	2,0	0,010	4,0	NA	0,0	0,1	0,00	0,41	55,2
4	L2	1	2,0	0,003	8,1	LOS A	0,0	0,1	0,01	1,00	51,6
5	T1	1	2,0	0,003	8,5	LOS A	0,0	0,1	0,01	1,00	51,6
6	R2	1	2,0	0,003	8,0	LOS A	0,0	0,1	0,01	1,00	51,4
Approach		3	2,0	0,003	8,2	LOS A	0,0	0,1	0,01	1,00	51,5
7	L2	1	2,0	0,001	5,6	LOS A	0,0	0,0	0,00	0,41	54,8
8	T1	3	2,0	0,002	0,0	LOS A	0,0	0,0	0,05	0,20	58,0
9	R2	1	2,0	0,002	5,7	LOS A	0,0	0,0	0,05	0,16	56,5
Approach		5	2,0	0,002	2,3	NA	0,0	0,0	0,04	0,23	57,0
10	L2	1	2,0	0,013	8,1	LOS A	0,0	0,3	0,00	1,00	51,7
11	T1	1	2,0	0,013	8,5	LOS A	0,0	0,3	0,00	1,00	51,7
12	R2	13	2,0	0,013	8,0	LOS A	0,0	0,3	0,00	1,00	51,5
Approach		15	2,0	0,013	8,1	LOS A	0,0	0,3	0,00	1,00	51,6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 1 [Future 2023 AM Peak Hour Traffic]

D2001 / Exxaro Warehouse Deliveries
Stop (Two-Way)

1	L2	23	2,0	0,013	5,6	LOS A	0,0	0,0	0,00	0,58	53,5
2	T1	1	2,0	0,001	0,0	LOS A	0,0	0,0	0,03	0,29	57,3
3	R2	1	2,0	0,001	5,6	LOS A	0,0	0,0	0,03	0,29	55,5
Approach		25	2,0	0,013	5,3	NA	0,0	0,0	0,00	0,55	53,8
4	L2	1	2,0	0,003	8,1	LOS A	0,0	0,1	0,02	0,99	51,6
5	T1	1	2,0	0,003	8,5	LOS A	0,0	0,1	0,02	0,99	51,7
6	R2	1	2,0	0,003	8,0	LOS A	0,0	0,1	0,02	0,99	51,4
Approach		3	2,0	0,003	8,2	LOS A	0,0	0,1	0,02	0,99	51,6
7	L2	1	2,0	0,001	5,6	LOS A	0,0	0,0	0,00	0,25	56,2
8	T1	5	2,0	0,004	0,0	LOS A	0,0	0,1	0,04	0,22	57,9
9	R2	2	2,0	0,004	5,6	LOS A	0,0	0,1	0,06	0,20	56,1
Approach		8	2,0	0,004	2,1	NA	0,0	0,1	0,04	0,22	57,2
10	L2	1	2,0	0,015	8,1	LOS A	0,0	0,3	0,01	1,00	51,7
11	T1	1	2,0	0,015	8,4	LOS A	0,0	0,3	0,01	1,00	51,7
12	R2	15	2,0	0,015	8,0	LOS A	0,0	0,3	0,01	1,00	51,5
Approach		17	2,0	0,015	8,1	LOS A	0,0	0,3	0,01	1,00	51,6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 1 [Future 2023 PM Peak Hour Traffic]

D2001 / Exxaro Warehouse Deliveries
Stop (Two-Way)

1	L2	22	2,0	0,012	5,6	LOS A	0,0	0,0	0,00	0,58	53,5
2	T1	6	2,0	0,005	0,0	LOS A	0,0	0,1	0,01	0,15	58,6
3	R2	2	2,0	0,005	5,5	LOS A	0,0	0,1	0,01	0,15	56,7
Approach		31	2,0	0,012	4,4	NA	0,0	0,1	0,00	0,46	54,7
4	L2	1	2,0	0,003	8,1	LOS A	0,0	0,1	0,00	1,00	51,6
5	T1	1	2,0	0,003	8,5	LOS A	0,0	0,1	0,00	1,00	51,6
6	R2	1	2,0	0,003	8,0	LOS A	0,0	0,1	0,00	1,00	51,4
Approach		3	2,0	0,003	8,2	LOS A	0,0	0,1	0,00	1,00	51,5
7	L2	1	2,0	0,001	5,6	LOS A	0,0	0,0	0,00	0,50	54,2
8	T1	2	2,0	0,002	0,1	LOS A	0,0	0,0	0,06	0,23	57,7
9	R2	1	2,0	0,002	5,7	LOS A	0,0	0,0	0,07	0,20	56,1
Approach		4	2,0	0,002	2,8	NA	0,0	0,0	0,05	0,29	56,4
10	L2	1	2,0	0,015	8,1	LOS A	0,0	0,4	0,01	1,00	51,7
11	T1	1	2,0	0,015	8,5	LOS A	0,0	0,4	0,01	1,00	51,7
12	R2	15	2,0	0,015	8,0	LOS A	0,0	0,4	0,01	1,00	51,5
Approach		17	2,0	0,015	8,1	LOS A	0,0	0,4	0,01	1,00	51,6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 1 [Total Future 2023 AM Peak Hour Traffic Demand]

D2001 / Exxaro Warehouse Deliveries
Stop (Two-Way)

1	L2	23	2,0	0,029	5,6	LOS A	0,0	0,0	0,00	0,25	56,2
2	T1	196	2,0	0,085	0,0	LOS A	0,0	0,1	0,00	0,04	59,6
3	R2	1	2,0	0,085	5,8	LOS A	0,0	0,1	0,00	0,00	58,0
Approach		220	2,0	0,085	0,6	NA	0,0	0,1	0,00	0,07	59,2
4	L2	1	2,0	0,004	8,2	LOS A	0,0	0,1	0,09	0,95	50,6
5	T1	1	2,0	0,004	10,6	LOS B	0,0	0,1	0,09	0,95	50,7
6	R2	1	2,0	0,004	10,4	LOS B	0,0	0,1	0,09	0,95	50,5
Approach		3	2,0	0,004	9,7	LOS A	0,0	0,1	0,09	0,95	50,6
7	L2	1	2,0	0,008	5,6	LOS A	0,0	0,0	0,00	0,04	57,9
8	T1	57	2,0	0,024	0,1	LOS A	0,0	0,1	0,03	0,03	59,6
9	R2	2	2,0	0,024	6,6	LOS A	0,0	0,1	0,04	0,03	57,7
Approach		60	2,0	0,024	0,4	NA	0,0	0,1	0,03	0,03	59,5
10	L2	1	2,0	0,019	8,2	LOS A	0,1	0,5	0,27	0,89	51,2
11	T1	1	2,0	0,019	10,6	LOS B	0,1	0,5	0,27	0,89	51,3
12	R2	15	2,0	0,019	9,3	LOS A	0,1	0,5	0,27	0,89	51,1
Approach		17	2,0	0,019	9,3	LOS A	0,1	0,5	0,27	0,89	51,1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Accentuation Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 1 [Total Future 2023 PM Peak Hour Traffic Demand]

D2001 / Exxaro Warehouse Deliveries
Stop (Two-Way)

1	L2	22	2,0	0,012	5,6	LOS A	0,0	0,0	0,00	0,58	53,5
2	T1	58	2,0	0,032	0,0	LOS A	0,0	0,1	0,03	0,02	59,7
3	R2	2	2,0	0,032	6,3	LOS A	0,0	0,1	0,03	0,02	57,8
Approach		82	2,0	0,032	1,7	NA	0,0	0,1	0,02	0,17	57,8
4	L2	1	2,0	0,004	8,3	LOS A	0,0	0,1	0,22	0,88	50,8
5	T1	1	2,0	0,004	10,7	LOS B	0,0	0,1	0,22	0,88	50,8
6	R2	1	2,0	0,004	10,4	LOS B	0,0	0,1	0,22	0,88	50,6
Approach		3	2,0	0,004	9,8	LOS A	0,0	0,1	0,22	0,88	50,7
7	L2	1	2,0	0,026	5,6	LOS A	0,0	0,0	0,00	0,01	58,2
8	T1	197	2,0	0,077	0,0	LOS A	0,0	0,1	0,00	0,01	59,9
9	R2	1	2,0	0,077	5,9	LOS A	0,0	0,1	0,00	0,00	58,0
Approach		199	2,0	0,077	0,1	NA	0,0	0,1	0,00	0,01	59,9
10	L2	1	2,0	0,019	8,1	LOS A	0,1	0,5	0,00	1,00	50,8
11	T1	1	2,0	0,019	10,6	LOS B	0,1	0,5	0,00	1,00	50,9
12	R2	15	2,0	0,019	9,3	LOS A	0,1	0,5	0,00	1,00	50,7
Approach		17	2,0	0,019	9,3	LOS A	0,1	0,5	0,00	1,00	50,7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Accentuation Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [Existing 2018 AM Peak Hour Traffic]

D2001 / Grootgeluk Mine Access

Signals - Fixed Time Isolated Cycle Time = 45 seconds (User-Given Cycle Time)

1	L2	1	2,0	0,008	18,7	LOS B	0,1	0,5	0,75	0,52	47,3
2	T1	3	2,0	0,008	13,2	LOS B	0,1	0,5	0,75	0,52	48,5
3	R2	137	2,0	0,316	20,6	LOS C	2,5	18,0	0,84	0,77	44,0
Approach		141	2,0	0,316	20,4	LOS C	2,5	18,0	0,84	0,76	44,1
4	L2	107	2,0	0,080	6,3	LOS A	0,3	2,1	0,25	0,61	53,3
5	T1	19	2,0	0,019	5,8	LOS A	0,2	1,5	0,51	0,37	54,8
6	R2	243	2,0	0,313	12,7	LOS B	3,2	22,8	0,62	0,74	48,6
Approach		369	2,0	0,313	10,5	LOS B	3,2	22,8	0,50	0,68	50,2
7	L2	356	2,0	0,192	5,6	LOS A	0,0	0,0	0,00	0,53	54,8
8	T1	20	2,0	0,050	13,6	LOS B	0,4	2,9	0,77	0,58	48,5
9	R2	4	2,0	0,050	19,1	LOS B	0,4	2,9	0,77	0,58	47,2
Approach		380	2,0	0,192	6,2	LOS A	0,4	2,9	0,05	0,53	54,4
10	L2	3	2,0	0,003	11,3	LOS B	0,0	0,2	0,50	0,61	49,4
11	T1	8	2,0	0,016	5,8	LOS A	0,1	1,1	0,51	0,47	53,1
12	R2	5	2,0	0,016	11,4	LOS B	0,1	1,1	0,51	0,47	51,6
Approach		17	2,0	0,016	8,6	LOS A	0,1	1,1	0,51	0,50	51,9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [Existing 2018 PM Peak Hour Traffic]

D2001 / Grootgeluk Mine Access

Signals - Fixed Time Isolated Cycle Time = 45 seconds (User-Given Cycle Time)

Movement Summary											
1	L2	2	2,0	0,143	17,2	LOS B	1,5	10,4	0,73	0,58	49,1
2	T1	91	2,0	0,143	11,6	LOS B	1,5	10,4	0,73	0,58	50,4
3	R2	243	2,0	0,451	18,9	LOS B	4,4	31,2	0,83	0,79	44,9
Approach		336	2,0	0,451	16,9	LOS B	4,4	31,2	0,80	0,73	46,3
4	L2	4	2,0	0,003	6,2	LOS A	0,0	0,1	0,23	0,57	53,4
5	T1	23	2,0	0,027	7,6	LOS A	0,3	2,0	0,58	0,42	53,4
6	R2	306	2,0	0,448	15,3	LOS B	4,8	34,5	0,74	0,78	47,0
Approach		334	2,0	0,448	14,6	LOS B	4,8	34,5	0,72	0,75	47,4
7	L2	204	2,0	0,110	5,6	LOS A	0,0	0,0	0,00	0,53	54,9
8	T1	1	2,0	0,004	10,8	LOS B	0,0	0,2	0,68	0,52	49,1
9	R2	1	2,0	0,004	16,4	LOS B	0,0	0,2	0,68	0,52	47,8
Approach		206	2,0	0,110	5,7	LOS A	0,0	0,2	0,01	0,53	54,8
10	L2	5	2,0	0,006	13,0	LOS B	0,1	0,5	0,57	0,63	48,3
11	T1	9	2,0	0,013	7,5	LOS A	0,1	0,9	0,58	0,42	53,0
12	R2	1	2,0	0,013	13,0	LOS B	0,1	0,9	0,58	0,42	51,5
Approach		16	2,0	0,013	9,7	LOS A	0,1	0,9	0,57	0,49	51,2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [Existing 2018 AM Peak Hour Traffic WITH Development]

D2001 / Grootgeluk Mine Access

Signals - Fixed Time Isolated Cycle Time = 45 seconds (User-Given Cycle Time)

Movement Summary											
1	L2	1	2,0	0,009	17,9	LOS B	0,1	0,6	0,73	0,51	48,0
2	T1	4	2,0	0,009	12,4	LOS B	0,1	0,6	0,73	0,51	49,2
3	R2	141	2,0	0,308	19,7	LOS B	2,5	18,1	0,82	0,76	44,5
Approach		146	2,0	0,308	19,5	LOS B	2,5	18,1	0,82	0,75	44,6
4	L2	132	2,0	0,099	6,3	LOS A	0,4	2,6	0,25	0,61	53,3
5	T1	19	2,0	0,020	6,4	LOS A	0,2	1,5	0,53	0,38	54,3
6	R2	243	2,0	0,326	13,3	LOS B	3,3	23,8	0,64	0,75	48,1
Approach		394	2,0	0,326	10,6	LOS B	3,3	23,8	0,51	0,68	50,0
7	L2	354	2,0	0,191	5,6	LOS A	0,0	0,0	0,00	0,53	54,8
8	T1	27	2,0	0,059	12,8	LOS B	0,5	3,7	0,75	0,57	49,2
9	R2	4	2,0	0,059	18,3	LOS B	0,5	3,7	0,75	0,57	47,9
Approach		385	2,0	0,191	6,3	LOS A	0,5	3,7	0,06	0,53	54,3
10	L2	3	2,0	0,003	11,8	LOS B	0,0	0,2	0,52	0,61	49,0
11	T1	8	2,0	0,021	6,4	LOS A	0,2	1,4	0,53	0,52	52,1
12	R2	8	2,0	0,021	12,0	LOS B	0,2	1,4	0,53	0,52	50,7
Approach		20	2,0	0,021	9,6	LOS A	0,2	1,4	0,53	0,54	51,0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [Existing 2018 PM Peak Hour Traffic WITH Development]

D2001 / Grootgeluk Mine Access

Signals - Fixed Time Isolated Cycle Time = 45 seconds (User-Given Cycle Time)

Movement Summary											
1	L2	2	2,0	0,143	16,4	LOS B	1,5	10,7	0,71	0,56	49,6
2	T1	97	2,0	0,143	10,8	LOS B	1,5	10,7	0,71	0,56	50,9
3	R2	266	2,0	0,469	18,2	LOS B	4,7	33,7	0,82	0,79	45,3
Approach		365	2,0	0,469	16,2	LOS B	4,7	33,7	0,79	0,73	46,7
4	L2	11	2,0	0,008	6,2	LOS A	0,0	0,2	0,23	0,58	53,4
5	T1	23	2,0	0,028	8,2	LOS A	0,3	2,1	0,61	0,44	52,9
6	R2	306	2,0	0,469	16,1	LOS B	5,0	35,9	0,77	0,79	46,5
Approach		340	2,0	0,469	15,2	LOS B	5,0	35,9	0,74	0,76	47,1
7	L2	204	2,0	0,110	5,6	LOS A	0,0	0,0	0,00	0,53	54,9
8	T1	3	2,0	0,007	10,1	LOS B	0,1	0,4	0,66	0,48	50,5
9	R2	1	2,0	0,007	15,7	LOS B	0,1	0,4	0,66	0,48	49,1
Approach		208	2,0	0,110	5,8	LOS A	0,1	0,4	0,01	0,53	54,8
10	L2	5	2,0	0,007	13,6	LOS B	0,1	0,5	0,60	0,63	47,9
11	T1	9	2,0	0,013	8,1	LOS A	0,1	1,0	0,60	0,44	52,5
12	R2	1	2,0	0,013	13,7	LOS B	0,1	1,0	0,60	0,44	51,0
Approach		16	2,0	0,013	10,3	LOS B	0,1	1,0	0,60	0,50	50,8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [Future 2023 AM Peak Hour Traffic]

D2001 / Grootgeluk Mine Access

Signals - Fixed Time Isolated Cycle Time = 45 seconds (User-Given Cycle Time)

Movement Summary											
1	L2	1	2,0	0,008	18,7	LOS B	0,1	0,5	0,75	0,52	47,3
2	T1	3	2,0	0,008	13,2	LOS B	0,1	0,5	0,75	0,52	48,5
3	R2	159	2,0	0,369	20,8	LOS C	3,0	21,3	0,86	0,78	43,9
Approach		163	2,0	0,369	20,7	LOS C	3,0	21,3	0,85	0,77	44,0
4	L2	124	2,0	0,093	6,3	LOS A	0,3	2,4	0,25	0,61	53,3
5	T1	22	2,0	0,022	5,8	LOS A	0,2	1,7	0,51	0,37	54,7
6	R2	282	2,0	0,364	12,9	LOS B	3,8	27,3	0,64	0,75	48,4
Approach		428	2,0	0,364	10,6	LOS B	3,8	27,3	0,52	0,69	50,1
7	L2	411	2,0	0,222	5,7	LOS A	0,0	0,0	0,00	0,53	54,8
8	T1	23	2,0	0,059	13,6	LOS B	0,5	3,4	0,77	0,59	48,4
9	R2	5	2,0	0,059	19,2	LOS B	0,5	3,4	0,77	0,59	47,2
Approach		439	2,0	0,222	6,2	LOS A	0,5	3,4	0,05	0,53	54,4
10	L2	3	2,0	0,003	11,3	LOS B	0,0	0,2	0,50	0,61	49,4
11	T1	9	2,0	0,018	5,8	LOS A	0,2	1,2	0,51	0,48	53,0
12	R2	6	2,0	0,018	11,4	LOS B	0,2	1,2	0,51	0,48	51,5
Approach		19	2,0	0,018	8,6	LOS A	0,2	1,2	0,51	0,50	51,9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [Future 2023 PM Peak Hour Traffic]

D2001 / Grootgeluk Mine Access

Signals - Fixed Time Isolated Cycle Time = 45 seconds (User-Given Cycle Time)

Movement Summary										
1	L2	2	2,0	0,166	17,3	LOS B	1,7	12,2	0,74	0,59
2	T1	105	2,0	0,166	11,7	LOS B	1,7	12,2	0,74	0,59
3	R2	282	2,0	0,523	19,3	LOS B	5,2	37,4	0,86	0,80
Approach		389	2,0	0,523	17,2	LOS B	5,2	37,4	0,82	0,74
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4	L2	5	2,0	0,004	6,2	LOS A	0,0	0,1	0,23	0,57
5	T1	27	2,0	0,032	7,6	LOS A	0,3	2,4	0,58	0,43
6	R2	355	2,0	0,520	15,7	LOS B	5,8	41,6	0,77	0,79
Approach		387	2,0	0,520	15,0	LOS B	5,8	41,6	0,75	0,77
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7	L2	237	2,0	0,128	5,6	LOS A	0,0	0,0	0,00	0,53
8	T1	1	2,0	0,004	10,8	LOS B	0,0	0,2	0,68	0,52
9	R2	1	2,0	0,004	16,4	LOS B	0,0	0,2	0,68	0,52
Approach		239	2,0	0,128	5,7	LOS A	0,0	0,2	0,01	0,53
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10	L2	6	2,0	0,008	13,0	LOS B	0,1	0,5	0,57	0,63
11	T1	11	2,0	0,014	7,5	LOS A	0,1	1,0	0,58	0,42
12	R2	1	2,0	0,014	13,1	LOS B	0,1	1,0	0,58	0,42
Approach		18	2,0	0,014	9,8	LOS A	0,1	1,0	0,58	0,50
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Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY



Site: 2 [Total Future 2023 AM Peak Hour Traffic Demand]

D2001 / Grootgeluk Mine Access

Signals - Fixed Time Isolated Cycle Time = 45 seconds (User-Given Cycle Time)

Movement Summary											
1	L2	1	2,0	0,010	18,8	LOS B	0,1	0,6	0,75	0,52	47,5
2	T1	4	2,0	0,010	13,2	LOS B	0,1	0,6	0,75	0,52	48,6
3	R2	163	2,0	0,383	20,9	LOS C	3,1	22,0	0,86	0,78	43,8
Approach		168	2,0	0,383	20,7	LOS C	3,1	22,0	0,86	0,77	44,0
4	L2	148	2,0	0,112	6,3	LOS A	0,4	3,0	0,26	0,61	53,3
5	T1	192	2,0	0,193	6,5	LOS A	2,3	16,4	0,57	0,47	54,2
6	R2	285	2,0	0,382	13,0	LOS B	3,9	28,0	0,65	0,75	48,4
Approach		625	2,0	0,382	9,4	LOS A	3,9	28,0	0,53	0,63	51,2
7	L2	422	2,0	0,228	5,7	LOS A	0,0	0,0	0,00	0,53	54,8
8	T1	31	2,0	0,133	14,1	LOS B	1,0	7,4	0,79	0,67	47,1
9	R2	29	2,0	0,133	19,6	LOS B	1,0	7,4	0,79	0,67	45,9
Approach		482	2,0	0,228	7,0	LOS A	1,0	7,4	0,10	0,55	53,7
10	L2	9	2,0	0,010	11,3	LOS B	0,1	0,7	0,51	0,63	49,4
11	T1	52	2,0	0,068	6,0	LOS A	0,7	4,9	0,53	0,45	53,9
12	R2	9	2,0	0,068	11,6	LOS B	0,7	4,9	0,53	0,45	52,3
Approach		71	2,0	0,068	7,5	LOS A	0,7	4,9	0,53	0,48	53,0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [Total Future 2023 PM Peak Hour Traffic Demand]

D2001 / Grootgeluk Mine Access

Signals - Fixed Time Isolated Cycle Time = 45 seconds (User-Given Cycle Time)

1	L2	5	2,0	0,208	19,1	LOS B	2,0	14,3	0,79	0,63	47,9
2	T1	112	2,0	0,208	13,5	LOS B	2,0	14,3	0,79	0,63	49,0
3	R2	304	2,0	0,627	21,8	LOS C	6,2	44,5	0,92	0,84	43,4
Approach		421	2,0	0,627	19,6	LOS B	6,2	44,5	0,88	0,78	44,8
4	L2	11	2,0	0,008	6,2	LOS A	0,0	0,2	0,23	0,58	53,4
5	T1	69	2,0	0,073	6,6	LOS A	0,8	5,8	0,55	0,43	54,1
6	R2	366	2,0	0,623	16,7	LOS B	6,6	46,9	0,82	0,82	46,1
Approach		446	2,0	0,623	14,9	LOS B	6,6	46,9	0,76	0,76	47,3
7	L2	240	2,0	0,130	5,6	LOS A	0,0	0,0	0,00	0,53	54,9
8	T1	3	2,0	0,025	13,5	LOS B	0,2	1,2	0,76	0,62	46,7
9	R2	7	2,0	0,025	19,0	LOS B	0,2	1,2	0,76	0,62	45,5
Approach		251	2,0	0,130	6,1	LOS A	0,2	1,2	0,03	0,53	54,4
10	L2	31	2,0	0,034	12,0	LOS B	0,3	2,5	0,54	0,66	48,9
11	T1	180	2,0	0,191	7,1	LOS A	2,3	16,2	0,60	0,49	53,7
12	R2	1	2,0	0,191	12,6	LOS B	2,3	16,2	0,60	0,49	52,2
Approach		212	2,0	0,191	7,8	LOS A	2,3	16,2	0,59	0,51	53,0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 3 [Existing 2018 AM Peak Hour Traffic]

D2001 / Matimba Power Station Access
Stop (All-Way)

Intersection Summary											
2	T1	377	2,0	0,652	14,0	LOS B	3,9	28,0	0,83	1,50	48,6
3	R2	257	2,0	0,652	17,1	LOS C	3,9	28,0	0,89	1,63	46,9
Approach		634	2,0	0,652	15,3	LOS C	3,9	28,0	0,85	1,55	47,9
4	L2	15	2,0	0,076	17,7	LOS C	0,3	1,9	0,99	1,25	46,7
6	R2	1	2,0	0,006	15,8	LOS C	0,0	0,2	1,00	1,23	47,3
Approach		16	2,0	0,076	17,6	LOS C	0,3	1,9	0,99	1,25	46,7
7	L2	57	2,0	0,527	14,0	LOS B	2,5	17,6	0,72	1,49	48,9
8	T1	444	2,0	0,527	13,7	LOS B	2,5	17,6	0,72	1,49	48,7
Approach		501	2,0	0,527	13,7	LOS B	2,5	17,6	0,72	1,49	48,7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Accentuation Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 3 [Existing 2018 PM Peak Hour Traffic]

D2001 / Matimba Power Station Access
Stop (All-Way)

Intersection Summary											
2	T1	293	2,0	0,398	12,2	LOS B	1,7	11,8	0,84	1,36	49,8
3	R2	13	2,0	0,398	13,2	LOS B	1,7	11,8	0,85	1,38	49,4
Approach		305	2,0	0,398	12,3	LOS B	1,7	11,8	0,84	1,36	49,8
4	L2	188	2,0	0,571	25,5	LOS D	3,0	21,6	1,00	1,50	42,5
6	R2	41	2,0	0,141	13,4	LOS B	0,5	3,5	0,94	1,27	48,8
Approach		229	2,0	0,571	23,3	LOS C	3,0	21,6	0,99	1,46	43,5
7	L2	3	2,0	0,538	15,2	LOS C	2,6	18,5	0,78	1,50	48,3
8	T1	453	2,0	0,538	14,8	LOS B	2,6	18,5	0,78	1,50	48,1
Approach		456	2,0	0,538	14,8	LOS B	2,6	18,5	0,78	1,50	48,1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Accentuation Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 3 [Existing 2018 AM Peak Hour Traffic WITH Development]

D2001 / Matimba Power Station Access
Stop (All-Way)

Intersection Summary											
2	T1	401	2,0	0,676	14,6	LOS B	4,3	30,5	0,84	1,53	48,2
3	R2	257	2,0	0,676	18,0	LOS C	4,3	30,5	0,90	1,67	46,3
Approach		658	2,0	0,676	15,9	LOS C	4,3	30,5	0,86	1,58	47,4
4	L2	15	2,0	0,076	17,7	LOS C	0,3	1,9	0,99	1,25	46,7
6	R2	1	2,0	0,006	15,8	LOS C	0,0	0,2	1,00	1,23	47,3
Approach		16	2,0	0,076	17,6	LOS C	0,3	1,9	0,99	1,25	46,7
7	L2	57	2,0	0,530	14,1	LOS B	2,5	17,7	0,72	1,50	48,9
8	T1	448	2,0	0,530	13,7	LOS B	2,5	17,7	0,72	1,50	48,7
Approach		505	2,0	0,530	13,7	LOS B	2,5	17,7	0,72	1,50	48,7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Accentuation Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 3 [Existing 2018 PM Peak Hour Traffic WITH Development]

D2001 / Matimba Power Station Access
Stop (All-Way)

2	T1	299	2,0	0,405	12,3	LOS B	1,7	12,1	0,84	1,36	49,8
3	R2	13	2,0	0,405	13,2	LOS B	1,7	12,1	0,85	1,39	49,4
	Approach	312	2,0	0,405	12,4	LOS B	1,7	12,1	0,84	1,36	49,8
4	L2	188	2,0	0,577	26,0	LOS D	3,1	22,0	1,00	1,50	42,3
6	R2	41	2,0	0,142	13,5	LOS B	0,5	3,6	0,95	1,27	48,7
	Approach	229	2,0	0,577	23,7	LOS C	3,1	22,0	0,99	1,46	43,3
7	L2	3	2,0	0,560	15,5	LOS C	2,8	20,0	0,79	1,52	48,1
8	T1	476	2,0	0,560	15,2	LOS C	2,8	20,0	0,79	1,52	47,8
	Approach	479	2,0	0,560	15,2	LOS C	2,8	20,0	0,79	1,52	47,9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Accentuation Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 3 [Future 2023 AM Peak Hour Traffic]

D2001 / Matimba Power Station Access
Stop (All-Way)

Intersection Summary											
2	T1	437	2,0	0,753	16,8	LOS C	5,7	40,8	0,86	1,62	46,8
3	R2	298	2,0	0,753	21,7	LOS C	5,7	40,8	0,94	1,83	44,3
Approach		735	2,0	0,753	18,8	LOS C	5,7	40,8	0,89	1,71	45,8
4	L2	17	2,0	0,087	18,0	LOS C	0,3	2,2	0,99	1,25	46,5
6	R2	1	2,0	0,006	15,8	LOS C	0,0	0,2	1,00	1,23	47,3
Approach		18	2,0	0,087	17,8	LOS C	0,3	2,2	0,99	1,25	46,6
7	L2	66	2,0	0,609	15,5	LOS C	3,3	23,5	0,76	1,58	48,0
8	T1	515	2,0	0,609	15,2	LOS C	3,3	23,5	0,76	1,58	47,8
Approach		581	2,0	0,609	15,2	LOS C	3,3	23,5	0,76	1,58	47,8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Accentuation Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 3 [Future 2023 PM Peak Hour Traffic]

D2001 / Matimba Power Station Access
Stop (All-Way)

Intersection Summary											
2	T1	339	2,0	0,461	13,2	LOS B	2,1	14,7	0,86	1,39	49,2
3	R2	15	2,0	0,461	14,3	LOS B	2,1	14,7	0,87	1,42	48,7
Approach		354	2,0	0,461	13,2	LOS B	2,1	14,7	0,86	1,39	49,2
4	L2	219	2,0	0,664	31,0	LOS D	4,1	28,9	1,00	1,60	39,9
6	R2	47	2,0	0,162	13,8	LOS B	0,6	4,1	0,95	1,27	48,5
Approach		266	2,0	0,664	27,9	LOS D	4,1	28,9	0,99	1,54	41,2
7	L2	3	2,0	0,622	17,1	LOS C	3,5	24,9	0,82	1,60	47,2
8	T1	524	2,0	0,622	16,7	LOS C	3,5	24,9	0,82	1,60	46,9
Approach		527	2,0	0,622	16,7	LOS C	3,5	24,9	0,82	1,60	46,9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Accentuation Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 3 [Total Future 2023 AM Peak Hour Traffic Demand]

D2001 / Matimba Power Station Access
Stop (All-Way)

Intersection Summary											
2	T1	618	2,0	0,933	29,8	LOS D	12,8	91,3	0,92	2,17	40,2
3	R2	298	2,0	0,933	40,8	LOS E	12,8	91,3	1,00	2,64	36,0
Approach		916	2,0	0,933	33,4	LOS D	12,8	91,3	0,94	2,33	38,7
4	L2	17	2,0	0,086	17,7	LOS C	0,3	2,1	0,99	1,25	46,7
6	R2	1	2,0	0,006	15,7	LOS C	0,0	0,2	1,00	1,23	47,4
Approach		18	2,0	0,086	17,6	LOS C	0,3	2,1	0,99	1,25	46,7
7	L2	66	2,0	0,644	16,3	LOS C	3,7	26,6	0,78	1,63	47,6
8	T1	558	2,0	0,644	15,9	LOS C	3,7	26,6	0,78	1,63	47,3
Approach		624	2,0	0,644	15,9	LOS C	3,7	26,6	0,78	1,63	47,4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Accentuation Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 3 [Total Future 2023 PM Peak Hour Traffic Demand]

D2001 / Matimba Power Station Access
Stop (All-Way)

Intersection Summary											
2	T1	384	2,0	0,510	13,9	LOS B	2,4	17,4	0,87	1,42	48,8
3	R2	15	2,0	0,510	15,2	LOS C	2,4	17,4	0,88	1,46	48,2
Approach		399	2,0	0,510	13,9	LOS B	2,4	17,4	0,87	1,42	48,8
4	L2	219	2,0	0,703	35,6	LOS E	4,6	32,7	1,00	1,66	38,0
6	R2	47	2,0	0,173	14,5	LOS B	0,6	4,4	0,96	1,27	48,1
Approach		266	2,0	0,703	31,8	LOS D	4,6	32,7	0,99	1,59	39,5
7	L2	3	2,0	0,793	23,6	LOS C	6,8	48,5	0,91	1,97	43,6
8	T1	704	2,0	0,793	23,3	LOS C	6,8	48,5	0,91	1,97	43,4
Approach		707	2,0	0,793	23,3	LOS C	6,8	48,5	0,91	1,97	43,4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Accentuation Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 4 [Existing 2018 AM Peak Hour Traffic]

D2001 / D1675 Intersection

Stop (All-Way)

1	L2	1103	2,0	2,999	923,5	LOS F	161,7	1151,1	1,00	8,12	3,7
2	T1	564	2,0	1,235	123,3	LOS F	26,3	187,2	0,99	3,16	12,8
	Approach	1667	2,0	2,999	652,7	LOS F	161,7	1151,1	1,00	6,44	4,4
9	R2	203	2,0	0,289	11,1	LOS B	1,0	7,4	0,76	1,32	44,6
	Approach	203	2,0	0,289	11,1	LOS B	1,0	7,4	0,76	1,32	44,6
10	L2	65	2,0	0,328	19,2	LOS C	1,3	9,3	0,92	1,34	30,9
12	R2	68	2,0	0,328	19,5	LOS C	1,3	9,3	0,92	1,34	45,9
	Approach	134	2,0	0,328	19,4	LOS C	1,3	9,3	0,92	1,34	39,3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Accentance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 4 [Existing 2018 PM Peak Hour Traffic]

D2001 / D1675 Intersection

Stop (All-Way)

1	L2	37	2,0	0,784	153,2	LOS F	4,1	29,3	1,00	1,47	17,1
2	T1	273	2,0	4,122	1273,4	LOS F	44,4	316,1	1,00	2,10	1,5
	Approach	309	2,0	4,122	1140,1	LOS F	44,4	316,1	1,00	2,03	1,9
9	R2	20	2,0	0,002	5,9	LOS A	0,0	0,0	0,00	1,01	48,6
	Approach	20	2,0	0,002	5,9	LOS A	0,0	0,0	0,00	1,01	48,6
10	L2	32	2,0	1,103	81,9	LOS F	34,5	245,6	1,00	5,03	15,9
12	R2	1039	2,0	1,103	82,2	LOS F	34,5	245,6	1,00	5,03	25,8
	Approach	1071	2,0	1,103	82,2	LOS F	34,5	245,6	1,00	5,03	25,5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Accentance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY



Site: 4 [Existing 2018 AM Peak Hour Traffic With Latent Upgrades]

D2001 / D1675 Intersection

Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Cycle Time)

1	L2	1103	2,0	0,596	5,7	LOS A	0,0	0,0	0,00	0,53	54,7
2	T1	564	2,0	0,311	3,2	LOS A	4,6	32,8	0,37	0,32	54,8
Approach		1667	2,0	0,596	4,9	LOS A	4,6	32,8	0,13	0,46	54,7
8	T1	18	2,0	0,006	2,5	LOS A	0,1	0,5	0,29	0,20	55,8
9	R2	203	2,0	0,361	9,1	LOS A	2,8	20,0	0,49	0,70	45,4
Approach		221	2,0	0,361	8,5	LOS A	2,8	20,0	0,47	0,66	46,1
10	L2	65	2,0	0,310	33,5	LOS C	1,9	13,7	0,95	0,75	24,7
12	R2	68	2,0	0,310	33,6	LOS C	1,9	13,7	0,95	0,75	38,2
Approach		134	2,0	0,310	33,5	LOS C	1,9	13,7	0,95	0,75	32,2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Accptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 4 [Existing 2018 PM Peak Hour Traffic With Latent Upgrades]

D2001 / D1675 Intersection

Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Cycle Time)

1	L2	37	2,0	0,020	5,6	LOS A	0,0	0,0	0,00	0,53	54,9
2	T1	273	2,0	0,359	17,8	LOS B	4,9	35,1	0,81	0,66	39,3
	Approach	309	2,0	0,359	16,4	LOS B	4,9	35,1	0,72	0,64	41,6
8	T1	609	2,0	0,522	19,3	LOS B	7,6	54,2	0,88	0,74	38,2
9	R2	20	2,0	0,066	24,6	LOS C	0,5	3,4	0,82	0,69	33,7
	Approach	629	2,0	0,522	19,5	LOS B	7,6	54,2	0,88	0,74	38,0
10	L2	32	2,0	0,542	15,6	LOS B	10,4	74,0	0,70	0,79	31,8
12	R2	1039	2,0	0,542	15,6	LOS B	10,4	74,0	0,70	0,79	47,0
	Approach	1071	2,0	0,542	15,6	LOS B	10,4	74,0	0,70	0,79	46,6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Accptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY



Site: 4 [Existing 2018 AM Peak Hour Traffic With Latent Upgrades & Development]

D2001 / D1675 Intersection

Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Cycle Time)

Intersection Summary											
1	L2	1103	2,0	0,596	5,7	LOS A	0,0	0,0	0,00	0,53	54,7
2	T1	585	2,0	0,323	3,2	LOS A	4,8	34,4	0,38	0,33	54,8
Approach		1688	2,0	0,596	4,9	LOS A	4,8	34,4	0,13	0,46	54,7
8	T1	260	2,0	0,093	2,7	LOS A	1,1	8,1	0,32	0,26	55,5
9	R2	204	2,0	0,372	9,6	LOS A	3,0	21,1	0,51	0,71	44,9
Approach		464	2,0	0,372	5,8	LOS A	3,0	21,1	0,40	0,46	50,3
10	L2	68	2,0	0,317	33,6	LOS C	2,0	14,0	0,95	0,75	29,1
12	R2	68	2,0	0,317	33,6	LOS C	2,0	14,0	0,95	0,75	38,2
Approach		137	2,0	0,317	33,6	LOS C	2,0	14,0	0,95	0,75	34,4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Accptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY



Site: 4 [Existing 2018 PM Peak Hour Traffic With Latent Upgrades & Development]

D2001 / D1675 Intersection

Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Cycle Time)

1	L2	37	2,0	0,020	5,6	LOS A	0,0	0,0	0,00	0,53	54,9
2	T1	278	2,0	0,366	17,8	LOS B	5,0	35,9	0,81	0,66	39,2
	Approach	315	2,0	0,366	16,4	LOS B	5,0	35,9	0,72	0,65	41,6
8	T1	629	2,0	0,539	19,4	LOS B	7,9	56,3	0,89	0,75	38,1
9	R2	23	2,0	0,077	24,7	LOS C	0,6	4,0	0,83	0,69	33,6
	Approach	653	2,0	0,539	19,6	LOS B	7,9	56,3	0,88	0,75	37,9
10	L2	33	2,0	0,543	15,6	LOS B	10,4	74,1	0,70	0,79	31,8
12	R2	1039	2,0	0,543	15,6	LOS B	10,4	74,1	0,70	0,79	47,0
	Approach	1072	2,0	0,543	15,6	LOS B	10,4	74,1	0,70	0,79	46,6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Accptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 4 [Future 2023 AM Peak Hour Traffic (With Latent Upgrades)]

D2001 / D1675 Intersection

Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Cycle Time)

1	L2	1279	2,0	0,691	5,8	LOS A	0,0	0,0	0,00	0,53	54,6
2	T1	654	2,0	0,360	3,3	LOS A	5,6	39,9	0,39	0,34	54,6
Approach		1933	2,0	0,691	5,0	LOS A	5,6	39,9	0,13	0,46	54,6
8	T1	297	2,0	0,106	2,8	LOS A	1,3	9,4	0,32	0,27	55,4
9	R2	236	2,0	0,470	10,2	LOS B	3,8	26,7	0,56	0,73	44,3
Approach		533	2,0	0,470	6,0	LOS A	3,8	26,7	0,43	0,47	49,9
10	L2	76	2,0	0,358	33,7	LOS C	2,2	15,9	0,96	0,76	24,7
12	R2	79	2,0	0,358	33,8	LOS C	2,2	15,9	0,96	0,76	38,1
Approach		155	2,0	0,358	33,8	LOS C	2,2	15,9	0,96	0,76	32,1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Accptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 4 [Future 2023 PM Peak Hour Traffic (With Latent Upgrades)]

D2001 / D1675 Intersection

Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Cycle Time)

1	L2	43	2,0	0,023	5,6	LOS A	0,0	0,0	0,00	0,53	54,9
2	T1	316	2,0	0,416	18,1	LOS B	5,8	41,5	0,83	0,68	39,0
	Approach	359	2,0	0,416	16,6	LOS B	5,8	41,5	0,73	0,66	41,4
8	T1	706	2,0	0,605	19,9	LOS B	9,1	64,8	0,91	0,77	37,7
9	R2	23	2,0	0,082	24,8	LOS C	0,6	4,0	0,83	0,70	33,6
	Approach	729	2,0	0,605	20,1	LOS C	9,1	64,8	0,91	0,77	37,6
10	L2	37	2,0	0,629	16,3	LOS B	12,9	91,8	0,75	0,81	31,5
12	R2	1204	2,0	0,629	16,3	LOS B	12,9	91,8	0,75	0,81	46,6
	Approach	1241	2,0	0,629	16,3	LOS B	12,9	91,8	0,75	0,81	46,2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Accptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY



Site: 4 [Total Future 2023 AM Peak Hour Traffic (With Latent Upgrades)]

D2001 / D1675 Intersection

Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Cycle Time)

1	L2	1315	2,0	0,711	5,8	LOS A	0,0	0,0	0,00	0,53	54,6
2	T1	844	2,0	0,466	3,6	LOS A	8,1	57,4	0,43	0,38	54,2
	Approach	2159	2,0	0,711	5,0	LOS A	8,1	57,4	0,17	0,47	54,5
8	T1	342	2,0	0,123	2,8	LOS A	1,5	11,0	0,33	0,27	55,4
9	R2	247	2,0	0,638	14,4	LOS B	5,4	38,3	0,71	0,81	40,6
	Approach	589	2,0	0,638	7,7	LOS A	5,4	38,3	0,49	0,50	48,0
10	L2	82	2,0	0,395	33,9	LOS C	2,5	17,7	0,97	0,76	24,6
12	R2	88	2,0	0,395	33,9	LOS C	2,5	17,7	0,97	0,76	38,0
	Approach	171	2,0	0,395	33,9	LOS C	2,5	17,7	0,97	0,76	32,1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Accptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY



Site: 4 [Total Future 2023 PM Peak Hour Traffic (With Latent Upgrades)]

D2001 / D1675 Intersection

Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Cycle Time)

1	L2	53	2,0	0,028	5,6	LOS A	0,0	0,0	0,00	0,53	54,9
2	T1	363	2,0	0,410	15,8	LOS B	6,3	45,0	0,78	0,65	40,8
	Approach	416	2,0	0,410	14,5	LOS B	6,3	45,0	0,68	0,63	43,2
8	T1	896	2,0	0,697	18,9	LOS B	11,7	83,1	0,90	0,81	38,4
9	R2	29	2,0	0,095	23,1	LOS C	0,7	4,9	0,80	0,70	34,6
	Approach	925	2,0	0,697	19,1	LOS B	11,7	83,1	0,90	0,80	38,3
10	L2	49	2,0	0,738	20,2	LOS C	15,9	113,5	0,85	0,86	29,6
12	R2	1240	2,0	0,738	20,3	LOS C	15,9	113,5	0,85	0,86	44,3
	Approach	1289	2,0	0,738	20,3	LOS C	15,9	113,5	0,85	0,86	43,8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Accptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 5 [Existing 2018 AM Peak Hour Traffic]

D1675 / D2649 Intersection

Stop (All-Way)

1	L2	24	2,0	0,166	25,5	LOS D	0,6	4,3	0,98	1,27	42,5
3	R2	13	2,0	0,166	25,0	LOS C	0,6	4,3	0,98	1,27	42,2
	Approach	37	2,0	0,166	25,3	LOS D	0,6	4,3	0,98	1,27	42,4
4	L2	11	2,0	1,302	159,6	LOS F	72,7	517,4	1,00	8,38	16,6
5	T1	1303	2,0	1,302	159,3	LOS F	72,7	517,4	1,00	8,38	16,6
	Approach	1314	2,0	1,302	159,3	LOS F	72,7	517,4	1,00	8,38	16,6
11	T1	131	2,0	0,222	10,8	LOS B	0,8	5,5	0,80	1,31	50,8
12	R2	11	2,0	0,021	9,0	LOS A	0,1	0,4	0,79	1,23	51,6
	Approach	141	2,0	0,222	10,7	LOS B	0,8	5,5	0,80	1,31	50,9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Accentuation Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 5 [Existing 2018 PM Peak Hour Traffic]

D1675 / D2649 Intersection

Stop (All-Way)

1	L2	12	2,0	0,102	24,6	LOS C	0,4	2,5	0,98	1,25	42,9
3	R2	11	2,0	0,102	24,1	LOS C	0,4	2,5	0,98	1,25	42,6
	Approach	22	2,0	0,102	24,4	LOS C	0,4	2,5	0,98	1,25	42,8
4	L2	11	2,0	0,114	11,8	LOS B	0,3	2,5	0,70	1,28	50,4
5	T1	71	2,0	0,114	11,5	LOS B	0,3	2,5	0,70	1,28	50,1
	Approach	81	2,0	0,114	11,5	LOS B	0,3	2,5	0,70	1,28	50,2
11	T1	1068	2,0	1,648	313,7	LOS F	94,9	675,7	1,00	8,63	9,7
12	R2	11	2,0	0,016	8,5	LOS A	0,0	0,3	0,71	1,18	51,6
	Approach	1079	2,0	1,648	310,7	LOS F	94,9	675,7	1,00	8,55	9,8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Accentuation Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 5v [Existing 2018 AM Peak Hour Traffic WITH Mitigating Measures]

D1675 / D2649 Intersection

Stop (Two-Way)

1	L2	24	2,0	0,275	41,6	LOS E	0,8	5,6	0,93	1,02	24,5
3	R2	13	2,0	0,275	25,2	LOS D	0,8	5,6	0,93	1,02	37,5
	Approach	37	2,0	0,275	36,0	LOS E	0,8	5,6	0,93	1,02	29,5
4	L2	11	2,0	0,676	5,7	LOS A	0,0	0,0	0,00	0,00	57,9
5	T1	1303	2,0	0,676	0,2	LOS A	0,0	0,0	0,00	0,00	59,6
	Approach	1314	2,0	0,676	0,2	NA	0,0	0,0	0,00	0,00	59,6
12	R2	11	2,0	0,057	22,5	LOS C	0,2	1,2	0,90	0,96	34,3
	Approach	11	2,0	0,057	22,5	NA	0,2	1,2	0,90	0,96	34,3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 5v [Existing 2018 PM Peak Hour Traffic WITH Mitigating Measures]

D1675 / D2649 Intersection
Stop (Two-Way)

1	L2	12	2,0	0,019	8,3	LOS A	0,1	0,5	0,16	0,90	36,0
3	R2	11	2,0	0,019	8,0	LOS A	0,1	0,5	0,16	0,90	51,4
	Approach	22	2,0	0,019	8,2	LOS A	0,1	0,5	0,16	0,90	44,2
4	L2	11	2,0	0,042	5,6	LOS A	0,0	0,0	0,00	0,08	57,6
5	T1	71	2,0	0,042	0,0	LOS A	0,0	0,0	0,00	0,08	58,7
	Approach	81	2,0	0,042	0,7	NA	0,0	0,0	0,00	0,08	58,5
12	R2	11	2,0	0,006	3,8	LOS A	0,0	0,2	0,18	0,51	50,3
	Approach	11	2,0	0,006	3,8	NA	0,0	0,2	0,18	0,51	50,3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 5v [Existing 2018 AM Peak Hour Traffic WITH Development & Mitigating Measures]

D1675 / D2649 Intersection
Stop (Two-Way)

Intersection Performance Summary											
						LOS	LOS	LOS	LOS	LOS	LOS
1	L2	24	2,0	0,276	41,8	E	0,8	5,7	0,93	1,02	24,4
3	R2	13	2,0	0,276	25,3	D	0,8	5,7	0,93	1,02	37,5
Approach		37	2,0	0,276	36,1	E	0,8	5,7	0,93	1,02	29,4
4	L2	11	2,0	0,676	5,7	A	0,0	0,0	0,00	0,00	57,9
5	T1	1304	2,0	0,676	0,2	A	0,0	0,0	0,00	0,00	59,6
Approach		1315	2,0	0,676	0,2	NA	0,0	0,0	0,00	0,00	59,6
12	R2	11	2,0	0,057	22,6	C	0,2	1,2	0,90	0,96	34,3
Approach		11	2,0	0,057	22,6	NA	0,2	1,2	0,90	0,96	34,3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 5v [Existing 2018 PM Peak Hour Traffic WITH Development & Mitigating Measures]

D1675 / D2649 Intersection
Stop (Two-Way)

1	L2	12	2,0	0,019	8,4	LOS A	0,1	0,5	0,17	0,90	36,0
3	R2	11	2,0	0,019	8,0	LOS A	0,1	0,5	0,17	0,90	51,4
	Approach	22	2,0	0,019	8,2	LOS A	0,1	0,5	0,17	0,90	44,2
4	L2	11	2,0	0,044	5,6	LOS A	0,0	0,0	0,00	0,07	57,6
5	T1	74	2,0	0,044	0,0	LOS A	0,0	0,0	0,00	0,07	58,8
	Approach	84	2,0	0,044	0,7	NA	0,0	0,0	0,00	0,07	58,5
12	R2	11	2,0	0,006	3,8	LOS A	0,0	0,2	0,18	0,51	50,2
	Approach	11	2,0	0,006	3,8	NA	0,0	0,2	0,18	0,51	50,2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 5 [Future 2023 AM Peak Hour Traffic]

D1675 / D2649 Intersection

Stop (All-Way)

1	L2	24	2,0	0,168	25,8	LOS D	0,6	4,4	0,99	1,27	42,3
3	R2	13	2,0	0,168	25,3	LOS D	0,6	4,4	0,99	1,27	42,0
	Approach	37	2,0	0,168	25,6	LOS D	0,6	4,4	0,99	1,27	42,2
4	L2	13	2,0	1,506	247,7	LOS F	114,5	815,5	1,00	11,15	11,8
5	T1	1511	2,0	1,506	247,3	LOS F	114,5	815,5	1,00	11,15	11,8
	Approach	1523	2,0	1,506	247,3	LOS F	114,5	815,5	1,00	11,15	11,8
11	T1	152	2,0	0,257	11,1	LOS B	0,9	6,6	0,81	1,33	50,6
12	R2	13	2,0	0,025	9,1	LOS A	0,1	0,5	0,79	1,23	51,6
	Approach	164	2,0	0,257	11,0	LOS B	0,9	6,6	0,81	1,32	50,7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Accentuation Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 5 [Future 2023 PM Peak Hour Traffic]

D1675 / D2649 Intersection

Stop (All-Way)

Intersection Summary											
1	L2	14	2,0	0,121	25,0	LOS C	0,4	3,1	0,98	1,26	42,8
3	R2	13	2,0	0,121	24,5	LOS C	0,4	3,1	0,98	1,26	42,5
Approach		26	2,0	0,121	24,7	LOS C	0,4	3,1	0,98	1,26	42,6
4	L2	13	2,0	0,134	12,0	LOS B	0,4	3,0	0,70	1,29	50,3
5	T1	82	2,0	0,134	11,6	LOS B	0,4	3,0	0,70	1,29	50,0
Approach		95	2,0	0,134	11,7	LOS B	0,4	3,0	0,70	1,29	50,1
11	T1	1239	2,0	1,914	431,3	LOS F	130,6	929,8	1,00	10,08	7,4
12	R2	13	2,0	0,020	8,5	LOS A	0,1	0,4	0,71	1,18	51,6
Approach		1252	2,0	1,914	427,0	LOS F	130,6	929,8	1,00	9,99	7,5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 5v [Total Future 2023 AM Peak Hour Traffic (With Mitigating Measures)]

D1675 / D2649 Intersection

Stop (Two-Way)

Movement Summary											
1	L2	24	2,0	0,984	243,6	LOS F	3,6	25,3	1,00	1,17	7,6
3	R2	13	2,0	0,984	167,2	LOS F	3,6	25,3	1,00	1,17	13,1
Approach		37	2,0	0,984	217,4	LOS F	3,6	25,3	1,00	1,17	9,6
4	L2	13	2,0	0,808	5,8	LOS A	0,0	0,0	0,00	0,00	57,7
5	T1	1559	2,0	0,808	0,3	LOS A	0,0	0,0	0,00	0,00	59,3
Approach		1572	2,0	0,808	0,4	NA	0,0	0,0	0,00	0,00	59,2
12	R2	13	2,0	0,231	73,3	LOS F	0,6	4,5	0,98	1,00	18,4
Approach		13	2,0	0,231	73,3	NA	0,6	4,5	0,98	1,00	18,4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 5v [Total Future 2023 PM Peak Hour Traffic (With Mitigating Measures)]

D1675 / D2649 Intersection

Stop (Two-Way)

Movement Summary										
1	L2	14	2,0	0,023	8,5	LOS A	0,1	0,6	0,20	0,89
3	R2	13	2,0	0,023	8,1	LOS A	0,1	0,6	0,20	0,89
Approach		26	2,0	0,023	8,3	LOS A	0,1	0,6	0,20	0,89
4	L2	13	2,0	0,057	5,6	LOS A	0,0	0,0	0,00	0,07
5	T1	98	2,0	0,057	0,0	LOS A	0,0	0,0	0,00	0,07
Approach		111	2,0	0,057	0,6	NA	0,0	0,0	0,00	0,07
12	R2	13	2,0	0,008	3,9	LOS A	0,0	0,2	0,21	0,51
Approach		13	2,0	0,008	3,9	NA	0,0	0,2	0,21	0,51
Total										

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

2017-125 B20190530-01

2019-05-31

GOLDER ASSOCIATES AFRICA (PTY) LTD

ATTENTION: MS. MARIE SCHLECHTER

BY ELECTRONIC MAIL: *mschlechter@golder.co.za*

Dear Madam,

TRAFFIC IMPACT ASSESSMENT FOR EXXARO TURFVLAKTE FARM 463-L Q (LEPHALALE)

The traffic impact study with reference 2017-125 of October 2018 by EDS Engineering Design Services (Pty) Ltd, comments received from the client under cover of your e-mail of 6 November 2018 and the meeting held in your offices on 24 January 2019, refer.

The traffic impact study was undertaken for the traffic impact of the proposed additional mining activity planned by Exxaro at the Turfvlakte Mining Pit. The traffic impact will be limited to the traffic generated by the additional employees as the mine confirmed that all coal mined at the new facility will be transported off site using the rail system.

The report estimated the vehicular traffic impact using the expected composition of the labour force to be employed at the new facility as well as the transport the labour force is likely to make use of. The report found that the additional vehicular traffic likely as a result of the additional operation will be 39 vehicular trips during the peak hour of the adjacent road network. This is a very low impact from a traffic impact perspective and does not require a traffic impact study in terms of National Guideline documentation on Traffic Impact Assessment (THM16 Volume 1 : South African Traffic Impact and Site Traffic Assessment Manual).

The impact of a development that generates 39 vehicular trips on the operating conditions on the road network during the peak hour is considered to be negligible. The concluding statement in the comments received which states that "*This project will further contribute to the congestion, and the Traffic Impact Statement has failed to state this.*" is therefore not correct.

The Traffic Impact Study analysis indicated that the morning peak hour occurs between 06:00 and 07:00. The comments received indicates that the commencement time of the morning shift at 06:00 will likely result in the peak being before 06:00. Unfortunately, the traffic counts undertaken as part of the study commenced only at 06:00 and this could not be verified.

EDS Engineers subsequently decided to undertake additional traffic surveys. The counts were done on Thursday and Friday, the 11th and 12th of April 2019 respectively. The traffic counts were overseen by the undersigned.

Surveys were done in the morning from 05:00 to 07:00. The results are included in **Appendix A**. The analysis of the traffic counts confirmed that the peak through the intersections occurred between 06:00 and 07:00. The counts also indicate that certain movements are slightly higher

between 05:00 and 06:00. This was observed for the left turn movement from Road D2001 towards Medupi (onto Road D1675) where the volume of left turn movements between 05:00 and 06:00 was 393 vehicles and the volume for the same movement from 06:00 to 07:00 was 235 vehicles. The total volume through the intersection between 05:00 and 06:00 was 1183 vehicles and the volume between 06:00 and 07:00 was 2295 vehicles. The peak hour from a traffic engineering perspective is therefore between 06:00 and 07:00 and it is confirmed that the analysis and conclusions reached in the report are valid.

The report clearly states that certain intersections operate at and in excess of capacity and that these intersections require upgrading. The need to upgrade these intersections are however not as a result of this proposed development. As indicated, the impact of this application on the operating conditions is considered negligible.

Site inspections were undertaken by the undersigned during the morning and afternoon peak periods and the following observations were made:

- The intersection of Road D2001 and Road D1675 is considered to be extremely unsafe. Operations at the intersection were controlled by pointsmen to improve operations. The lane configuration was also changed by the pointsmen to allow for two left turn lanes from Lephalale into Road D1675 to accommodate the high left turn volume towards Medupi during the morning peak hour.

The following items are of concern and must be addressed by the roads authorities:

- No lighting is provided at the intersection
 - No facilities for pedestrians to cross
 - Intersection is controlled by three way stop control. This is considered inappropriate given the traffic volumes. Consideration should be given to upgrade the intersection to traffic signal control.
 - Inadequate capacity
-
- The intersection of Road D2001 and the access to the Matimba Power Station is considered to be acceptable.
 - The intersection of D2001 and the access to the Grootegeluk Mine and the residential area of Marapong is relatively well lit and the traffic signal and intersection configuration result in acceptable operations at the intersection. The intersection is relatively uncongested during the peak periods.
 - Traffic congestion was observed along the “Mine Entrance Road” referred to be the client during the morning peak hour. Vehicle queues were observed up to the rail crossing marked on the diagram and Rail-crossing 2. This can be attributed to the access control at the entrance to the mine.

CONCLUSIONS AND RECOMMENDATIONS

The following can be concluded:

1. The additional traffic counts confirmed that the peak hour during the morning peak on the road network is between 06:00 and 07:00.
2. The expected impact of the proposed mining activities on the operating conditions of the adjacent road network is considered to be negligible
3. Certain intersections require upgrading to improve capacity and most importantly to improve road safety. This is not the responsibility of the applicant. EDS Engineers can however assist in investigating the situation and make recommendations for implementation if required. We will submit a project proposal for consideration should the client wish to investigate this.
4. The results of the Traffic Impact Study are valid, and the report can be submitted as part of the EIA process

I trust the above will suffice

Yours faithfully



**GARNET VAN DER WALT PR. ENG.
DIRECTOR**

APPENDIX A : TRAFFIC COUNTS

INTERSECTION 2		Movement																
Time interval		d	e	f	g	h	i	j	k	l	a	b	c	total 15min	total hour			
05:00	05:15	27	31	0	0	0	1	0	4	7	48	6	18	142		New traffic surveys		
05:15	05:30	49	68	0	0	0	0	0	10	6	74	10	18	235				
05:30	05:45	74	26	6	1	1	0	5	7	4	111	18	23	276				
05:45	06:00	46	45	8	4	2	0	1	10	4	144	35	22	321	974			
06:00	06:15	182	95	15	2	2	1	0	7	10	103	28	33	478	1310			
06:15	06:30	104	61	5	3	0	1	2	55	42	91	32	35	431	1506			
06:30	06:45	108	33	16	1	3	0	0	14	14	53	28	34	304	1534			
06:45	07:00	180	37	4	3	4	1	0	7	16	58	18	62	390	1603			
07:00	07:15	71	4	1	2	2	0	1	0	26	24	2	61	194	1319	Previous traffic surveys		
07:15	07:30	58	5	0	0	2	2	0	4	20	27	3	69	190	1078			
07:30	07:45	28	4	0	1	1	4	0	0	12	32	3	61	146	920			
07:45	08:00	22	3	0	0	1	0	1	0	5	12	5	36	85	615			
08:00	08:15	21	3	0	0	1	1	2	3	12	14	3	31	91	512			
08:15	08:30	25	5	0	2	2	0	4	3	5	9	4	24	83	405			
08:30	08:45	26	3	0	1	4	4	0	3	16	6	5	44	112	371			
08:45	09:00	37	2	0	4	7	4	2	1	18	6	3	34	118	404			

xxx intersection peak

xxx peak according to TIA

2017-125 B20190530-01

2019-05-31

GOLDER ASSOCIATES AFRICA (PTY) LTD

ATTENTION : MS. MARIE SCHLECHTER

BY ELECTRONIC MAIL: mschlechter@golder.co.za

Dear Madam,

TRAFFIC IMPACT ASSESSMENT FOR EXXARO TURFVLAKTE FARM 463-LQ (LEPHALALE)

The traffic impact study with reference 2017-125 of October 2018 by EDS Engineering Design Services (Pty) Ltd, comments received from the client under cover of your e-mail of 6 November 2018 and the meeting held in your offices on 24 January 2019, refer.

The traffic impact study was undertaken for the traffic impact of the proposed additional mining activity planned by Exxaro at the Turfvlakte Mining Pit. The traffic impact will be limited to the traffic generated by the additional employees as the mine confirmed that all coal mined at the new facility will be transported off site using the rail system.

The report estimated the vehicular traffic impact using the expected composition of the labour force to be employed at the new facility as well as the transport the labour force is likely to make use of. The report found that the additional vehicular traffic likely as a result of the additional operation will be 39 vehicular trips during the peak hour of the adjacent road network. This is a very low impact from a traffic impact perspective and does not require a traffic impact study in terms of National Guideline documentation on Traffic Impact Assessment (THM16 Volume 1 : South African Traffic Impact and Site Traffic Assessment Manual).

The impact of a development that generates 39 vehicular trips on the operating conditions on the road network during the peak hour is considered to be negligible. The concluding statement in the comments received which states that "*This project will further contribute to the congestion, and the Traffic Impact Statement has failed to state this.*" is therefore not correct.

The Traffic Impact Study analysis indicated that the morning peak hour occurs between 06:00 and 07:00. The comments received indicates that the commencement time of the morning shift at 06:00 will likely result in the peak being before 06:00. Unfortunately, the traffic counts undertaken as part of the study commenced only at 06:00 and this could not be verified.

EDS Engineers subsequently decided to undertake additional traffic surveys. The counts were done on Thursday and Friday, the 11th and 12th of April 2019 respectively. The traffic counts were overseen by the undersigned.

Surveys were done in the morning from 05:00 to 07:00. The results are included in **Appendix A**. The analysis of the traffic counts confirmed that the peak through the intersections occurred between 06:00 and 07:00. The counts also indicate that certain movements are slightly higher

between 05:00 and 06:00. This was observed for the left turn movement from Road D2001 towards Medupi (onto Road D1675) where the volume of left turn movements between 05:00 and 06:00 was 393 vehicles and the volume for the same movement from 06:00 to 07:00 was 235 vehicles. The total volume through the intersection between 05:00 and 06:00 was 1183 vehicles and the volume between 06:00 and 07:00 was 2295 vehicles. The peak hour from a traffic engineering perspective is therefore between 06:00 and 07:00 and it is confirmed that the analysis and conclusions reached in the report are valid.

The report clearly states that certain intersections operate at and in excess of capacity and that these intersections require upgrading. The need to upgrade these intersections are however not as a result of this proposed development. As indicated, the impact of this application on the operating conditions is considered negligible.

Site inspections were undertaken by the undersigned during the morning and afternoon peak periods and the following observations were made:

- The intersection of Road D2001 and Road D1675 is considered to be extremely unsafe. Operations at the intersection were controlled by pointsmen to improve operations. The lane configuration was also changed by the pointsmen to allow for two left turn lanes from Lephalale into Road D1675 to accommodate the high left turn volume towards Medupi during the morning peak hour.

The following items are of concern and must be addressed by the roads authorities:

- No lighting is provided at the intersection
 - No facilities for pedestrians to cross
 - Intersection is controlled by three way stop control. This is considered inappropriate given the traffic volumes. Consideration should be given to upgrade the intersection to traffic signal control.
 - Inadequate capacity
-
- The intersection of Road D2001 and the access to the Matimba Power Station is considered to be acceptable.
-
- The intersection of D2001 and the access to the Grootegeluk Mine and the residential area of Marapong is relatively well lit and the traffic signal and intersection configuration result in acceptable operations at the intersection. The intersection is relatively uncongested during the peak periods.
-
- Traffic congestion was observed along the "Mine Entrance Road" referred to be the client during the morning peak hour. Vehicle queues were observed up to the rail crossing marked on the diagram and Rail-crossing 2. This can be attributed to the access control at the entrance to the mine.

CONCLUSIONS AND RECOMMENDATIONS

The following can be concluded:

1. The additional traffic counts confirmed that the peak hour during the morning peak on the road network is between 06:00 and 07:00.
2. The expected impact of the proposed mining activities on the operating conditions of the adjacent road network is considered to be negligible
3. Certain intersections require upgrading to improve capacity and most importantly to improve road safety. This is not the responsibility of the applicant. EDS Engineers can however assist in investigating the situation and make recommendations for implementation if required. We will submit a project proposal for consideration should the client wish to investigate this.
4. The results of the Traffic Impact Study are valid, and the report can be submitted as part of the EIA process

I trust the above will suffice

Yours faithfully



**GARNET VAN DER WALT PR. ENG.
DIRECTOR**

APPENDIX A : TRAFFIC COUNTS

INTERSECTION 2		Movement													
Time interval	d	e	f	g	h	i	j	k	l	a	b	c	total 15min	total hour	
05:00	05:15	27	31	0	0	1	0	4	7	48	6	18	142		
05:15	05:30	49	68	0	0	0	0	10	6	74	10	18	235		
05:30	05:45	74	26	6	1	1	0	5	7	4	111	18	23	276	
05:45	06:00	46	45	8	4	2	0	1	10	4	144	35	22	321	
06:00	06:15	182	95	15	2	2	0	7	10	103	28	33	478	1310	
06:15	06:30	104	61	5	3	0	1	2	55	42	91	32	35	431	
06:30	06:45	108	33	16	1	3	0	0	14	14	53	28	34	304	
06:45	07:00	180	37	4	3	4	1	0	7	16	58	18	62	390	
07:00	07:15	71	4	1	2	2	0	1	0	26	24	2	61	194	
07:15	07:30	58	5	0	0	2	2	0	4	20	27	3	69	190	
07:30	07:45	28	4	0	1	1	4	0	0	12	32	3	61	146	
07:45	08:00	22	3	0	0	1	0	0	1	5	12	5	36	85	
08:00	08:15	21	3	0	0	1	1	2	3	12	14	3	31	91	
08:15	08:30	25	5	0	2	2	0	4	3	5	9	4	24	83	
08:30	08:45	26	3	0	1	4	4	0	3	16	6	5	44	112	
08:45	09:00	37	2	0	4	7	4	2	1	18	6	3	34	118	
														404	

xxx intersection peak
xxx peak according to TIA

Previous traffic surveys

New traffic surveys

INTERSECTION 4	Time interval	Movement						total hour	
		m	n	o	p	q	r		
05:00	05:15	24	9	3	1	27	87	151	
05:15	05:30	36	18	4	4	73	91	226	
05:30	05:45	45	28	4	4	141	182	404	
05:45	06:00	24	27	2	5	152	192	402	1183
06:00	06:15	34	33	14	7	156	173	417	1449
06:15	06:30	84	42	7	23	199	159	514	1737
06:30	06:45	87	61	9	15	295	193	660	1993
06:45	07:00	99	61	13	14	290	227	704	2295
07:00	07:15	85	18	2	18	120	169	412	2290
07:15	07:30	83	6	2	53	75	130	349	2125
07:30	07:45	40	2	0	27	57	116	242	1707
07:45	08:00	25	4	2	13	36	67	147	1150
08:00	08:15	36	5	5	29	23	60	158	896
08:15	08:30	33	1	8	20	26	35	123	670
08:30	08:45	42	5	6	25	30	53	161	589
08:45	09:00	61	13	1	29	25	47	176	618

XXX Peak hour

XXX Peak hour according to TIA

Previous traffic surveys

New traffic surveys