



Newcastle Coal Mine Traffic Impact Assessment

June 2023
Rev1

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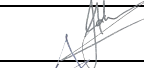
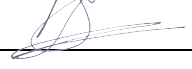
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SYNOPSIS Traffic Impact Assessment for the proposed Newcastle Coal Mine in the Newcastle Local Municipality of the Amajuba District Municipality in Kwa-Zulu Natal Province.
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Newcastle Coal Mine Traffic Impact Assessment

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1 INTRODUCTION

1.1 Scope, Purpose and Objectives of this Specialist Report

The Newcastle Coal Project (“NCP” or “the Project” hereafter) consists of a Prospecting Right for Coal over various Farms west of Newcastle, comprising in total approximately 3,250 hectares (Ha). The Prospecting Right area has been extensively studied by third parties.

Section 22(1) of the MPRDA states that “Any person who wishes to apply to the Minister for a mining right must simultaneously apply for an environmental authorisation” (in terms of the National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA) and the Environmental Impact Assessment (EIA) Regulations, 2014 (as amended). An application for environmental authorisation was simultaneously submitted with the mining right application on 26 April 2023.

The Regional Location and local context of the Project are illustrated in **Figure 1-1** and **Figure 1-2**.

JG Afrika (Pty) Ltd was appointed by Cabanga Environmental to undertake a Traffic Impact Assessment (TIA) on behalf of Minetek Resources (Pty) Ltd for the proposed Newcastle Coal Project.

The Traffic Impact Assessment is required to determine the traffic impact of the development proposal and whether such development can be accommodated by the existing transport road network.

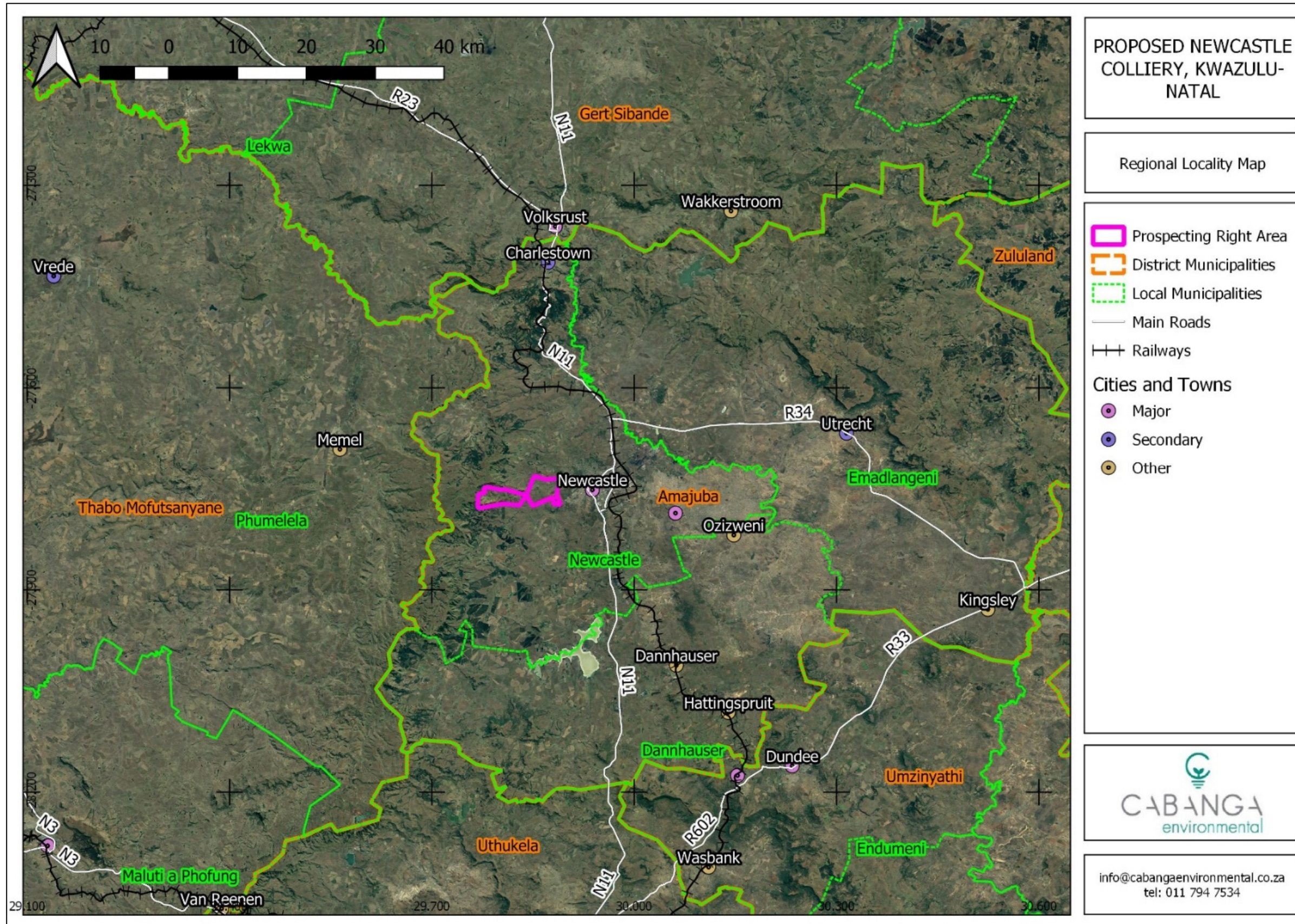


Figure 1-1: Regional Location of the proposed Newcastle Coal Project

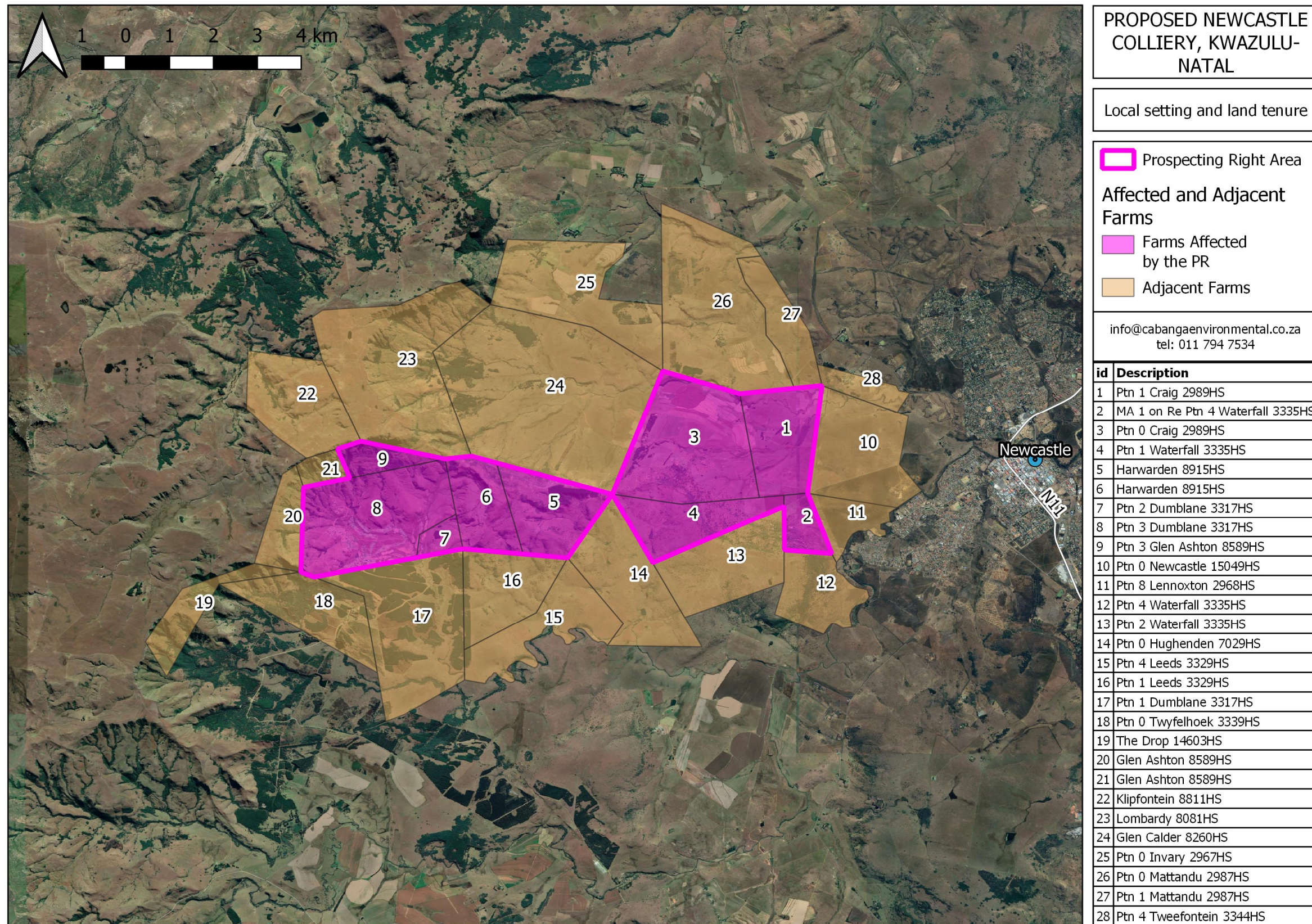


Figure 1-2: Local Context of the Newcastle Coal Project

1.2 Terms of Reference

The Terms of Reference for this TIA include the following:

General:

- an indication of the methodology used in determining the significance of potential environmental impacts.
- a description of all traffic related environmental issues that were identified during the environmental impact assessment process.
- an assessment of the significance of direct, indirect and cumulative impacts
- a description and comparative assessment of all alternatives identified during the environmental impact assessment process.
- recommendations regarding practical mitigation measures for potentially significant impacts, for inclusion in the Environmental Management Programme (EMPr);
- an indication of the extent to which the issue could be addressed by the adoption of mitigation measures.
- a description of any assumptions, uncertainties and gaps in knowledge.
- an environmental impact statement which contains:
 - a summary of the key findings of the environmental impact assessment; and
 - an assessment of the positive and negative implications of the proposed activity.

Specific:

- Extent of the transport study and study area.
- The proposed development.
- Trip generation for the facility during construction, operation and decommissioning.
- Traffic impact on external road network.
- Accessibility and turning requirements.
- National and local haulage routes.
- Assessment of internal roads and site access.
- Assessment of freight requirements and permitting needed for abnormal loads; and
- Traffic accommodation during construction.

1.3 Approach and Methodology

The report deals with the traffic impact on the surrounding road network in the vicinity of the site:

- during the construction of the mine infrastructure.
- operation and maintenance of the mine during the operational phase; and
- the decommissioning phase.

This transport study was informed by the following:

Site Visit and Project Assessment

- Site visit to gain a good understanding of site location.
- An initial meeting with the client or client representative.
- Overview of project background information including location maps, component specifications and any resulting abnormal loads to be transported; and
- Research of all available documentation and information relevant to the proposed facility.

The transport study considered and assessed the following:

Traffic Impact Assessment

- Peak hours analysed:
The critical peak hour or critical traffic scenario from a road capacity point of view occurs when the traffic generated by the development is at a maximum, or when the highest combination of existing external traffic and traffic generated by the development occurs.

The development is proposed to be a coal mine. Based on similar studies, the highest combination of existing external traffic and traffic generated by the proposed development is expected to occur during the weekday morning peak (AM) and afternoon peak (PM).

- Understanding of background traffic:
Traffic counts were conducted in the vicinity of the site (three intersections). The data was utilised to establish the status quo of the transport operations on the surrounding road network.

Monthly total traffic data information was provided by the client. The data was unfortunately not classified traffic data thus it could not be utilised for the peak traffic capacity analysis conducted in this study.

- Assessment of traffic impact:
To determine the impact of the development traffic on the surrounding road network, the following scenarios were analysed:
 - Scenario 1 – Present Traffic (2023) demand **without the proposed development**. The purpose of this scenario is to obtain the present Level of Service (LOS) on the adjacent road network.
 - Scenario 2 – Future Traffic (2025) **without the proposed development**. The purpose of this scenario is to establish the Level of Service and operating conditions on the surrounding road network in year 2025, taking only the background traffic into consideration.

It must be noted that it is assumed that full operation of the proposed mine will occur at year 2025. This is a worst-case scenario estimate taking into consideration timelines for authorisations and approvals, and land acquisition.

- Scenario 3 Future Traffic (2030) **without the proposed development**. The purpose of this scenario is to establish the future Level of Service and operating conditions on the surrounding road network in a 5-year horizon from the start of operations.
- Scenario 4 - Future Traffic (2025) **with the proposed development**. The purpose of this scenario is to establish the future impact of the proposed development on the existing road network.
- Scenario 5 - Future Traffic (2030) **with the proposed development**. The purpose of this scenario is to establish the future impact of the proposed development on the existing road network in a 5-year horizon from the start of operations.

Site layout, Access Points and Internal Roads Assessment per Site

- Description of the surrounding road network.
- Description of site layout.
- Assessment of the possible access points onto the site.
- Queuing analysis and stacking requirements at the access point(s); and
- Assessment of the proposed internal roads.

Report (Documentation)

- Reporting on all findings and preparation of the report document.

1.4 Assumptions, knowledge gaps and limitations

The following assumptions and limitations apply:

- This study is based on the project information provided by the Client.
- Material for the construction of internal access roads will be sourced locally as far as possible.
- It is assumed that the site will be operational in year 2025 as a worst-case scenario assumption. This duration accommodates the timeframes required to obtain environmental authorization as well as conclude land acquisition requirements.

1.5 Information sources

The following resources have been used to conduct the study:

- TRH26 South African Road Classification and Access Management Manual, COTO, August 2012
- TMH 16 South African Traffic Impact and Site Traffic Assessment Manual (Vol 1), COTO, August 2012
- TMH17 South African Trip Data manual, COTO, September 2013
- Google Earth Pro
- Chief Surveyor General Website
- Project background data
- Traffic data from the security camera on the D96
- Newcastle Municipality Integrated Development Plan (IDP) (Final IDP_2022/23-2026/27)
- The World Bank website

1.6 Extent of Study Area

The study area is an area from which transportation elements are selected for the Traffic Impact Assessment. The elements to be included in the primary study area shall be selected as follows:

- Site access (vehicular and pedestrian)
- Road network:
Class 4 and 5 roads in the vicinity of the proposed development up to the first Class 1 to 3 roads that can be reached by the Class 4 and 5 road networks from the proposed development, up to and including the first connection(s) on the Class 1 to 3 roads.

The roads shall be restricted to those within a maximum distance of 1.5 km from the accesses to the site, measured along the shortest routes to the accesses, provided that there is at least one intersection within this distance. Where there is no such intersection, the distance will be extended to include at least one intersection.

The roads to be considered in the study area are the D96, R34, and Allen street.

- Public transportation, pedestrian and cyclist facilities accommodated in the external roads and within the site boundary.

Based on experience with similar traffic studies, the anticipated traffic impact on the surrounding road network and its location within the wider road network, the following intersections were included in the scope of this study:

1. Allen Street/R34
2. R34/D96
3. D96/Farm Road

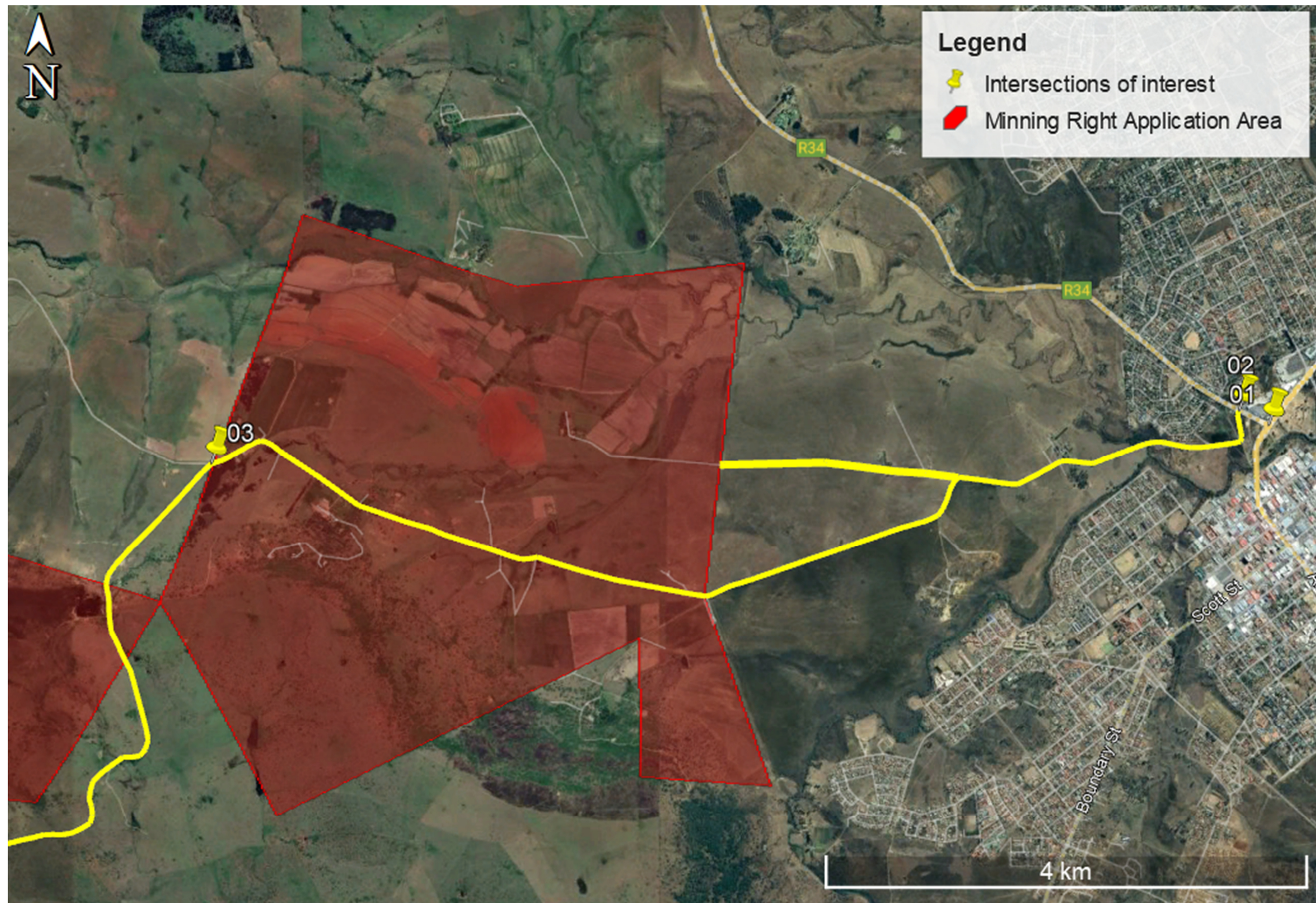


Figure 1-3: Intersection of interest

2 DESCRIPTION OF PROJECT ASPECTS RELEVANT TO THE STUDY

2.1 Transportation requirements

2.1.1 Abnormal Load Considerations

Abnormal permits are required for vehicles exceeding the following permissible maximum dimensions on road freight transport in terms of the Road Traffic Act (Act No. 93 of 1996) and the National Road Traffic Regulations, 2000:

- Length: 22m for an interlink, 18.5m for truck and trailer and 13.5m for a single unit truck
- Width: 2.6m
- Height: 4.3m measured from the ground. Possible height of load – 2.7m.
- Weight: Gross vehicle mass of 56t resulting in a payload of approximately 30t
- Axle unit limitations: 18t for dual and 24t for triple-axle units
- Axle load limitation: 7.7t on the front axle and 9t on the single or rear axles

Any dimension / mass outside the above will be classified as an Abnormal Load and will necessitate an application to the Department of Transport and Public Works for a permit that will give authorisation for the conveyance of said load. A permit is required for each Province that the haulage route traverses.

2.1.2 Further Guideline Documentation

The Technical Recommendations for Highways (TRH 11): “Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads” outlines the rules and conditions that apply to the transport of abnormal loads and vehicles on public roads and the detailed procedures to be followed in applying for exemption permits are described and discussed. Legal axle load limits and the restrictions imposed on abnormally heavy loads are discussed in relation to the damaging effect on road pavements, bridges and culverts.

The general conditions, limitations and escort requirements for abnormally dimensioned loads and vehicles are also discussed and reference is made to speed restrictions, power / mass ratio, mass distribution and general operating conditions for abnormal loads and vehicles. Provision is also made for the granting of permits for all other exemptions from the requirements of the Road Traffic Act and the relevant regulations.

2.1.3 Permitting – General Rules

The limits recommended in the TRH 11 guideline document are intended to serve as a guide to the Permit Issuing Authorities. It must be noted that each Administration has the right to refuse a permit application or to modify the conditions under which a permit is granted. It is understood that:

- a) A permit is issued at the sole discretion of the Issuing Authority. The permit may be refused because of the condition of the road, the culverts and bridges, the nature of other traffic on the road, abnormally heavy traffic during certain periods or for any other reason.
- b) A permit can be withdrawn if the vehicle upon inspection is found in any way not fit to be operated.
- c) During certain periods, such as school holidays or long weekends an embargo may be placed on the issuing of permits. Embargo lists are compiled annually and are obtainable from the Issuing Authorities.

2.1.4 Load Limitations

The maximum load that a road vehicle or combination of vehicles will be allowed to carry legally under permit on a public road is limited by:

- the capacity of the vehicles as rated by the manufacturer.
- the load which may be carried by the tyres.
- the damaging effect on pavements.
- the structural capacity on bridges and culverts.
- the power of the prime mover(s).
- the load imposed by the driving axles; and
- the load imposed by the steering axles.

2.1.5 Dimensional Limitations

A load of abnormal dimensions may cause an obstruction and danger to other traffic. For this reason, all loads must, as far as possible, conform to the legal dimensions. Permits will only be considered for indivisible loads, i.e. loads that cannot, without disproportionate effort, expense or risk of damage, be divided into two or more loads for the purpose of transport on public roads. For each of the characteristics below there is a legally permissible limit and what is allowed under permit:

- Width;
- Height;
- Length;
- Front Overhang;
- Rear Overhang;
- Front Load Projection;
- Rear Load Projection;
- Wheelbase;
- Turning Radius; and
- Stability of Loaded Vehicles.

2.1.6 Expected vehicle types.

The following vehicle types are typically utilised during the construction phase of mining projects:

- Conventional trucks within the freight limitations to transport building material to the site.
- Abnormal construction vehicles such as excavators. These vehicles will be delivered to site and mostly work within the site with little to no impact to the external road network.
- Conventional vehicles within freight limitations for the transportation of staff to site.

The following vehicle types are typically utilised during the operational phase of the project:

- Abnormal load mining haul trucks for movement of material to be stockpiled within the site.
- Abnormal load excavators to lift material into haulage trucks.
- Conventional trucks within the freight limitations to transport coal.
- Conventional vehicles within freight limitations for the transportation of staff to site.

The decommissioning phase is expected to require similar vehicle types as the construction phase.

3 APPLICABLE LEGISLATION AND PERMIT REQUIREMENTS

Key legal requirements pertaining to the transport requirements for the proposed mining development are:

- Abnormal load permits, (Section 81 of the National Road Traffic Act 93 of 1996 and National Road Traffic Regulations, 2000); and
- Authorisation from Road Authorities to modify the road reserve to accommodate turning movements of abnormal loads at intersections.

4 DESCRIPTION OF THE AFFECTED ENVIRONMENT

4.1 Site Location

The project site is located in Ward 1 and Ward 21 of the Newcastle Local Municipality, located within the Amajuba District Municipality in Kwa-Zulu Natal Province.

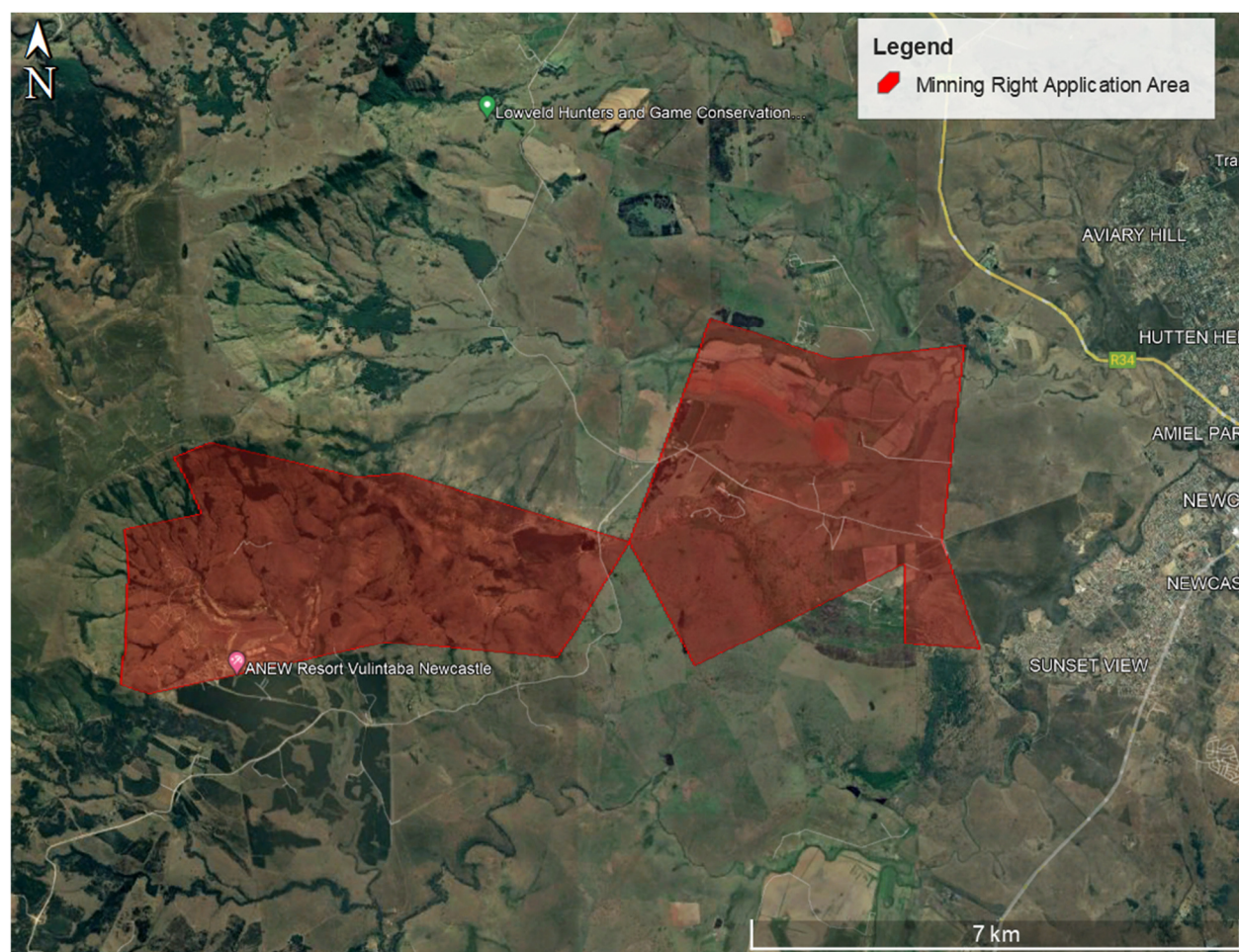


Figure 4-1: The Proposed Site

Coordinates of the site corners are shown in **Figure 4-2**. The Prospecting Right (and Mining Right Application) is registered over the following farms:

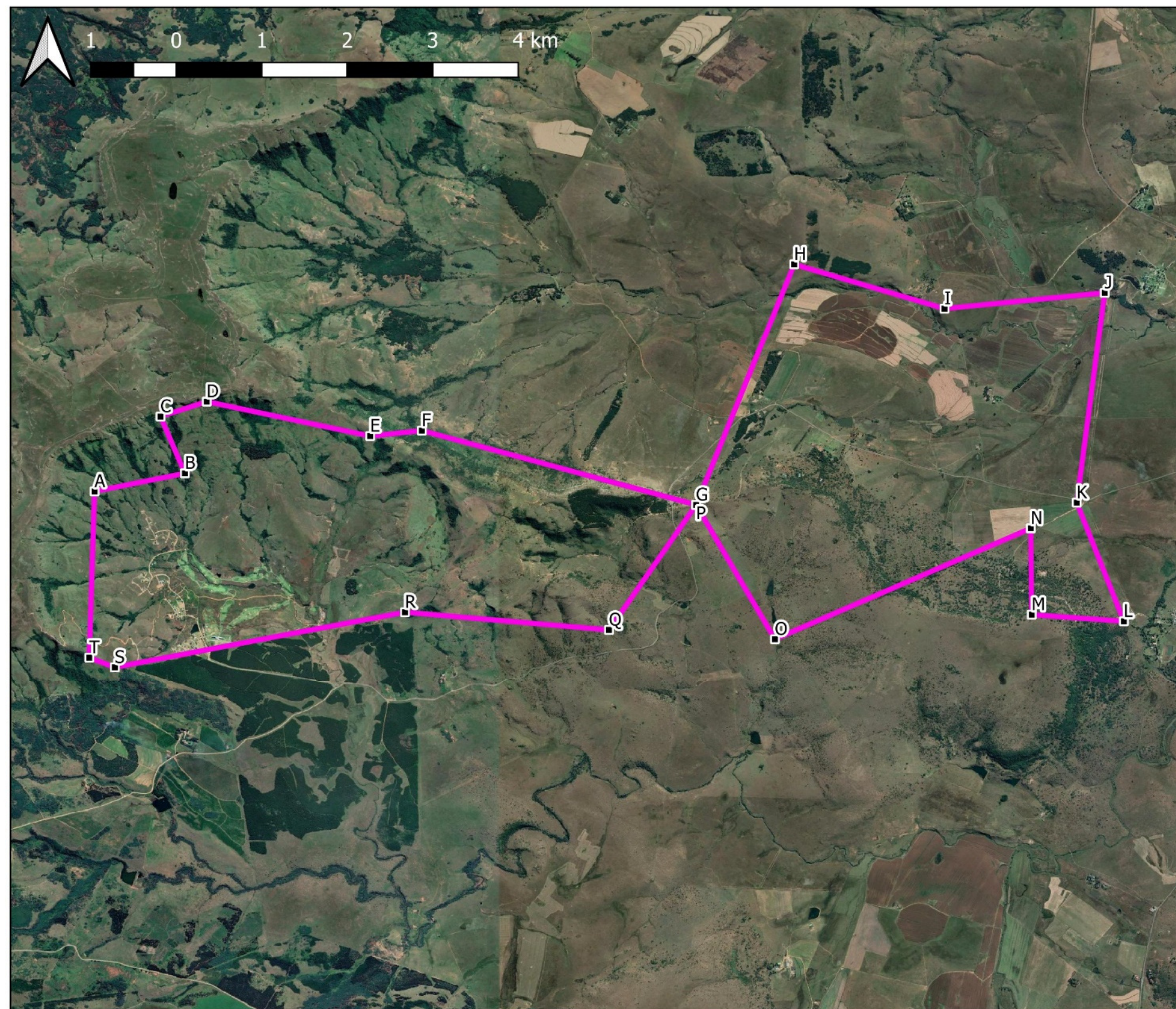
Table 4-1: Affected farm portions

Farm Portion	Planned Activity	SG Code
Subdivision 1 of Craig No 2989-HS	Surface	NOHS00000000298900001
Remainder of Craig No 2989-HS	Surface	NOHS00000000298900000
Subdivision 3(of 1) Glen Ashton No 8589-HS	Underground	NOHS00000000858900003
Harwarden No 8915-HS	Underground	NOHS00000000891500000
Mineral Area 1 on Remainder of Subdivision 4 of Waterfall No 3335-HS	Surface	NOHS00000000333500004
Portion 1 of Waterfall No 3335-HS	Surface	NOHS00000000333500001
Subdivision 2 of Dumblane No 3317-HS.	Underground	NOHS00000000331700002
Subdivision 3 of Dumblane No 3317-HS.	Underground	NOHS00000000331700003

The planned surface activities and infrastructure affects the following farms, with the remaining farms considered for future underground mining:

Table 4-2: Farm portions with planned surface activities and infrastructure

id	Farm Name	Farm No	Portion No
1	CRAIG	2989HS	1
2	WATERFALL	3335HS	MA1 ON RE 4
3	CRAIG	2989HS	0
4	WATERFALL	3335HS	1



**PROPOSED NEWCASTLE
COLLIERY, KWAZULU-
NATAL**

Site Coordinates

 Prospecting Right Area

Point	Lat	Long
A	27°45'29.68"S	29°46'7.75"E
B	27°45'21.93"S	29°46'46.37"E
C	27°44'57.74"S	29°46'35.92"E
D	27°44'51.36"S	29°46'55.68"E
E	27°45'6.06"S	29°48'5.53"E
F	27°45'3.73"S	29°48'27.64"E
G	27°45'35.43"S	29°50'24.86"E
H	27°43'52.56"S	29°51'6.79"E
I	27°44'11.46"S	29°52'11.03"E
J	27°44'4.67"S	29°53'19.54"E
K	27°45'34.46"S	29°53'7.57"E
L	27°46'25.06"S	29°53'27.72"E
M	27°46'22.22"S	29°52'48.31"E
N	27°45'45.42"S	29°52'47.90"E
O	27°46'32.70"S	29°50'58.57"E
P	27°45'35.43"S	29°50'24.86"E
Q	27°46'28.75"S	29°49'47.64"E
R	27°46'21.19"S	29°48'20.39"E
S	27°46'44.71"S	29°46'16.40"E
T	27°46'40.58"S	29°46'5.45"E



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Figure 4-2:Coordinates of the project

4.2 Surrounding road network

The surrounding road network in the vicinity of the site is assessed below. The road classification mentioned has been derived from the *COTO's South African Road Classification and Access Management Manual (TRH26), (2012)*. **Figure 4-3** shows the surrounding road network in the vicinity of the site with an indication of the respective classification of roads.

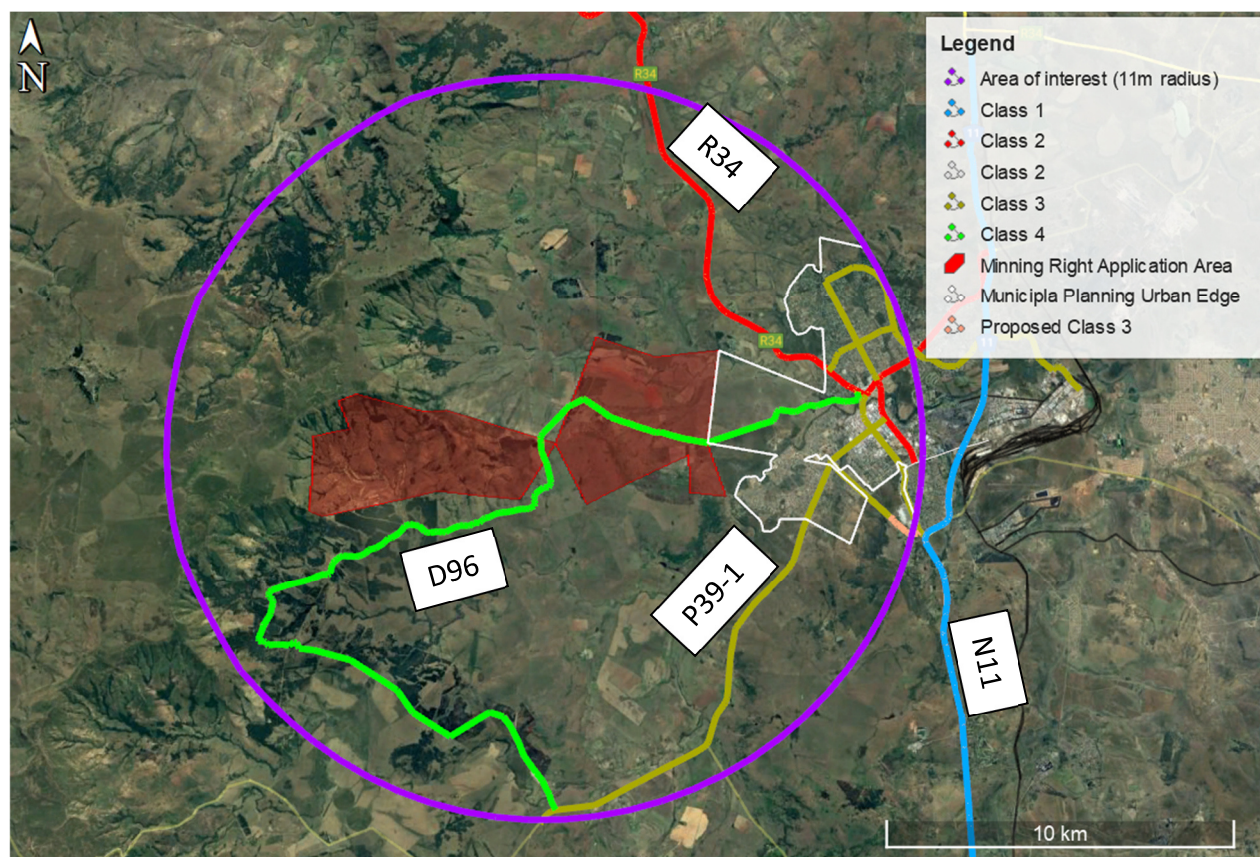


Figure 4-3: Surrounding road network

TRH26 makes a distinction between rural and urban areas. Roads in rural and urban areas have the same type of functional classes but at different scales and standards. Rural roads have longer reaches of connectivity and therefore require higher levels of mobility than urban roads. It is therefore necessary that the road classification system should differentiate between rural and urban areas.

The affected roads are discussed hereafter.

R34:

The R34 is a Class 2 road that links Newcastle via Memel onto the N3. This road ultimately continues north to Gauteng. Sections of the route fall within a rural environment and function as a rural major arterial while some sections fall within an urban zone and function as an urban major arterial.

The R34 is a single carriageway surfaced road with one way per direction. No formalised pedestrian facilities are accommodated along the route.

P39-1:

The P39-1 is a Class R3 Minor Arterial located approximately 8km south of the site.

Sections of the route fall within the urban zone and the rest of the route lies within the rural zone.

The P39-1 is a single carriageway surfaced road with one lane direction and gravel shoulders. No formalised pedestrian facilities are accommodated along the route.

D96:

The D96 is a Class 4 road which connects the R34 towards the east and the P39-1 towards the south. Sections of the route fall within the urban zone and the rest of the route lies within the rural zone.

The D96 is a single carriageway gravel road with one lane direction. No formalised pedestrian facilities are accommodated along the route.

The D96 road accommodates road infrastructure such as culverts and a bridge. These structures are recommended to be assessed for suitability of use in terms of road safety, road geometrics, structural integrity etc.



Figure 4-4: bridge structures at sections of the D96

Due to the anticipated increase in traffic, it would be ideal to investigate the road infrastructure and its ability to accommodate the development traffic beyond the aspect of road capacity. It is therefore recommended that the condition of the pavement structure, bridges, culverts etc be investigated to gain an informed understanding of whether the development trips can be accommodated.

it is also recommended that road safety investigations and studies be considered to limit risks for road users in the area. These studies will take into consideration terrain limitations, geometric limitations, road surface conditions etc and their impact on road safety, highlighting aspects that need improvement to reduce road safety risks.

4.3 Future planned road upgrades and projects

The Newcastle Municipality Integrated Development Plan (IDP) (Final IDP_2022/23-2026/27) provides a diagram of the proposed Newcastle Local Municipality Spatial Development Plan (SDP) 2020/21 (see **Figure 4-5**). Based on this diagram, there are planned Class U3 roads that will connect to the R34 and the D96 road. Not much is known regarding the design layout or the timeframes of implementation for the proposed routes. It is however suggested within the IDP that the exact timelines for road infrastructure upgrades will be largely dependent on developments that have taken place within the area. It is further noted in the IDP that before proposed plans on the SDP are considered, all parties involved (i.e., SANRAL, provincial and local bodies, the transportation authority, town planning and finance) will need to be consulted.

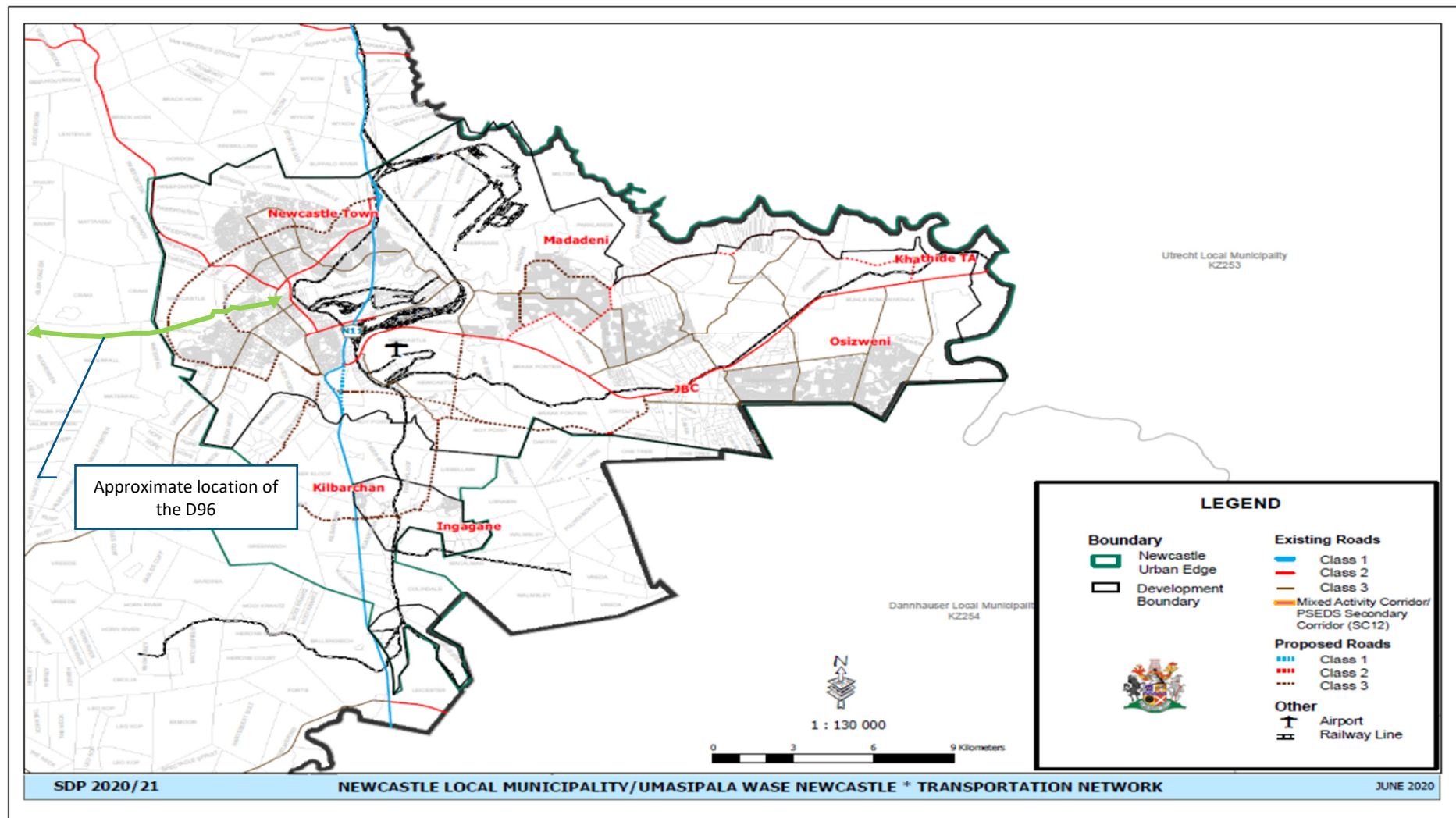


Figure 4-5: Newcastle Local Municipality SDP 2020/21 (extract from Newcastle local Municipality IDP)

4.4 Site Access

4.4.1 Access location

The proposed site will accommodate two access points as shown in **Figure 4-6**. Proposed Access 02 is located off an existing local road (i.e., Class R5 road) that allows access to farm properties. The access meets the prescribed 450-600m access spacing requirement along Class R5 roads.

Proposed Access 01 is located at a location that accommodates an existing access point on the north approach. As the access is located at an existing access point, no access spacing issues are envisaged. It is however recommended that the geometric design of the access take sight lines into consideration as per TRH17 guidelines.

When considering the location of a site access points, the following considerations are recommended:

- Mobility and access requirements:

The following access spacing requirements are outlined as per the TRH26 standards and guidelines.

In rural areas, the traffic safety and mobility considerations dictate access spacing requirements, and these are considerably longer than urban requirements. **Table 4-3** below summarises the access spacing recommendations along the stipulated road classes.

Table 4-3: Minimum spacing recommendations for intersections on access streets

Rural		Urban		
Class	Spacing	Class	Spacing (signals)	Spacing (roundabouts and priority)
Class 4	600 - 800 m	Class 4a Commercial collector street	200 - 300 m	200 – 300 m
		Class 4b Residential collector street	150 - 250 m	150 – 250 m
Class 5	450 - 600 m	Class 5a Commercial collector street	150 - 250 m	150 – 250 m
		Class 5b Residential collector street	150 m	75 - 150 m

In terms of mobility and circulation, the access points to the site will need to be able to cater for construction and abnormal load vehicles in terms of road width, access bell-mouth radius, and road grade.

- **Traffic safety:**
Access points should allow for sight distances as prescribed by appropriate road design guidelines for the design speed (i.e., TRH 17 Geometric Design of Rural Roads). To maintain sight lines, sight triangles should be kept clear of obstructions, including street furniture and landscaping elements. However, objects less than 0.6m in height, such as street signs, may be placed in the triangle.

It is recommended that appropriate signage and markings are provided to alert road users of access points ahead. The road reserve needs to be maintained to prevent obstructions to sight lines. Additionally, road upgrades may be required along existing access roads to accommodate expected vehicles.

All road markings and signage need to be in accordance with the South African Road Traffic Signs Manual (SARTSM).

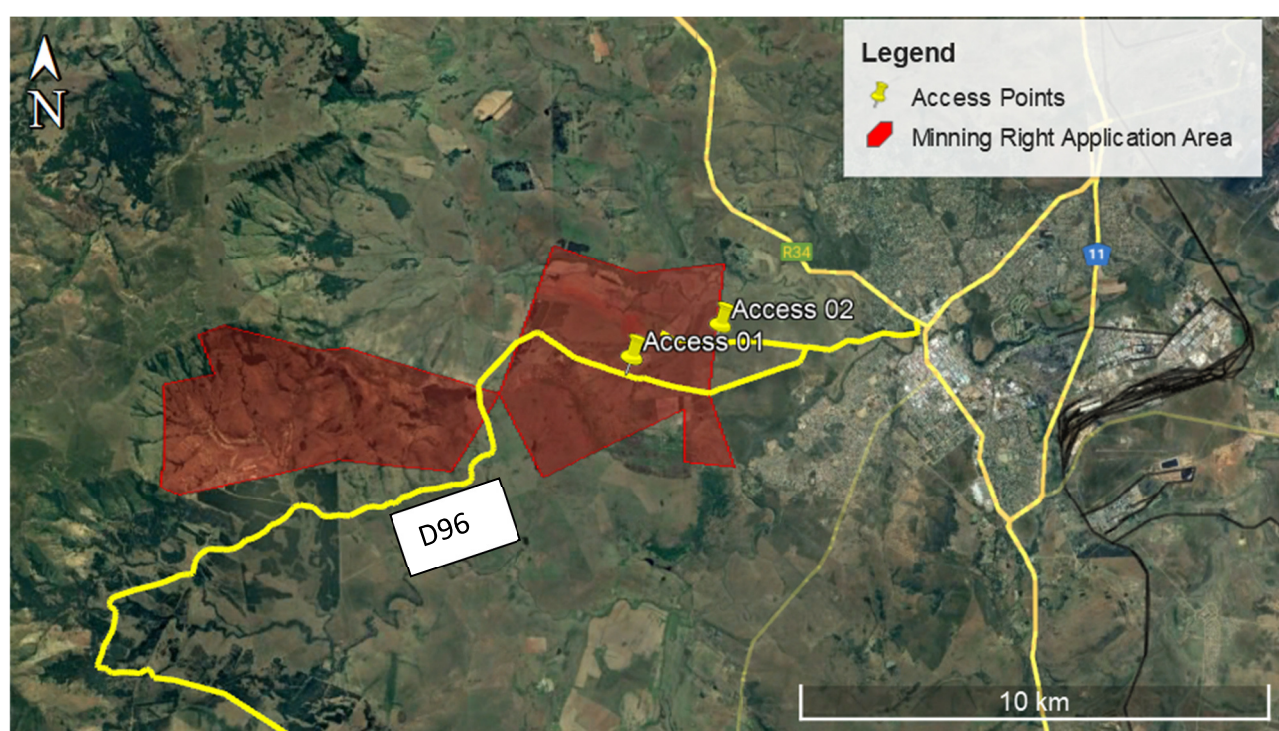


Figure 4-6: Access locations

4.4.2 Queue length storage (stacking distance)

Site access points to facilities are often controlled by gates or booms. To mitigate the impact of the vehicles waiting to access the site on the external road network, it is recommended to accommodate a stacking distance/queue length at the access. Queue length is the access road length between the access control and the road edge of the external connecting road.

TMH 16 Volume 2 provides guidelines on determining queue length. The following considerations have to be made when considering queue length:

- Traffic ratio (i.e., $\text{Traffic ratio} = \frac{\text{Total volume / PHF}}{\text{Service flow rate}} \times 100$)
- The Peak Hour Factor (PHF) compares the traffic volume during the busiest 15-minutes of the peak hour with the total volume during the peak hour.

$$\text{(i.e., PHF} = \frac{\text{Peak hour volume}}{(\text{peak 15 minute volume within the peak hour}) \times 4} \text{)}$$

- Service flow rates as outlined in **Table 4-4** below.

Table 4-4: Access control service flow rates

Access control type	Service flow (vph)
Swipe magnetic card	480
Remote controlled gates	450
Ticket dispenser: Automatic	390 -450
Ticket dispenser: Push button	220 - 360
Pin number operated gates	150
Pay fee on entry	120
Cell-phone operated gates (gate opens when a call is received)	100
Manual recording, Visitor completes form	80
Intercom operated gates (visitor contacts resident by intercom)	50

Once the traffic ratio is calculated for the site access, **Table 4-5** can be utilised to determine the required storage (i.e., number of vehicles to be accommodated in the queue length).

For example, if a site access has 1 access lane (i.e., 1 channel), and a traffic ratio of 30, the vehicle storage required (N_{que}) would be two (2) vehicles. This would correspond to a 12m queue length for a passenger car design vehicle (i.e., parallel parking bay length x 2).

Kindly note that if a calculated traffic ratio lies between two traffic ratio values in **Table 4-5** (e.g., 30 is between 23 and 39), the preferred traffic ratio for analysis of queue length is the highest next value (i.e., 39).

Table 4-5:TMH 16 Vol 2 Queue length at controlled access points

90 th Percentile queue length (vehicles per channel) at controlled accesses						
Storage (Vehs)	Traffic ratio (Percentage) for different Numbers of Channels					
N _{Que}	1 Channel	2 Channel	3 Channel	4 Channel	5 Channel	6 Channel
1	23	58	97	140	188	235
2	39	94	155	220	292	363
3	49	115	186	261	341	421
4	56	128	205	283	367	449
5	61	137	216	297	382	466
6	65	143	224	306	392	476
7	68	147	229	312	399	484
8	70	151	233	317	403	489
9	71	153	236	321	407	493
10	73	155	239	324	410	496

Queue length calculation:

The maximum inbound traffic or queue distance demand would occur during the AM peak. Allowance has been made for two access points to the site, however, not much is known regarding the traffic split between the two access points. As a worst-case scenario, it is assumed that all development trips will travel via one access gate when assessing queue length (i.e., 26 passenger vehicles for staff and 13 truck trips) (see **section 6.2.1** for trip estimation).

Based on traffic counts conducted at an intersection along the D96 road, the peak hour factor during the AM peak is calculated as follows: PHF= 35/ (4 x11) = 0.80

Assuming manual recording (i.e., Visitor completes form) at the access, a service flow rate of 80 can be assumed.

The above results in a Traffic ratio of:

$$\text{Traffic ratio (passenger vehicles)} = \frac{26 / 0.80}{80} \times 100 = 40.6$$

$$\text{Traffic ratio (Trucks)} = \frac{13 / 0.80}{80} \times 100 = 20.3$$

If one entry lane is accommodated at each access, the following queue lengths are estimated:

- N_{que} = 3 for passenger vehicles + 1 for trucks
- Queue length (m) = 3 x queue length for 1 passenger vehicle + 1 x queue length for 1 truck
= 3x6 + 1x10.1m = 28.1m

Proposed Access 01 and Proposed Access 02 are both feasible access locations from a traffic engineering perspective provided that:

- The traffic safety recommendations made in section 4.4.1 are taken into consideration.
- A recommended minimum queue distance of 28.1m is provided at the proposed access points.

Access 02 is at a much more favourable location as opposed to access 01 because Access 02 accommodates an entry road that would assist in limiting the traffic impact on the surrounding road network and properties. It must however be noted that it is still advisable to have two access points to allow for emergency access and evacuation when necessary.

4.4.3 Provision for emergency vehicles

Emergency vehicles will need to be able to enter and circulate through the proposed development site. The site should be capable of accommodating the largest emergency vehicle which is required to cater for the risk of the premises.

The dimension of the access must be suitable for the largest emergency vehicle while the carrying capacity should cater for the heaviest emergency vehicle. The design emergency vehicle is recommended to cater for the risk of the premises and the emergency vehicle that is likely to be used on the premises.

Emergency service vehicles typically include ambulances, fire trucks and police vehicles.

As a guide, emergency service routes are typically recommended to have a total unobstructed width of not less than 5.0 m, while property access control gates and accesses to buildings must have a total unobstructed width of not less than 4.5 m. A minimum height clearance of 4.2m, is recommended if an overhead structure is planned.

The design, road marking, use and maintenance of any emergency vehicle route not forming part of a public road must comply with the requirements of the controlling authority. To prevent the obstruction of emergency vehicle routes or facilities, appropriate maps, and signage to indicate emergency vehicle routes and facilities is recommended.

It has been noted that the D96 accommodates a culvert and bridge. This infrastructure will need to be assessed for its suitability to accommodate the largest emergency vehicle which is required to cater for the risk of the premises.

4.5 Internal roads

The internal road network is yet to be established. Existing structures and services, such as drainage structures, signage, street lighting and pipelines will need to be evaluated if impacting on the roads. It needs to be ensured that any gravel sections remain in good condition and will need to be maintained during the additional loading of the construction phase and then reinstated after construction is completed. The gravel roads will require regular grading with a grader to obtain a flat even surface.

The geometric design constraints encountered due to the terrain should be taken into consideration by the geometric designer. Preferably, the internal roads need to be designed with smooth,

relatively flat gradients (recommended to be no more than 8%) to accommodate larger transport load vehicles.

4.6 Public Transport and Non-motorised Transport

In terms of the National Land Transport Act (NLTA) (Act No.5 of 2009), it is a requirement that an assessment of the available public transport services be considered for proposed developments. The following comments are relevant in respect to the public transport availability for the proposed development.

4.6.1 Non-motorised Transport (NMT)

There are no non-motorised transport facilities accommodated on the routes within the vicinity of the site (i.e., R34 and D96). It is recommended that pedestrian facilities be accommodated at the access roads to the site as well as the internal roads. These pedestrian facilities are recommended to be strategically located in areas where pedestrian activity is anticipated to allow for safe travel routes for pedestrians, linking them to facilities within the site.

4.6.2 Public Transport

4.6.2.1 Existing Services

There are existing minibus taxi routes located along the R34 located east of the site, Allen Street located southeast of the site and the P39-1 road located south of the site (see **Figure 4-7**).

4.6.2.2 Planned Public Transport Services

According to the Newcastle Municipality IDP 2022/23-2026/27, there are plans to introduce a fast train service between Johannesburg and Durban. This train route is planned to pass through Newcastle. The existing railway line in Newcastle is located approximately 7.9km southeast of the site.

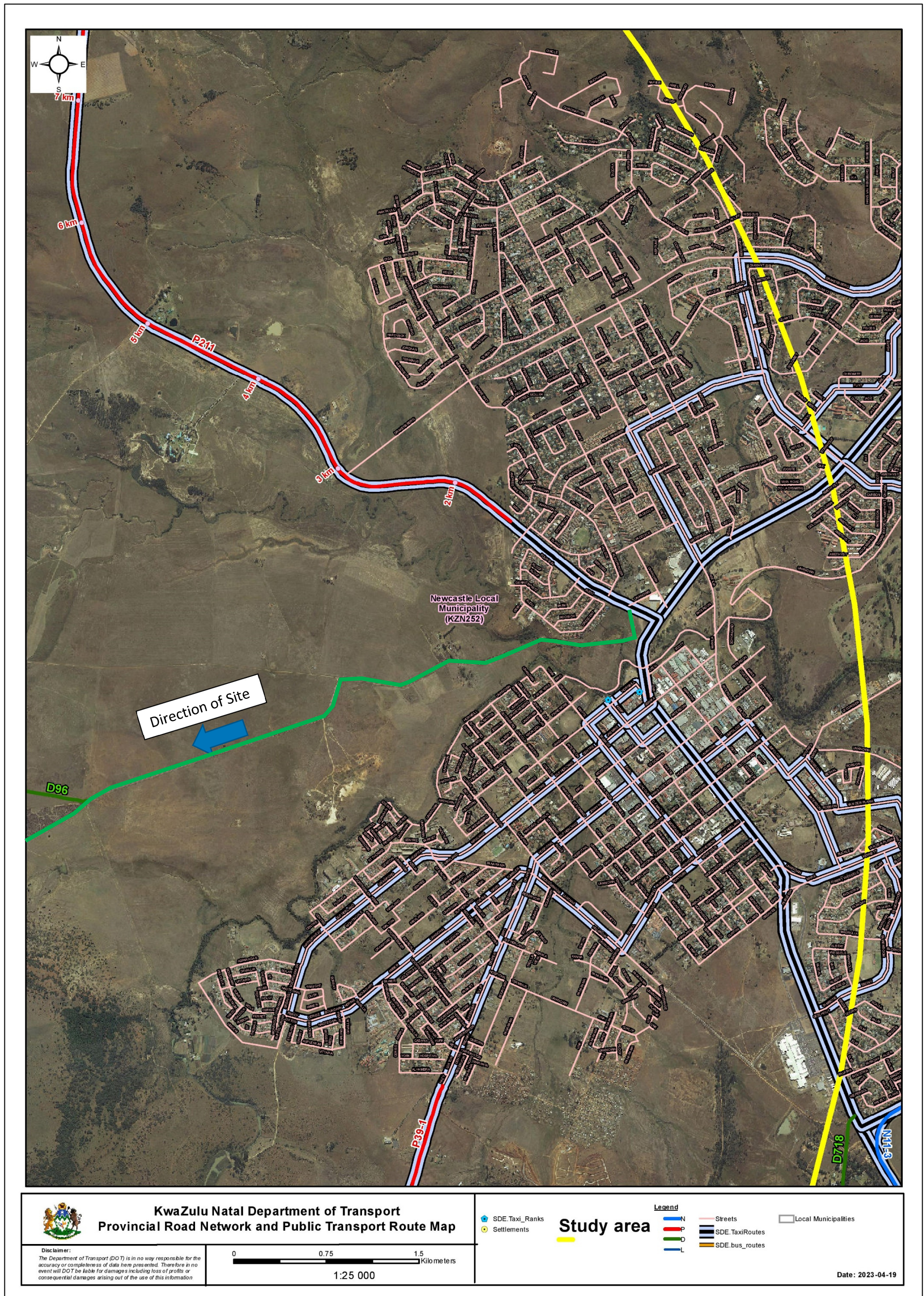


Figure 4-7:Public transport route

4.7 Parking

4.7.1 Parking requirements

Typically, on-site parking requirements need to be provided in accordance with the Local Municipal Planning By-Law, unless otherwise agreed with and approved by the respective Authority. However, there were no available planning by-laws that prescribe parking rates associated with the Newcastle Local Municipality. The following is considered to develop a parking requirement estimate:

- It is estimated that 152 staff members will be required during the operational phase. Based on the staff breakdown provided by the client, It is assumed that approximately 29% of staff will travel by taxi, 42% will travel by a shuttle bus, and the rest will travel by passenger vehicle.

The total number of staff envisaged to travel by passenger vehicle is 44, 44 by taxi and 64 by bus. The total trips estimated to be generated by staff is summarised below:

Table 4-6: Staff trip estimate (Parking demand)

Total staff	Vehicle type	Average occupancy	Vehicle	Estimated trips
44	Passenger	Average 1.2 (6 of staff on single occupancy)		$(38/1.2) + 6 = 38$ cars
44	Taxi	15		$44/15 = 3$ taxis
64	Bus	64		$64/64 = 1$ bus

Based on the above, it is proposed to accommodate 38 passenger vehicle parking bays, and a drop and go facility that can accommodate 1 bus and 1 taxi.

4.7.2 Parking Dimensions

All parking bays are recommended to be in line with the TMH 16 Volume 2 South African Traffic Impact and Site Impact Assessment Standards and Requirements Manual (February 2014). It must however be noted that the local municipal approving authorities may recommend preferences outside these standards.

It is also recommended that the designers ensure that the required movements of the design vehicle can be accommodated in the proposed parking layout.

According to the standards, the following minimum parking dimensions can be considered:

Table 4-7: Passenger vehicle parking dimensions

Bay angle	Bay width (m)*	Bay depth (m)		Aisle width (m)	
		No interlocking	Interlocking	Two-way	One-way
90°	2.5	5.0	5.0	7.5	7.5
60°	2.9	5.3	4.8	5.2	4.4
45°	3.5	4.9	4.2	5.2	4.2

(*) Add 0.35 m for parking bays adjacent to a wall.

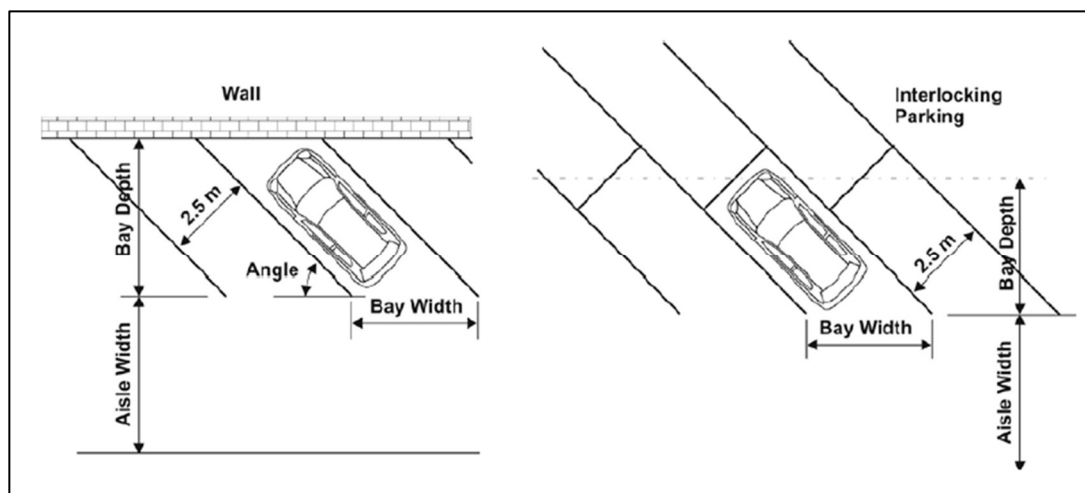


Figure 4-8: Typical parking layout dimension diagram

Where drop-off and pick-up facilities are provided on a development site, the location and design of the facilities should be aimed at encouraging the use of such facilities. It is therefore recommended that the facility should be located within an acceptable walking distance from the development. Such walking distances should preferably not exceed a maximum of between 100 and 200 m.

Provision should also be made for fast and convenient vehicular access to the drop-off facilities. In the facility, provision should be made for dropping off as well as picking up of persons. Picking up may require the provision of some short-term parking facilities.

5 IDENTIFICATION OF KEY ISSUES

5.1 Identification of Potential Impacts

The potential transport related impacts are described below.

5.1.1 Construction Phase

Potential impact

- Traffic congestion due to construction related traffic.
This phase also includes the construction of roads, excavations, trenching and ancillary construction works that will temporarily generate the most traffic.
- The construction traffic would also lead to noise and dust pollution.
- Road surface deterioration due to additional traffic loading.
- Potential road safety impacts due to increased traffic on the road.

5.1.2 Operational Phase

Potential impact

- Traffic congestion related to staff travel, and transportation of minerals.
- Mining pit excavation, coal processing and mineral transportation would lead to noise and dust pollution.
- Road surface deterioration due to additional traffic loading.
- Potential road safety impacts due to increased traffic on the road.

5.1.3 Decommissioning Phase

This phase will result in the same impact as the Construction Phase as similar trips are expected.

5.1.4 Cumulative Impacts

Potential impact

- Traffic congestion/delays on the surrounding road network.
- Noise and dust pollution.
- Road surface deterioration due to additional traffic loading.
- Potential road safety impacts due to increased traffic on the road.

In general, it must be noted that TIA's are aimed at determining whether the development can be accommodated by the surrounding road network capacity. Secondary impacts resulting from traffic congestion (i.e., noise, dust, pavement deterioration, road safety impacts etc.) fall outside the scope of a TIA thus detailed assessments of these aspects would require additional specialist studies to address these topics appropriately.

6 ASSESSMENT OF IMPACTS AND IDENTIFICATION OF MANAGEMENT ACTIONS

6.1 Potential Impact - Construction Phase

Nature of the impact

- Potential traffic congestion and delays on the surrounding road network.

Significance of impact without mitigation measures

- Traffic generated by the construction of the facility is envisaged to have a insignificant impact on the surrounding road network in comparison to the impacts expected during the operational phase. The exact number of trips generated during construction will be determined by the contractor and the haulage company transporting the materials and equipment to site.

6.1.1 Proposed impact mitigation measures - Construction phase.

The following mitigation measures are proposed to potentially reduce the impact during the Construction Phase:

- The delivery of materials in and out of the site must be staggered and trips must be scheduled to occur outside of peak traffic periods.
- Dust suppression of gravel roads during the construction and decommissioning phases, as required.
- Regular maintenance of gravel roads by the Contractor during the construction and decommissioning phases.
- The use of mobile batching plants and quarries on or in close proximity to the site would decrease the impact on the surrounding road network.
- Staff and general trips should occur outside of peak traffic periods as far as possible.
- Any low hanging overhead obstructions (e.g. Eskom and Telkom lines, etc.) along the proposed routes will have to be moved to accommodate the abnormal load vehicles.
- The preferred route should be surveyed to identify problem areas e.g. intersections with limited turning radii and sections of the road with sharp horizontal curves or steep gradients, that may require modification. It needs to be ensured that the gravel sections of the haulage routes remain in good condition and will need to be maintained during the additional loading of the construction phase and reinstated after construction is completed.
- Design and maintenance of internal roads: The internal gravel roads will require grading with a road grader to obtain a flat even surface and the geometric design of these gravel roads needs to be confirmed at detailed design stage. This process is to be undertaken by a civil engineering consultant or a geometric design professional. The road designer should take cognizance that roads need to be designed with smooth, relatively flat gradients to allow an abnormal load vehicle to ascend to the top of a hill.
- Stockpile materials to allow for staggered haulage and delivery.

6.1.2 Significance of impact with mitigation measures

The proposed mitigation measures for the construction traffic will result in a minor reduction of the impact on the surrounding road network, but the impact on the local traffic will remain low as the existing intersections are performing at an acceptable capacity.

Dust suppression, is however, expected to significantly reduce the impact of dust pollution.

6.2 Potential Impact - Operational Phase

Nature of the impact

- Potential traffic congestion and delays on the surrounding road network.

6.2.1 Traffic flows and trip generation

6.2.1.1 Assessment Scenarios

To determine the impact of the development traffic on the surrounding road network, the following scenarios were analysed:

- Scenario 1 – Present Traffic (2023) demand **without the proposed development**. The purpose of this scenario is to obtain the present Level of Service (LOS) on the adjacent road network.
- Scenario 2 – Future Traffic (2025) **without the proposed development**. The purpose of this scenario is to establish the Level of Service and operating conditions on the surrounding road network in year 2025, taking only the background traffic into consideration.

It must be noted that it is assumed that full operation of the mine will occur at year 2025. This is a worst-case scenario estimate taking into consideration timelines for authorisations and approvals, land acquisition, as well as construction of supporting facility infrastructure.

- Scenario 3 Future Traffic (2030) **without the proposed development**. The purpose of this scenario is to establish the future Level of Service and operating conditions on the surrounding road network in a 5-year horizon from start of operations.
- Scenario 4 - Future Traffic (2025) **with the proposed development**. The purpose of this scenario is to establish the future impact of the proposed development on the existing road network.
- Scenario 5 - Future Traffic (2030) **with the proposed development**. The purpose of this scenario is to establish the future impact of the proposed development on the existing road network in a 5-year horizon from start of operations.

6.2.1.2 Trip generation

To investigate and assess the feasibility of accommodating the impact of the proposed development on the road network system, the potential peak hour development traffic volumes that can be generated by the proposed development need to be estimated.

The following assumptions are considered to estimate development trips:

- The trips generated by staff commuting to the site is summarised in **Table 6-1**.

Table 6-1: Summary table of total staff trips

Total staff	Travel Vehicle type	Average Vehicle occupancy	Estimated trips
44	Passenger	Average 1.2 (6 of staff on single occupancy)	$(38/1.2) + 6 = 38$ cars
44	Taxi	15	$44/15 = 3$ taxis
64	Bus	64	$64/64 = 1$ bus

Table 6-2: Trip estimation assumptions (staff trips)

Item	Trip generation generator	Number of workers	Vehicle type	Assumed occupancy per vehicle	Total workers by vehicle type	Comments
1	Management staff	6	Passenger	1	6	
2	Mining staff (superintendents)	3	Passenger	1.2	3	possible ride share considered
3	Mining staff (supervisors)	8	Passenger	1.2	7	90% passenger vehicle users
			Bus / Taxi	64 bus+ 15 taxi	1	10% arranged transport users
4	Mining staff (operators)	78	Bus / Taxi	64 bus+ 15 taxi	78	100% arranged transport
5	Engineering staff (superintendents)	3	Passenger	1.2	3	possible ride share considered
6	Engineering staff (specialists)	22	Passenger	1.2	5	20% passenger vehicle users
			Bus / Taxi	64 bus+ 15 taxi	17	80% arranged transport users
7	Engineering staff (safety officers)	10	Passenger	1.2	2	20% passenger vehicle users
			Bus / Taxi	64 bus+ 15 taxi	8	80% arranged transport users
8	Environmental officer	1	Passenger	1	1	
9	Chief safety officer	1	Passenger	1	1	
10	Occupational hygienist	1	Passenger	1	1	
11	Health and safety specialist	5	Passenger	1.2	1	20% passenger vehicle users
			Bus / Taxi	64 bus+ 15 taxi	4	80% arranged transport users
12	Safety Officers	3	Passenger	1.2	3	possible ride share considered
13	Mineral resources staff (superintendents)	4	Passenger	1.2	4	possible ride share considered
14	Mineral resources staff (specialists)	2	Passenger	1.2	2	possible ride share considered
15	Mine planner	2	Passenger	1.2	2	possible ride share considered
16	Strata control officer	1	Passenger	1	1	
17	Surveyors	2	Passenger	1.2	2	possible ride share considered
Total staff trips		152	Passenger	38 staff on 1.2 occupancy + 6 on single occupancy	44	38 trips
			Taxi	15	44	3 trips
			Bus	64	64	1 trip

- Estimated truck trips during the peak hour:

Table 6-3: Estimated peak hour truck trips.

Operational trucks			Number of trucks/days	% Truck during peak hour	Number of trucks during peak hour	Comments
Daily coal production	4,464.29	tonnes/day	131	20%	26	34-ton tipper trucks (most used)

It must also be noted that the coal delivery trips are a conservative estimate. The client is considering building a conveyor to transport coal off-site which is expected to reduce coal delivery trips.

- For staff trips: A 60%/40% (in/out) split is assumed for the AM peak to account for shift changes. The reverse is assumed for the PM peak (i.e., 40%/60% (in/out) split)
- For truck trips: A 50%/50% (in/out) split is assumed for both the AM and PM peak.

Based on the above assumptions the following development trips are estimated for the site:

Table 6-4: Estimated peak hour trips (operational phase)

Trip source	AM		PM	
	in	out	in	out
Staff	26	16	16	26
Operational trucks	13	13	13	13
Total trips	39	29	29	39

The proposed development traffic distribution is summarised in **Annexure A**.

6.2.1.3 Traffic counts

6.2.1.3.1 Existing traffic counts

Classified traffic counts were conducted during normal weekday traffic on the 09 March 2023 at the following locations:

- Allen Street/R34
- R34/D96
- D96/Farm Road

The counts were conducted to help gain an understanding of the current capacity of the intersections of interest as well as provide a means to determine the traffic impact with and without the proposed development. The peak hour periods were found to occur during the AM peak at 06:45-07:45 and the PM peak at 16:00 -17:00.

The traffic volumes are summarised in **Annexure B**.

6.2.1.3.2 Projected traffic counts

There is a strong correlation between traffic growth and economic conditions and economic growth. The short-medium term economic outlook for South Africa does not currently appear promising with the country's electricity supply, a marked deterioration in freight rail and port logistics and inflation remaining key risks.

According to the World Bank, the annual Gross Domestic Product (GDP) growth rate in South Africa ranged between 0.3% and 1.4% from 2014 to 2019. The GDP declined to -6.34 in 2020, which can be attributed to the worldwide Covid-19 pandemic, but rebounded to 4.91% in 2021. However, this high GDP can be attributed to the return to normal activities. (The World Bank, n.d.)

As stated in its May 2023 Statement of the Monetary Policy Committee, the South African Reserve Bank (SARB) forecasted 2023 GDP growth is at 0.3%. The GDP growth forecast for 2024 and 2025 is estimated at 1.0% and 1.1% respectively. (South African Reserve Bank, 2023)

The traffic growth rate is expected to remain constrained in the near future until the economy recovers significantly. However, a growth rate of 2% has been applied to the traffic data. The 2% growth rate is in line with the proposed TMH17 growth rate range for low growth development areas. The resulting future traffic volumes are attached in **Annexure C to F**.

6.2.2 Intersection capacity analysis

6.2.2.1 Results of Capacity Analysis

6.2.2.1.1 General

To assess the impact of the proposed development on the road network, the results of the capacity analyses **with** and **without** the proposed development are compared. The results tables in section 6.2.2.1.2 summarises the level of service (LOS – see definitions in **Table 6-5**), volume/capacity ratio (v/c) and average delay (in seconds) for each intersection approach as well as for the overall intersections.

Table 6-5: Level of Service Definition

Level of Service (LOS)	Delay (d) in seconds		Degree of Performance
	Signals and Traffic Circles	Stop and Yield Controlled	
A	$d \leq 10$	$d \leq 10$	Excellent intersection performance
B	$10 < d \leq 20$	$10 < d \leq 15$	Good intersection performance
C	$20 < d \leq 35$	$15 < d \leq 25$	Adequate intersection performance
D	$35 < d \leq 55$	$25 < d \leq 35$	Fair intersection performance
E	$55 < d \leq 80$	$35 < d \leq 50$	Poor Intersection performance
F	$d > 80$	$d > 50$	

The average delay is calculated from the time a vehicle comes to a stop to driving over stop line at a respective approach. In a research project, it was found that drivers accept a maximum delay or waiting time of around 55 seconds at a signalised intersection, but only 35 seconds at a stop-controlled intersection. Thereafter the driver will become impatient, and the intersection is deemed to not operate well anymore. Another factor that plays a role when calculating the level of service at an intersection is the queuing distance, which is the number of vehicles waiting at an intersection.

6.2.2.1.2 Results summary

Table 6-6: Results summary – “Without the proposed development” Scenarios

Intersection		2023 Without Development						2025 Without Development						2030 Without Development					
		AM Peak			PM Peak			AM Peak			PM Peak			AM Peak			PM Peak		
		v/c	Delay (sec)	LOS	v/c	Delay (sec)	LOS	v/c	Delay (sec)	LOS	v/c	Delay (sec)	LOS	v/c	Delay (sec)	LOS	v/c	Delay (sec)	LOS
1	South: Allen Street	0.39	9.2	LOS A	0.40	7.7	LOS A	0.40	9.3	LOS A	0.42	7.8	LOS A	0.45	9.4	LOS A	0.46	7.9	LOS A
	North: Allen Street	0.44	11.5	LOS B	0.31	9.8	LOS A	0.46	11.6	LOS B	0.33	9.8	LOS A	0.51	11.7	LOS B	0.36	10.0	LOS A
	West: M34	0.40	12.9	LOS B	0.31	14.1	LOS B	0.42	12.9	LOS B	0.32	14.2	LOS B	0.46	13.1	LOS B	0.36	14.3	LOS B
	All Vehicles	0.44	11.2	LOS B	0.40	9.7	LOS A	0.46	11.2	LOS B	0.42	9.7	LOS A	0.51	11.4	LOS B	0.46	9.8	LOS A
2	South: D96	0.06	12.5	LOS B	0.03	12.3	LOS B	0.06	13.0	LOS B	0.04	13.0	LOS B	0.08	14.1	LOS B	0.05	13.8	LOS B
	East: M34	0.12	0.3	LOS A	0.18	0.4	LOS A	0.13	0.4	LOS A	0.19	0.4	LOS A	0.14	0.4	LOS A	0.21	0.4	LOS A
	North: Shopping Centre	0.01	10.3	LOS B	0.00	8.1	LOS A	0.01	10.8	LOS B	0.00	8.4	LOS A	0.01	12.3	LOS B	0.00	9.1	LOS A
	West: M34	0.31	0.2	LOS A	0.15	0.4	LOS A	0.32	0.2	LOS A	0.16	0.4	LOS A	0.36	0.2	LOS A	0.18	0.5	LOS A
	All Vehicles	0.31	0.7	LOS A	0.18	0.7	LOS A	0.32	0.8	LOS A	0.19	0.8	LOS A	0.36	0.8	LOS A	0.21	0.8	LOS A

Intersection		2023 Without Development						2025 Without Development						2030 Without Development					
		AM Peak			PM Peak			AM Peak			PM Peak			AM Peak			PM Peak		
		v/c	Delay (sec)	LOS	v/c	Delay (sec)	LOS	v/c	Delay (sec)	LOS	v/c	Delay (sec)	LOS	v/c	Delay (sec)	LOS	v/c	Delay (sec)	LOS
3	South: D96	0.01	5.0	LOS A	0.01	5.0	LOS A	0.01	5.0	LOS A	0.01	5.0	LOS A	0.01	5.0	LOS A	0.01	5.0	LOS A
	North: D96	0.01	5.0	LOS A	0.01	4.9	LOS A	0.01	5.1	LOS A	0.01	4.9	LOS A	0.01	5.0	LOS A	0.01	4.9	LOS A
	West: Farm Rd	0.01	20.2	LOS C	0.01	18.0	LOS C	0.01	20.5	LOS C	0.01	18.4	LOS C	0.01	20.7	LOS C	0.01	18.7	LOS C
	All Vehicles	0.01	5.8	LOS A	0.01	6.2	LOS A	0.01	5.8	LOS A	0.01	6.1	LOS A	0.01	5.7	LOS A	0.01	6.0	LOS A

Table 6-7: Results summary – “With the proposed development” Scenarios

Intersection		2025 With Development						2030 With Development					
		AM Peak			PM Peak			AM Peak			PM Peak		
		v/c	Delay (sec)	LOS	v/c	Delay (sec)	LOS	v/c	Delay (sec)	LOS	v/c	Delay (sec)	LOS
1	South: Allen Street	0.40	9.2	LOS A	0.43	7.8	LOS A	0.45	9.3	LOS A	0.48	8.0	LOS A
	North: Allen Street	0.46	11.8	LOS B	0.33	10.0	LOS B	0.51	11.9	LOS B	0.36	10.2	LOS B
	West: M34	0.44	13.1	LOS B	0.35	14.3	LOS B	0.49	13.2	LOS B	0.39	14.4	LOS B
	All Vehicles	0.46	11.4	LOS B	0.43	9.9	LOS A	0.51	11.5	LOS B	0.48	10.1	LOS B
2	South: D96	0.18	18.1	LOS C	0.14	16.1	LOS C	0.23	20.5	LOS C	0.16	17.6	LOS C
	East: M34	0.14	0.8	LOS A	0.20	0.6	LOS A	0.17	0.7	LOS A	0.22	0.6	LOS A
	North: Shopping Centre	0.01	11.1	LOS B	0.00	8.6	LOS A	0.01	12.7	LOS B	0.00	9.4	LOS A
	West: M34	0.33	0.4	LOS A	0.17	0.8	LOS A	0.37	0.5	LOS A	0.19	0.8	LOS A
	All Vehicles	0.33	1.7	LOS A	0.20	1.7	LOS A	0.37	1.8	LOS A	0.22	1.8	LOS A
3	South: D96	0.01	5.0	LOS A	0.01	5.0	LOS A	0.01	5.0	LOS A	0.01	5.0	LOS A
	North: D96	0.01	5.1	LOS A	0.01	4.9	LOS A	0.01	5.0	LOS A	0.01	4.9	LOS A
	West: Farm Rd	0.01	20.5	LOS C	0.01	18.4	LOS C	0.01	20.7	LOS C	0.01	18.7	LOS C
	All Vehicles	0.01	5.8	LOS A	0.01	6.1	LOS A	0.01	5.7	LOS A	0.01	6.0	LOS A

6.2.2.1.3 Discussion of analysis results

a) Allen Street/R34

The intersection is currently a signalised T-junction with dedicated turning lanes on each approach.

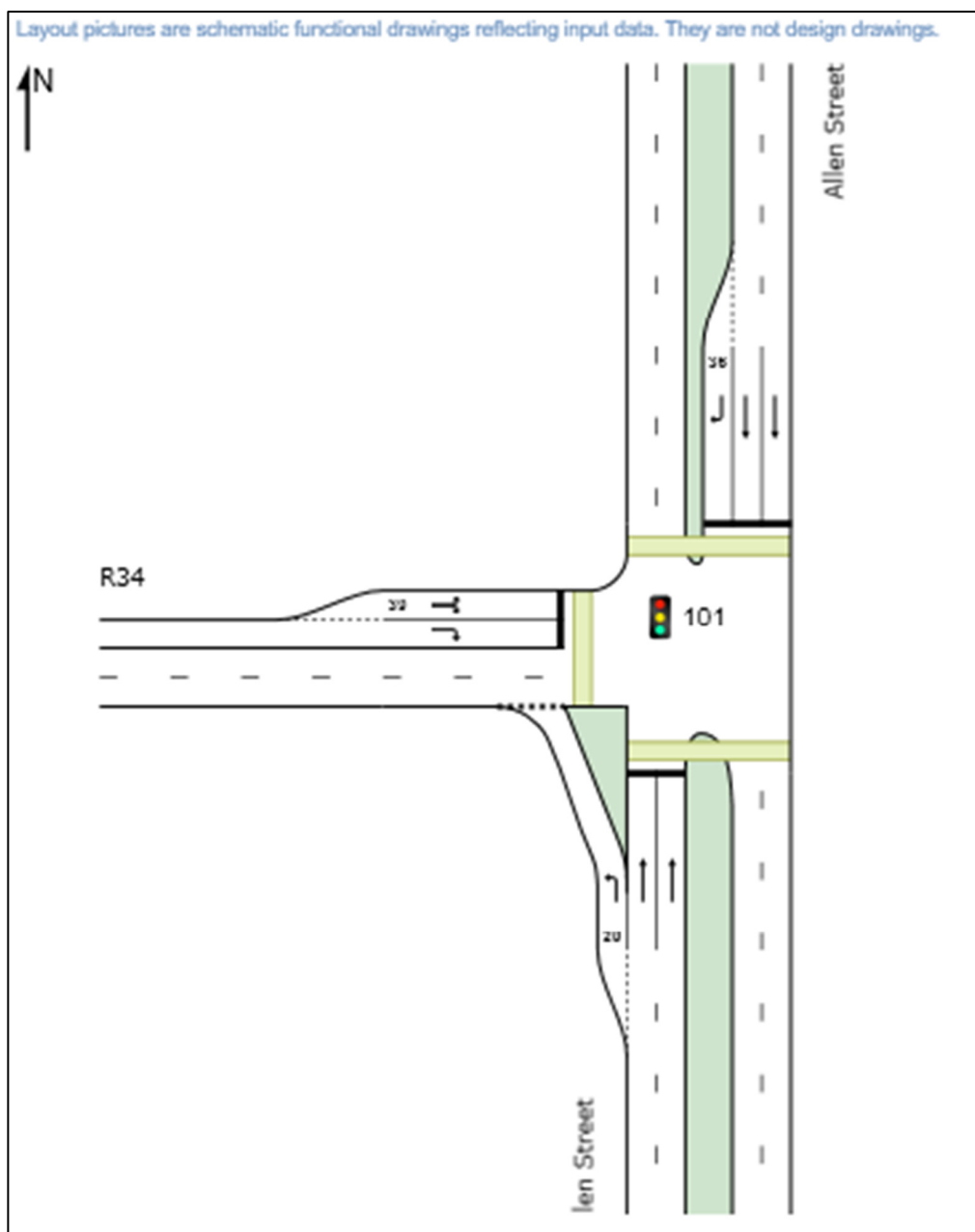


Figure 6-1: R34/Allen Street intersection layout

The intersection performs well across all analysed scenarios. The overall intersection performs well at LOS B during the AM peak across all analysed scenarios. During the PM peak, the intersection performs at free flow traffic at LOS A across all analysed scenarios with the exception of the 2030 PM peak “with development traffic” scenario. During the 2030 PM peak “with development traffic” scenario the intersection performs well at LOS B. The development has a negligible impact at this intersection and no intersection improvements are deemed necessary.

b) R34/D96

The R34/D96 intersection is a 4-way intersection with priority control on the R34 and a one way exit on the north approach.

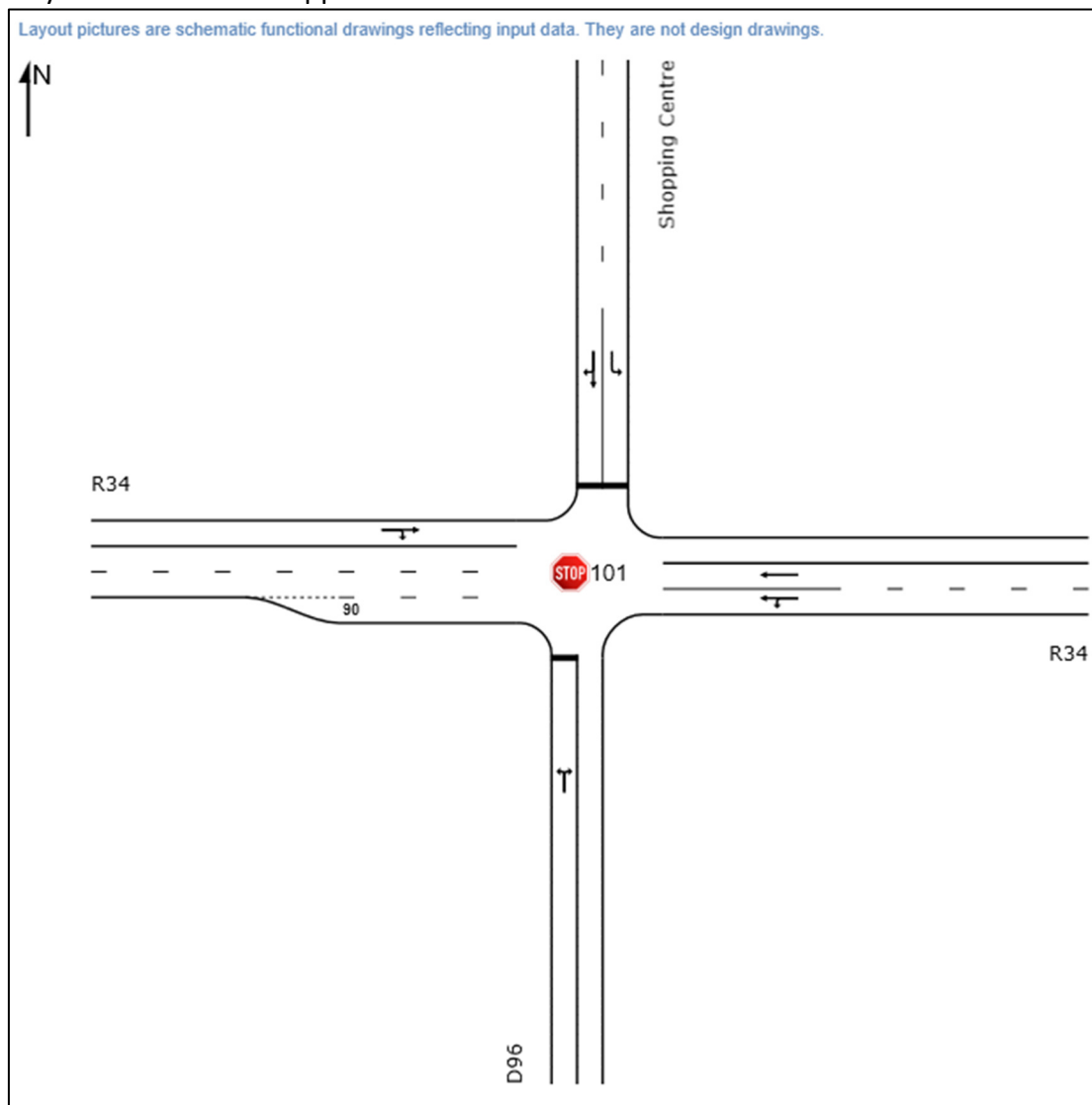


Figure 6-2: R34/D96 intersection layout

During the “without development traffic” scenarios: the overall intersection performs excellently at LOS A across all analysed scenarios; the south approach performs at LOS B during the AM peak and PM peak; and the north approach performs at LOS B during the AM peak and LOS A during the PM peak.

During the “with development traffic” scenarios, with the exception of the south approach, the LOS across all other approaches remains unchanged when compared to the “without development traffic” scenario. The south approach performs adequately at LOS C.

The intersection capacity can accommodate the estimated development trips thus no intersection improvements are recommended.

c) D96/Farm Road

The intersection is a T junction with priority on the D96. There are single lanes on each approach.

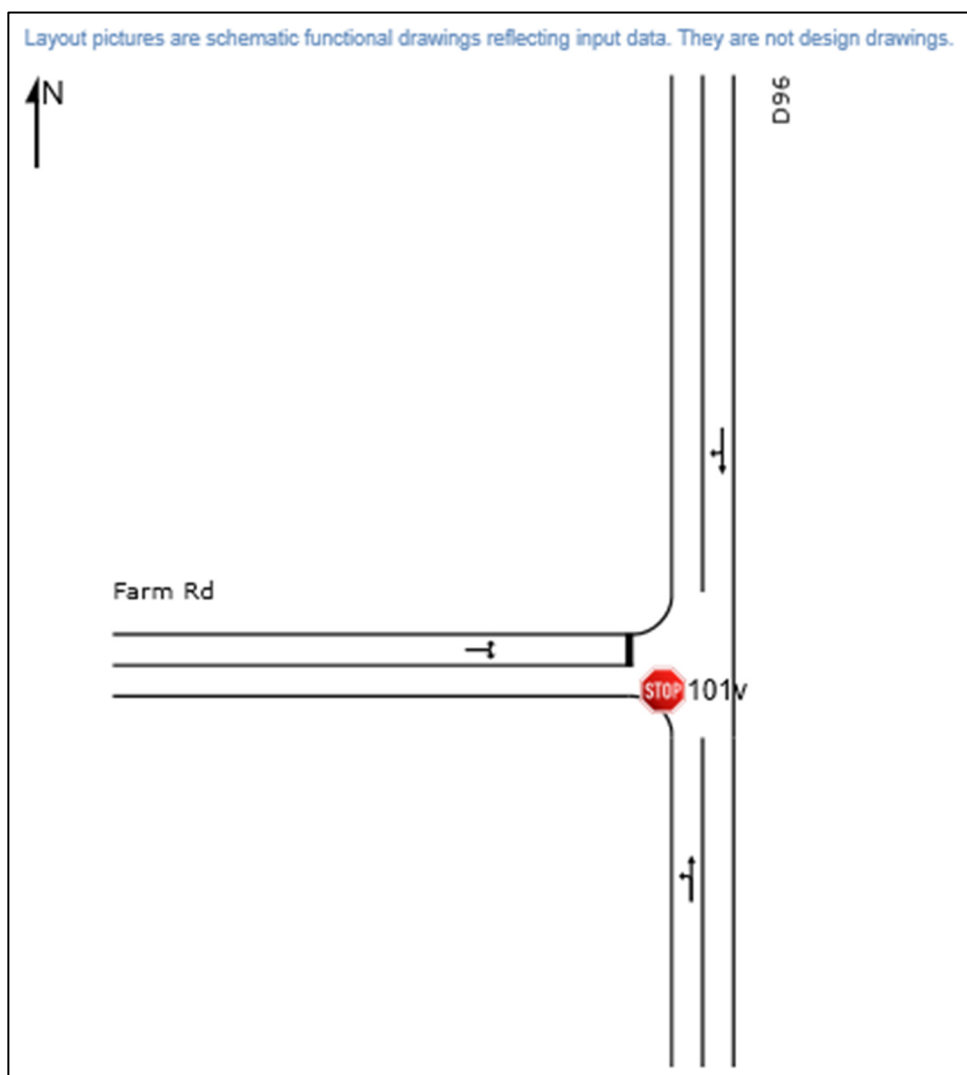


Figure 6-3:D96/Farm road intersection layout

The overall intersection performs adequately at LOS A across all analysed scenarios. The west approach experiences the highest delays however the approach performs adequately at LOS C. The development has a negligible impact at this intersection, with no change in LOS observed at any of the approaches across all analysis periods. No intersection improvements are deemed necessary.

6.2.3 Proposed impact mitigation measures - Operational Phase

The following mitigation measures are proposed to potentially reduce the impact during the Operational Phase:

- stagger the transportation of coal off-site.
- stockpile coal on site to allow for haulage during off peak periods.
- use of a conveyor belt system to transport coal off-site.
- staff and general trips should occur outside of peak traffic periods where possible.
- appropriate maintenance of internal roads.
- schedule abnormal loads to outside peak traffic periods.
- implement dust suppression.

6.3 Potential Impact - Decommissioning Phase

The decommissioning phase will result in the same impact as the Construction Phase as similar trips are expected. The potential traffic impact will be of medium significance before mitigation measures during the construction and decommissioning phases. However, considering that this is temporary and short term in nature, the impact can be mitigated to an acceptable level of low significance.

6.4 Cumulative Impacts

There are no known approved developments in the vicinity of the site to be considered as part of the cumulative impacts.

6.5 No-Go Alternative

The no-go alternative implies that the proposed development does not proceed. This would mean that **there will be no negative environmental impacts and no traffic impact on the surrounding network.** However, this would also mean that there would be no socio-economic benefits to the surrounding communities. Hence, the no-go alternative is not a preferred alternative.

7 IMPACT ASSESSMENT SUMMARY

7.1 Impact Assessment Summary

The assessment of impacts and recommendation of mitigation measures as discussed in Chapter 6 are collated in the tables below. The assessment methodology is attached as **Annexure H**.

Table 7-1: Impact assessment table (Construction OR Decommissioning phase)

No	Activity	Aspect	Impact / Risks	Significance	Nature of Impact	Probability		Sensitivity of the Aspect		Severity of the Impact		Duration		Scale / Extent		Significance (without Mitigation)	
1	Traffic generated during construction		Traffic congestion	Moderate without mitigation and low with mitigation measures	Negative	4	Highly Probable	3	Sensitive	3	Moderate	1	Short Term	3	Local	40	Moderate

Mitigation (can the impact be reversed, avoided, managed or mitigated?)		Probability		Sensitivity of the Aspect		Severity of the Impact		Duration		Scale / Extent		Significance (with Mitigation)		Time periods for implementation of Mitigation	Monitoring Method (Implementation & Compliance)	Monitoring Frequency	Person(s) Responsible for Monitoring
<u>Mitigation measures</u> - Stagger coal delivery trips - Stockpile coal on site to allow for haulage during off peak periods. - The use of mobile batch plants and quarries in close proximity to the site would decrease the impact on the surrounding road network. - Staff and general trips should occur outside of peak traffic periods - Appropriate design and maintenance of internal roads. - Schedule abnormal loads to outside peak traffic periods. - Reuse of existing infrastructure to limit construction extents. - Implement dust suppression		4	Highly Probable	2	Somewhat sensitive	2	Slight to Moderate	1	Short Term	3	Local	32	Low	Full construction period	- Regular monitoring of road surface quality and air quality. - Apply for required permits prior to commencement of construction.	Before construction commences and regularly during construction phase.	EPC and/or Contractor

Table 7-2: Impact assessment table (Operational phase)

No	Activity	Aspect	Impact / Risks	Significance	Nature of Impact	Probability		Sensitivity of the Aspect		Severity of the Impact		Duration		Scale / Extent		Significance (without Mitigation)	
2	Traffic generated during operational stage		Traffic congestion	Moderate with and without mitigation measures	Negative	4	Highly Probable	3	Sensitive	3	Moderate	4	Long Term	3	Local	52	Moderate

Mitigation (can the impact be reversed, avoided, managed, or mitigated?)		Probability		Sensitivity of the Aspect		Severity of the Impact		Duration		Scale / Extent		Significance (with Mitigation)		Time periods for implementation of Mitigation	Monitoring Method (Implementation & Compliance)	Monitoring Frequency	Person(s) Responsible for Monitoring
<u>Mitigation measures</u> - Stagger coal delivery trips - Stockpile coal on site to allow for haulage during off peak periods. - Staff and general trips should occur outside of peak traffic periods - Appropriate maintenance of internal roads. - Schedule abnormal loads to outside peak traffic periods. - Implement dust suppression		4	Highly Probable	2	Somewhat sensitive	2	Slight to Moderate	4	Long Term	3	Local	44	Moderate	Full operational period	Regular monitoring of road surface quality and air quality.	Regularly during operational phase.	Client/Facility Manager

8 CONCLUSION AND RECOMMENDATION

8.1 Public transport access

There are limited public transport facilities and infrastructure in the vicinity of the site. The only available public transport routes near the site are the R34 and the P39-1 which accommodate minibus taxi routes.

Based on the Newcastle Municipality IDP 2022/23-2026/27, there are plans to introduce a fast train service between Johannesburg and Durban which will pass through Newcastle.

8.2 Non-motorised transport (NMT) facilities

There are no NMT facilities accommodated on the routes in the vicinity of the site.

8.3 Parking provision

There is no available planning by-law that prescribes parking rates within the Newcastle Local Municipality. Based on the estimated vehicle trips generated by the site, it is proposed to accommodate 38 passenger vehicle parking bays, and a drop and go facility that can accommodate 1 bus and 1 taxi.

All parking bays are recommended to be in line with the TMH 16 Volume 2 South African Traffic Impact and Site Impact Assessment Standards and Requirements Manual (February 2014). It is also recommended that the designers ensure that the required movements of the design vehicle can be accommodated in the proposed parking layout.

The drop off facility is recommended to be located within a walking distance to the proposed development (i.e., maximum walking distance of between 100m and 200m). Provision should also be made for fast and convenient vehicular access to the drop-off facilities. Picking up may require the provision of some short-term parking facilities.

8.4 Site access

The site is proposed to accommodate two access points.

- Access 01 is located at an existing farm access point to the north of the D96. The access is located off an existing access point thus access spacing limitations are not envisaged.

It is however recommended that the detailed design of the access take sight distance requirements into consideration as per TRH17 design guidelines.

- Access 02 is located off an existing access road. The access is located in a manner at which TRH26 access spacing guidelines are met (i.e., 450-600m minimum spacing along Class R5 roads) and there are no sight distance limitations envisaged at the access point.

In general, access points should allow for sight distances as prescribed by appropriate road design guidelines for the design speed (i.e., TRH17 Geometric Design of Rural Roads). To maintain sight lines, sight triangles should be kept clear of obstructions, including street furniture and landscaping elements. However, objects less than 0.6m in height, such as street signs, may be placed in the triangle.

It is recommended that appropriate signage and markings be accommodated in accordance with the South African Road Traffic Signs Manual (SARTSM).

A minimum queue length of 28.1m is recommended at the access points. This distance is measured between the access stop line/access control device and the edge of the road edge of the crossing road.

Proposed Access 01 and Proposed Access 02 are both viable from a traffic engineering perspective provided that the access recommendations made in this study are adhered to.

Proposed access 02 is much more favourable than access 01 because Access 02 accommodates an entry road that would assist in limiting the traffic impact on the surrounding road network and properties. It must however be noted that it is advisable for the site to maintain two access points to allow for emergency access and evacuation.

It must also be stressed that the client consideration to explore the accommodation of a conveyor to transport coal product off-site is strongly encouraged from as this will reduce coal delivery trips.

Emergency vehicles will need to be able to enter and circulate through the proposed development site. The site should be capable of accommodating the largest emergency vehicle which is required to cater for the risk of the premises.

In terms of emergency vehicle access, the D96 accommodates a culvert and bridge. This infrastructure will need to be assessed for its suitability to accommodate the largest emergency vehicle which is required to cater for the risk of the premises.

8.5 Internal roads

The internal roads should be designed to accommodate the expected design vehicles on site.

8.6 Intersection Capacity

- a) The Allen Street/R34 intersection performs adequately at LOS B during the AM peak and LOS A during the PM peak across all analysed scenarios with the exception of the 2030 PM peak “with development traffic” scenario. During the 2030 PM peak “with development traffic” scenario, the intersection performs adequately at LOS B. None of the approaches perform below LOS B. The proposed development has a negligible impact at this intersection and no intersection improvements are deemed necessary.
- b) The R34/D96 overall intersection performs well at LOS A across all analysed scenarios. The worst intersection approach performance is at LOS C which occurs during the “with development traffic” scenarios along the south approach. LOS C is still however an acceptable LOS. The intersection performs at an acceptable LOS thus no intersection improvements are recommended.
- c) The D96/Farm road intersection performs well at LOS A across all analysed scenarios. No change in LOS was observed at any of the approaches across all analysed years thus the proposed development has a negligible impact on the intersection capacity. No intersection improvements are deemed necessary.

Although the analysed intersections have been assessed to have the capacity to accommodate the development trips it would be ideal to conduct further investigations to determine if the road infrastructure (i.e., road pavement structure, bridges, culverts) along the sections of the R34 and D96 impacted by the development, can accommodate the expected increase in traffic.

It is also recommended that road safety investigations and studies be considered to limit risks for road users in the impacted area. These studies will take into consideration terrain limitations, geometric limitations, road surface conditions etc and their impact on road safety, highlighting aspects that need improvement to reduce road safety risks.

8.7 Environmental considerations

8.7.1 Potential impacts

The impact on the surrounding environment related to an increase in traffic includes:

- traffic congestion and delays on the surrounding road network
- associated noise and dust pollution,
- road pavement deterioration, and
- potential road safety impacts.

These impacts are applicable for the construction, operational and decommissioning phase.

In general, it must be noted that Traffic Impact Studies are suitable for assessing impacts in terms of traffic congestion and delays. Secondary impacts resulting from traffic congestion (i.e., noise, dust, pavement deterioration, road safety impacts etc.) fall outside the scope of a TIA thus detailed assessments of these aspects would require additional specialist studies to address these topics appropriately.

An assessment of the traffic congestion and delays was conducted to determine the significance of the impact on the surrounding road network. The significance of the noise and dust pollution will be addressed by the relevant specialist studies (i.e., air quality and noise specialist studies).

The pavement and road safety aspects would also need to be addressed as part of separate specialist studies.

With regard to the impact of traffic congestion and traffic delays:

- For the construction phase, the significance of the impacts is expected to be moderate without mitigation measures and low with the implementation of mitigation measures.
- For the operational phase, the significance of the impact is expected to be moderate with and without mitigation. It must however be noted that with mitigation the significance is slightly reduced.
- The decommissioning phase is expected to have similar impacts to the construction phase.

8.7.2 Possible impact mitigation measures

The potential mitigation measures mentioned in the construction and decommissioning phases are as follows:

- the delivery of materials in and out of the site must be staggered and trips must be scheduled to occur outside of peak traffic periods.
- dust suppression of gravel roads during the construction and decommissioning phases, as required.
- regular maintenance of gravel roads by the contractor during the construction and decommissioning phases.
- the use of mobile batching plants and quarries on or in close proximity to the site would decrease the impact on the surrounding road network.
- staff and general trips should occur outside of peak traffic periods as far as possible.
- any low hanging overhead obstructions (e.g. eskom and telkom lines, etc.) along the proposed routes will have to be moved to accommodate the abnormal load vehicles.
- the preferred route should be surveyed to identify problem areas e.g. intersections with limited turning radii and sections of the road with sharp horizontal curves or steep gradients, that may require modification. it needs to be ensured that the gravel sections of the haulage routes remain in good condition and will need to be maintained during the additional loading of the construction phase and reinstated after construction is completed.
- design and maintenance of internal roads: the internal gravel roads will require grading with a road grader to obtain a flat even surface and the geometric design of these gravel roads needs to be confirmed at detailed design stage. this process is to be undertaken by a civil engineering consultant or a geometric design professional. the road designer should take cognizance that roads need to be designed with smooth, relatively flat gradients to allow an abnormal load vehicle to ascend to the top of a hill.
- stockpile materials to allow for staggered haulage and delivery.

The potential mitigation measures mentioned in the operational phase are as follows:

- stagger the transportation of coal off-site.
- stockpile coal on site to allow for haulage during off peak periods.
- use of a conveyor belt system to transport coal off-site.
- staff and general trips should occur outside of peak traffic periods.
- appropriate maintenance of internal roads.
- schedule abnormal loads to outside peak traffic periods.
- implement dust suppression.

9 FINAL SPECIALIST STATEMENT

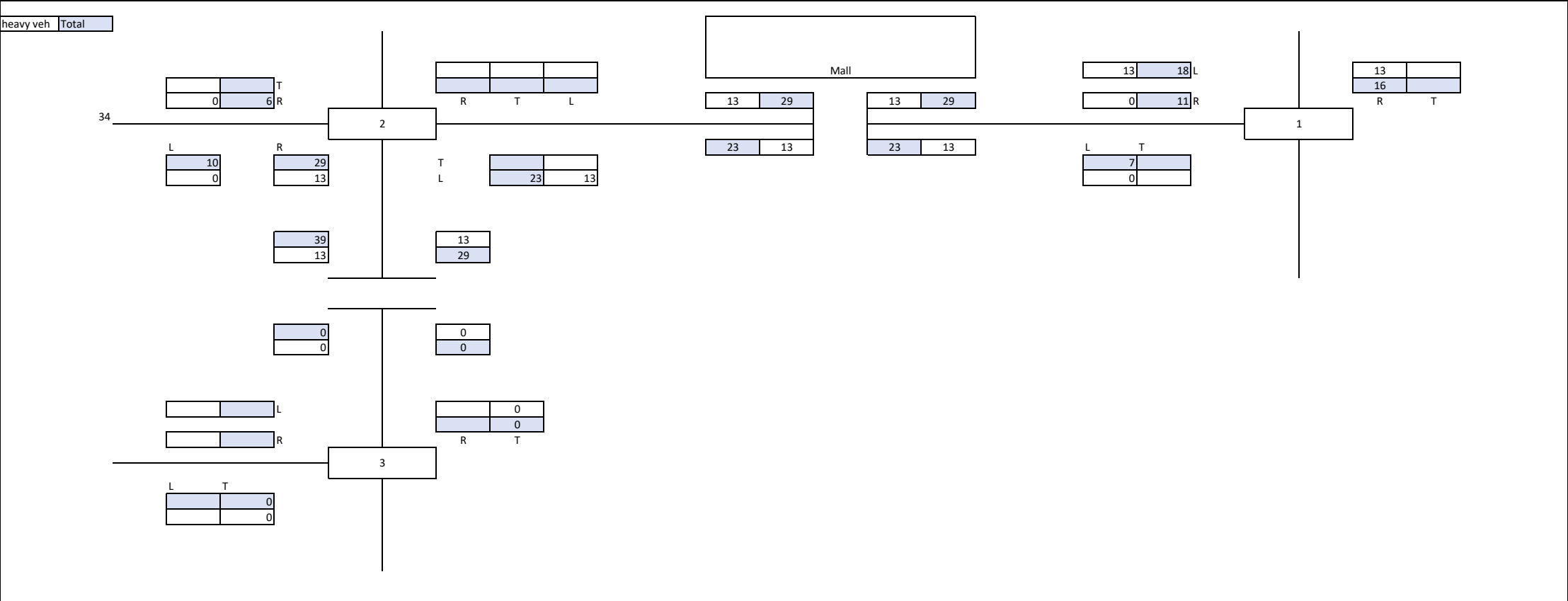
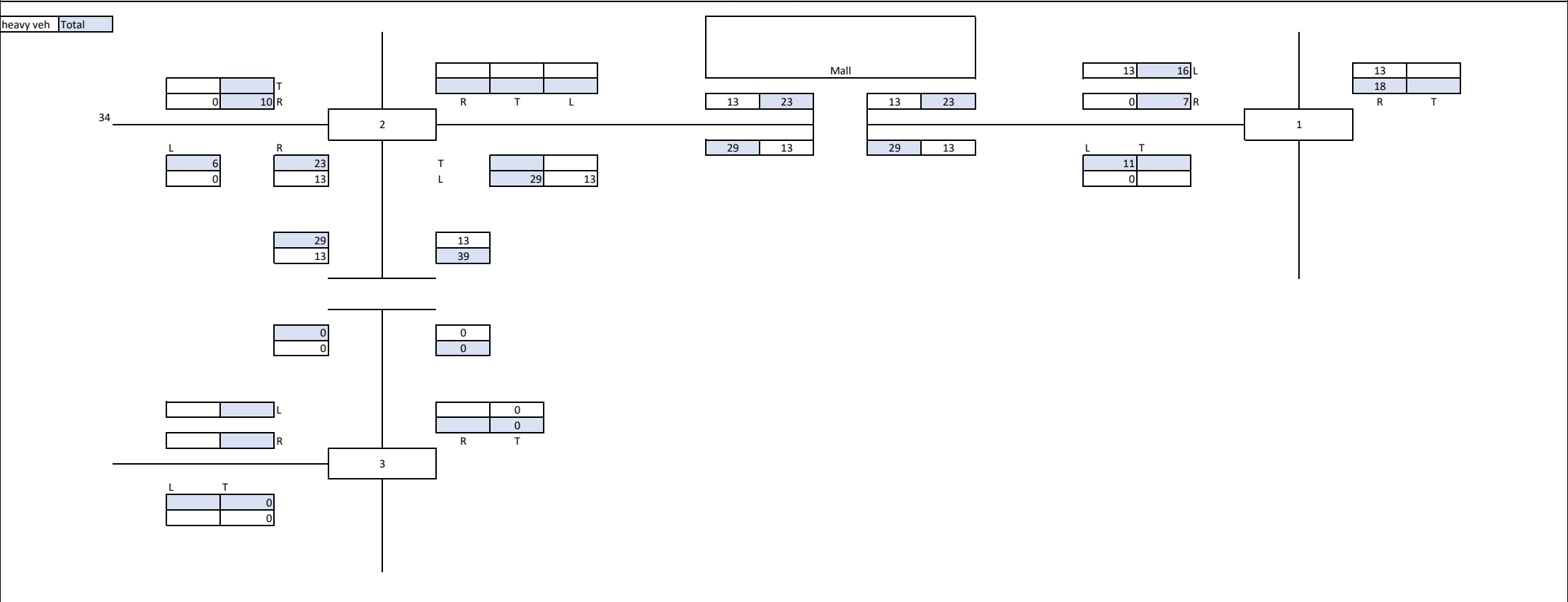
The proposed development is supported from a transport perspective provided that the recommendations and mitigations contained in this report are adhered to.

10 REFERENCES

- South African Reserve Bank. (2023, May 25). *Statement of the Monetary Policy Committee May 2023*. Retrieved June 12, 2023, from South African Reserve Bank:
<https://www.resbank.co.za/content/dam/sarb/publications/statements/monetary-policy-statements/2023/may/Statement%20of%20the%20Monetary%20Policy%20Committee%20May%202023%20.pdf>
- The World Bank. (n.d.). *GDP growth (annual %) - South Africa*. Retrieved June 12, 2023, from World Bank Open Data:
<https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?end=2021&locations=ZA&start=2014>

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Annexure A: Development Traffic Distribution



Annexure B: Existing Traffic



Annexure C: 2025 Traffic Without Development

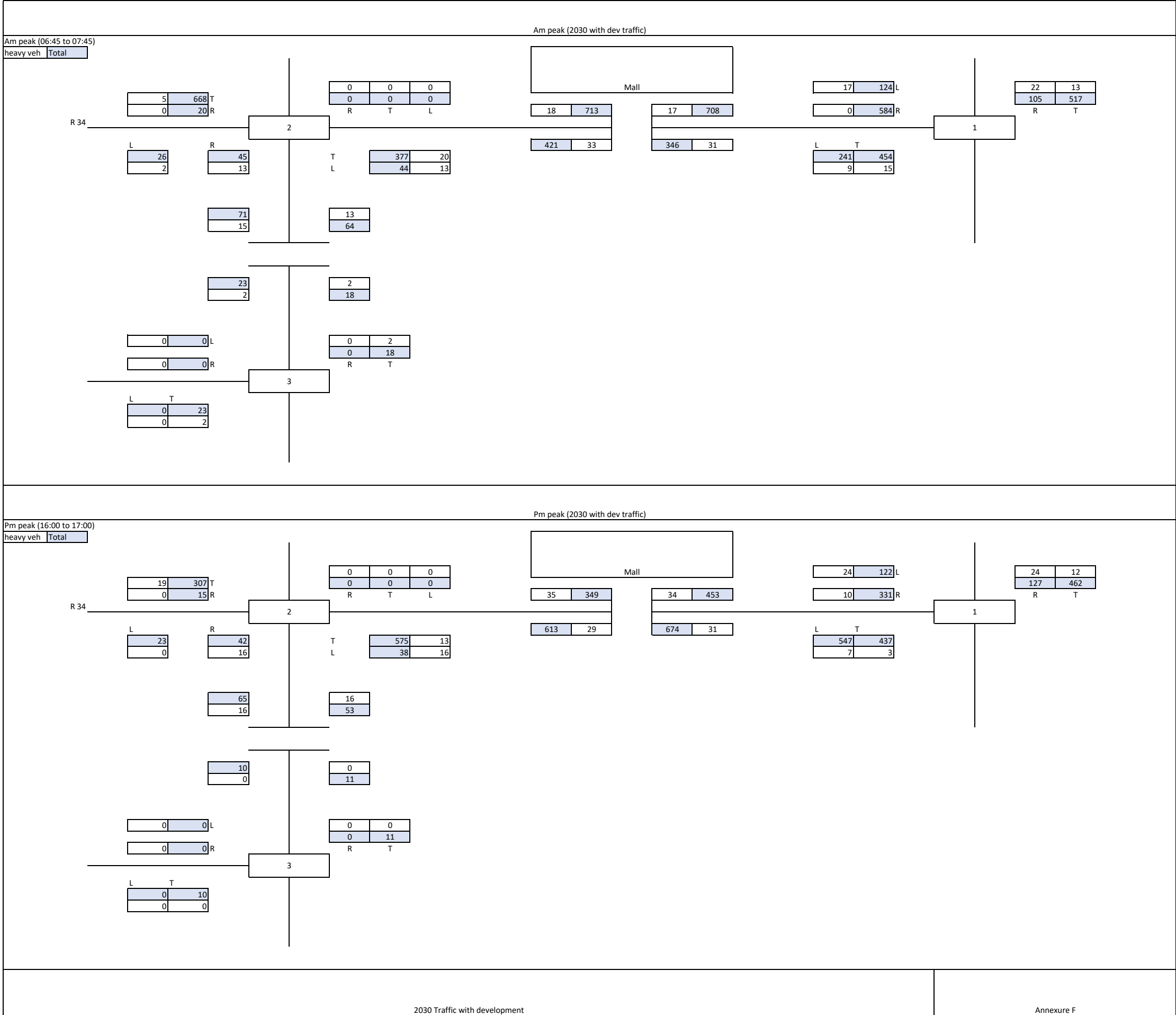


Annexure D: 2030 Traffic Without Development

Annexure E: 2025 Traffic With Development



Annexure F: 2030 Traffic With Development



Annexure G: Intersection Assessment Results (SIDRA)

SITE LAYOUT

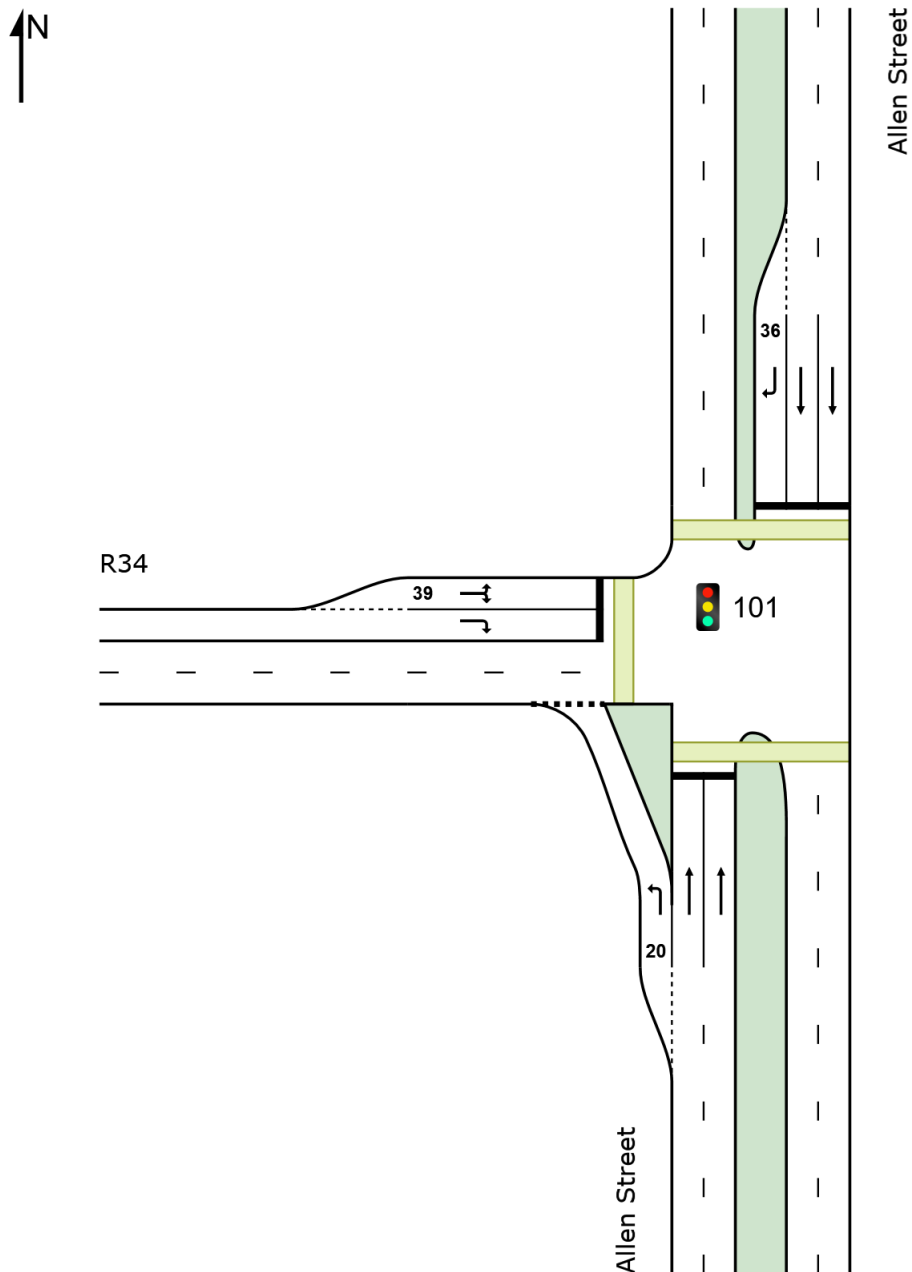
 **Site: 101 [Allen Street / R34 -site (Site Folder: General)]**

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

 **Site: 101 [Allen Street / R34 - 2023 Am peak- no dev (Site Folder: General)]**

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
						v/c	sec							km/h
South: Allen Street														
1	L2	200	7	200	3.5	0.165	6.9	LOS A	0.7	5.0	0.43	0.66	0.43	50.7
2	T1	395	13	395	3.3	0.388	10.4	LOS B	2.5	18.3	0.86	0.70	0.86	47.4
Approach		595	20	595	3.4	0.388	9.2	LOS A	2.5	18.3	0.72	0.68	0.72	48.6
North: Allen Street														
8	T1	450	11	450	2.4	* 0.440	10.6	LOS B	2.9	21.0	0.87	0.71	0.87	47.2
9	R2	75	7	75	9.3	0.229	17.1	LOS B	1.0	7.6	0.87	0.74	0.87	30.1
Approach		525	18	525	3.4	0.440	11.5	LOS B	2.9	21.0	0.87	0.72	0.87	45.1
West: R34														
10	L2	94	3	94	3.2	0.403	12.9	LOS B	3.3	23.1	0.76	0.77	0.76	19.5
12	R2	502	0	502	0.0	* 0.403	12.9	LOS B	3.3	23.1	0.76	0.77	0.76	46.4
Approach		596	3	596	0.5	0.403	12.9	LOS B	3.3	23.1	0.76	0.77	0.76	42.1
All Vehicles		1716	41	1716	2.4	0.440	11.2	LOS B	3.3	23.1	0.78	0.72	0.78	45.1

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.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

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

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Allen Street												
P1	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	179.2	220.5	1.23
North: Allen Street												
P3	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	179.2	220.5	1.23
West: R34												
P4	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	175.2	215.2	1.23
All Pedestrians		150	150	9.6	LOS A	0.0	0.0	0.80	0.80	177.9	218.7	1.23

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 **Site: 101 [Allen Street / R34 - 2023 Pm peak - no dev (Site Folder: General)]**

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Allen Street														
1	L2	470	6	470	1.3	0.397	7.2	LOS A	2.0	13.9	0.52	0.70	0.52	50.6
2	T1	380	2	380	0.5	0.293	8.4	LOS A	2.2	15.3	0.78	0.63	0.78	49.3
Approach		850	8	850	0.9	0.397	7.7	LOS A	2.2	15.3	0.64	0.67	0.64	50.1
North: Allen Street														
8	T1	402	10	402	2.5	* 0.314	8.5	LOS A	2.3	16.6	0.78	0.64	0.78	49.3
9	R2	96	9	96	9.4	0.240	15.3	LOS B	1.2	9.0	0.82	0.74	0.82	31.5
Approach		498	19	498	3.8	0.314	9.8	LOS A	2.3	16.6	0.79	0.66	0.79	46.4
West: R34														
10	L2	90	9	90	10.0	0.307	14.1	LOS B	2.1	15.5	0.78	0.76	0.78	23.3
12	R2	278	8	278	2.9	* 0.307	14.1	LOS B	2.1	15.4	0.78	0.76	0.78	45.4
Approach		368	17	368	4.6	0.307	14.1	LOS B	2.1	15.5	0.78	0.76	0.78	40.8
All Vehicles		1716	44	1716	2.6	0.397	9.7	LOS A	2.3	16.6	0.71	0.68	0.71	46.8

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.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

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

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Allen Street												
P1	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	179.2	220.5	1.23
North: Allen Street												
P3	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	179.2	220.5	1.23
West: R34												
P4	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	175.2	215.2	1.23
All Pedestrians		150	150	9.6	LOS A	0.0	0.0	0.80	0.80	177.9	218.7	1.23

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 **Site: 101 [Allen Street / R34 - 2025 Am peak - no dev (Site Folder: General)]**

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Allen Street														
1	L2	209	8	209	3.8	0.173	7.0	LOS A	0.7	5.3	0.43	0.66	0.43	50.7
2	T1	411	14	411	3.4	0.404	10.4	LOS B	2.7	19.1	0.86	0.70	0.86	47.3
Approach		620	22	620	3.5	0.404	9.3	LOS A	2.7	19.1	0.72	0.69	0.72	48.6
North: Allen Street														
8	T1	469	12	469	2.6	* 0.458	10.6	LOS B	3.1	22.1	0.88	0.72	0.88	47.1
9	R2	79	8	79	10.1	0.246	17.1	LOS B	1.1	8.1	0.88	0.74	0.88	29.9
Approach		548	20	548	3.6	0.458	11.6	LOS B	3.1	22.1	0.88	0.72	0.88	45.0
West: R34														
10	L2	98	4	98	4.1	0.420	13.0	LOS B	3.4	24.4	0.76	0.77	0.76	19.5
12	R2	523	0	523	0.0	* 0.420	12.9	LOS B	3.5	24.3	0.76	0.77	0.76	46.3
Approach		621	4	621	0.6	0.420	12.9	LOS B	3.5	24.4	0.76	0.77	0.76	42.1
All Vehicles		1789	46	1789	2.6	0.458	11.2	LOS B	3.5	24.4	0.78	0.73	0.78	45.0

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.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

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

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Allen Street												
P1	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	179.2	220.5	1.23
North: Allen Street												
P3	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	179.2	220.5	1.23
West: R34												
P4	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	175.2	215.2	1.23
All Pedestrians		150	150	9.6	LOS A	0.0	0.0	0.80	0.80	177.9	218.7	1.23

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 **Site: 101 [Allen Street / R34 - 2025 Pm peak- no dev (Site Folder: General)]**

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
						v/c	sec							km/h
South: Allen Street														
1	L2	489	7	489	1.4	0.415	7.2	LOS A	2.1	14.8	0.53	0.70	0.53	50.6
2	T1	396	3	396	0.8	0.306	8.4	LOS A	2.3	16.0	0.78	0.63	0.78	49.3
Approach		885	10	885	1.1	0.415	7.8	LOS A	2.3	16.0	0.64	0.67	0.64	50.1
North: Allen Street														
8	T1	419	11	419	2.6	* 0.328	8.5	LOS A	2.4	17.4	0.79	0.64	0.79	49.2
9	R2	100	10	100	10.0	0.255	15.3	LOS B	1.3	9.5	0.82	0.75	0.82	31.3
Approach		519	21	519	4.0	0.328	9.8	LOS A	2.4	17.4	0.79	0.66	0.79	46.3
West: R34														
10	L2	94	10	94	10.6	0.321	14.2	LOS B	2.2	16.3	0.79	0.76	0.79	23.2
12	R2	290	9	290	3.1	* 0.321	14.1	LOS B	2.3	16.2	0.79	0.76	0.79	45.3
Approach		384	19	384	4.9	0.321	14.2	LOS B	2.3	16.3	0.79	0.76	0.79	40.7
All Vehicles		1788	50	1788	2.8	0.415	9.7	LOS A	2.4	17.4	0.72	0.69	0.72	46.8

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.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

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

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Allen Street												
P1	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	179.2	220.5	1.23
North: Allen Street												
P3	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	179.2	220.5	1.23
West: R34												
P4	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	175.2	215.2	1.23
All Pedestrians		150	150	9.6	LOS A	0.0	0.0	0.80	0.80	177.9	218.7	1.23

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 **Site: 101 [Allen Street / R34 -2030 Am peak-no dev (Site Folder: General)]**

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Allen Street														
1	L2	230	9	230	3.9	0.192	7.0	LOS A	0.8	5.9	0.44	0.66	0.44	50.6
2	T1	454	15	454	3.3	0.446	10.6	LOS B	3.0	21.4	0.88	0.71	0.88	47.2
Approach		684	24	684	3.5	0.446	9.4	LOS A	3.0	21.4	0.73	0.70	0.73	48.5
North: Allen Street														
8	T1	517	13	517	2.5	* 0.505	10.8	LOS B	3.5	24.7	0.89	0.73	0.89	47.0
9	R2	87	9	87	10.3	0.281	17.3	LOS B	1.2	9.1	0.88	0.75	0.88	29.8
Approach		604	22	604	3.6	0.505	11.7	LOS B	3.5	24.7	0.89	0.74	0.89	44.9
West: R34														
10	L2	108	4	108	3.7	0.463	13.1	LOS B	3.9	27.4	0.78	0.78	0.78	19.5
12	R2	577	0	577	0.0	* 0.463	13.1	LOS B	3.9	27.4	0.78	0.78	0.78	46.2
Approach		685	4	685	0.6	0.463	13.1	LOS B	3.9	27.4	0.78	0.78	0.78	42.0
All Vehicles		1973	50	1973	2.5	0.505	11.4	LOS B	3.9	27.4	0.80	0.74	0.80	44.9

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.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

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

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Allen Street												
P1	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	179.2	220.5	1.23
North: Allen Street												
P3	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	179.2	220.5	1.23
West: R34												
P4	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	175.2	215.2	1.23
All Pedestrians		150	150	9.6	LOS A	0.0	0.0	0.80	0.80	177.9	218.7	1.23

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 **Site: 101 [Allen Street / R34 -2030 Pm peak- no dev (Site Folder: General)]**

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Allen Street														
1	L2	540	7	540	1.3	0.464	7.3	LOS A	2.4	17.2	0.55	0.71	0.55	50.5
2	T1	437	3	437	0.7	0.338	8.6	LOS A	2.5	17.9	0.79	0.65	0.79	49.2
Approach		977	10	977	1.0	0.464	7.9	LOS A	2.5	17.9	0.66	0.68	0.66	50.0
North: Allen Street														
8	T1	462	12	462	2.6	* 0.361	8.6	LOS A	2.7	19.4	0.80	0.65	0.80	49.1
9	R2	111	11	111	9.9	0.293	15.5	LOS B	1.4	10.7	0.83	0.75	0.83	31.2
Approach		573	23	573	4.0	0.361	10.0	LOS A	2.7	19.4	0.81	0.67	0.81	46.2
West: R34														
10	L2	104	11	104	10.6	0.355	14.3	LOS B	2.5	18.3	0.80	0.77	0.80	23.2
12	R2	320	10	320	3.1	* 0.355	14.3	LOS B	2.5	18.1	0.80	0.77	0.80	45.3
Approach		424	21	424	5.0	0.355	14.3	LOS B	2.5	18.3	0.80	0.77	0.80	40.6
All Vehicles		1974	54	1974	2.7	0.464	9.8	LOS A	2.7	19.4	0.73	0.70	0.73	46.7

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.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

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

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Allen Street												
P1	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	179.2	220.5	1.23
North: Allen Street												
P3	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	179.2	220.5	1.23
West: R34												
P4	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	175.2	215.2	1.23
All Pedestrians		150	150	9.6	LOS A	0.0	0.0	0.80	0.80	177.9	218.7	1.23

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 Site: 101 [Allen Street / R34 -2025 Am + dev (Site Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Allen Street														
1	L2	220	8	220	3.6	0.185	7.0	LOS A	0.8	5.6	0.44	0.66	0.44	50.7
2	T1	411	14	411	3.4	0.404	10.4	LOS B	2.7	19.1	0.86	0.70	0.86	47.3
Approach		631	22	631	3.5	0.404	9.2	LOS A	2.7	19.1	0.72	0.69	0.72	48.6
North: Allen Street														
8	T1	469	12	469	2.6	* 0.458	10.6	LOS B	3.1	22.1	0.88	0.72	0.88	47.1
9	R2	97	21	97	21.6	0.315	17.4	LOS B	1.3	11.1	0.89	0.75	0.89	28.5
Approach		566	33	566	5.8	0.458	11.8	LOS B	3.1	22.1	0.88	0.72	0.88	44.3
West: R34														
10	L2	114	17	114	14.9	0.442	13.2	LOS B	3.6	26.1	0.77	0.78	0.77	19.4
12	R2	530	0	530	0.0	* 0.442	13.0	LOS B	3.7	25.8	0.77	0.78	0.77	46.2
Approach		644	17	644	2.6	0.442	13.1	LOS B	3.7	26.1	0.77	0.78	0.77	41.5
All Vehicles		1841	72	1841	3.9	0.458	11.4	LOS B	3.7	26.1	0.79	0.73	0.79	44.6

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.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

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

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Allen Street												
P1	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	179.2	220.5	1.23
North: Allen Street												
P3	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	179.2	220.5	1.23
West: R34												
P4	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	175.2	215.2	1.23
All Pedestrians		150	150	9.6	LOS A	0.0	0.0	0.80	0.80	177.9	218.7	1.23

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 **Site: 101 [Allen Street / R34 -2025 Pm+dev (Site Folder: General)]**

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Allen Street														
1	L2	496	7	496	1.4	0.429	7.2	LOS A	2.2	15.3	0.54	0.70	0.54	50.6
2	T1	396	3	396	0.8	0.306	8.4	LOS A	2.3	16.0	0.78	0.63	0.78	49.3
Approach		892	10	892	1.1	0.429	7.8	LOS A	2.3	16.0	0.64	0.67	0.64	50.1
North: Allen Street														
8	T1	419	11	419	2.6	* 0.328	8.5	LOS A	2.4	17.4	0.79	0.64	0.79	49.2
9	R2	116	23	116	19.8	0.308	15.5	LOS B	1.5	12.1	0.84	0.76	0.84	30.0
Approach		535	34	535	6.4	0.328	10.0	LOS B	2.4	17.4	0.80	0.67	0.80	45.6
West: R34														
10	L2	112	23	112	20.5	0.352	14.5	LOS B	2.4	18.3	0.80	0.77	0.80	23.1
12	R2	301	9	301	3.0	* 0.352	14.3	LOS B	2.5	18.0	0.80	0.77	0.80	45.3
Approach		413	32	413	7.7	0.352	14.3	LOS B	2.5	18.3	0.80	0.77	0.80	40.1
All Vehicles		1840	76	1840	4.1	0.429	9.9	LOS A	2.5	18.3	0.72	0.69	0.72	46.3

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.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

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

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Allen Street												
P1	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	179.2	220.5	1.23
North: Allen Street												
P3	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	179.2	220.5	1.23
West: R34												
P4	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	175.2	215.2	1.23
All Pedestrians		150	150	9.6	LOS A	0.0	0.0	0.80	0.80	177.9	218.7	1.23

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 **Site: 101 [Allen Street / R34 -2030 Am +dev (Site Folder: General)]**

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Allen Street														
1	L2	241	9	241	3.7	0.205	7.0	LOS A	0.9	6.3	0.44	0.67	0.44	50.6
2	T1	454	15	454	3.3	0.446	10.6	LOS B	3.0	21.4	0.88	0.71	0.88	47.2
Approach		695	24	695	3.5	0.446	9.3	LOS A	3.0	21.4	0.73	0.70	0.73	48.5
North: Allen Street														
8	T1	517	13	517	2.5	* 0.505	10.8	LOS B	3.5	24.7	0.89	0.73	0.89	47.0
9	R2	105	22	105	21.0	0.353	17.5	LOS B	1.5	12.1	0.90	0.76	0.90	28.5
Approach		622	35	622	5.6	0.505	11.9	LOS B	3.5	24.7	0.89	0.74	0.89	44.2
West: R34														
10	L2	124	17	124	13.7	0.485	13.3	LOS B	4.0	29.3	0.79	0.79	0.79	19.3
12	R2	584	0	584	0.0	* 0.485	13.2	LOS B	4.1	29.0	0.79	0.79	0.79	46.1
Approach		708	17	708	2.4	0.485	13.2	LOS B	4.1	29.3	0.79	0.79	0.79	41.4
All Vehicles		2025	76	2025	3.8	0.505	11.5	LOS B	4.1	29.3	0.80	0.74	0.80	44.5

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.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

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

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Allen Street												
P1	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	179.2	220.5	1.23
North: Allen Street												
P3	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	179.2	220.5	1.23
West: R34												
P4	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	175.2	215.2	1.23
All Pedestrians		150	150	9.6	LOS A	0.0	0.0	0.80	0.80	177.9	218.7	1.23

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 **Site: 101 [Allen Street / R34 -2030 Pm+dev (Site Folder: General)]**

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Allen Street														
1	L2	547	7	547	1.3	0.478	7.6	LOS A	2.8	19.8	0.59	0.72	0.59	50.3
2	T1	437	3	437	0.7	0.338	8.6	LOS A	2.5	17.9	0.79	0.65	0.79	49.2
Approach		984	10	984	1.0	0.478	8.0	LOS A	2.8	19.8	0.68	0.69	0.68	49.9
North: Allen Street														
8	T1	462	12	462	2.6	* 0.361	8.6	LOS A	2.7	19.4	0.80	0.65	0.80	49.1
9	R2	127	24	127	18.9	0.348	15.7	LOS B	1.6	13.4	0.85	0.76	0.85	30.0
Approach		589	36	589	6.1	0.361	10.2	LOS B	2.7	19.4	0.81	0.68	0.81	45.5
West: R34														
10	L2	122	24	122	19.7	0.385	14.6	LOS B	2.6	20.3	0.81	0.77	0.81	23.0
12	R2	331	10	331	3.0	* 0.385	14.4	LOS B	2.8	20.0	0.81	0.77	0.81	45.2
Approach		453	34	453	7.5	0.385	14.4	LOS B	2.8	20.3	0.81	0.77	0.81	40.0
All Vehicles		2026	80	2026	3.9	0.478	10.1	LOS B	2.8	20.3	0.75	0.70	0.75	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.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

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

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Allen Street												
P1	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	179.2	220.5	1.23
North: Allen Street												
P3	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	179.2	220.5	1.23
West: R34												
P4	Full	50	50	9.6	LOS A	0.0	0.0	0.80	0.80	175.2	215.2	1.23
All Pedestrians		150	150	9.6	LOS A	0.0	0.0	0.80	0.80	177.9	218.7	1.23

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SITE LAYOUT

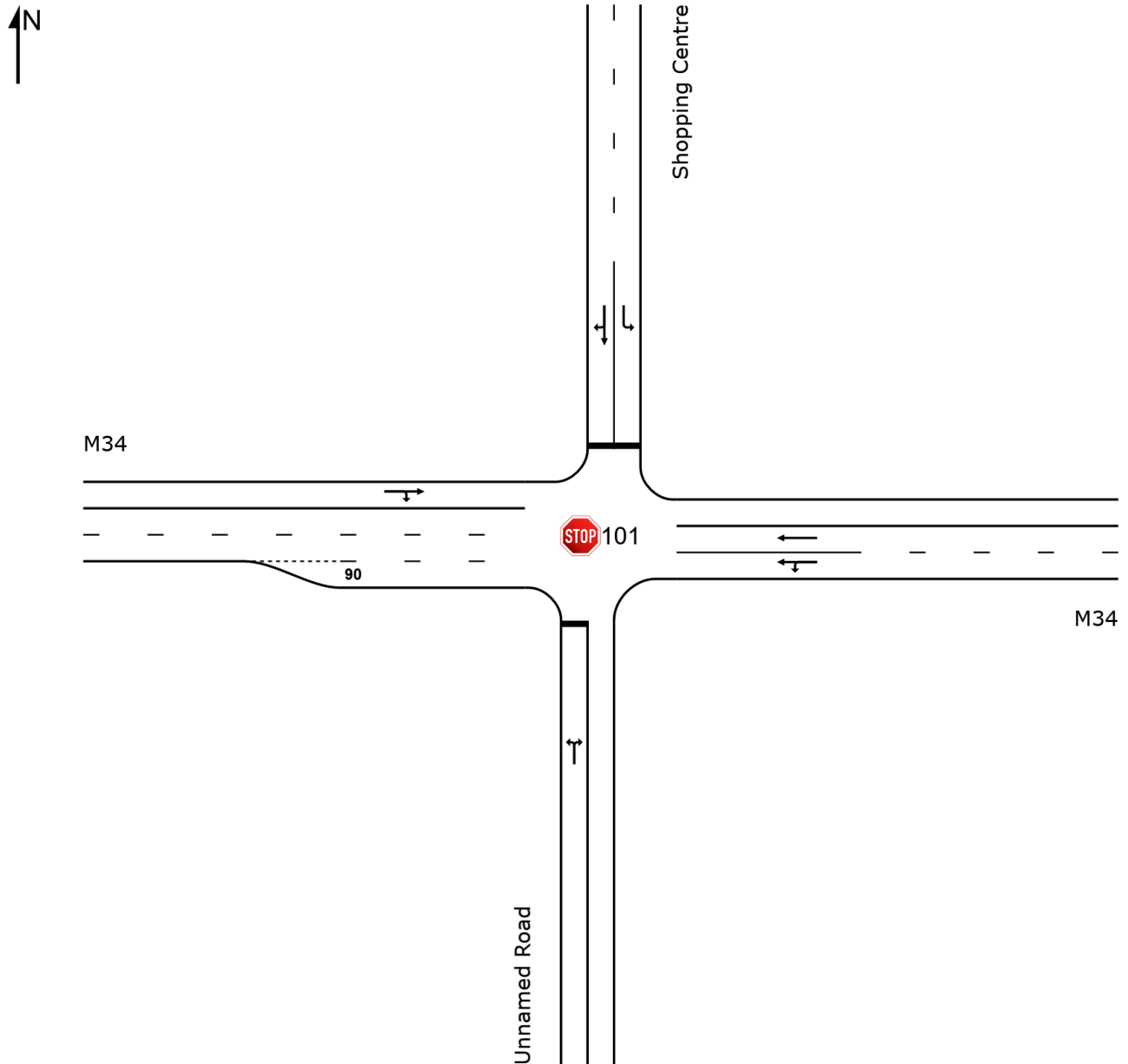
 **Site: 101 [R34/D96 layout (Site Folder: General)]**

New Site

Site Category: (None)

Stop (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Organisation: JG AFRICA (PTY) LTD | Licence: NETWORK / 1PC | Created: 08 May 2023 15:30:14

Project: C:\Users\ramawaa\OneDrive - JG Afrika (Pty) Ltd\One drive work\Desktop\report images\5936 Newcastle\2. R34- D96.sip9

MOVEMENT SUMMARY

 **Site: 101 [2023 Am peak- no dev (Site Folder: General)]**

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: D96														
1	L2	17	1	17	5.9	0.056	9.1	LOS A	0.2	1.6	0.33	0.91	0.33	44.9
3	R2	19	0	19	0.0	0.056	15.6	LOS C	0.2	1.6	0.33	0.91	0.33	46.2
Approach		36	1	36	2.8	0.056	12.5	LOS B	0.2	1.6	0.33	0.91	0.33	45.6
East: R34														
4	L2	13	0	13	0.0	0.058	5.5	LOS A	0.0	0.0	0.00	0.07	0.00	57.0
5	T1	328	17	328	5.2	0.123	0.1	LOS A	0.0	0.0	0.00	0.02	0.00	59.5
Approach		341	17	341	5.0	0.123	0.3	NA	0.0	0.0	0.00	0.02	0.00	59.3
North: Shopping Centre														
7	L2	1	0	1	0.0	0.001	7.8	LOS A	0.0	0.0	0.66	0.68	0.66	39.9
8	T1	1	0	1	0.0	0.005	11.6	LOS B	0.0	0.1	0.70	0.83	0.70	43.6
9	R2	1	0	1	0.0	0.005	11.4	LOS B	0.0	0.1	0.70	0.83	0.70	28.8
Approach		3	0	3	0.0	0.005	10.3	LOS B	0.0	0.1	0.69	0.78	0.69	38.7
West: R34														
11	T1	581	4	581	0.7	0.307	0.1	LOS A	0.1	0.8	0.02	0.01	0.02	59.6
12	R2	8	0	8	0.0	0.307	7.8	LOS A	0.1	0.8	0.02	0.01	0.02	57.5
Approach		589	4	589	0.7	0.307	0.2	NA	0.1	0.8	0.02	0.01	0.02	59.6
All Vehicles		969	22	969	2.3	0.307	0.7	NA	0.2	1.6	0.03	0.05	0.03	58.3

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101 [2023 Pm peak- no dev (Site Folder: General)]**

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: D96														
1	L2	11	0	11	0.0	0.031	9.3	LOS A	0.1	1.0	0.40	0.86	0.40	46.1
3	R2	11	2	11	18.2	0.031	15.2	LOS C	0.1	1.0	0.40	0.86	0.40	44.7
Approach		22	2	22	9.1	0.031	12.3	LOS B	0.1	1.0	0.40	0.86	0.40	45.4
East: R34														
4	L2	13	2	13	15.4	0.086	5.7	LOS A	0.0	0.0	0.00	0.05	0.00	56.3
5	T1	500	11	500	2.2	0.181	0.2	LOS A	0.0	0.0	0.00	0.01	0.00	59.6
Approach		513	13	513	2.5	0.181	0.4	NA	0.0	0.0	0.00	0.01	0.00	59.5
North: Shopping Centre														
7	L2	1	0	1	0.0	0.001	5.7	LOS A	0.0	0.0	0.46	0.70	0.46	42.9
8	T1	1	0	1	0.0	0.004	9.5	LOS A	0.0	0.1	0.62	0.81	0.62	45.8
9	R2	1	0	1	0.0	0.004	9.1	LOS A	0.0	0.1	0.62	0.81	0.62	31.4
Approach		3	0	3	0.0	0.004	8.1	LOS A	0.0	0.1	0.57	0.77	0.57	41.3
West: R34														
11	T1	267	16	267	6.0	0.151	0.1	LOS A	0.1	0.7	0.04	0.02	0.04	59.1
12	R2	7	0	7	0.0	0.151	8.6	LOS A	0.1	0.7	0.04	0.02	0.04	57.2
Approach		274	16	274	5.8	0.151	0.4	NA	0.1	0.7	0.04	0.02	0.04	59.1
All Vehicles		812	31	812	3.8	0.181	0.7	NA	0.1	1.0	0.03	0.04	0.03	58.5

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.
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101 [2025 Am peak-no dev (Site Folder: General)]**

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: D96														
1	L2	18	2	18	11.1	0.062	9.4	LOS A	0.3	1.8	0.34	0.91	0.34	44.2
3	R2	20	0	20	0.0	0.062	16.3	LOS C	0.3	1.8	0.34	0.91	0.34	45.9
Approach		38	2	38	5.3	0.062	13.0	LOS B	0.3	1.8	0.34	0.91	0.34	45.1
East: R34														
4	L2	14	0	14	0.0	0.061	5.5	LOS A	0.0	0.0	0.00	0.07	0.00	56.9
5	T1	342	18	342	5.3	0.128	0.1	LOS A	0.0	0.0	0.00	0.02	0.00	59.5
Approach		356	18	356	5.1	0.128	0.4	NA	0.0	0.0	0.00	0.02	0.00	59.3
North: Shopping Centre														
7	L2	1	0	1	0.0	0.001	8.1	LOS A	0.0	0.0	0.67	0.68	0.67	39.5
8	T1	1	0	1	0.0	0.005	12.2	LOS B	0.0	0.1	0.72	0.84	0.72	43.0
9	R2	1	0	1	0.0	0.005	12.1	LOS B	0.0	0.1	0.72	0.84	0.72	28.1
Approach		3	0	3	0.0	0.005	10.8	LOS B	0.0	0.1	0.70	0.79	0.70	38.1
West: R34														
11	T1	605	5	605	0.8	0.321	0.1	LOS A	0.1	0.9	0.02	0.01	0.02	59.6
12	R2	9	0	9	0.0	0.321	8.0	LOS A	0.1	0.9	0.02	0.01	0.02	57.5
Approach		614	5	614	0.8	0.321	0.2	NA	0.1	0.9	0.02	0.01	0.02	59.5
All Vehicles		1011	25	1011	2.5	0.321	0.8	NA	0.3	1.8	0.03	0.05	0.03	58.2

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101 [2025 Pm peak_no dev (Site Folder: General)]**

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: D96														
1	L2	12	0	12	0.0	0.037	9.4	LOS A	0.2	1.2	0.42	0.86	0.42	45.6
3	R2	12	3	12	25.0	0.037	16.6	LOS C	0.2	1.2	0.42	0.86	0.42	43.6
Approach		24	3	24	12.5	0.037	13.0	LOS B	0.2	1.2	0.42	0.86	0.42	44.5
East: R34														
4	L2	14	3	14	21.4	0.090	5.8	LOS A	0.0	0.0	0.00	0.05	0.00	55.9
5	T1	521	12	521	2.3	0.190	0.2	LOS A	0.0	0.0	0.00	0.01	0.00	59.7
Approach		535	15	535	2.8	0.190	0.4	NA	0.0	0.0	0.00	0.02	0.00	59.5
North: Shopping Centre														
7	L2	1	0	1	0.0	0.001	5.8	LOS A	0.0	0.0	0.47	0.70	0.47	42.8
8	T1	1	0	1	0.0	0.004	9.9	LOS A	0.0	0.1	0.63	0.81	0.63	45.4
9	R2	1	0	1	0.0	0.004	9.5	LOS A	0.0	0.1	0.63	0.81	0.63	30.9
Approach		3	0	3	0.0	0.004	8.4	LOS A	0.0	0.1	0.58	0.78	0.58	40.9
West: R34														
11	T1	278	17	278	6.1	0.158	0.2	LOS A	0.1	0.9	0.05	0.02	0.05	59.0
12	R2	8	0	8	0.0	0.158	8.8	LOS A	0.1	0.9	0.05	0.02	0.05	57.1
Approach		286	17	286	5.9	0.158	0.4	NA	0.1	0.9	0.05	0.02	0.05	58.9
All Vehicles		848	35	848	4.1	0.190	0.8	NA	0.2	1.2	0.03	0.04	0.03	58.3

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101 [2030 Am peak -no dev (Site Folder: General)]**

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: D96														
1	L2	20	2	20	10.0	0.080	9.4	LOS A	0.3	2.2	0.38	0.90	0.38	43.5
3	R2	22	0	22	0.0	0.080	18.4	LOS C	0.3	2.2	0.38	0.90	0.38	45.1
Approach		42	2	42	4.8	0.080	14.1	LOS B	0.3	2.2	0.38	0.90	0.38	44.4
East: R34														
4	L2	15	0	15	0.0	0.067	5.5	LOS A	0.0	0.0	0.00	0.07	0.00	57.0
5	T1	377	20	377	5.3	0.141	0.2	LOS A	0.0	0.0	0.00	0.02	0.00	59.5
Approach		392	20	392	5.1	0.141	0.4	NA	0.0	0.0	0.00	0.02	0.00	59.3
North: Shopping Centre														
7	L2	1	0	1	0.0	0.001	8.8	LOS A	0.0	0.0	0.70	0.69	0.70	38.5
8	T1	1	0	1	0.0	0.006	14.0	LOS B	0.0	0.1	0.77	0.86	0.77	41.4
9	R2	1	0	1	0.0	0.006	14.1	LOS B	0.0	0.1	0.77	0.86	0.77	26.3
Approach		3	0	3	0.0	0.006	12.3	LOS B	0.0	0.1	0.74	0.81	0.74	36.5
West: R34														
11	T1	668	5	668	0.7	0.355	0.1	LOS A	0.2	1.2	0.02	0.01	0.03	59.5
12	R2	10	0	10	0.0	0.355	8.4	LOS A	0.2	1.2	0.02	0.01	0.03	57.4
Approach		678	5	678	0.7	0.355	0.2	NA	0.2	1.2	0.02	0.01	0.03	59.5
All Vehicles		1115	27	1115	2.4	0.355	0.8	NA	0.3	2.2	0.03	0.05	0.03	58.1

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101 [2030 Pm peak- no dev (Site Folder: General)]**

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: D96														
1	L2	13	0	13	0.0	0.045	9.6	LOS A	0.2	1.4	0.46	0.87	0.46	45.0
3	R2	13	3	13	23.1	0.045	18.0	LOS C	0.2	1.4	0.46	0.87	0.46	43.4
Approach		26	3	26	11.5	0.045	13.8	LOS B	0.2	1.4	0.46	0.87	0.46	44.1
East: R34														
4	L2	15	3	15	20.0	0.099	5.8	LOS A	0.0	0.0	0.00	0.05	0.00	56.0
5	T1	575	13	575	2.3	0.209	0.3	LOS A	0.0	0.0	0.00	0.01	0.00	59.6
Approach		590	16	590	2.7	0.209	0.4	NA	0.0	0.0	0.00	0.01	0.00	59.5
North: Shopping Centre														
7	L2	1	0	1	0.0	0.001	5.9	LOS A	0.0	0.0	0.50	0.69	0.50	42.6
8	T1	1	0	1	0.0	0.004	10.9	LOS B	0.0	0.1	0.67	0.82	0.67	44.4
9	R2	1	0	1	0.0	0.004	10.6	LOS B	0.0	0.1	0.67	0.82	0.67	29.7
Approach		3	0	3	0.0	0.004	9.1	LOS A	0.0	0.1	0.62	0.78	0.62	40.0
West: R34														
11	T1	307	19	307	6.2	0.176	0.2	LOS A	0.1	1.1	0.05	0.02	0.05	58.9
12	R2	9	0	9	0.0	0.176	9.4	LOS A	0.1	1.1	0.05	0.02	0.05	57.1
Approach		316	19	316	6.0	0.176	0.5	NA	0.1	1.1	0.05	0.02	0.05	58.8
All Vehicles		935	38	935	4.1	0.209	0.8	NA	0.2	1.4	0.03	0.04	0.03	58.2

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101 [2025 Am peak - with dev (Site Folder: General)]**

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: D96														
1	L2	24	2	24	8.3	0.180	9.2	LOS A	0.7	5.6	0.39	0.92	0.39	41.2
3	R2	43	13	43	30.2	0.180	23.1	LOS C	0.7	5.6	0.39	0.92	0.39	39.9
Approach		67	15	67	22.4	0.180	18.1	LOS C	0.7	5.6	0.39	0.92	0.39	40.3
East: R34														
4	L2	43	13	43	30.2	0.068	5.9	LOS A	0.0	0.0	0.00	0.21	0.00	54.0
5	T1	342	18	342	5.3	0.142	0.1	LOS A	0.0	0.0	0.00	0.05	0.00	59.1
Approach		385	31	385	8.1	0.142	0.8	NA	0.0	0.0	0.00	0.07	0.00	58.1
North: Shopping Centre														
7	L2	1	0	1	0.0	0.001	8.1	LOS A	0.0	0.0	0.67	0.68	0.67	39.5
8	T1	1	0	1	0.0	0.005	12.9	LOS B	0.0	0.1	0.74	0.85	0.74	42.6
9	R2	1	0	1	0.0	0.005	12.4	LOS B	0.0	0.1	0.74	0.85	0.74	27.6
Approach		3	0	3	0.0	0.005	11.1	LOS B	0.0	0.1	0.71	0.79	0.71	37.7
West: R34														
11	T1	605	5	605	0.8	0.332	0.2	LOS A	0.3	2.1	0.05	0.02	0.05	59.0
12	R2	19	0	19	0.0	0.332	8.3	LOS A	0.3	2.1	0.05	0.02	0.05	57.2
Approach		624	5	624	0.8	0.332	0.4	NA	0.3	2.1	0.05	0.02	0.05	58.9
All Vehicles		1079	51	1079	4.7	0.332	1.7	NA	0.7	5.6	0.05	0.09	0.06	56.0

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.
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101 [2025 Pm peak- with dev (Site Folder: General)]**

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: D96														
1	L2	22	0	22	0.0	0.137	9.4	LOS A	0.5	4.5	0.48	0.90	0.48	43.6
3	R2	41	16	41	39.0	0.137	19.7	LOS C	0.5	4.5	0.48	0.90	0.48	40.6
Approach		63	16	63	25.4	0.137	16.1	LOS C	0.5	4.5	0.48	0.90	0.48	41.5
East: R34														
4	L2	37	16	37	43.2	0.096	6.0	LOS A	0.0	0.0	0.00	0.13	0.00	54.2
5	T1	521	12	521	2.3	0.201	0.2	LOS A	0.0	0.0	0.00	0.03	0.00	59.4
Approach		558	28	558	5.0	0.201	0.6	NA	0.0	0.0	0.00	0.04	0.00	58.8
North: Shopping Centre														
7	L2	1	0	1	0.0	0.001	5.8	LOS A	0.0	0.0	0.47	0.70	0.47	42.8
8	T1	1	0	1	0.0	0.004	10.3	LOS B	0.0	0.1	0.65	0.82	0.65	45.1
9	R2	1	0	1	0.0	0.004	9.7	LOS A	0.0	0.1	0.65	0.82	0.65	30.5
Approach		3	0	3	0.0	0.004	8.6	LOS A	0.0	0.1	0.59	0.78	0.59	40.6
West: R34														
11	T1	278	17	278	6.1	0.166	0.3	LOS A	0.2	1.6	0.08	0.03	0.08	58.2
12	R2	14	0	14	0.0	0.166	9.1	LOS A	0.2	1.6	0.08	0.03	0.08	56.7
Approach		292	17	292	5.8	0.166	0.8	NA	0.2	1.6	0.08	0.03	0.08	58.1
All Vehicles		916	61	916	6.7	0.201	1.7	NA	0.5	4.5	0.06	0.10	0.06	56.0

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.
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101 [2030 Am peak - with dev (Site Folder: General)]**

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: D96														
1	L2	26	2	26	7.7	0.225	9.5	LOS A	0.8	6.9	0.36	0.93	0.37	39.6
3	R2	45	13	45	28.9	0.225	26.9	LOS D	0.8	6.9	0.36	0.93	0.37	38.6
Approach		71	15	71	21.1	0.225	20.5	LOS C	0.8	6.9	0.36	0.93	0.37	39.0
East: R34														
4	L2	44	13	44	29.5	0.058	5.9	LOS A	0.0	0.0	0.00	0.26	0.00	53.6
5	T1	377	20	377	5.3	0.171	0.1	LOS A	0.0	0.0	0.00	0.04	0.00	59.2
Approach		421	33	421	7.8	0.171	0.7	NA	0.0	0.0	0.00	0.06	0.00	58.2
North: Shopping Centre														
7	L2	1	0	1	0.0	0.001	8.8	LOS A	0.0	0.0	0.70	0.69	0.70	38.5
8	T1	1	0	1	0.0	0.006	14.8	LOS B	0.0	0.2	0.78	0.87	0.78	40.8
9	R2	1	0	1	0.0	0.006	14.5	LOS B	0.0	0.2	0.78	0.87	0.78	25.6
Approach		3	0	3	0.0	0.006	12.7	LOS B	0.0	0.2	0.75	0.81	0.75	36.0
West: R34														
11	T1	668	5	668	0.7	0.367	0.2	LOS A	0.4	2.7	0.05	0.02	0.06	58.9
12	R2	20	0	20	0.0	0.367	8.8	LOS A	0.4	2.7	0.05	0.02	0.06	57.1
Approach		688	5	688	0.7	0.367	0.5	NA	0.4	2.7	0.05	0.02	0.06	58.9
All Vehicles		1183	53	1183	4.5	0.367	1.8	NA	0.8	6.9	0.05	0.09	0.06	55.8

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.
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101 [2030 Pm peak- with dev (Site Folder: General)]**

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: D96														
1	L2	23	3	23	13.0	0.161	10.2	LOS B	0.6	5.4	0.53	0.91	0.53	41.7
3	R2	42	16	42	38.1	0.161	21.7	LOS C	0.6	5.4	0.53	0.91	0.53	39.9
Approach		65	19	65	29.2	0.161	17.6	LOS C	0.6	5.4	0.53	0.91	0.53	40.5
East: R34														
4	L2	38	16	38	42.1	0.105	6.0	LOS A	0.0	0.0	0.00	0.12	0.00	54.3
5	T1	575	13	575	2.3	0.221	0.3	LOS A	0.0	0.0	0.00	0.03	0.00	59.5
Approach		613	29	613	4.7	0.221	0.6	NA	0.0	0.0	0.00	0.04	0.00	58.9
North: Shopping Centre														
7	L2	1	0	1	0.0	0.001	5.9	LOS A	0.0	0.0	0.50	0.69	0.50	42.6
8	T1	1	0	1	0.0	0.004	11.4	LOS B	0.0	0.1	0.69	0.83	0.69	44.0
9	R2	1	0	1	0.0	0.004	10.9	LOS B	0.0	0.1	0.69	0.83	0.69	29.2
Approach		3	0	3	0.0	0.004	9.4	LOS A	0.0	0.1	0.63	0.78	0.63	39.7
West: R34														
11	T1	307	19	307	6.2	0.185	0.4	LOS A	0.3	1.9	0.09	0.03	0.09	58.0
12	R2	15	0	15	0.0	0.185	9.7	LOS A	0.3	1.9	0.09	0.03	0.09	56.6
Approach		322	19	322	5.9	0.185	0.8	NA	0.3	1.9	0.09	0.03	0.09	57.9
All Vehicles		1003	67	1003	6.7	0.221	1.8	NA	0.6	5.4	0.06	0.09	0.06	55.9

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.
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

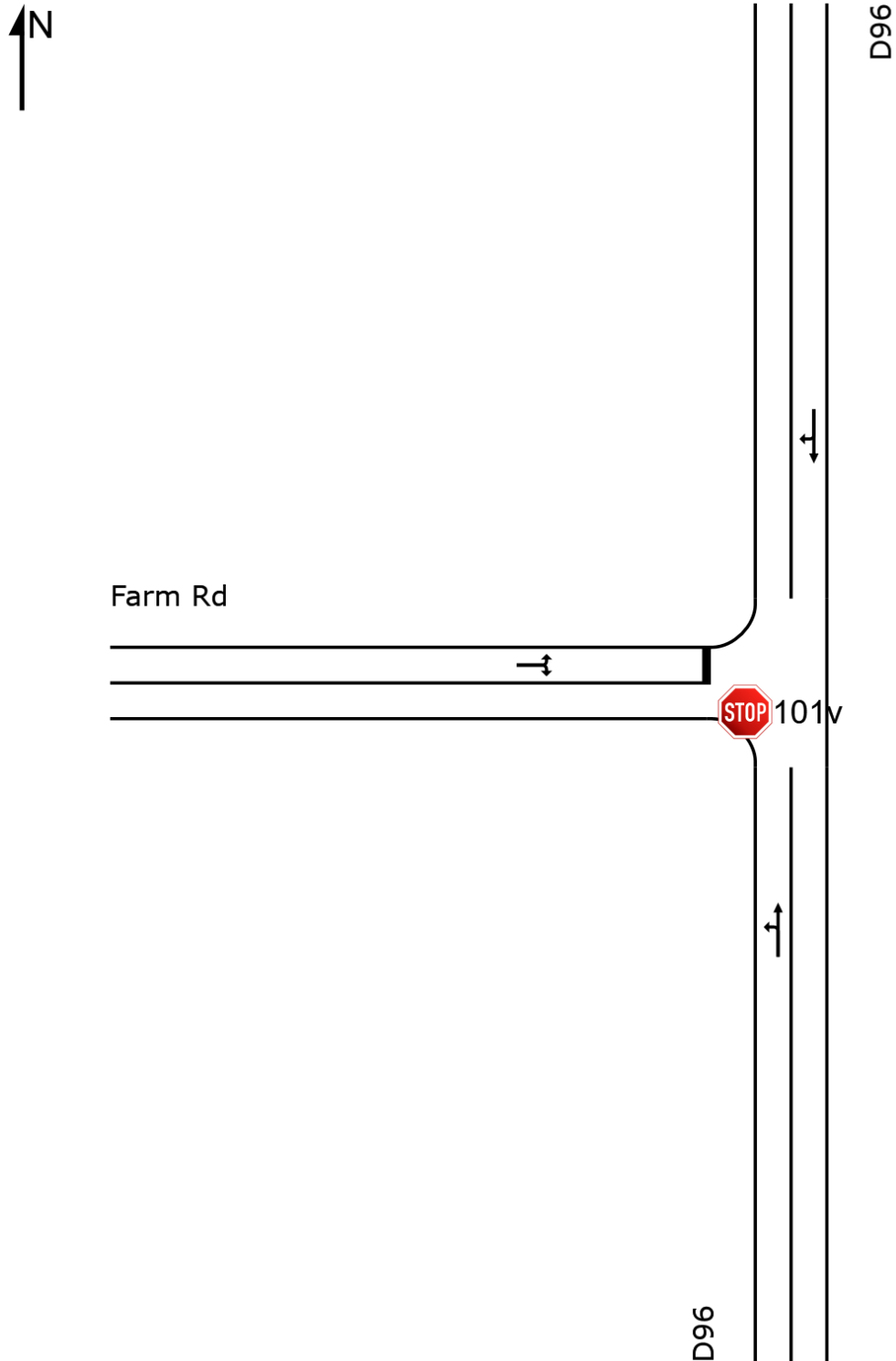
 **Site: 101v [D96/Farm Rd layout (Site Folder: General)]**

New Site

Site Category: (None)

Stop (All-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

 **Site: 101v [2023 Am peak - no dev - (Site Folder: General)]**

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: D96														
30	L2	1	0	1	0.0	0.011	5.5	LOS A	0.0	0.0	0.00	0.57	0.00	54.1
31	T1	20	1	20	5.0	0.011	5.0	LOS A	0.0	0.0	0.00	0.57	0.00	53.6
Approach		21	1	21	4.8	0.011	5.0	LOS A	0.0	0.0	0.00	0.57	0.00	53.6
North: D96														
25	T1	15	1	15	6.7	0.009	5.0	LOS A	0.0	0.0	0.00	0.57	0.00	53.5
26	R2	1	0	1	0.0	0.009	5.4	LOS A	0.0	0.0	0.00	0.57	0.00	53.5
Approach		16	1	16	6.3	0.009	5.0	LOS A	0.0	0.0	0.00	0.57	0.00	53.5
West: Farm Rd														
27	L2	1	0	1	0.0	0.008	20.5	LOS C	0.0	0.2	0.95	1.23	1.96	45.1
29	R2	1	0	1	0.0	0.008	20.0	LOS C	0.0	0.2	0.95	1.23	1.96	44.7
Approach		2	0	2	0.0	0.008	20.2	LOS C	0.0	0.2	0.95	1.23	1.96	44.9
All Vehicles		39	2	39	5.1	0.011	5.8	LOS A	0.0	0.2	0.05	0.60	0.10	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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101v [2023 Pm peak - no dev - (Site Folder: General)]**

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: D96														
30	L2	1	0	1	0.0	0.005	5.5	LOS A	0.0	0.0	0.00	0.57	0.00	54.1
31	T1	8	0	8	0.0	0.005	4.9	LOS A	0.0	0.0	0.00	0.57	0.00	53.8
Approach		9	0	9	0.0	0.005	5.0	LOS A	0.0	0.0	0.00	0.57	0.00	53.8
North: D96														
25	T1	9	0	9	0.0	0.005	4.9	LOS A	0.0	0.0	0.00	0.57	0.00	53.8
26	R2	1	0	1	0.0	0.005	5.4	LOS A	0.0	0.0	0.00	0.57	0.00	53.5
Approach		10	0	10	0.0	0.005	4.9	LOS A	0.0	0.0	0.00	0.57	0.00	53.8
West: Farm Rd														
27	L2	1	0	1	0.0	0.007	18.3	LOS C	0.0	0.2	0.92	1.23	1.93	46.3
29	R2	1	0	1	0.0	0.007	17.7	LOS C	0.0	0.2	0.92	1.23	1.93	45.9
Approach		2	0	2	0.0	0.007	18.0	LOS C	0.0	0.2	0.92	1.23	1.93	46.1
All Vehicles		21	0	21	0.0	0.007	6.2	LOS A	0.0	0.2	0.09	0.63	0.18	52.9

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101v [2025 Am peak - no dev - (Site Folder: General)]**

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: D96														
30	L2	1	0	1	0.0	0.012	5.5	LOS A	0.0	0.0	0.00	0.57	0.00	54.1
31	T1	21	2	21	9.5	0.012	5.0	LOS A	0.0	0.0	0.00	0.57	0.00	53.4
Approach		22	2	22	9.1	0.012	5.0	LOS A	0.0	0.0	0.00	0.57	0.00	53.4
North: D96														
25	T1	16	2	16	12.5	0.009	5.0	LOS A	0.0	0.0	0.00	0.57	0.00	53.2
26	R2	1	0	1	0.0	0.009	5.4	LOS A	0.0	0.0	0.00	0.57	0.00	53.5
Approach		17	2	17	11.8	0.009	5.1	LOS A	0.0	0.0	0.00	0.57	0.00	53.3
West: Farm Rd														
27	L2	1	0	1	0.0	0.008	20.7	LOS C	0.0	0.2	0.95	1.23	1.96	45.0
29	R2	1	0	1	0.0	0.008	20.2	LOS C	0.0	0.2	0.95	1.23	1.96	44.6
Approach		2	0	2	0.0	0.008	20.5	LOS C	0.0	0.2	0.95	1.23	1.96	44.8
All Vehicles		41	4	41	9.8	0.012	5.8	LOS A	0.0	0.2	0.05	0.60	0.10	52.9

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101v [2025 Pm peak - no dev - (Site Folder: General)]**

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: D96														
30	L2	1	0	1	0.0	0.005	5.5	LOS A	0.0	0.0	0.00	0.57	0.00	54.1
31	T1	9	0	9	0.0	0.005	4.9	LOS A	0.0	0.0	0.00	0.57	0.00	53.8
Approach		10	0	10	0.0	0.005	5.0	LOS A	0.0	0.0	0.00	0.57	0.00	53.8
North: D96														
25	T1	10	0	10	0.0	0.006	4.9	LOS A	0.0	0.0	0.00	0.57	0.00	53.8
26	R2	1	0	1	0.0	0.006	5.4	LOS A	0.0	0.0	0.00	0.57	0.00	53.5
Approach		11	0	11	0.0	0.006	4.9	LOS A	0.0	0.0	0.00	0.57	0.00	53.8
West: Farm Rd														
27	L2	1	0	1	0.0	0.007	18.6	LOS C	0.0	0.2	0.93	1.23	1.93	46.1
29	R2	1	0	1	0.0	0.007	18.1	LOS C	0.0	0.2	0.93	1.23	1.93	45.7
Approach		2	0	2	0.0	0.007	18.4	LOS C	0.0	0.2	0.93	1.23	1.93	45.9
All Vehicles		23	0	23	0.0	0.007	6.1	LOS A	0.0	0.2	0.08	0.63	0.17	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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101v [2030 Am peak - no dev (Site Folder: General)]**

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: D96														
30	L2	1	0	1	0.0	0.013	5.5	LOS A	0.0	0.0	0.00	0.57	0.00	54.1
31	T1	23	2	23	8.7	0.013	5.0	LOS A	0.0	0.0	0.00	0.57	0.00	53.4
Approach		24	2	24	8.3	0.013	5.0	LOS A	0.0	0.0	0.00	0.57	0.00	53.4
North: D96														
25	T1	18	2	18	11.1	0.010	5.0	LOS A	0.0	0.0	0.00	0.57	0.00	53.3
26	R2	1	0	1	0.0	0.010	5.4	LOS A	0.0	0.0	0.00	0.57	0.00	53.5
Approach		19	2	19	10.5	0.010	5.0	LOS A	0.0	0.0	0.00	0.57	0.00	53.3
West: Farm Rd														
27	L2	1	0	1	0.0	0.008	21.0	LOS C	0.0	0.2	0.95	1.23	1.96	44.8
29	R2	1	0	1	0.0	0.008	20.4	LOS C	0.0	0.2	0.95	1.23	1.96	44.5
Approach		2	0	2	0.0	0.008	20.7	LOS C	0.0	0.2	0.95	1.23	1.96	44.7
All Vehicles		45	4	45	8.9	0.013	5.7	LOS A	0.0	0.2	0.04	0.60	0.09	52.9

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101v [2030 Pm peak - no dev (Site Folder: General)]**

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: D96														
30	L2	1	0	1	0.0	0.006	5.5	LOS A	0.0	0.0	0.00	0.57	0.00	54.1
31	T1	10	0	10	0.0	0.006	4.9	LOS A	0.0	0.0	0.00	0.57	0.00	53.8
Approach		11	0	11	0.0	0.006	5.0	LOS A	0.0	0.0	0.00	0.57	0.00	53.8
North: D96														
25	T1	11	0	11	0.0	0.006	4.9	LOS A	0.0	0.0	0.00	0.57	0.00	53.8
26	R2	1	0	1	0.0	0.006	5.4	LOS A	0.0	0.0	0.00	0.57	0.00	53.5
Approach		12	0	12	0.0	0.006	4.9	LOS A	0.0	0.0	0.00	0.57	0.00	53.8
West: Farm Rd														
27	L2	1	0	1	0.0	0.007	19.0	LOS C	0.0	0.2	0.93	1.23	1.94	46.0
29	R2	1	0	1	0.0	0.007	18.4	LOS C	0.0	0.2	0.93	1.23	1.94	45.6
Approach		2	0	2	0.0	0.007	18.7	LOS C	0.0	0.2	0.93	1.23	1.94	45.8
All Vehicles		25	0	25	0.0	0.007	6.0	LOS A	0.0	0.2	0.07	0.62	0.15	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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101v [2025 Am peak+ dev (Site Folder: General)]**

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: D96														
30	L2	1	0	1	0.0	0.012	5.5	LOS A	0.0	0.0	0.00	0.57	0.00	54.1
31	T1	21	2	21	9.5	0.012	5.0	LOS A	0.0	0.0	0.00	0.57	0.00	53.4
Approach		22	2	22	9.1	0.012	5.0	LOS A	0.0	0.0	0.00	0.57	0.00	53.4
North: D96														
25	T1	16	2	16	12.5	0.009	5.0	LOS A	0.0	0.0	0.00	0.57	0.00	53.2
26	R2	1	0	1	0.0	0.009	5.4	LOS A	0.0	0.0	0.00	0.57	0.00	53.5
Approach		17	2	17	11.8	0.009	5.1	LOS A	0.0	0.0	0.00	0.57	0.00	53.3
West: Farm Rd														
27	L2	1	0	1	0.0	0.008	20.7	LOS C	0.0	0.2	0.95	1.23	1.96	45.0
29	R2	1	0	1	0.0	0.008	20.2	LOS C	0.0	0.2	0.95	1.23	1.96	44.6
Approach		2	0	2	0.0	0.008	20.5	LOS C	0.0	0.2	0.95	1.23	1.96	44.8
All Vehicles		41	4	41	9.8	0.012	5.8	LOS A	0.0	0.2	0.05	0.60	0.10	52.9

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101v [2025 Pm peak + dev (Site Folder: General)]**

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: D96														
30	L2	1	0	1	0.0	0.005	5.5	LOS A	0.0	0.0	0.00	0.57	0.00	54.1
31	T1	9	0	9	0.0	0.005	4.9	LOS A	0.0	0.0	0.00	0.57	0.00	53.8
Approach		10	0	10	0.0	0.005	5.0	LOS A	0.0	0.0	0.00	0.57	0.00	53.8
North: D96														
25	T1	10	0	10	0.0	0.006	4.9	LOS A	0.0	0.0	0.00	0.57	0.00	53.8
26	R2	1	0	1	0.0	0.006	5.4	LOS A	0.0	0.0	0.00	0.57	0.00	53.5
Approach		11	0	11	0.0	0.006	4.9	LOS A	0.0	0.0	0.00	0.57	0.00	53.8
West: Farm Rd														
27	L2	1	0	1	0.0	0.007	18.6	LOS C	0.0	0.2	0.93	1.23	1.93	46.1
29	R2	1	0	1	0.0	0.007	18.1	LOS C	0.0	0.2	0.93	1.23	1.93	45.7
Approach		2	0	2	0.0	0.007	18.4	LOS C	0.0	0.2	0.93	1.23	1.93	45.9
All Vehicles		23	0	23	0.0	0.007	6.1	LOS A	0.0	0.2	0.08	0.63	0.17	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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101v [2030 Am peak + dev (Site Folder: General)]**

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: D96														
30	L2	1	0	1	0.0	0.013	5.5	LOS A	0.0	0.0	0.00	0.57	0.00	54.1
31	T1	23	2	23	8.7	0.013	5.0	LOS A	0.0	0.0	0.00	0.57	0.00	53.4
Approach		24	2	24	8.3	0.013	5.0	LOS A	0.0	0.0	0.00	0.57	0.00	53.4
North: D96														
25	T1	18	2	18	11.1	0.010	5.0	LOS A	0.0	0.0	0.00	0.57	0.00	53.3
26	R2	1	0	1	0.0	0.010	5.4	LOS A	0.0	0.0	0.00	0.57	0.00	53.5
Approach		19	2	19	10.5	0.010	5.0	LOS A	0.0	0.0	0.00	0.57	0.00	53.3
West: Farm Rd														
27	L2	1	0	1	0.0	0.008	21.0	LOS C	0.0	0.2	0.95	1.23	1.96	44.8
29	R2	1	0	1	0.0	0.008	20.4	LOS C	0.0	0.2	0.95	1.23	1.96	44.5
Approach		2	0	2	0.0	0.008	20.7	LOS C	0.0	0.2	0.95	1.23	1.96	44.7
All Vehicles		45	4	45	8.9	0.013	5.7	LOS A	0.0	0.2	0.04	0.60	0.09	52.9

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101v [2030 Pm peak +dev (Site Folder: General)]**

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: D96														
30	L2	1	0	1	0.0	0.006	5.5	LOS A	0.0	0.0	0.00	0.57	0.00	54.1
31	T1	10	0	10	0.0	0.006	4.9	LOS A	0.0	0.0	0.00	0.57	0.00	53.8
Approach		11	0	11	0.0	0.006	5.0	LOS A	0.0	0.0	0.00	0.57	0.00	53.8
North: D96														
25	T1	11	0	11	0.0	0.006	4.9	LOS A	0.0	0.0	0.00	0.57	0.00	53.8
26	R2	1	0	1	0.0	0.006	5.4	LOS A	0.0	0.0	0.00	0.57	0.00	53.5
Approach		12	0	12	0.0	0.006	4.9	LOS A	0.0	0.0	0.00	0.57	0.00	53.8
West: Farm Rd														
27	L2	1	0	1	0.0	0.007	19.0	LOS C	0.0	0.2	0.93	1.23	1.94	46.0
29	R2	1	0	1	0.0	0.007	18.4	LOS C	0.0	0.2	0.93	1.23	1.94	45.6
Approach		2	0	2	0.0	0.007	18.7	LOS C	0.0	0.2	0.93	1.23	1.94	45.8
All Vehicles		25	0	25	0.0	0.007	6.0	LOS A	0.0	0.2	0.07	0.62	0.15	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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Annexure H: Environmental Assessment Methodology

Impact Assessment Methodology

Impact Significance is calculated by the following formula:

$$\text{Impact Significance} = \text{Consequence} \times \text{Likelihood}$$

Likelihood refers to the probability that an impact will occur at some time during the project.

The Matrix which is proposed to determine Likelihood is as follows:

Table 1: Matrix used to determine likelihood

Likelihood	Unlikely: Impact Could occur in extreme events. Less than 15% chance of the impact ever occurring.	1
	Possible: possibility of impact occurring is very low. 16% - 30% chance of the impact occurring.	2
	Probable There is a distinct possibility of the impact occurring. 31% to 60% chance.	3
	Highly Probable: The impact is expected to occur. Between 61% and 85 % chance.	4
	Definite: There are sound scientific reasons to expect that the impact will occur	5

Consequence is calculated by considering the **duration**, spatial **scale** and **intensity** of an impact.

Duration relates to the time-frame that an aspect will be impacted upon. For example, any impact to a heritage resource is considered permanent, while the impact of increased traffic related to a construction activity will only last as long as the construction phase. Duration is rated according to the following criteria:

Table 2: Matrix used to rate duration

Duration	Short term: Less than 1 year and is reversible.	1
	Short to medium term: 2 - 3 years	2
	Medium term - 3 to 10 years	3
	Long term: 11-20 years	4
	Permanent: in excess of 20 years	5

Spatial **Scale** relates to the physical extent of the zone of influence of an impact. Where groundwater or air quality impacts, for example, can extend far beyond the footprint of the activity, it is not expected that the impact of vegetation removal should extend beyond the footprint of the activity. Scale is rated according to **Table 3:**

Table 3: Matrix used to rate scale

Scale / Extent	Isolated: Limited footprint within the site will be affected (less than 50% of the site)	1
	Site Specific: The Entire Site will be affected	2
	Local: Will affect the site and surrounding areas	3
	Regional: Will affect the entire region / catchment / province	4
	National: Will affect the country, and possibly beyond the borders of the country	5

The **Intensity** of an impact is calculated by considering the **severity of the impact** (how it will change the aspect, will it be destroyed completely, or altered slightly?) and the **sensitivity of the aspect** (is the aspect sensitive to change, and is the aspect important to ecosystem processes or social dynamics?). For example, if the impact is anticipated to completely destroy a local plant population, but the plant population is commonly found and protected in nearby surroundings, the over-all intensity is lowered. If, however, the plant population in question is unique or protected, the intensity increases proportionately.

The Matrix which is proposed to determine Intensity is as follows:

Table 4: Matrix used to rate Intensity

Magnitude	Slight: Little effect, negligible disturbance / benefit	1
	Slight to Moderate: Effects are observable but natural process continue	2
	Moderate: ecosystem processes / social dynamics are permanently altered, but functioning.	3
	Moderate - High: natural / social processes are altered to the point where function is limited	4
	High: The aspect is affected so that its functioning is compromised and this effect is irreversible	5
Sensitivity	The aspect is not sensitive to change (No irreplaceable loss of resource)	1
	The aspect is of not of significant value but is sensitive to change	2
	The affected aspect is of moderate value and is slightly resilient to change	3
	The affected aspect is of significant value and only slightly resilient to change	4
	The affected aspect is valued, irreplaceable and sensitive to change. Irreplaceable loss of significant resource	5

Therefore, considering the formula:

$$\text{Significance} = \text{Consequence} \times \text{Likelihood}$$

Where **Consequence = Duration + Scale + Severity of the Impact + Sensitivity of the Aspect**

The over-all Significance rating can be calculated as a value between 4 and 100. The score is then categorised as follows:

- 4 to 19 = Insignificant Impact, no mitigation is required beyond standard best practice;
- From 20 to 39 = Low Impact, specific mitigation should be included in the EMP and monitoring should be undertaken;
- From 40 to 59 = Moderate Impact, specific mitigation with strict monitoring is required;
- From 60 to 79 = High Impact, mitigation should consider alteration of the design or process to reduce the impact significance;
- >Higher than 80 (100 max) = The Impact is so Significant that the project design must be reconsidered to avoid the impact.

Impacts will be rated as per the abovementioned methodology without consideration of mitigation measures first, however there may be some mitigation already inherent in the design of the Project (i.e. by avoiding identified wetland areas in the layout of the project, by using existing roads instead of constructing a new access road, etc.).

Those impacts that are rated as having a moderate impact or above will be investigated further and management measures identified to attempt to reduce the Consequence or Likelihood of the impact. These impacts will then be rated again, while considering the mitigation measures that have been imposed.

Likelihood	5	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
	4	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80
	3	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60
	2	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
	1	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Consequence																		

As shown in the Table below, impacts that are insignificant do not justify the effort and expense that most types of mitigation measures would be associated with. As impact significance increases, increased efforts (and associated costs) of mitigation become relevant.

Range		Significance	Management
From	To		
4	19	Insignificant	None required
20	39	Low	Continue to Monitor
40	59	Moderate	Implement mitigation and monitoring.
60	79	High	High negative impacts must be justified by positive value of project, potential offsets or altered design required.
80	100	Significant	Alter design to address impact cause If still significant after mitigation = fatal flaw to the Project.

Annexure I: Specialist Expertise

ADRIAN WESLEY NATHANIEL JOHNSON



Position in Firm	Associate and Manager: Traffic and Transportation
Area of Specialisation	Traffic and Transportation Engineering
Qualifications	PrTechEng, Master of Transport Studies, BSc (Hons) (Applied Science: Transport Planning), BTech Civil Engineering
Years of Experience	18 Years
Years with Firm	6 Years

SUMMARY OF EXPERIENCE

Adrian Johnson is a Professional Technologist registered with ECSA (201570274). He joined JG Afrika (Pty)Ltd. in January 2017. Adrian holds a BSc (Hons) (Applied Sciences: Transportation Planning) degree from the University of Pretoria, a BTech degree in Civil Engineering from the Cape Peninsula University of Technology and completed a Masters' degree in Transport Studies at the University of Cape Town in 2020. He has more than 18 years of experience in a wide range of engineering projects.

He has technical and professional skills in traffic impact studies, transport impact assessments, public transport planning, non-motorised transport planning & design, data analysis of public transport systems, access management plans, quality control, project planning and implementation, geometric design, site supervision, transport assessments for renewable energy projects, speed limit reviews and road safety audits.

PROFESSIONAL REGISTRATIONS & INSTITUTE MEMBERSHIPS

- PrTechEng** - Engineering Council of South Africa, Registration No 201570274
- SAICE** - South African Institute of Civil Engineering. No 201700129
- SARF WR** - South African Road Federation Western Region Administrator and Committee Member

EDUCATION

- 2004 - National Diploma (Civil)** – Peninsula Technikon
- 2006 - BTech (Civil)** – Cape Peninsula University of Technology
- 2011 - BSc (Hon)** (Applied Sciences: Transportation Planning) – University of Pretoria
- 2020 – Master of Transport Studies** – University of Cape Town

SPECIFIC EXPERIENCE

JG Afrika (Pty) Ltd (Previously Jeffares & Green (Pty) Ltd)

September 2022 – Date

Position – Associate and Manager: Traffic and Transportation

Traffic Engineering Support Services Provision of Professional Services: Transport Engineering, Planning and Management to the City of Cape Town, Western Cape. Client: City of Cape Town

Adam Tas Corridor Transport Studies for the Adam Tas Corridor in Stellenbosch, Western Cape. Client: Stellenbosch Municipality

Limpopo Road Asset Management System Undertake network level road safety assessments and analysis of accident statistics of the Limpopo road network (5 000km). – Client: Roads Agency Limpopo SOC Ltd

Aberdeen WEFs Transport study for the proposed Windfarms, Western Cape Client: Private

Hydra B Solar Cluster Transport study for multiple solar facilities in the Northern Cape. Client: Private

Britstown WEFs Transport study for the proposed Windfarms, Northern Cape Client: Private

JG Afrika (Pty) Ltd (Previously Jeffares & Green (Pty) Ltd)

2017 – June 2022

Position – Senior Technologist (Traffic and Transportation Engineering)

Various Transport Impact Statements (TIA) and Traffic Impact Statements (TIS) for private clients including:

- Weltevreden Clinic TIS for Edifice Consulting Engineers
- Oakhurst Primary TIS for BVZ Plan
- Sinai Academy TIS for Bettsworth Scott Planners
- Rustlamere TIA for Bettsworth Scott Planners
- Joostenbergvlakte Farms 732 and 728 TIA for Asla
- Garden Emporium TIA for Rory Cameron Smith Architects
- Strandfontein Sandmine TIS for Chand Environmental Consultants
- Proposed development of Erf 538 Grassy Park TIA for First Plan
- Riebeek West: Proposed Function/Wedding Venue TIS for Elco Property Developers

Kampies Housing Development Proposed upgrade of the informal settlement on Cape Farm 616 Philipi and Erf 63 Spring Field, providing 275 units. Client: Ian Rout & Associates

Highlands Housing Project Traffic calming plans for three proposed sites in Mitchells Plain, Cape Town – Client: City of Cape Town

Richards Bay Gas to Power Facility Transport study for the proposed renewable energy facility in Richards Bay, KwaZulu Natal – Client: Private Client

Solid Waste Management Sector Plan – Collections Work Brief Information Analyst assisting with the assessments and detailed analysis of the collections and drop-off facilities operating model of the City of Cape Town – Client: City of Cape Town

Nooiensfontein Housing Project Transport Study for the Nooiensfontein Housing Development in Bluedowns (2500 units) – Client: Ian Rout & Associates

Bardale Housing Development Transport Impact Assessment and Signal timing plan, Western Cape – Client: Integrated Housing Development

Enkanini Housing Transport Impact Assessment for the development of the Enkanini Informal Settlement, Kayamandi - Client: Stellenbosch Municipality

Sutherland and Rietrug Access Road Transport study for the upgrading and widening of the access road to the proposed Sutherland Windfarm, Northern Cape Client: Nala Environmental Consulting

Pienaarspoort Windfarm Transport study for the proposed Pienaarspoort Windfarm, Western Cape Client: Savannah Environmental (Pty) Ltd

Speed Limit Review Main Road 546, Main Road 552 and Divisional Road 2220, Lutzville, Western Cape – Client: Western Cape Government

Gromis and Komis Wind Energy Facility Transport study for the proposed Windfarm, Northern Cape. Client: CSIR

Geelkop Solar Facility Transport study for the proposed Geelkop Solar PV Facility near Upington, Northern Cape – Client: AEP (Pty) Ltd

Khunab Solar Facility Transport study for the proposed Khunab Solar PV Facility near Upington, Northern Cape – Client: AEP (Pty) Ltd

Bloemsmond Solar Facility Transport study for the proposed Bloemsmond Solar PV Facility near Upington, Northern Cape – Client: AEP (Pty) Ltd

NMT Study for the Upgrading of DR1285, Elgin – Client: Western Cape Government

Traffic Study for the Kudusberg and Rondekop Wind Energy Facilities, Northern Cape. Client: G7

Speed Limit Review Main Road 540, Elandsbay, Western Cape – Client: Western Cape Government

Road Safety Audit for N1 Section 16 Winburg to Ventersburg – Client: Aurecon on behalf of SANRAL

Road Safety Audit for the for the N4 at Bapong, Client: Bakwena

Road Safety Audit for N2 Wild Coast Toll Road Projects, Eastern Cape & Natal, Client: Aurecon/Knight Piesold on behalf of SANRAL

Kuruman Wind Energy Facility Transport study for the proposed Kuruman Windfarm, Northern Cape. Client: CSIR

Coega West Windfarm Transportation and Traffic Management Plan for the proposed Coega Windfarm in Coega, Port Elizabeth – Client: Electrawinds Coega

Parking Audit of the Groenvallei area in Bellville – Client: City of Cape Town

Road Safety Appraisals for the Mpumalanga Province – Client: Mpumalanga Provincial Government

Transportation and Traffic Management Plan for the proposed Coega West Wind Energy Facility in Port Elizabeth – Client: Electrawinds Coega (Pty) Ltd

Road Safety Appraisals for North Region of Cape Town – Client: Aurecon on behalf of City of Cape Town

Speed Limit Reviews for North Region of Cape Town – Client: Aurecon on behalf of City of Cape Town

Road Safety Audit for the Upgrade of N1 Section 4 Monument River – Client: Aurecon on behalf of SANRAL

Road Safety Audit for the Upgrade of N2 Section 8 Knysna to Wittedrift – Client: SMEC on behalf of SANRAL

Road Safety Audit for the Upgrade of N1 Section 16 Zandkraal to Winburg South – Client: SMEC on behalf of SANRAL

Traffic and Road Safety Studies for the Improvement of N7 Section 2 and Section 3 (Rooidraai and Piekenierskloofpass) – Client: SANRAL

Traffic Engineer for the Upgrade of a 150km Section of the National Route N2 from Kangela to Pongola in KwaZulu-Natal, Client: SANRAL

GIBB (Pty) Ltd

2014 – 2016

Position – Technologist / Project Leader (Traffic and Transportation Engineering)

Operational Support to the MyCiTi Integrated Rapid Transit System - Tasks included analysis of AFC data, generating monthly operations reports, analysis of passenger surveys, journey time runs, travel time surveys, compilation of a MyCiTi Festive Season Report and compilation of reports for the Century City and V&A Waterfront stakeholders. Client: Transport for Cape Town.

Technical Support to the MyCiTi Business Planning Department - A detailed route-by-route analysis, during peak and off-peak conditions to generate daily demand profiles, with a focus on identifying inefficiencies.

Additional tasks included:

- An assessment of profitability of routes based on patronage, revenue and operating costs;
- Analysis of AFC data;
- Comparison between the manual survey results and the Transportation Reporting System (TRS) data;
- Analysis of the Free Token Card Promotion;
- Route and bus optimisation;
- Station and feeder stop utilization and
- Assessment of Parking Tariffs for Managed Parking Bays within the City of Cape Town.

Client: Transport for Cape Town.

AFC Data Analysis - Data Analysis of AFC Data of the City of Tshwane's A Re Yeng Bus Service.

Client: Development Bank of Southern Africa.

Ghana Transport Status Quo Study - Transport Status Quo Study for the Greater Accra Regional Spatial Development Framework. Client: Government of Ghana: Ministry of Lands & Natural Resources.

Botswana TIA – Transport Impact Assessment for the Mogoditshane- Kanye Road project in Botswana. Client: Republic of Botswana's Ministry of Transport and Communications: Roads Department.

Botswana Access Management Plan Transport Impact Assessment for the Mogoditshane- Kanye Road project in Botswana. Client: Republic of Botswana's Ministry of Transport and Communications: Roads Department.

MyCiTi System Planning - Rationalisation of the GABS bus routes within the City of Cape Town.
Client: Transport for Cape Town.

Road Safety Master Plan - Compilation of a Road Safety Master Plan for Stellenbosch Municipality.
Client: Stellenbosch Municipality.

Constantia TIS - Transport Impact Statement and Parking Motivation for the proposed redevelopment of Erf 2134, Constantia. Client: High Constantia Properties.

Top Yard TIA - Transport Impact Assessment for the Government Garage Precinct Plan (Top Yard).
Client: PricewaterhouseCoopers (PWC).

Boschendal TIA - Transport Impact Assessment for the development of Boschendal Village.
Client: Boschendal (Pty)Ltd.

Vergenoegd TIA - Transport Impact Assessment for the development of Portion 19 of Farm 653, Vergenoegd. Client: Headland Planners.

Tygerberg Hospital Traffic Status Quo Study - Traffic Status Quo Study for the Development Framework for the Tygerberg Hospital Site in Bellville. Client: City Think Space.

Eerste River TIA - Transport Impact Assessment for Erf 5541, Eerste River. Client: Headland Planners

BVi Consulting Engineers

2013– 2014

Position – Technologist (Transportation Engineering)

Waaiohoek Wind Energy Facility TIA - Transport Impact Assessment for the proposed construction of a Wind Energy Facility on Waaiohoek Farm near Utrecht Town in Kwazulu-Natal. Client: Mainstream Renewable Power.

Sere Wind Farm - Supervision of bellmouth widening and other modifications along routes between the Saldanha Port and the Sere Wind Farm near Koekenaap. Client: Siemens.

Slip lane Design for Windhoek Service Station - Geometric design of a slip lane to the existing Windhoek Fuel Centre, Windhoek, Namibia. Client: Multi Consult.

Lafarge Industries

2011– 2013

Position – Quality Controller

Responsible for the quality control at four ReadyMix concrete plants and the Tygerberg Quarry.

- Design of new concrete mixes and optimisation of existing mix designs.
- Assist client with technical matters and problem solving.
- Compile technical reports.
- Motivate, train and develop staff to ensure growth and succession.

- Arrange and monitor staff schedules.
- Conduct Quality training for field technicians, reps and batchers.
- Statistical analysis of concrete results and monitoring product performance.

Aurecon Mozambique

2010– 2011

Position – Roadworks Engineer (Site Supervision)

Mozambique site supervision - Roadworks Engineer responsible for inspection of works and monitoring workmanship for the Construction of a 135km road from Montepuez to Ruaca in Northern Mozambique. Client: Administracao Nacional De Estradas (Mozambican Roads Authority)

Aurecon South Africa

2004– 2010

Position – Technician/Technologist (Traffic and Transportation Engineering)

Kewtown site supervision - Resident Engineer for the Community Residential Units Programme Pilot Project in Kewtown. Client: City of Cape Town.

N2 road design - Vertical and horizontal alignment of the N2 from Coega to Colchester. Client: SANRAL.

Western Cape Provincial Weighbridges - Resident Engineer on various projects involving the upgrading and expansion of the 9 Provincial Weighbridges in the Western Cape. Client: Provincial Administration: Western Cape.

Traffic and Transport tasks - Various traffic counts, traffic data analysis and transport impact statements. Client: Various.

CONTINUED PROFESSIONAL DEVELOPMENT

Courses

- 2007** - SAICE Flood estimation and Storm Water Drainage for Roads Course
- 2008** - Certificate in Project Management
- 2009** - SAICE Practical Geometric Design Course
- 2011** - C&CI Concrete Technology
- 2013** - Post graduate Courses – Financial Management and Asset Management
AutoCAD Civil 3D Training
- 2014** - Leadership Training -Project Risk Training and Anti- Corruption and Integrity Management
Post graduate Courses – Strategic Operations Management and Project Management
- 2015** - Leadership Training – Report Writing
- 2016** - Leadership Training - Quality Management and Time Management
- 2017** - Road Safety Auditor Course (SARF)
- 2018** - Road Safety in Engineering Seminar (SARF)
- 2020** Understanding and the Investigation of Road Traffic Accidents
- 2021** Intersection Optimisation course (SARF)

PERSONAL DETAILS

Nationality – South African

Date of Birth – 1984-05-31

Domicile – Cape Town, South Africa

Languages

English – Very Good

Afrikaans – Good

Annexure J: Specialist Declaration

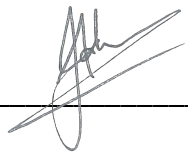
Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

DECLARATION BY THE SPECIALIST

I, Adrian Johnson, declare that –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the Specialist: _____



Name of Company: JG Afrika (Pty) Ltd

Date: 14-06-2023

Annexure K: Compliance with Appendix 6 of the 2014 EIA Regulations (As Amended)

Requirements of Appendix 6 (Specialist Reports) of Government Notice R326 (Environmental Impact Assessment (EIA) Regulations of 2014, as amended)	Section where this has been addressed in the Specialist Report
1. (1) A specialist report prepared in terms of these Regulations must contain -	Annexure I
a) details of -	
i. the specialist who prepared the report; and	
ii. the expertise of that specialist to compile a specialist report including a curriculum vitae;	
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Annexure J
c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 1
(cA) an indication of the quality and age of base data used for the specialist report;	Section 6.2.1.3
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 6
d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 6.2.1.3
e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Annexure H
f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 4
g) an identification of any areas to be avoided, including buffers;	Section 4
h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	n/a
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 1
j) a description of the findings and potential implications of such findings on the impact of the proposed activity or activities;	Section 5
k) any mitigation measures for inclusion in the EMPr;	Section 6.1.2 and 6.2.3
l) any conditions for inclusion in the environmental authorisation;	Section 6
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 7
n) a reasoned opinion- i. whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and ii. if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	Section 9
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	Undertaken by EAP
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Undertaken by EAP
q) any other information requested by the competent authority.	Undertaken by EAP
(2) Where a government notice by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	No traffic protocol published to date