

Wembesi JunXion

Traffic Impact Assessment for a Proposed Petrol Filling Station, Retail and Industrial Development on Portion 51 of the Farm Kliplaat No.1009 in Wembesi

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1 Development Particulars

Zutari (Pty) Ltd was appointed to carry out a Traffic Impact Assessment for a proposed petrol filling station, retail and industrial development in Wembesi, KwaZulu-Natal. The proposed development is located at the intersection of the P29 and P179 in Wembesi.

The purpose of this report is to assess the traffic impact of the proposed development on the existing road network. The report analyses the existing peak hour traffic conditions based on recent traffic counts, the impact of the peak hour traffic generated by the proposed development, public transport infrastructure and requirements, horizon year traffic impact and recommendations for any improvements required to the road network as well as access requirements to accommodate the additional traffic generated by the proposed development.

Site Description	<ul style="list-style-type: none"> ▪ Portion 51 of the Farm Kliplaat No.1009 in Wembesi
Proposed zone	<ul style="list-style-type: none"> ▪ Shopping Centre as Commercial ▪ Filling Station as Petrol Filling Station ▪ Industry as Light Industry
Site Access Proposal	<ul style="list-style-type: none"> ▪ Full access on the P179, minimum 60m from the P29 STOP line, ▪ No access on the P29
Development Type	<ul style="list-style-type: none"> ▪ Petrol Filling Station ▪ Retail – 12 363m² GLA (250m² convenience shop for PFS and 12 113m² shopping centre) ▪ 20 000m² Light Industry
Building Line	<ul style="list-style-type: none"> ▪ 15m building line to be applied from the road reserve boundary of the P29 and P179. The 15m building line may be relaxed to 7.5m for internal roads and parking on application to the KZN DoT ▪ No fuel tanks permitted within the building line

Table 1: Site Information

2 Study Area & Access

The proposed petrol filling station, shopping centre and industrial development is located on Portion 51 of the Farm Kliplaat No.1009 in Wembesi, KwaZulu-Natal. The site is currently vacant land. The P29 is aligned in a northeast – southwest direction forming the south-eastern boundary of the site and the P179 is aligned in a northwest – southeast direction forming the south-western boundary of the site.

Access to the proposed development will be off the P179 a minimum of 60m from the P29 STOP line. There will be no access to the development off the P29. The locality of the site in relation to the existing road network is shown in Figure 1 below.

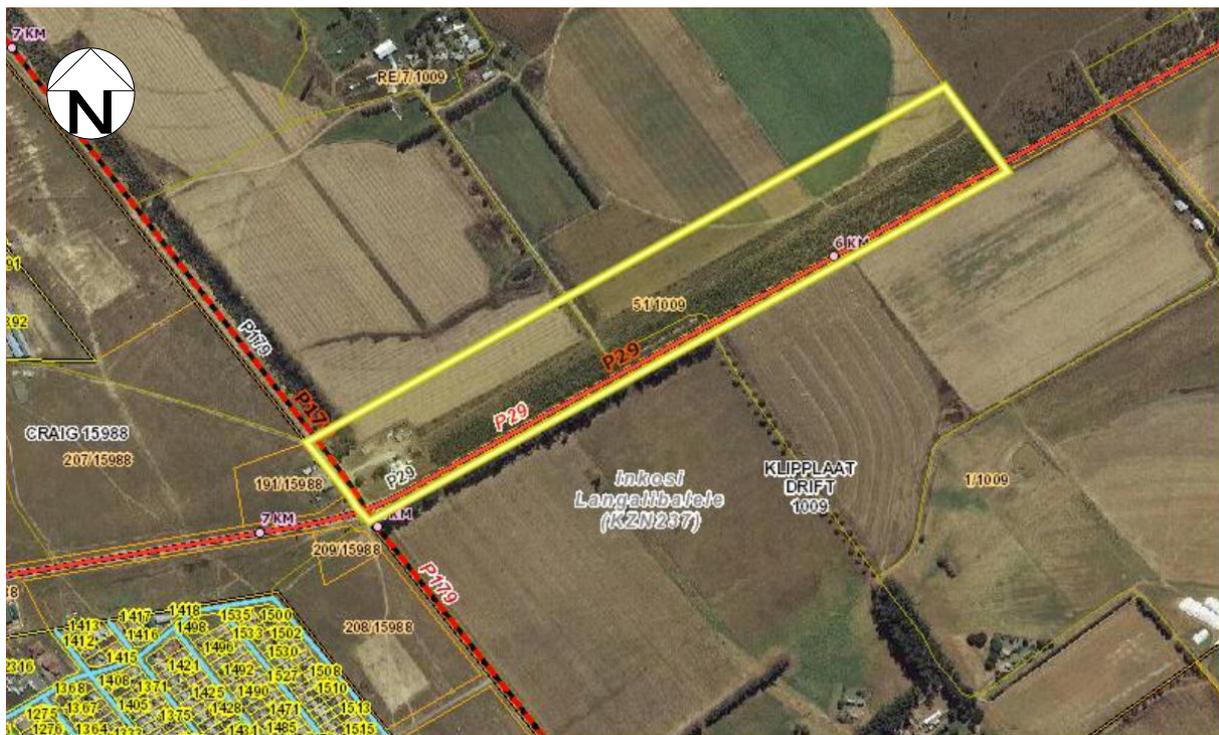


Figure 1: Locality Plan

3 Site Investigation

A description of the road network most likely to be affected by this proposed development is described below.

3.1 P29

The P29 is a Class R3 provincial, single carriageway road with 1 lane in each direction within the study area. The speed limit along this road is 60km/h. There are no public transport laybys along this road in close proximity to the site for this proposed development. The alignment of this road has moderate horizontal and vertical curves. P29 is an asphalt surfaced road and has no streetlights. Both approaches of P29 are uncontrolled at its intersection with P179 and P29 has an exclusive right-turn lane in the southwest-bound direction at the P29 and P179 intersection.



P29

3.2 P179

P179 is a Class R4 provincial, single carriageway road with 1 lane in each direction within the study area. The speed limit along this road is 60km/h. There are no public transport facilities along this road. The alignment of this road has moderate horizontal and vertical curves. The P179 is asphalt surfaced and becomes a gravel surfaced road about 80m from the P29. The road has no streetlights. P179 is under stop control at its intersection with P29.



P179

4 Traffic Demand Estimation

4.1 Assessment Years and Hours

For the maximum impact scenario of the proposed development, the Saturday AM and Friday PM peak hours will be analysed further in this TIA.

The maximum potential trip generation of the proposed development during the above peak periods will be less than 2 000 veh/h and therefore a 5-year design horizon (2026) needs to be assessed in terms of the TMH16 South African Traffic Impact and Site Traffic Assessments Manual (August 2012).

4.2 Traffic Counts

As the major trip generator within the proposed development is a shopping centre that generates its peak traffic during a Friday PM peak hour and a Saturday AM peak hour, these two peak hours will be analysed in this report. The existing traffic volumes on the road network immediately surrounding the site were obtained from classified traffic counts undertaken by Bala Survey and Research on Friday, 16 April 2021 and Saturday, 17 April 2021 at the following intersection:

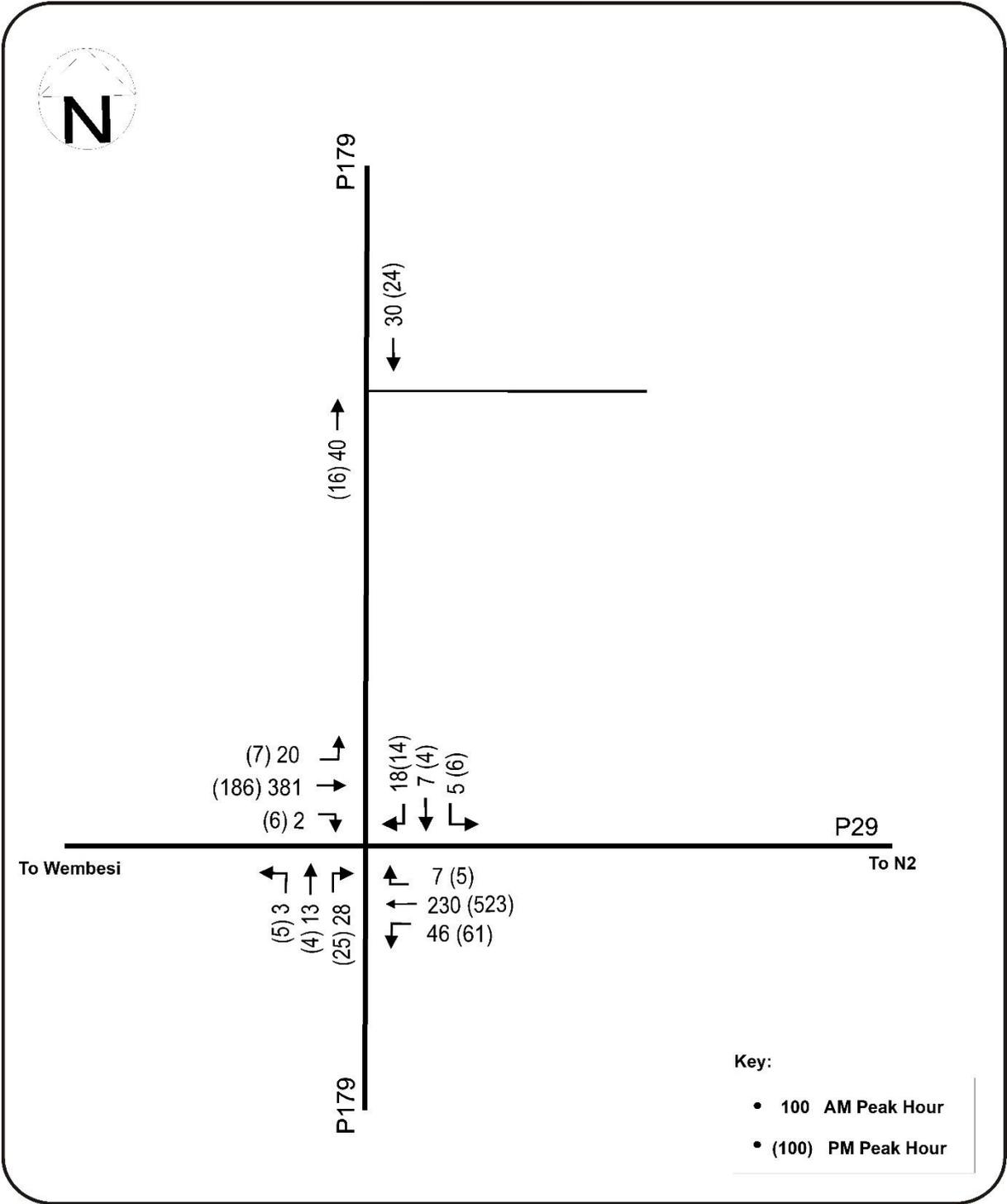
- P29 / P179 intersection

The results and analysis of the above counts are contained in Appendix B to this report.

The traffic counts were undertaken from 12:00 to 18:00 on the Friday and from 08:00 to 14:00 on the Saturday. An analysis of the traffic counts revealed that the Saturday AM peak hour occurred from 10:00 to 11:00 which is a typical Saturday shopping activity peak period and the Friday PM peak hour occurred from 17:00 to 18:00, which is a typical commuter peak period.

It is noted that this TIA was conducted during Level 3 of the national lockdown due to the COVID-19 pandemic. It is therefore anticipated that any traffic counts undertaken during this period will be lower than normal traffic conditions before the lockdown. Therefore, a 15% increase in these existing traffic volumes was applied to take account this reduction in traffic due to the current Covid-19 pandemic. This is the factor that has generally been accepted by most municipalities in KwaZulu-Natal including eThekweni and is therefore deemed appropriate for this assessment.

The factored existing peak hour traffic volumes on the surrounding road network are shown on Figure 2 below.



	Existing Saturday AM & Friday PM Peak Hour Traffic Volumes (with 15% escalation due to Covid)	PROJECT:
	Proposed Wembesi Development	
August 2021	ZUTARI (PTY) LTD	NOT TO SCALE

Figure 2: Existing Saturday AM & Friday PM Peak Hour Traffic Volumes

4.3 Trip Generation by Other Approved Developments

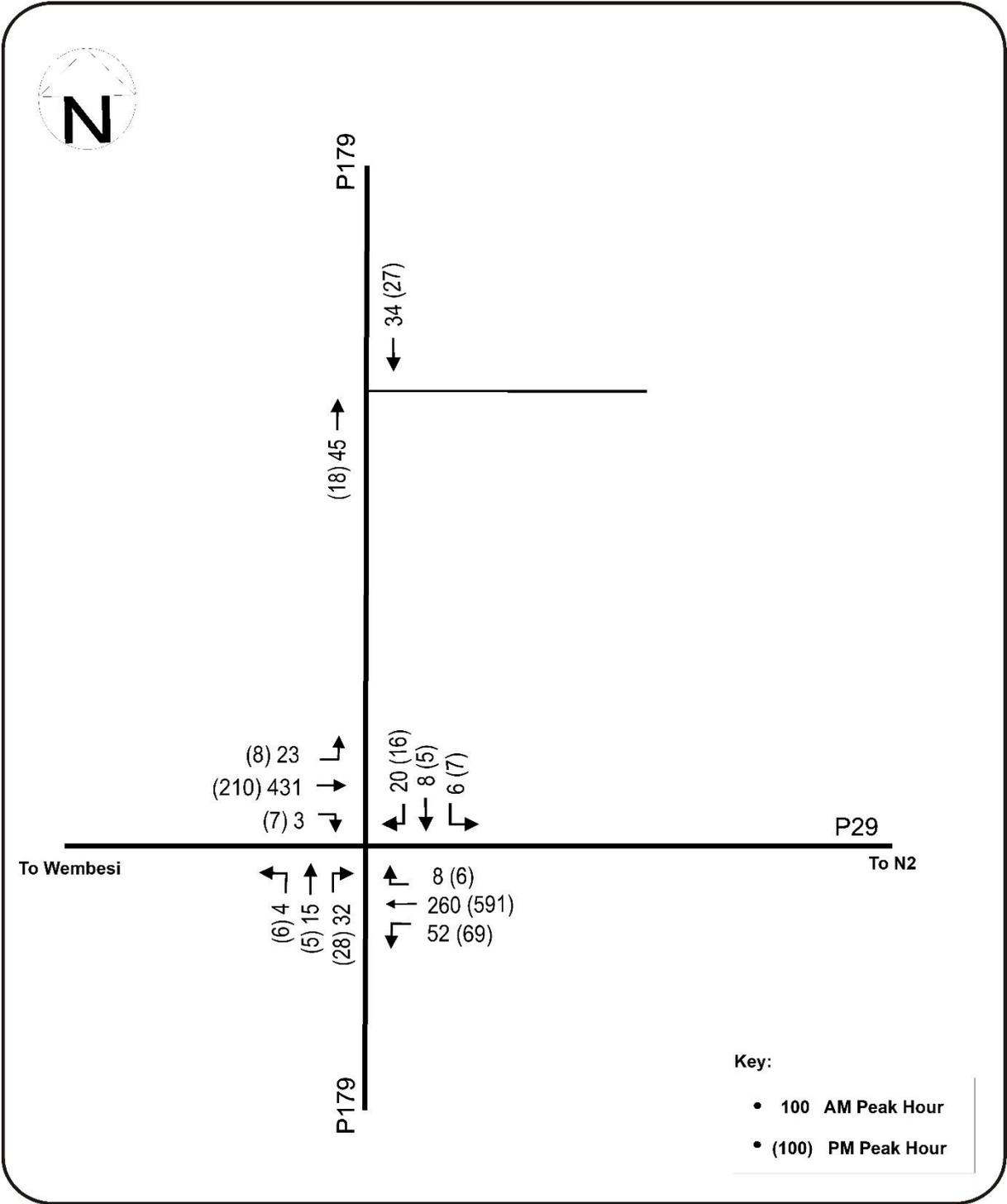
There are no known approved neighbouring developments in the area that are expected to be developed in the vicinity of the site within a similar time frame that could have an impact on the traffic conditions within the study area.

4.4 Traffic Growth Rates

For the purpose of assessing the 5-year design horizon, the base year background traffic needs to be factored up by a specified growth rate from 2021 to 2026. The Wembesi area has large undeveloped land and therefore has the potential for further development. Traffic volumes in these areas therefore have the potential to increase in the future.

Consequently, a 2.5% per annum growth rate as indicated in TMH16 South African Traffic Impact and Site Traffic Assessments Manual (August 2012) is considered reasonable for the roads expected to be affected by the traffic generated by the proposed petrol filling station, retail and industrial development.

The existing traffic volumes were thus extrapolated using a compound growth rate of 2.5% per annum to get forecast 2026 5-year design horizon traffic flows which are shown in Figure 3 below.



	2026 (5 Year) Saturday AM & Friday PM Peak Hour Traffic Volumes (with 15% escalation due to Covid)	PROJECT:
	Proposed Wembesi Development	
August 2021	ZUTARI (PTY) LTD	NOT TO SCALE

Figure 3: 2026 Design Year Peak Hour Traffic Volumes without Development Generated Traffic

5 2026 Design Year Without Development Generated Traffic

5.1 Method of Analysis

The signalised & unsignalized Intersection Design and Research Aid (SIDRA) computer software was used to analyse the traffic conditions at the affected intersections. The underlying objective of intersection analysis is to quantify the performance of an intersection with regard to specified traffic volumes and environmental conditions. This traffic operational performance can be measured in terms of 'Level of Service' (LOS). Six levels of service exist, ranging from A to F.

LOS A represents the best operating conditions (free-flow conditions and no delay or congestion) whereas LOS F represents the worst, (breakdown conditions with congestion and very high delays). LOS D is deemed the minimum acceptable level of service.

The legend hereafter is used to depict the LOS of each movement at the intersections.

LOS A: No delay or congestion

LOS B: Negligible delay or congestion

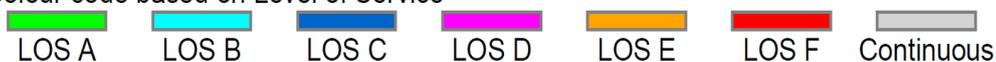
LOS C: Low delay or congestion

LOS D: Some delay or congestion

LOS E: Moderate delay or congestion

LOS F: Congestion and very high delays

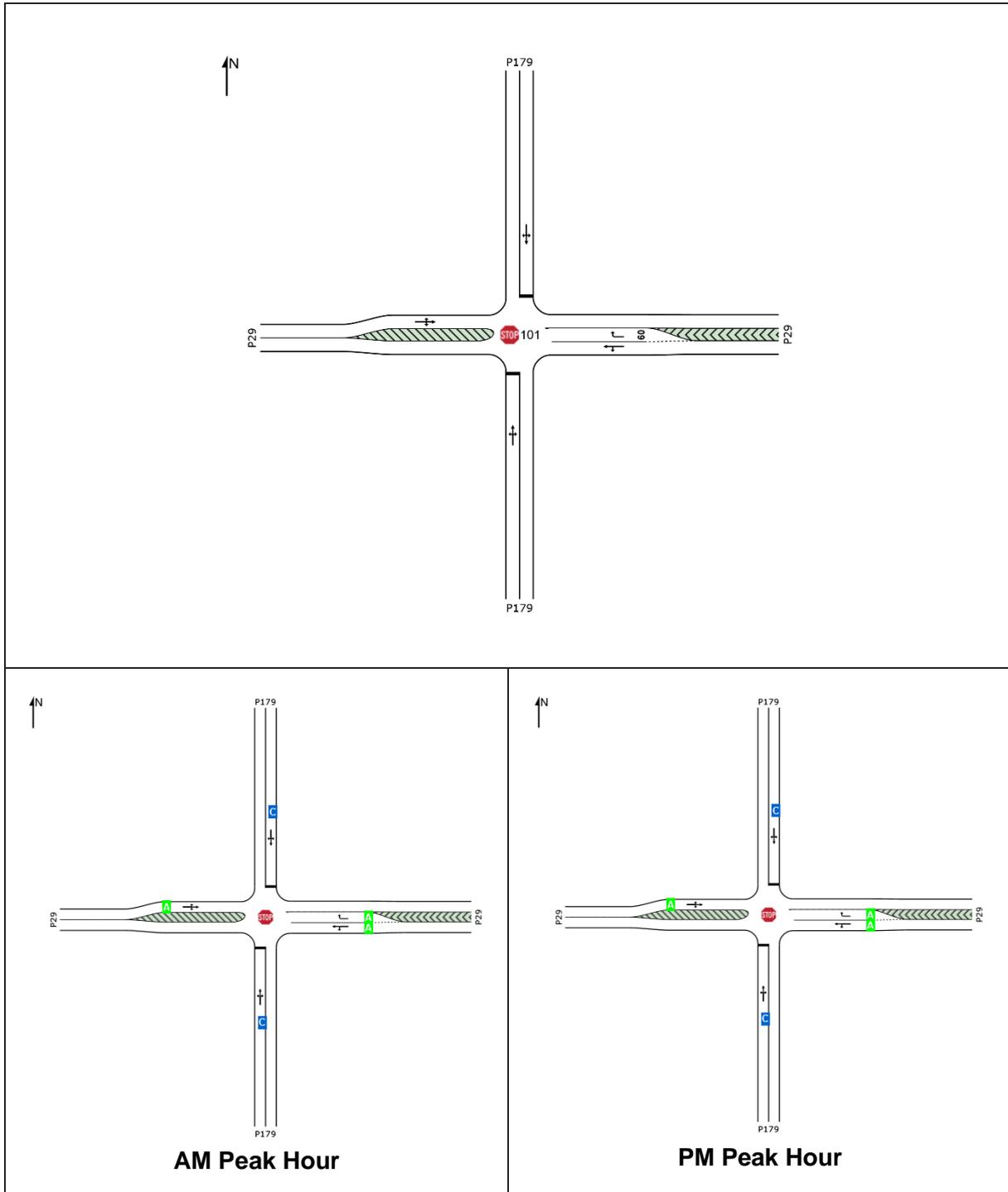
Colour code based on Level of Service



The results of these analyses are presented below with the details contained in Appendix C to this report.

5.2 P29 / P179 Intersection

The following intersection configuration was used for this analysis and the analysis gave the Levels of Service (LOS) as presented below for the 2026 design year traffic without any development generated traffic:



From the SIDRA results, it is evident that this intersection operates at good levels of service during the peak hours. No upgrades are therefore required for this intersection to accommodate the 2026 design year background traffic volumes.

5.3 Existing Pedestrian and Public Transport

Very little pedestrian activity was observed along the roads in the vicinity of the site, along both P29 and P179.

There are no public transport laybys in close vicinity to the site for the proposed development. There are also no sidewalks provided along either the P29 or the P179 in the vicinity of the site.

5.4 Existing Road Safety

Sight distance conditions along all the roads in the vicinity of the proposed development are generally acceptable where specific sight distance types are required. Traffic generally travels at acceptable speeds on the surrounding road network in the vicinity of the proposed development along the P29 and along the P179.

6 Development Traffic Particulars

6.1 The Development Proposals

The proposed development is planned to consist of the following land uses and floor area:

- Petrol Filling Station
- Retail – 12 363m² GLA (250m² convenience shop for PFS and 12 113m² shopping centre)
- 20 000m² Light Industry

Access to the proposed development will be off the P179, a minimum 60m from the P29 STOP line. No access will be provided off the P29.

6.2 Trip Generation Rates

Based on the intention to analyse the development for the land uses and floor areas as described above, the Saturday AM and Friday PM peak hour trip generation rates as contained in the TMH16 South African Traffic Impact and Site Traffic Assessments Manual (August 2012) have been used to calculate the maximum potential traffic that could be generated by the proposed mixed use development.

This manual gives the following AM and PM peak hour trip generation rates and directional splits for the above-mentioned land uses:

Petrol Filling Station:

- Saturday AM Peak Hour: 4% of traffic on adjacent streets with a 50:50 (In: Out) directional split
- Friday PM Peak Hour: 4% of traffic on adjacent streets with a 50:50 (In: Out) directional split

Of the above, 16% are deemed to be new trips on the surrounding road network and the balance will pass by trips already travelling along the R66.

Retail (12 363m²):

- Saturday AM Peak Hour: 4.50 veh/h two-way per 100m² with a 50:50 (In: Out) directional split
- Friday PM Peak Hour: 3.40 veh/h two-way per 100m² with a 50:50 (In: Out) directional split

For a shopping centre, a Retail Size Adjustment Factor must be multiplied to the Trip Generation Rates to compensate for the size of the shops. The Retail Size Adjustment Factor for the shops was calculated to be 2.32.

The adjusted trip generation rates for the shops are as follows:

- Saturday AM Peak Hour: 10.44 veh/h two-way per 100m² with a 50:50 (In: Out) directional split
- Friday PM Peak Hour: 7.89 veh/h two-way per 100m² with a 50:50 (In: Out) directional split

Service Industry:

- Saturday AM Peak Hour: 0.15 veh/h two-way per 100m² with a 50:50 (In: Out) directional split
- Friday PM Peak Hour: 0.9 veh/h two-way per 100m² with a 25:75 (In: Out) directional split

6.3 Trip Generation Calculations

Based on the above trip generation rates and directional splits, the maximum potential trip generation of the proposed development for the Saturday AM and Friday PM peak hours are calculated in Table 2 below:

Landuse	Traffic Vols (veh/h) GLA (m ²)	Trip Gen Rate	Total Two- Way Trips	AM Peak Hour		PM Peak Hour	
				IN	OUT	IN	OUT
Petrol Filling Station	862	AM: 4%	34	17	17	19	19
	952	PM: 4%	38				
Retail	12 363(m ²)	AM: 10.44/100m ²	1290	645	645	488	488
		PM: 7.89/100m ²	976				
Service Industry	20 000(m ²)	AM: 0.15/100m ²	30	15	15	45	135
		PM: 0.9/100m ²	180				
TOTAL				677	677	552	642

Table 2: Maximum Potential Trip Generation by Peak Hour

7 Trip Distribution and Traffic Assignment

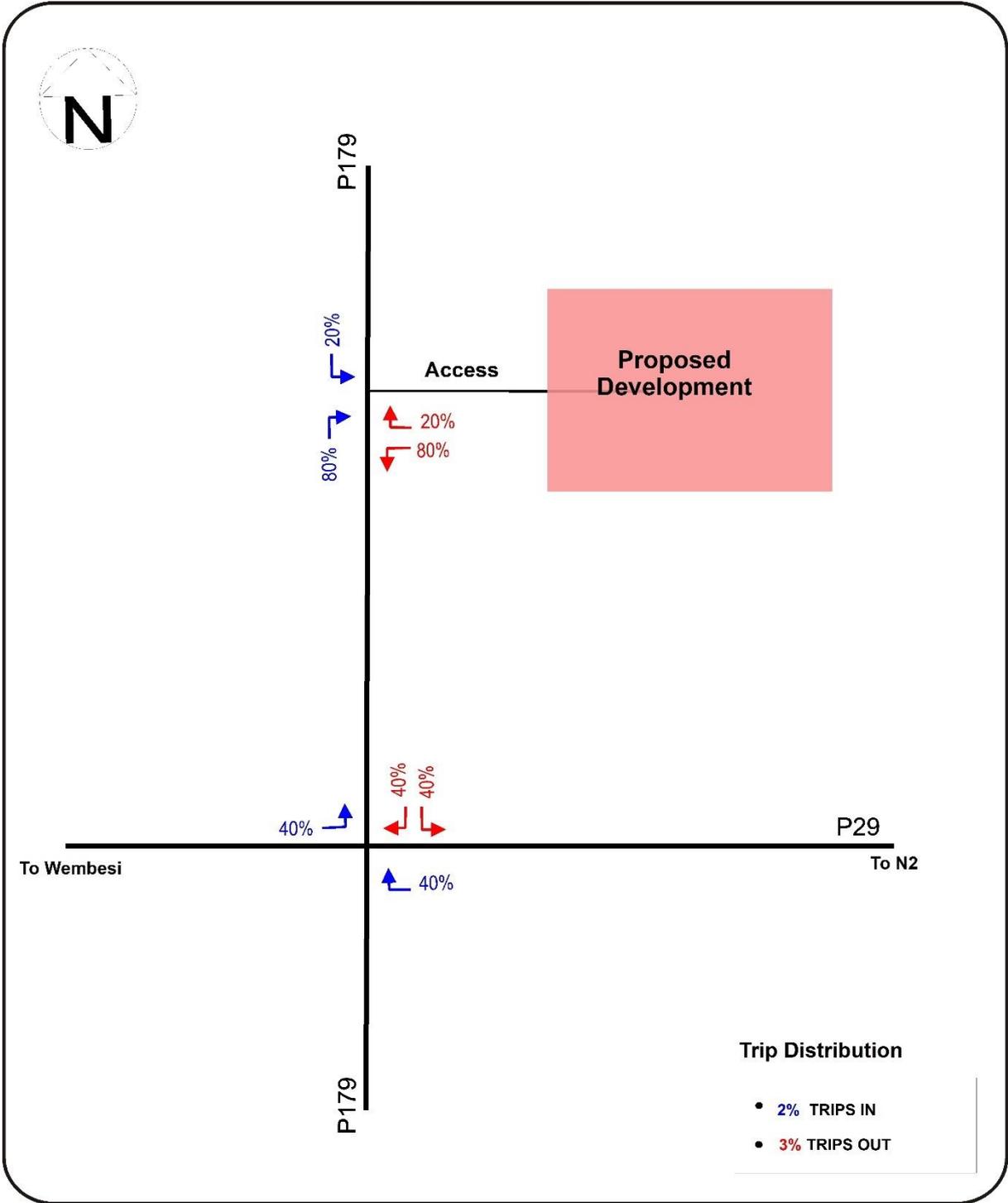
7.1 Trip Distribution

The distribution of the traffic generated by the proposed development is expected to be in similar ratios by direction to the distribution of the existing Saturday AM and Friday PM peak hour traffic travelling along the two roads and through the intersection that are being analysed in this assessment. This distribution is also deemed to reflect the location of surrounding residential developments for the shopping centre as well as the location of the workers in the industrial component of the development. This will therefore be used to assign the traffic generated by the proposed development.

The distribution patterns for the proposed development are shown in Figure 4 below.

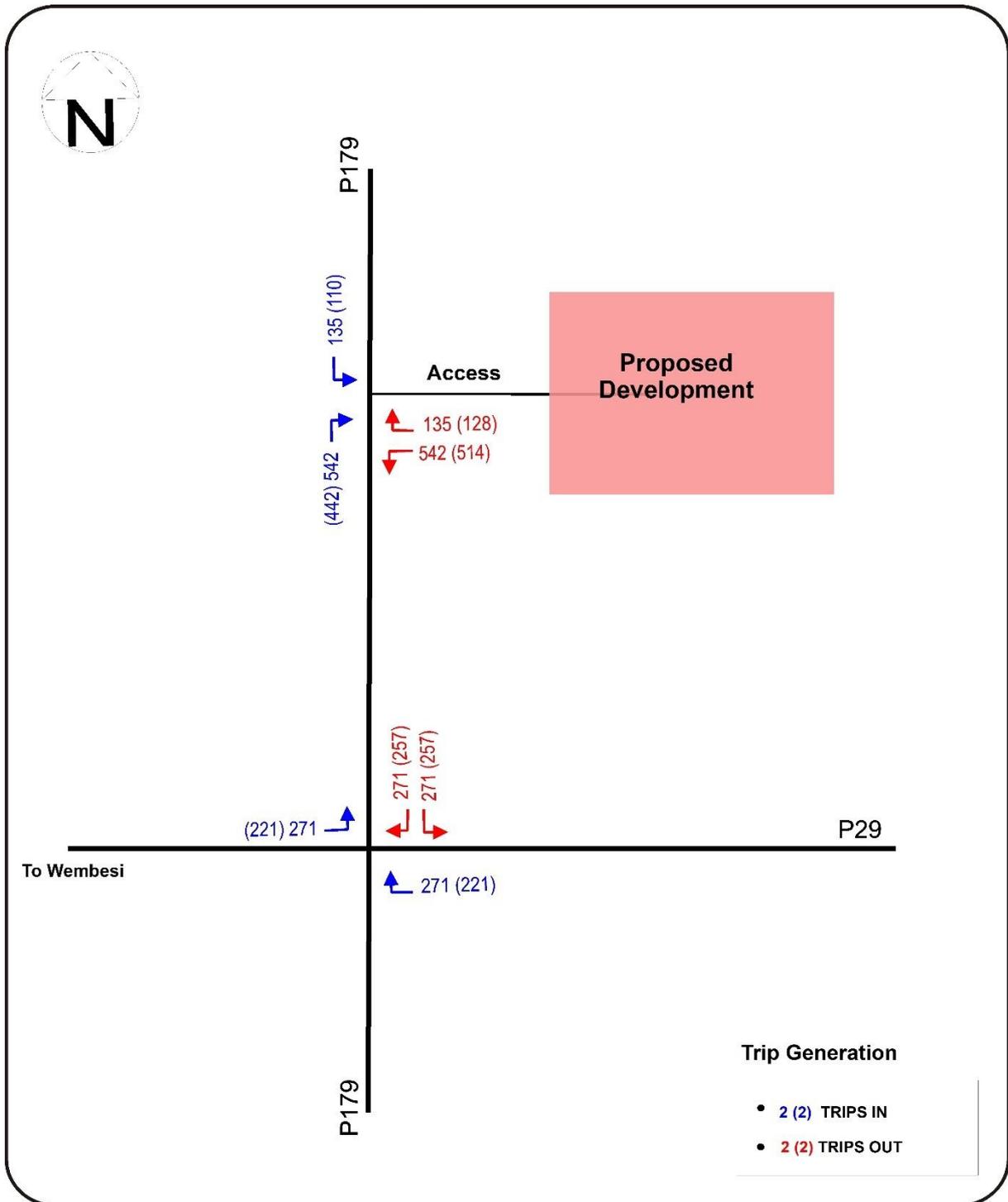
7.2 Trip Assignment

Based on the distribution pattern, the maximum potential Saturday AM and Friday PM peak hour traffic expected to be generated by the proposed development was assigned onto the road network as shown in Figure 5 below.



	Trip Distribution	PROJECT:
	Proposed Wembesi Development	
August 2021	ZUTARI (PTY) LTD	NOT TO SCALE

Figure 4: Trip Distribution



	Trip Generation	PROJECT:
	Proposed Wembesi Development	
August 2021	ZUTARI (PTY) LTD	NOT TO SCALE

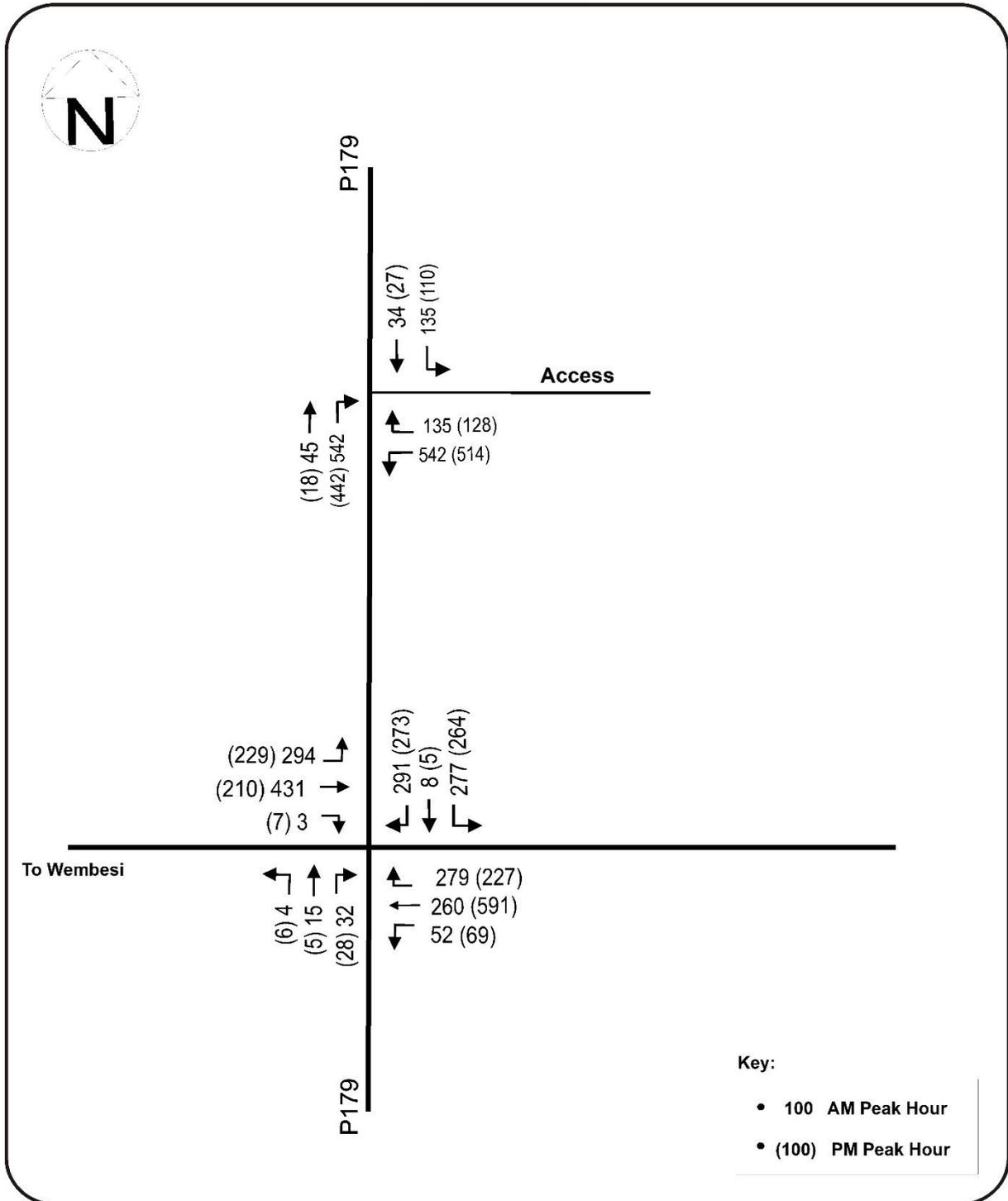
Figure 5: Trip Generation

8 2026 Design Year Background Traffic with Development Traffic

The traffic impact assessment has been based on the following:

- 2026 background Saturday AM and Friday PM peak hour traffic volumes as shown in Figure 3 above
- Maximum potential Saturday AM and Friday PM peak hour traffic expected to be generated by the proposed development as calculated in Table 2 and shown in Figure 5 above.

The combined 2026 Design Year plus the development generated Saturday AM and Friday PM peak hour traffic is shown in Figure 6 below. The results of the SIDRA analyses of these combined 2026 Design Year plus the development generated Saturday AM and Friday PM peak hour traffic are contained in Appendix C.

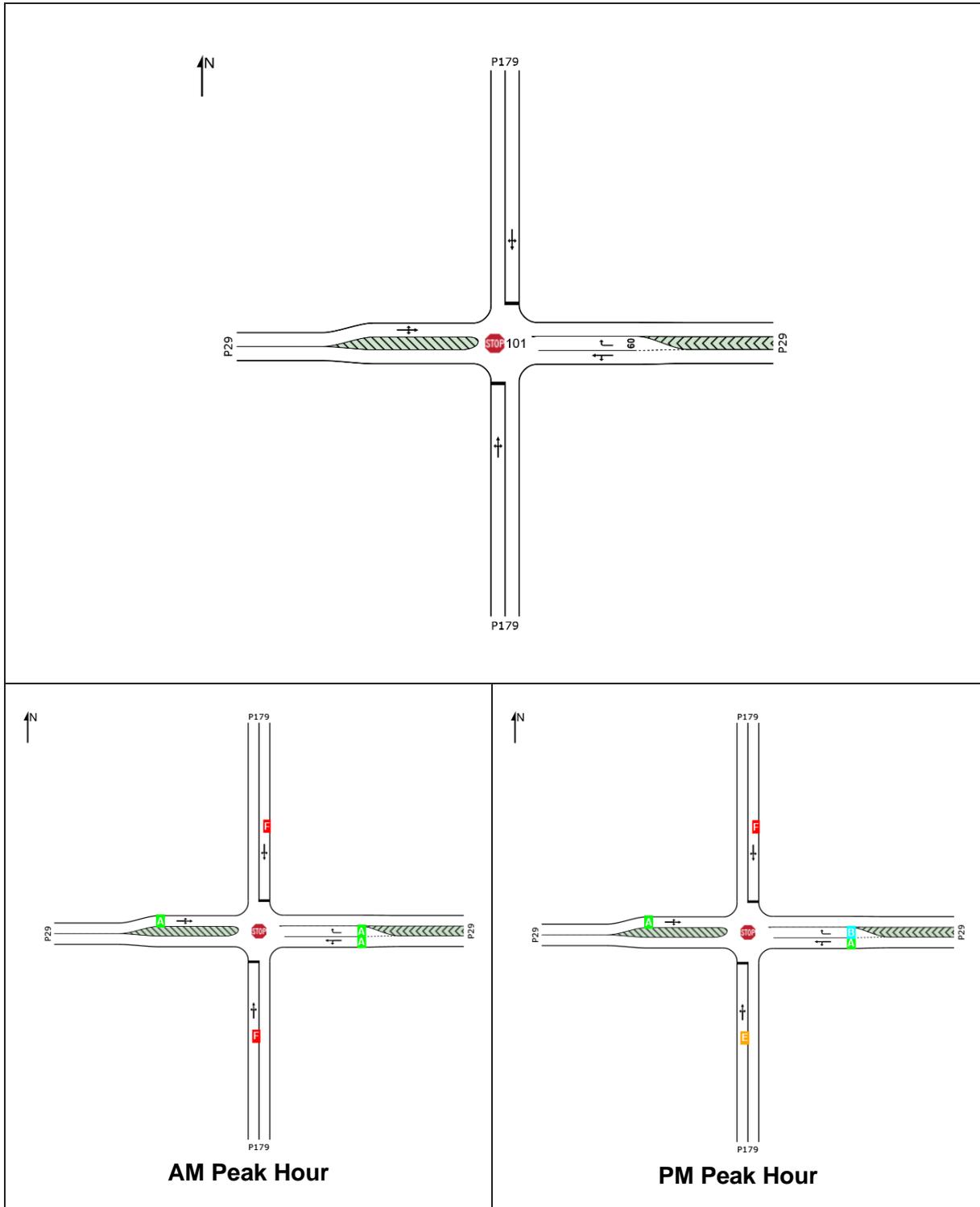


	2026 (5 Year) Saturday AM & Friday PM Peak Hour Traffic Volumes with development generated traffic	PROJECT:
	Proposed Wembesi Development	
August 2021	ZUTARI (PTY) LTD	NOT TO SCALE

Figure 6: 2026 Design Year Peak Hour Volumes with Development Generated Volumes

8.1 P29 / P179 Intersection

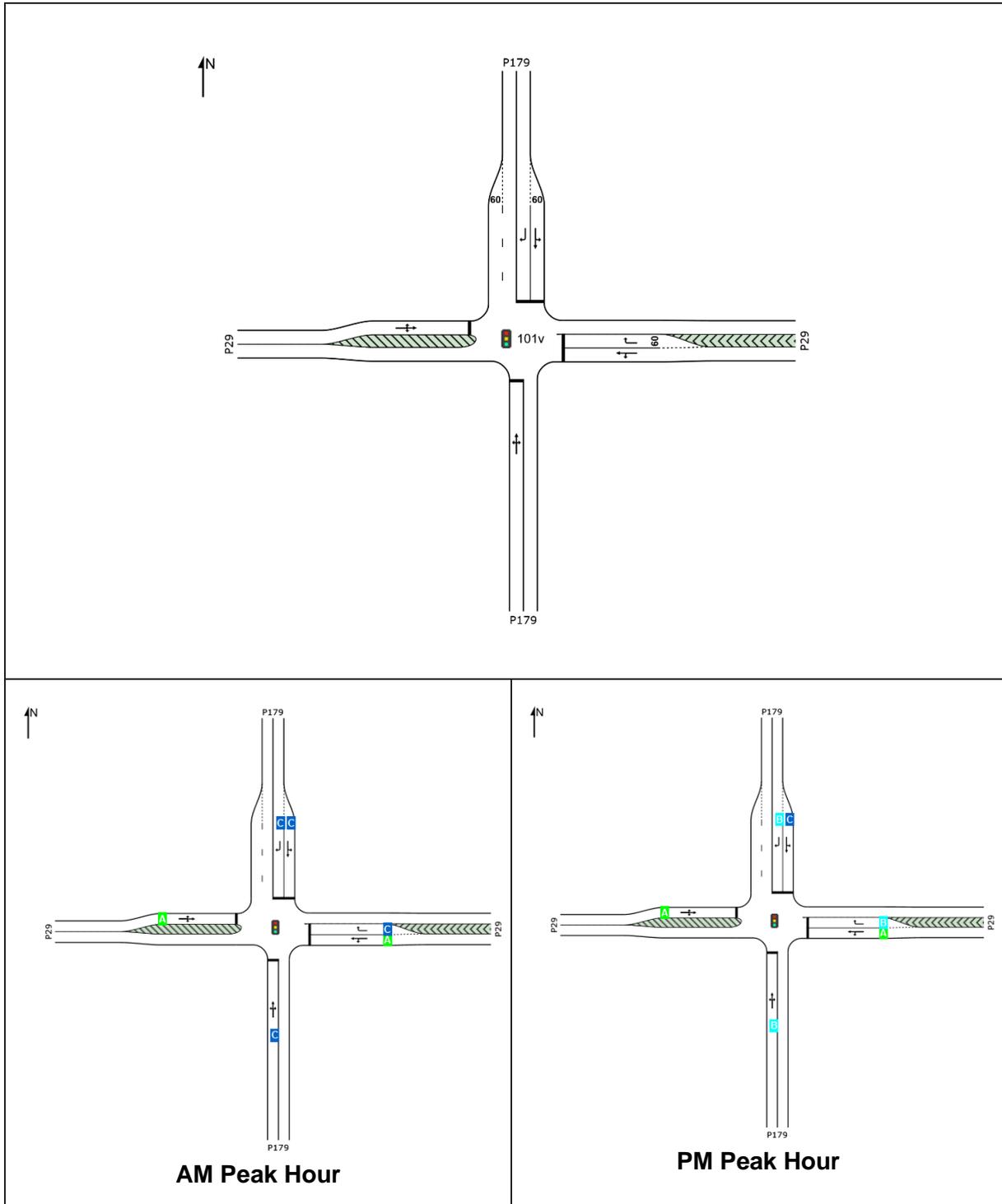
The following intersection configuration was used for this analysis and the analysis gave the Levels of Service (LOS) as presented below for the 2026 design year traffic with development generated traffic:



From the SIDRA results, it is evident that this intersection will fail during the peak hours due to eth traffic generated by this mixed use development. This intersection will need to be upgraded to accommodate the 2026 design year traffic volumes.

8.2 P29 / P179 Intersection – Upgrade

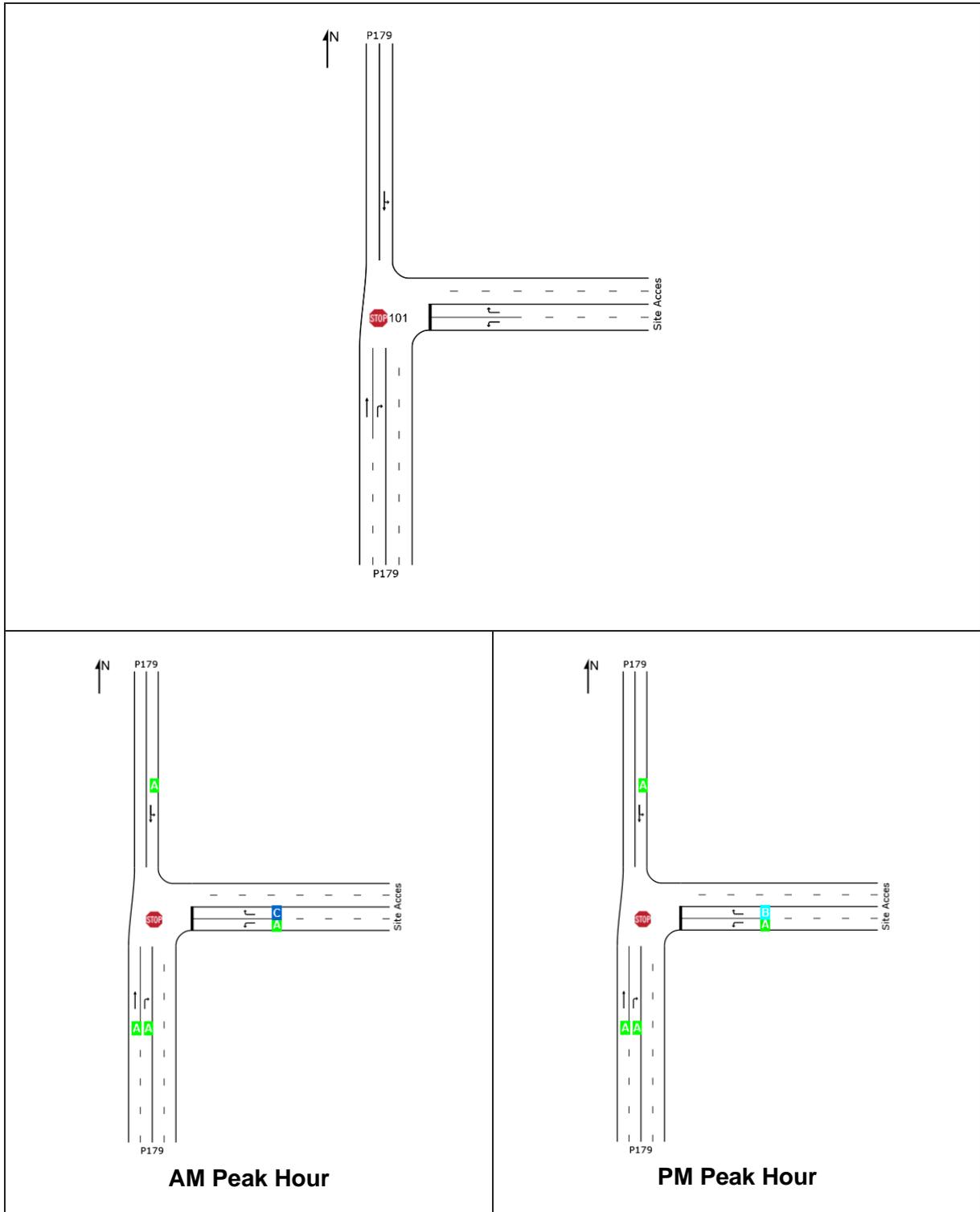
A review of the potential options to upgrade this intersection showed that the most cost effective upgrade will be to convert the existing intersection layout into a signalised intersection with some minor geometric improvements. The intersection was therefore analysed as a signalised intersection plus an additional lane in each direction in the P179 between the P29 and the planned access to the proposed development.



From the SIDRA results, it is evident that this upgraded and signalised intersection will operate at acceptable levels of service during the respective peak hours.

8.3 P179 / Site Access Intersection

The following intersection configuration was used for this analysis and the analysis gave the Levels of Service (LOS) as presented below for the 2026 design year traffic plus the development generated traffic:



From the SIDRA results, it is evident that this intersection will operate at acceptable levels of service during the peak hours.

8.4 Road Link Capacity

P29

The existing two-way capacity of the P29 can accommodate the increase in two-way traffic generated by the proposed development without requiring any additional lanes in both directions on both sides of the P29 intersection. The capacity of the P29 will also be sufficient to handle the development traffic and background traffic in the 5-year horizon.

P179

The P179 will not be able to handle the additional traffic generated by the proposed development in the vicinity of the site. Therefore, an additional lane in each direction is required between the intersection of P29/P179 and the site access. This length is 60m.

The cost of this upgrade is to the developer of the centre.

9 Future Road Conditions

9.1 Pedestrians and Public Transport

The proposed development is expected to generate public transport passengers and pedestrians. Sidewalks are therefore to be provided along the P179 frontage up to the intersection of P29 to cater for the pedestrians generated by this proposed development. It is also recommended that sidewalks are provided along both edges of the access road into the development to separate pedestrians from the vehicular traffic.

A public transport facility is recommended to be provided within the development to cater for public transport activity and public transport passengers that the proposed development will generate. It is further recommended that the layout of this facility is presented to the local minibus taxi associations that are likely to use the facility before it is constructed.

9.2 Road Safety

No adverse road safety conditions are expected to occur due to the increase in traffic, pedestrians and public transport generated by the proposed development.

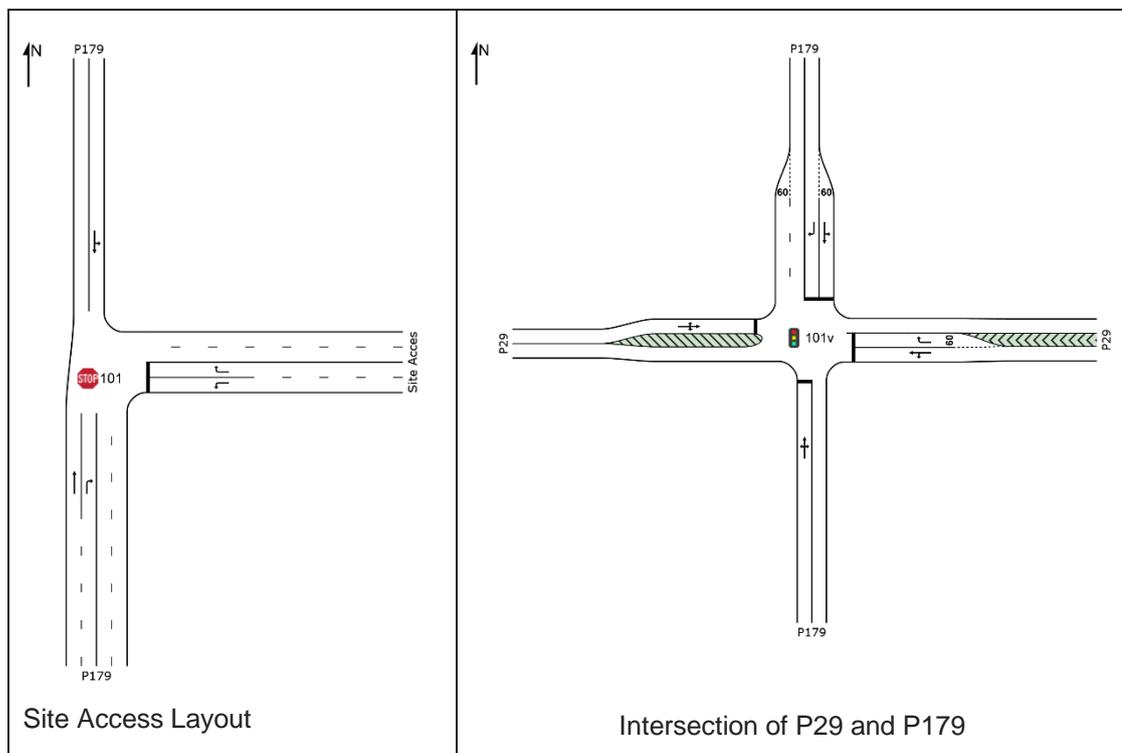
Sight distance conditions are acceptable along all existing roads in the vicinity of the proposed development. Traffic along these roads travel at acceptable speeds in the vicinity of the proposed development.

In accordance with the requirements of the KwaZulu-Natal Department of Transport, all signalised intersections are required to have street lighting along all approaches. It is also recommended that street lighting is provided at the development entrance intersection to improve visibility at the intersection at night.

10 Proposed Road Network Improvements

The following road network improvements are required with the addition of the development generated traffic:

- The intersection of P29 and P179 to be converted to a signalised intersection.
- An additional lane is required in each direction on the P179 between the P29 and the proposed development access. The length of these two lanes 60m.
- Sidewalks are to be provided along the P179 frontage of the proposed development to cater for the pedestrians generated by the development.
- Sidewalks are also recommended along both edges of the access road into the development.
- In accordance with the requirements of the KwaZulu-Natal Department of Transport, all signalised intersections are required to have street lighting along all approaches.
- It is also recommended that street lighting is provided at the development entrance intersection to improve visibility at the intersection at night.
- It is recommended that a public transport facility is provided within the development to cater for any public transport activity and the public transport passengers generated by the proposed development.
- A 15m building line is to be applied along both the P29 and P179 frontages of the development. The 15m building line may be relaxed by the KZN DoT on application to 7.5m for internal roads and parking
- No fuel tanks permitted within the building line
- The recommended intersection layouts and control are presented below:



11 Conclusions

The following conclusions can be drawn from the above Traffic Impact Assessment for the proposed petrol filling station, retail and industrial development in Wembesi, KwaZulu-Natal.

- Petrol Filling Station
- Retail – 12 363m² GLA (250m² convenience shop for PFS and 12 113m² shopping centre)
- Light Industry - 20 000m² floor area
- The proposed development is situated on Portion 51 of the Farm Kliplaat No.1009 in Wembesi
- The analysis of the 2026 background traffic conditions on the road network surrounding the site operated at good levels of service during the peak hours.
- There are no existing public transport facilities in close proximity of the proposed development.
- The road safety conditions on all the roads in the vicinity of the site are acceptable for the function of the road and environment through which they pass. There are no known adverse road safety conditions in any of the roads that have been assessment as part of this TIA.
- For the purpose of this Traffic Impact Assessment the development of a petrol filling station, retail, and light industry, is deemed to be the maximum impact scenario and was analysed for the proposed uses permitted for the Saturday AM and Friday PM peak hours.
- The distribution of the traffic generated by the proposed development is expected to be in similar ratios to the distribution of the existing Saturday AM and Friday PM peak hour traffic travelling along all the roads and through all the intersections that are being analysed in this assessment as well as reflect the location of the surrounding residential areas.
- With the addition of the development generated traffic, the analysis showed that road network improvements are required. These are presented in the Recommendations section of this report above.

The proposed development can therefore be supported from a traffic and transportation perspective, provided the recommended road network improvements are implemented.

Appendices

Appendix A: Site Development Plan

Appendix B: Traffic Counts

TRAFFIC SURVEY																
CLIENT:																
SITE:	INTERSECTION OF P29 AND P179, WEMBEZI															
DATE:	PEAK HOUR COUNT ON FRIDAY 16 APRIL 2021															
UNITS:	CLASSIFIED															
APPROACH FROM NAME	NORTH															TOTAL
	P29					P179					P179					ALL
MOVEMENT	LEFT TURN					STRAIGHT					RIGHT TURN					MOVEMENTS
TIME	C	T	H	B	TOTAL	C	T	H	B	TOTAL	C	T	H	B	TOTAL	
12:00 - 12:15	5	2	0	0	7	31	8	0	0	39	0	0	0	0	0	46
12:15 - 12:30	5	0	1	0	6	18	8	1	0	27	0	0	0	0	0	33
12:30 - 12:45	6	1	0	0	7	41	14	0	0	55	1	0	0	0	1	63
12:45 - 13:00	3	1	1	0	5	38	10	2	1	51	2	0	0	0	2	58
13:00 - 13:15	6	1	0	0	7	31	24	1	0	56	1	0	0	0	1	64
13:15 - 13:30	9	2	0	0	11	31	14	1	0	46	1	0	0	0	1	58
13:30 - 13:45	5	1	0	0	6	32	20	0	0	52	1	0	1	0	2	60
13:45 - 14:00	4	0	0	0	4	37	17	0	0	54	1	0	0	0	1	59
14:00 - 14:15	5	0	0	0	5	35	5	1	0	41	3	0	0	0	3	49
14:15 - 14:30	1	2	0	0	3	50	19	3	0	72	2	0	1	0	3	78
14:30 - 14:45	3	0	0	0	3	37	9	1	0	47	0	0	1	0	1	51
14:45 - 15:00	9	0	1	0	10	34	16	0	0	50	0	0	0	0	0	60
15:00 - 15:15	6	1	0	0	7	39	15	0	0	54	0	0	0	0	0	61
15:15 - 15:30	11	0	1	0	12	42	15	0	0	57	1	0	0	0	1	70
15:30 - 15:45	8	3	0	0	11	35	13	2	0	50	2	0	0	0	2	63
15:45 - 16:00	5	3	0	0	8	62	16	1	0	79	1	0	0	0	1	88
16:00 - 16:15	9	0	0	0	9	68	26	0	0	94	3	0	0	0	3	106
16:15 - 16:30	9	0	0	0	9	28	19	3	0	50	2	0	0	0	2	61
16:30 - 16:45	5	1	0	0	6	102	33	2	0	137	2	1	0	0	3	146
16:45 - 17:00	7	1	0	0	8	75	17	2	0	94	0	0	0	0	0	102
17:00 - 17:15	12	1	1	0	14	87	29	1	0	117	1	0	0	0	1	132
17:15 - 17:30	10	1	2	0	13	77	27	1	0	105	0	0	0	0	0	118
17:30 - 17:45	12	2	1	0	15	91	35	0	0	126	2	0	0	0	2	143
17:45 - 18:00	8	3	0	0	11	81	24	2	0	107	0	1	0	0	1	119
TOTAL	163	26	8	0	197	1202	433	24	1	1660	26	2	3	0	31	1888

TRAFFIC SURVEY																
CLIENT:																
SITE:	INTERSECTION OF P29 AND P179, WEMBEZI															
DATE:	PEAK HOUR COUNT ON FRIDAY 16 APRIL 2021															
UNITS:	CLASSIFIED															
APPROACH FROM NAME MOVEMENT TIME	SOUTH P29															TOTAL
	LEFT TURN					STRAIGHT					RIGHT TURN					ALL
	C	T	H	B	TOTAL	C	T	H	B	TOTAL	C	T	H	B	TOTAL	MOVEMENTS
12:00 - 12:15	1	0	0	0	1	26	11	1	0	38	0	0	0	0	0	39
12:15 - 12:30	0	0	0	0	0	32	8	2	0	42	0	0	0	0	0	42
12:30 - 12:45	3	0	0	0	3	36	13	3	0	52	0	0	0	0	0	55
12:45 - 13:00	0	0	0	0	0	76	15	0	0	91	0	0	0	0	0	91
13:00 - 13:15	0	0	0	0	0	63	10	1	0	74	0	0	1	0	1	75
13:15 - 13:30	6	0	0	0	6	59	12	1	0	72	1	0	0	0	1	79
13:30 - 13:45	2	0	0	0	2	57	12	1	0	70	3	0	0	0	3	75
13:45 - 14:00	4	0	1	0	5	57	14	0	0	71	0	0	0	0	0	76
14:00 - 14:15	1	0	0	0	1	60	7	1	0	68	0	0	0	0	0	69
14:15 - 14:30	1	0	0	0	1	62	19	0	0	81	0	0	0	0	0	82
14:30 - 14:45	0	0	0	0	0	34	9	2	0	45	1	0	0	0	1	46
14:45 - 15:00	2	0	0	0	2	34	20	2	0	56	0	0	0	0	0	58
15:00 - 15:15	1	0	0	0	1	41	15	0	0	56	0	0	0	0	0	57
15:15 - 15:30	6	0	3	0	9	33	15	1	0	49	0	0	0	0	0	58
15:30 - 15:45	1	0	0	0	1	24	20	0	0	44	0	0	0	0	0	45
15:45 - 16:00	2	0	0	0	2	23	11	2	0	36	0	0	0	0	0	38
16:00 - 16:15	2	0	0	0	2	24	15	0	0	39	2	0	0	0	2	43
16:15 - 16:30	0	0	0	0	0	21	17	0	0	38	0	0	0	0	0	38
16:30 - 16:45	1	0	0	0	1	32	16	1	0	49	1	0	0	0	1	51
16:45 - 17:00	2	0	0	0	2	36	13	1	0	50	0	0	0	0	0	52
17:00 - 17:15	1	0	0	0	1	22	20	0	0	42	0	0	0	0	0	43
17:15 - 17:30	1	0	0	0	1	18	23	1	0	42	2	0	0	0	2	45
17:30 - 17:45	1	0	0	0	1	23	15	1	0	39	1	0	0	0	1	41
17:45 - 18:00	3	0	0	0	3	19	20	0	0	39	2	0	0	0	2	44
TOTAL	41	0	4	0	45	912	350	21	0	1283	13	0	1	0	14	1342

TRAFFIC SURVEY																
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DATE:	PEAK HOUR COUNT ON FRIDAY 16 APRIL 2021															
UNITS:	CLASSIFIED															
APPROACH FROM NAME	EAST P179															TOTAL
	LEFT TURN					STRAIGHT					RIGHT TURN					ALL MOVEMENTS
MOVEMENT TIME	C	T	H	B	TOTAL	C	T	H	B	TOTAL	C	T	H	B	TOTAL	
12:00 - 12:15	0	0	0	0	0	0	0	0	0	0	4	0	1	0	5	5
12:15 - 12:30	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	4
12:30 - 12:45	0	0	0	0	0	0	0	0	0	0	4	1	1	0	6	6
12:45 - 13:00	1	0	0	0	1	0	0	0	0	0	4	0	0	0	4	5
13:00 - 13:15	3	0	0	0	3	0	0	0	0	0	5	0	0	0	5	8
13:15 - 13:30	1	1	0	0	2	0	0	0	0	0	6	1	0	0	7	9
13:30 - 13:45	1	0	0	0	1	1	0	0	0	1	5	1	0	0	6	8
13:45 - 14:00	0	0	0	0	0	3	0	0	0	3	6	1	0	0	7	10
14:00 - 14:15	0	0	0	0	0	1	0	0	0	1	3	1	0	0	4	5
14:15 - 14:30	0	0	0	0	0	0	0	0	0	0	4	1	0	1	6	6
14:30 - 14:45	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	2
14:45 - 15:00	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
15:00 - 15:15	1	0	0	0	1	0	0	0	0	0	3	1	0	0	4	5
15:15 - 15:30	0	0	0	0	0	0	0	0	0	0	2	2	0	0	4	4
15:30 - 15:45	1	0	0	0	1	0	0	0	0	0	4	0	0	0	4	5
15:45 - 16:00	0	0	0	0	0	0	0	0	0	0	2	1	0	0	3	3
16:00 - 16:15	1	0	0	0	1	0	0	0	0	0	2	0	1	0	3	4
16:15 - 16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30 - 16:45	1	0	0	0	1	1	0	0	0	1	3	2	0	0	5	7
16:45 - 17:00	0	0	0	0	0	0	0	0	0	0	2	1	0	0	3	3
17:00 - 17:15	1	0	0	0	1	0	0	1	0	1	3	0	0	0	3	5
17:15 - 17:30	1	0	0	0	1	0	0	0	0	0	3	2	0	0	5	6
17:30 - 17:45	0	0	0	0	0	1	0	0	0	1	4	3	0	0	7	8
17:45 - 18:00	2	0	0	0	2	1	0	0	0	1	6	1	0	0	7	10
TOTAL	15	1	0	0	16	9	0	1	0	10	81	19	3	1	104	130

TRAFFIC SURVEY																
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DATE:	PEAK HOUR COUNT ON FRIDAY 16 APRIL 2021															
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APPROACH FROM NAME MOVEMENT TIME	WEST P179															TOTAL
	LEFT TURN					STRAIGHT					RIGHT TURN					ALL MOVEMENTS
	C	T	H	B	TOTAL	C	T	H	B	TOTAL	C	T	H	B	TOTAL	
12:00 - 12:15	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
12:15 - 12:30	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
12:30 - 12:45	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	2
12:45 - 13:00	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
13:00 - 13:15	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
13:15 - 13:30	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
13:30 - 13:45	4	0	0	0	4	3	0	0	0	3	0	0	0	0	0	7
13:45 - 14:00	1	0	0	0	1	1	0	0	0	1	1	0	0	0	1	3
14:00 - 14:15	1	0	0	0	1	1	0	0	0	1	2	0	0	0	2	4
14:15 - 14:30	1	0	0	0	1	0	0	0	0	0	5	0	0	0	5	6
14:30 - 14:45	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
14:45 - 15:00	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1	2
15:00 - 15:15	1	0	1	0	2	2	0	0	0	2	2	0	0	0	2	6
15:15 - 15:30	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	2
15:30 - 15:45	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
15:45 - 16:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
16:00 - 16:15	0	0	1	0	1	0	0	0	0	0	7	0	0	0	7	8
16:15 - 16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30 - 16:45	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
16:45 - 17:00	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	3
17:00 - 17:15	1	0	0	0	1	0	0	0	0	0	3	0	0	0	3	4
17:15 - 17:30	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
17:30 - 17:45	1	0	0	0	1	2	0	0	0	2	2	0	0	0	2	5
17:45 - 18:00	3	0	0	0	3	1	0	0	0	1	4	1	0	0	5	9
TOTAL	20	0	2	0	22	12	1	1	0	14	38	1	0	0	39	75

TRAFFIC SURVEY																
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DATE:	PEAK HOUR COUNT ON SATURDAY 17 APRIL 2021															
UNITS:	CLASSIFIED															
APPROACH FROM NAME MOVEMENT TIME	NORTH P29															TOTAL
	LEFT TURN					STRAIGHT					RIGHT TURN					ALL
	C	T	H	B	TOTAL	C	T	H	B	TOTAL	C	T	H	B	TOTAL	MOVEMENTS
08:00 - 08:15	4	3	0	0	7	20	16	0	0	36	0	0	0	0	0	43
08:15 - 08:30	5	2	1	0	8	19	11	1	0	31	1	0	0	0	1	40
08:30 - 08:45	3	1	0	0	4	20	8	3	0	31	1	0	0	0	1	36
08:45 - 09:00	5	1	2	0	8	36	3	3	0	42	3	0	0	0	3	53
09:00 - 09:15	6	0	1	0	7	31	8	0	1	40	2	0	0	0	2	49
09:15 - 09:30	8	0	0	0	8	28	3	1	0	32	1	0	0	0	1	41
09:30 - 09:45	8	0	0	0	8	31	19	0	0	50	0	0	0	0	0	58
09:45 - 10:00	9	1	0	0	10	31	7	2	0	40	5	0	0	0	5	55
10:00 - 10:15	13	1	1	0	15	43	7	1	0	51	1	0	0	0	1	67
10:15 - 10:30	6	1	0	0	7	47	8	0	0	55	2	0	0	0	2	64
10:30 - 10:45	7	0	1	0	8	35	8	1	0	44	2	0	0	0	2	54
10:45 - 11:00	8	1	0	1	10	45	4	1	0	50	1	0	0	0	1	61
11:00 - 11:15	2	1	0	0	3	25	5	0	0	30	1	0	0	0	1	34
11:15 - 11:30	4	0	0	0	4	29	8	0	0	37	0	0	0	0	0	41
11:30 - 11:45	2	1	0	0	3	39	8	1	0	48	0	0	0	0	0	51
11:45 - 12:00	6	0	0	0	6	28	4	0	0	32	0	0	0	0	0	38
12:00 - 12:15	5	0	0	0	5	32	10	1	0	43	2	0	0	0	2	50
12:15 - 12:30	6	1	0	0	7	41	14	0	0	55	2	0	0	0	2	64
12:30 - 12:45	3	0	0	0	3	35	11	1	0	47	0	0	0	0	0	50
12:45 - 13:00	6	0	0	0	6	36	9	0	0	45	1	0	0	0	1	52
13:00 - 13:15	6	1	0	0	7	40	11	0	0	51	0	0	0	0	0	58
13:15 - 13:30	7	1	0	0	8	39	16	0	0	55	1	0	0	0	1	64
13:30 - 13:45	7	0	0	0	7	31	7	1	0	39	2	0	0	0	2	48
13:45 - 14:00	5	0	0	0	5	42	13	0	0	55	2	0	0	0	2	62
TOTAL	141	16	6	1	164	803	218	17	1	1039	30	0	0	0	30	1233

TRAFFIC SURVEY																
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UNITS:	CLASSIFIED															
APPROACH FROM NAME MOVEMENT TIME	SOUTH P29															TOTAL
	LEFT TURN					STRAIGHT					RIGHT TURN					ALL
	C	T	H	B	TOTAL	C	T	H	B	TOTAL	C	T	H	B	TOTAL	MOVEMENTS
08:00 - 08:15	1	0	0	0	1	36	12	1	0	49	1	0	0	0	1	51
08:15 - 08:30	2	0	0	0	2	35	13	5	0	53	1	0	0	0	1	56
08:30 - 08:45	3	0	0	0	3	38	11	1	1	51	0	0	0	0	0	54
08:45 - 09:00	3	0	0	0	3	49	13	0	0	62	2	0	0	0	2	67
09:00 - 09:15	0	0	0	0	0	57	16	0	0	73	1	0	0	0	1	74
09:15 - 09:30	2	0	0	0	2	45	19	1	0	65	1	0	0	0	1	68
09:30 - 09:45	4	0	0	0	4	72	19	0	0	91	0	0	0	0	0	95
09:45 - 10:00	3	0	1	0	4	39	8	0	0	47	0	0	0	0	0	51
10:00 - 10:15	3	0	0	0	3	59	16	0	0	75	0	0	0	0	0	78
10:15 - 10:30	7	0	0	0	7	40	12	0	0	52	0	0	0	0	0	59
10:30 - 10:45	4	0	0	0	4	87	28	2	0	117	0	0	0	0	0	121
10:45 - 11:00	3	0	0	0	3	70	16	1	0	87	0	0	0	0	0	90
11:00 - 11:15	2	0	0	0	2	29	10	2	0	41	0	0	0	0	0	43
11:15 - 11:30	6	0	0	0	6	57	14	0	0	71	0	0	0	0	0	77
11:30 - 11:45	4	0	0	0	4	74	7	1	0	82	0	0	0	0	0	86
11:45 - 12:00	3	0	0	0	3	48	17	1	0	66	2	0	0	0	2	71
12:00 - 12:15	10	2	0	0	12	43	13	2	0	58	0	0	0	0	0	70
12:15 - 12:30	3	0	0	0	3	51	23	2	0	76	1	0	0	0	1	80
12:30 - 12:45	2	0	0	0	2	87	20	0	1	108	1	0	0	0	1	111
12:45 - 13:00	3	0	0	0	3	27	9	0	0	36	0	0	0	0	0	39
13:00 - 13:15	4	0	0	0	4	30	6	0	0	36	0	0	0	0	0	40
13:15 - 13:30	7	0	0	0	7	31	10	2	0	43	0	0	0	0	0	50
13:30 - 13:45	4	0	0	0	4	31	13	1	0	45	0	0	0	0	0	49
13:45 - 14:00	1	0	0	0	1	31	10	1	0	42	2	0	0	0	2	45
TOTAL	84	2	1	0	87	1166	335	23	2	1526	12	0	0	0	12	1625

TRAFFIC SURVEY																
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DATE:	PEAK HOUR COUNT ON SATURDAY 17 APRIL 2021															
UNITS:	CLASSIFIED															
APPROACH FROM NAME	EAST P179															TOTAL
	LEFT TURN					STRAIGHT					RIGHT TURN					ALL MOVEMENTS
MOVEMENT TIME	C	T	H	B	TOTAL	C	T	H	B	TOTAL	C	T	H	B	TOTAL	
08:00 - 08:15	1	0	0	0	1	0	0	0	0	0	2	1	0	0	3	4
08:15 - 08:30	1	0	0	0	1	1	0	0	0	1	3	0	0	0	3	5
08:30 - 08:45	0	0	0	0	0	1	0	0	0	1	4	0	1	0	5	6
08:45 - 09:00	0	0	0	0	0	1	0	0	0	1	8	0	0	0	8	9
09:00 - 09:15	0	0	0	0	0	0	0	0	0	0	6	0	0	0	6	6
09:15 - 09:30	0	0	0	0	0	1	0	0	0	1	3	0	0	1	4	5
09:30 - 09:45	2	0	0	0	2	0	0	0	0	0	4	1	0	0	5	7
09:45 - 10:00	3	0	0	0	3	0	0	0	0	0	1	0	0	0	1	4
10:00 - 10:15	1	0	0	0	1	1	0	0	0	1	4	1	0	0	5	7
10:15 - 10:30	0	0	0	0	0	1	0	0	0	1	6	0	0	0	6	7
10:30 - 10:45	1	0	0	0	1	3	0	1	0	4	5	1	1	0	7	12
10:45 - 11:00	0	0	0	0	0	5	0	0	0	5	6	0	0	0	6	11
11:00 - 11:15	2	0	0	0	2	1	0	0	0	1	1	1	0	0	2	5
11:15 - 11:30	1	0	0	0	1	1	0	0	0	1	5	0	0	0	5	7
11:30 - 11:45	0	0	0	0	0	0	0	0	0	0	6	1	0	0	7	7
11:45 - 12:00	2	0	0	0	2	0	0	0	0	0	12	0	0	0	12	14
12:00 - 12:15	0	0	0	0	0	2	0	0	0	2	5	0	1	0	6	8
12:15 - 12:30	0	0	0	0	0	1	0	0	0	1	2	2	0	0	4	5
12:30 - 12:45	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	3
12:45 - 13:00	0	0	0	0	0	0	0	0	0	0	12	0	0	0	12	12
13:00 - 13:15	2	0	0	0	2	0	0	0	0	0	7	1	0	0	8	10
13:15 - 13:30	0	0	0	0	0	0	0	0	0	0	7	0	0	0	7	7
13:30 - 13:45	0	0	0	0	0	1	0	0	0	1	7	0	1	0	8	9
13:45 - 14:00	1	0	0	0	1	0	0	0	0	0	4	1	0	0	5	6
TOTAL	17	0	0	0	17	20	0	1	0	21	123	10	4	1	138	176

TRAFFIC SURVEY																
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APPROACH FROM NAME MOVEMENT TIME	WEST P179															TOTAL
	LEFT TURN					STRAIGHT					RIGHT TURN					ALL MOVEMENTS
	C	T	H	B	TOTAL	C	T	H	B	TOTAL	C	T	H	B	TOTAL	
08:00 - 08:15	0	0	0	0	0	2	0	0	0	2	2	0	0	0	2	4
08:15 - 08:30	2	0	0	0	2	2	0	0	0	2	3	0	0	0	3	7
08:30 - 08:45	1	0	0	0	1	1	0	0	0	1	5	0	0	0	5	7
08:45 - 09:00	1	0	0	0	1	0	0	0	0	0	4	0	0	0	4	5
09:00 - 09:15	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	3
09:15 - 09:30	1	0	0	0	1	2	0	0	0	2	1	0	0	0	1	4
09:30 - 09:45	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	3
09:45 - 10:00	0	0	0	0	0	1	0	0	0	1	2	0	2	0	4	5
10:00 - 10:15	1	0	0	0	1	1	0	0	0	1	3	0	0	0	3	5
10:15 - 10:30	0	0	0	0	0	1	0	0	0	1	6	0	0	0	6	7
10:30 - 10:45	2	0	0	0	2	3	0	0	0	3	4	0	0	0	4	9
10:45 - 11:00	1	0	0	0	1	1	0	0	0	1	3	0	0	0	3	5
11:00 - 11:15	2	0	0	0	2	0	0	0	0	0	1	0	0	0	1	3
11:15 - 11:30	0	0	0	0	0	1	0	0	0	1	3	0	0	0	3	4
11:30 - 11:45	4	0	0	0	4	1	0	0	0	1	1	0	0	0	1	6
11:45 - 12:00	3	0	0	0	3	0	0	0	0	0	4	0	0	0	4	7
12:00 - 12:15	0	0	0	0	0	3	0	0	0	3	1	0	0	0	1	4
12:15 - 12:30	0	0	0	0	0	2	0	0	0	2	4	0	0	0	4	6
12:30 - 12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 - 13:00	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	2
13:00 - 13:15	0	0	0	0	0	1	0	1	0	2	4	0	0	0	4	6
13:15 - 13:30	1	0	0	0	1	1	0	0	0	1	3	0	0	0	3	5
13:30 - 13:45	0	0	0	0	0	1	0	0	0	1	5	0	0	0	5	6
13:45 - 14:00	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	2
TOTAL	19	0	0	0	19	26	0	1	0	27	67	0	2	0	69	115

Appendix C: SIDRA Analysis

5 YEAR SCENARIO WITHOUT DEVELOPMENT GENERATED TRAFFIC

MOVEMENT SUMMARY

Site: 101 [P29 and P179 intersection 5Yr Fri PM]

New Site
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h	
South: P179												
1	L2	6	0.0	0.152	11.4	LOS B	0.5	3.6	0.77	1.00	44.5	
2	T1	5	0.0	0.152	20.0	LOS C	0.5	3.6	0.77	1.00	44.4	
3	R2	28	0.0	0.152	23.4	LOS C	0.5	3.6	0.77	1.00	44.3	
Approach		39	0.0	0.152	21.1	LOS C	0.5	3.6	0.77	1.00	44.3	
East: P29												
4	L2	69	0.0	0.340	5.6	LOS A	0.0	0.0	0.00	0.06	57.8	
5	T1	591	0.0	0.340	0.0	LOS A	0.0	0.0	0.00	0.06	59.4	
6	R2	6	0.0	0.004	6.1	LOS A	0.0	0.1	0.31	0.54	52.3	
Approach		666	0.0	0.340	0.7	NA	0.0	0.1	0.00	0.07	59.1	
North: P179												
7	L2	7	0.0	0.091	8.8	LOS A	0.3	2.2	0.63	0.94	45.9	
8	T1	5	0.0	0.091	20.8	LOS C	0.3	2.2	0.63	0.94	45.8	
9	R2	16	0.0	0.091	21.4	LOS C	0.3	2.2	0.63	0.94	45.5	
Approach		28	0.0	0.091	18.2	LOS C	0.3	2.2	0.63	0.94	45.7	
West: P29												
10	L2	8	0.0	0.120	7.7	LOS A	0.1	0.9	0.07	0.04	57.7	
11	T1	210	0.0	0.120	0.2	LOS A	0.1	0.9	0.07	0.04	59.3	
12	R2	7	0.0	0.120	8.9	LOS A	0.1	0.9	0.07	0.04	57.1	
Approach		225	0.0	0.120	0.7	NA	0.1	0.9	0.07	0.04	59.1	
All Vehicles		958	0.0	0.340	2.0	NA	0.5	3.6	0.07	0.12	57.8	

MOVEMENT SUMMARY

Site: 101 [P29 and P179 intersection 5Yr Sat AM]

New Site
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h	
South: P179												
1	L2	4	0.0	0.153	9.1	LOS A	0.5	3.8	0.69	0.98	46.4	
2	T1	15	0.0	0.153	17.0	LOS C	0.5	3.8	0.69	0.98	46.3	
3	R2	32	0.0	0.153	18.9	LOS C	0.5	3.8	0.69	0.98	46.2	
Approach		51	0.0	0.153	17.5	LOS C	0.5	3.8	0.69	0.98	46.2	
East: P29												
4	L2	52	0.0	0.161	5.6	LOS A	0.0	0.0	0.00	0.10	57.5	
5	T1	260	0.0	0.161	0.0	LOS A	0.0	0.0	0.00	0.10	59.1	
6	R2	8	0.0	0.007	7.0	LOS A	0.0	0.2	0.47	0.60	51.9	
Approach		320	0.0	0.161	1.1	NA	0.0	0.2	0.01	0.11	58.6	
North: P179												
7	L2	6	0.0	0.096	10.1	LOS B	0.3	2.4	0.67	0.98	47.0	
8	T1	8	0.0	0.096	16.9	LOS C	0.3	2.4	0.67	0.98	46.9	
9	R2	20	0.0	0.096	18.0	LOS C	0.3	2.4	0.67	0.98	46.6	
Approach		34	0.0	0.096	16.4	LOS C	0.3	2.4	0.67	0.98	46.8	
West: P29												
10	L2	23	0.0	0.236	5.7	LOS A	0.0	0.3	0.01	0.03	58.0	
11	T1	431	0.0	0.236	0.0	LOS A	0.0	0.3	0.01	0.03	59.6	
12	R2	3	0.0	0.236	6.8	LOS A	0.0	0.3	0.01	0.03	57.4	
Approach		457	0.0	0.236	0.3	NA	0.0	0.3	0.01	0.03	59.5	
All Vehicles		862	0.0	0.236	2.3	NA	0.5	3.8	0.08	0.16	57.6	

5 YEAR SCENARIO WITH DEVELOPMENT GENERATED TRAFFIC

MOVEMENT SUMMARY

Site: 101 [P29 and P179 intersection 5Yr with dev Fri PM]

New Site
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h	
South: P179												
1	L2	6	0.0	0.387	20.6	LOS C	1.3	9.1	0.93	1.05	31.8	
2	T1	5	0.0	0.387	46.5	LOS E	1.3	9.1	0.93	1.05	31.8	
3	R2	28	0.0	0.387	62.5	LOS F	1.3	9.1	0.93	1.05	31.7	
Approach		39	0.0	0.387	54.0	LOS F	1.3	9.1	0.93	1.05	31.7	
East: P29												
4	L2	69	0.0	0.340	5.6	LOS A	0.0	0.0	0.00	0.06	57.8	
5	T1	591	0.0	0.340	0.0	LOS A	0.0	0.0	0.00	0.06	59.4	
6	R2	227	0.0	0.195	7.3	LOS A	0.9	6.2	0.51	0.71	51.7	
Approach		887	0.0	0.340	2.3	NA	0.9	6.2	0.13	0.23	57.1	
North: P179												
7	L2	264	0.0	2.361	2469.8	LOS F	403.2	2822.3	1.00	13.07	1.4	
8	T1	5	0.0	2.361	2487.0	LOS F	403.2	2822.3	1.00	13.07	1.4	
9	R2	273	0.0	2.361	2488.7	LOS F	403.2	2822.3	1.00	13.07	1.4	
Approach		542	0.0	2.361	2479.5	LOS F	403.2	2822.3	1.00	13.07	1.4	
West: P29												
10	L2	229	0.0	0.239	5.7	LOS A	0.2	1.2	0.05	0.30	55.5	
11	T1	210	0.0	0.239	0.2	LOS A	0.2	1.2	0.05	0.30	57.0	
12	R2	7	0.0	0.239	9.5	LOS A	0.2	1.2	0.05	0.30	55.0	
Approach		446	0.0	0.239	3.2	NA	0.2	1.2	0.05	0.30	56.2	
All Vehicles		1914	0.0	2.361	705.1	NA	403.2	2822.3	0.37	3.90	4.7	

MOVEMENT SUMMARY

Site: 101 [P29 and P179 intersection 5Yr with dev Sat AM]

New Site
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h	
South: P179												
1	L2	4	0.0	0.424	18.0	LOS C	1.5	10.7	0.91	1.04	33.4	
2	T1	15	0.0	0.424	47.9	LOS E	1.5	10.7	0.91	1.04	33.4	
3	R2	32	0.0	0.424	52.5	LOS F	1.5	10.7	0.91	1.04	33.3	
Approach		51	0.0	0.424	48.5	LOS E	1.5	10.7	0.91	1.04	33.4	
East: P29												
4	L2	52	0.0	0.161	5.6	LOS A	0.0	0.0	0.00	0.10	57.5	
5	T1	260	0.0	0.161	0.0	LOS A	0.0	0.0	0.00	0.10	59.1	
6	R2	279	0.0	0.354	10.4	LOS B	1.8	12.8	0.67	0.93	49.6	
Approach		591	0.0	0.354	5.4	NA	1.8	12.8	0.32	0.49	54.0	
North: P179												
7	L2	277	0.0	2.478	2678.5	LOS F	439.9	3079.5	1.00	15.92	1.3	
8	T1	8	0.0	2.478	2689.5	LOS F	439.9	3079.5	1.00	15.92	1.3	
9	R2	291	0.0	2.478	2691.9	LOS F	439.9	3079.5	1.00	15.92	1.3	
Approach		576	0.0	2.478	2685.4	LOS F	439.9	3079.5	1.00	15.92	1.3	
West: P29												
10	L2	294	0.0	0.382	5.6	LOS A	0.1	0.4	0.01	0.24	56.3	
11	T1	431	0.0	0.382	0.0	LOS A	0.1	0.4	0.01	0.24	57.8	
12	R2	3	0.0	0.382	7.2	LOS A	0.1	0.4	0.01	0.24	55.7	
Approach		728	0.0	0.382	2.3	NA	0.1	0.4	0.01	0.24	57.2	
All Vehicles		1946	0.0	2.478	798.6	NA	439.9	3079.5	0.42	4.98	4.2	

MOVEMENT SUMMARY

Site: 101v [P29 and P179 intersection 5Yr with dev Sat AM - Conversion]

New Site

Signals - Fixed Time Isolated Cycle Time = 35 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h	
South: P179												
1	L2	4	0.0	0.229	22.3	LOS C	0.9	6.1	0.94	0.72	43.9	
2	T1	15	0.0	0.229	16.8	LOS B	0.9	6.1	0.94	0.72	44.8	
3	R2	32	0.0	0.229	22.3	LOS C	0.9	6.1	0.94	0.72	43.7	
Approach		51	0.0	0.229	20.6	LOS C	0.9	6.1	0.94	0.72	44.0	
East: P29												
4	L2	52	0.0	0.297	10.4	LOS B	3.0	20.9	0.58	0.53	53.5	
5	T1	260	0.0	0.297	4.8	LOS A	3.0	20.9	0.58	0.53	54.8	
6	R2	279	0.0	0.858	28.2	LOS C	6.5	45.4	1.00	1.13	40.1	
Approach		591	0.0	0.858	16.3	LOS B	6.5	45.4	0.78	0.81	46.7	
North: P179												
7	L2	277	0.0	0.894	30.3	LOS C	6.6	46.2	1.00	1.17	39.4	
8	T1	8	0.0	0.894	24.8	LOS C	6.6	46.2	1.00	1.17	40.1	
9	R2	291	0.0	0.844	26.4	LOS C	6.1	42.7	1.00	1.05	40.9	
Approach		576	0.0	0.894	28.3	LOS C	6.6	46.2	1.00	1.11	40.1	
West: P29												
10	L2	294	0.0	0.704	13.1	LOS B	10.2	71.2	0.79	0.80	50.5	
11	T1	431	0.0	0.704	7.6	LOS A	10.2	71.2	0.79	0.80	51.7	
12	R2	3	0.0	0.704	13.0	LOS B	10.2	71.2	0.79	0.80	50.0	
Approach		728	0.0	0.704	9.8	LOS A	10.2	71.2	0.79	0.80	51.2	
All Vehicles		1946	0.0	0.894	17.5	LOS B	10.2	71.2	0.85	0.89	45.9	

MOVEMENT SUMMARY

Site: 101v [P29 and P179 intersection 5Yr with dev Fri PM - Conversion]

New Site

Signals - Fixed Time Isolated Cycle Time = 30 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h	
South: P179												
1	L2	6	0.0	0.187	20.5	LOS C	0.6	4.1	0.95	0.71	44.4	
2	T1	5	0.0	0.187	14.9	LOS B	0.6	4.1	0.95	0.71	45.3	
3	R2	28	0.0	0.187	20.4	LOS C	0.6	4.1	0.95	0.71	44.2	
Approach		39	0.0	0.187	19.7	LOS B	0.6	4.1	0.95	0.71	44.4	
East: P29												
4	L2	69	0.0	0.729	14.5	LOS B	9.1	63.7	0.86	0.84	50.7	
5	T1	591	0.0	0.729	8.9	LOS A	9.1	63.7	0.86	0.84	51.9	
6	R2	227	0.0	0.518	15.0	LOS B	2.9	20.5	0.85	0.79	46.9	
Approach		887	0.0	0.729	10.9	LOS B	9.1	63.7	0.86	0.83	50.4	
North: P179												
7	L2	264	0.0	0.724	20.3	LOS C	4.4	30.5	0.99	0.92	44.1	
8	T1	5	0.0	0.724	14.8	LOS B	4.4	30.5	0.99	0.92	45.1	
9	R2	273	0.0	0.653	19.1	LOS B	4.2	29.1	0.97	0.87	44.5	
Approach		542	0.0	0.724	19.7	LOS B	4.4	30.5	0.98	0.89	44.3	
West: P29												
10	L2	229	0.0	0.519	11.9	LOS B	4.8	33.7	0.75	0.72	50.8	
11	T1	210	0.0	0.519	6.4	LOS A	4.8	33.7	0.75	0.72	52.1	
12	R2	7	0.0	0.519	11.8	LOS B	4.8	33.7	0.75	0.72	50.4	
Approach		446	0.0	0.519	9.3	LOS A	4.8	33.7	0.75	0.72	51.4	
All Vehicles		1914	0.0	0.729	13.2	LOS B	9.1	63.7	0.87	0.82	48.6	

MOVEMENT SUMMARY

Site: 101 [P179 and site access intersection 5Yr with dev Sat AM]

New Site
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h	
South: P179												
2	T1	45	0.0	0.023	0.0	LOS A	0.0	0.0	0.00	0.00	60.0	
3	R2	542	0.0	0.350	6.3	LOS A	2.0	14.3	0.36	0.58	52.5	
Approach		587	0.0	0.350	5.8	NA	2.0	14.3	0.33	0.53	53.0	
East: Site Acces												
4	L2	542	0.0	0.388	8.2	LOS A	2.3	15.9	0.15	0.90	51.8	
6	R2	135	0.0	0.333	17.3	LOS C	1.5	10.4	0.72	1.05	46.4	
Approach		677	0.0	0.388	10.0	LOS B	2.3	15.9	0.27	0.93	50.6	
North: P179												
7	L2	135	0.0	0.090	5.5	LOS A	0.0	0.0	0.00	0.47	54.5	
8	T1	34	0.0	0.090	0.0	LOS A	0.0	0.0	0.00	0.47	55.9	
Approach		169	0.0	0.090	4.4	NA	0.0	0.0	0.00	0.47	54.8	
All Vehicles		1433	0.0	0.388	7.6	NA	2.3	15.9	0.26	0.71	52.0	

MOVEMENT SUMMARY

Site: 101 [P179 and site access intersection 5Yr with dev Fri PM]

New Site
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h	
South: P179												
2	T1	18	0.0	0.009	0.0	LOS A	0.0	0.0	0.00	0.00	60.0	
3	R2	442	0.0	0.277	6.1	LOS A	1.5	10.7	0.30	0.56	52.7	
Approach		460	0.0	0.277	5.8	NA	1.5	10.7	0.28	0.54	52.9	
East: Site Acces												
4	L2	514	0.0	0.366	8.2	LOS A	2.1	14.6	0.13	0.91	51.8	
6	R2	128	0.0	0.248	13.6	LOS B	1.0	7.1	0.61	1.01	48.5	
Approach		642	0.0	0.366	9.2	LOS A	2.1	14.6	0.23	0.93	51.1	
North: P179												
7	L2	110	0.0	0.073	5.5	LOS A	0.0	0.0	0.00	0.47	54.5	
8	T1	27	0.0	0.073	0.0	LOS A	0.0	0.0	0.00	0.47	55.9	
Approach		137	0.0	0.073	4.5	NA	0.0	0.0	0.00	0.47	54.8	
All Vehicles		1239	0.0	0.366	7.4	NA	2.1	14.6	0.22	0.73	52.1	

In diversity there is beauty
and there is strength.

MAYA ANGELOU

Document prepared by:

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DECLARATION OF INTEREST BY SPECIALIST



KWAZULU-NATAL PROVINCE
 ECONOMIC DEVELOPMENT, TOURISM
 AND ENVIRONMENTAL AFFAIRS
 REPUBLIC OF SOUTH AFRICA

	(For official use only)
Provincial Reference Number:	
NEAS Reference Number:	KZN / EIA /
Waste Management Licence Number (if applicable):Date Received by Department:	

DETAILS OF SPECIALIST AND DECLARATION OF INTEREST

Submitted in terms of section 24(2) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) or for a waste management licence in terms of section 20(b) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008).

KINDLYNOTE:

1. This form is current as of May 2021. It is the responsibility of the Applicant / Environmental Assessment Practitioner (“EAP”) to ascertain whether subsequent versions of the form have been released by the Department.

PROJECT TITLE

Wembezi JunXion Commercial Development
--

DISTRICT MUNICIPALITY:

uThukela District Municipality

1. SPECIALIST INFORMATION

Specialist name:	Zutari (Pty) Ltd		
Contact person:	Faisal Barakzai		
Postal address:	Pencarrow Park, Pencarrow Crescent, La Luci Ridge, Durban		
Postal code:	4051	Cell:	083 651 6273
Telephone:	031 575 5500	Fax:	
E-mail:	Faisal.barakzai@zutari.com		
Professional affiliation(s) (if any)	Pr Eng (ECSA)		

Department of Economic Development, Tourism & Environmental Affairs, KwaZulu-Natal	Details of the Specialist and Declaration of Interest	May 2021 V1
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DECLARATION OF INTEREST BY SPECIALIST

Project Consultant / EAP:	Metamorphosis Environmental Consultants		
Contact person:	Ms Vicki King		
Postal address:	P. O. Box 2116, Link Hills		
Postal code:	3625	Cell:	076 420 1441
Telephone:	031 – 756 7554	Fax:	
E-mail:	Vicki@metamorphosisdbn.co.za		
Professional affiliation(s) (if any)	IAIAsa, Reg EAP (EASPAPA), IWM, ELA		

2. DECLARATION BY THE SPECIALIST

I, Faisal Barakzai

General declaration:

- I act as the independent specialist in this application;
- do not have and will not have any vested interest (either business, financial, personal or other) in the undertaking of the proposed activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2014;
- 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 am aware that a person is guilty of an offence in terms of Regulation 48 (1) of the EIA Regulations, 2014, if that person provides incorrect or misleading information. A person who is convicted of an offence in terms of sub-regulation 48(1) (a)-(e) is liable to the penalties as contemplated in section 49B(1) of the National Environmental Management Act, 1998 (Act 107 of 1998).

F Barakzai
Signature of the specialist:

Zutari (Pty) Ltd
Name of company:

10/2/2022
Date:

Department of Economic Development, Tourism & Environmental Affairs, KwaZulu-Natal	Details of the Specialist and Declaration of Interest	May 2021 V1
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Engineering Council of South Africa



This is to
certify
that

Faisal Barakzai

is registered as

Professional Engineer

in terms of the Engineering Profession of South Africa Act 2000
(Act No. 46 of 2000)

Date **2019-07-25**

Registration
Number

20190818

President

Chief Executive Officer



ECOSA-00036974



Qualifications

BSc Civil Eng

Professional registrations

Professional Civil Engineer, Engineering Council of South Africa (ECSA)

Civil Engineer, South African Institution of Civil Engineering (SAICE)

Member, Society for Asphalt Technology (SAT)

Specialisation

Traffic Engineering/
Pavement Engineering

9

years in industry

Qualifications

BSc Civil Eng

MSc Civil Eng

Professional registrations

Professional Civil Engineer, Engineering Council of South Africa (ECSA)

Civil Engineer, South African Institution of Civil Engineering (SAICE)

Member, Society for Asphalt Technology (SAT)

Specialisation

Traffic Engineering/
Pavement Engineering

Faisal Barakzai

Civil Engineer



Faisal is a qualified civil engineer with Zutari's eThekweni office. He specialises in traffic and pavement engineering and is proficient in traffic impact assessments (TIA), design of geometric layouts for transportation engineering, structural pavement design, visual and condition assessment of existing roads. He has been responsible for the preparation and management of contract documents and the management and supervision of road rehabilitation projects.

Faisal holds BSc and MSc Civil Eng degrees from the University of KwaZulu-Natal (UKZN). He is a registered Professional civil engineer with the Engineering Council of South Africa (ECSA), a member of the Society for Asphalt Technology (SAT) and a civil engineer with the South African Institute for Civil Engineering (SAICE).

Experience

Supply, Installation, Commissioning and Maintenance of a Door Control System for the ETA (ETA IRPTN)	KwaZulu-Natal, South Africa	2018-ongoing	Project Manager	The project entails Supply, Installation, Commissioning and Maintenance of a Door Control System for the ETA (ETA IRPTN). I was responsible for project management. This includes payment certs, site instructions, door testing, health and safety, project finances, progress meetings.	14 ongoing	eThekweni Transport Authority
uPhongolo Municipality Roads and Stormwater Masterplan	KwaZulu-Natal, South Africa	08/2017 – 05/2018	Project Leader	The project entailed developing the Roads and Stormwater Masterplan for the uPhongolo Municipality. Duties included developing the roads masterplan by reviewing previous institutional plans, identifying disaster projects, developing long term roads master planning that will unlock nodes with economic potential and linking adjacent regios, report writing, project management, Managing the GIS and Stormwater Master planning component, engagement with DoT, KZN COGTA, DBSA (funders) and uPhongolo Municipality. All project finances.	8	uPhongolo Municipality
EThekweni Central Densification and Implementation plan	KwaZulu-Natal, South Africa	11/2016-01/2017	Transportation planner	The project entailed identifying possible locations within the city that are suited to densification considering the available supply of all engineering infrastructure. Responsible for the transportation component which looked at spare PT capacity, possible underutilised roads, underutilised rail infrastructure and drafting a status quo report.	1.0	eThekweni
Traffic modelling for the proposed Sheffield interchange	KwaZulu-Natal, South Africa	09/2016-11/2016	Traffic Engineer	The project entailed developing an AIMSUN model for the proposed Sheffield interchange. Responsible for developing the traffic matrix for all surrounding developments and carrying out AIMSUN modelling for the interchange.	1.0	Tongaat Hulett Developments
Department of Transport Economic Feasibility of Public transport routes in KZN	KwaZulu-Natal, South Africa	07/2016-09/2016	Project Leader	The project entailed assessing the status quo of all PT routes in the province and assessing the number of licences per route. I was a project leader and undertook all project management duties.	0.2	DoT
Traffic impact assessment (TIA) for Tinley Manor Development	KwaZulu-Natal, South Africa	07/2016-09/2016	Traffic Engineer	The project entailed a complete revision of the previous regional traffic impact assessment (TIA) for the proposed Tinley Manor Residential Development. Responsible for interchange analysis and test various options for an interchange configuration and site access.	1.0	Tongaat Hulett Developments
Khor Fakkan Corniche Concept Design	United Arab Emirates	07/2015-08/2016	Transport Lead	The project entailed the compilation of a traffic impact assessment (TIA) and a concept Transport Design Report for the proposed upgrade to the Khor Fakkan Corniche as part of the Khor Fakkan Corniche masterplan. I was the lead traffic engineer on the project until 50% project completion. Duties included all aspects of transportation planning for the project.	1.2	Broadway Malan Architects



Ilembe Investment Programme	KwaZulu-Natal, South Africa	05/2016-09/2016	Traffic Engineer	The project entailed an investigation of proposed infrastructure projects in the Ilembe District and identifying and recommending feasible projects to the Swiss funding organisation. I am part of the research team as the transport lead in key stakeholder liaison, data collection, project identification and report review.	2.0	SECO
Umhlanga Taxi Rank – Public transport study	KwaZulu-Natal, South Africa	06/2016-06/2016	Traffic Engineer	The project entailed compilation of a status quo study and future design of the Umhlanga Taxi Rank. Responsible for municipal liaison for changes and alterations required for the approval of the design.	0.2	GOTYA PRPPS
Traffic impact assessment (TIA) uShukela development	KwaZulu-Natal, South Africa	06/2016-06/2016	Traffic Engineer	The project entailed the compilation of a traffic impact assessment (TIA) for the proposed uShukela development. Responsible for testing the regional road network for the maximum bulk potential of the site.	0.2	Tongaat Hulett Developments
Kingsburgh West Traffic Impact Assessment (TIA)	KwaZulu-Natal, South Africa	05/2016-05/2016	Traffic Engineer	The project entailed the compilation of a traffic impact assessment (TIA) for the proposed Kingsburgh West housing development. Responsible for analysing traffic counts, intersections using computer software, possible access routes, future traffic growth, client and town planning liaison, intersection and road upgrade recommendations and report writing and compilation.	0.5	Motheo Construction Group
Umhlanga Taxi Rank – Public transport study	KwaZulu-Natal, South Africa	05/2016-05/2016	Traffic Engineer	The project entailed updating of the status quo study and future design of the Umhlanga Taxi Rank. Responsible for analysing existing bus and taxi movement patterns, assessing existing flows and capacity of rank. Proposing expansion requirements to allow for growth and compilation of report.	0.25	GOTYA PRPPS
Building Inspections for Mettle	KwaZulu-Natal, South Africa	05/2016-05/2016	Civil Engineer	The project entailed carrying out building inspections. Responsible for assessing the existing conditions of several buildings.	0.5	Mettle
Traffic Study of the Umlalazi Interchange	KwaZulu-Natal, South Africa	03/2016-04/2016	Traffic Engineer	The project entailed assessing the status quo of the traffic on the Umlalazi interchange and providing recommendations. Responsible for analysing traffic counts, intersections using computer software, client liaison, recommendations and report writing and compilation.	0.5	Tronox
Traffic impact assessment (TIA) for Elaleni Development	KwaZulu-Natal, South Africa	02/2016-03/2016	Traffic Engineer	The project entailed the compilation of a traffic impact assessment (TIA) for the proposed Elaleni development. Responsible for analysing traffic counts, intersections using computer software, future traffic growth, trip distribution, road and intersection layouts and upgrades, client liaison, recommendations and report writing and compilation.	1.0	Cross Atlantic Properties 65



Traffic impact assessment (TIA) for Shongweni Farmers Market	KwaZulu-Natal, South Africa	02/2016-02/2016	Traffic Engineer	The project entailed updating of the traffic impact assessment (TIA) for the proposed Shongweni farmers Market. Responsible for analysing traffic counts, intersections using computer software, possible access routes, future traffic growth, client, municipal and community liaison, intersection and road upgrade recommendations and report writing and compilation.	0.5	Christine Standeaven
Traffic impact assessment (TIA) for Tinley Manor Development	KwaZulu-Natal, South Africa	12/2015-01/2016	Traffic Engineer	The project entailed a complete revision of the previous regional traffic impact assessment (TIA) for the proposed Tinley Manor Residential Development. Responsible for analysing traffic counts, intersections using computer software, possible access routes, intersection and road layouts, analysing a proposed new diverging diamond interchange with freeway and ramp analysis, future traffic growth, client and municipal liaison, internal and external road network upgrade recommendations and report writing and compilation.	1.5	Tongaat Hulett Developments
Traffic impact assessment (TIA) for the Provincial Teachers Development Institute	KwaZulu-Natal, South Africa	11/2015-12/2015	Traffic Engineer	The project entailed the compilation of a traffic impact assessment (TIA) for the proposed PTDI. Responsible for analysing traffic counts, intersections using computer software, future traffic growth, trip distribution, road and intersection layouts and upgrades, client and municipal liaison, recommendations and report writing and compilation. Project finances.	1.0	VNA Consulting
Traffic impact assessment (TIA) Rohill development	KwaZulu-Natal, South Africa	11/2015-12/2015	Traffic Engineer	The project entailed the compilation of a traffic impact assessment (TIA) for the proposed Rohill development. Responsible for route determination of heavy vehicles and schematic presentation thereof.	0.5	JT Ross
Traffic impact assessment (TIA) uShukela development	KwaZulu-Natal, South Africa	10/2015-11/2015	Traffic Engineer	The project entailed the compilation of a traffic impact assessment (TIA) for the proposed uShukela development. Responsible for analysing traffic counts, intersections using computer software, future traffic growth, trip distribution, road and intersection layouts and upgrades, client liaison, recommendations and report writing and compilation.	1.0	Tongaat Hulett Developments
Umhlanga Taxi Rank – Public transport study	KwaZulu-Natal, South Africa	10/2015-11/2015	Traffic Engineer	The project entailed compilation of a status quo study and future design of the Umhlanga Taxi Rank. Responsible for analysing existing bus and taxi movement patterns, assessing existing flows and capacity of rank. Proposing expansion requirements to allow for growth and compilation of report.	0.25	GOTYA PRPPS
Traffic impact assessment (TIA) for Clairwood	KwaZulu-Natal, South Africa	09/2015 – 10/2015	Traffic Engineer	The project entailed the compilation of a traffic impact assessment (TIA) for the proposed Avoca South development. Responsible for freight route planning and alternative route determination.	0.1	Investec property Group



Huawei Site Structural Analysis	KwaZulu-Natal, South Africa	05/2015 – 04/2016	Engineer	The project entailed carrying out site visits to assess the ground conditions for the installation of cell phone towers. Responsible for carrying out DCP's and inspecting completed tower structure.	1.0	Huawei South Africa
Traffic impact assessment (TIA) Cotswold Fenns development	KwaZulu-Natal, South Africa	07/2015 – 08/2015	Traffic Engineer	The project entailed the compilation of a traffic impact assessment (TIA) for the proposed Cotswold Fenns development. Responsible for analysing traffic counts, intersections using computer software, future traffic growth, trip distribution, road and intersection layouts and upgrades, client liaison, recommendations and report writing and compilation.	1	Cotswold Fenns
Traffic impact assessment (TIA) for Avoca South	KwaZulu-Natal, South Africa	08/2015 – 07/2015	Traffic Engineer	The project entailed the compilation of a traffic impact assessment (TIA) for the proposed Avoca South development. Responsible for freight route planning and alternative route determination.	0.1	Investec property Group
New link road from Ottos Bluff road to Chase Valley Road	KwaZulu-Natal, South Africa	06/2015 – 07/2015	Traffic Engineer	The project entailed AIMSUN traffic modelling to identify the impact of the new link road from Ottos Bluff Road to Chase Valley Road. Responsible for the development of the road network on AIMSUN.	0.5	Samani Consulting
The Hotazel manganese mines' employee commuter transport optimisation project	Northern Cape, South Africa	05/2015 – 06/2015	Traffic Engineer	The project entailed compilation of a status quo investigation on the current transportation methods of the employees of the Hotazel mine. Responsible for drafting report.	0.5	BHP Billiton South Africa
Traffic impact assessment (TIA) for Tinley Manor Development	KwaZulu-Natal, South Africa	05/2015 – 06/2015	Traffic Engineer	The project entailed a complete revision of the previous regional traffic impact assessment (TIA) for the proposed Tinley Manor Residential Development. Responsible for analysing traffic counts, intersections using computer software, possible access routes, intersection and road layouts, analysing a proposed new diverging diamond interchange with freeway and ramp analysis, future traffic growth, client and municipal liaison, internal and external road network upgrade recommendations and report writing and compilation.	1.5	Tongaat Hulett Developments
Traffic impact assessment (TIA) Lenasia Business Park	Gauteng, South Africa	04/2015 – 05/2015	Traffic Engineer	The project entailed the compilation of a traffic impact assessment (TIA) for the proposed Lenasia Business Park. Responsible for analysing traffic counts, intersections using computer software, possible access routes, future traffic growth, client, town planning and municipal liaison, intersection and road upgrade recommendations and report writing and compilation.	1.0	Buy, Build and Sell Developments
Status Quo Report – BHP Billiton Transportation Optimising Project	Northern Cape, South Africa	03/2015 – 04/2015	Traffic Engineer	The project entailed obtaining Survey requirements for the Transportation optimisation at the Manganese Mines in Hotazel. Responsible for drafting and report compilation.	0.3	BHP Billiton



Traffic impact assessment (TIA) for Waterfall Shopping Centre, KwaZulu-Natal, South Africa, Rowles Trust Group, 03/2014 - 04/2014, Traffic Engineer

The project entailed the compilation of a traffic impact assessment (TIA) for the proposed Waterfall Shopping Centre. Responsible for analysing traffic counts, intersections using computer software, future traffic growth, client liaison, recommendations and report compilation.

Traffic impact assessment (TIA) for Umhlanga Shopping Centre, KwaZulu-Natal, South Africa, GOTYA Properties, 02/2014 - 03/2014, Traffic Engineer

The project entailed the compilation of a traffic impact assessment (TIA) for the proposed Umhlanga Shopping Centre. Responsible for analysing traffic counts, intersections using computer software, future traffic growth, road upgrade recommendations and TIA report.

Pavement design for a new Durban University of Technology (DUT) residence, KwaZulu-Natal, South Africa, Durban University of Technology (DUT), 12/2013 - 12/2013, Pavement Engineer

The project entailed design and construction of a new student residence with 800 rooms. Responsible for the pavement design report.

Traffic impact assessment (TIA) for Hull Valley Housing Project, KwaZulu-Natal, South Africa, eThekweni Municipality, 11/2013 - 02/2014, Understudy to project leader/Traffic Engineer

The project entailed the compilation of a traffic impact assessment (TIA) for the proposed Hull Valley Housing Development. Responsible for analysing traffic counts, intersections using computer software, possible access routes, future traffic growth, client, municipal and community liaison, road upgrade recommendations and report compilation.

Planning and proposal administration for a driver development Park, KwaZulu-Natal, South Africa, eThekweni Transport Authority, 11/2013 - Date, Traffic Engineer

The project entailed a proposal for a driver development park for the eThekweni Municipality. Responsible for a feasibility study of identified sites, research on national driving school best practices, design of identified site, municipal and community liaison.

Traffic impact assessment (TIA) for an Umhlanga Rocks Shopping Centre, KwaZulu-Natal, South Africa, Hohn Rowan Property Group, 09/2013 - 11/2013, Understudy to project leader/Traffic Engineer

The project entailed the compilation of a traffic impact assessment (TIA) for the proposed Umhlanga Rocks Drive Shopping Centre. Responsible for analysing traffic counts, intersections using computer software, possible access routes, future traffic growth, client and municipal liaison, road upgrade recommendations and report compilation.

Design of a Ballito right turn lane, KwaZulu-Natal, South Africa, Phezulu Project (Pty) Ltd, 08/2013 - 12/2013, Understudy to project leader/Traffic Engineer

The project entailed geometric design and approval for a proposed right turn lane into a car dealership. Responsible for analysing traffic counts, intersection using computer software, possible access, future traffic growth, client and municipal liaison, road upgrade recommendations, report and drawing compilation.

Traffic impact assessment (TIA) for Engen Refinery, KwaZulu-Natal, South Africa, Elliot Duckworth & Associates, 08/2013 - 10/2013, Traffic Engineer

The project entailed the compilation of a traffic impact assessment (TIA) for the proposed rezoning of an Engen Refinery. Responsible for analysing traffic counts, intersections using computer software, possible access routes, future traffic growth, client and municipal liaison, road upgrade recommendations and report compilation.



Traffic impact assessment (TIA) for Keystone Development, KwaZulu-Natal, South Africa, Keystone Park CC, 08/2013 - 08/2013, Pavement Engineer

The project entailed the compilation of a traffic impact assessment (TIA) for the proposed Keystone Park Development. Responsible for generating a visual assessment report for the primary access route to the proposed development assessing the condition of the existing road.

Traffic impact assessment (TIA) for Tinley Manor Development, KwaZulu-Natal, South Africa, Tongaat Hulett Developments, 06/2013 - 01/2014, Traffic Engineer

The project entailed the compilation of a regional traffic impact assessment (TIA) for the proposed Tinley Manor Residential Development. Responsible for analysing traffic counts, intersections using computer software, possible access routes, analysing a proposed new interchange with freeway analysis, future traffic growth, client and municipal liaison, road upgrade recommendations and report compilation.

Rehabilitation of Harding Street, KwaZulu-Natal, South Africa, Richmond Municipality, 05/2013 - date, Understudy to project leader

The project entailed the preparation of bidding documents, project management, design and site supervision of the rehabilitation of Harding Street in Richmond. Responsible for the visual assessment report for the road, all contract and project management, liaised with contractor and client, management of project finances and site supervision.

Traffic impact assessment (TIA) for The Colony and Standard bank, KwaZulu-Natal, South Africa, Unity Properties, 05/2013 - 07/2013, Traffic Engineer

The project entailed the compilation of a traffic impact assessment (TIA) for the proposed rezoning and development of Standard Bank and The Colony Shopping Centre. Responsible for analysing traffic counts, intersections using computer software, possible access routes, future traffic growth, client and municipal liaison, road upgrade recommendations and report compilation.

Traffic impact assessment (TIA) for Zulti Mine, KwaZulu-Natal, South Africa, SRK Consultants, 03/2013 - 05/2013, Traffic Engineer

The project entailed the compilation of a traffic impact assessment (TIA) for the proposed Zulti Mine. Responsible for analysing traffic counts, intersections using computer software, possible access routes, future traffic growth, recommendations and report compilation.

Traffic impact statement for Brand Road, KwaZulu-Natal, South Africa, Spoomaker & Partners Inc., 02/2013 - 03/2013, Traffic Engineer

The project entailed the compilation of a traffic impact statement for the proposed rezoning of a house to offices on Brand Road. Responsible for analysing traffic counts, intersections using computer software, possible access routes, future traffic growth, client and municipal liaison, road upgrade recommendations and report compilation.

Contract, design and construction of Boscombe Place Right Turn Lane, KwaZulu-Natal, South Africa, Shoprite Checkers, 02/2013 - 12/2013, Understudy to project leader/ Traffic and Pavement Engineer

The project entailed project management contract management, design, construction and site supervision of the road widening required for a right turn lane. Responsible for preparation of contract and bidding documents, all contract and project management, liaison with contractor and client, management of project finances, geometric and pavement design and site supervision.

Durban's South Port roads combined project, KwaZulu-Natal, South Africa, Transnet National Port Authority, 10/2012 - 03/2013, Researcher and Draughtsman

The project entailed the compilation of a sustainability report for the development of the Durban South Port and geometric and structural design of roads and bridges to be used as access to the Durban South Port. Responsible for providing data on sustainable pavement engineering practices and green pavement as a



portion of the final report and responsible for AutoCAD drawing and producing a traffic road layout for discussion.



Document prepared by:

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