Appendix G10:
Traffic

Royal HaskoningDHV
Enhancing Society Together

forestry, fisheries
& the environment
Department:
Forestry, Fisheries and the Environment
REPUBLIC OF SOUTH AFRICA

Private Bag X447, Pretoria, 0001, Environment House, 473 Steve Biko Road, Pretoria, 0002 Tel: +27 12 399 9000, Fax: +27 86 625 1042

SPECIALIST DECLARATION FORM – AUGUST 2023

Specialist Declaration form for assessments undertaken for 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)

REPORT TITLE

Traffic Impact Assessment for the Maltery Soufflet Malt Plant

Kindly note the following:

1. This form must always be used for assessment that are in support of applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting, where this Department is the Competent Authority.
2. This form is current as of August 2023. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at https://www.dffe.gov.za/documents/forms.
3. An electronic copy of the signed declaration form must be appended to all Draft and Final Reports submitted to the department for consideration.
4. The specialist must be aware of and comply with '*the Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the act, when applying for environmental authorisation - GN 320/2020)'*, where applicable.

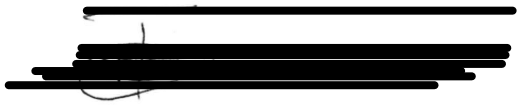
1. SPECIALIST INFORMATION

Title of Specialist Assessment	Traffic Impact Assessment for the Maltery Soufflet Malt Plant
Specialist Company Name	Royal HaskoningDHV Pty Ltd
Specialist Name	Themba Mangane
Specialist Identity Number	[redacted]
Specialist Qualifications:	BSc (Hons) Transportation Planning, B-Tech Transportation Engineering, and National Diploma, Civil Engineering
Professional affiliation/registration:	ECSA Prof Techni , 201630040
Physical address:	21 Woodlands Drive, Building No 5 Country Club Estate, Woodmead
Postal address:	P O Box 867,
Postal address	Gallo Manor, 2052
Telephone	[redacted]
Cell phone	[redacted]
E-mail	[redacted]

2. DECLARATION BY THE SPECIALIST

I, **Themba Mangane.** declare that –

- I act as the independent specialist in this application;
- I am aware of the procedures and requirements for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act (NEMA), 1998, as amended, when applying for environmental authorisation which were promulgated in Government Notice No. 320 of 20 March 2020 (i.e. "the Protocols") and in Government Notice No. 1150 of 30 October 2020.
- 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 NEMA Act.



Signature of the Specialist

Royal HaskoningDHV Pty Ltd

Name of Company:

16 October 2024

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, _ **Themba Mangane**_____, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

[redacted]

Signature of the Specialist

Royal HaskoningDHV Pty Ltd

Name of Company

16 October 2024

Date

Signature of the Commissioner of Oaths

Click or tap to enter a date.

Date

REPORT

Traffic Impact Assessment for The Malteries Soufflet Malt Plant

Traffic Impact Assessment

Client: Malteries Soufflet

Reference: MD6453-RHD-XX-XX-RP-X-0002

Status: Draft/0002

Date: 3 July 2024

Royal HaskoningDHV
Enhancing Society Together

ROYAL HASKONINGDHV (PTY) LTD

21 Woodlands Drive
Building 5
Country Club Estate
Woodmead
Johannesburg
2191
South Africa
Southern Africa

+27 87 352 1500 **T**
+27 11 798 6005 **F**
themba.mangane@rhdhv.com **E**
royalhaskoningdhv.com **W**

Document title: Traffic Impact Assessment for The Malteries Soufflet Malt Plant

Subtitle: Traffic Impact Assessment
Reference: MD6453-RHD-XX-XX-RP-X-0002
Your reference Malteries Soufflet TIA
Status: Draft/0002
Date: 3 July 2024
Project name: MD6453
Project number: MD6453

Classification
Personal

Revision	Date	Description	Prepared	Checked	Approved
Revision 001	07 June 2024	Draft Traffic Impact Assessment for The Malteries Soufflet Malt Plant	Tanita Bhayroo	Themba Mangane	Themba Mangane
Revision 002	15 June 2024	Draft Traffic Impact Assessment for The Malteries Soufflet Malt Plant	Tanita Bhayroo	Themba Mangane	Themba Mangane
Revision 003	24 June 2024	Draft Traffic Impact Assessment for The Malteries Soufflet Malt Plant	Tanita Bhayroo	Themba Mangane	Prashika Reddy
Revision 004	03 July 2024	Draft Traffic Impact Assessment for The Malteries Soufflet Malt Plant	Tanita Bhayroo	Themba Mangane	Prashika Reddy

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1 Introduction and Background

1.1 Introduction

Royal HaskoningDHV (RHDHV) was appointed by Soufflet Malt South Africa (Soufflet Malt) to undertake a traffic impact assessment (TIA) for the malt production facility adjacent to the Heineken Sedibeng Brewery, located in the Kliprivier Business Park. Soufflet Malt intend to construct a new greenfield malt production facility in the Sedibeng District Municipality of Gauteng, in South Africa. The proposed malt production facility is located to the south of the Heineken Sedibeng Brewery within a greenfield area in the Sedibeng District Municipality and Midvaal Local Municipality (MLM).

The main purpose of that study was therefore to determine the road network and access requirements to adequately serve the total development site. The study area will encompass the immediate vicinity of the malt production facility, including primary and secondary roadways, intersections, and access points. A detailed analysis of the existing traffic conditions and infrastructure within the study area will be conducted to assess the potential traffic impacts.

1.2 Location

The location of malt production facility in relation to the Heineken Sedibeng Brewery is shown in Figure 1. The figure shows that malt production facility lies in the southern extremity of Heineken Sedibeng Brewery. The site is also bordered by the R59 in the east (Figure 1).

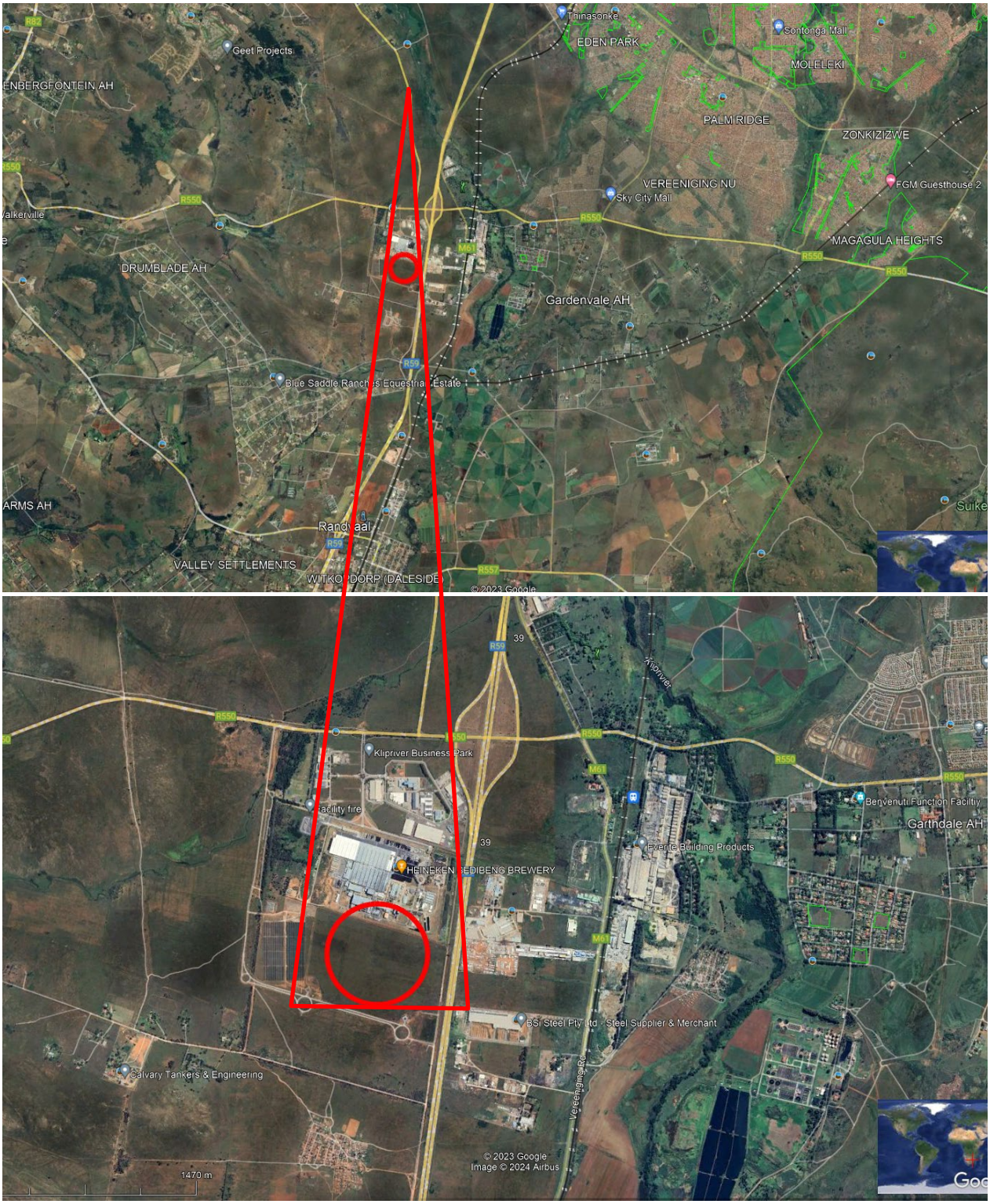


Figure 1: Locality map

1.3 Scope of this Report

This report examines the traffic impact of the malt production facility as a step towards developing the land parcel. In other words, the report will assess the transportation infrastructure requirements for the site to function as a standalone development. An assessment of the public transport implications is included in this report. The study area, development trip generation, trip distribution, capacity analysis and site access requirements are also discussed in this report.

2 Approach and Methodology

To better understand the traffic situation on the local road network close to the site, manual classified turning count surveys were undertaken on the 22nd of May 2024. Traffic data obtained was analysed in SIDRA intersection assessment software to assess the performance impact at key intersections close the site. Development traffic was generated using the South African Trip Data Manual (TMH17), Draft 2.1 June 2020. Trip distribution was undertaken by assigning development traffic in relation to turning proportions at each intersection.

The assessment considered the following aspects:

- Traffic generation implications;
- The existing road network and its capacity to accommodate development traffic against the background of the malt production facility TIA;
- The volume of development traffic that can be accommodated on the existing road network before improvements have to be made;
- The level of road network improvements that may be necessary to mitigate the impact of malt production facility when constructed and in operation;
- The required road and public transport network to provide connectivity to the surrounding area.
- Sustainable transport options aimed at enhancing the sites permeability and sustainability.

2.1 Assessment Years

For the purpose of analyses the following assessment years and scenarios have been analysed to provide a basis for comparison and to develop a good understanding of the transport impact presented by the development proposal.

- 2024 Base Year Weekday AM and PM peak;
- 2029 Design Year Weekday AM and PM peak without development; and
- 2029 Design Year Weekday AM and PM peak plus development traffic.

2.2 Study Area

The study area includes the area of the proposed malt production facility as well as the external road network immediately surrounding the development. The area identified is based on the transportation infrastructure expected to be affected by the proposed development. Figure 2 shows the study area which includes the following intersections:

- R550 East West / R550 North-South
- R550/ De Man Drive
- R550 / Unknown Road

Figure 2: Key intersections

2.3 Peak Hours

The following peak hour periods were assessed to determine the transport impact of the development:

- AM - 06:30 – 07:30
- PM - 17:00 – 18:00

3 Proposed Development

In the context of a malt production facility, it would generally be considered a light manufacturing operation. The land use includes offices, warehouses and other facilities associated with manufacturing. The initial malthouse capacity will be 100 KT/year of malt with a future capacity of 135 KT/year and will consist of the following key components (Table 1). The malt plant will provide the adjoining Heineken Brewery with malt via a conveyor system.

Table 1: Key Components of the Malt Facility

General Arrangement of Proposed Buildings	Description
Working building	▪ The process of barley intake, cleaning and grading and malt blending, cleaning and bulk shipping will take place at this building. ▪ Pit for grain will be arranged in front of the processing tower for receiving and shipping by truck. ▪ Several bins with steel support structure will be situated on beams system of the building. ▪ Conveyor systems also run inside the building.
Barley storage	▪ Storage of barley before the malting process starts.
Malt storage	▪ Storage and distribution of malt.

General Arrangement of Proposed Buildings	Description
Steeping building	▪ The barley steeping process will occur in this building. ▪ Steeping tanks with steel support structures will be arranged inside the building. ▪ There will be conveyor system for transferring malt from here to the germination vessels.
Germination vessels	▪ The germination process will occur in these vessels.
Kilning vessel	▪ This building is where the kilning process takes place. ▪ The kilning process occurs at various degrees Celsius ranging from 40ºC to 90ºC.
Solar Plant and Energy System	▪ Total area of the facility – 9.2ha ▪ Capacity of the solar photovoltaic plant (PV) – 4 to 8MW ▪ Capacity of the combined heat and power genset (CHP) – 5-6 MW (including back up system) ▪ Capacity of the boilers (back-up) – 20MW using liquified natural gas (LNG) as a fuel source.
Administration building	▪ The administration building contains the following functions: office space, meeting room, laboratory, security/weighbridge office, canteen, toilet, lockers, and dressing rooms. This building is a single storey structure is a local designed building with traditional features optimised to facilitate the cooperate identity. ▪ The canteen and lockers are to serve an assumed 50 personnel with an estimated max. 40persons in the day shift.
Workshop and spare parts	▪ The building will comprise of welding workshop, forklift maintenance, storage area, office, and ablutions
Electrical building	▪ Switch gear and transformers.
Water storage	▪ The malting process consumes large amounts of water on a daily basis. The expected water usage for the current mandate based on the process mass energy balance spreadsheet is projected at 1000 m^3/day peak load. ▪ The arrangement of the water storage tanks is described below: o One (1) freshwater tank of 1000 m^3 available water storage volume. This volume includes 10% spare capacity for malt production usage demand for 24 hours. o One (1) process water tank of 1000 m^3 available water storage volume. This volume including the option to be 50% recycled water.
Wastewater treatment plant	Treatment of the following wastewater streams: ▪ Domestic sewage/wastewater from the Administration building to a maximum of 10 m^3/d.

The total area of the facility is approximately 10ha with Gross Leasable Area (GLA) of 8344m².

4 Trip Generation

The proposed development will increase the number of trips in the vicinity. The South African Trip Data Manual Version 1.01, September 2013" prepared by the local Committee of Transport Officials (COTO) was used to determine the trip rates for the Industrial development. Table 2 and Table 3 provide information about the expected trip generation from the development. It is anticipated that 50 vehicle trips will be generated during both AM and PM peak hours, with a split of 80/20% during AM and 20/80% during PM peak hours. This data is used to plan infrastructure such as roads, parking, and public transportation to accommodate the expected traffic. The intersection capacity analysis was based on these vehicle traffic generation figures.

Table 2: Weekday AM Expected Trip Generation

Land-Use	GLA (m2)	Vehicle Trip Rate	AM		Total Trips
			In	Out	
Light Manufacturing	8344	0.6	40	10	50
			80%	20%	
Totals			**40**	**10**	**50**

Table 3: Weekday PM Expected Trip Generation

Land-Use	GLA (m2)	Vehicle Trip Rate	AM		Total Trips
			In	Out	
Light Manufacturing	8344	0.6	10	40	50
			20%	80%	
Totals			**10**	**40**	**50**

5 Trip Distribution and Trip Assignment

This proposed malt production facility is located in an industrial area where workers are expected to be employed. The construction and operation of the malt production facility will create numerous job opportunities for local workers in the surrounding industrial area. This will not only boost employment rates but also contribute to the economic growth and development of the community. There is good access to both R550 and R59 from the development. Having easy access to major roads like the R550 and R59 is advantageous for the development as it allows for convenient transportation and connectivity. Therefore, the following trip distribution has been assumed to assign the development traffic to the surrounding road network:

- At the peak hour of AM, 98% of development traffic to and from the east is routed via the R550, and 2% of development traffic is routed via the R550 to the west.
- At the peak hour of PM, 94% of development traffic to and from the east is routed via the R550, and 6% of development traffic is routed via the R550 to the west.

Appendix A5 and Appendix A6 of this report provide information regarding the expected assignments of the development trips.

6 Public Transport and Pedestrian Accessibility

6.1 Current Public Transport Infrastructure

6.1.1 Taxi Services

It is difficult to see taxis despite the existence of two formal taxi laybys located near the intersection of the East-West route of the R550 and the access road, particularly during off-peak hours. If commuters were to be picked up and dropped off at these taxi laybys, they would have to walk about 3 kilometers to reach the proposed malt production facility. Once the facility is operational, public taxis will be available on the access road to the development.

6.1.2 Bus Routes

No buses were observed along the R550, this was confirmed by locals who noted that minibus taxis were the only form of public transport servicing the area, dropping off commuters at the two entrance gates to the Heineken Sedibeng Brewery before continuing towards Meyerton.

6.1.3 Pedestrian Movement

The area where the development is proposed is currently an open field, meaning there are no pedestrians walking nearby. Additionally, the site nearby exhibits low pedestrian movements, particularly along the R550 East/West road. The road leading to the facility, however, has extensive non-motorised transport (NMT) facilities on one side of the road. Overgrown vegetation, however, made it difficult to determine the continuity of the sidewalk. NMT facilities, such as sidewalks, bike lanes, and crosswalks, are designed to accommodate non-motorized forms of transportation such as walking and cycling. These facilities promote pedestrian safety and encourage active modes of transportation, which can lead to numerous benefits including improved public health, reduced traffic congestion, and decreased air pollution.

7 Existing Road Network

7.1 Existing Road Network

The key roads that form part of the study area were identified. The South African Road Classification and Access Management Manual (RCAM) Version 1.0 (July 2012) was used to classify the surrounding road networks.

R550 East -West

The R550 East-West is a Class 2 east-west regional route located to the north of the development. The road is a two-lane single carriageway and serves as a mobility corridor for the region. The R550 East-West route plays a crucial role in enhancing transportation connectivity in the region. By serving as a mobility corridor, it facilitates the smooth flow of traffic, connecting various areas and enabling efficient movement of goods and people. Its classification as a Class 2 regional route highlights its significance in supporting regional development and ensuring convenient access to key destinations within the area.

R550 North -South

The R550 North-South is a Class 2 north-south regional route located to the north of the development. The road is a two-lane single carriageway and serves as a mobility corridor for the region. The R550 East-West route plays a crucial role in enhancing transportation connectivity in the region. By serving as a mobility corridor, it facilitates the smooth flow of traffic, connecting various areas and enabling efficient movement of goods and people. Its classification as a Class 2 regional route highlights its significance in supporting regional development and ensuring convenient access to key destinations within the area.

De Man Drive

De Man Drive is a North-South activity road serving as the collector street for the Kliprivier Business Park. It is a two-lane dual carriageway. Compared to other collector streets in the area, De Man Drive stands out for its efficient traffic flow and well-maintained infrastructure. Its two-lane dual carriageway design ensures smooth and uninterrupted travel for both commuters and businesses within the Kliprivier Business Park.

The speed limit on this road is 60km/h.

Access Road

The Access Road (Unknown Road) serves as a North-South activity road intended to be the collector street for the proposed malt production facility. The road is a two-lane single carriageway.

The speed limit on this road is 60km/h.

7.2 Existing Intersections

The following intersections are included in the study area for the purpose of capacity assessment:

- R550 East -West / R550 North -South
- R550 East -West / De Man Drive
- R550 East -West / Unknown Road

7.2.1 Existing Traffic Operations

The present traffic demand on the surrounding road network was obtained from traffic counts conducted during weekday AM and PM peak periods. The existing 2024 weekday AM and PM peak periods traffic volumes are indicated in Appendix A1 and A4. The traffic counts indicate that R550 carries the highest volumes in both peaks; with approximately 301 vehicle per hour (vph) and 396 vph (both directions) during the AM and PM peak respectively.

7.2.2 Visual Observations

Site observations were conducted during both AM and PM peak periods at various intersections near the study area. The observations indicate that all roads are operating well in both AM and PM peak.

8 Future Road Network

8.1 Future Road Layouts

The future provincial in the area is shown in Annexure A (Figure 14) and briefly discussed in Table 4 and depicted in Figure 3. These planned infrastructure upgrades were identified based on the likeliness of affecting the proposed development.

Table 4: Future Infrastructure Upgrades

Infrastructure type	Description	Source	Possible Impact
K77	Planned Class 2	Gauteng Department of Roads and Transport	The K77 will run along the west side of the development as a North-South route. By connecting this new alignment with the R550 route North-South, the intersection of the R550 East-West and the R550 North-South may be closed. Additionally, the alignment will create a new intersection along the existing R550. The introduction of the K77 and the closure of the intersection may result in a significant change in traffic patterns in the area. This could potentially alleviate congestion at the current intersection of the R550 East-West and North-South, while also creating a new point of traffic convergence at the intersection with the existing R550.
Planned Class 3	Planned Class 3	Gauteng Department of Roads and Transport	Class 3 roads will also be constructed in the west of the development as a North-South route. The construction of this road will have a direct impact on the newly constructed road network, which will facilitate the traffic flow for the development.

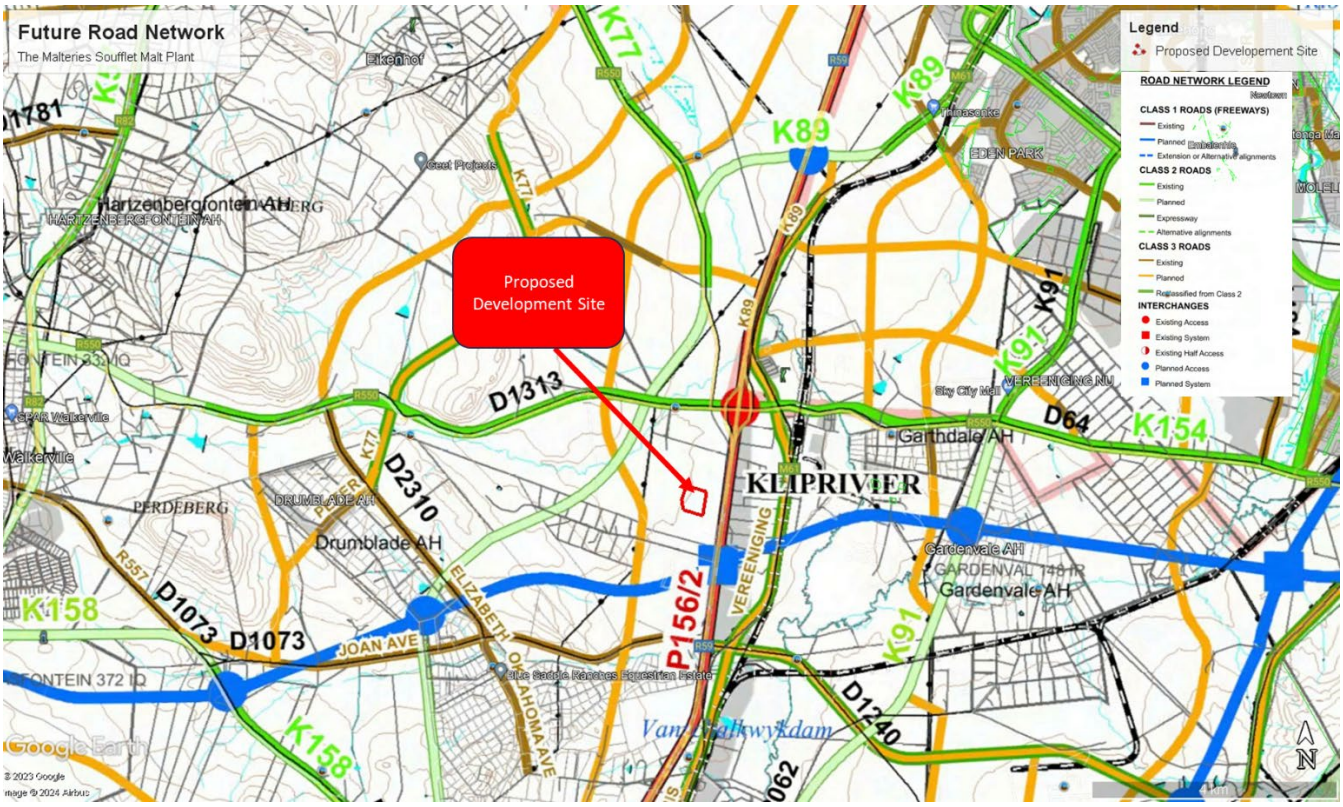


Figure 3: Future roads within the study area

9 Intersection Capacity Analysis

9.1 Purpose and Scope

A key focus of this report was to examine the traffic impact of the malt production facility when developed as a standalone entity (i.e. not included as part of the larger Kliprivier Business Park). In other words, the report will assess the road network requirements for the site to function independently. To this end the capacity analysis has to model a number of scenarios. Intersection capacity analyses were carried out using the SIDRA model.

9.2 2024 Baseline Assessment

To identify the operational efficiency of the intersections in the study area in their current form the 2024 base scenario was modelled using the SIDRA software program. The capacity assessments were based on existing intersection layouts / geometry. The results are illustrated in Table 5 and the outputs from the base model are presented in Appendix B1.

The intersection capacity analysis conducted on three different intersections has revealed that all three intersections are currently operating at the acceptable level of service (LOS). The LOS assessment was conducted in both the AM peak and PM peak scenarios, and the results were consistent across all three intersections. This positive outcome indicates that the intersections are effectively managing traffic flow and minimizing congestion. Appendices A1 and A2 of this report provide information about Base / Surveyed Traffic AM Peaks and PM Peaks for 2024.

Table 5: Intersection Capacity Analysis Results – 2024 Existing Traffic (AM and PM Peak)

Intersection / Approach		2024 Existing Traffic							
		AM Peak				PM Peak			
		Demand	V/C	Delay	LOS	Demand	V/C	Delay	LOS
R550 East West / R550 North -South	R550 Westbound	259	0.14	0.7	LOS A	223	0.14	3.40	LOS A
	R550 Southbound	127	0.13	9.2	LOS A	72	0.09	9.70	LOS A
	R550 Eastbound	171	0.09	0.5	LOS A	257	0.13	0.60	LOS A
	Overall	**557**	**0.14**	**2.6**	**LOS A**	**552**	**0.14**	**2.90**	**LOS A**
R550/ De Man Drive	De Man Northbound	158	0.16	8.6	LOS A	247	0.23	8.3	LOS A
	R550 Westbound	289	0.16	5.4	LOS A	166	0.09	4.9	LOS A
	R550 Eastbound	13	0.01	0.6	LOS A	13	0.01	0.5	LOS A
	Overall	**460**	**0.16**	**6.3**	**LOS A**	**426**	**0.23**	**6.8**	**LOS A**
R550 / Unknown Road	Unknown Road Northbound	8	0.01	7.9	LOS A	6	0.01	8	LOS A
	R550 Westbound	11	0.00	3.5	LOS A	21	0.01	1.3	LOS A
	R550 Eastbound	7	0.00	0.8	LOS A	10	0.01	0.6	LOS A
	Overall	**26**	**0.01**	**4.1**	**LOS A**	**37**	**0.01**	**2.2**	**LOS A**

9.3 2029 Future Traffic without Development Traffic

A comprehensive traffic observation yearbook published by SANRAL in 2021 provides good historical data. Two locations in close proximity to the proposed site were used to estimate historical traffic growth. In the period 2010 to 2015, traffic growth at station 0283 (Waterval) was 4.2%, and at station 0282 (Zonkizizwe) was 1.1%. According to TMH17, aggregate growth rates were calculated as 2.7%, which is considered low growth (0 to 3%) areas. Thus, a growth rate of 3% was applied to this study. Appendices A3 and A4 of this report provide information about 2029 Future Traffic without Development Traffic AM Peak and PM Peak.

A summary of the results for 2029 Future Traffic without development traffic (AM and PM Peak) is shown in Table 6. The outputs from the future model are presented in Appendix B2. The results indicate that all three intersections will continue to operate at an acceptable level of service (LOS). The LOS is within the acceptable range of A-B. This indicates that no additional measures are required to improve traffic conditions at these intersections.

Table 6: Intersection Capacity Analysis Results – 2029 Future Traffic without Development Traffic (AM and PM Peak)

Intersection / Approach		2029 Future Traffic							
		AM Peak				PM Peak			
		Demand	V/C	Delay	LOS	Demand	V/C	Delay	LOS
R550 East West / R550 North -South	R550 Westbound	300	0.16	0.7	LOS A	259	0.16	3.6	LOS A
	R550 Southbound	147	0.16	9.5	LOS A	83	0.11	10.2	LOS B
	R550 Eastbound	198	0.10	0.5	LOS A	298	0.15	0.6	LOS A
	Overall	**646**	**0.16**	**2.7**	**LOS A**	**640**	**0.16**	**3.1**	**LOS A**
R550/ De Man Drive	De Man Northbound	183	0.19	8.8	LOS A	286	0.27	8.4	LOS A
	R550 Westbound	335	0.18	5.4	LOS A	183	0.10	4.9	LOS A
	R550 Eastbound	15	0.01	0.6	LOS A	15	0.01	0.5	LOS A
	Overall	**533**	**0.19**	**6.4**	**LOS A**	**485**	**0.27**	**6.8**	**LOS A**
R550 / Unknown Road	Unknown Road Northbound	9	0.01	7.9	LOS A	7	0.01	8	LOS A
	R550 Westbound	13	0.01	3.6	LOS A	24	0.01	1.3	LOS A
	R550 Eastbound	8	0.00	0.8	LOS A	12	0.01	0.6	LOS A
	Overall	**30**	**0.01**	**4.1**	**LOS A**	**43**	**0.01**	**2.2**	**LOS A**

9.4 2029 Future Traffic with the Proposed Development

To assess the impact of the proposed development traffic on the road network, the intersections were also analysed with the development traffic for the 2029 scenarios, as shown in Table 7. The addition of development traffic will have minor impact on the performance of the intersections within the study area. All intersections level of services will remain unchanged, with a small increase in delay and v/c ratio. Appendices A7 and A8 of this report provide information about 2029 Future Traffic with Development Traffic AM Peak and PM Peak. The outputs from the future model are presented in Appendix B3.

Table 7: Intersection Capacity Analysis Results – 2029 Future Traffic with Development Traffic (AM and PM Peak)

Intersection / Approach		2029 Future Traffic + Development Traffic							
		AM Peak				PM Peak			
		Demand	V/C	Delay	LOS	Demand	V/C	Delay	LOS
R550 East West / R550 North -South	R550 Westbound	331	0.18	0.7	LOS A	265	0.17	3.7	LOS A
	R550 Southbound	155	0.18	9.8	LOS A	87	0.12	10.6	LOS B
	R550 Eastbound	208	0.11	0.5	LOS A	336	0.17	0.6	LOS A
	Overall	**694**	**0.18**	**2.7**	**LOS A**	**688**	**0.17**	**3**	**LOS A**
R550/ De Man Drive	De Man Northbound	183	0.20	9.1	LOS A	286	0.29	8.8	LOS A
	R550 Westbound	374	0.20	4.8	LOS A	202	0.11	4.7	LOS A
	R550 Eastbound	25	0.01	0.3	LOS A	53	0.03	0.1	LOS A
	Overall	**582**	**0.20**	**6**	**LOS A**	**541**	**0.29**	**6.4**	**LOS A**
R550 / Unknown Road	Unknown Road Northbound	19	0.02	8	LOS A	47	0.05	8	LOS A
	R550 Westbound	52	0.03	5	LOS A	35	0.01	2.5	LOS A
	R550 Eastbound	8	0.00	0.7	LOS A	11	0.01	0.5	LOS A
	Overall	79	0.03	5.3	LOS A	**93**	**0.05**	**5.1**	**LOS A**

9.5 Proposed Access Points to the Malt Production Facility

A southern extension of the existing access road will serve as the access road to the development. The access road will begin at the existing circle and the first gate will be located on the Soufflet Malt property. There will be no closure of any area outside of the Soufflet Malt property. In addition, trucks will move from the main entrance to the administrative building and weighbridge. In the event that the samples are approved, the truck will continue to the north for offloading. In the event that a truck is rejected, it will turn around at the circle and exit the facility.

A draft development master plan, showing the access road, Is provided In Appendix C.

9.6 Future Public Transport and NMT Infrastructure

9.6.1 Public Transport

The development will operate on a 24/7 operating cycle, which will require employees to be present at all times. However, the existing public transport services are located too far away from the proposed development, making it impractical for employees to utilize these existing services.

To address the issue of accessibility, the developer has proposed several measures. Firstly, the existing public transport services within the area will be permitted to continue operating, allowing taxis to pick-up and drop-off employees near the development site gate. Secondly, the developer is considering providing either a company shuttle or a combination of a public taxi and a shuttle service to transport the employees.

Furthermore, the developer has also decided to allocate a dedicated taxi parking layby near the facility gate. This arrangement eliminates the need for extensive investments in constructing and maintaining large public transport infrastructure. By providing a dedicated taxi parking space, the developer ensures that employees have access to reliable transportation options.

9.6.2 NMT Infrastructure

The surrounding development must be designed to be NMT-friendly. The following could be considered with the intent of creating a suitable environment. As part of the development infrastructure, it is recommended that a paved sidewalk be provided on the property frontage and an access road (2m wide) as follows:

- Footpaths (2m minimum) and cycle paths to be provided along the frontage of the development.
- Connect the proposed taxi layby area with the development site with NMT facilities
- Allowance to be made for elevated (using unmountable kerbs) pedestrian walkways to separate vehicles and pedestrians.
- Internal layout design to make provision for pedestrians and cyclists within internal roads.
- Non-motorised access points to be separated from the main vehicle access points.

10 Parking Requirements

Parking is an important and integral part of the transportation system and is an essential transportation service that is required at the development. For this development, on-site parking will be provided. The TMH16 stipulates that parking rates in a development should be defined in the town planning scheme of the municipality and must be provided accordingly. A total of 36 parking spaces will be provided for this development in accordance with the Midvaal Land Use Scheme (2017), as shown in Table 8.

Table 8: Parking requirements for the development

Land-Use	Size (m^2)	Bays per 100 m²	Total Parking Required
Office space	985	3	30
Workshops	610	1	6
Totals			**36**

11 RISK/IMPACT ASSESSMENT

11.1 Impact Assessment Methodology

A Risk Impact Assessment was conducted, identifying the risks posed by the proposed development. The assessment delved into various aspects such as the impact on the road network in terms of safety, traffic, and road condition. By examining these factors, the assessment aimed to provide a comprehensive understanding of the potential risks the development could pose.

The significance of the identified impacts was determined using the approach outlined in the Department of Environmental Affairs and Tourism Guideline document on EIA Regulations (April 1998). This approach

incorporates two aspects for assessing the potential significance of impacts, namely occurrence and severity, which are further sub-divided as follows:

Occurrence:
- Probability of occurrence; and
- Duration of occurrence.

Severity:
- Scale/ extent of impact; and
- Magnitude (severity) of impact.

To assess each of these factors for each impact, the following ranking scales are used:

Table 9: Risk assessment ranking scales

Factor	Ranking Scale
Probability of occurrence	5 - Definite/don't know
	4 - Highly probable
	3 - Medium probability
	2 - Low probability
	1 - Improbable
	0 - None
Duration of occurrence	5 - Permanent
	4 - Long-term
	3 - Medium-term (8-15 years)
	2 - Short-term (0-7 years) (impact ceases after the operational life of the activity)
	1 – Immediate
Scale / extent of impact	5 - International
	4 - National
	3 - Regional
	2 - Local
	1 - Site only
	0 - None
Magnitude (severity) of impact	10 - Very high/don't know
	8 - High
	6 - Moderate
	4 - Low
	2 - Minor

Once these factors are ranked for each impact, the significance of the two aspects, occurrence, and severity, is assessed using the following formula:

SP (significance points) = (magnitude + duration + scale) x probability

The maximum value is 100 significance points (SP). The impact significance will then be rated as follows:

Table 10 Significance points

Significance Points	Rating	Discussion
SP >75	Indicates high environmental significance	An impact which could influence the decision about whether or not to proceed with the project regardless of any possible mitigation.
SP 30 – 75	Indicates moderate Environmental significance	An impact or benefit which is sufficiently important to require management and which could have an influence on the decision unless it is mitigated.
SP <30	Indicates low environmental significance	Impacts with little real effect and which should not have an influence on or require modification of the project design.
+	Positive impact	An impact that constitutes an improvement over pre-project conditions

11.2 Overview of Impact Significance

The envisioned impact of the malt production facility on the surrounding road network includes:

- Deterioration of road network conditions;
- Environmental impact;
- Increase in traffic volumes impacting on infrastructure LOS; and
- Deterioration of road safety conditions.

Table 11: Overview of significance points before implementation of the mitigation measures

Factor	Deterioration of road network condition	Environmental Impact	Increase in traffic volumes	Deterioration of road safety conditions
Probability of occurrence	5	4	5	5
Duration of occurrence	4	5	4	4
Scale / extent of impact	2	4	2	1
Magnitude (severity) of impact	6	4	6	6
Significance points	**60**	**52**	**60**	**60**

Deterioration of Road Network Condition:

The increase in traffic, and especially of vehicles carrying workers will cause a deterioration of the road network, especially as the development will operate on a 24/7 operating cycle. The expected heavy vehicles are unlikely to have a significant impact on the surrounding higher order road (R59-Sybrand van Niekerk Freeway) as this road has been built to a high standard to carry heavy loads over a long design period, however the condition of the road local network (R550 East/West, R550 North/South, De Man Drive) will be impacted by the additional traffic generated. A deteriorating road network can lead to increased travel times, congestion, and higher maintenance costs for vehicles. It can also negatively impact the safety of road users, increasing the risk of accidents and injuries.

Environmental Impact:
The malt production facility may have an environmental impact on the road network. For example, increased traffic can lead to higher emissions, negatively impacting air quality.

Increase in Traffic Volumes Impacting on Level of Service of the Infrastructure:
The increase in traffic during the peak hour of 50 vehicles, will have a minor impact on the LOS of the roads or intersections during operation. A LOS A will be maintained at all intersections in the Future Traffic scenario of 2029 with the proposed development. The expected increase in traffic volume during the peak hour is projected to be around 4%, which is still within the capacity of the roads and intersections. Therefore, the impact on the LOS is expected to be minimal and a LOS A will be maintained.

Deterioration of Road Safety Conditions:
The development of a malt production facility can have significant impacts on road safety conditions, affecting both the local road network and traffic flow. The heavy loads associated with malt production vehicles can contribute to the deterioration of road surfaces. This damage can include potholes, cracks, and reduced grip, making the road less safe for drivers, pedestrians, and cyclists. Additionally, the expected increased volume of public transport vehicles, particularly taxis, also pose a risk to road safety as these vehicles are known to stop in intersections and along the hard shoulder causing sight distance issues.

11.3 Mitigation and Monitoring Measures

From Table 11 above, it can be concluded that all three of the identified impacts have a moderate environmental significance (30-75 Significance Points) before mitigation. These impacts are therefore significant enough to require management and could influence the decision unless mitigated.

The key mitigation and monitoring measures to implement includes:

1. The condition of the R550 East/West, R550 North/South and access road to be monitored by the relevant parties and remedial actions to be implemented to maintain an acceptable road conditions.
2. The movement of materials and equipment by trucks can be phased through the day to the reduce the impact the trucks have on traffic congestion. The delivery of materials/ equipment by abnormal vehicles, if required, should be scheduled during off-peak periods in order to have the least impact on traffic conditions.
3. The road safety conditions to be monitored by Traffic Police on the R550 East/West and R550 North/South intersection, this will increase the road safety and minimize the risk of accidents along this section of the road.
4. The proposed dedicated taxi parking layby near the facility gate will reduce congestion on the R550 East/West and R550 North/South intersection and R550 East/West intersection with the access road (Unknown road).
5. The transportation of employees either with company shuttle or a combination of a public taxi and a shuttle service will reduce the congestion on the local road network as dedicated vehicles will be transporting employees to the facility rather than general public transport vehicles which may be transporting fewer employees each resulting in increased volumes.
6. The provision of the dedicated taxi parking layby near the facility gate will also reduce the number of pedestrians on the R550 East/West, R550 North/South, and access road, thereby reducing road safety risks to both pedestrians and drivers.
7. The suggested provision of NMT facilities in the form of a paved sidewalk on the property frontage and along the access road will also increase road safety for both pedestrians and drivers as well as improve the pedestrian-friendliness of the area as a whole.

8. Increased traffic, resulting from the operation of the facility, can lead to higher emissions, potentially negatively impacting air quality. Encouraging the use of alternative fuels, such as biodiesel or electric-powered trucks, can significantly reduce emissions. Additionally, promoting the use of electric vehicles (EVs) for on-site transportation or providing charging stations can further support the transition towards cleaner transportation.

With the incorporation of these mitigation measures all three of the identified impacts have a reduced significance as seen in Table 12 below.

Table 12: Overview of significance points after implementation of the mitigation measures

Factor	Deterioration of road network condition	Environmental Impact	Increase in traffic volumes	Deterioration of road safety conditions
Probability of occurrence	5	4	5	5
Duration of occurrence	4	5	4	4
Scale / extent of impact	2	4	2	1
Magnitude (severity) of impact	2	2	2	2
Significance points	**40**	**44**	**40**	**35**

12 Conclusions and Recommendations

The TIA is in support of a proposed malt production facility development application in the Sedibeng District Municipality of Gauteng, in South Africa. The following recommendations are proposed:

- The development proposal will ensure that the site is well connected to the existing road network and accessible to pedestrians and cyclist.
- It is expected that the development will generate an additional 50 vph in both weekdays AM and PM peak periods on the surrounding road network.
- The analysis indicates that all the intersections are currently operating at acceptable levels of service (A) in the 2024 scenario. This correlates with the visual observation.
- The AM peak and PM peak scenarios for the future traffic in 2029 without development have been analysed. The results indicate that all three intersections will continue to operate at an acceptable LOS. Therefore, additional measures are not necessary to improve traffic conditions at these intersections
- The AM peak and PM peak scenarios for the future traffic in 2029 with development have been analysed. The addition of the development traffic will have a negligible impact on the intersections in the study area. There is no need to upgrade an intersection within the study area.
- From a traffic engineering perspective, there is no intersection upgrade required to improve the performance of the network near the site. However, all roads anticipated to provide access to the proposed development, should be paved to improve accessibility (3.0 - 5.5m roadway (two way)).
- Parking and internal circulation will be provided inside the development, and it is envisaged that sufficient parking will be provided (36 parking spaces).
- It is recommended to strengthen the sustainability of the site, and to provide improved facilities to pedestrian and public transport users by providing a taxi layby near the development site entrance.

- The paved footpath should be provided on the property frontage of the development as part of the development infrastructure, with a minimum width of 2m.

Provided that the above comments and recommendations are adhered to, the proposed application will be supported from a traffic engineering perspective.

13 References

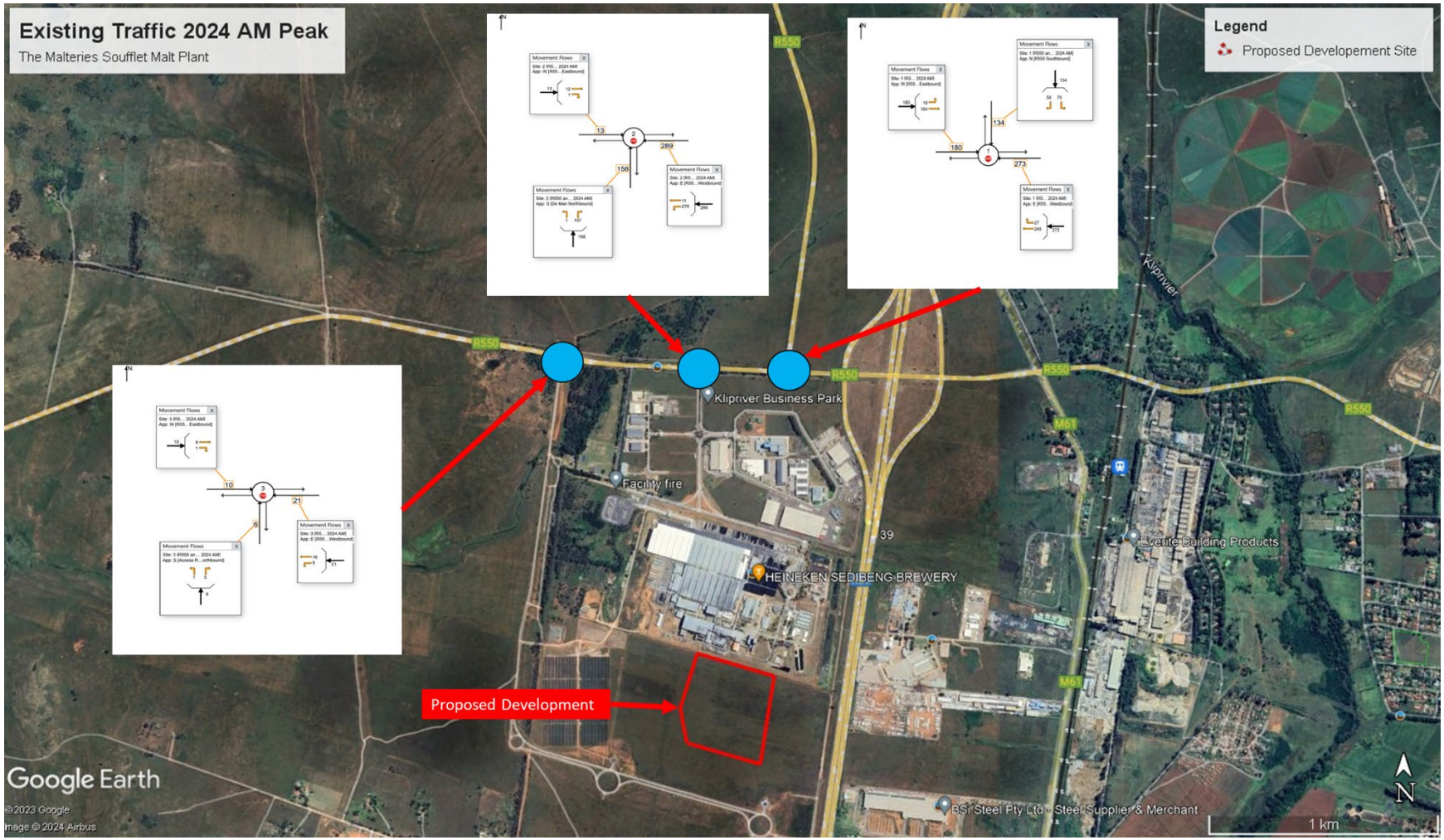
- Geometric Design of Urban Collector Road, October 1988, Department of Transport
- Highway Capacity Manual, Transportation Research Board, National Research Council, Fourth Edition, 2000
- TRH26, South African Road Classification and Access Management Manual, Version 1.0, August 2012
- TMH 16, South African Traffic Impact and Site Traffic Assessment Standards and Requirements Manual, Version 2, February 2014
- TMH14, South African Trip Data Manual Version 1.01, September 2013
- TMH17-Trip-Data-Manual
- Midvaal-Land-Use-Scheme-2017
- Guideline document on EIA Regulations (April 1998)

Acronyms

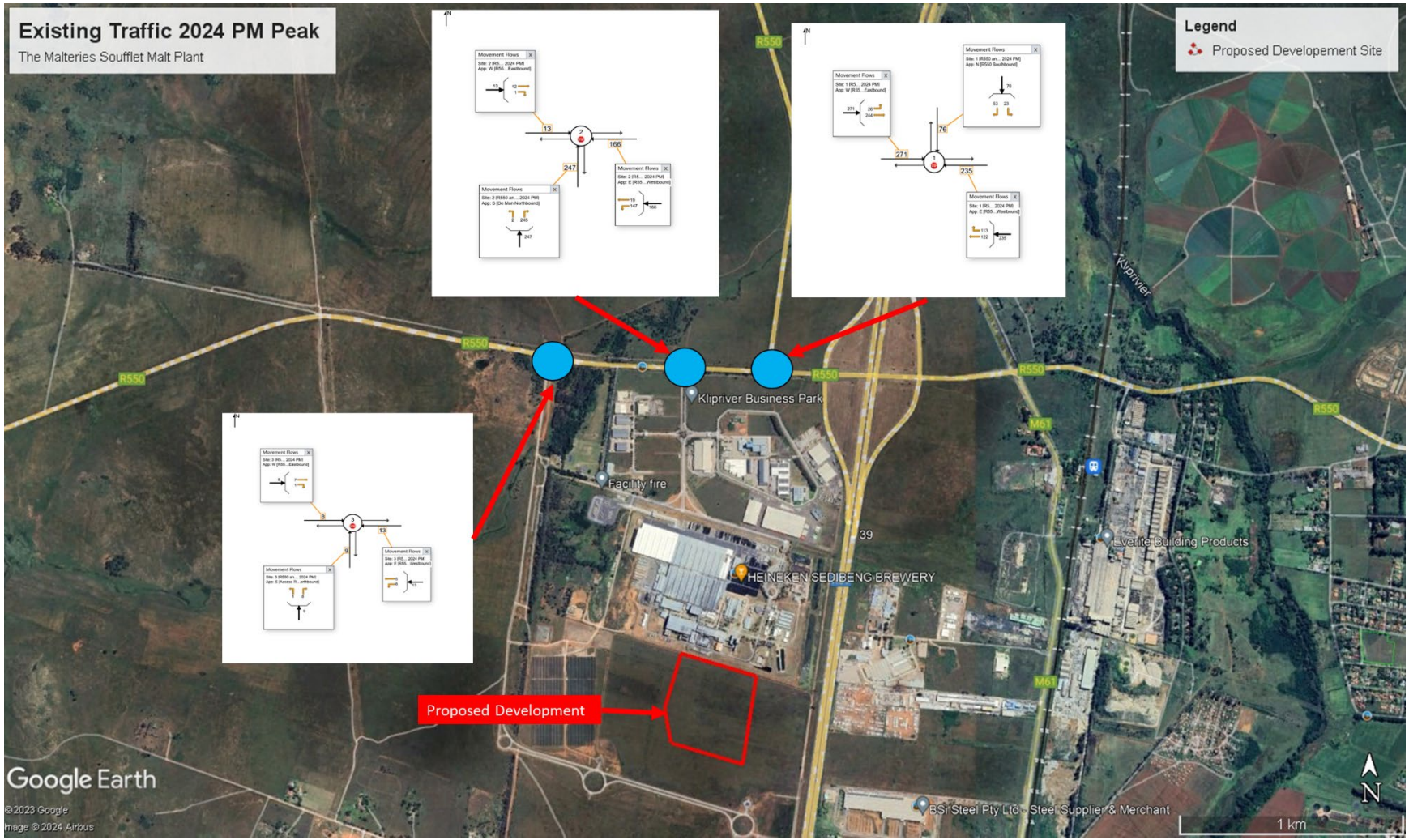
Acronym	Acronym description
GLA	Gross Leasable Area
COTO	Committee of Transport Officials
NMT	Non-Motorized Transport
MLM	Midvaal Local Municipality
RCAM	Road Classification and Access Management Manual
vph	Volume per Hour
LOS	Level of Service
V/C	Volume Capacity Ratio
TMH	Technical Methods For Highways
KT	Kilotonnes
AM	Before midday
PM	After midday
RHDHV	Royal HaskoningDHV

Appendix A

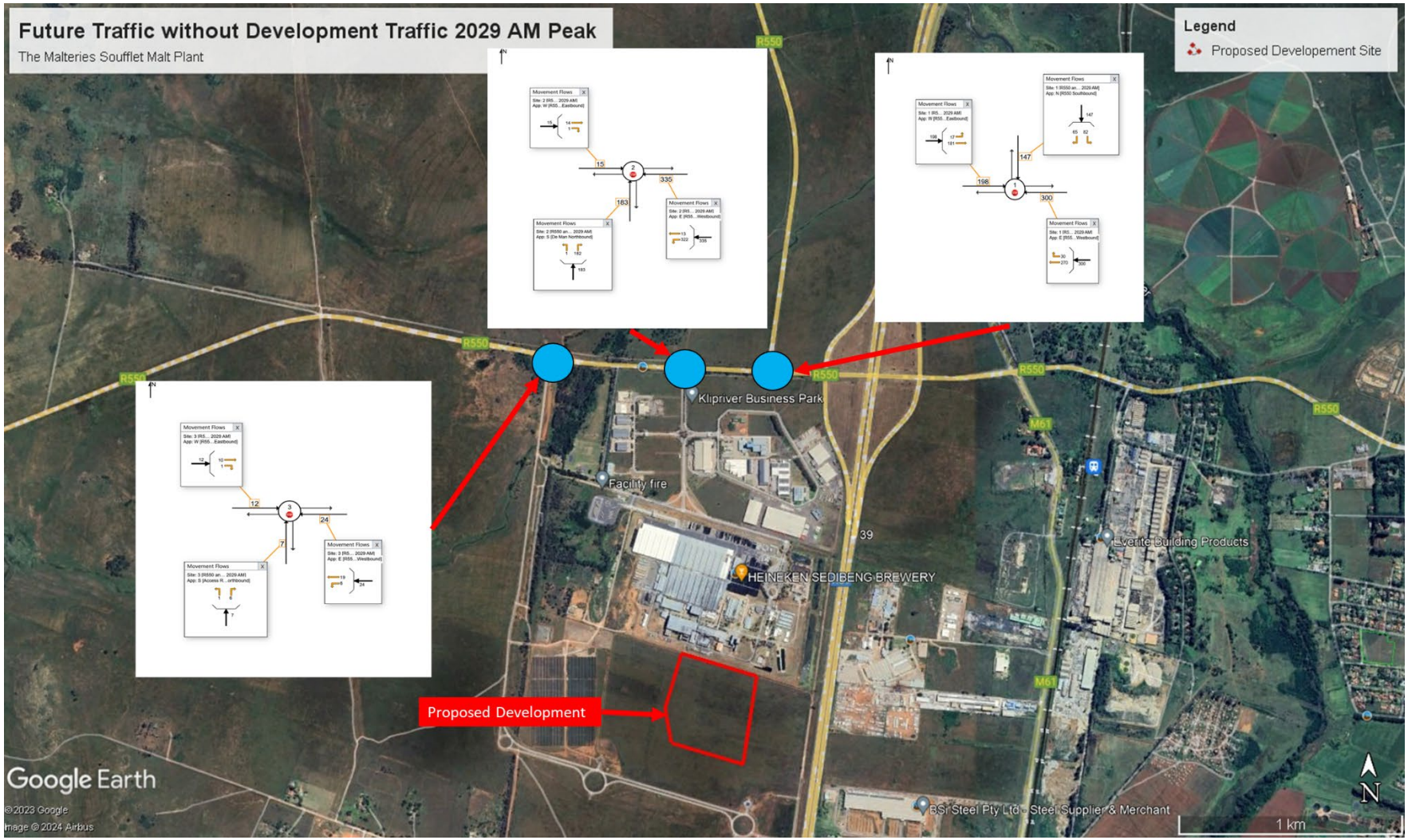
Appendix A1: Existing Traffic 2024 AM Peak



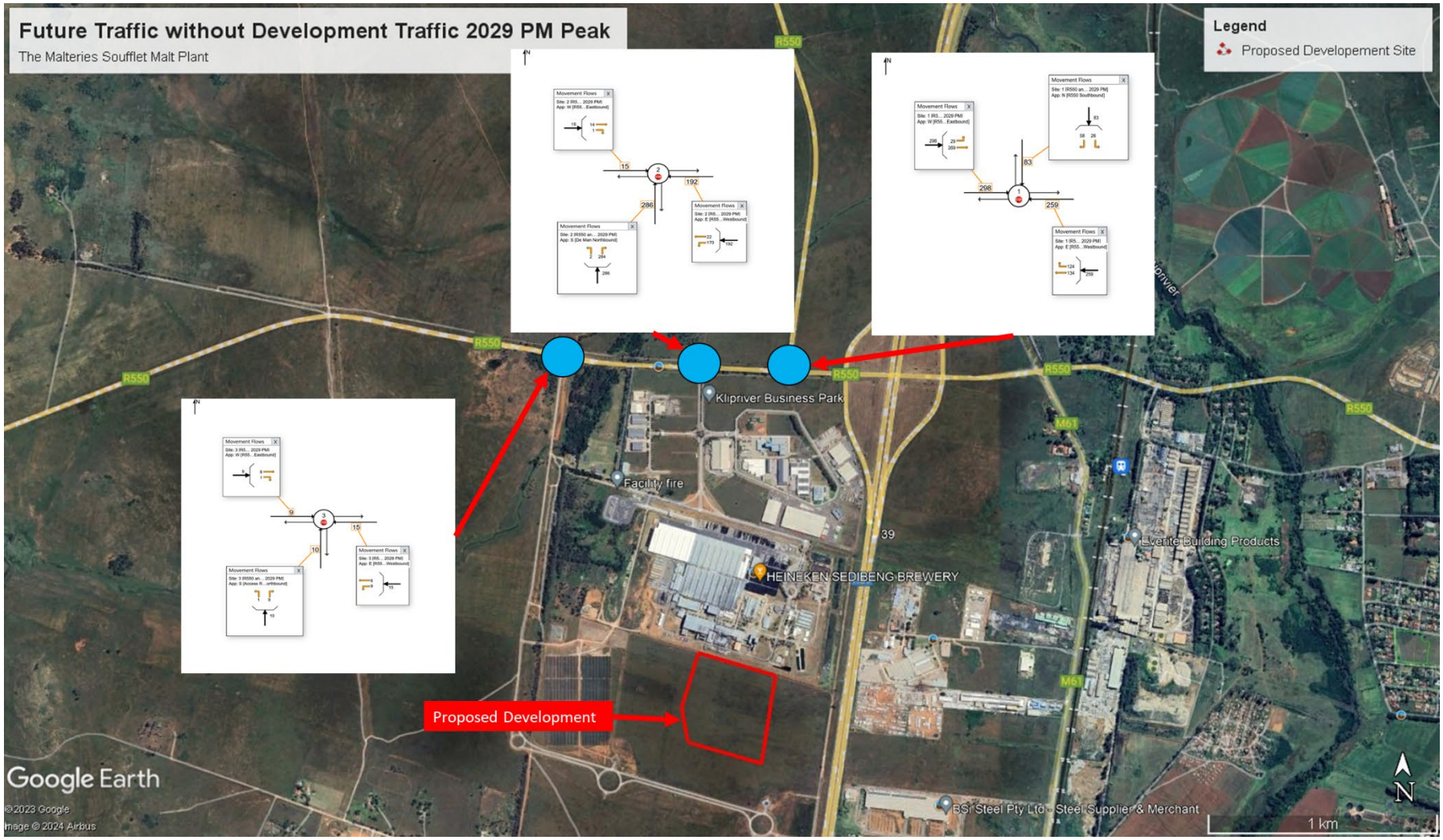
Appendix A2: Existing Traffic 2024 PM Peak



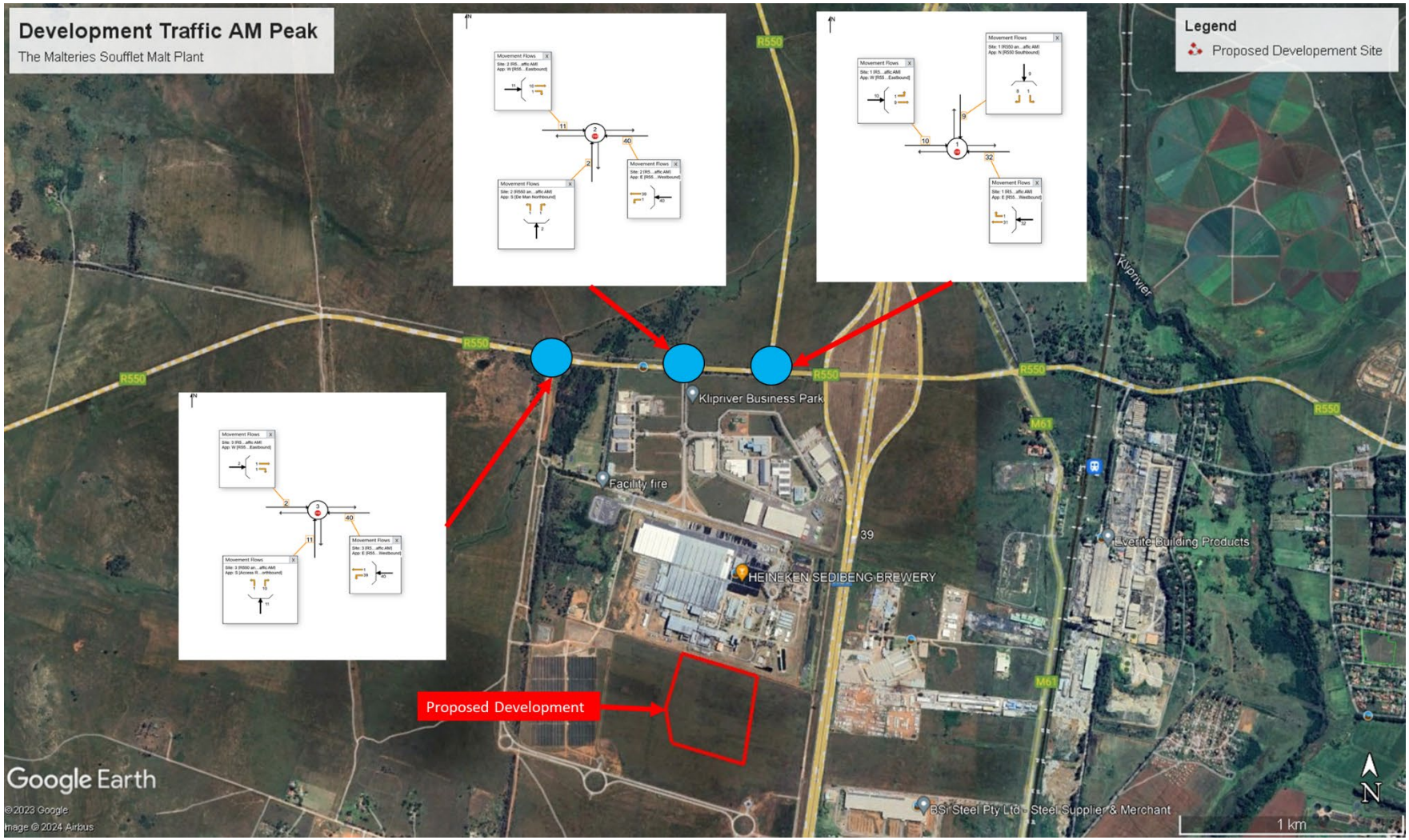
Appendix A3: Future Traffic without Development Traffic 2029 AM Peak



Appendix A4: Future Traffic without Development Traffic 2029 PM Peak

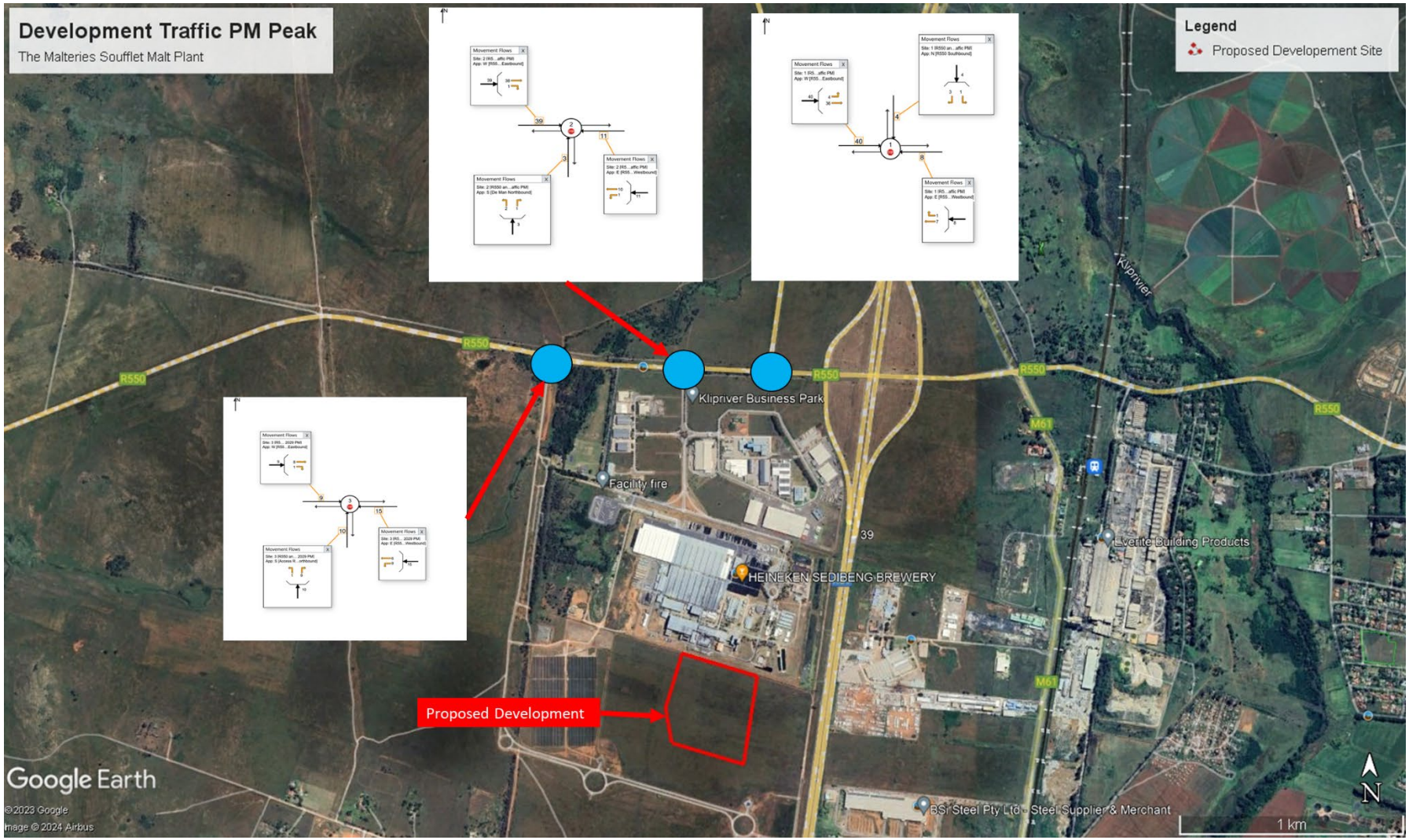


Appendix A5: Development Traffic AM Peak



Royal HaskoningDHV

Appendix A6: Development Traffic PM Peak



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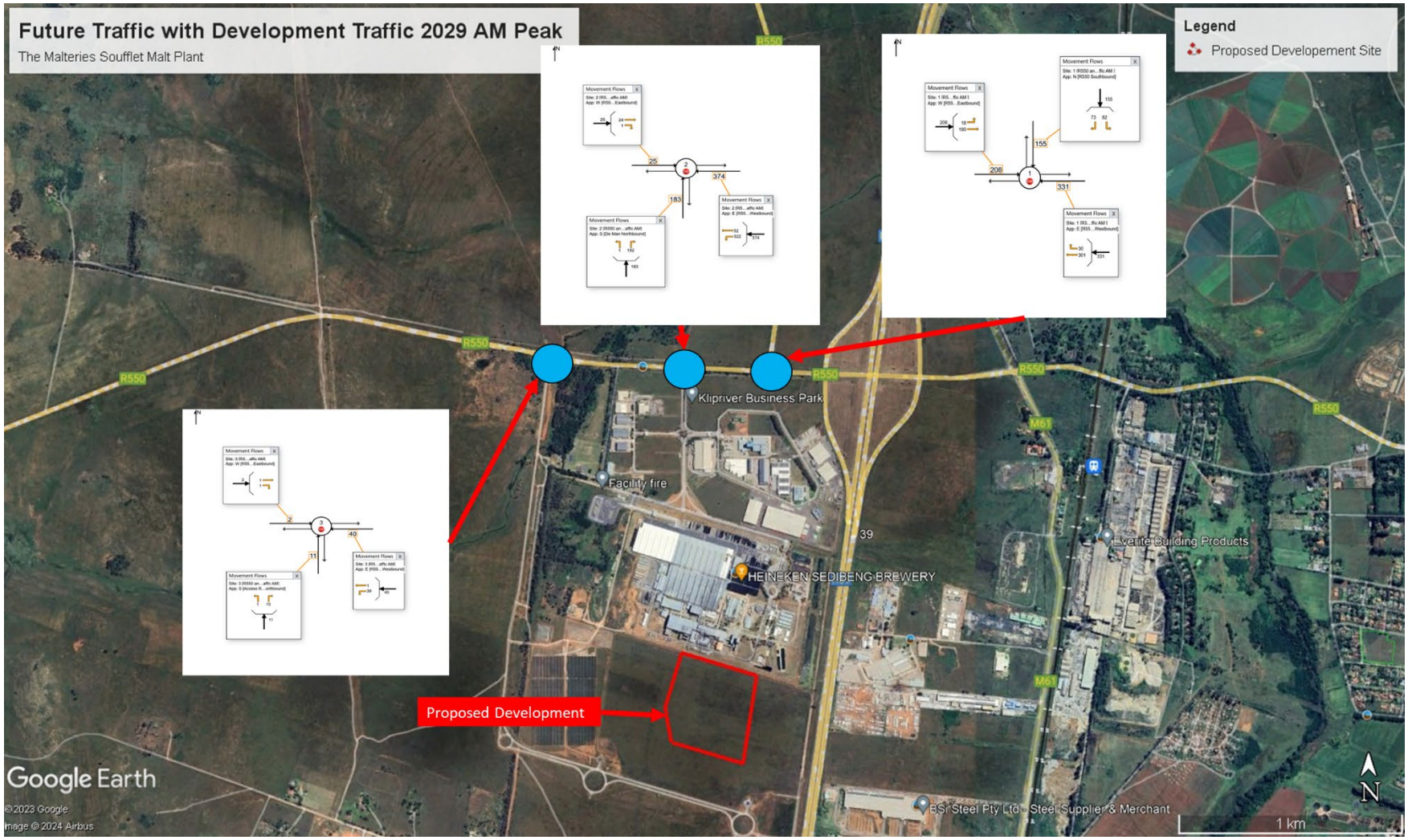
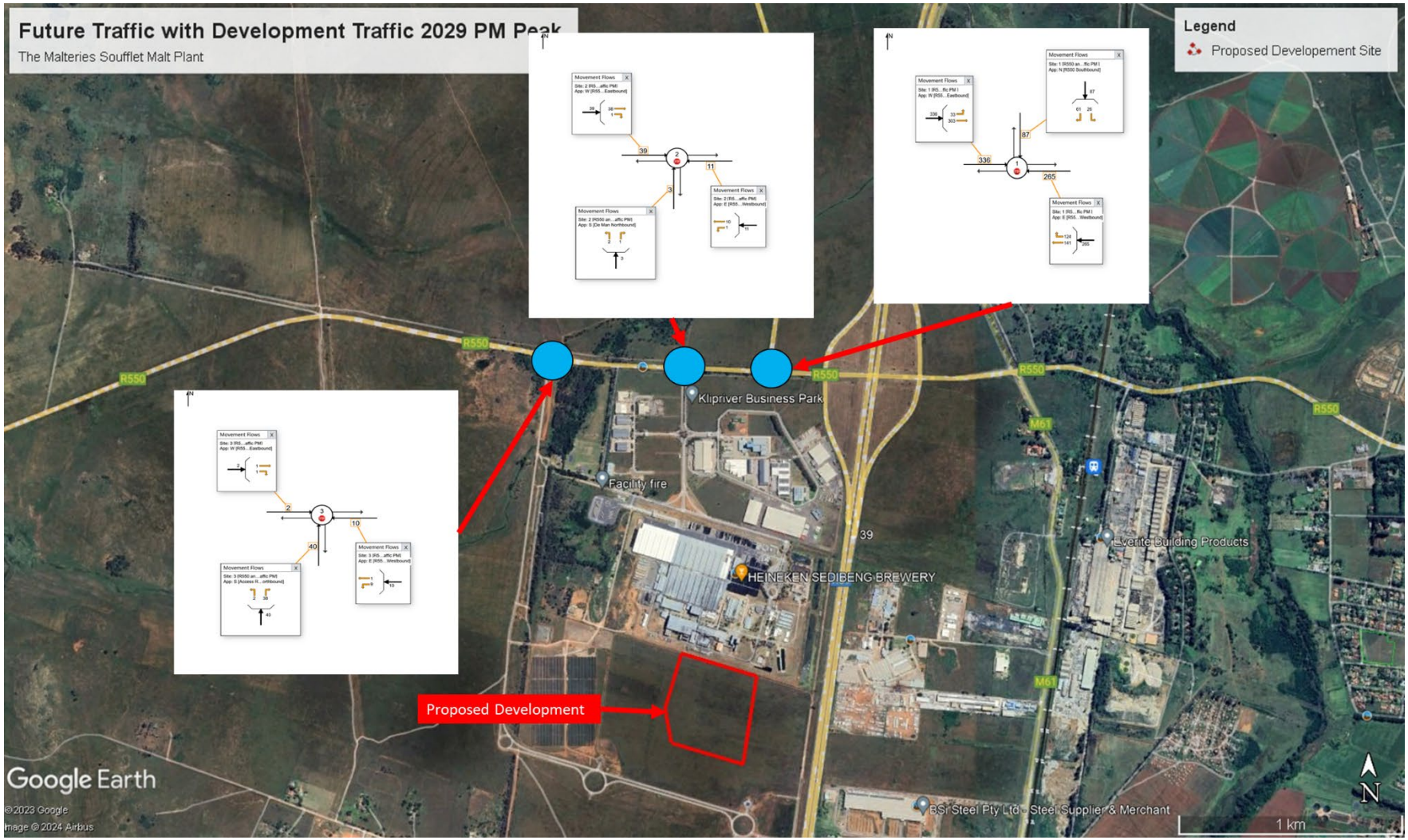
Appendix A7: Future Traffic with Development Traffic 2029 AM Peak



Appendix A8: Future Traffic with Development Traffic 2029 PM Peak



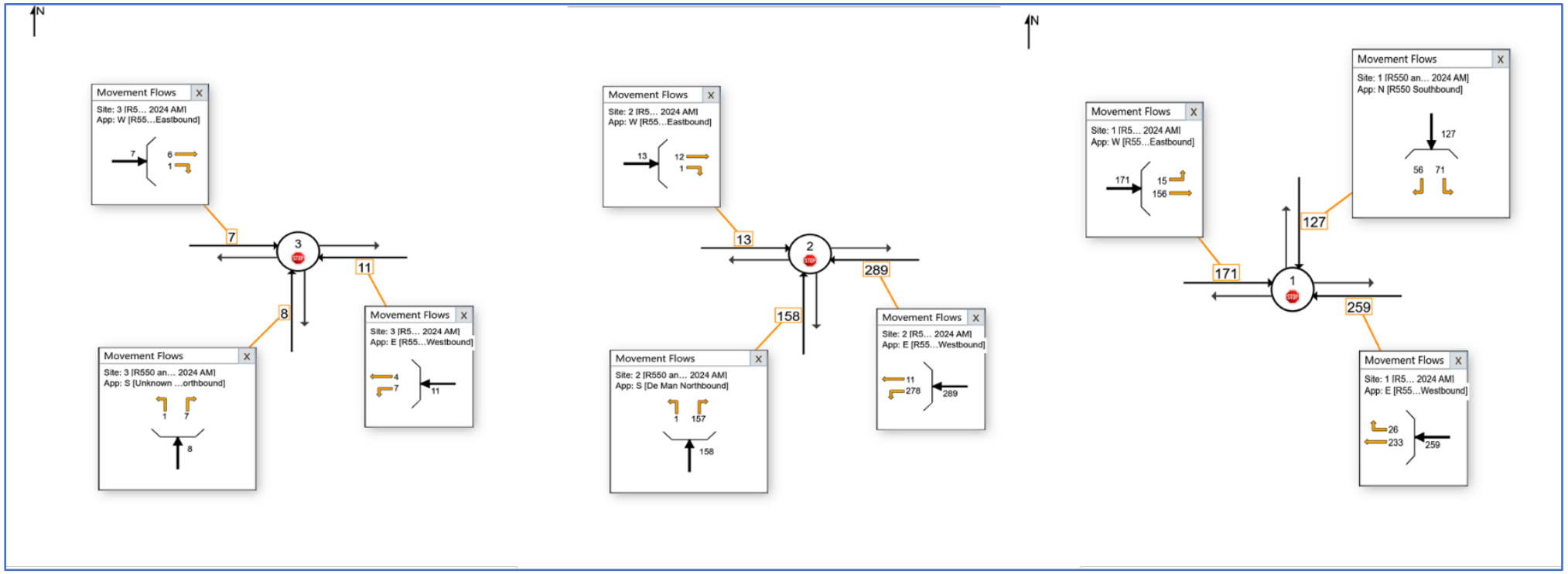
Appendix B:

Appendix B1: Base (2024) Model

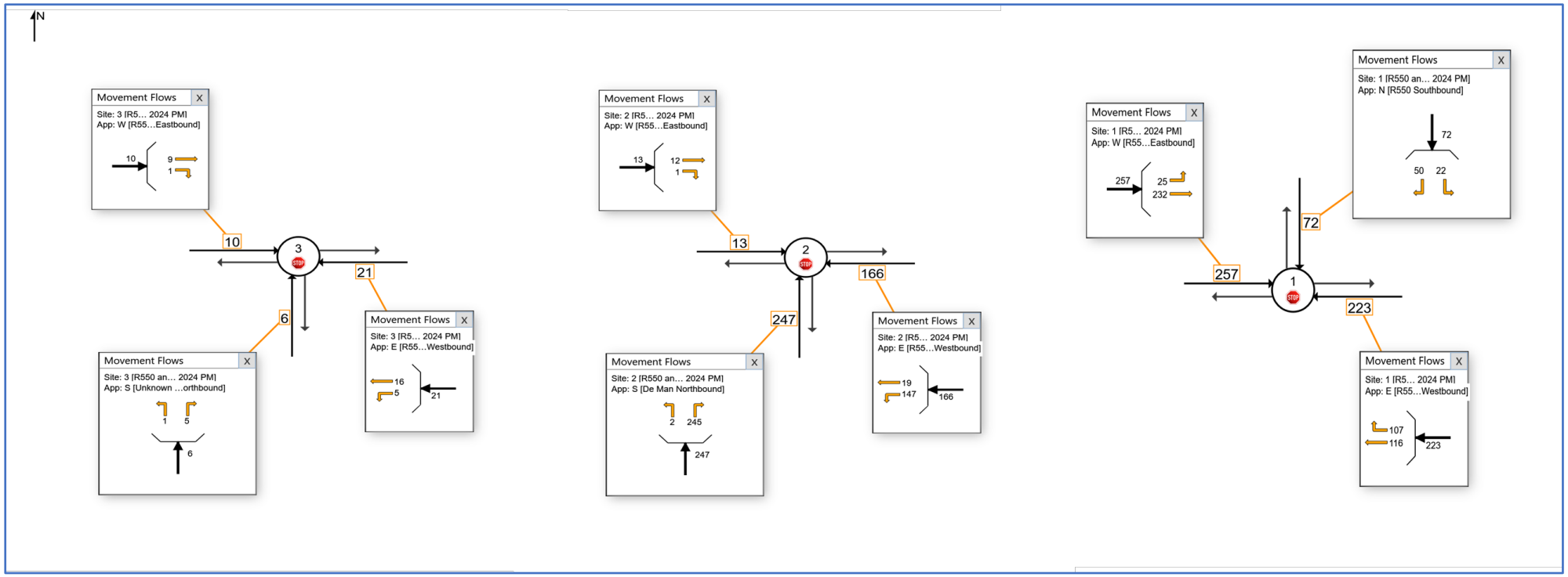
Appendix B2: Future (2029) Model without development traffic

Appendix B3: Future (2029) Model with development traffic

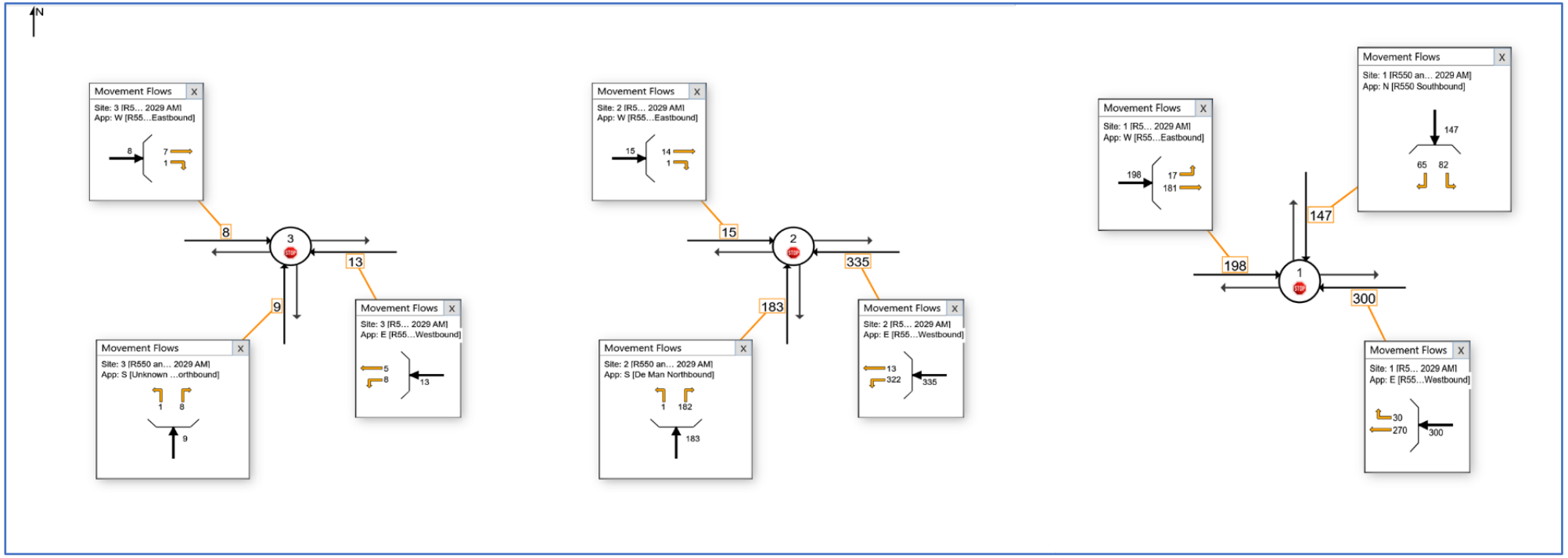
2024 Base / Surveyed Traffic AM



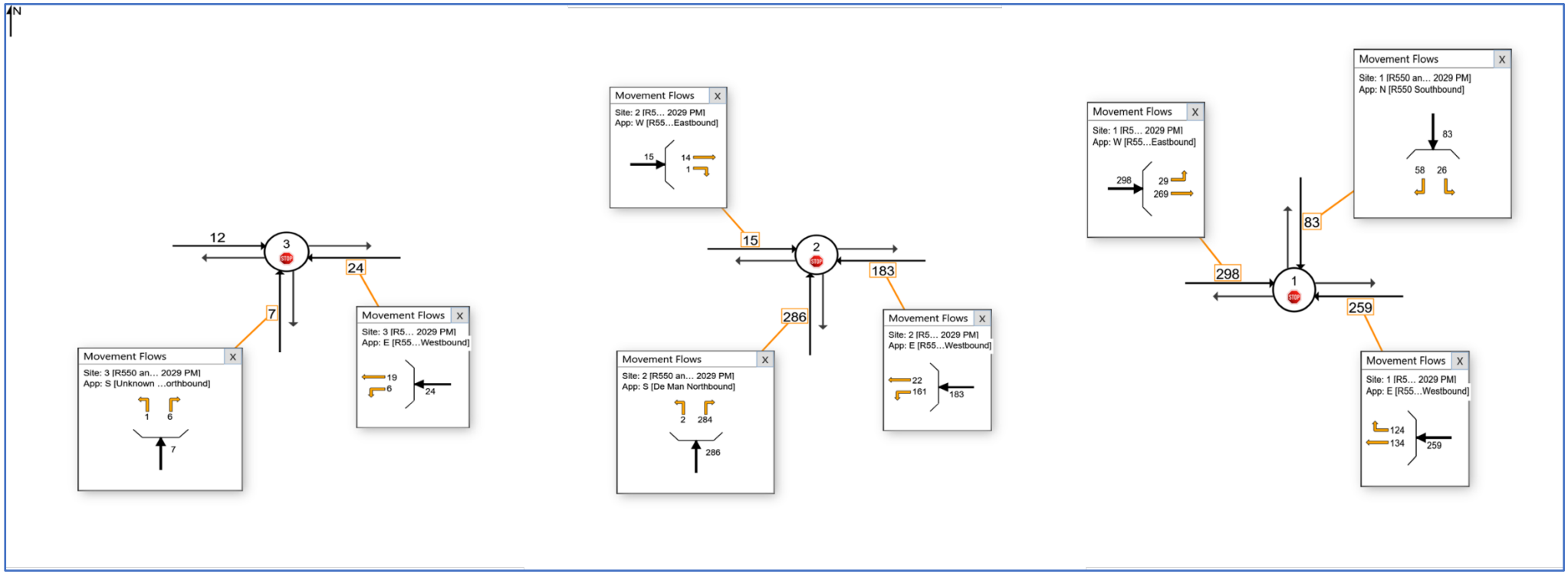
2024 Base / Surveyed Traffic PM



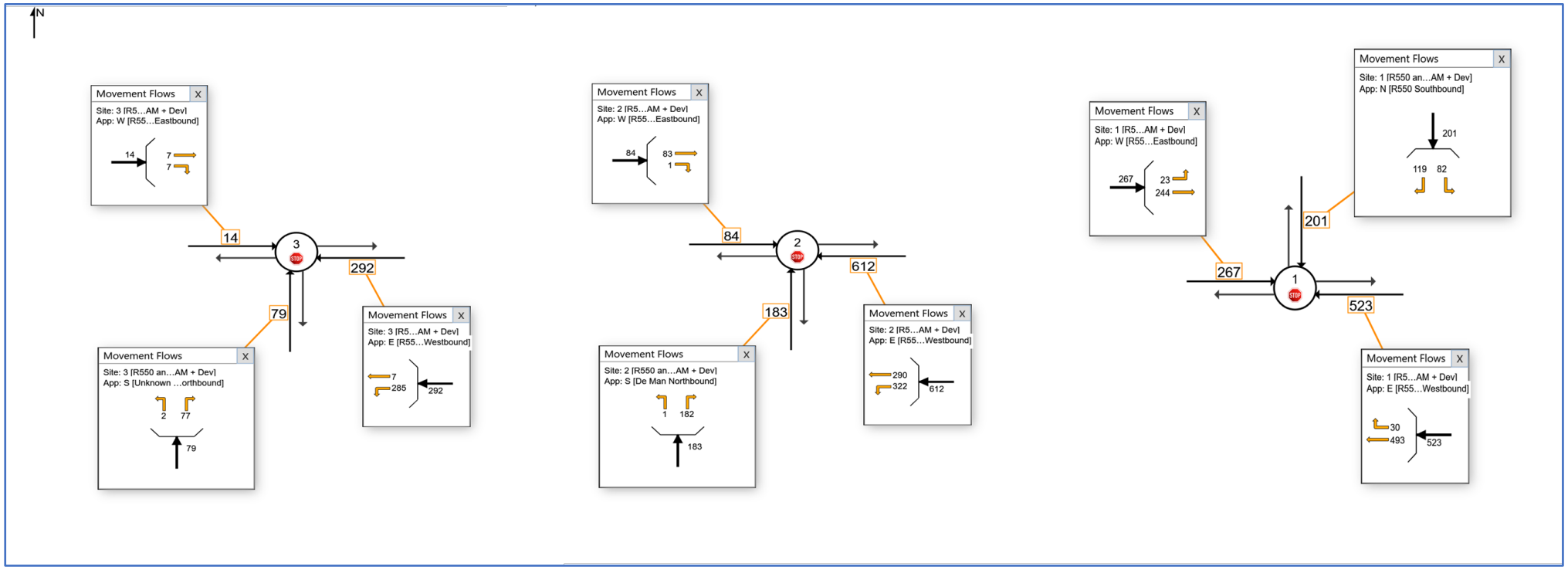
2029 Future Traffic without Development Traffic AM



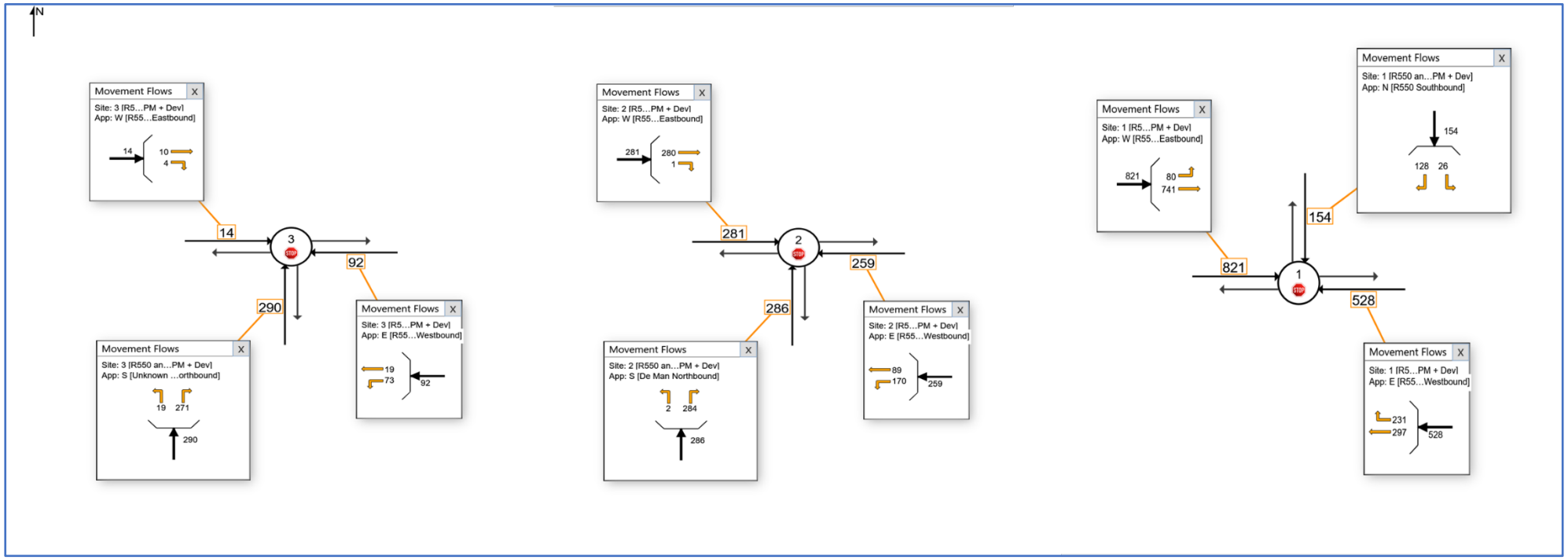
2029 Future Traffic without Development Traffic PM



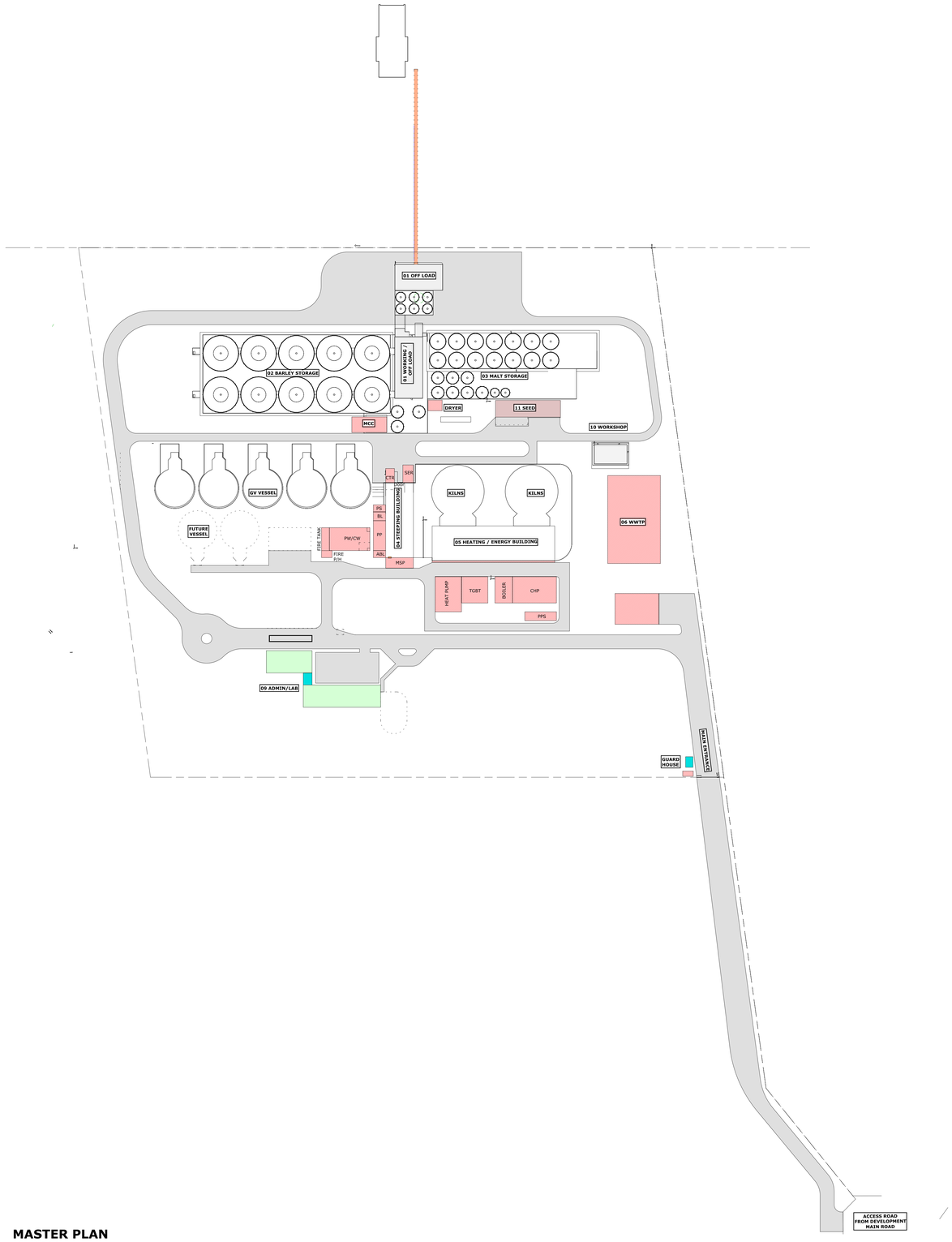
2029 Future Traffic with Development Traffic AM



2029 Future Traffic with Development Traffic PM



Appendix C: Draft Development Master Plan



MASTER PLAN
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GENERAL NOTES

NO.	DATE	REVISION DESCRIPTION	BY	TO
P01	2023/06/29	Issued for costing	RHDHV	SOU

CLIENT
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SOUFFLET

Royal HaskoningDHV
Enhancing Society Together
PO Box 867
Gallo Manor
2052
Building No. 5
Country Club Estate
21 Woodlands Drive
Woodmead
2191
Tel No. +27 11 798 6000
ISO 19650-1/2/3/5 Certified: *PRJ1100302839*

TASK TEAM MANAGER (DL)
S. Cronje
AUTHOR (IA)
S. Cronje
PROJECT DELIVERY MANAGER (PM)
L. Govender

PROJECT
MALTINGS FACILITY
ERF 244 GRACEVIEW EXTENSION 3,
SEDIBENG, MIDVAAL

DRAWING DESCRIPTION
MASTER PLAN
SI - SITE

S2 - FOR INFORMATION

PROJECT No		CONTRACT No	
MD6264			
DISCIPLINE		DOCUMENT STATE	
ARCHITECTURE		**SHARED**	
PROJECT STAGE	STATUS	SHEET SIZE	SCALE
WS2	**S2**	**A0**	**1 : 1000**

DRAWING No.
MD6264-RHD-SI-SI-DR-AR-0001
REVISION
P01