N4/R35 TRUCK STOP AND INDUSTRIAL DEVELOPMENT

Portion 58 of the farm Vaalbank 289 JS

Steve Tshwete Local Municipality

(The Site)

TRAFFIC IMPACT ASSESSMENT (TIA)

for rezoning purposes (Agricultural to Industrial 2)

December 2019

mpe **moyeni professional engineering**

mpe0282

Report mpe0282/TIA

NOTE:

- Moyeni Professional Engineering (MPE) appointed Trafsol to undertake the data collection under MPE's supervision.

mpe

TITLE OF REPORT:

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Portion 58 of the farm Vaalbank 289 JS
Steve Tshwete Local Municipality
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for rezoning purposes (Agricultural to Industrial 2)

CLIENT:

Bakkos Projects (Pty) Ltd

REPORT NO: MPE0282 – N4/R35 Truck Deport and Industrial TIA

PREPARED BY:

B Roberts Pr Eng

SIGNED

REVIEWED BY :

The engineer and his team

APPROVED :

BN Roberts Pr. Eng

I certify that this Traffic Impact Assessment has been prepared by myself and I have the experience and training in the field of traffic and transportation engineering.

SIGNED

	REVISION	DATE
Report for submission to the Road Authorities for comment / approval purposes.		December 2019

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1. INTRODUCTION

- The farm portion is located in the south-eastern quadrant of the N4/R35 Interchange in Middelburg Central as shown in **Figures 1-5**.

- In terms of the requirement of the Steve Tshwete Local Municipality, a Traffic Impact Assessment (TIA) was required as part of the rezoning application.

- The farm portion currently operates 4 businesses with preparation of more to come.

- The four businesses are a large truck stop and 3 truck distribution logistic type operations (generally related to the transportation of coal).

- The owner of the farm portion intends to rezone the property to Industrial 2 which will allow the existing and future business to operate into the future.

- The N4/R35 Interchange is a crucial section of the road network and is included in this study.

- This TIA is carried out in terms of National Manuals as set out by the COTO.

- As is the normal case, road upgrades will be required to be carried out by both the Road Agencies and the Applicant.

Figure 1: N4/R35 TRUCK STOP & INDUSTRIAL - Regional Locality Plan

Figure 2: N4/R35 TRUCK STOP & INDUSTRIAL - Area-wide Locality Plan (Google)

Figure 3: N4/R35 TRUCK STOP & INDUSTRIAL – Local Locality Plan (Google) and farm portion boundaries

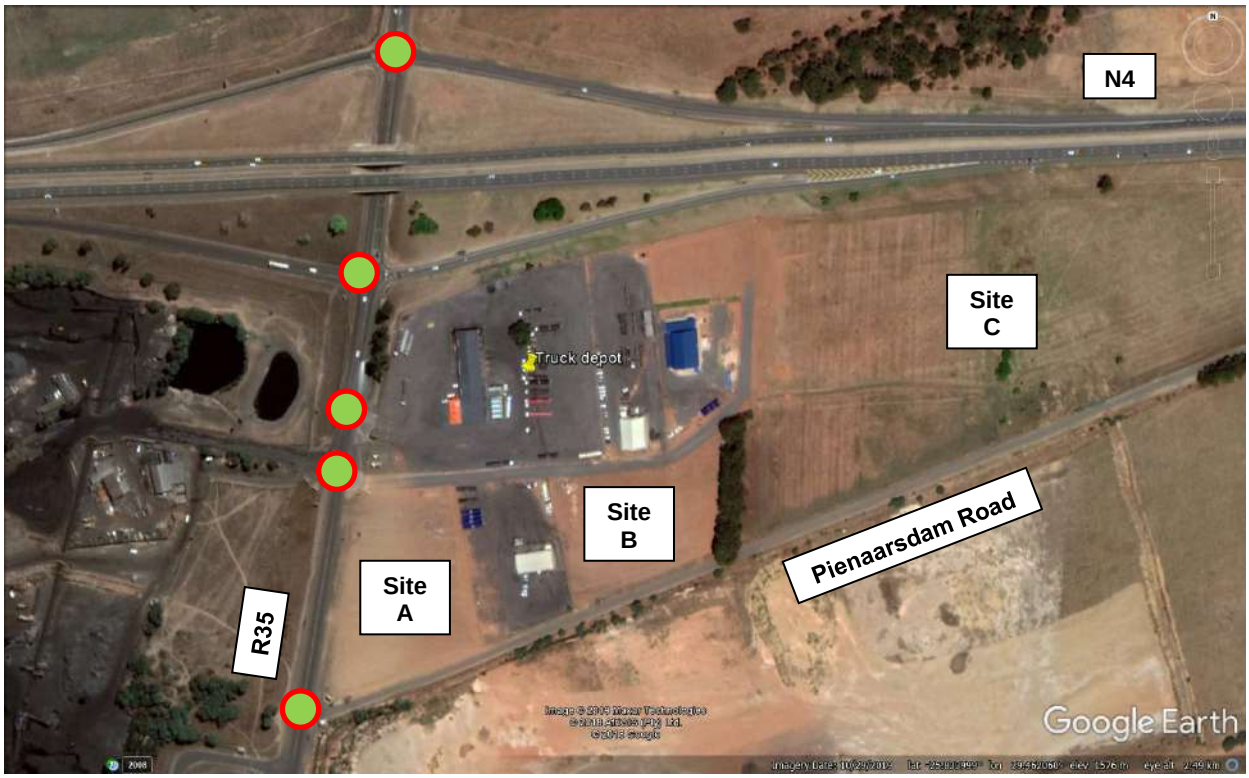


Figure 4: N4/R35 TRUCK STOP & INDUSTRIAL - Site Locality Plan and study area
Intersections counted

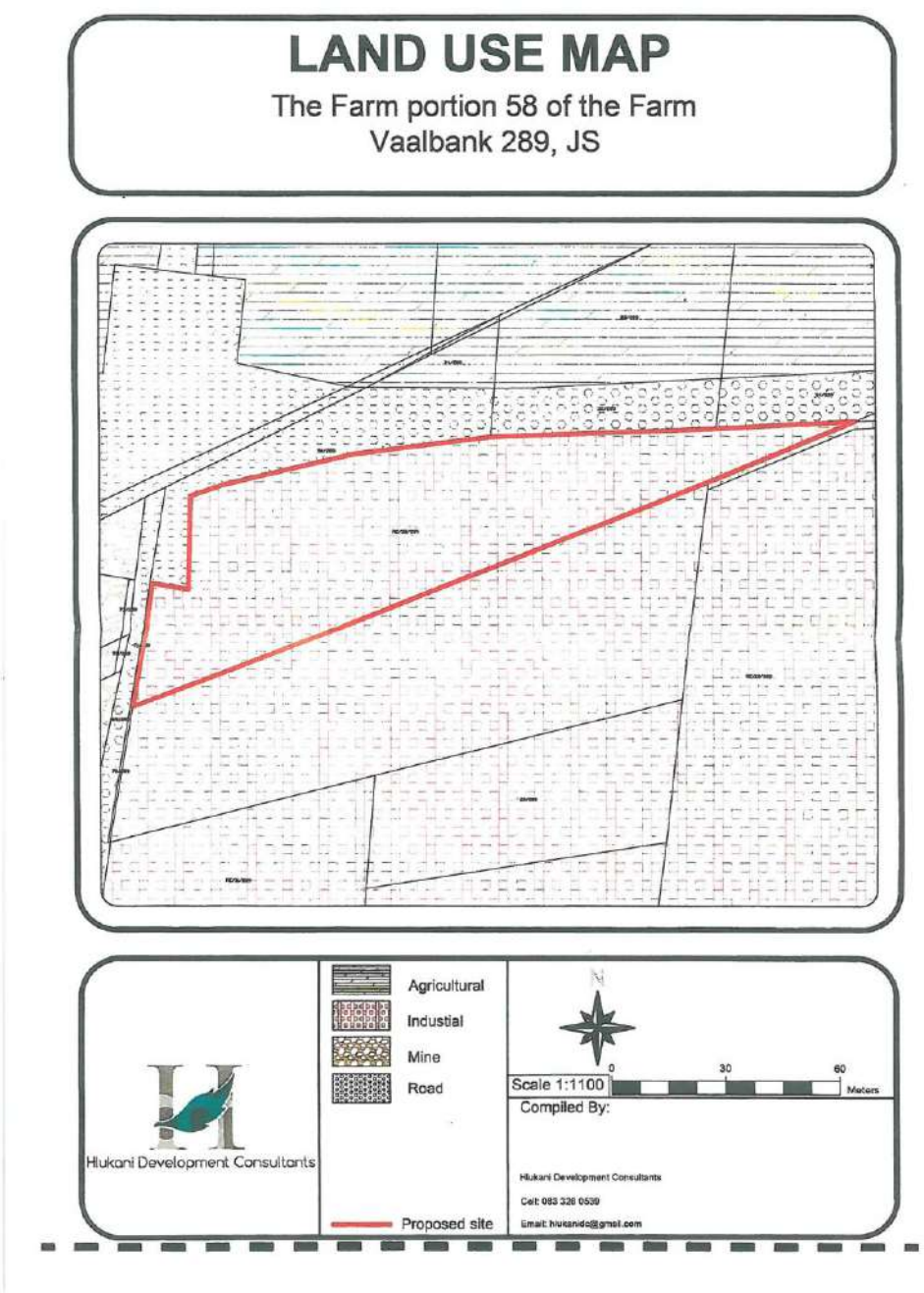
Figure 5: N4/R35 TRUCK STOP & INDUSTRIAL - Site Locality Plan (zoomed in)

Figure 6: N4/R35 TRUCK STOP & INDUSTRIAL – Existing accesses

TOWN PLANNING

Details are included in **Annexure E**.

An application to rezoning the farm portion from Agricultural to Industrial 2 was lodged on 22 March 2019 by Hlukane development consultants.



In November 2019, and based on existing trends in the market, an **amendment to the FAR from 1,6 to 0,1** was made by Urban Dynamics Mpumalanga.

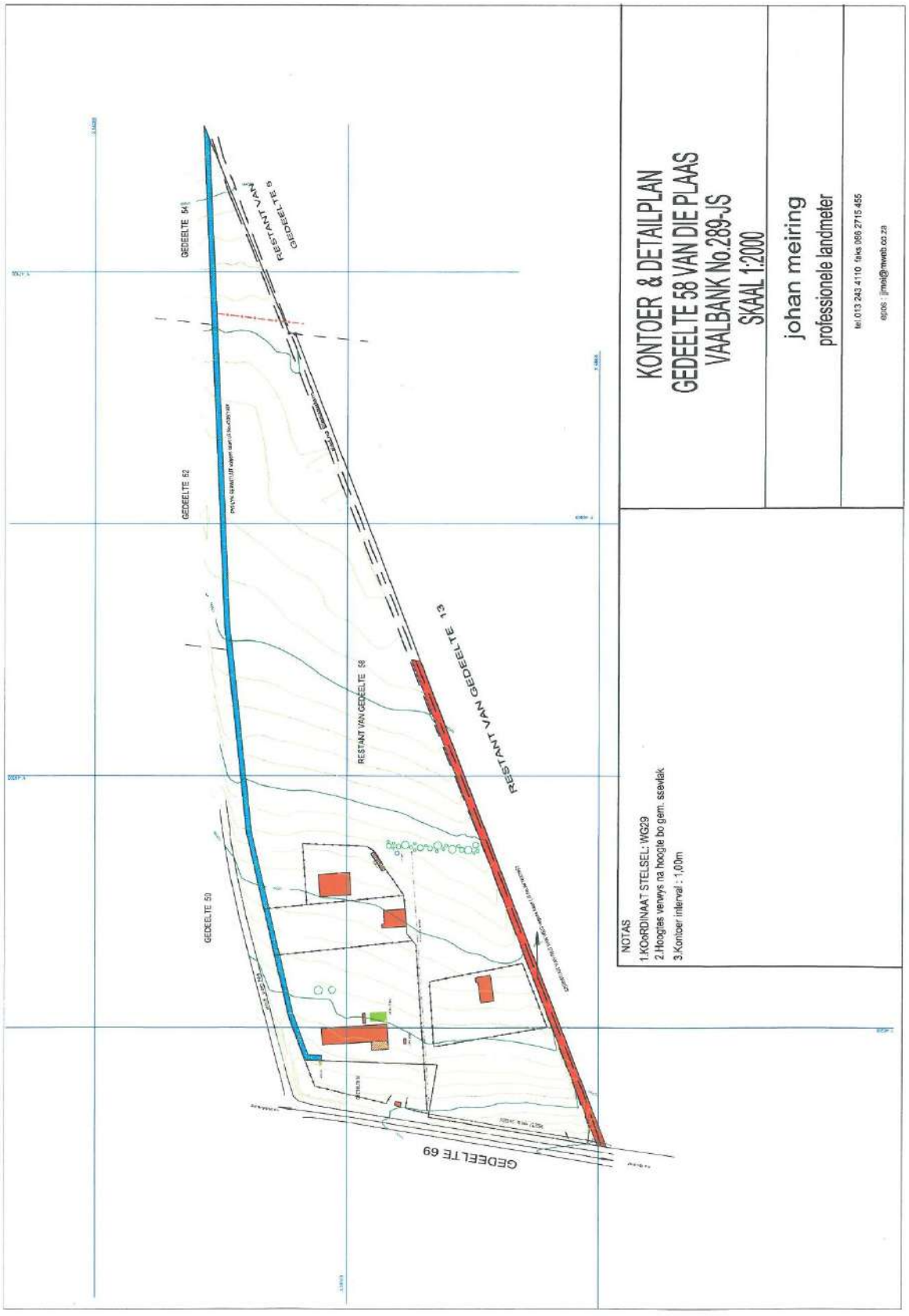


Figure 7: Land surveyor's diagram

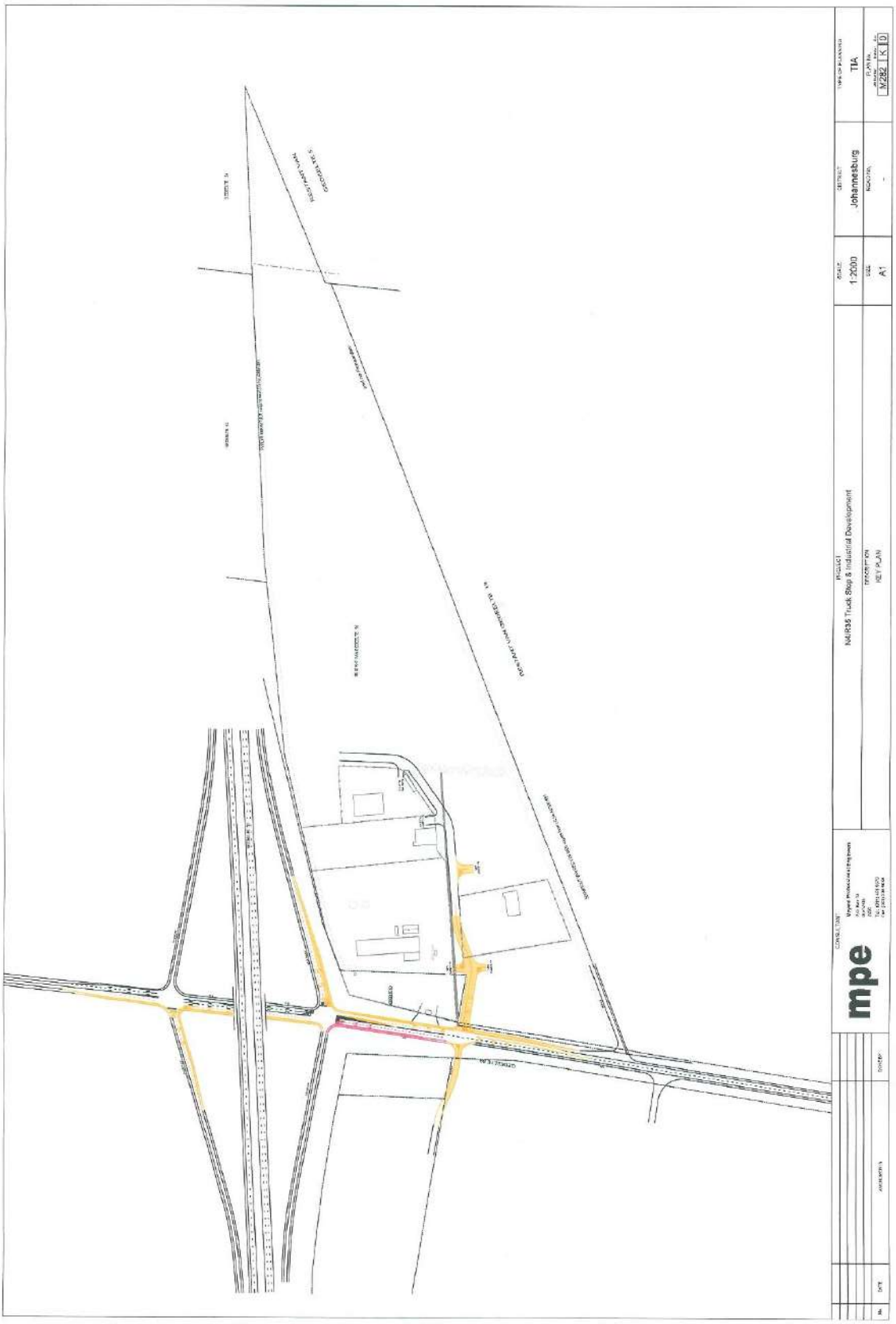


Figure 8: Overall road upgrading proposal

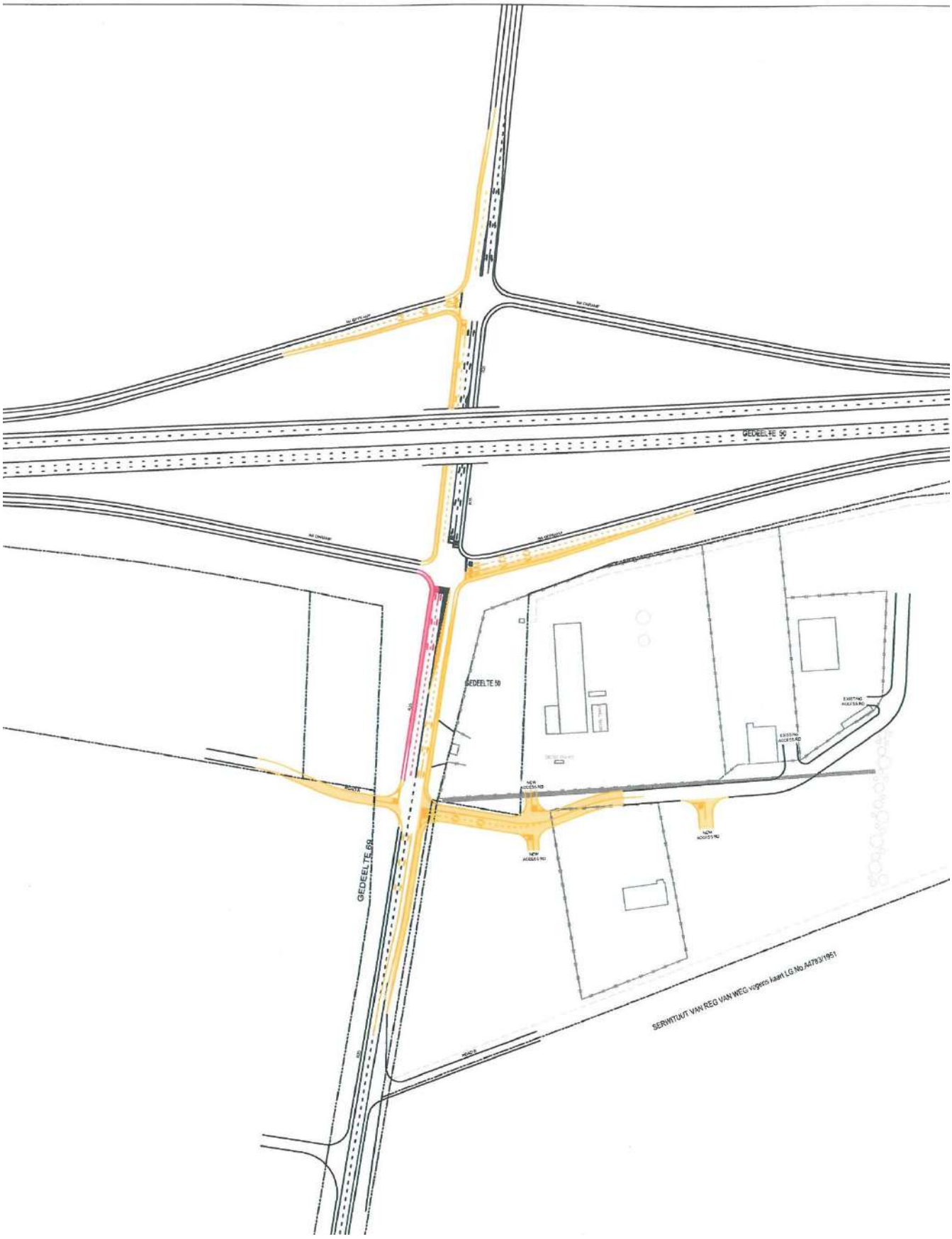


Figure 9: Overall road upgrading proposal (zoomed in)

The land uses included in the applied for rights include:

Primary rights:

- A Service Industry
- Workshops
- Petrol Filling Station
- Warehouse
- Parking Garage
- Light Industry
- General Industry
- Business premises

By consent

- Communications tower
- Kiosk
- Canteen
- Place of refreshment
- Factory shop
- Retail warehouse outlet
- Truck stop

Statistics

Refer to Table 1 overleaf for details.

- The **farm portion is 22,6971sqm and with an Far of o,1 gives 22 697sqm of rights.**
- Approximately 4 130sqm GLA is developed on 4 sites including a large truck stop and coal-related distribution activities.
- The undeveloped portions of the farm portion are divided into 3 Sites, namely:
    - Site A – a platform of approximately 16 535sqm
    - Site B – a platform of approximately 14 781sqm
    - Site C – farm remainder of approximately 121 819sqm
      Totalling **15 313sqm of potential GLA to be developed.**

However, taking an overall view, a potential 18 567sqm of rights has been investigated in this report.

Table 1: Land use rights summary

		Site (m^2)	GLA	FAR
	Existing			
1	Truck stop	28 120	2 060	
2	Distribution 1	16 535	450	
3	Distribution 2 - Shosholoza	17 136	500	
4	Distribution 3	12 046	1 120	
	Subtotal	**73 836**	**4 130**	
	Farm portion	**226 971**	**22 697**	**0,1**
	Remainder	**153 135**	**18 567**	

	Site A	16 535	1 653	0,1
	Site B	14 781	1 478	0,1
	Subtotal	**31 316**	**3 132**	
	Site C	121 819	12 182	0,1
	Subtotal	**153 135**	**15 313**	

For this TIA, three land use scenarios were adopted on the undeveloped sections of the farm portion, namely;

1. ***Industrial only***
2. ***Distribution only***
3. ***Combination of Industrial and distribution***

Architect's layout

There is no concept plan at this stage and each Site is sized and leased as the market requires.

Photographs of the farm portion activities

Photo 1: Looking east at the Truck Stop from the R35 (south of the N4)

Photo 2: Looking east at the Truck Stop's entrance from the R35

Photo 3: Looking east approaching the Truck Stop' building – Access to the pumps is to the left, under the cover portion.

Photo 4: Looking north at the Truck Stop' building – entrance on the left (west) and exit is to the right (where the pumps are located)

Photo 5: Looking south at the Truck Stop' "canteen" area

Photo 6: Typical lunch menu

Photo 7: Looking west -leaving the Truck Stop towards the R35

Photo 8: Looking east at one of the truck distribution businesses (Shosholoza Transport)

Photo 9: Looking south-west at one of other the truck distribution businesses.

Photo 10: Looking north from the Pienaarsdam road at the same one truck distribution businesses across a future site with a prepared platform.

2. TRANSPORTATION INFRASTRUCTURE

2.1 Existing Road Network (refer to Annexure A for details)

The definitions of any road network is in terms of 5 classes with associated characteristics (Department of Community Development, Guidelines for the provision of engineering Services in residential townships, 1994. (Pages B4 and B5)(11) as follows:

Class 1 roads

These are predominantly rural roads whose main function is to facilitate regional distribution of traffic (inter-city movement). They may be national or provincial roads and the type of facilities found in this class is freeways, expressways, dual carriageways and single carriageway main roads. Continuous sections of trunk roads in urban areas of trunk roads in urban areas should be designed as by-pass routes.

Continuity of route is important.

Class 2 roads

They can be described as ***primary distributors***

"...form the primary network for the urban area as a whole. All long distance traffic movements to, from and within the city should be focussed onto such roads. Characteristics are high volumes, restricted access and fairly high speeds. Continuity of route is important."

Class 3 roads

This road can be described as ***District Distributors (Class 3)*** *i.e. road that:*

"distribute traffic between the various residential, industrial and principle business districts of the town and form the link between the primary network and the roads within residential areas. They should connect environmental areas without passing through them. They should also carry high volumes, have restricted access and be characterized by moderately high speeds. The major public transport movements are routed on district distributors and accordingly, facilities should be provided off the roadway for passenger loading and unloading."

Class 4 roads

*They can be described as **local distributors (Class 4),** i.e. roads that:*

> *"...distribute traffic between various residential, industrial and principal business districts of the town and form the link between the primary road network and the roads within the residential areas ... should also carry high volumes, have restricted access and be characterised by moderate traffic speeds. The major public transport movements are routed on district distributors and accordingly, facilities should be provided off the roadway for passenger loading and unloading."*

Class 5 roads

These are residential and access roads.

> *Access roads form the final interface between the domestic unit and the primary network, and because of their narrowness and higher environmental standard, will not normally be used by bus services. It may, however, be necessary to make use of certain access roads to provide a turn-around for buses, avoiding the need for reversing. The minimum roadway width of access road so used, should be 6,8 metres.*

TABLE 2: Road network classification

Road / Street	***Class***	***Carriageway***	***Number of lanes***	***Road reserve width (m)***	***Characteristic***
N4	*2*	*Dual*	*4*	*75*	*SANRAL / TRAC*
R35	*3*	*Single*	*2*	*45*	*Provincial*
Pienaarsdam Road	*4*	*Single*	*2*	*24*	*Local Municipality*
Access Road / colliery access road	*2*	*Single*	*2*	*15*	*Private*

2.2 Planned Road Network (future)

There are no road network changes planned for the future. Due to growing traffic demand, the interchange is likely to be upgraded in the medium to longer term. No formal plans, however, in this regard.

2.3 Public Transport

Interlink coal distribution type trucks (ore carriers) use the R35 route to deliver coal to the nearby Eskom power stations. As such there is little need for public transport in the area. Local staff use mini-bus taxis as their main mode of transport to the places of work.

No lay byes or in-lane stops exist within / on the roads within the study area.

2.4 Non-motorised transport

As the R35 is predominantly a rural type road, no paved sidewalks exist on either side of the study area roads within the study area. This is also the situation for improved traffic safety reasons.

Likewise, no separate bicycle lanes are evident.

3 SITE ACCESS

3.1 Existing access

Refer to **Figure A3-1 in Annexure A** for details.

- A The farm portion is accessed from ONE central collector type gravel road linking to nearly opposite the existing Black Wattle Colliery access on the R35 (termed the Access Road in this report). This access existed before the truck stop and distribution type businesses were established.
- The existing Access Road is an upgrade of what the existing owner “inherited”.
- As the Access Road is located in the central portion of the farm portion, access to each site is easily obtained for either side of the road as shown in the overall plan.

Photo 11: Looking north over the truck Stop access towards the N4 Interchange.

Photo 12: Looking north over the truck Stop access from the Access Road towards the N4 Interchange.

Photo 13: Looking east along the Access Road from the R35 (the Trcuk Stop is on the left and its new proposed access is proposed 60m down the Access Road

Photo 14: Looking west along the Access Road towards the R35 at the Colliery Access access road (note the small staggered layout)

Photo 15: Looking south at the R35 from the Access Road

3.2 Proposed upgraded and new access positions

Refer to **Figure A3-3 in Annexure A** for details.

- The Truck Stop has access directly off the R35 some 47m north of the site's Access Road and 120m south of the Interchange's southern terminal.This access is not approved, is proposed to be closed and relocated 60m east of the R35 off the Access Road.
- A new access to **Site A** (refer to Image 1 overleaf) is proposed to be opposite this new Truck Stop access.
- As the existing Access Road traverses over a triangular area under the SANRAL juridiction, this road is proposed to be "kinked" around the SANRAL land so as, in the immediate term, not require permission from SANRAL to use their land for road purposes. The SANRAL permission process is expected to take some time to obtain and approval for this study is reqiuired now by the Local Municipality.
- All other existing and future sites within this farm portion, are planned to take access off the Access Road and at a distance well in excess of 100m from the R35.

Photo 16: Looking north along the R35 showing typical high volumes of coal-orientated truck traffic.

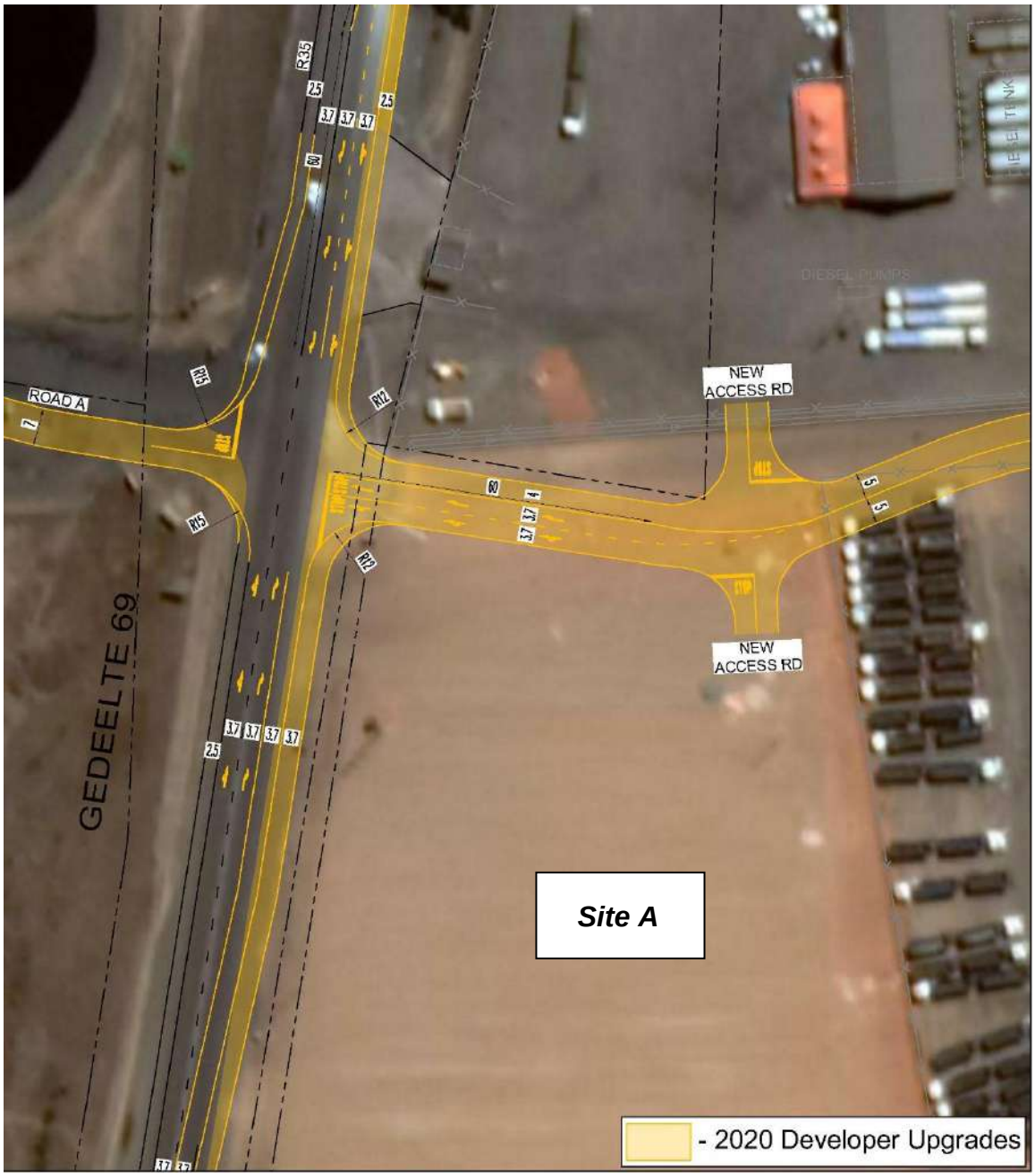


Image 1: Proposed immediate Access Road upgrade.

4 DATA COLLECTION

Refer to **Figures 10 for traffic flow details.**

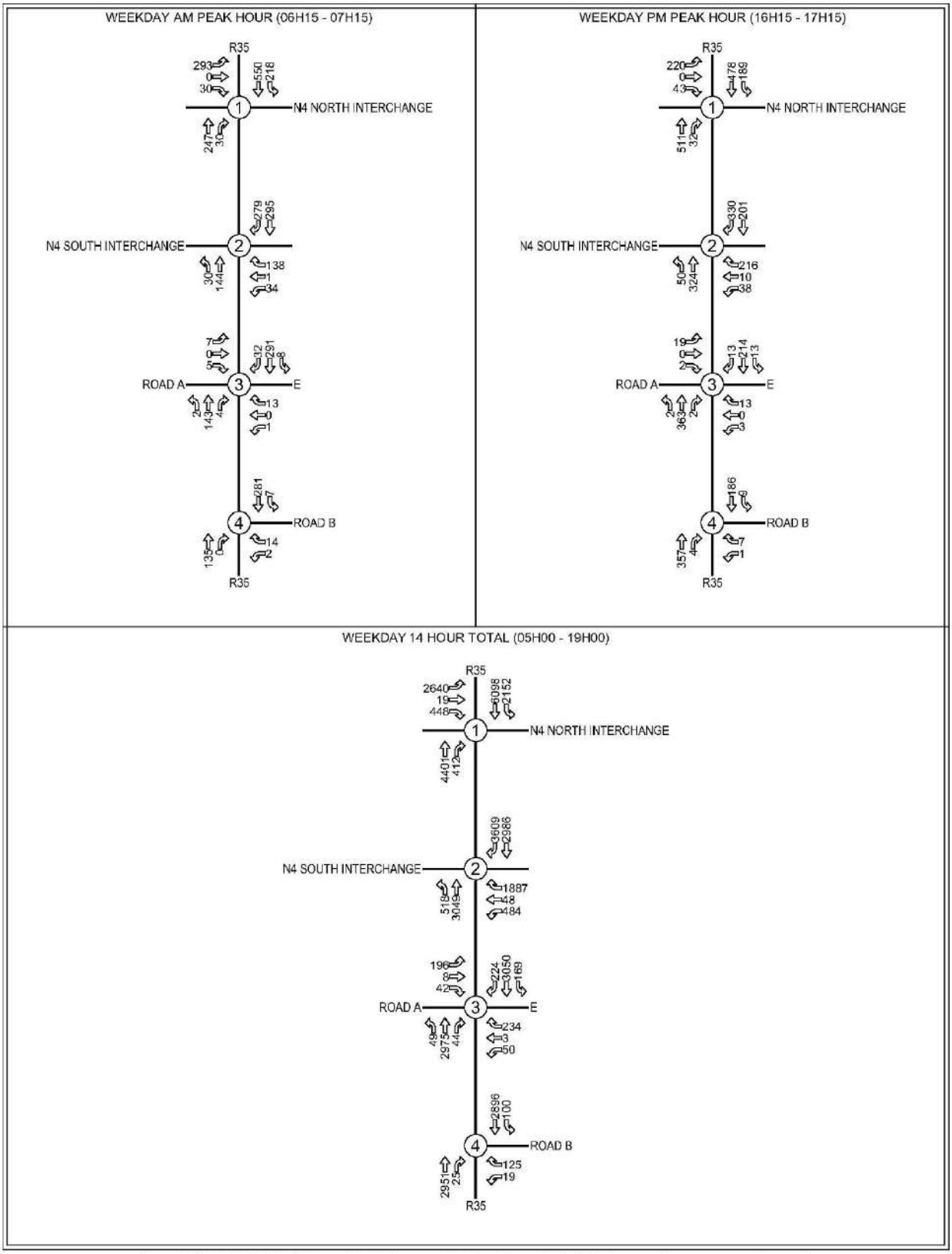
Classified manual traffic counts were conducted by Trafsol who undertook manual classified counts on **Tuesday 5 November 2019** as detailed in **Annexure D.**

The traffic mid-block volumes have the following characteristics:

TABLE 3: Link traffic flows

Road	Flow (vph)	AM peak hour	PM peak hour	Capacity (vph) / Number of lanes required / existing	% of capacity
R35 north of the Interchange / **At the Access Road**	Northbound	540 / **149**	731 / **367**	1900 / 1 / 1	38 / **19**
	Southbound	580 / **331**	667 / **240**	1900 / 1 / 1	35 / **17**
Access Road	Eastbound	12	15	1200 / 1 / 1	2
	Westbound	14	16	1200 / 1 / 1	2
Colliery access road	Eastbound	12	21	1200 / 1 / 1	2
	Westbound	33	15	1200 / 1 / 1	2
Pienaarsdam Road	Eastbound	7	13	1800 / 1 / 1	3
	Westbound	16	8	1800 / 1 / 1	1

The above shows that the links capacities are more than adequate to meet the current traffic demand. NO additional link lanes are required in 2019.



mpe

N4/R35 Truck Stop & Industrial Development

2019 Existing Traffic Flows
Weekday AM & PM Peak Hours

10

Notwithstanding the slowdown in traffic flow over the past 3 years, a **traffic growth rate of 3% pa** was adopted in this mature rural area and guided from the COTO data Manual.

The existing modal split is as follows:

TABLE 4: Modal Split (as per traffic survey) 2019

Mode	**All surveyed hours and intersections**
	Tuesday 5th November 2019
Cars	33 083
Mini-bus taxi	1 289
Buses	94
Trucks	7 445
All vehicles	**41 911**
Mode	***Percentage***
Cars	78,9
Mini-bus taxi	3,1
Buses	0,2
Trucks	17,8
All vehicles	100.0

The client had 7-day counts undertaken by **Mikros Traffic Monitoring (Pty) Ltd** which are included in **Annexure D** for information purposes. The traffic counts undertaken by **mpe** were used in this TIA report.

Queue lengths were recorded at the N4 / R35 Interchange, as follows:

- Northern terminal –
  - Off ramp, 4 and 9 vehicles between 09:00 and 13:30.
  - Southbound through lane more than 10 vehicles for most of the day.
- Southern terminal –
  - Northbound through lane more than 10 vehicles for most of the afternoon.
  - Westbound off-ramp more than 10 vehicles in the late afternoon
  - Southbound right-turn lane between 4 and 9 vehicles for most of the day until 16:00 when it increases to 10 plus vehicles until 17:00

5 TRIP GENERATION

Details are included in **Annexure C.**

The **surveyed trip generation was adopted for the distribution trip generation rate as it is higher than the COTO rate for code 150.**

Table 5: ***Surveyed and future trip generation rate (trips per peak hour)***

PEAK HOUR	IN	OUT	TWO-WAY
Existing surveyed trips - 11 998sqm GLA			
Weekday AM	12	14	26
Weekday PM	15	16	31
Saturday	276	214	490
Weekday AM	**0,29**	**0,34**	**0,63**
Weekday PM	**0,36**	**0,39**	**0,75**
Industrial trip generation rate *(trips/100sqm) (COTO code 130)*			
Weekday AM	0,56	0,24	0,80
Weekday PM	0,56	0,24	0,80
Distribution trip generation rate *(trips/100sqm)* *(Used the surveyed results as the trip generation is higher than the COTO rate)*			
Weekday AM	0,29	0,34	0,63
Weekday PM	0,36	0,39	0,75

All three land use scenarios were tested for levels of service as shown overleaf.

Table 6: ***Trip generation (trips per hour) (2020) (peak hour trips for 17620sqm)***

PEAK HOUR	IN	OUT	TWO-WAY
Industrial			
Weekday AM	86	37	123
Weekday PM	31	92	123
Distribution			
Weekday AM	44	52	96
Weekday PM	**56**	**59**	**115**
Combined Industrial and Distribution			
Weekday AM	**77**	**40**	**117**
Weekday PM	**80**	**132**	**212**

6 TRIP DISTRIBUTION

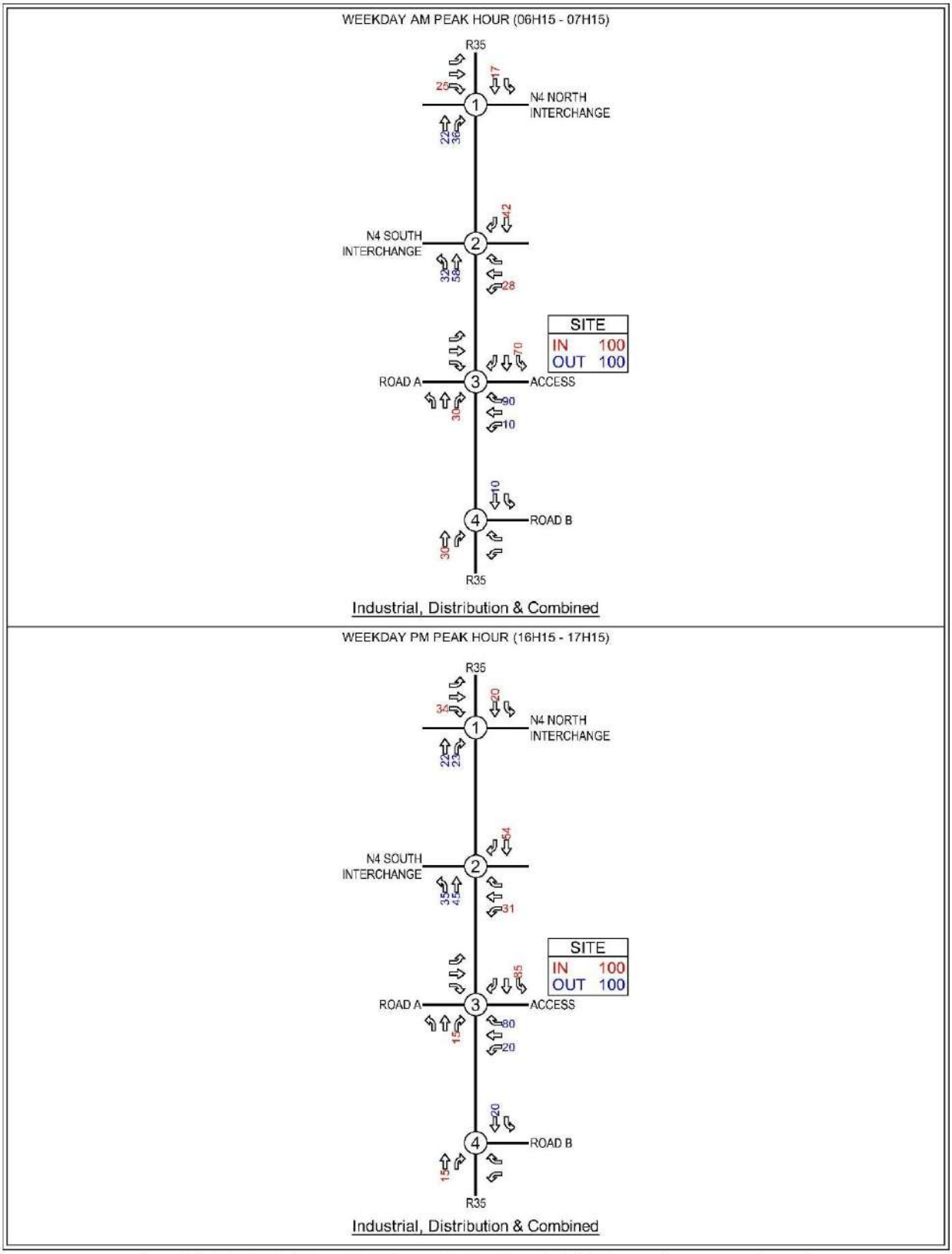
The expected trip distribution is based on the existing traffic flow situation.

TABLE 7: **Trip Distribution percentages**
(Refer to Figures 11 for a pictorial representation)

DIRECTION OF ORIGIN	PERCENTAGE (%) (AM / PM peak periods)		ROUTE FOLLOWED
	From	To	
From / to the north	17 / 20	22 / 22	R35
From / to the west	25 / 34	32 / 35	N4 west
From / to the east	28 / 31	36 / 23	N4 east
Access south	30 / 15	10 / 20	R35 south
TOTAL	100 / 100	100 / 100	

The above indicates that:

- The majority of additional trips are, as in the existing situation, expected to originate and return from and to the east and west along the N4 freeway.
- The northern area is secondary re distribution and
- the south is more for local requirements.

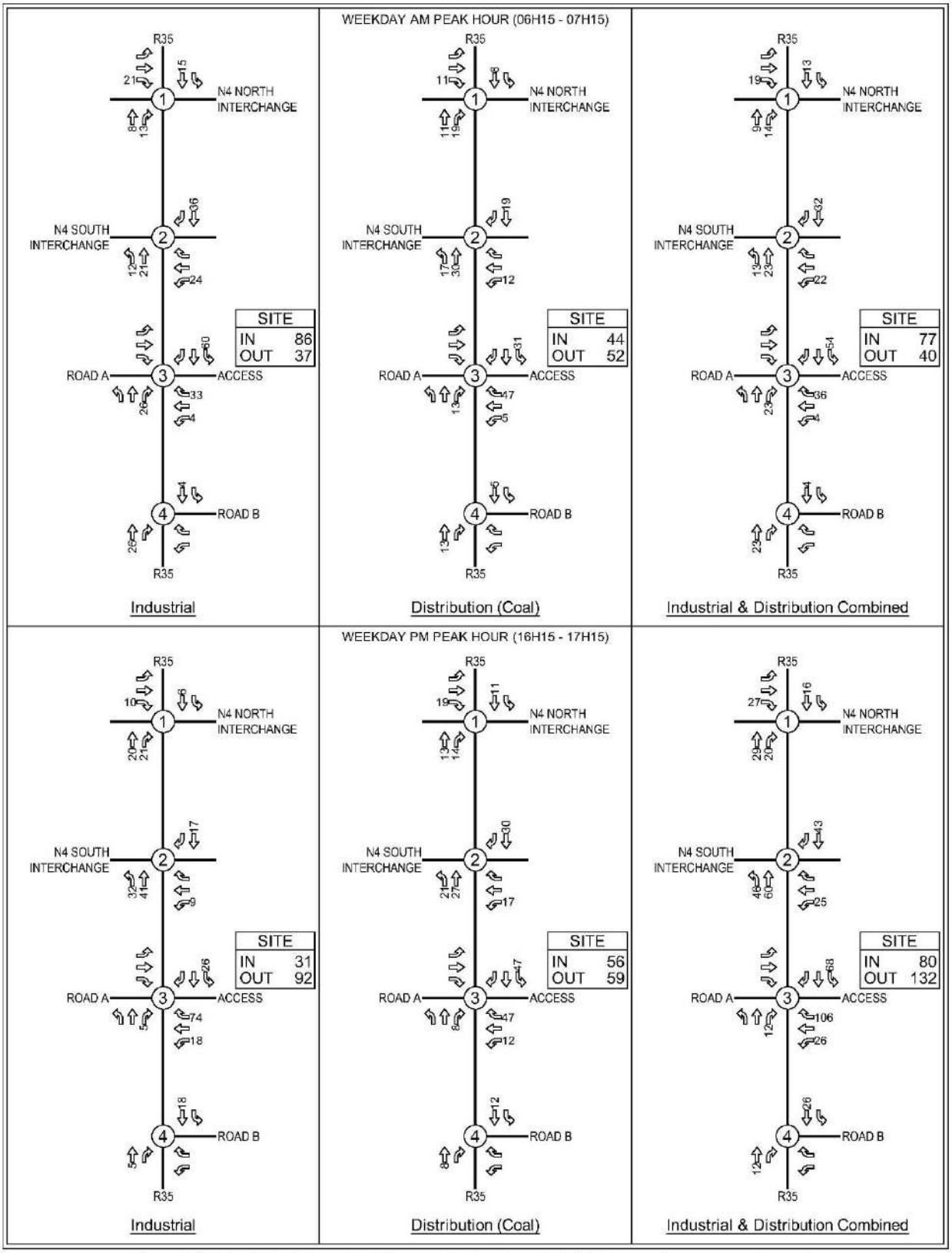


mpe

N4/R35 Truck Stop & Industrial Development

Trip Distribution (%) - Industrial, Distribution & Combined
Weekday AM & PM Peak Hours

11



mpe

N4/R35 Truck Stop & Industrial Development

Trip assignmnets (vph) - Industrial, Distribution & Combined
Weekday AM & PM Peak Hours

12

7 CAPACITY ANALYSES

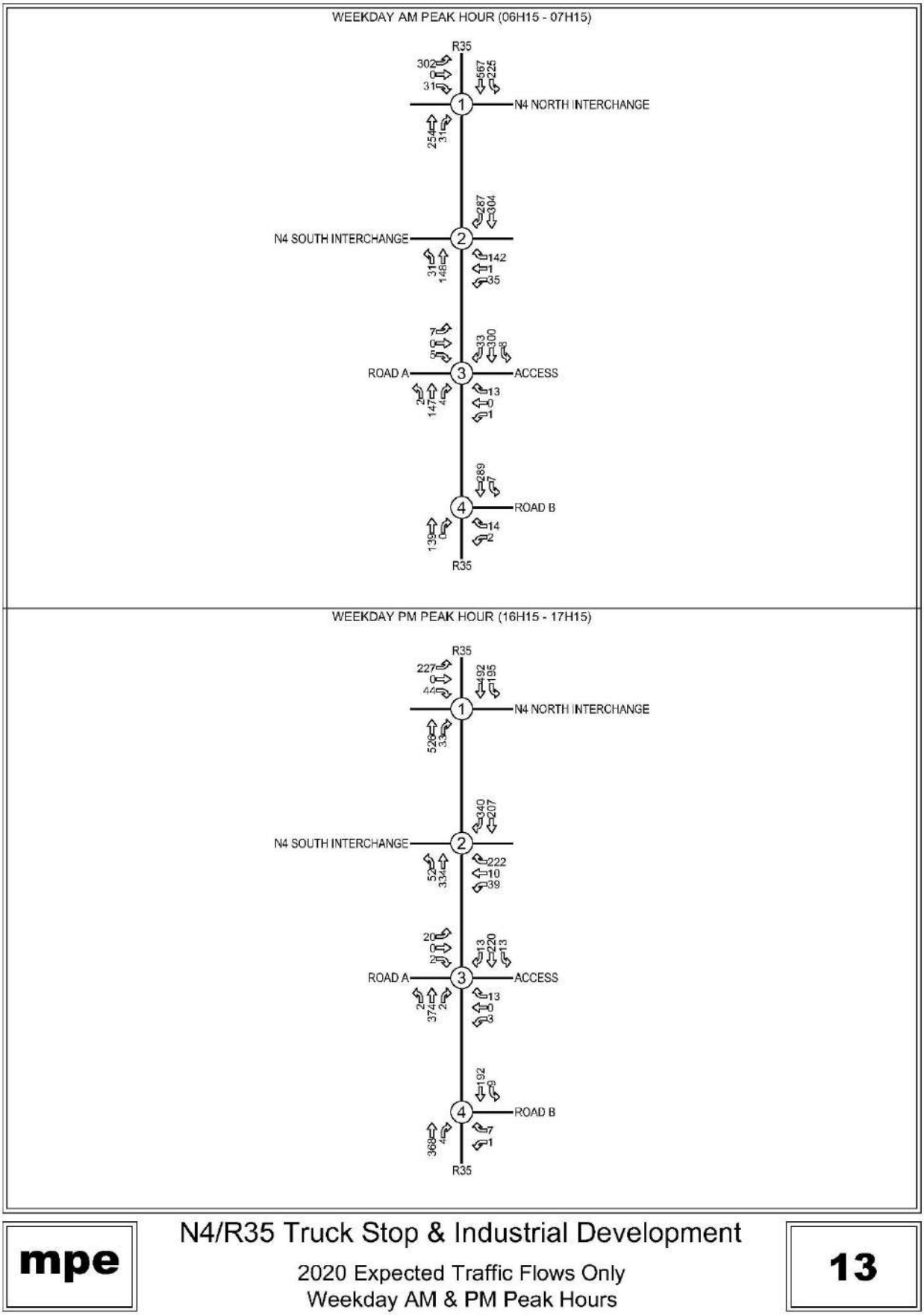
7.1 Introduction

The performance of intersections in urban road networks is defined by the level of service (LOS) for each approach to the intersection. These levels of service have been defined in the Highway Capacity Manual (HCM) (**Reference 5**) as shown in **TABLE** below. During the peak hours, the road infrastructure capacity provided should ensure that the intersection approach level of service should ***ideally*** not exceed LOS D.

TABLE 8: **Level of Service Criteria (HCM)**

Level of Service	***Average Approach Delay (d) for Signalised Intersections (seconds)***	***Average Approach Delay (d) for Priority Intersections (seconds)***
A	d ≤ 10	d ≤ 10
B	10 < d ≤ 20	10 < d ≤ 15
C	20 < d ≤ 35	15 < d ≤ 25
D	35 < d ≤ 55	25 < d ≤ 35
E	55 < d ≤ 80	35 < d ≤ 50
F	80 < d	50 < d

The intersection approach performance for the intersections within the study area was determined using the AutoJ software programme.



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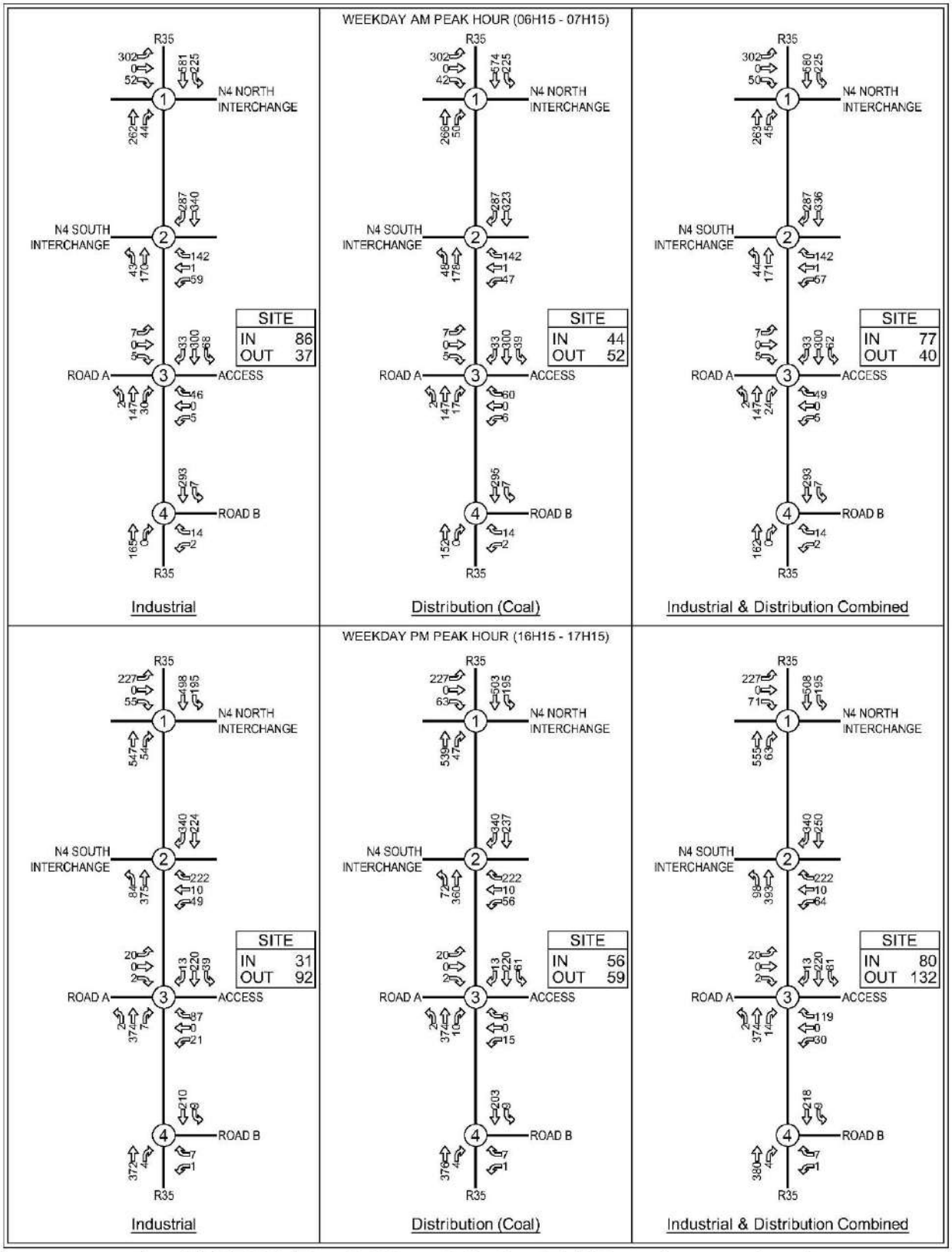
N4/R35 Truck Stop & Industrial Development

2020 Expected Traffic Flows Only
Weekday AM & PM Peak Hours

13



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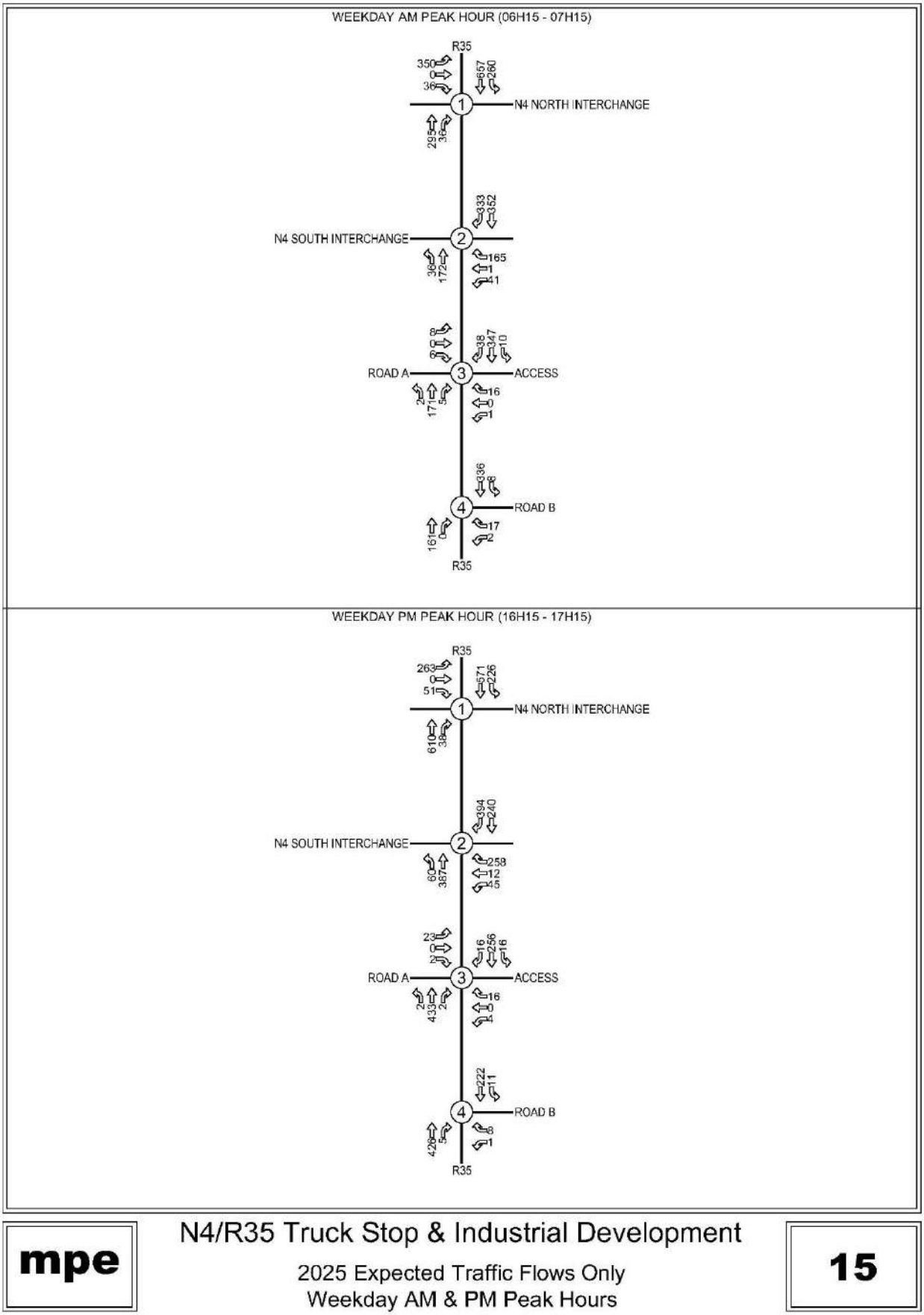
N4/R35 Truck Stop & Industrial Development

2020 Expected Traffic Flows With Site Trips
Weekday AM & PM Peak Hours

14



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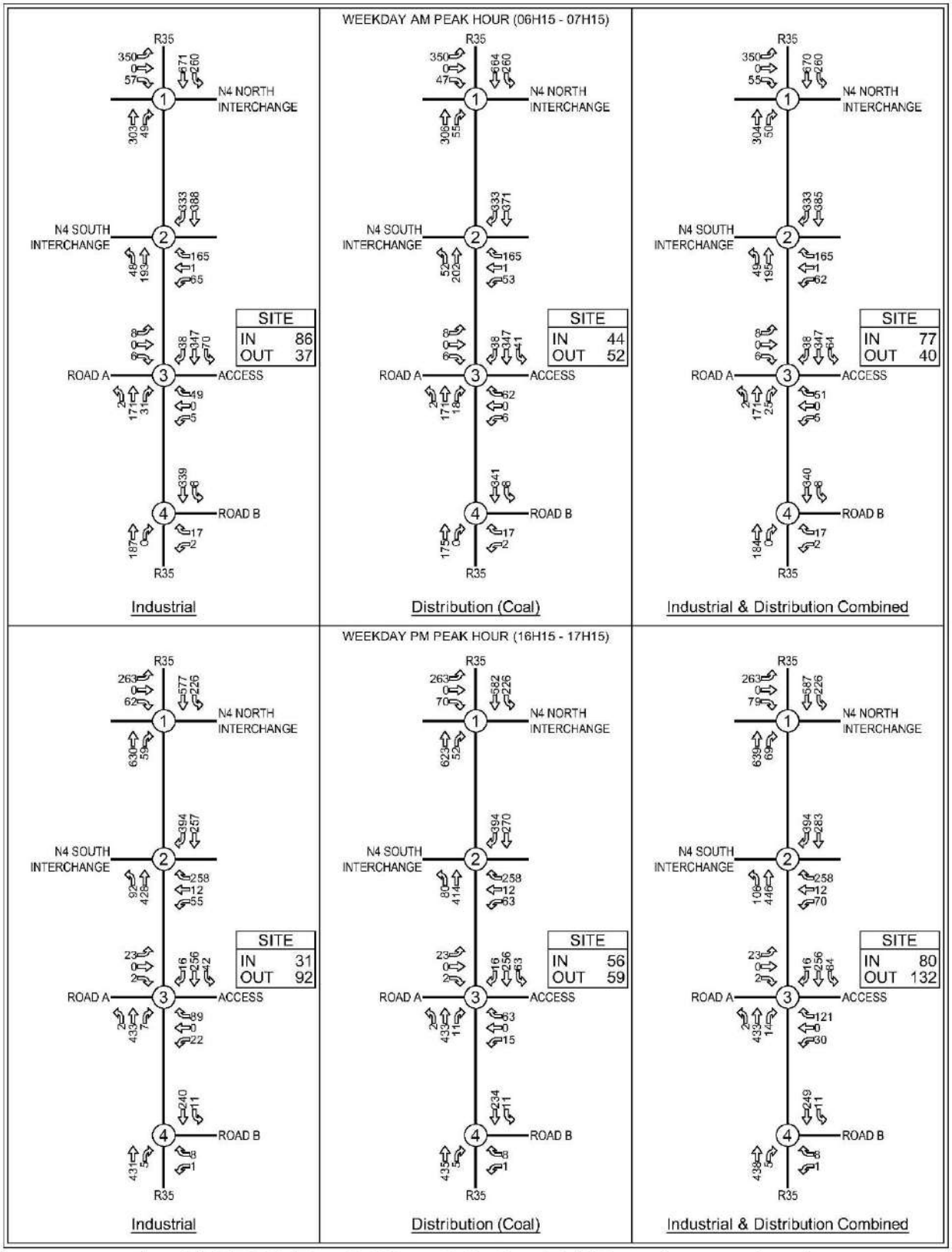
N4/R35 Truck Stop & Industrial Development

2025 Expected Traffic Flows Only
Weekday AM & PM Peak Hours

15


WEEKDAY AM PEAK HOUR (06H15 - 07H15)
WEEKDAY PM PEAK HOUR (16H15 - 17H15)
R35
N4 NORTH INTERCHANGE
N4 SOUTH INTERCHANGE
ROAD A
ACCESS
ROAD B
SITE
IN 86
OUT 37
IN 44
OUT 52
IN 77
OUT 40
IN 31
OUT 92
IN 56
OUT 59
IN 80
OUT 132
Industrial
Distribution (Coal)
Industrial & Distribution Combined
mpe
N4/R35 Truck Stop & Industrial Development
2025 Expected Traffic Flows With Site Trips
Weekday AM & PM Peak Hours
16

7.2 2019

The existing traffic flows from the surrounding road network for the AM and PM peak hours are shown in **Figure 10.** The detailed capacity analyses results are shown in **Annexure C.**

Of importance is the result that the N4 / R35 interchange is failing in terms of levels of service, as follows:

- The all-way stop controls on both the northern and southern terminals cause excessive delays on both north/south through movements.
- The existing Access Road / Colliery access road as well as the Pienaarsdam Road intersection are currently operating satisfactorily.

It is important to note that since TRAC are not in favour of traffic signal controls along the N4 route (due to high incidents of theft) non-signal controls have been proposed instead.

The following without site road upgrades are proposed (refer to **Annexure A**):

- **Figure A1-2** – Immediate requirement – remove the stop controls on the southern and northern legs. It has been noted that these controls were implemented for traffic safety reasons (large trucks) but the consequence is long delays in the north-south directions (Road Authority responsibility)
- **Figure A2-2** – Additional right-turn lane from the off-ramp and new associated second accepting northbound lane (Road Authority responsibility)
- **Figure A3-2** – Additional right-turn lanes on the R35 to improve the traffic safety of the access intersection (Not required from a level of service viewpoint) from the off-ramp and new associated second accepting lane (Developer responsibility)

No upgrading is required at the R35 / Pienaarsdam Road intersection.

7.3 2020

Refer to **Figures 13 and 14** for the expected traffic flows.

The capacity analysis results are included in **Annexure C** for details.

The following without-development road upgrades are proposed (refer to **Annexure A**):

- **Figure A1-3** – additional through lane from the south as well as an additional right-turn lane from the west on the off-ramp (Road Authority responsibility & Developer)

No further road upgrading is required at the R35 intersections.

7.4 2025

Refer to **Figures 15 and 16** for the expected traffic flows.

The capacity analysis results are included in **Annexure C** for details.

The following without-development road upgrades are proposed (refer to **Annexure A**):

- **Figures A2-3** & **A3-3** – additional left-turn lane from the south. (Road Authority responsibility & Developer)

No further road upgrading is required at the R35 intersections.

8 NON-MOTORISED TRANSPORT

The provision of non-motorised transport facilities forms an integral part of transport planning, and should be considered during the planning phases. Non-motorised transport facilities include pedestrian walkways, pedestrian crossings and cycling lanes. The following facilities should be taken into account when undertaking the Site development plan. In terms of good practice all new townships require 1,2m walkways / footpaths to be provided on one side of the road where pedestrian demand is expected to be high.

The following is relevant:

- **Pedestrian walkways** – Paved sidewalks do not exist within the study area for traffic safety reasons and are proposed to remain that way.

  Pedestrian crossings – Not required as all pedestrians are expected to cross at the intersections.

9 PUBLIC TRANSPORT

9.1 Context

This section of the report deals with public transport proposals that are essential to, and will impact on the Site. In order to promote manoeuvrability of all modes of transport, it is vital to design within a framework that will relate to the surroundings. In this case there are no Council initiatives existing or planned in the vicinity of the Site.

9.2 Background

It is good planning practice as well as a requirement of the NLTA Act (1) that an assessment of the public transport be included in a traffic impact assessment.

The following comments are relevant in respect to the public transport availability at the expanded development.

The R35 route is characteristic of mini-bus taxis. These have been counted separately in the Traffic Data section.

9.3 Public Transport Requirements

Road-based public transport such as mini-bus taxis and buses are subject to the same road operating conditions as private vehicles.

In the context of the type of expanded development for the Site, thorough planning will be required to accommodate the following factors relating to public transport:

- Taxi routes
- Bus routes
- Non-motorised transport

The above factors are therefore pivotal in the provision of adequate public transport system.

The existing public transport routes are found along the R35 route.

On the R35 the following public transport exists:

- **Mini bus taxis** – AM peak hour (15 southbound, 18 northbound) and PM peak hour (10 southbound, 10 northbound).
- **Buses** – AM peak hour (2 southbound, 4 northbound) and PM peak hour (1 southbound, 0 northbound).

Lay byes and facilities

- No lay byes exist throughout the study roads.
- Public transport makes use of in-lane stops whilst Minibus Taxis occasionally use the road's shoulder.
- No further public transport facilities are therefore proposed as the existing system is adequate to meet the demands of the local staff.

Additional Minibus taxis

It should be noted however, that am a**dditional 4 Minibus Taxis are recommended to operate on the R35** route to meet the future additional public transport supply demands as detailed overleaf.

EXPECTED PUBLIC TRANSPORT DEMAND

MODAL SPLIT

Vehicle	Percentage by vehicle	Average vehicle Occupancy	Persons	Percentage by persons
Car	78,9%	1,6	126	69,6%
MBT	3,1%	15	46	25,4%
Bus	0,2%	40	9	4,9%
TOTAL			181	100,0%

Industrial

TRIP GENERATION (Peak hour)

Max one way = 92

				PT vehicles required
Car	73	1,6	116	
MBT	3	15	42	3
Bus	0	40	8	0
TOTAL	76		167	

Distribution (Coal)

TRIP GENERATION (Peak hour)

Max one way = 59

				PT vehicles required
Car	47	1,6	75	
MBT	2	15	27	2
Bus	0	40	5	0
TOTAL	49		108	

COMBINED INDUSTRIAL & Distributi

TRIP GENERATION (Peak hour)

Max one way = 132

				PT vehicles required
Car	104	1,6	167	
MBT	4	15	61	4
Bus	0	40	12	0
TOTAL	109		239	

0

TRIP GENERATION (Peak hour)

Max one way = 132

				PT vehicles required
Car	104	1,6	167	
MBT	4	15	61	4
Bus	0	40	12	0
TOTAL	109		239	

10 CONCLUSIONS

The following can be concluded:

1. **The local intersections** around the property for the proposed development are operating at satisfactory levels of service, except for the N4/R35 Interchange which fails mainly on:

    - The southern and northern through lanes
    - The right-turn movement on the westbound off-ramp

2. ***Proposals to upgrade these two terminals, which are NOT signal control related, are depicted in Figures A1-2, A2-2 and A3-2 in Annexure A. Additional lanes are proposed on two-way priority-controlled intersections. The proposed road upgrades are the responsibility of both the Road Authority and the developer (the former in the first two cases and the latter in the latter case).***

3. ***In 2020, Figure A1-3 in Annexure A depicts an additional through lane from the south as well as an additional right-turn lane from the west on the eastbound off-ramp is required (Road Authority and developer responsibility).***

4. ***In 2020, the developer is required upgrade the existing Access Road intersection with the R35. The proposed right-turn lane on the R35 is for safety and not capacity reasons as shown in Figure A3-2 in Annexure A.***

5. ***By 2025 and beyond and as depicted in Figures A2-3 and A3-3 in Annexure A an additional northbound left-turn lane is proposed at the southern terminal.***

6. ***Pedestrians***

    - **Pedestrian walkways** – No paved sidewalks exist within the study area for traffic safety reasons and are proposed to remain that way.
    - **Pedestrian crossings** – Not required as all pedestrians are expected to cross at the intersections.

7. ***Public Transport***

    On the R35 the following public transport exists:

- **Mini bus taxis** – AM peak hour (15 southbound, 18 northbound) and PM peak hour (10 southbound, 10 northbound).
- **Buses** – AM peak hour (2 southbound, 4 northbound) and PM peak hour (1 southbound, 0 northbound).

Lay byes and facilities

- No lay byes exist throughout the study roads.
- Public transport makes use of in-lane stops whilst Minibus Taxis occasionally use the road's shoulder.
- No further public transport facilities are therefore proposed as the existing system is adequate to meet the demands of the local staff.

Additional Minibus taxis

It should be noted however, that am a**dditional 4 Minibus Taxis are recommended to operate on the R35** route to meet the future additional public transport supply demands as detailed overleaf.

10 RECOMMENDATIONS

Given the findings of this review report, the following ***recommendations*** are made:

1. ***That the proposed rezoning of Portion 58 of the farm Vaalbank 289 JS from agricultural to Industrial 2 be approved from a Traffic and Transportation point of view with road upgrading being required as depicted in Annexure A.***

2. ***No additional sidewalks along the external roads be implemented, as paved sidewalks are currently not available for traffic safety reason and is proposed to remain that way.***

3. ***An additional 4 Mini-bus Taxis be permitted to travel along the R35 route to service the needs of the future development.***

11 REFERENCES

The following references were used in the compilation of this report:

1. National Land Transport Act **NLTA** (Act No 5 of 2009).
2. **TMH 15** South African Engineering Service Contribution Manual for Municipal Road Infrastructure, Ver 1.0, COTO, September 2012.
3. **TMH 16** Volumes 1 & 2 South African Traffic Impact and Site Traffic Assessment Manual, Ver 1.0, COTO, August 2012.
4. **TMH 17** Volume 1, Trip Data Manual, COTO, September 2012.
5. **TMH 26** South African Road Classification and Access Management Manual, Ver 1.0, COTO, August 2012.
6. Highway Capacity Manual, FHWA, USA, 2000.
7. Department of Community Development, Guidelines for the provision of engineering Services in residential townships, 1994.
8. AutoJ User Guide, (2016)
9. Highway Capacity Manual, FHWA, USA, 2000.
10. Application for rezoning of portion 58 of the farm Vaalbank 286 JS, Hlukani Development consultants, 2019.
11. Mikros Traffic monitoring (Pty) Ltd, 7-day counts

ANNEXURE A

INTERSECTION LAYOUTS

No.	DATE	AMENDMENTS	DONE BY

CONSULTANT

mpe

Moyeni Professional Engineers
P.O. Box 14
Glenvista
2058
Tel.: (011) 491 5670
Fax: (001) 298 5066

PROJECT
N4/R35 Truck Stop & Industrial Development

DESCRIPTION
KEY PLAN

SCALE
1:2000

SIZE
A1

DISTRICT
Johannesburg

ROAD No.
-

TYPE OF PLANNING
TIA

PLAN No.

Job Number	Number	Rev.
M282	K	0

N4 OFFRAMP
N4 ONRAMP
N4 ONRAMP
N4 OFFRAMP
GEDEELTE 50
GEDEELTE 50
GEDEELTE 69
ROAD A
ROAD B
R35
R35
EXISTING ACCESS RD
NEW ACCESS RD
NEW ACCESS RD
NEW ACCESS RD
DIESEL PUMPS
SERWITUUT VAN REG VAN WEG vogens kaart LG.No.A4783/1951

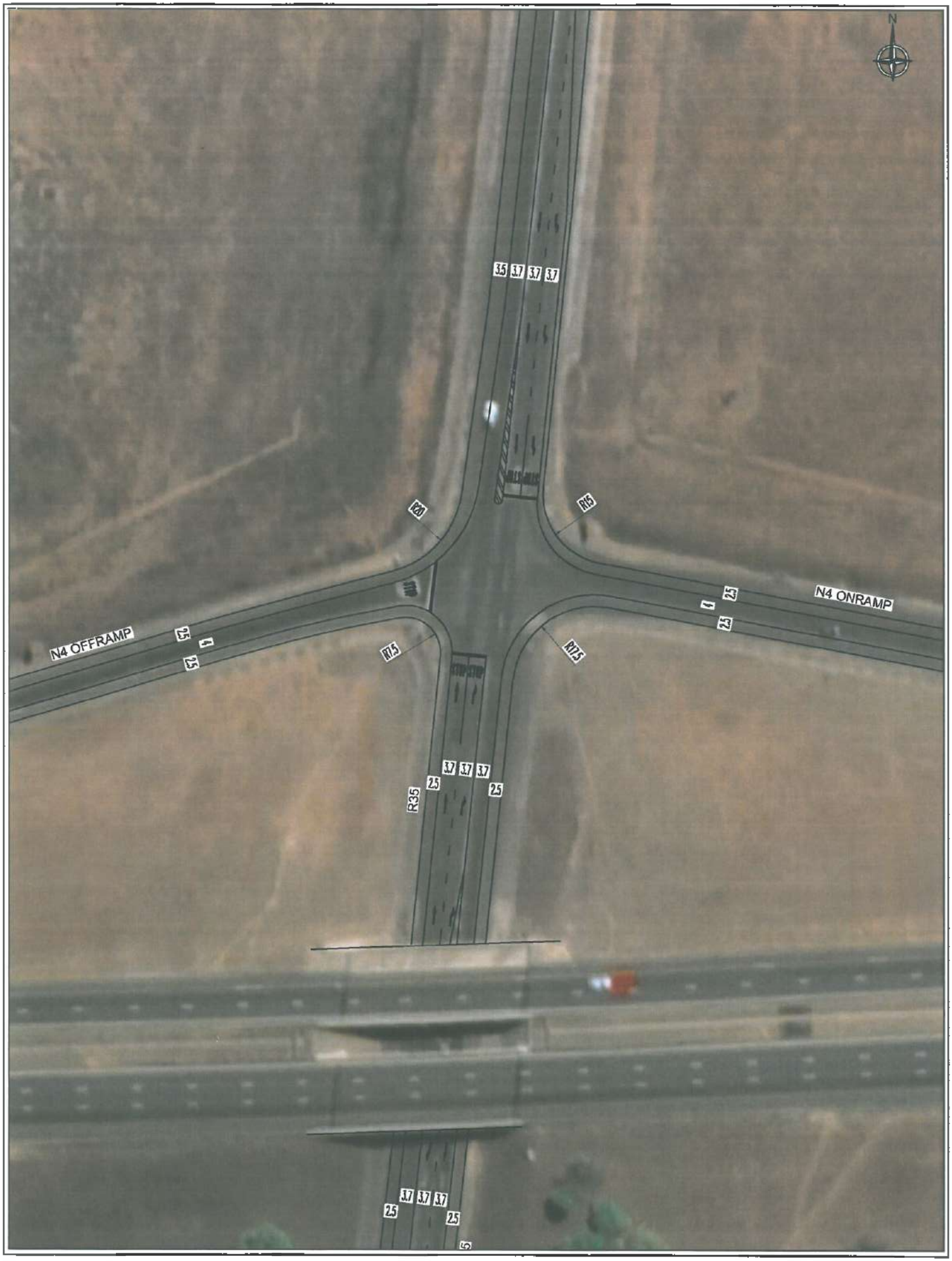
No.	DATE	AMENDMENTS	DONE BY

CONSULTANT

mpe

Moyeni Professional Engineers
P.O. Box 14
Glenvista
2058
Tel.: (011) 491 5670
Fax: (001) 298 5066

PROJECT	SCALE	DISTRICT	TYPE OF PLANNING
N4/R35 Truck Stop & Industrial Development	1:1000	Johannesburg	TIA
DESCRIPTION	**SIZE**	**ROAD No.**	**PLAN No.** (Job Number / Number / Rev)
OVERALL UPGRADING LAYOUT PLAN	A1	-	M282 / A / 0



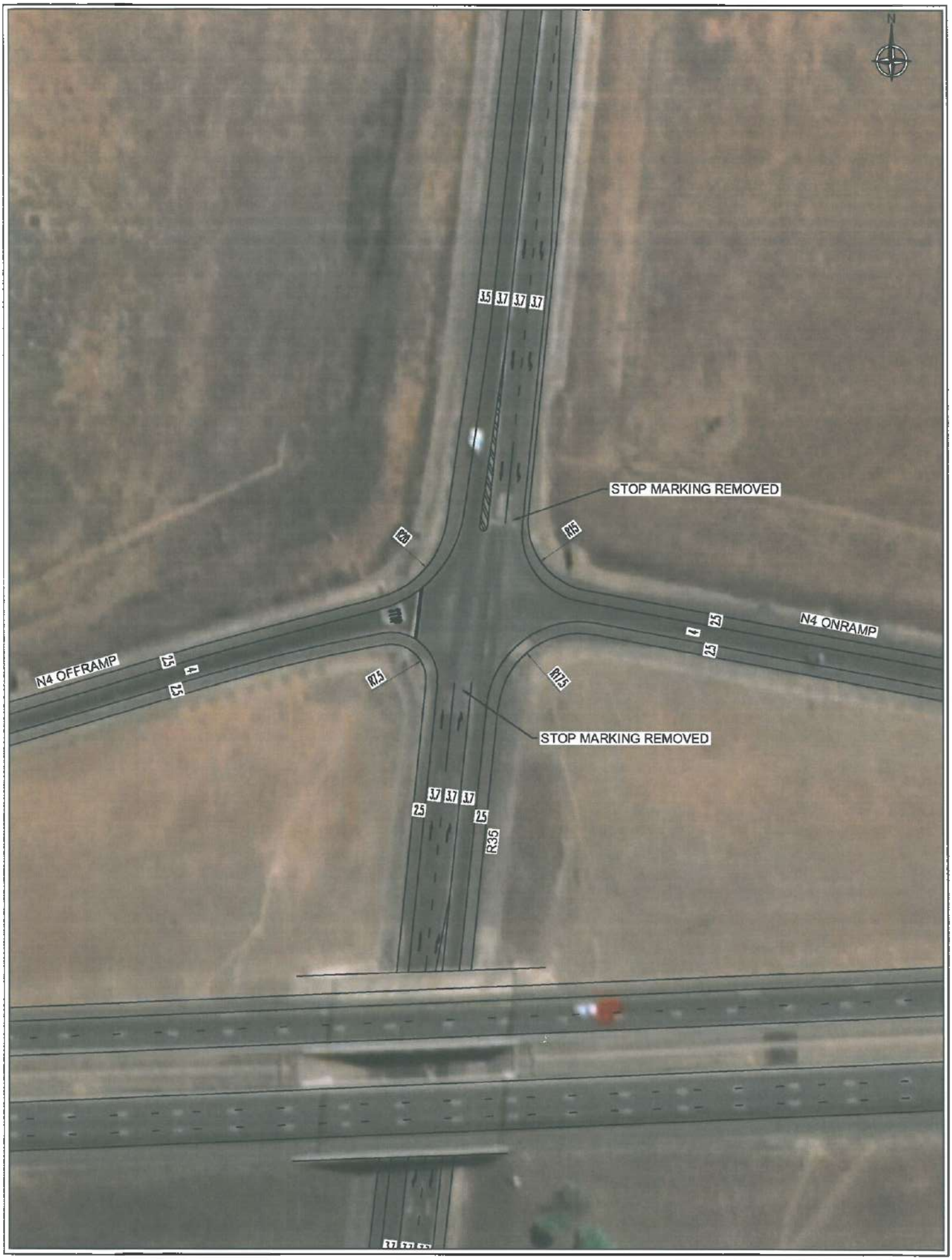
mpe

N4/R35 Truck Stop & Industrial Development

Existing Intersection of
R35 and N4 North Interchange

A1-1

SCALE 1:1000



mpe

N4/R35 Truck Stop & Industrial Development

Proposed Changes of Intersection of
R35 and N4 North Interchange

A1-2

SCALE 1:1

mpe

N4/R35 Truck Stop & Industrial Development

Proposed 2020 Upgrading of
R35 and N4 North Interchange

A1-3

SCALE 1:1

mpe

N4/R35 Truck Stop & Industrial Development

Existing Intersection of
R35 and N4 South Interchange

A2-1

SCALE 1:1000

mpe

N4/R35 Truck Stop & Industrial Development

Proposed 2020 Upgrading of
R35 and N4 South Interchange

A2-2

SCALE 1:1

mpe

N4/R35 Truck Stop & Industrial Development

Proposed 2025 Upgrading of
R35 and N4 South Interchange

A2-3

SCALE 1:1

N4/R35 Truck Stop & Industrial Development

Existing Intersection of
R35 and Road A/Access Rd

A3-1

SCALE 1:1

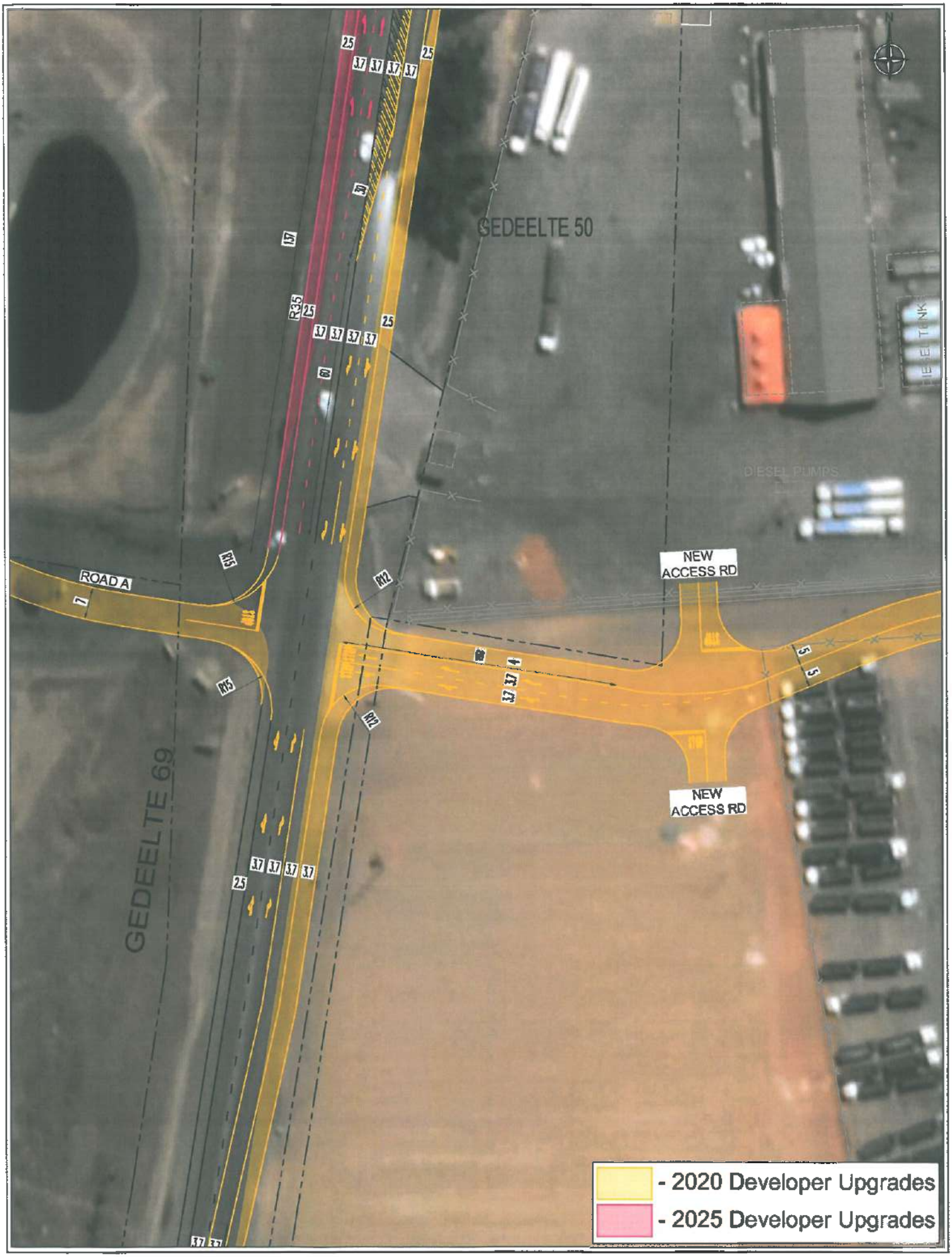
mpe

N4/R35 Truck Stop & Industrial Development

Proposed 2020 Upgrading of
R35 and Road A/Access Rd

A3-2

SCALE 1:1



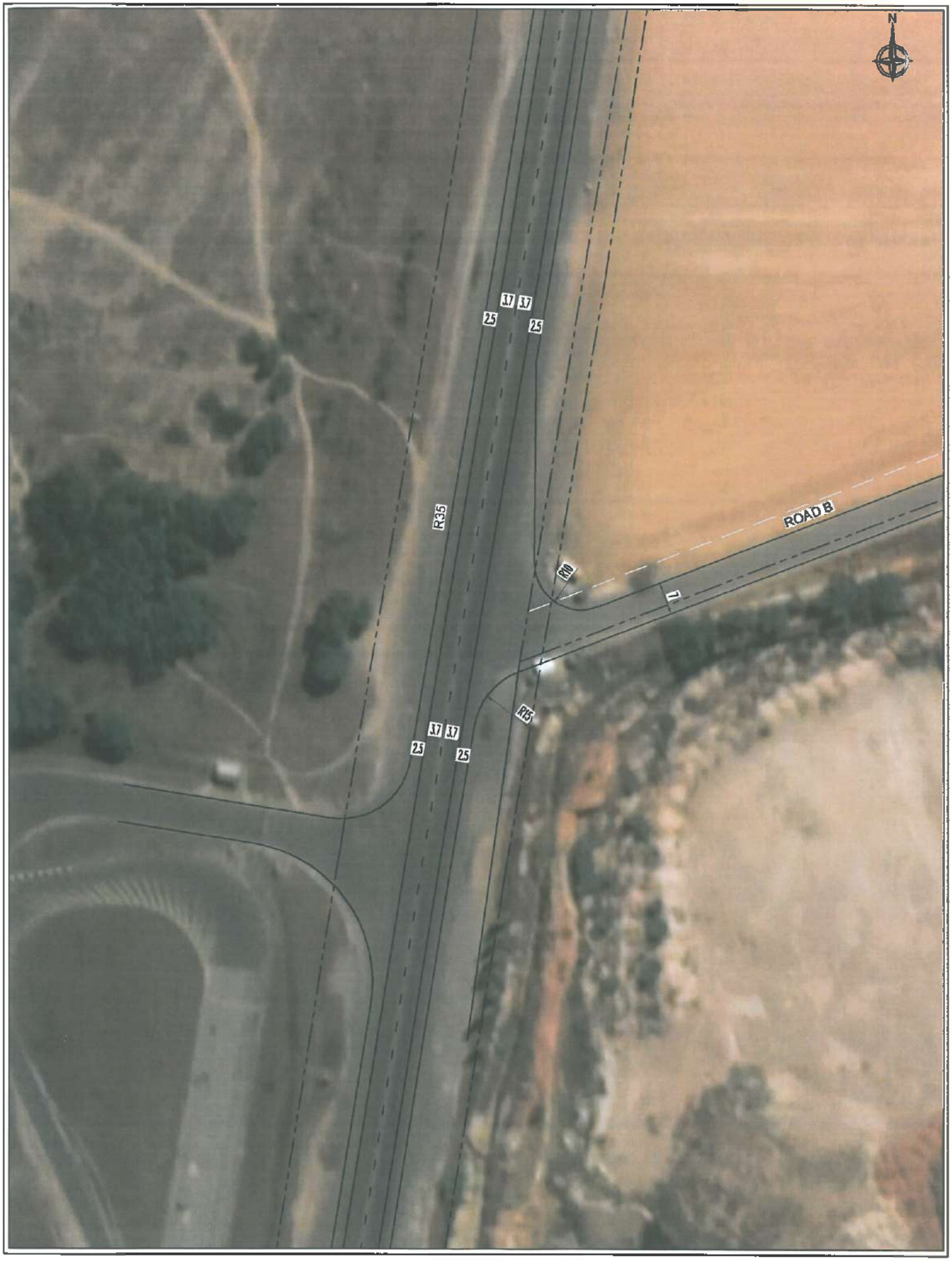
mpe

N4/R35 Truck Stop & Industrial Development

Proposed 2025 Upgrading of
R35 and Road A/Access Rd

A3-3

SCALE 1:1



mpe

N4/R35 Truck Stop & Industrial Development

Existing Intersection of
R35 and Road B

A4-1

SCALE 1:1

ANNEXURE B

Traffic Flow Calculations

N4/R35 TRUCK STOP AND INDUSTRIAL

From Agricultural to Industrial 2

As @ 18 November 2019

mpe Moyeni Professional Engineering (Project MPE 278)

COTO CODE	Land use	Site size (Ha)		FAR	GLA sqm	RATE IN	RATE OUT	TRIPS NEW TWO-WAY	TRIP GENERATION WEEKDAY AM IN	WEEKDAY AM OUT	WEEKDAY AM TWO-WAY	WEEKDAY PM IN	WEEKDAY PM OUT	WEEKDAY PM TWO-WAY
	Existing TRUCK STOP & Coal distribution	7,38		0,06	4 130				12	14	26	15	16	31
	(4 businesses)								0,29	0,34	0,63	0,36	0,39	0,75
									46%	54%		48%	52%	
150	Warehousing & Distribution	7,38		0,06	4 130	Trips			12	8	21	9	11	21
	Remainder of the farm portion								0,30	0,20	0,50	0,23	0,28	0,50
									60%	40%		45%	55%	
130	Industrial	15,31		0,10	15 313	Trips			86	37	123	31	92	123
	Remaindedr of the farm portion								0,56	0,24	0,80	0,20	0,60	0,80
									70%	30%		25%	75%	
150	Distribution (Coal)	15,31		0,10	15 313	Trips			44	52	96	56	59	115
	Using survey trip generation rates								0,29	0,34	0,63	0,36	0,39	0,75
									46%	54%		48%	52%	
	COMBINATION													
130	Industrial	12,18		0,10	12 182	Trips			68	29	97	24	73	97
	Remainder of farm portion								0,56	0,24	0,80	0,20	0,60	0,80
									70%	30%		25%	75%	
150	Distribution (Coal)	3,13		0,10	3 132	Trips			9	11	20	56	59	115
	Sites A & B								0,29	0,34	0,63	0,36	0,39	0,75
									46%	54%		48%	52%	
710	COMBINED INDUSTRIAL & Distribution (Coal)	15,31		0,10	15 313	Trips			77	40	117	80	132	212

	COTO TMH 17 - Table 3.2	Factor	Factor used
1	Mixed Use	na	1,00
2	Low vehicle ownership	na	1,00
3	Very Low vehicle ownership	na	1,00
4	Transit nodes or corridors	na	1,00
1-4	Overall factor	na	1,00

		WEEKDAY AM IN	WEEKDAY AM OUT	WEEKDAY AM TWO-WAY	WEEKDAY PM IN	WEEKDAY PM OUT	WEEKDAY PM TWO-WAY
Worst case - All Industrial		86	37	123	31	92	123
	New	86	37	123	31	92	123
	Pass-by	0	0	0	0	0	0
Worst case - All distribution		44	52	96	56	59	115
	New	44	52	96	56	59	115
	Pass-by	0	0	0	0	0	0
Worst case - Combined		77	40	117	80	132	212
	New	77	40	117	80	132	212
	Pass-by	0	0	0	0	0	0

N4/R35 TRUCK STOP AND INDUSTRIAL DEVELOPMENT

MODAL SPLIT 2019

Tuesday 25 November 2019

			Tuesday peak period - November 2019					
Intersection No		Intersection Name	TOTAL	Cars	Taxi	Bus	Trucks	HEAVIES
1		N4/R35 - Northern terminal	16170	13486	369	28	2287	2315
			100%	83%	2%	0,2%	14%	14%
2		N4/R35 - Northern terminal	12581	9945	393	24	2219	2243
			100%	79%	3%	0,2%	18%	18%
3		R35/Truckstop plus R35/Access Road	7044	5087	291	29	1637	1666
			100%	72%	4%	0,4%	23%	24%
4		R35/Pienaars Dam	6116	4565	236	13	1302	1315
			100%	75%	4%	0,2%	21%	22%
TOTAL			41911	33083	1289	94	7445	7539
Average			100%	78,9%	3,1%	0,2%	17,8%	18,0%
Percentage - average			100%	78,9%	3,1%	0,2%	17,8%	18,0%

N4/R35 TRUCK STOP AND INDUSTRIAL DEVELOPMENT

AM PEAK

2019 to 2020	1,03
2020 to 2025	1,16

Growth Rate pa: 3%

PORTION				Industrial TRIP GENERATION IN	Industrial TRIP GENERATION OUT	Distribution (Coal) TRIP GENERATION IN	Distribution (Coal) TRIP GENERATION OUT	COMBINED INDUSTRIAL & Distribution (Coal) TRIP GENERATION IN	COMBINED INDUSTRIAL & Distribution (Coal) TRIP GENERATION OUT
SITE				56	37	44	52	77	40
New				56	37	44	52	77	40
Passby				0	0	0	0	0	0

Intersection 1: N4/R35 - Northern terminal

		Model 1	Model 2	Model 6	Industrial Trip Distribution (%) Inbound	Industrial Trip Distribution (%) Outbound	Industrial Trip assignment Inbound	Industrial Trip assignment Outbound	Distribution (Coal) Trip Distribution (%) Inbound	Distribution (Coal) Trip Distribution (%) Outbound	Distribution (Coal) Trip assignment Inbound	Distribution (Coal) Trip assignment Outbound	COMBINED INDUSTRIAL & Distribution (Coal) Trip Distribution (%) Inbound	COMBINED INDUSTRIAL & Distribution (Coal) Trip Distribution (%) Outbound	COMBINED INDUSTRIAL & Distribution (Coal) Trip assignment Inbound	COMBINED INDUSTRIAL & Distribution (Coal) Trip assignment Outbound	AM PEAK hour SITE Industrial TOTAL Two-way	AM PEAK hour SITE Distribution TOTAL Two-way	AM PEAK hour SITE Combined TOTAL Two-way	2020 SITE plus Background traffic Model 3	2020 SITE plus Background traffic Model 4	2020 SITE plus Background traffic Model 5	2025 SITE plus Background traffic Model 7	2025 SITE plus Background traffic Model 8	2025 SITE plus Background traffic Model 9
Movement (approach)		2019 traffic	2020 traffic	2025 traffic			Inbound Trips	Outbound Trips			Inbound Trips	Outbound Trips			Inbound Trips	Outbound Trips				2020 traffic Trips	2020 traffic Trips	2020 traffic Trips	2025 traffic Trips	2025 traffic Trips	2025 traffic Two-way
s-left	1	0	0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
s-thru	2	247	254	295		22%	0	8		22%	0	11		22%	0	9	8	11	9	262	266	263	303	306	304
s-right	3	30	31	36		36%	0	13		36%	0	18		36%	0	14	13	18	14	44	50	45	49	55	50
e-left	4		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
e-thru	5		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
e-right	6		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
n-left	7	218	225	260			0	0			0	0			0	0	0	0	0	225	225	225	260	260	260
n-thru	8	550	567	657	17%		15	0	17%		8	0	17%		13	0	15	8	13	581	574	580	671	664	670
n-right	9		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
w-left	10	293	302	350			0	0			0	0			0	0	0	0	0	302	302	302	350	350	350
w-thru	11	0	0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
w-right	12	30	31	36	25%		21	0	25%		11	0	25%		16	0	21	11	16	52	42	50	57	47	55
		1 368	*1 409*	*1 633*	42%	58%	36	21	42%	58%	19	29	42%	58%	32	23	57	49	56	*1486*	*1458*	*1468*	*1661*	*1632*	*1683*

Intersection 2: N4/R35 - Northern terminal

		2019 traffic	2020 traffic	2025 traffic	Distribution (Coal) Trip Distribution (%) Inbound	Distribution (Coal) Trip Distribution (%) Outbound	Distribution (Coal) Trip assignment Inbound	Distribution (Coal) Trip assignment Outbound	Distribution (Coal) Trip Distribution (%) Inbound	Distribution (Coal) Trip Distribution (%) Outbound	Distribution (Coal) Trip assignment Inbound	Distribution (Coal) Trip assignment Outbound	COMBINED INDUSTRIAL & Distribution (Coal) Trip Distribution (%) Inbound	COMBINED INDUSTRIAL & Distribution (Coal) Trip Distribution (%) Outbound	COMBINED INDUSTRIAL & Distribution (Coal) Trip assignment Inbound	COMBINED INDUSTRIAL & Distribution (Coal) Trip assignment Outbound	SITE Industrial TOTAL Two-way	SITE Distribution TOTAL Two-way	SITE Combined TOTAL Two-way	Model 3 2020 traffic Trips	Model 4 2020 traffic Trips	Model 5 2020 traffic Trips	Model 7 2025 traffic Trips	Model 8 2025 traffic Trips	Model 9 2025 traffic Two-way
Movement (approach)					Inbound Trips	Outbound Trips	Inbound Trips	Outbound Trips	Inbound Trips	Outbound Trips	Inbound Trips	Outbound Trips	Inbound Trips	Outbound Trips	Inbound Trips	Outbound Trips									
s-left	1	30	31	36		32%	0	12		32%	0	17		32%	0	13	12	17	13	43	48	44	48	52	49
s-thru	2	144	148	172		58%	0	21		58%	0	30		58%	0	23	21	30	23	170	178	171	193	202	195
s-right	3		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
e-left	4	34	35	41	28%		24	0	28%		12	0	28%		22	0	24	12	22	59	47	57	65	53	62
e-thru	5	1	1	1			0	0			0	0			0	0	0	1	0	1	1	1	1	1	1
e-right	6	138	142	166			0	0			0	0			0	0	0	142	142	142	142	142	166	166	166
n-left	7	0	0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
n-thru	8	295	304	352	42%		36	0	42%		19	0	42%		32	0	36	19	32	340	323	336	388	371	386
n-right	9	279	287	333			0	0			0	0			0	0	0	287	287	287	287	287	333	333	333
w-left	10		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
w-thru	11		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
w-right	12		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
		921	*948*	*1 100*	70%	90%	60	33	70%	90%	31	47	70%	90%	54	36	82	78	89	*1642*	*1038*	*1039*	*1193*	*1178*	*1180*

Intersection 3: R35/Truckstop plus R35/Accasa Road

AM PEAK

Movement (approach)		2019 traffic	2020 traffic	2025 traffic	Distribution (Coal) Trip Distribution (%) Inbound Trips	Distribution (Coal) Trip Distribution (%) Outbound Trips	Distribution (Coal) Trip assignment Inbound Trips	Distribution (Coal) Trip assignment Outbound Trips	Distribution (Coal) Trip Distribution (%) Inbound Trips	Distribution (Coal) Trip Distribution (%) Outbound Trips	Distribution (Coal) Trip assignment Inbound Trips	Distribution (Coal) Trip assignment Outbound Trips	COMBINED INDUSTRIAL & Distribution (Coal) #REF! Inbound Trips	COMBINED INDUSTRIAL & Distribution (Coal) #REF! Outbound Trips	Trip assignment Inbound Trips	Trip assignment Outbound Trips	SITE Industrial TOTAL Two-way	SITE Distribution TOTAL Two-way	SITE Combined TOTAL Two-way	Model 3 2020 traffic Trips	Model 4 2020 traffic Trips	Model 5 2020 traffic Trips	Model 7 2025 traffic Trips	Model 8 2025 traffic Trips	Model 9 2025 traffic Two-way
s-left	1	2	2	2			0	0			0	0			0	0	0	0	0	2	2	2	2	2	2
s-thru	2	143	147	171			0	0			0	0			0	0	0	0	0	147	147	147	171	171	171
s-right	3	4	4	5	30%		26	0	30%		13	0	30%		23	0	26	13	23	30	17	27	31	18	28
e-left	4	1	1	1		10%	0	4		10%	0	5		10%	0	4	4	5	4	5	6	5	5	6	5
e-thru	5	0	0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
e-right	6	13	13	16		90%	0	33		90%	0	47		90%	0	36	33	47	36	46	60	49	49	62	51
n-left	7	8	8	10	70%		60	0	70%		31	0	70%		54	0	60	31	54	66	39	62	70	41	64
n-thru	8	291	300	347			0	0			0	0			0	0	0	0	0	300	300	300	347	347	347
n-right	9	32	33	38			0	0			0	0			0	0	0	0	0	33	33	33	38	38	39
w-left	10	7	7	8			0	0			0	0			0	0	0	0	0	7	7	7	8	8	8
w-thru	11	0	0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
w-right	12	5	5	6			0	0			0	0			0	0	0	0	0	5	5	5	6	6	6
		609	621	694	100%	100%	86	37	100%	100%	44	53	100%	100%	77	60	123	98	117	844	818	838	727	701	731

Intersection 4: R35/Pienaars Dam

Movement (approach)		2019 traffic	2020 traffic	2025 traffic	Distribution (Coal) Trip Distribution (%) Inbound Trips	Distribution (Coal) Trip Distribution (%) Outbound Trips	Distribution (Coal) Trip assignment Inbound Trips	Distribution (Coal) Trip assignment Outbound Trips	Distribution (Coal) Trip Distribution (%) Inbound Trips	Distribution (Coal) Trip Distribution (%) Outbound Trips	Distribution (Coal) Trip assignment Inbound Trips	Distribution (Coal) Trip assignment Outbound Trips	COMBINED INDUSTRIAL & Distribution (Coal) #REF! Inbound Trips	COMBINED INDUSTRIAL & Distribution (Coal) #REF! Outbound Trips	Trip assignment Inbound Trips	Trip assignment Outbound Trips	SITE Industrial TOTAL Two-way	SITE Distribution TOTAL Two-way	SITE Combined TOTAL Two-way	Model 3 2020 traffic Trips	Model 4 2020 traffic Trips	Model 5 2020 traffic Trips	Model 7 2025 traffic Trips	Model 8 2025 traffic Trips	Model 9 2025 traffic Two-way
s-left	1		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
s-thru	2	135	139	161	30%		26	0	30%		13	0	30%		23	0	26	13	23	166	152	152	167	175	184
s-right	3	0	0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
e-left	4	2	2	2			0	0			0	0			0	0	0	0	0	2	2	2	2	2	2
e-thru	5		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
e-right	6	14	14	17			0	0			0	0			0	0	0	0	0	14	14	14	17	17	17
n-left	7	7	7	8			0	0			0	0			0	0	0	0	0	7	7	7	8	8	8
n-thru	8	281	289	336		10%	0	4		10%	0	5		10%	0	4	4	5	4	293	286	293	339	341	340
n-right	9		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
w-left	10		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
w-thru	11		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
w-right	12		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
		439	452	524	30%	10%	26	4	30%	10%	13	5	30%	10%	23	4	26	13	27	482	471	478	564	543	551

N4/R35 TRUCK STOP AND INDUSTRIAL DEVELOPMENT

PM PEAK

2019 to 2020	1.03
2020 to 2025	1.16

Growth Rate pa: 3%

PORTION				Industrial TRIP GENERATION IN	Industrial TRIP GENERATION OUT	Distribution (Coal) TRIP GENERATION IN	Distribution (Coal) TRIP GENERATION OUT	COMBINED INDUSTRIAL & Distribution (Coal) TRIP GENERATION IN	COMBINED INDUSTRIAL & Distribution (Coal) TRIP GENERATION OUT
SITE				31	92	58	58	89	132
New				31	92	58	58	89	132
Passby				0	0	0	0	0	0

Intersection 1: N4/R35 - Northern terminal

Movement (approach)		Model 1 2019 traffic	Model 2 2020 traffic	Model 6 2025 traffic	Industrial Trip Distribution (%) Inbound Trips	Industrial Trip Distribution (%) Outbound Trips	Industrial Trip assignment Inbound Trips	Industrial Trip assignment Outbound Trips	Distribution (Coal) Trip Distribution (%) Inbound Trips	Distribution (Coal) Trip Distribution (%) Outbound Trips	Distribution (Coal) Trip assignment Inbound Trips	Distribution (Coal) Trip assignment Outbound Trips	COMBINED INDUSTRIAL & Distribution (Coal) Trip Distribution (%) Inbound Trips	COMBINED INDUSTRIAL & Distribution (Coal) Trip Distribution (%) Outbound Trips	COMBINED INDUSTRIAL & Distribution (Coal) Trip assignment Inbound Trips	COMBINED INDUSTRIAL & Distribution (Coal) Trip assignment Outbound Trips	SITE Industrial TOTAL Two-way	SITE Distribution TOTAL Two-way	SITE Combined TOTAL Two-way	Model 3 2020 traffic Trips	Model 4 2020 traffic Trips	Model 5 2020 traffic Trips	Model 7 2025 traffic Trips	Model 8 2025 traffic Trips	Model 9 2025 traffic Two-way
s-left	1		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
s-thru	2	511	526	610		22%	0	20		22%	0	13		22%	0	29	20	13	29	547	539	555	630	623	639
s-right	3	32	33	38		23%	0	21		23%	0	14		23%	0	30	21	14	30	54	47	63	59	52	68
e-left	4		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
e-thru	5		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
e-right	6		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
n-left	7	189	195	226			0	0			0	0			0	0	0	0	0	195	195	195	226	226	226
n-thru	8	476	492	571	20%		6	0	20%		14	0	20%		15	0	6	11	16	498	503	508	577	582	587
n-right	9		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
w-left	10	220	227	263			0	0			0	0			0	0	0	0	0	227	227	227	263	263	263
w-thru	11	0	0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
w-right	12	43	44	51	34%		10	0	34%		19	0	34%		27	0	10	19	27	55	63	71	82	70	79
		1 473	1 517	1 769	54%	45%	17	49	54%	45%	30	27	54%	45%	43	60	58	57	103	1576	1574	1628	1917	1810	1882

Intersection 2: N4/R35 - Northern terminal

Movement (approach)		2019 traffic	2020 traffic	2025 traffic	Distribution (Coal) Trip Distribution (%) Inbound Trips	Distribution (Coal) Trip Distribution (%) Outbound Trips	Distribution (Coal) Trip assignment Inbound Trips	Distribution (Coal) Trip assignment Outbound Trips	Distribution (Coal) Trip Distribution (%) Inbound Trips	Distribution (Coal) Trip Distribution (%) Outbound Trips	Distribution (Coal) Trip assignment Inbound Trips	Distribution (Coal) Trip assignment Outbound Trips	COMBINED INDUSTRIAL & Distribution (Coal) Trip Distribution (%) Inbound Trips	COMBINED INDUSTRIAL & Distribution (Coal) Trip Distribution (%) Outbound Trips	COMBINED INDUSTRIAL & Distribution (Coal) Trip assignment Inbound Trips	COMBINED INDUSTRIAL & Distribution (Coal) Trip assignment Outbound Trips	SITE Industrial TOTAL Two-way	SITE Distribution TOTAL Two-way	SITE Combined TOTAL Two-way	Model 3 2020 traffic Trips	Model 4 2020 traffic Trips	Model 5 2020 traffic Trips	Model 7 2025 traffic Trips	Model 8 2025 traffic Trips	Model 9 2025 traffic Two-way
s-left	1	50	52	60		35%	0	32		35%	0	21		35%	0	45	32	21	48	84	72	96	92	80	106
s-thru	2	324	334	387		45%	0	41		45%	0	27		45%	0	60	41	27	60	375	360	393	423	414	446
s-right	3		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
e-left	4	38	38	45	31%		0	0	31%		17	0	31%		25	0	9	17	25	49	56	64	65	63	70
e-thru	5	10	10	12			0	0			0	0			0	0	0	0	0	10	10	10	12	12	12
e-right	6	216	222	258			0	0			0	0			0	0	0	0	0	222	222	222	258	258	258
n-left	7	0	0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
n-thru	8	201	207	240	54%		17	0	54%		30	0	54%		43	0	17	30	43	224	237	250	257	270	283
n-right	9	330	340	394			0	0			0	0			0	0	0	0	0	340	340	340	394	394	394
w-left	10		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
w-thru	11		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
w-right	12		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
		1 169	1 204	1 396	86%	80%	39	74	85%	80%	47	47	86%	80%	68	105	100	96	174	2204	1299	1378	1495	1491	1670

Intersection 3: R35/Truckstop plus R35/Access Road

					Distribution (Coal)				Distribution (Coal)				COMBINED INDUSTRIAL & Distribution (Coal				AM PEAK SITE							
					Trip Distribution (%)		Trip assignment		Trip Distribution (%)		Trip assignment		(REF)		Trip assignment		Industrial	Distribution	Combined	Model 3	Model 4	Model 5	Model 7	Model 8	Model 9
Movement (approach)		2019 traffic	2020 traffic	2025 traffic	Inbound Trips	Outbound Trips	Inbound Trips	Outbound Trips	Inbound Trips	Outbound Trips	Inbound Trips	Outbound Trips	Inbound Trips	Outbound Trips	Inbound Trips	Outbound Trips	TOTAL Two-way	TOTAL Two-way	TOTAL Two-way	2020 traffic Trips	2020 traffic Trips	2020 traffic Trips	2025 traffic Trips	2025 traffic Trips	2025 traffic Two-way
s-left	1	2	2	2			0	0			0	0			0	0	2	0	0	2	2	2	2	2	2
s-thru	2	143	147	171			0	0			0	0			0	0	0	0	0	147	147	147	171	171	171
s-right	3	4	4	5	30%		26	0	30%		13	0	30%		23	0	26	13	23	30	17	27	31	15	28
e-left	4	1	1	1		10%	0	4		10%	0	5		10%	0	4	4	5	4	5	5	5	5	6	5
e-thru	5	0	0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
e-right	6	13	13	15		90%	0	33		90%	0	47		90%	0	36	36	47	36	46	60	49	49	62	51
n-left	7	8	8	10	70%		60	0	70%		31	0	70%		54	0	60	31	54	68	39	62	70	41	64
n-thru	8	291	300	347			0	0			0	0			0	0	0	0	0	300	300	300	347	347	347
n-right	9	32	33	38			0	0			0	0			0	0	0	0	0	33	33	33	38	38	38
w-left	10	7	7	8			0	0			0	0			0	0	0	0	0	7	7	7	8	8	8
w-thru	11	0	0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
w-right	12	5	5	6			0	0			0	0			0	0	0	0	0	5	5	5	6	6	6
		586	619	684	100%	100%	86	37	100%	100%	44	62	100%	100%	77	40	126	86	117	644	616	638	727	709	724

Intersection 4: R35/Pioneers Dam

					Distribution (Coal)				Distribution (Coal)				COMBINED INDUSTRIAL & Distribution (Coal				SITE							
					Trip Distribution (%)		Trip assignment		Trip Distribution (%)		Trip assignment		(REF)		Trip assignment		Industrial	Distribution	Combined	Model 3	Model 4	Model 5	Model 7	Model 8	Model 9
Movement (approach)		2019 traffic	2020 traffic	2025 traffic	Inbound Trips	Outbound Trips	Inbound Trips	Outbound Trips	Inbound Trips	Outbound Trips	Inbound Trips	Outbound Trips	Inbound Trips	Outbound Trips	Inbound Trips	Outbound Trips	TOTAL Two-way	TOTAL Two-way	TOTAL Two-way	2020 traffic Trips	2020 traffic Trips	2020 traffic Trips	2025 traffic Trips	2025 traffic Trips	2025 traffic Two-way
s-left	1		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
s-thru	2	135	139	161	30%		26	0	30%		13	0	30%		23	0	26	13	23	165	152	152	187	175	184
s-right	3	0	0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
e-left	4	2	2	2			0	0			0	0			0	0	0	0	0	2	2	2	2	2	2
e-thru	5		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
e-right	6	14	14	17			0	0			0	0			0	0	0	0	0	14	14	14	17	17	17
n-left	7	7	7	8			0	0			0	0			0	0	0	0	0	7	7	7	8	8	8
n-thru	8	281	289	336		10%	0	4		10%	0	5		10%	0	4	4	5	4	293	295	293	339	341	340
n-right	9		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
w-left	10		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
w-thru	11		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
w-right	12		0	0			0	0			0	0			0	0	0	0	0	0	0	0	0	0	0
		439	452	524	30%	10%	26	4	30%	10%	13	6	30%	10%	23	4	30	18	27	467	471	479	554	543	551

ANNEXURE C

Capacity Analysis Results (AutoJ)

AutoJ

1. R35 & N4 terminal (north)

Middelburg

2019

SUMMARY

&AutoJ 1910 roberts

			Volume / Capacity (max)					Delay / vehicle (max)					Queue (max)				
	weighting	100%		25%	4%	25%	10%		4%	7%	4%	6%		4%	3%	4%	5%
	Control	Perf Index	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s sum
BEST overall	RR	81%		0,30		0,30	0,17		7		7	7		1,1		1,0	5,5
best signal	2	46%		0,53		0,46	0,27		21		21	13		1,9		1,5	10,1
		PI	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s sum
Priority	Xns	36%		0,66		0,73	0,30		17		19	13		2,5		2,8	9,3
	Xwe	53%		0,60		0,68	0,20		14		16	4		1,1		0,9	3,0
	XX	13%		1,69		1,26	0,66		829		470	343		126,7		66,8	247,8
	mC	58%		0,52		0,46	0,26		8		7	7		1,2		0,9	5,2
	RR	81%		0,30		0,30	0,17		7		7	7		1,1		1,0	5,5
2 stage	2	46%		0,53		0,46	0,27		21		21	13		1,9		1,5	10,1
3 stage	3ns	39%		0,59		0,52	0,30		27		27	18		2,8		2,2	13,8
	3we	40%		0,59		0,52	0,30		27		27	18		2,8		2,2	13,6
	n3	41%		0,57		0,54	0,28		26		28	15		2,1		2,4	11,8
	s3	39%		0,61		0,52	0,30		28		27	18		2,9		2,2	13,1
	w3	41%		0,59		0,52	0,28		19		19	16		2,7		2,2	12,5
	e3	38%		0,61		0,54	0,31		28		28	19		2,9		2,4	14,2
4 stage	4nswe	35%		0,65		0,58	0,33		33		32	23		3,7		3,0	17,6
	n4we	36%		0,63		0,60	0,31		32		33	20		2,6		3,2	15,3
	s4we	35%		0,68		0,57	0,33		34		32	23		3,9		3,0	16,8
	w4ns	36%		0,65		0,58	0,31		24		24	21		3,6		3,0	16,4
	e4ns	34%		0,68		0,60	0,34		34		33	24		3,9		3,2	18,2
	nw4	39%		0,53		0,60	0,29		23		25	18		2,5		3,1	14,2
	ne4	35%		0,66		0,62	0,32		33		34	20		2,7		3,3	15,9
	sw4	36%		0,67		0,57	0,31		25		24	21		3,8		2,9	15,6
	se4	34%		0,70		0,59	0,34		35		33	24		4,1		3,1	17,4
separate (split) stage	n-s-3	29%		0,69		0,77	0,43		39		41	33		4,0		4,6	24,6
	w-e-3	37%		0,62		0,55	0,32		31		31	21		3,4		2,8	16,2
	n-s-4we	26%		0,76		0,84	0,46		45		50	41		5,1		6,0	30,1
	w-e-4ns	33%		0,68		0,60	0,35		38		37	26		4,3		3,5	20,2
	n-s-w-e-4	23%		0,82		0,91	0,50		49		61	50		5,9		7,6	35,3
	optimums	81%		0,30		0,30	0,17		7		7	4		1,1		0,9	3,0

performance colours	best	near best, within 10% of optimum	LOS colours	A-B	C-D	E	F

print:
2019-12-06

AutoJ

1. R35 & N4 terminal (north)

Middelburg

2019

XX — Stop street on all approaches

&AutoJ 1910 roberts

Volume (evu/hr)

	from North					from South					from West					from East					intersection	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R		total
AM		218	550		768			247	30	277		293		30	323							1 368
off																						
PM		189	478		667			511	32	543		220		43	263							1 473

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		1,0	1,0				1,0	1,0		0,3	0,4	0,3				

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
		stop	stop				stop	stop		stop		stop				

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R		max	overall
AM		0,36	1,69		1,31			0,76	0,09	0,69		0,68		0,68	0,68							1,69	1,04
off																							
PM		0,27	1,18		0,93			1,26	0,08	1,19		0,48		0,48	0,48							1,26	0,94

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R		max	overall
AM		10	829		597			21	9	20		15		16	15							829	343
off																							
PM		10	372		269			470	9	443		11		12	11							470	287

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R		max	total
AM		0,6	126,7		127,3			1,5	0,1	1,5		1,2		0,1	1,4							126,7	130,2
off																							
PM		0,5	49,4		49,9			66,8	0,1	66,8		0,7		0,1	0,8							66,8	117,6

print:
2019-12-06

AutoJ

1. R35 & N4 terminal (north)

Middelburg

2019

Xwe — **Stop street on west and east approaches**

Volume (evu/hr)

	from North					from South					from West					from East					intersection
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	total
AM		218	550		768			247	30	277		293		30	323						1 368
off																					
PM		189	478		667			511	32	543		220		43	263						1 473

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		1,0	1,0				1,0	1,0		0,3	0,4	0,3				

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
										stop		stop				

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0,11	0,27		0,23			0,12	0,04	0,11		0,60		0,60	0,60						0,60	0,29
off																						
PM		0,10	0,24		0,20			0,26	0,04	0,24		0,68		0,68	0,68						0,68	0,30

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0	2		1			1	0	1		13		14	13						14	4
off																						
PM		0	1		1			1	0	1		15		16	15						16	4

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM		0,0	0,2		0,3			0,0	0,0	0,0		1,1		0,1	1,2						1,1	1,5
off																						
PM		0,0	0,2		0,2			0,2	0,0	0,2		0,9		0,2	1,1						0,9	1,5

print:
2019-12-06

AutoJ

1. R35 & N4 terminal (north)

Middelburg

2019

RR — Roundabout, yield on all approaches

&AutoJ 1910 roberts

Volume (evu/hr)

	from North					from South					from West					from East					intersection	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R		total
AM		218	550		768			247	30	277		293		30	323							1 368
off																						
PM		189	478		667			511	32	543		220		43	263							1 473

Lanes

	from North		from South		from West		from East	
	L~	LSR	L~	LSR	L~	LSR	L~	LSR
# lanes		2,0		2,0		1,0		

Control

	from North			from South			from West			from East		
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
		yield	yield				yield	yield		yield		yield				

VOLUME to CAPACITY (V/C)

A-B C-D E F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0,30	0,30	0,30	0,30		0,10	0,10	0,10	0,10		0,29	0,29	0,29	0,29						0,30	0,25
off																						
PM		0,26	0,26	0,26	0,26		0,20	0,20	0,20	0,20		0,30	0,30	0,30	0,30						0,30	0,24

Average DELAY per vehicle (secs)

A-B C-D E F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		7	7		7			6	6	6		7		7	7						7	7
off																						
PM		7	7		7			7	7	7		7		7	7						7	7

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK WARN POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM		0,4	1,1		1,5			0,4	0,1	0,5		0,6		0,1	0,6						1,1	2,7
off																						
PM		0,4	0,9		1,3			1,0	0,1	1,0		0,4		0,1	0,5						1,0	2,8

print:
2019-12-06

AutoJ

1. R35 & N4 terminal (north)

Middelburg

2020

Xwe — Stop street on west and east approaches

Volume (evu/hr)

	from North					from South					from West					from East					intersection
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	total
AM		225	567		791			254	31	285		302		31	333						1 409
off																					
PM		195	492		687			526	33	559		227		44	271						1 517

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		1,0	1,0				1,0	1,0		0,3	0,4	0,3				

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
										stop		stop				

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0,12	0,28		0,24			0,13	0,05	0,12		0,63		0,63	0,63						0,63	0,30
off																						
PM		0,10	0,25		0,21			0,26	0,04	0,25		0,72		0,72	0,72						0,72	0,31

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0	2		1			1	0	1		14		14	14						14	4
off																						
PM		0	1		1			1	0	1		17		17	17						17	4

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM		0,0	0,2		0,3			0,0	0,0	0,0		1,2		0,1	1,3						1,2	1,6
off																						
PM		0,0	0,2		0,2			0,2	0,0	0,2		1,1		0,2	1,3						1,1	1,7

print:
2019-12-07

AutoJ

1. R35 & N4 terminal (north)

Middelburg

2020 PLUS INDUSTRIAL

Xwe — **Stop street on west and east approaches**

Volume (evu/hr)

	from North					from South					from West					from East					intersection
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	total
AM		225	567		791			262	44	306		302		52	354						1 451
off																					
PM		195	492		687			546	54	600		227		54	281						1 568

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		1,0	1,0				1,0	1,0		0,3	0,4	0,3				

Control

	from North				from South				from West				from East			
	peds	left	str	right	*peds*	left	str	right	*peds*	left	str	right	*peds*	left	str	right
										stop		stop				

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM		0,12	0,28		0,24			0,13	0,07	0,12		0,78		0,78	0,78						0,78	0,35
off																						
PM		0,10	0,25		0,21			0,27	0,07	0,26		0,90		0,90	0,90						0,90	0,35

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM		0	2		1			1	0	1		20		21	20						21	6
off																						
PM		0	1		1			2	0	1		35		37	35						37	7

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	total
AM		0,0	0,2		0,3			0,0	0,0	0,0		1,7		0,3	2,0						1,7	2,3
off																						
PM		0,0	0,2		0,2			0,2	0,0	0,2		2,2		0,6	2,7						2,2	3,2

print:
2019-12-07

1. R35 & N4 terminal (north)

Middelburg

2020 PLUS DISTRIBUTION

Xwe — **Stop street on west and east approaches**

AutoJ

Volume (evu/hr)

	from North					from South					from West					from East					intersection	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R		total
AM		225	575		799			265	50	315		302		42	344							1 458
off																						
PM		195	503		698			539	47	586		227		63	290							1 574

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		1,0	1,0				1,0	1,0		0,3	0,4	0,3				

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
										stop		stop				

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R		max	overall
AM		0,12	0,29		0,24			0,13	0,08	0,12		0,73		0,73	0,73							0,73	0,33
off																							
PM		0,10	0,25		0,21			0,27	0,06	0,25		0,87		0,87	0,87							0,87	0,35

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R		max	overall
AM		0	2		1			1	0	1		17		18	17							18	5
off																							
PM		0	1		1			1	0	1		28		29	28							29	6

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R		max	total
AM		0,0	0,3		0,3			0,0	0,0	0,0		1,4		0,2	1,6							1,4	2,0
off																							
PM		0,0	0,2		0,2			0,2	0,0	0,2		1,8		0,5	2,3							1,8	2,7

print:
2019-12-07

AutoJ

1. R35 & N4 terminal (north)

Middelburg

2020 PLUS COMBINED

Xwe — Stop street on west and east approaches

&AutoJ 1910 roberts

Volume (evu/hr)

	from North					from South					from West					from East					intersection
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	total
AM		225	580		804			263	45	308		302		50	352						1 464
off																					
PM		195	510		705			555	63	618		227		71	298						1 621

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		1,0	1,0				1,0	1,0		0,3	0,4	0,3				

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
										stop		stop				

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0,12	0,29		0,24			0,13	0,07	0,12		0,78		0,78	0,78						0,78	0,35
off																						
PM		0,10	0,26		0,21			0,28	0,09	0,26		0,98		0,98	0,98						0,98	0,37

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0	2		1			1	0	1		20		20	20						20	6
off																						
PM		0	1		1			2	0	1		66		68	66						66	13

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM		0,0	0,3		0,3			0,0	0,0	0,0		1,6		0,3	1,9						1,6	2,3
off																						
PM		0,0	0,2		0,2			0,2	0,0	0,2		4,1		1,4	5,5						4,1	6,0

AutoJ

1. R35 & N4 terminal (north)

Middelburg

2025

Xwe — Stop street on west and east approaches

Volume (evu/hr)

	from North					from South					from West					from East					intersection
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	total
AM		260	657		917			295	36	331		350		36	386						1 633
off																					
PM		226	571		796			610	38	648		263		51	314						1 759

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		1,0	1,0				1,0	1,0		0,3	0,4	0,3				

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
										stop		stop				

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0,14	0,33		0,27			0,15	0,07	0,14		0,79		0,79	0,79						0,79	0,37
off																						
PM		0,12	0,29		0,24			0,31	0,06	0,29		0,97		0,97	0,97						0,97	0,39

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		1	2		2			1	0	1		21		22	21						22	6
off																						
PM		0	2		1			2	0	2		61		64	62						64	12

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM		0,0	0,4		0,4			0,1	0,0	0,1		2,0		0,2	2,2						2,0	2,7
off																						
PM		0,0	0,3		0,3			0,3	0,0	0,3		4,5		0,9	5,4						4,5	6,0

AutoJ

1. R35 & N4 terminal (north)

Middelburg

2025 plus upgrade

Xwe — **Stop street on west and east approaches**

&AutoJ 1910 roberts

Volume (evu/hr)

	from North					from South					from West					from East					intersection	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R		total
AM		260	657		917			295	36	331		350		36	386							1 633
off																						
PM		226	571		796			610	38	648		263		51	314							1 759

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		1,0	1,0				1,0	1,0		0,5	0,5	1,0				

Control

	from North				from South				from West				from East			
	peds	left	str	right	*peds*	left	str	right	*peds*	left	str	right	*peds*	left	str	right
										stop		stop				

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM		0,14	0,33		0,27			0,15	0,07	0,14		0,47		0,18	0,44						0,47	0,29
off																						
PM		0,12	0,29		0,24			0,31	0,06	0,29		0,53		0,38	0,50						0,53	0,30

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM		1	2		2			1	0	1		11		9	11						11	4
off																						
PM		0	2		1			2	0	2		12		11	12						12	3

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	total
AM		0,0	0,4		0,4			0,1	0,0	0,1		1,1		0,1	1,2						1,1	1,6
off																						
PM		0,0	0,3		0,3			0,3	0,0	0,3		0,9		0,2	1,0						0,9	1,6

AutoJ

1. R35 & N4 terminal (north)

Middelburg

2025 PLUS INDUSTRIAL plus upgrade

Xwe — **Stop street on west and east approaches**

Volume (evu/hr)

	from North					from South					from West					from East					intersection
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	total
AM		260	672		932			303	49	352		350		57	407						1 690
off																					
PM		226	577		802			630	59	689		263		61	324						1 816

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		1,0	1,0				1,0	1,0		0,5	0,5	1,0				

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
										stop		stop				

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0,14	0,34		0,28			0,15	0,09	0,14		0,47		0,31	0,45						0,47	0,29
off																						
PM		0,12	0,29		0,24			0,32	0,09	0,30		0,54		0,51	0,54						0,54	0,31

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		1	2		2			1	0	1		11		10	11						11	4
off																						
PM		0	2		1			2	0	2		12		12	12						12	3

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM		0,0	0,4		0,4			0,1	0,0	0,1		1,1		0,2	1,3						1,1	1,7
off																						
PM		0,0	0,3		0,3			0,3	0,0	0,3		0,9		0,2	1,1						0,9	1,7

print:
2019-12-07

AutoJ

1. R35 & N4 terminal (north)

Middelburg

2025 PLUS DISTRIBUTION plus upgrade

Xwe — **Stop street on west and east approaches**

&AutoJ 1910 roberts

Volume (evu/hr)

	from North					from South					from West					from East					intersection
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	total
AM		260	665		925			306	55	361		350		47	397						1 682
off																					
PM		226	582		807			623	52	675		263		70	333						1 816

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		1,0	1,0				1,0	1,0		0,5	0,5	1,0				

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
										stop		stop				

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0,14	0,33		0,28			0,15	0,10	0,15		0,47		0,26	0,45						0,47	0,29
off																						
PM		0,12	0,29		0,24			0,31	0,08	0,29		0,54		0,57	0,54						0,57	0,32

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		1	2		2			1	0	1		11		10	11						11	4
off																						
PM		0	2		1			2	0	2		12		13	12						13	3

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM		0,0	0,4		0,4			0,1	0,0	0,1		1,1		0,1	1,2						1,1	1,7
off																						
PM		0,0	0,3		0,3			0,3	0,0	0,3		0,9		0,3	1,1						0,9	1,7

AutoJ

1. R35 & N4 terminal (north)

Middelburg

2025 PLUS COMBINED plus upgrade

Xwe — **Stop street on west and east approaches**

Volume (evu/hr)

	from North					from South					from West					from East					intersection	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R		total
AM		260	670		930			304	50	354		350		55	405							1 688
off																						
PM		226	589		814			639	68	707		263		78	341							1 863

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		1,0	1,0				1,0	1,0		0,5	0,5	1,0				

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
										stop		stop				

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0,14	0,33		0,28			0,15	0,09	0,14		0,47		0,30	0,45						0,47	0,29
off																						
PM		0,12	0,29		0,25			0,32	0,11	0,30		0,55		0,69	0,58						0,69	0,33

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		1	2		2			1	0	1		11		10	11						11	4
off																						
PM		0	2		1			2	0	2		12		16	13						16	4

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM		0,0	0,4		0,4			0,1	0,0	0,1		1,1		0,2	1,2						1,1	1,7
off																						
PM		0,0	0,3		0,3			0,3	0,0	0,3		0,9		0,4	1,3						0,9	1,9

print:
2019-12-07

2. R35 & N4 terminal (south)

AutoJ

Middelburg

2019

SUMMARY

&AutoJ 1910 roberts

			Volume / Capacity (max)					Delay / vehicle (max)					Queue (max)				
	weighting	100%		25%	4%	25%	10%		4%	7%	4%	6%		4%	3%	4%	5%
	Control	Perf Index	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s sum
BEST overall	RR	83%		0,21		0,43	0,16		7		8	7		0,6		0,7	4,1
best signal	n3	52%		0,32		0,54	0,25		23		27	17		0,9		2,0	9,4
		PI	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s sum
Priority	Xns	31%		0,51		1,04	0,33		13		154	51		1,0		14,1	19,2
	Xwe	25%		0,75		1,48	0,25		21		678	153		0,7		40,3	50,6
	XX	16%		1,03		1,38	0,66		154		586	329		12,6		52,8	126,4
	mC	71%		0,36		0,47	0,22		6		7	6		0,5		0,6	3,6
	RR	83%		0,21		0,43	0,16		7		8	7		0,6		0,7	4,1
2 stage	2	46%		0,39		0,76	0,25		19		30	13		0,8		1,6	7,1
3 stage	3ns	47%		0,39		0,55	0,27		26		28	21		1,5		2,1	11,1
	3we	38%		0,44		0,90	0,28		25		45	20		1,1		2,8	10,3
	n3	52%		0,32		0,54	0,25		23		27	17		0,9		2,0	9,4
	s3	36%		0,45		0,93	0,29		26		50	22		1,2		3,5	11,0
	w3	36%		0,45		0,93	0,30		26		50	24		1,2		3,5	11,8
	e3	40%		0,41		0,90	0,26		20		30	18		1,0		2,7	9,2
4 stage	4nswe	40%		0,43		0,64	0,30		32		35	26		2,0		2,7	14,0
	n4we	44%		0,37		0,63	0,28		28		34	23		1,1		2,7	12,2
	s4we	28%		0,51		1,14	0,32		32		365	112		1,5		27,9	41,1
	w4ns	40%		0,44		0,64	0,31		32		35	27		2,0		2,7	14,6
	e4ns	45%		0,41		0,57	0,28		26		28	23		1,8		2,4	12,5
	nw4	44%		0,37		0,63	0,29		29		34	24		1,1		2,7	12,6
	ne4	50%		0,34		0,56	0,25		26		28	20		1,1		2,3	10,6
	sw4	27%		0,52		1,18	0,34		33		424	130		1,6		32,2	47,3
	se4	29%		0,48		1,14	0,30		26		351	111		1,4		32,2	40,2
separate (split) stage	n-s-3	41%		0,40		0,62	0,31		31		34	30		1,8		2,8	16,0
	w-e-3	34%		0,46		0,94	0,31		29		60	29		1,3		4,3	14,1
	n-s-4we	37%		0,45		0,70	0,34		36		41	35		2,2		3,4	19,1
	w-e-4ns	38%		0,45		0,65	0,32		36		39	31		2,3		3,0	16,5
	n-s-w-e-4	34%		0,48		0,74	0,37		38		43	38		2,4		3,6	20,7
	optimums	83%		0,21		0,43	0,16		6		7	6		0,5		0,6	3,6

performance colours	best	near best, within 10% of optimum	LOS colours	A-B	C-D	E	F

print:
2019-12-06

AutoJ

2. R35 & N4 terminal (south)

Middelburg

2019

XX — Stop street on all approaches

Volume (evu/hr)

	from North					from South					from West					from East					intersection
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	total
AM			295	279	574		30	144		174							34	1	138	173	921
off																					
PM			201	330	531		50	324		374							38	10	216	264	1 169

Lanes

(if lanes shared L:S or S:R = 0.5:0.5, L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes			1,0	1,0		0,5	0,5							0,3	0,4	0,3

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
			stop	stop		stop	stop							stop	stop	stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM			1,03	0,98	1,01		0,60	0,60		0,60							0,59	0,59	0,59	0,59	1,03	0,85
off																						
PM			0,76	1,24	1,06		1,38	1,38		1,38							0,97	0,97	0,97	0,97	1,38	1,14

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM			154	73	115		13	15		15							13	15	14	14	154	77
off																						
PM			21	439	281		578	586		585							61	69	63	63	586	329

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM			12,6	5,7	18,3		0,1	0,6		0,7							0,1	0,0	0,5	0,6	12,6	19,6
off																						
PM			1,2	40,2	41,4		8,0	52,8		60,8							0,6	0,2	3,8	4,6	52,8	106,8

print:
2019-12-06

AutoJ

2. R35 & N4 terminal (south)

Middelburg

2019

Xwe | Stop street on west and east approaches

Volume (evu/hr)

	from North					from South					from West					from East					intersection
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	total
AM			295	279	574		30	144		174							34	1	138	173	921
off																					
PM			201	330	531		50	324		374							38	10	216	264	1 169

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes			1,0	1,0		0,5	0,5							0,3	0,4	0,3

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
													stop	stop	stop	stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM			0,15	0,19	0,17		0,09	0,09		0,09							0,75	0,75	0,75	0,75	0,75	0,26
off																						
PM			0,10	0,29	0,22		0,19	0,19		0,19							1,48	1,48	1,48	1,48	1,48	0,50

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM			1	1	1		0	0		0							18	21	19	19	21	4
off																						
PM			0	1	1		1	1		1							670	678	672	672	678	153

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM			0,1	0,1	0,1		0,0	0,0		0,0							0,2	0,0	0,7	0,9	0,7	1,0
off																						
PM			0,0	0,1	0,2		0,0	0,1		0,1							7,1	1,9	40,3	49,3	40,3	49,5

print:
2019-12-06

AutoJ

2. R35 & N4 terminal (south)

Middelburg

2019

RR — **Roundabout, yield on all approaches**

&AutoJ 1910 roberts

Volume (evu/hr)

	from North					from South					from West					from East					intersection	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R		total
AM			295	279	574		30	144		174							34	1	138	173		921
off																						
PM			201	330	531		50	324		374							38	10	216	264		1 169

Lanes

	from North		from South		from West		from East	
	L~	LSR	L~	LSR	L~	LSR	L~	LSR
# lanes		2,0		1,0				1,0

Control

	from North			from South			from West			from East		
	peds	left	str	right	*peds*	left	str	right	*peds*	left	str	right	*peds*	left	str	right
			yield	yield		yield	yield							yield	yield	yield

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM		0,21	0,21	0,21	0,21		0,17	0,17	0,17	0,17							0,20	0,20	0,20	0,20	0,21	0,20
off																						
PM		0,19	0,19	0,19	0,19		0,43	0,43	0,43	0,43							0,29	0,29	0,29	0,29	0,43	0,29

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM			7	7	7		7	7		7							7	7	7	7	7	7
off																						
PM			7	7	7		8	8		8							7	7	7	7	8	7

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	total
AM			0,6	0,5	1,1		0,1	0,3		0,3							0,1	0,0	0,3	0,3	0,6	1,7
off																						
PM			0,4	0,6	1,0		0,1	0,7		0,8							0,1	0,0	0,4	0,5	0,7	2,3

print:
2019-12-06

AutoJ

2. R35 & N4 terminal (south)

Middelburg

2020

Xwe — **Stop street on west and east approaches**

Volume (evu/hr)

	from North					from South					from West					from East					intersection
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	total
AM			304	287	591		31	148		179							35	1	142	178	949
off																					
PM			207	340	547		52	334		385							39	10	222	272	1 204

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes			1,0	1,0		0,5	0,5							0,3	0,4	0,3

Control

	from North				from South				from West				from East			
	peds	left	str	right	*peds*	left	str	right	*peds*	left	str	right	*peds*	left	str	right
													stop	stop	stop	stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM			0,15	0,20	0,17		0,09	0,09		0,09							0,81	0,81	0,81	0,81	0,81	0,28
off																						
PM			0,10	0,30	0,23		0,20	0,20		0,20							1,60	1,60	1,60	1,60	1,60	0,53

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM			1	1	1		0	0		0							22	25	23	22	25	5
off																						
PM			0	2	1		1	1		1							764	772	766	766	772	174

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	total
AM			0,1	0,1	0,1		0,0	0,0		0,0							0,2	0,0	0,9	1,1	0,9	1,3
off																						
PM			0,0	0,1	0,2		0,0	0,1		0,1							8,3	2,2	47,4	57,9	47,4	58,1

2. R35 & N4 terminal (south)

AutoJ

Middelburg

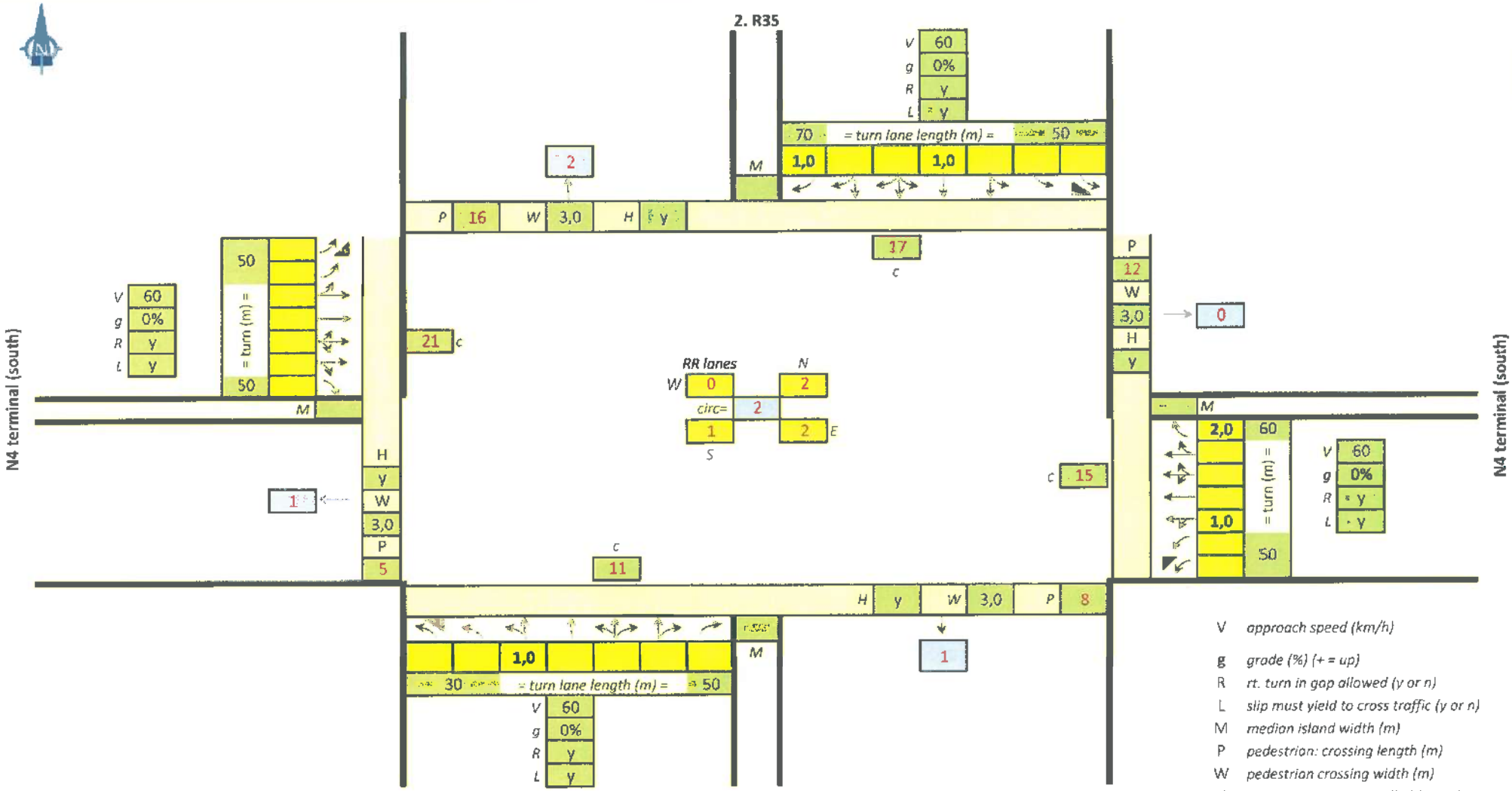
&AutoJ 1910 roberts

	type	V/C	delay	PI
best	RR	0,15	7	78%
best signal	n3	0,19	14	62%

Reminder: Check medians, grades, etc. If correct, delete this blue cell

2020 plus upgrade

INTERSECTION GEOMETRY



print:
2019-12-07

2. R35 & N4 terminal (south)

AutoJ

Middelburg

2020 plus upgrade

SUMMARY

&AutoJ 1910 roberts

			Volume / Capacity (max)					Delay / vehicle (max)					Queue (max)				
	weighting	100%		25%	4%	25%	10%		4%	7%	4%	6%		4%	3%	4%	5%
	Control	Perf Index	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s sum
BEST overall	RR	78%		0,22		0,44	0,15		7		8	7		0,6		0,8	4,1
best signal	n3	62%		0,25		0,44	0,19		29		30	14		1,2		1,9	7,8
		PI	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s sum
Priority	Xns	27%		0,56		1,18	0,35		13		367	112		1,1		34,7	40,2
	Xwe	68%		0,32		0,59	0,15		10		14	4		0,4		0,8	1,9
	XX	19%		0,71		1,67	0,59		18		816	467		1,6		75,7	160,1
	mC	64%		0,37		0,49	0,23		6		7	7		0,5		0,7	3,8
	RR	78%		0,22		0,44	0,15		7		8	7		0,6		0,8	4,1
2 stage	2	58%		0,29		0,52	0,18		24		25	10		1,0		1,5	5,7
3 stage	3ns	55%		0,33		0,45	0,21		29		30	17		1,2		1,9	9,5
	3we	50%		0,33		0,61	0,20		29		29	14		1,0		1,7	7,7
	n3	62%		0,25		0,44	0,19		29		30	14		1,2		1,9	7,8
	s3	48%		0,35		0,63	0,20		29		30	14		1,2		1,9	7,9
	w3	47%		0,35		0,63	0,21		29		30	16		1,2		1,9	8,6
	e3	50%		0,35		0,63	0,20		21		21	13		0,8		1,4	7,5
4 stage	4nswe	49%		0,37		0,51	0,23		34		34	21		1,6		2,1	12,0
	n4we	55%		0,28		0,50	0,20		34		34	18		1,2		2,0	9,9
	s4we	41%		0,39		0,75	0,22		34		34	18		1,2		2,1	10,2
	w4ns	47%		0,39		0,53	0,24		34		36	23		1,7		2,2	12,9
	e4ns	48%		0,39		0,53	0,23		25		26	21		1,7		2,2	11,7
	nw4	53%		0,29		0,52	0,22		34		36	20		1,4		2,2	10,7
	ne4	55%		0,29		0,52	0,20		25		26	17		1,0		2,1	9,6
	sw4	40%		0,41		0,77	0,24		34		36	20		1,4		2,3	11,2
	se4	41%		0,41		0,77	0,22		25		26	18		1,2		2,3	10,0
separate (split) stage	n-s-3	46%		0,36		0,55	0,26		34		35	28		1,5		2,5	15,3
	w-e-3	45%		0,36		0,63	0,23		35		39	18		1,4		2,4	10,4
	n-s-4we	42%		0,39		0,61	0,28		39		39	32		1,9		3,0	18,0
	w-e-4ns	45%		0,39		0,54	0,26		43		43	26		1,9		2,7	14,8
	n-s-w-e-4	38%		0,43		0,66	0,32		44		46	36		2,2		3,3	20,1
	optimums	78%		0,22		0,44	0,15		6		7	4		0,4		0,7	1,9

performance colours	best	near best, within 10% of optimum	LOS colours	A-B	C-D	E	F

AutoJ

2. R35 & N4 terminal (south)

Middelburg

2020 plus upgrade

Xwe — **Stop street on west and east approaches**

Volume (evu/hr)

	from North					from South					from West					from East					intersection
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	total
AM			304	287	591		31	148		179							35	1	142	178	949
off																					
PM			207	340	547		52	334		385							39	10	222	272	1 204

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes			1,0	1,0		0,5	0,5							0,5	0,5	2,0

Control

	from North				from South				from West				from East			
	peds	left	str	right	*peds*	left	str	right	*peds*	left	str	right	*peds*	left	str	right
													stop	stop	stop	stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM			0,15	0,20	0,17		0,09	0,09		0,09							0,06	0,06	0,32	0,27	0,32	0,18
off																						
PM			0,10	0,30	0,23		0,20	0,20		0,20							0,07	0,07	0,59	0,50	0,59	0,28

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM			1	1	1		0	0		0							8	9	10	10	10	2
off																						
PM			0	2	1		1	1		1							9	9	14	13	14	4

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	total
AM			0,1	0,1	0,1		0,0	0,0		0,0							0,1	0,0	0,4	0,5	0,4	0,6
off																						
PM			0,0	0,1	0,2		0,0	0,1		0,1							0,1	0,0	0,8	1,0	0,8	1,2

AutoJ

2. R35 & N4 terminal (south)

Middelburg

2020 PLUS INDUSTRIAL plus upgrade

Xwe — **Stop street on west and east approaches**

Volume (evu/hr)

	from North					from South					from West					from East					intersection
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	total
AM			340	287	627		43	169		212							59	1	142	202	1 042
off																					
PM			224	340	564		84	375		458							48	10	222	281	1 303

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes			1,0	1,0		0,5	0,5							0,5	0,5	2,0

Control

	from North				from South				from West				from East			
	peds	left	str	right	*peds*	left	str	right	*peds*	left	str	right	*peds*	left	str	right
													stop	stop	stop	stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM			0,17	0,21	0,19		0,11	0,11		0,11							0,09	0,09	0,35	0,27	0,35	0,19
off																						
PM			0,11	0,34	0,25		0,24	0,24		0,24							0,08	0,08	0,63	0,51	0,63	0,30

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM			1	1	1		0	0		0							9	9	10	10	10	3
off																						
PM			1	2	1		1	1		1							9	9	14	13	14	4

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	total
AM			0,1	0,1	0,1		0,0	0,0		0,0							0,1	0,0	0,4	0,6	0,4	0,7
off																						
PM			0,0	0,2	0,2		0,0	0,1		0,2							0,1	0,0	0,9	1,0	0,9	1,4

print:
2019-12-07

2. R35 & N4 terminal (south)

Middelburg

2020 PLUS DISTRIBUTION plus upgrade

Xwe — **Stop street on west and east approaches**

AutoJ

Volume (evu/hr)

	from North					from South					from West					from East					intersection
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	total
AM			323	287	610		48	178		226							47	1	142	190	1 027
off																					
PM			224	340	564		73	361		433							56	10	222	289	1 286

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes			1,0	1,0		0,5	0,5							0,5	0,5	2,0

Control

	from North				from South				from West				from East			
	peds	left	str	right	*peds*	left	str	right	*peds*	left	str	right	*peds*	left	str	right
													stop	stop	stop	stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM			0,16	0,21	0,18		0,12	0,12		0,12							0,08	0,08	0,34	0,27	0,34	0,19
off																						
PM			0,11	0,32	0,24		0,22	0,22		0,22							0,09	0,09	0,62	0,50	0,62	0,29

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM			1	1	1		0	1		1							9	9	10	10	10	2
off																						
PM			1	2	1		1	1		1							9	9	14	13	14	4

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	total
AM			0,1	0,1	0,1		0,0	0,0		0,0							0,1	0,0	0,4	0,5	0,4	0,7
off																						
PM			0,0	0,2	0,2		0,0	0,1		0,1							0,1	0,0	0,9	1,0	0,9	1,4

print:
2019-12-07

AutoJ

2. R35 & N4 terminal (south)

Middelburg

2020 PLUS COMBINED plus upgrade

Xwe — **Stop street on west and east approaches**

Volume (evu/hr)

	from North					from South					from West					from East					intersection
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	total
AM			336	287	623		44	171		215							57	1	142	200	1 039
off																					
PM			250	340	590		98	394		491							64	10	222	297	1 378

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes			1,0	1,0		0,5	0,5							0,5	0,5	2,0

Control

	from North				from South				from West				from East			
	peds	left	str	right	*peds*	left	str	right	*peds*	left	str	right	*peds*	left	str	right
													stop	stop	stop	stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM			0,17	0,21	0,19		0,11	0,11		0,11							0,09	0,09	0,34	0,27	0,34	0,19
off																						
PM			0,13	0,35	0,25		0,25	0,25		0,25							0,11	0,11	0,67	0,53	0,67	0,31

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM			1	1	1		0	1		0							9	9	10	10	10	3
off																						
PM			1	2	1		1	1		1							9	9	15	14	15	4

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	total
AM			0,1	0,1	0,1		0,0	0,0		0,0							0,1	0,0	0,4	0,5	0,4	0,7
off																						
PM			0,0	0,2	0,2		0,0	0,1		0,2							0,2	0,0	1,0	1,1	1,0	1,5

AutoJ

2. R35 & N4 terminal (south)

Middelburg

2025 plus upgrade

SUMMARY

&AutoJ 1910 roberts

			Volume / Capacity (max)					Delay / vehicle (max)					Queue (max)				
	weighting	100%		25%	4%	25%	10%		4%	7%	4%	6%		4%	3%	4%	5%
	Control	Perf Index	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s sum
BEST overall	RR	85%		0,25		0,30	0,15		7		7	7		0,7		0,8	4,8
best signal	n3	54%		0,29		0,48	0,20		30		31	15		1,4		2,2	9,5
		PI	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s sum
Priority	Xns	20%		0,73		1,67	0,43		18		812	239		1,6		88,9	96,6
	Xwe	45%		0,49		0,93	0,19		12		45	10		0,5		3,2	4,7
	XX	12%		1,18		1,81	0,62		363		894	306		35,5		97,8	182,5
	mC	54%		0,43		0,64	0,28		7		9	8		0,7		1,0	4,9
	RR	85%		0,25		0,30	0,15		7		7	7		0,7		0,8	4,8
2 stage	2	50%		0,34		0,63	0,20		24		25	11		1,1		1,8	6,9
3 stage	3ns	46%		0,39		0,49	0,23		30		31	18		1,5		2,2	11,4
	3we	43%		0,39		0,75	0,22		29		31	15		1,2		1,9	9,5
	n3	54%		0,29		0,48	0,20		30		31	15		1,4		2,2	9,5
	s3	41%		0,41		0,78	0,23		30		31	15		1,4		2,2	9,6
	w3	40%		0,41		0,78	0,24		30		31	17		1,4		2,2	10,6
	e3	43%		0,41		0,78	0,22		21		21	15		1,0		2,1	9,3
4 stage	4nswe	41%		0,44		0,55	0,25		33		36	22		2,0		2,7	14,2
	n4we	48%		0,32		0,54	0,22		34		36	19		1,4		2,6	11,9
	s4we	34%		0,46		0,92	0,25		33		41	23		1,4		4,5	13,9
	w4ns	39%		0,46		0,57	0,26		35		36	23		2,1		2,8	15,2
	e4ns	40%		0,46		0,57	0,25		26		26	22		2,1		2,8	14,0
	nw4	46%		0,33		0,56	0,23		35		36	20		1,6		2,7	12,9
	ne4	48%		0,33		0,56	0,22		26		26	18		1,2		2,7	11,6
	sw4	32%		0,48		0,96	0,27		35		60	30		1,6		6,5	16,8
	se4	33%		0,48		0,96	0,25		26		60	28		1,5		6,5	15,5
separate (split) stage	n-s-3	41%		0,39		0,60	0,27		35		36	27		1,7		3,0	17,3
	w-e-3	38%		0,42		0,76	0,26		36		41	19		1,6		3,0	12,4
	n-s-4we	37%		0,43		0,65	0,29		38		42	32		2,1		3,6	20,3
	w-e-4ns	38%		0,45		0,59	0,28		43		43	27		2,3		3,2	17,5
	n-s-w-e-4	33%		0,47		0,72	0,34		43		46	36		2,4		4,0	22,9
	optimums	85%		0,25		0,30	0,15		7		7	7		0,5		0,8	4,7

performance colours: best; near best, within 10% of optimum

LOS colours: A-B; C-D; E; F

AutoJ

2. R35 & N4 terminal (south)

Middelburg

2025 plus upgrade

Xwe — **Stop street on west and east approaches**

Volume (evu/hr)

	from North					from South					from West					from East					intersection
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	total
AM			352	333	685		36	172		208							41	1	165	207	1 100
off																					
PM			240	394	634		60	387		447							45	12	258	315	1 396

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes			1,0	1,0		1,5	0,5							0,9	0,1	2,0

Control

	from North				from South				from West				from East			
	peds	left	str	right	*peds*	left	str	right	*peds*	left	str	right	*peds*	left	str	right
													stop	stop	stop	stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM			0,18	0,23	0,20		0,02	0,09		0,08							0,06	0,06	0,49	0,40	0,49	0,22
off																						
PM			0,12	0,37	0,27		0,03	0,20		0,18							0,06	0,90	0,93	0,80	0,93	0,36

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM			1	1	1		0	0		0							9	9	12	11	12	3
off																						
PM			1	2	1		0	1		1							9	39	45	39	45	10

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	total
AM			0,1	0,1	0,2		0,0	0,0		0,0							0,1	0,0	0,5	0,6	0,5	0,8
off																						
PM			0,0	0,2	0,3		0,0	0,1		0,1							0,1	0,1	3,2	3,4	3,2	3,8

print:
2019-12-11

AutoJ

2. R35 & N4 terminal (south)

Middelburg

2025 PLUS INDUSTRIAL plus upgrade

Xwe — **Stop street on west and east approaches**

Volume (evu/hr)

	from North					from South					from West					from East					intersection
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	total
AM			388	333	721		48	193		241							65	1	165	231	1 193
off																					
PM			257	394	651		92	428		520							54	12	258	324	1 495

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes			1,0	1,0		1,5	0,5							0,8	0,2	2,2

Control

	from North				from South				from West				from East			
	peds	left	str	right	*peds*	left	str	right	*peds*	left	str	right	*peds*	left	str	right
													stop	stop	stop	stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM			0,19	0,24	0,22		0,03	0,10		0,09							0,12	0,04	0,48	0,37	0,48	0,22
off																						
PM			0,13	0,40	0,29		0,05	0,22		0,19							0,09	0,51	0,88	0,73	0,88	0,35

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM			1	1	1		0	0		0							9	9	12	11	12	3
off																						
PM			1	2	2		0	1		1							9	13	31	27	31	7

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	total
AM			0,1	0,1	0,2		0,0	0,0		0,0							0,2	0,0	0,5	0,7	0,5	0,9
off																						
PM			0,0	0,3	0,3		0,0	0,1		0,1							0,1	0,0	2,2	2,4	2,2	2,8

print:
2019-12-11

AutoJ

2. R35 & N4 terminal (south)

Middelburg

2025 PLUS DISTRIBUTION plus upgrade

Xwe — **Stop street on west and east approaches**

&Autol 1910 roberts

Volume (evu/hr)

	from North					from South					from West					from East					intersection
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	total
AM			371	333	704		53	202		255							53	1	165	219	1 178
off																					
PM			257	394	651		81	414		495							62	12	258	332	1 478

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes			1,0	1,0		1,5	0,5							0,8	0,2	2,2

Control

	from North				from South				from West				from East			
	peds	left	str	right	*peds*	left	str	right	*peds*	left	str	right	*peds*	left	str	right
													stop	stop	stop	stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM			0,19	0,24	0,21		0,03	0,10		0,09							0,10	0,04	0,47	0,37	0,47	0,22
off																						
PM			0,13	0,39	0,28		0,04	0,21		0,19							0,10	0,49	0,87	0,71	0,87	0,35

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM			1	1	1		0	0		0							9	9	12	11	12	3
off																						
PM			1	2	2		0	1		1							9	13	29	25	29	7

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	total
AM			0,1	0,1	0,2		0,0	0,0		0,0							0,1	0,0	0,5	0,7	0,5	0,9
off																						
PM			0,0	0,2	0,3		0,0	0,1		0,1							0,2	0,0	2,1	2,3	2,1	2,7

AutoJ

2. R35 & N4 terminal (south)

Middelburg

2025 PLUS COMBINED plus upgrade

Xwe — **Stop street on west and east approaches**

Volume (evu/hr)

	from North					from South					from West					from East					intersection
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	total
AM			384	333	717		49	195		244							63	1	165	229	1 190
off																					
PM			283	394	677		106	447		553							70	12	258	340	1 570

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0 3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes			1,0	1,0		1,5	0,5							0,8	0,2	2,2

Control

	from North				from South				from West				from East			
	peds	left	str	right	*peds*	left	str	right	*peds*	left	str	right	*peds*	left	str	right
													stop	stop	stop	stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM			0,19	0,24	**0,22**		0,03	0,10		0,09							0,12	0,04	0,47	**0,37**	0,47	0,22
off																						
PM			0,14	0,41	**0,30**		0,06	0,23		0,20							0,11	0,55	0,93	**0,75**	0,93	0,36

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM			1	1	1		0	0		0							9	9	12	**11**	12	3
off																						
PM			1	2	2		0	1		1							9	14	44	**36**	44	9

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	total
AM			0,1	0,1	**0,2**		0,0	0,0		**0,0**							0,2	0,0	0,5	**0,7**	0,5	**0,9**
off																						
PM			0,1	0,3	**0,3**		0,0	0,1		**0,2**							0,2	0,0	3,1	**3,4**	3,1	**3,8**

print:
2019-12-11

3. R35 & ACCESS ROADS

AutoJ

Middelburg

2019

SUMMARY

&AutoJ 1910 roberts

			Volume / Capacity (max)					Delay / vehicle (max)					Queue (max)				
	weighting	100%		25%	4%	25%	10%		4%	7%	4%	6%		4%	3%	4%	5%
	Control	Perf Index	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s sum
BEST overall	Xwe	83%		0,19		0,20	0,11		9		9	1		0,1		0,1	0,4
best signal	2	47%		0,28		0,29	0,15		25		25	6		0,4		0,5	1,8
		PI	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s sum
Priority	Xns	34%		0,39		0,43	0,22		12		12	11		0,9		1,2	3,4
	Xwe	83%		0,19		0,20	0,11		9		9	1		0,1		0,1	0,4
	XX	11%		0,92		1,30	0,60		44		514	304		3,6		51,8	59,0
	mC	64%		0,21		0,24	0,12		6		6	6		0,4		0,6	1,7
	RR	57%		0,23		0,26	0,13		7		7	7		0,6		0,7	2,2
2 stage	2	47%		0,28		0,29	0,15		25		25	6		0,4		0,5	1,8
3 stage	3ns	40%		0,31		0,32	0,17		30		30	9		0,6		0,8	2,8
	3we	40%		0,31		0,32	0,17		30		30	9		0,6		0,8	2,8
	n3	44%		0,26		0,33	0,16		30		30	8		0,3		0,9	2,4
	s3	43%		0,32		0,27	0,16		30		30	8		0,7		0,5	2,4
	w3	39%		0,32		0,33	0,18		30		30	10		0,7		0,9	3,0
	e3	39%		0,32		0,33	0,18		30		30	10		0,7		0,9	3,0
4 stage	4nswe	36%		0,35		0,36	0,19		35		35	13		0,9		1,2	3,9
	n4we	38%		0,29		0,37	0,18		35		35	12		0,6		1,3	3,4
	s4we	38%		0,36		0,30	0,18		35		35	12		1,0		0,7	3,5
	w4ns	35%		0,36		0,37	0,20		35		35	13		1,0		1,3	4,2
	e4ns	34%		0,36		0,37	0,20		35		35	13		1,0		1,3	4,2
	nw4	37%		0,30		0,39	0,18		35		35	12		0,6		1,4	3,6
	ne4	37%		0,30		0,39	0,18		35		35	13		0,6		1,4	3,6
	sw4	37%		0,37		0,31	0,19		35		35	12		1,1		0,8	3,7
	se4	37%		0,37		0,31	0,19		35		35	12		1,1		0,8	3,7
separate (split) stage	n-s-3	31%		0,35		0,44	0,25		35		35	24		1,2		2,0	7,1
	w-e-3	43%		0,29		0,30	0,16		39		39	8		0,5		0,7	2,6
	n-s-4we	28%		0,39		0,48	0,27		40		40	28		1,6		2,5	8,6
	w-e-4ns	39%		0,32		0,33	0,18		44		44	12		0,8		1,0	3,6
	n-s-w-e-4	28%		0,38		0,48	0,27		44		44	28		1,5		2,4	8,6
	optimums	83%		0,19		0,20	0,11		6		6	1		0,1		0,1	0,4

performance colours	best	near best, within 10% of optimum	LOS colours	A-B	C-D	E	F

AutoJ

3. R35 & ACCESS ROADS

Middelburg

2019

Xwe — Stop street on west and east approaches

&Autol 1910 roberts

Volume (evu/hr)

	from North					from South					from West					from East					intersection	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R		total
AM		8	291	32	**331**		2	143	4	**149**		7		5	**12**		1		13	**14**		**506**
off																						
PM		13	214	13	**240**		2	363	2	**367**		19		2	**21**		3		13	**16**		**644**

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		0,3	0,4	0,3		0,3	0,4	0,3		0,3	0,4	0,3		0,3	0,4	0,3

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
										stop		stop		stop		stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0,19	0,19	0,19	**0,19**		0,08	0,08	0,08	**0,08**		0,02		0,02	**0,02**		0,03		0,03	**0,03**	0,19	0,15
off																						
PM		0,15	0,15	0,15	**0,15**		0,20	0,20	0,20	**0,20**		0,05		0,05	**0,05**		0,04		0,04	**0,04**	0,20	0,17

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		1	1	1	1		0	0	0	0		8		9	8		8		9	9	9	1
off																						
PM		1	1	1	1		1	1	1	1		8		9	8		8		9	9	9	1

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM		0,0	0,1	0,0	**0,1**		0,0	0,0	0,0	**0,0**		0,0		0,0	**0,0**		0,0		0,0	**0,0**	0,1	**0,2**
off																						
PM		0,0	0,0	0,0	**0,0**		0,0	0,1	0,0	**0,1**		0,0		0,0	**0,0**		0,0		0,0	**0,0**	0,1	**0,2**

AutoJ

3. R35 & ACCESS ROADS

Middelburg

2020

Xwe — **Stop street on west and east approaches**

Volume (evu/hr)

	from North				from South				from West				from East				intersection
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	total
AM		8	300	33	341		2	147	4	153		7		5	12		1		13	14	521
off																					
PM		13	220	13	247		2	374	2	378		20		2	22		3		13	16	663

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		0,3	0,4	0,3		0,3	0,4	0,3		0,3	0,4	0,3		0,3	0,4	0,3

Control

	from North				from South				from West				from East			
	peds	left	str	right	*peds*	left	str	right	*peds*	left	str	right	*peds*	left	str	right
										stop		stop		stop		stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM		0,19	0,19	0,19	**0,19**		0,08	0,08	0,08	**0,08**		0,02		0,02	**0,02**		0,03		0,03	**0,03**	0,19	0,15
off																						
PM		0,16	0,16	0,16	**0,16**		0,20	0,20	0,20	**0,20**		0,05		0,05	**0,05**		0,04		0,04	**0,04**	0,20	0,18

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM		1	1	1	1		0	0	0	0		8		9	8		8		9	9	9	1
off																						
PM		1	1	1	1		1	1	1	1		8		9	8		8		9	9	9	1

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	total
AM		0,0	0,1	0,0	**0,1**		0,0	0,0	0,0	**0,0**		0,0		0,0	**0,0**		0,0		0,0	**0,0**	0,1	0,2
off																						
PM		0,0	0,0	0,0	**0,1**		0,0	0,1	0,0	**0,1**		0,0		0,0	**0,1**		0,0		0,0	**0,0**	0,1	0,2

print:
2019-12-10

AutoJ

3. R35 & ACCESS ROADS

Middelburg

2020 PLUS INDUSTRIAL

Xwe — **Stop street on west and east approaches**

Volume (evu/hr)

	from North					from South					from West					from East					intersection	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R		total
AM		68	300	33	401		2	147	30	179		7		5	12		5		46	51		644
off																						
PM		39	220	13	273		2	374	7	383		20		2	22		21		87	108		786

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		0,3	0,4	0,3		0,3	0,4	0,3		0,3	0,4	0,3		0,3	0,4	0,3

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
										stop		stop		stop		stop

VOLUME to CAPACITY (V/C)

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					A-B / C-D / E / F V/C from South					V/C from West				V/C from East				V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0,22	0,22	0,22	0,22		0,12	0,12	0,12	0,12		0,03		0,03	0,03		0,12		0,12	0,12	0,22	0,18
off																						
PM		0,17	0,17	0,17	0,17		0,25	0,25	0,25	0,25		0,05		0,05	0,05		0,28		0,28	0,28	0,28	0,22

Average DELAY per vehicle (secs)

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					A-B / C-D / E / F delay from South					delay from West				delay from East				delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		1	1	1	1		0	1	0	1		8		9	8		9		9	9	9	2
off																						
PM		1	1	1	1		1	1	1	1		8		9	8		10		10	10	10	2

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK / WARN / POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West				Q from East				Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM		0,0	0,1	0,0	0,1		0,0	0,0	0,0	0,0		0,0		0,0	0,0		0,0		0,1	0,1	0,1	0,3
off																						
PM		0,0	0,0	0,0	0,1		0,0	0,1	0,0	0,1		0,0		0,0	0,1		0,1		0,2	0,3	0,2	0,5

print:
2019-12-10

3. R35 & ACCESS ROADS

AutoJ

Middelburg

2020 PLUS DISTRIBUTION

Xwe — **Stop street on west and east approaches**

Volume (evu/hr)

	from North					from South					from West					from East					intersection	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R		total
AM		39	300	33	372		2	147	17	166		7		5	12		7		60	67		618
off																						
PM		60	220	13	294		2	374	10	386		20		2	22		15		60	75		777

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		0,5	0,5	1,0		0,5	0,5	1,0		0,3	0,4	0,3		0,9	0,1	1,0

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
										stop		stop		stop		stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0,17	0,17	0,02	**0,16**		0,08	0,08	0,01	**0,07**		0,02		0,02	**0,02**		0,01		0,14	**0,13**	0,17	0,13
off																						
PM		0,14	0,14	0,01	**0,14**		0,19	0,19	0,01	**0,18**		0,05		0,05	**0,05**		0,02		0,16	**0,14**	0,19	0,16

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		1	1	0	1		0	0	0	0		8		9	8		8		9	9	9	2
off																						
PM		1	1	0	1		1	1	0	1		8		9	9		8		9	9	9	2

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM		0,0	0,1	0,0	**0,1**		0,0	0,0	0,0	**0,0**		0,0		0,0	**0,0**		0,0		0,2	**0,2**	0,2	**0,3**
off																						
PM		0,0	0,0	0,0	**0,1**		0,0	0,1	0,0	**0,1**		0,0		0,0	**0,1**		0,0		0,2	**0,2**	0,2	**0,4**

print:
2019-12-10

AutoJ

3. R35 & ACCESS ROADS

Middelburg

2020 PLUS COMBINED

Xwe — **Stop street on west and east approaches**

&Autol 1910 roberts

Volume (evu/hr)

	from North					from South					from West					from East					intersection
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	total
AM		62	300	33	395		2	147	27	176		7		5	12		5		49	54	638
off																					
PM		81	220	13	315		2	374	14	390		20		2	22		29		119	148	875

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		0,3	0,4	0,3		0,3	0,4	0,3		0,3	0,4	0,3		0,3	0,4	0,3

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
										stop		stop		stop		stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0,22	0,22	0,22	0,22		0,12	0,12	0,12	0,12		0,03		0,03	0,03		0,13		0,13	0,13	0,22	0,18
off																						
PM		0,19	0,19	0,19	0,19		0,25	0,25	0,25	0,25		0,05		0,05	0,05		0,39		0,39	0,39	0,39	0,25

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		1	1	1	1		0	1	0	1		8		9	8		9		9	9	9	2
off																						
PM		1	1	1	1		1	1	1	1		8		9	9		10		11	11	11	3

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM		0,0	0,1	0,0	0,1		0,0	0,0	0,0	0,0		0,0		0,0	0,0		0,0		0,1	0,1	0,1	0,3
off																						
PM		0,0	0,1	0,0	0,1		0,0	0,1	0,0	0,1		0,0		0,0	0,1		0,1		0,4	0,4	0,4	0,7

3. R35 & ACCESS ROADS

AutoJ

Middelburg

2020 PLUS INDUSTRIAL plus upgrade

SUMMARY

&Autol 1910 roberts

			Volume / Capacity (max)					Delay / vehicle (max)					Queue (max)				
	weighting	100%		25%	4%	25%	10%		4%	7%	4%	6%		4%	3%	4%	5%
	Control	Perf Index	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s sum
BEST overall	Xwe	82%		0,22		0,28	0,13		9		10	2		0,1		0,2	0,9
best signal	2	47%		0,33		0,41	0,20		26		28	9		0,4		0,6	3,1
		PI	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s sum
Priority	Xns	35%		0,51		0,56	0,27		13		14	11		1,1		1,5	4,3
	Xwe	82%		0,22		0,28	0,13		9		10	2		0,1		0,2	0,9
	XX	11%		1,40		1,36	0,70		604		572	380		50,3		59,4	133,5
	mC	71%		0,26		0,27	0,14		6		6	6		0,5		0,6	2,2
	RR	64%		0,29		0,29	0,15		7		7	7		0,6		0,7	2,7
2 stage	2	47%		0,33		0,41	0,20		26		28	9		0,4		0,6	3,1
3 stage	3ns	40%		0,38		0,47	0,22		31		33	13		0,7		1,0	4,5
	3we	41%		0,38		0,47	0,22		31		33	12		0,7		1,0	4,4
	n3	44%		0,32		0,48	0,21		31		34	12		0,4		1,1	4,0
	s3	41%		0,39		0,44	0,22		31		33	11		0,8		0,8	4,1
	w3	39%		0,39		0,48	0,23		31		34	13		0,8		1,1	4,8
	e3	40%		0,39		0,47	0,22		30		31	12		0,8		1,0	4,4
4 stage	4nswe	35%		0,42		0,53	0,25		36		39	16		1,0		1,5	6,0
	n4we	38%		0,36		0,55	0,23		36		39	16		0,6		1,6	5,4
	s4we	36%		0,44		0,50	0,24		36		38	15		1,1		0,9	5,6
	w4ns	34%		0,44		0,55	0,26		36		40	18		1,1		1,6	6,5
	e4ns	35%		0,44		0,53	0,25		35		37	16		1,1		1,5	6,0
	nw4	37%		0,37		0,56	0,25		36		40	17		0,7		1,7	5,8
	ne4	37%		0,37		0,55	0,23		35		37	15		0,7		1,6	5,4
	sw4	35%		0,46		0,51	0,25		36		38	16		1,2		1,0	6,0
	se4	37%		0,46		0,46	0,24		35		36	14		1,2		1,0	5,6
separate (split) stage	n-s-3	34%		0,43		0,50	0,28		36		38	26		1,4		2,2	9,7
	w-e-3	41%		0,35		0,46	0,22		40		39	14		0,6		1,1	4,9
	n-s-4we	31%		0,47		0,55	0,31		42		44	31		1,7		2,8	11,6
	w-e-4ns	37%		0,39		0,52	0,25		45		44	18		0,9		1,5	6,4
	n-s-w-e-4	31%		0,46		0,56	0,32		46		45	32		1,7		2,9	11,9
	optimums	82%		0,22		0,27	0,13		6		6	2		0,1		0,2	0,9

performance colours	best	near best, within 10% of optimum	LOS colours	A-B	C-D	E	F

print:
2019-12-10

AutoJ

3. R35 & ACCESS ROADS

Middelburg

2020 PLUS INDUSTRIAL plus upgrade

Xwe — **Stop street on west and east approaches**

&AutoJ 1910 roberts

Volume (evu/hr)

	from North					from South					from West					from East					intersection	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R		total
AM		68	300	33	401		2	147	30	179		7		5	12		5		46	51		644
off																						
PM		39	220	13	273		2	374	7	383		20		2	22		21		87	108		786

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		0,3	0,4	0,3		0,3	0,4	0,3		0,3	0,4	0,3		0,3	0,4	0,3

Control

from North				from South				from West				from East			
peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
									stop		stop		stop		stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, F<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

V/C from North					V/C from South					V/C from West					V/C from East					V/C	
peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0,22	0,22	0,22	**0,22**		0,12	0,12	0,12	**0,12**		0,03		0,03	**0,03**		0,12		0,12	**0,12**	0,22	0,18
off																						
PM		0,17	0,17	0,17	**0,17**		0,25	0,25	0,25	**0,25**		0,05		0,05	**0,05**		0,28		0,28	**0,28**	0,28	0,22

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

delay from North					delay from South					delay from West					delay from East					delay / veh	
peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		1	1	1	1		0	1	0	1		8		9	8		9		9	9	9	2
off																						
PM		1	1	1	1		1	1	1	1		8		9	8		10		10	10	10	2

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

Q from North					Q from South					Q from West					Q from East					Queue	
peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM		0,0	0,1	0,0	**0,1**		0,0	0,0	0,0	**0,0**		0,0		0,0	**0,0**		0,0		0,1	**0,1**	0,1	0,3
off																						
PM		0,0	0,0	0,0	**0,1**		0,0	0,1	0,0	**0,1**		0,0		0,0	**0,1**		0,1		0,2	**0,3**	0,2	0,5

AutoJ

3. R35 & ACCESS ROADS

Middelburg

2020 PLUS DISTRIBUTION plus upgrade

Xwe — **Stop street on west and east approaches**

Volume (evu/hr)

	from North					from South					from West					from East					intersection
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	total
AM		39	300	33	372		2	147	17	166		7		5	12		7		60	67	618
off																					
PM		60	220	13	294		2	374	10	386		20		2	22		15		60	75	777

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		0,3	0,4	0,3		0,3	0,4	0,3		0,3	0,4	0,3		0,3	0,4	0,3

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
										stop		stop		stop		stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0,21	0,21	0,21	0,21		0,10	0,10	0,10	0,10		0,02		0,02	0,02		0,15		0,15	0,15	0,21	0,17
off																						
PM		0,18	0,18	0,18	0,18		0,24	0,24	0,24	0,24		0,05		0,05	0,05		0,20		0,20	0,20	0,24	0,21

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		1	1	1	1		0	0	0	0		8		9	8		9		9	9	9	2
off																						
PM		1	1	1	1		1	1	1	1		8		9	8		9		9	9	9	2

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM		0,0	0,1	0,0	0,1		0,0	0,0	0,0	0,0		0,0		0,0	0,0		0,0		0,2	0,2	0,2	0,3
off																						
PM		0,0	0,1	0,0	0,1		0,0	0,1	0,0	0,1		0,0		0,0	0,1		0,0		0,2	0,2	0,2	0,4

print:
2019-12-10

AutoJ

3. R35 & ACCESS ROADS

Middelburg

2020 PLUS COMBINED plus upgrade

Xwe — **Stop street on west and east approaches**

&AutoJ 1910 roberts

Volume (evu/hr)

	from North					from South					from West					from East					intersection	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R		total
AM		62	300	33	395		2	147	27	176		7		5	12		5		49	54		638
off																						
PM		81	220	13	315		2	374	14	390		20		2	22		29		119	148		875

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		0,5	0,5	1,0		0,5	0,5	1,0		0,3	0,4	0,3		0,9	0,1	1,0

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
										stop		stop		stop		stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0,19	0,19	0,02	0,17		0,08	0,08	0,02	0,07		0,03		0,03	0,03		0,01		0,12	0,11	0,19	0,14
off																						
PM		0,16	0,16	0,01	0,15		0,19	0,19	0,01	0,18		0,05		0,05	0,05		0,04		0,33	0,27	0,33	0,18

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		1	1	0	1		0	0	0	0		8		9	8		8		9	9	9	2
off																						
PM		1	1	0	1		1	1	0	1		8		9	9		8		10	10	10	3

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM		0,0	0,1	0,0	0,1		0,0	0,0	0,0	0,0		0,0		0,0	0,0		0,0		0,1	0,1	0,1	0,3
off																						
PM		0,0	0,0	0,0	0,1		0,0	0,1	0,0	0,1		0,0		0,0	0,1		0,1		0,3	0,4	0,3	0,6

3. R35 & ACCESS ROADS

AutoJ

Middelburg

2025 PLUS INDUSTRIAL plus upgrade

SUMMARY

&AutoJ 1910 roberts

			Volume / Capacity (max)					Delay / vehicle (max)					Queue (max)				
	weighting	100%		25%	4%	25%	10%		4%	7%	4%	6%		4%	3%	4%	5%
	Control	Perf Index	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s sum
BEST overall	RR	72%		0,17		0,18	0,09		7		7	7		0,6		0,8	2,9
best signal	2	41%		0,31		0,32	0,16		26		26	8		0,5		0,7	3,2
		PI	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s sum
Priority	Xns	25%		0,53		0,62	0,27		14		15	12		1,3		1,9	5,1
	Xwe	67%		0,22		0,28	0,12		9		10	2		0,1		0,2	0,9
	XX	9%		0,96		1,75	0,65		65		865	542		6,2		104,1	142,5
	mC	48%		0,30		0,32	0,16		6		6	6		0,6		0,7	2,6
	RR	72%		0,17		0,18	0,09		7		7	7		0,6		0,8	2,9
2 stage	2	41%		0,31		0,32	0,16		26		26	8		0,5		0,7	3,2
3 stage	3ns	35%		0,35		0,35	0,18		31		32	11		0,8		1,0	4,7
	3we	35%		0,35		0,35	0,18		30		31	11		0,8		1,0	4,6
	n3	38%		0,29		0,37	0,17		31		32	11		0,4		1,1	4,1
	s3	38%		0,36		0,30	0,17		31		32	10		0,9		0,8	4,3
	w3	34%		0,36		0,37	0,19		31		32	12		0,9		1,1	5,0
	e3	34%		0,36		0,37	0,18		30		31	11		0,9		1,1	4,7
4 stage	4nswe	31%		0,38		0,39	0,19		35		36	15		1,1		1,4	6,2
	n4we	33%		0,32		0,41	0,18		35		36	14		0,7		1,6	5,6
	s4we	34%		0,40		0,33	0,19		35		36	13		1,3		0,9	5,7
	w4ns	30%		0,40		0,41	0,20		36		37	16		1,3		1,6	6,7
	e4ns	30%		0,40		0,41	0,20		35		36	15		1,3		1,6	6,4
	nw4	32%		0,34		0,42	0,19		36		37	15		0,8		1,7	6,0
	ne4	32%		0,34		0,42	0,19		35		36	14		0,8		1,7	5,7
	sw4	32%		0,41		0,34	0,20		36		37	14		1,4		1,0	6,2
	se4	32%		0,41		0,34	0,19		35		36	13		1,4		1,0	5,8
separate (split) stage	n-s-3	25%		0,43		0,53	0,28		36		37	26		1,5		2,6	10,7
	w-e-3	33%		0,35		0,37	0,19		37		36	14		0,9		1,3	5,8
	n-s-4we	22%		0,47		0,58	0,30		40		41	30		1,9		3,2	12,8
	w-e-4ns	30%		0,39		0,41	0,20		42		42	18		1,3		1,8	7,5
	n-s-w-e-4	21%		0,51		0,63	0,33		42		43	33		2,2		3,6	14,0
	optimums	72%		0,17		0,18	0,09		6		6	2		0,1		0,2	0,9

performance colours	best	near best, within 10% of optimum	LOS colours	A-B	C-D	E	F

print:
2019-12-10

AutoJ

3. R35 & ACCESS ROADS

Middelburg

2025 PLUS INDUSTRIAL plus upgrade

Xwe — **Stop street on west and east approaches**

Volume (evu/hr)

	from North					from South					from West					from East					intersection	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R		total
AM		70	347	38	455		2	171	31	204		8		6	14		5		49	54		727
off																						
PM		42	256	16	313		2	433	7	443		23		2	25		22		90	111		892

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		0,5	0,5	1,0		0,5	0,5	1,0		0,3	0,4	0,3		0,9	0,1	1,0

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
										stop		stop		stop		stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0,22	0,22	0,03	0,20		0,09	0,09	0,03	0,08		0,03		0,03	0,03		0,01		0,13	0,12	0,22	0,16
off																						
PM		0,15	0,15	0,01	0,15		0,22	0,22	0,01	0,22		0,07		0,07	0,07		0,03		0,28	0,23	0,28	0,19

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		1	1	0	1		0	0	0	0		8		9	8		8		9	9	9	2
off																						
PM		1	1	0	1		1	1	0	1		9		9	9		8		10	10	10	2

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM		0,0	0,1	0,0	0,1		0,0	0,0	0,0	0,0		0,0		0,0	0,0		0,0		0,1	0,1	0,1	0,3
off																						
PM		0,0	0,1	0,0	0,1		0,0	0,1	0,0	0,1		0,1		0,0	0,1		0,1		0,2	0,3	0,2	0,5

3. R35 & ACCESS ROADS

AutoJ

Middelburg

2025 PLUS DISTRIBUTION plus upgrade

&Autol 1910 roberts

Xwe — **Stop street on west and east approaches**

Volume (evu/hr)

	from North					from South					from West					from East					intersection	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R		total
AM		41	347	38	426		2	171	18	191		8		6	14		7		63	70		701
off																						
PM		63	256	16	334		2	433	10	446		23		2	25		16		63	78		883

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		0,5	0,5	1,0		0,5	0,5	1,0		0,3	0,4	0,3		0,9	0,1	1,0

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
										stop		stop		stop		stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0,20	0,20	0,03	**0,18**		0,09	0,09	0,02	**0,08**		0,03		0,03	**0,03**		0,01		0,17	**0,15**	0,20	0,15
off																						
PM		0,16	0,16	0,01	**0,16**		0,22	0,22	0,01	**0,21**		0,07		0,07	**0,07**		0,02		0,20	**0,16**	0,22	0,18

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		1	1	0	1		0	0	0	0		8		9	8		8		9	9	9	2
off																						
PM		1	1	0	1		1	1	0	1		9		9	9		8		9	9	9	2

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM		0,0	0,1	0,0	**0,1**		0,0	0,0	0,0	**0,0**		0,0		0,0	**0,0**		0,0		0,2	**0,2**	0,2	**0,3**
off																						
PM		0,0	0,1	0,0	**0,1**		0,0	0,1	0,0	**0,1**		0,1		0,0	**0,1**		0,0		0,2	**0,2**	0,2	**0,5**

print:
2019-12-10

AutoJ

3. R35 & ACCESS ROADS

Middelburg

2025 PLUS COMBINED plus upgrade

Xwe — **Stop street on west and east approaches**

Volume (evu/hr)

	from North					from South					from West					from East					intersection	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R		total
AM		64	347	38	449		2	171	28	201		8		6	14		5		52	57		721
off																						
PM		84	256	16	355		2	433	14	450		23		2	25		30		122	151		981

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		0,5	0,5	1,0		0,5	0,5	1,0		0,3	0,4	0,3		0,9	0,1	1,0

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
										stop		stop		stop		stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0,21	0,21	0,03	**0,20**		0,09	0,09	0,03	**0,08**		0,03		0,03	**0,03**		0,01		0,14	**0,13**	0,21	0,15
off																						
PM		0,17	0,17	0,01	**0,17**		0,22	0,22	0,01	**0,21**		0,07		0,07	**0,07**		0,04		0,39	**0,32**	0,39	0,21

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		1	1	0	**1**		0	0	0	**0**		8		9	**8**		8		9	**9**	9	2
off																						
PM		1	1	0	**1**		1	1	0	**1**		9		9	**9**		8		11	**10**	11	3

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM		0,0	0,1	0,0	**0,1**		0,0	0,0	0,0	**0,0**		0,0		0,0	**0,0**		0,0		0,1	**0,1**	0,1	0,3
off																						
PM		0,0	0,1	0,0	**0,1**		0,0	0,1	0,0	**0,1**		0,1		0,0	**0,1**		0,1		0,4	**0,4**	0,4	0,7

AutoJ

4. R35 & PIENAARSDAM RD

Middelburg

2019

SUMMARY

&Autoj 1910 roberts

			Volume / Capacity (max)					Delay / vehicle (max)					Queue (max)				
	weighting	100%		25%	4%	25%	10%		4%	7%	4%	6%		4%	3%	4%	5%
	Control	Perf Index	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s sum
BEST overall	Xwe	83%		0,15		0,18	0,09		9		9	1		0,1		0,1	0,2
best signal	2	47%		0,21		0,26	0,13		25		25	5		0,3		0,4	1,3
		PI	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s ave	Peds	AM	off	PM	i/s sum
Priority	Xns	32%		0,33		0,41	0,20		11		12	11		0,9		1,2	3,0
	Xwe	83%		0,15		0,18	0,09		9		9	1		0,1		0,1	0,2
	XX	25%		0,40		0,58	0,27		12		14	13		0,9		1,4	3,4
	mC	59%		0,18		0,23	0,11		5		6	5		0,4		0,6	1,5
	RR	52%		0,20		0,25	0,12		7		7	7		0,5		0,7	1,9
2 stage	2	47%		0,21		0,26	0,13		25		25	5		0,3		0,4	1,3
3 stage	3ns	41%		0,23		0,29	0,14		30		30	8		0,6		0,8	2,1
	3we	41%		0,23		0,29	0,14		30		30	8		0,6		0,8	2,1
	n3	44%		0,20		0,30	0,14		30		30	7		0,3		0,9	1,8
	s3	44%		0,24		0,25	0,13		30		30	7		0,6		0,4	1,8
	w3	39%		0,24		0,30	0,15		30		30	9		0,6		0,9	2,4
	e3	40%		0,24		0,30	0,15		21		21	8		0,6		0,9	2,3
4 stage	4nswe	36%		0,26		0,32	0,16		35		35	11		0,8		1,1	3,1
	n4we	39%		0,22		0,33	0,15		35		35	10		0,5		1,2	2,7
	s4we	39%		0,27		0,27	0,15		35		35	10		0,9		0,7	2,6
	w4ns	35%		0,27		0,33	0,16		35		35	12		0,9		1,2	3,4
	e4ns	35%		0,27		0,33	0,16		26		26	12		0,9		1,2	3,3
	nw4	37%		0,23		0,35	0,16		35		35	11		0,6		1,3	2,9
	ne4	38%		0,23		0,35	0,16		26		26	11		0,6		1,3	2,9
	sw4	37%		0,28		0,28	0,15		35		35	12		1,0		0,8	2,9
	se4	38%		0,28		0,28	0,15		26		26	11		1,0		0,8	2,8
separate (split) stage	n-s-3	29%		0,30		0,40	0,23		35		35	22		1,2		1,7	5,8
	w-e-3	44%		0,22		0,27	0,13		39		39	7		0,5		0,6	1,9
	n-s-4we	27%		0,33		0,43	0,25		40		40	26		1,5		2,2	7,1
	w-e-4ns	39%		0,24		0,29	0,15		44		44	10		0,7		1,0	2,7
	n-s-w-e-4	27%		0,33		0,43	0,25		44		44	26		1,4		2,1	7,1
	optimums	83%		0,15		0,18	0,09		5		6	1		0,1		0,1	0,2

performance colours	best	near best, within 10% of optimum	LOS colours	A-B	C-D	E	F

AutoJ

4. R35 & PIENAARSDAM RD

Middelburg

2019

Xwe

Stop street on west and east approaches

Volume (evu/hr)

	from North					from South					from West					from East					intersection	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R		total
AM		7	281		288			135		135							2		14	16		439
off																						
PM		9	186		195			357	4	361							1		7	8		564

Lanes

(If lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		0,5	0,5				0,5	0,5						0,3	0,4	0,3

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
														stop		stop

VOLUME to CAPACITY (V/C)

A-B C-D E F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0,15	0,15		0,15			0,07		0,07							0,03		0,03	0,03	0,15	0,12
off																						
PM		0,10	0,10		0,10			0,18	0,18	0,18							0,02		0,02	0,02	0,18	0,15

Average DELAY per vehicle (secs)

A-B C-D E F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		1	1		1			0		0							8		9	9	9	1
off																						
PM		0	0		0			1	1	1							8		9	9	9	1

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK WARN POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM		0,0	0,1		0,1			0,0		0,0							0,0		0,0	0,0	0,1	0,1
off																						
PM		0,0	0,0		0,0			0,1	0,0	0,1							0,0		0,0	0,0	0,1	0,1

print:
2019-12-06

AutoJ

4. R35 & PIENAARSDAM RD

Middelburg

2020

Xwe — Stop street on west and east approaches

&Autol 1910 roberts

Volume (evu/hr)

	from North					from South					from West					from East					intersection
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	total
AM		7	289		297			139		139							2		14	16	452
off																					
PM		9	192		201			368	4	372							1		7	8	581

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		0,5	0,5				0,5	0,5						0,3	0,4	0,3

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
														stop		stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0,15	0,15		0,15			0,07		0,07							0,03		0,03	0,03	0,15	0,12
off																						
PM		0,10	0,10		0,10			0,19	0,19	0,19							0,02		0,02	0,02	0,19	0,15

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		1	1		1			0		0							8		9	9	9	1
off																						
PM		0	0		0			1	1	1							8		9	9	9	1

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM		0,0	0,1		0,1			0,0		0,0							0,0		0,0	0,0	0,1	0,1
off																						
PM		0,0	0,0		0,0			0,1	0,0	0,1							0,0		0,0	0,0	0,1	0,1

print:
2019-12-10

AutoJ

4. R35 & PIENAARSDAM RD

Middelburg

2020 PLUS INDUSTRIAL

Xwe — **Stop street on west and east approaches**

Volume (evu/hr)

	from North					from South					from West					from East					intersection
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	total
AM		7	293		301			165		165							2		14	16	482
off																					
PM		9	210		219			373	4	377							1		7	8	604

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		0,5	0,5				0,5	0,5						0,3	0,4	0,3

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
														stop		stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0,15	0,15		0,15			0,08		0,08							0,03		0,03	0,03	0,15	0,12
off																						
PM		0,11	0,11		0,11			0,19	0,19	0,19							0,02		0,02	0,02	0,19	0,16

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		1	1		1			0		0							8		9	9	9	1
off																						
PM		0	0		0			1	1	1							8		9	9	9	1

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM		0,0	0,1		0,1			0,0		0,0							0,0		0,0	0,0	0,1	0,1
off																						
PM		0,0	0,0		0,0			0,1	0,0	0,1							0,0		0,0	0,0	0,1	0,1

print:
2019-12-10

AutoJ

4. R35 & PIENAARSDAM RD

Middelburg

2020 PLUS DISTRIBUTION

Xwe — **Stop street on west and east approaches**

Volume (evu/hr)

	from North					from South					from West					from East					intersection
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	total
AM		7	294		302			152		152							2		14	16	470
off																					
PM		9	204		213			376	4	380							1		7	8	601

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		0,5	0,5				0,5	0,5						0,3	0,4	0,3

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
														stop		stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0,15	0,15		0,15			0,08		0,08							0,03		0,03	0,03	0,15	0,12
off																						
PM		0,11	0,11		0,11			0,19	0,19	0,19							0,02		0,02	0,02	0,19	0,16

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		1	1		1			0		0							8		9	9	9	1
off																						
PM		0	0		0			1	1	1							8		9	9	9	1

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM		0,0	0,1		0,1			0,0		0,0							0,0		0,0	0,0	0,1	0,1
off																						
PM		0,0	0,0		0,0			0,1	0,0	0,1							0,0		0,0	0,0	0,1	0,1

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4. R35 & PIENAARSDAM RD

Middelburg

2020 PLUS COMBINED

Xwe — Stop street on west and east approaches

Volume (evu/hr)

	from North					from South					from West					from East					intersection
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	total
AM		7	293		301			162		162							2		14	16	479
off																					
PM		9	218		227			380	4	384							1		7	8	619

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		0,5	0,5				0,5	0,5						0,3	0,4	0,3

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
														stop		stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, F<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0,15	0,15		0,15			0,08		0,08							0,03		0,03	0,03	0,15	0,12
off																						
PM		0,11	0,11		0,11			0,19	0,19	0,19							0,02		0,02	0,02	0,19	0,16

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		1	1		1			0		0							8		9	9	9	1
off																						
PM		0	1		1			1	1	1							8		9	9	9	1

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM		0,0	0,1		0,1			0,0		0,0							0,0		0,0	0,0	0,1	0,1
off																						
PM		0,0	0,0		0,0			0,1	0,0	0,1							0,0		0,0	0,0	0,1	0,2

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AutoJ

4. R35 & PIENAARSDAM RD

Middelburg

2025

Xwe — Stop street on west and east approaches

Volume (evu/hr)

	from North					from South					from West					from East					intersection
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	total
AM		8	336		344			161		161							2		17	19	524
off																					
PM		11	222		233			426	5	431							1		8	10	673

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		0,5	0,5				0,5	0,5						0,3	0,4	0,3

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
														stop		stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0,17	0,17		0,17			0,08		0,08							0,04		0,04	0,04	0,17	0,14
off																						
PM		0,12	0,12		0,12			0,22	0,22	0,22							0,03		0,03	0,03	0,22	0,18

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		1	1		1			0		0							8		9	9	9	1
off																						
PM		0	1		1			1	1	1							8		9	9	9	1

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM		0,0	0,1		0,1			0,0		0,0							0,0		0,0	0,0	0,1	0,1
off																						
PM		0,0	0,0		0,0			0,1	0,0	0,1							0,0		0,0	0,0	0,1	0,2

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AutoJ

4. R35 & PIENAARSDAM RD

Middelburg

2025 PLUS INDUSTRIAL

Xwe — **Stop street on west and east approaches**

Volume (evu/hr)

	from North					from South					from West					from East					intersection
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	total
AM		8	340		348			187		187							2		17	19	554
off																					
PM		11	240		251			431	5	436							1		8	10	696

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		0,5	0,5				0,5	0,5						0,3	0,4	0,3

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
														stop		stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0,18	0,18		0,18			0,09		0,09							0,04		0,04	0,04	0,18	0,14
off																						
PM		0,13	0,13		0,13			0,22	0,22	0,22							0,03		0,03	0,03	0,22	0,18

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		1	1		1			0		0							8		9	9	9	1
off																						
PM		0	1		1			1	1	1							8		9	9	9	1

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM		0,0	0,1		0,1			0,0		0,0							0,0		0,0	0,0	0,1	0,1
off																						
PM		0,0	0,0		0,0			0,1	0,0	0,1							0,0		0,0	0,0	0,1	0,2

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2019-12-10

AutoJ

4. R35 & PIENAARSDAM RD

Middelburg

2025 PLUS DISTRIBUTION

Xwe — **Stop street on west and east approaches**

&AutoJ 1910 roberts

Volume (evu/hr)

	from North					from South					from West					from East					intersection	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R		total
AM		8	341		349			174		174							2		17	19		542
off																						
PM		11	234		245			434	5	439							1		8	10		693

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		0,5	0,5				0,5	0,5						0,3	0,4	0,3

Control

	from North				from South				from West				from East			
	peds	left	str	right	*peds*	left	str	right	*peds*	left	str	right	*peds*	left	str	right
														stop		stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM		0,18	0,18		0,18			0,09		0,09							0,04		0,04	0,04	0,18	0,14
off																						
PM		0,12	0,12		0,12			0,22	0,22	0,22							0,03		0,03	0,03	0,22	0,18

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	overall
AM		1	1		1			0		0							8		9	9	9	1
off																						
PM		0	1		1			1	1	1							8		9	9	9	1

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	*peds*	left	str	right	L+S+R	max	total
AM		0,0	0,1		0,1			0,0		0,0							0,0		0,0	0,0	0,1	0,1
off																						
PM		0,0	0,0		0,0			0,1	0,0	0,1							0,0		0,0	0,0	0,1	0,2

AutoJ

4. R35 & PIENAARSDAM RD

Middelburg

2025 PLUS COMBINED

Xwe — Stop street on west and east approaches

Volume (evu/hr)

	from North					from South					from West					from East					intersection
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	total
AM		8	340		348			184		184							2		17	19	551
off																					
PM		11	248		259			438	5	443							1		8	10	711

Lanes

(if lanes shared L:S or S:R = 0.5:0.5; L:S:R = 0.3:0.4:0.3)

	from North				from South				from West				from East			
	L~	L	S	R	L~	L	S	R	L~	L	S	R	L~	L	S	R
# lanes		0,5	0,5				0,5	0,5						0,3	0,4	0,3

Control

	from North				from South				from West				from East			
	peds	left	str	right	peds	left	str	right	peds	left	str	right	peds	left	str	right
														stop		stop

VOLUME to CAPACITY (V/C)

A-B | C-D | E | F

LOS A<0.5, B<0.8, C<0.9, D<0.95, E<0.99

Ped LOS A<0.1, B<0.3, C<0.4, D<0.6, E<0.97, F=0.97+

	V/C from North					V/C from South					V/C from West					V/C from East					V/C	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		0,18	0,18		0,18			0,09		0,09							0,04		0,04	0,04	0,18	0,14
off																						
PM		0,13	0,13		0,13			0,22	0,22	0,22							0,03		0,03	0,03	0,22	0,19

Average DELAY per vehicle (secs)

A-B | C-D | E | F

LOS A<10, B<15, C<25, D<35, E<50

Ped LOS A<10, B<15, C<25, D<35, E<50, F=50+

	delay from North					delay from South					delay from West					delay from East					delay / veh	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	overall
AM		1	1		1			0		0							8		9	9	9	1
off																						
PM		0	1		1			1	1	1							8		9	9	9	1

Average QUEUE length (veh)

(= total delay veh-hrs / hr)

OK | WARN | POOR

Q <4 = OK, <10 = WARN, 10+ = POOR

	Q from North					Q from South					Q from West					Q from East					Queue	
	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	peds	left	str	right	L+S+R	max	total
AM		0,0	0,1		0,1			0,0		0,0							0,0		0,0	0,0	0,1	0,1
off																						
PM		0,0	0,0		0,0			0,1	0,0	0,1							0,0		0,0	0,0	0,1	0,2

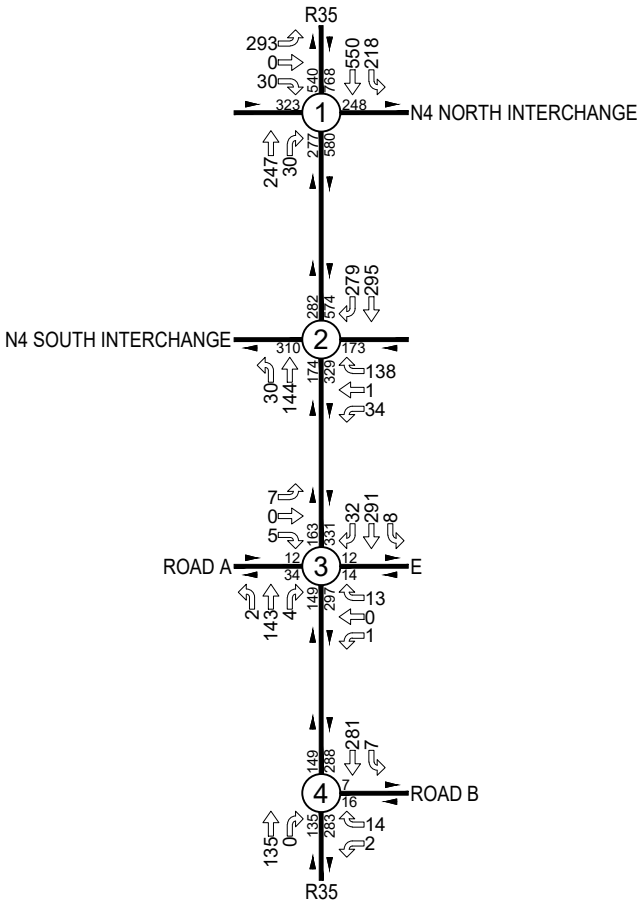
ANNEXURE D

TRAFFIC DATA

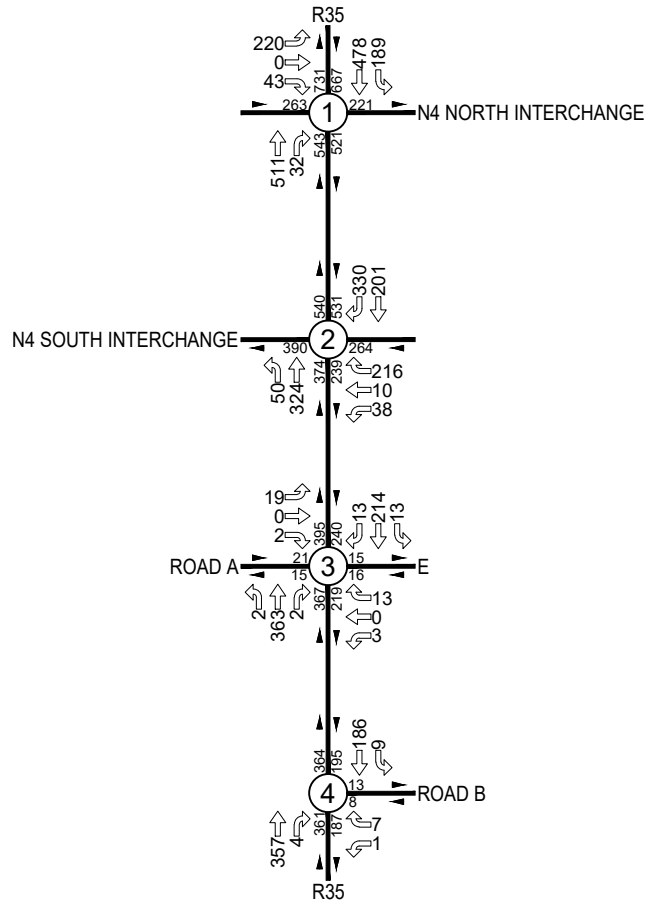
R35 MIDDELBURG PROJECT	
	Count Location
1	R35 AND N4 (NORTH INTERCHANGE)
2	R35 AND N4 (NORTH INTERCHANGE)
3	R35 AND TRUCK STOP ACCESS/ROAD A
4	R35 AND ROAD B

Trafsol		PROJECT:	FIGURE:	Nr.
		R35 MIDDELBURG PROJECT	TRAFFIC SURVEY LOCATIONS	1

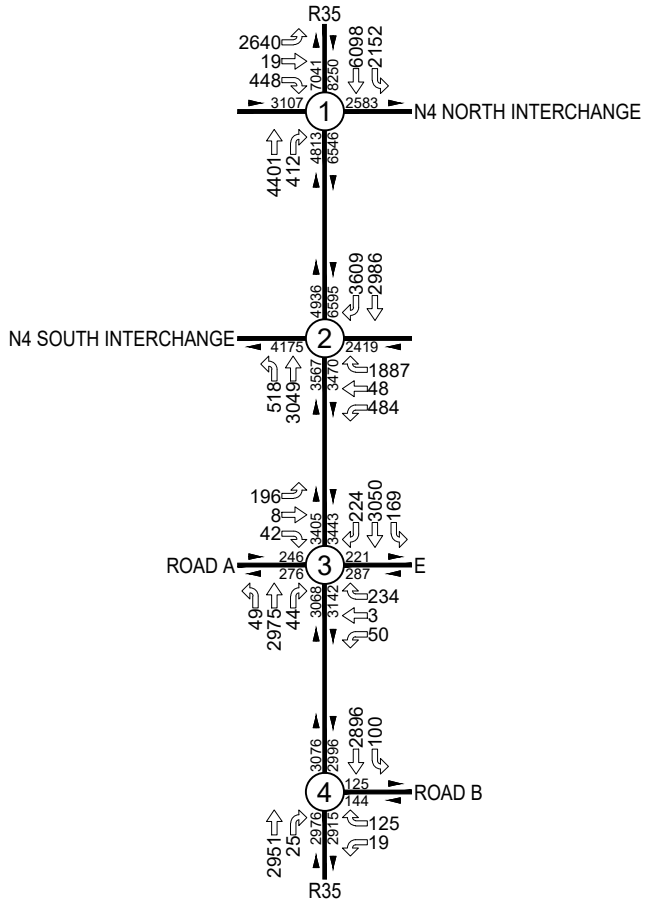
WEEKDAY AM PEAK HOUR (06H15 - 07H15)



WEEKDAY PM PEAK HOUR (16H15 - 17H15)



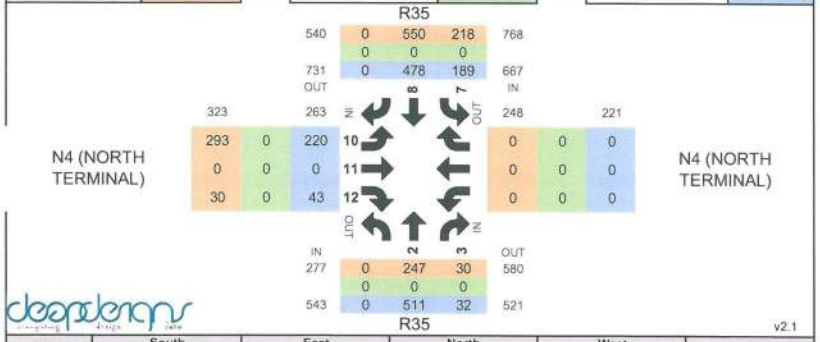
WEEKDAY 14 HOUR TOTAL (05H00 - 19H00)



Trafsol		PROJECT: R35 MIDDELBURG PROJECT	FIGURE: EXISTING TRAFFIC COUNT DATA - 2019 WEEKDAY AM, PM & 14 HOUR TOTALS	Nr. 2

R35 (MIDDLEBURG) TRAFFIC SURVEYS

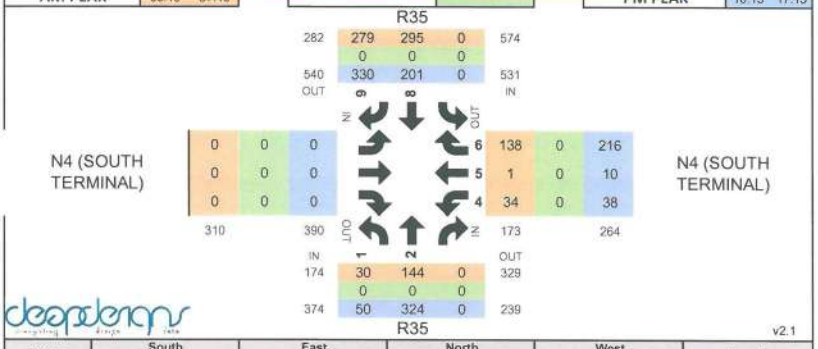
LOCATION 1	R35 AND N4 (NORTH TERMINAL)	05.11.2019
14 HOUR COUNT	TOTAL VEHICLES	TUESDAY
AM PEAK 06:15 07:15		PM PEAK 16:15 17:15



Time	South		East			North			West			Hourly	
	2	3				7	8		10	11	12		
AM PEAK	247	30				218	550		293		30	1368	
PM PEAK	511	32				189	478		220		43	1473	
TOTAL	4401	412				2152	6098		2640	19	448	16170	
05:00	19	5				28	102		13		5		
05:15	27	9				44	157		19		12		
05:30	30	10				34	165		27		18		
05:45	33	11				44	131		33	1	19	996	05:00
06:00	39	9				53	156		35		10	1126	05:15
06:15	59	16				59	154		47		3	1196	05:30
06:30	59	2				68	147		65		4	1257	05:45
06:45	63	7				47	127		88		6	1323	06:00
07:00	66	5				44	122		93		17	1368	06:15
07:15	56	10				35	133		56		5	1325	06:30
07:30	58	12				47	154		59		4	1314	06:45
07:45	83	8				41	127		54		9	1298	07:00
08:00	69	8				32	113		70	2	15	1260	07:15
08:15	67	5				21	96		30		4	1188	07:30
08:30	85	5				34	126		55	1	4	1164	07:45
08:45	92	3				25	77		45		9	1093	08:00
09:00	91	3				41	86		55	1	12	1073	08:15
09:15	74	7				17	118		52	1	4	1123	08:30
09:30	81	10				25	95		36	1	6	1067	08:45
09:45	70	6				25	125		50		4	1096	09:00
10:00	74	4				30	89		48		4	1056	09:15
10:15	74	6				33	107		57		5	1065	09:30
10:30	55	5				33	85		48		5	1042	09:45
10:45	58	6				39	96		68	1	12	1042	10:00
11:00	78	4				36	103		59		10	1083	10:15
11:15	72	7				32	83		57		13	1065	10:30
11:30	68	9				43	102		60		10	1126	10:45
11:45	76	11				24	90		64	1	10	1122	11:00
12:00	69	3				20	87		40		9	1060	11:15
12:15	80	15				29	105		67		9	1101	11:30
12:30	68	6				41	113		53		11	1101	11:45
12:45	64	6				28	105		54	1	7	1090	12:00
13:00	67	4				32	115		40		1	1121	12:15
13:15	61	4				31	122		42		7	1083	12:30
13:30	78	5				37	105		50		6	1072	12:45
13:45	76	4				40	104		38		7	1076	13:00
14:00	127	9				40	93		30		7	1123	13:15
14:15	89	3				47	127		40		6	1168	13:30
14:30	88	9				65	117		32		9	1207	13:45
14:45	93	11				51	129		46	2	10	1280	14:00
15:00	123	6				50	81		51		1	1286	14:15
15:15	112	11				45	108		62	1	9	1322	14:30
15:30	93	7				22	99		40	2	6	1271	14:45
15:45	131	7				36	94		47	1	5	1250	15:00
16:00	142	8				39	138		34		5	1304	15:15
16:15	121	7				46	131		41		15	1317	15:30
16:30	154	6				37	111		53		4	1413	15:45
16:45	109	12				53	119		74		9	1468	16:00
17:00	127	7				53	117		52		15	1473	16:15
17:15	104	9				55	110		39		9	1438	16:30
17:30	103	10				47	112		34	1	4	1384	16:45
17:45	82	10				50	69		48	1	10	1278	17:00
18:00	64	9				38	54		33	1	7	1113	17:15
18:15	83	10				26	74		21		6	1007	17:30
18:30	57	5				39	55		20		8	880	17:45
18:45	60	6				21	38		16		7	758	18:00
19:00												552	18:15
19:15												332	18:30
19:30												148	18:45
19:45													19:00

R35 (MIDDLEBURG) TRAFFIC SURVEYS

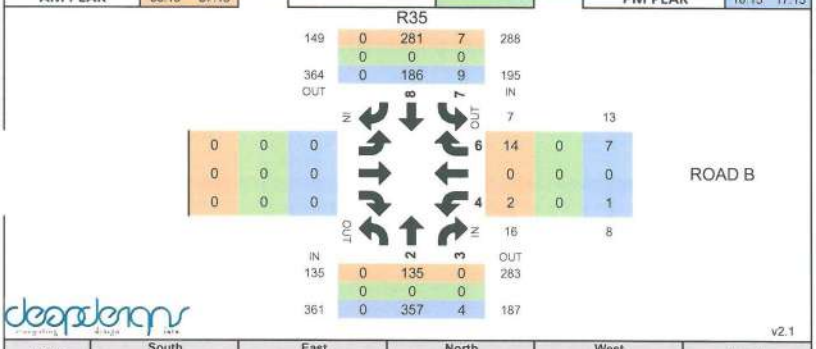
LOCATION 2	R35 AND N4 (SOUTH TERMINAL)		05.11.2019
14 HOUR COUNT	TOTAL VEHICLES		TUESDAY
AM PEAK	06:15 07:15	PM PEAK	16:15 17:15



Time	South			East			North			West			Hourly	
	1	2		4	5	6	8	9						
AM PEAK	30	144		34	1	138	295	279					921	
PM PEAK	50	324		38	10	216	201	330					1169	
TOTAL	518	3049		484	48	1887	2986	3609					12581	
05:00	3	21		6		9	56	37						
05:15	4	25		19		17	119	81						
05:30	5	28		13		8	97	59						
05:45	8	43		11	2	4	84	54					813	05:00
06:00	5	44		6		7	85	77					905	05:15
06:15	10	46		6		30	78	67					897	05:30
06:30	4	31		6		41	94	60					923	05:45
06:45	9	34		7		33	67	74					941	06:00
07:00	7	33		15	1	34	56	58					921	06:15
07:15	9	49		4		30	68	65					889	06:30
07:30	6	47		6		23	83	77					895	06:45
07:45	3	48		18		44	60	90					934	07:00
08:00	8	41		6		47	68	85					985	07:15
08:15	7	41		3		36	48	67					962	07:30
08:30	6	46		2		41	58	60					933	07:45
08:45	10	66		8	1	33	54	63					905	08:00
09:00	10	67		5		30	45	49					856	08:15
09:15	5	46		12	1	29	38	77					862	08:30
09:30	8	65		12		31	42	63					870	08:45
09:45	14	60		4		37	56	49					855	09:00
10:00	11	59		18		53	65	70					925	09:15
10:15	7	41		15	1	26	44	56					907	09:30
10:30	9	41		5		43	28	34					846	09:45
10:45	9	32		4	1	34	53	54					813	10:00
11:00	17	50		20	3	33	41	47					748	10:15
11:15	8	41		10	1	34	33	53					738	10:30
11:30	9	56		7		24	40	74					788	10:45
11:45	9	47		4	1	24	36	57					779	11:00
12:00	12	40		5		39	38	74					776	11:15
12:15	11	60		4	1	41	46	47					806	11:30
12:30	11	39		14	1	20	52	46					779	11:45
12:45	8	51		6	2	20	45	54					787	12:00
13:00	9	42		11	1	22	40	73					777	12:15
13:15	9	44		7	1	22	66	92					808	12:30
13:30	11	42		14		33	48	65					838	12:45
13:45	13	66		3	3	24	38	51					850	13:00
14:00	15	84		5	1	38	44	68					907	13:15
14:15	10	61		2	1	27	44	70					881	13:30
14:30	13	67		7	1	39	77	114					986	13:45
14:45	14	64		8		34	50	85					1043	14:00
15:00	11	101		6		30	21	46					1003	14:15
15:15	15	85		9	4	28	52	50					1031	14:30
15:30	10	93		7	1	43	48	63					978	14:45
15:45	13	87		6	1	72	39	63					1004	15:00
16:00	12	96		9	1	52	45	103					1107	15:15
16:15	13	86		10	4	45	44	70					1136	15:30
16:30	12	85		9	1	51	45	80					1154	15:45
16:45	15	67		7	2	62	54	106					1186	16:00
17:00	10	86		12	3	58	58	74					1169	16:15
17:15	8	63		6	2	50	50	69					1145	16:30
17:30	11	61		10	2	35	50	74					1105	16:45
17:45	8	59		12		34	39	43					987	17:00
18:00	6	49		15	2	28	62	65					913	17:15
18:15	7	40		4		30	25	21					792	17:30
18:30	6	45		11	1	45	44	37					738	17:45
18:45	5	38		13		30	26	29					684	18:00
19:00													457	18:15
19:15													330	18:30
19:30													141	18:45
19:45														19:00

R35 (MIDDLEBURG) TRAFFIC SURVEYS

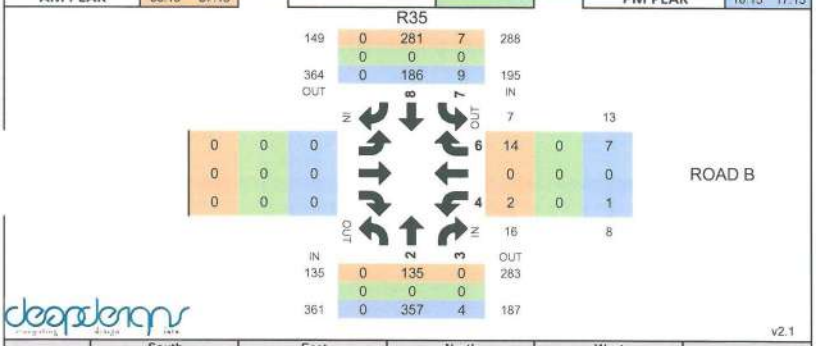
LOCATION 4	R35 AND ROAD B	05.11.2019
14 HOUR COUNT	TOTAL VEHICLES	TUESDAY
AM PEAK 06:15 07:15		PM PEAK 16:15 17:15



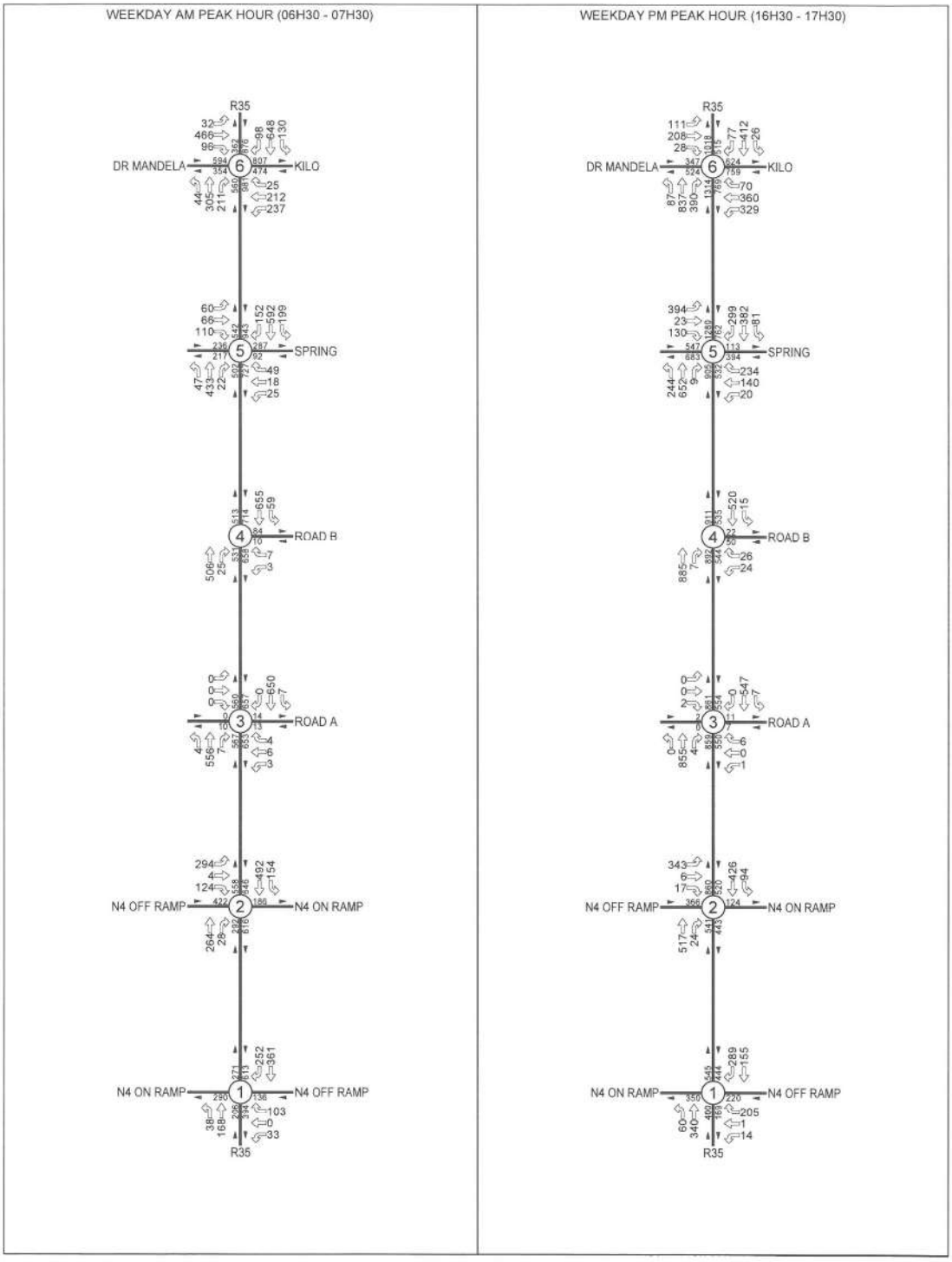
Time	South		East		North			West			Hourly	
	2	3	4	6	7	8						
AM PEAK	135		2	14	7	281					439	
PM PEAK	357	4	1	7	9	186					564	
TOTAL	2951	25	19	125	100	2896					6116	
05:00	8					41						
05:15	15	1		3		100						
05:30	25		1	1		104						
05:45	41	1		3	1	94					439	05:00
06:00	36			3		67					496	05:15
06:15	33			4	1	69					484	05:30
06:30	37			2	4	96					492	05:45
06:45	29		1	5	2	49					438	06:00
07:00	36		1	3		67					439	06:15
07:15	48				1	56					437	06:30
07:30	45	2		2		80					427	06:45
07:45	49	1	1		3	51					446	07:00
08:00	44	2		3	2	64					454	07:15
08:15	39			3		54					445	07:30
08:30	45			4		55					420	07:45
08:45	53				1	61					430	08:00
09:00	60			3		54					432	08:15
09:15	45	2	1		3	46					433	08:30
09:30	60		1	5	3	55					453	08:45
09:45	60	1		1	1	58					459	09:00
10:00	44		1	6		68					461	09:15
10:15	32			4	2	59					461	09:30
10:30	57	1	2	3	3	57					460	09:45
10:45	39			2	4	43					427	10:00
11:00	62			1	1	46					418	10:15
11:15	46	1		4		41					413	10:30
11:30	54		1	1	2	41					389	10:45
11:45	58				1	35					395	11:00
12:00	49	1			1	38					374	11:15
12:15	44	2		2	2	36					368	11:30
12:30	41	1	2	3	3	68					387	11:45
12:45	58			5	3	52					411	12:00
13:00	43			3	1	39					408	12:15
13:15	70			2		39					433	12:30
13:30	32			1	2	45					395	12:45
13:45	50			5	2	50					384	13:00
14:00	75			2	2	35					412	13:15
14:15	47			2	4	41					395	13:30
14:30	80	1	1		1	42					440	13:45
14:45	56	2		2	3	50					446	14:00
15:00	102			1	2	34					471	14:15
15:15	93	1	1	4		39					515	14:30
15:30	61			1	1	52					505	14:45
15:45	77	1	1	1	3	26					501	15:00
16:00	81		1	3	3	30					480	15:15
16:15	114	2		1		46					505	15:30
16:30	94	1			4	46					535	15:45
16:45	85		1	1	4	46					563	16:00
17:00	64	1		5	1	48					564	16:15
17:15	57		2	3	6	51					520	16:30
17:30	68			3	3	44					493	16:45
17:45	68			1	4	45					474	17:00
18:00	30			2	2	31					420	17:15
18:15	51			2	3	43					400	17:30
18:30	31			3	4	33					353	17:45
18:45	30			1	1	36					303	18:00
19:00											238	18:15
19:15											139	18:30
19:30											68	18:45
19:45												19:00

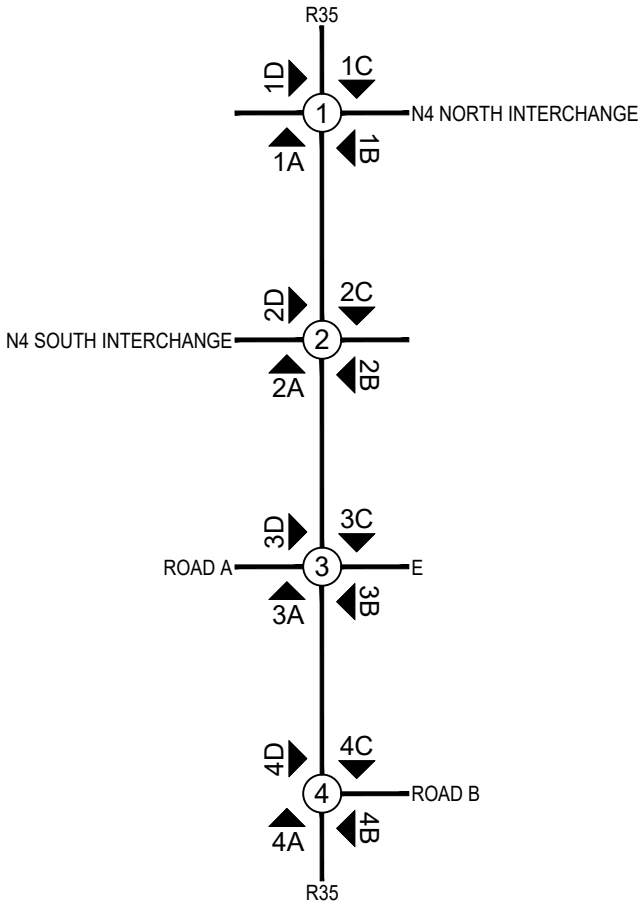
R35 (MIDDLEBURG) TRAFFIC SURVEYS

LOCATION 4	R35 AND ROAD B	05.11.2019
14 HOUR COUNT	TOTAL VEHICLES	TUESDAY
AM PEAK 06:15 07:15		PM PEAK 16:15 17:15



Time	South		East			North		West			Hourly	
	2	3	4		6	7	8					
AM PEAK	135		2		14	7	281				439	
PM PEAK	357	4	1		7	9	186				564	
TOTAL	2951	25	19		125	100	2896				6116	
05:00	8						41					
05:15	15	1			3		100					
05:30	25		1		1		104					
05:45	41	1			3	1	94				439	05:00
06:00	36				3		67				496	05:15
06:15	33				4	1	69				484	05:30
06:30	37				2	4	96				492	05:45
06:45	29		1		5	2	49				438	06:00
07:00	36		1		3		67				439	06:15
07:15	48					1	56				437	06:30
07:30	45	2			2		80				427	06:45
07:45	49	1	1			3	51				446	07:00
08:00	44	2			3	2	64				454	07:15
08:15	39				3		54				445	07:30
08:30	45				4		55				420	07:45
08:45	53					1	61				430	08:00
09:00	60				3		54				432	08:15
09:15	45	2	1			3	46				433	08:30
09:30	60		1		5	3	55				453	08:45
09:45	60	1			1	1	58				459	09:00
10:00	44		1		6		68				461	09:15
10:15	32				4	2	59				461	09:30
10:30	57	1	2		3	3	57				460	09:45
10:45	39				2	4	43				427	10:00
11:00	62				1	1	46				418	10:15
11:15	46	1			4		41				413	10:30
11:30	54		1		1	2	41				389	10:45
11:45	58					1	35				395	11:00
12:00	49	1				1	38				374	11:15
12:15	44	2			2	2	36				368	11:30
12:30	41	1	2		3	3	68				387	11:45
12:45	58				5	3	52				411	12:00
13:00	43				3	1	39				408	12:15
13:15	70				2		39				433	12:30
13:30	32				1	2	45				395	12:45
13:45	50				5	2	50				384	13:00
14:00	75				2	2	35				412	13:15
14:15	47				2	4	41				395	13:30
14:30	80	1	1			1	42				440	13:45
14:45	56	2			2	3	50				446	14:00
15:00	102				1	2	34				471	14:15
15:15	93	1	1		4		39				515	14:30
15:30	61				1	1	52				505	14:45
15:45	77	1	1		1	3	26				501	15:00
16:00	81		1		3	3	30				480	15:15
16:15	114	2			1		46				505	15:30
16:30	94	1				4	46				535	15:45
16:45	85		1		1	4	46				563	16:00
17:00	64	1			5	1	48				564	16:15
17:15	57		2		3	6	51				520	16:30
17:30	68				3	3	44				493	16:45
17:45	68				1	4	45				474	17:00
18:00	30				2	2	31				420	17:15
18:15	51				2	3	43				400	17:30
18:30	31				3	4	33				353	17:45
18:45	30				1	1	36				303	18:00
19:00											238	18:15
19:15											139	18:30
19:30											68	18:45
19:45												19:00


WEEKDAY AM PEAK HOUR (06H30 - 07H30)
WEEKDAY PM PEAK HOUR (16H30 - 17H30)
R35
DR MANDELA
KILO
SPRING
ROAD B
ROAD A
N4 OFF RAMP
N4 ON RAMP
R35
Trafsol
PROJECT:
MIDDLEBIRG HOSPITAL PROJECT
FIGURE:
EXISTING TRAFFIC COUNT DATA - 2017
WEEKDAY AM & PM PEAK HOURS
Nr.
2



◀ = DIRECTION OF PHOTO

Trafsol		PROJECT: R35 MIDDELBURG PROJECT	FIGURE: PHOTO INVENTORY KEY PLAN	Nr. P1

01A

01B

01C

01D

02A

02B

02C

02D

03A

03B

03C

03D

04A

04B

04C

04D

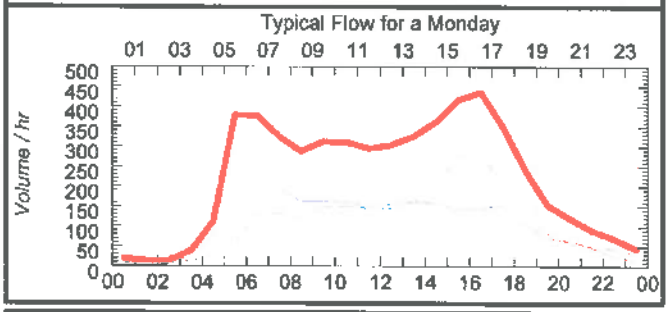
Typical Week Volume Report

Site	: 1121 - Nutfield (MS6)
Region	: Mpumalanga
Actual Period	: 2019/01/01 to 2019/10/09
Classification	: RSA Lgt/Hvy
Day Type	: Normal Day&Fixed Public Holiday+

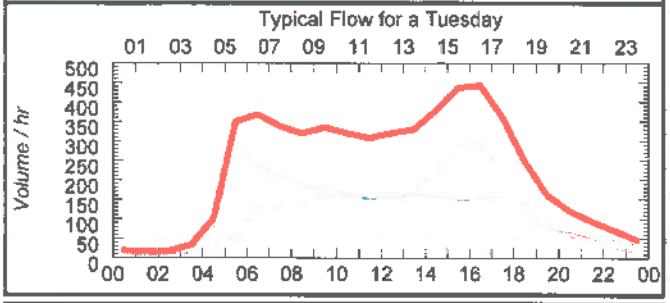
Total
To Middelburg
To Bethal

Total
Light
Heavy

Typical Flow for a Monday



Typical Flow for a Tuesday



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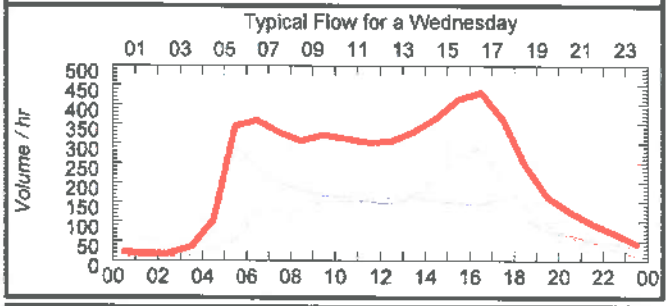

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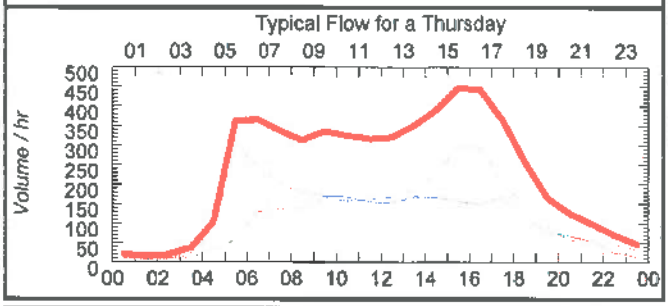

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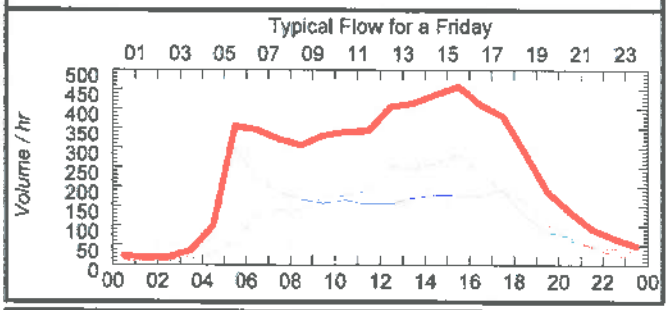
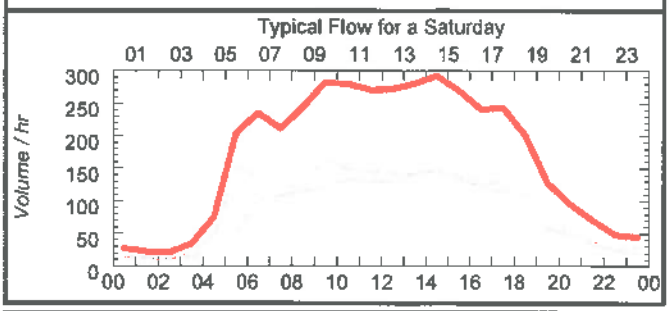
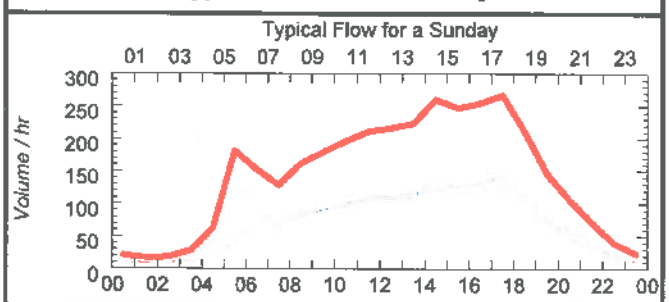


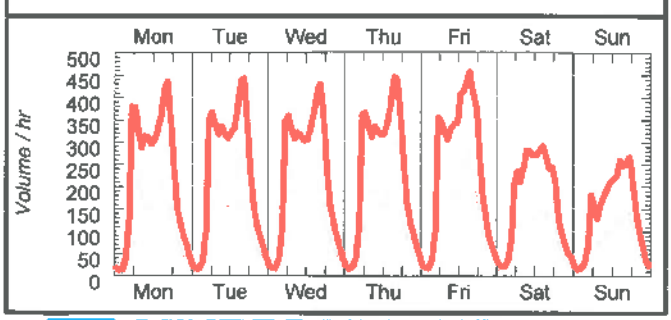
Typical Flow for a Saturday



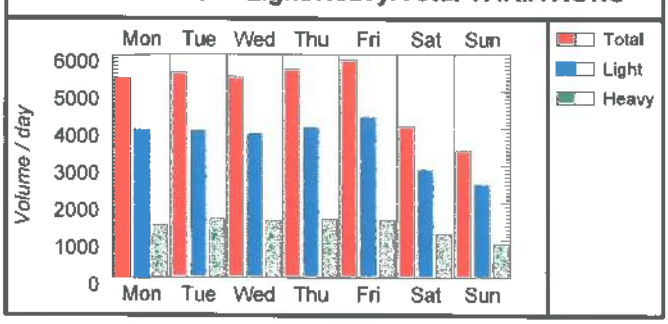
Typical Flow for a Sunday



TYPICAL FLOW FOR A WEEK



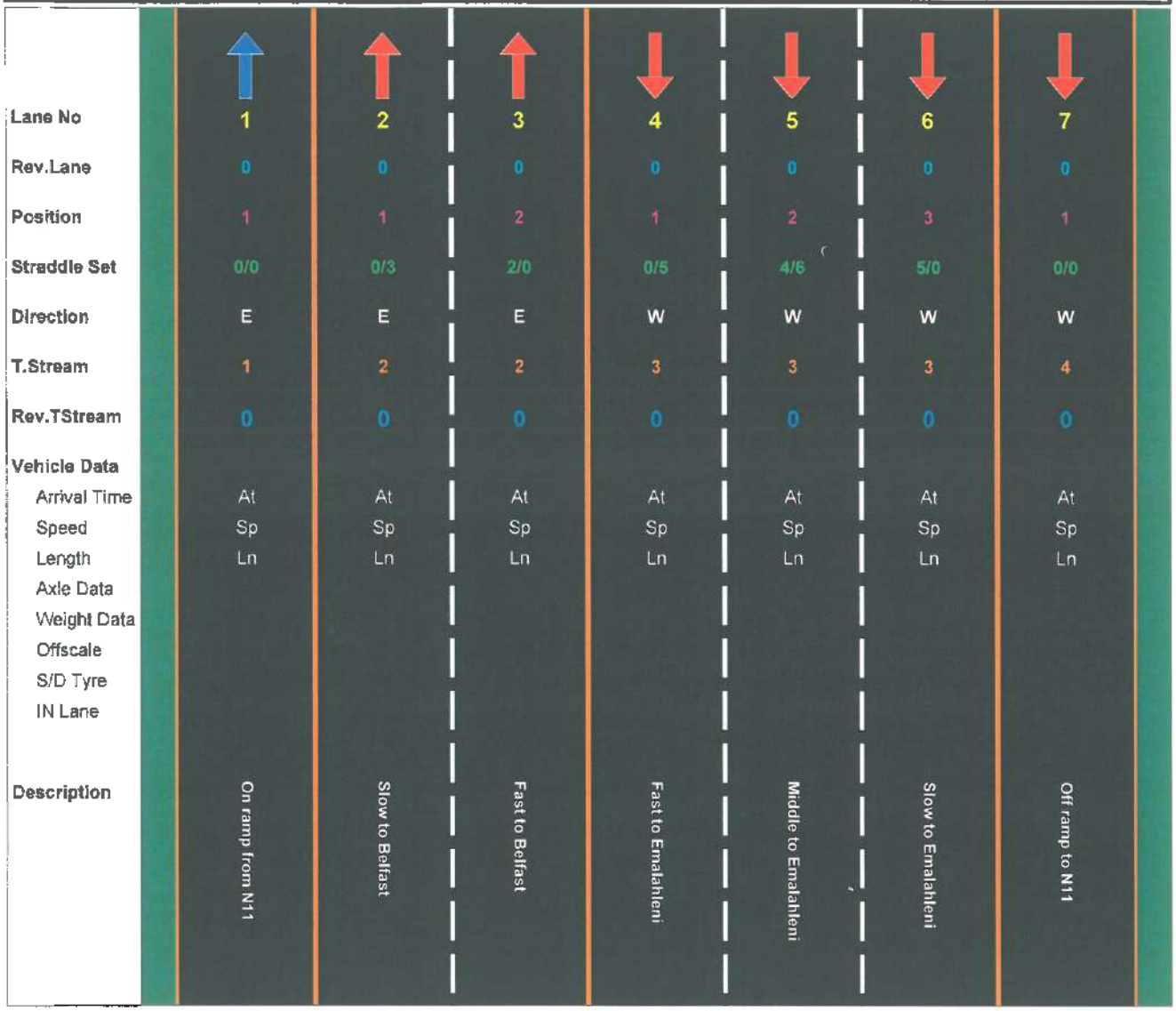
TYPICAL DAILY Light/Heavy/Total VARIATIONS



MIKROS TRAFFIC MONITORING

TRAFFIC HIGHLIGHTS OF SITE 1121				
1.1	Site Identifier			1121
1.2	Site Name			Nutfield (MS6)
1.3	Site Description			Between Middelburg and Bethal
1.4	Road Description	Route : R035 Road : R035 Section : 02 Distance : 69.1km		
1.5	GPS Position			29.460447E -25.855953S
1.6	Number of Lanes			2
1.7	Station Type			Permanent
1.8	Requested Period			2019/01/01 - 2019/12/31
1.9	Length of record requested (hours)			8760
1.10	Actual First & Last Dates			2019/01/01 - 2019/10/09
1.11	Actual available good data (hours)			6744
1.12	Percentage good data available for requested period			77.0
		To Middelburg	To Bethal	Total
2.1a	Total number of vehicles (counted)	714269	700050	1414319
2.1b	Total number of vehicles (projected for period)	927782	909313	1837095
2.2	Average daily traffic (ADT)	2542	2491	5033
2.3	Average daily truck traffic (ADTT)	716	672	1388
2.4	Percentage of trucks	28.2	27.0	27.6
2.5	Truck split % (short:medium:long)	18 : 5 : 77	19 : 5 : 76	18 : 5 : 77
2.6	Percentage of night traffic (20:00 - 06:00)	20.2	11.4	15.9
3.1	Speed limit (km/hr)			120
3.2	Average speed (km/hr)	75.2	75.6	75.4
3.3	Average speed - light vehicles (km/hr)	79.7	79.1	79.4
3.4	Average speed - heavy vehicles (km/hr)	63.7	66.2	64.9
3.5	Average night speed (km/hr)	81.1	77.3	79.8
3.6	15th centile speed (km/hr)	55.8	57.8	55.8
3.7	85th centile speed (km/hr)	97.9	97.9	97.9
3.8	Percentage vehicles in excess of speed limit	1.5	1.5	1.5
4.1	Percentage vehicles in flows over 600 vehicles/hr	0.0	0.0	0.0
4.2	Highest volume on the road (vehicles/hr)		2019/08/08 16:00:00	582
4.3	Highest volume in the To Middelburg (vehs/hr)		2019/04/29 06:00:00	442
4.4	Highest volume in the To Bethal (vehs/hr)		2019/08/08 16:00:00	418
4.5	Highest volume in a lane (vehicles/hr)		2019/04/29 06:00:00	442
4.6	15th highest volume on the road (vehicles/hr)		2019/06/18 16:00:00	518
4.7	15th highest volume in the To Middelburg direction (vehs/hr)		2019/04/05 06:00:00	338
4.8	15th highest volume in the To Bethal direction (vehs/hr)		2019/04/15 17:00:00	339
4.9	30th highest volume on the road (vehicles/hr)		2019/09/20 16:00:00	505
4.10	30th highest volume in the To Middelburg direction (vehs/hr)		2019/07/22 06:00:00	328
4.11	30th highest volume in the To Bethal direction (vehs/hr)		2019/01/31 17:00:00	326
5.1	Percentage of vehicles less than 2s behind vehicle ahead	14.7	17.2	15.9
6.1	Total number of heavy vehicles (projected for period)	261306	245432	506738
6.2	Estimated average number of axles per truck	6.0	6.0	6.0
6.3	Estimated truck mass (Ton/truck)	34.3	33.9	34.1
6.4	Estimated average E80/truck	3.2	3.2	3.2
6.5	Estimated daily E80 on the road			4455
6.6	Estimated daily E80 in the To Middelburg direction			2313
6.7	Estimated daily E80 in the To Bethal direction			2142
6.8	Estimated daily E80 in the worst To Middelburg lane			2313
6.9	Estimated daily E80 in the worst To Bethal lane			2142
6.10	ASSUMPTION on Axles/Truck (Short:Medium:Long)			(2.0 : 5.0 : 7.0)
6.11	ASSUMPTION on Mass/Truck (Short:Medium:Long)			(10.9 : 31.5 : 39.8)
6.12	ASSUMPTION on E80s/Truck (Short:Medium:Long)			(0.5 : 2.1 : 3.9)

STATION INFORMATION



Site Identifier	: 8233	***Site Number***	: 8233
Site Name	: N4 Rockdale		
Site Description	: Eastern Side of N11 Hendrina I/C		
Owner	: SANRAL	***Site Type***	: Permanent
Physical Lanes	: 7	***Logical Lanes***	: 7
GPS Longitude	: 29.531885E	***GPS Latitude***	: -25.829508S
Installation Date	: 2017/02/05	***Termination Date***	:
Speed Limit	: 120.0km/hr	***Companion Site***	:
Province	: Mpumalanga	***Municipality***	: (MP) Nkangala
Responsibility	: TOLL	***SANRAL Region***	: Northern
Route	: N004	***Road***	: N004
Section	: 04	***Distance***	: 19.800
Road Description	: N004-04 KM19.8		

MIKROS TRAFFIC MONITORING

STATION INFORMATION

Site Identifier	: 8233	***Site Number***	: 8233
Site Name	: N4 Rockdale		
Site Description	: Eastern Side of N11 Hendrina I/C		
Owner	: SANRAL	***Site Type***	: Permanent
Physical Lanes	: 7	***Logical Lanes***	: 7
GPS Longitude	: 29.531885E	***GPS Latitude***	: -25.829508S
Installation Date	: 2017/02/05	***Termination Date***	:
Speed Limit	: 120.0km/hr	***Companion Site***	:
Province	: Mpumalanga	***Municipality***	: (MP) Nkangala
Responsibility	: TOLL	***SANRAL Region***	: Northern
Route	: N004	***Road***	: N004
Section	: 04	***Distance***	: 19.800
Road Description	: N004-04 KM19.8		

No	Direction Description	Direction
01	On ramp from N11	East
02	To Belfast	East
03	To Emalahleni	West
04	Off ramp to N11	West

TRAFFIC HIGHLIGHTS OF SITE 8233				
1.1	Site Identifier			8233
1.2	Site Name			N4 Rockdale
1.3	Site Description			Eastern Side of N11 Hendrina I/C
1.4	Road Description	Route : N004 Road : N004 Section : 04 Distance : 19.8km		
1.5	GPS Position			29.531885E -25.829508S
1.6	Number of Lanes			7
1.7	Station Type			Permanent
1.8	Requested Period			2019/01/01 - 2019/12/31
1.9	Length of record requested (hours)			8760
1.10	Actual First & Last Dates			2019/01/01 - 2019/10/09
1.11	Actual available good data (hours)			6749
1.12	Percentage good data available for requested period			77.1
		On ramp from N11	To Belfast	Total
2.1a	Total number of vehicles (counted)	3101683	2204436	5306119
2.1b	Total number of vehicles (projected for period)	4025478	2860998	6886476
2.2	Average daily traffic (ADT)	11029	7838	18867
2.3	Average daily truck traffic (ADTT)	1938	1917	3855
2.4	Percentage of trucks	17.6	24.5	20.4
2.5	Truck split % (short:medium:long)	39 : 13 : 48	39 : 13 : 48	39 : 13 : 48
2.6	Percentage of night traffic (20:00 - 06:00)	15.6	15.0	15.3
3.1	Speed limit (km/hr)			120
3.2	Average speed (km/hr)	107.6	105.1	106.6
3.3	Average speed - light vehicles (km/hr)	112.9	111.3	112.3
3.4	Average speed - heavy vehicles (km/hr)	82.7	86.1	84.4
3.5	Average night speed (km/hr)	100.7	98.5	99.8
3.6	15th centile speed (km/hr)	77.7	77.6	77.7
3.7	85th centile speed (km/hr)	129.9	129.9	129.9
3.8	Percentage vehicles in excess of speed limit	34.4	25.7	30.8
4.1	Percentage vehicles in flows over 600 vehicles/hr	60.8	30.1	86.7
4.2	Highest volume on the road (vehicles/hr)		2019/04/22 15:00:00	3145
4.3	Highest volume in the On ramp from N11 (vehs/hr)		2019/06/14 16:00:00	2195
4.4	Highest volume in the To Belfast (vehs/hr)		2019/04/22 15:00:00	1562
4.5	Highest volume in a lane (vehicles/hr)		2019/06/14 16:00:00	1236
4.6	15th highest volume on the road (vehicles/hr)		2019/06/14 17:00:00	2703
4.7	15th highest volume in the On ramp from N11 direction (vehs/hr)		2019/08/08 17:00:00	1700
4.8	15th highest volume in the To Belfast direction (vehs/hr)		2019/03/24 14:00:00	1246
4.9	30th highest volume on the road (vehicles/hr)		2019/06/28 14:00:00	2439
4.10	30th highest volume in the On ramp from N11 direction (vehs/hr)		2019/08/30 16:00:00	1573
4.11	30th highest volume in the To Belfast direction (vehs/hr)		2019/07/07 17:00:00	1153
5.1	Percentage of vehicles less than 2s behind vehicle ahead	10.5	6.4	8.8
6.1	Total number of heavy vehicles (projected for period)	707273	699711	1406984
6.2	Estimated average number of axles per truck	4.8	4.8	4.8
6.3	Estimated truck mass (Ton/truck)	27.4	27.4	27.4
6.4	Estimated average E80/truck	2.3	2.3	2.3
6.5	Estimated daily E80 on the road			9029
6.6	Estimated daily E80 in the On ramp from N11 direction			4534
6.7	Estimated daily E80 in the To Belfast direction			4494
6.8	Estimated daily E80 in the worst On ramp from N11 lane			3671
6.9	Estimated daily E80 in the worst To Belfast lane			3338
6.10	ASSUMPTION on Axles/Truck (Short:Medium:Long)			(2.0 : 5.0 : 7.0)
6.11	ASSUMPTION on Mass/Truck (Short:Medium:Long)			(10.9 : 31.5 : 39.8)
6.12	ASSUMPTION on E80s/Truck (Short:Medium:Long)			(0.5 : 2.1 : 3.9)

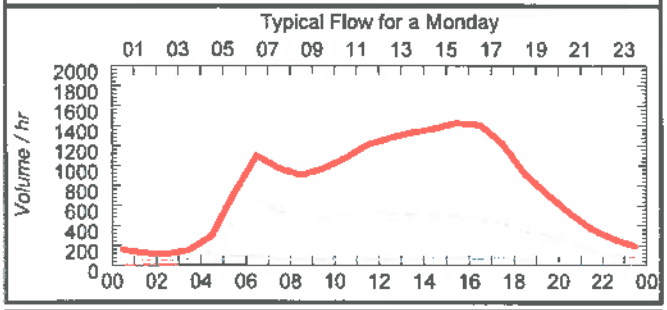
Typical Week Volume Report

Site	: 8233 - N4 Rockdale
Region	: Mpumalanga
Actual Period	: 2019/01/01 to 2019/10/09
Classification	: RSA Lgt/Hvy
Day Type	: Normal Day&Fixed Public Holiday+

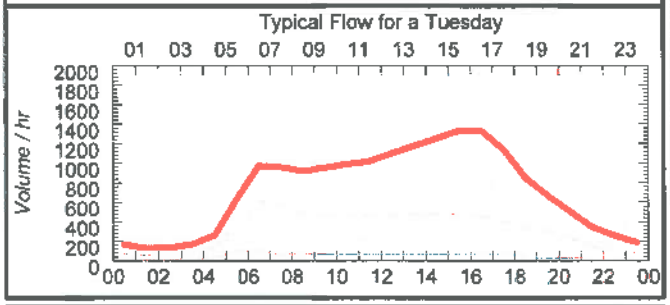
Total
On ramp from N11
To Belfast

Total
Light
Heavy

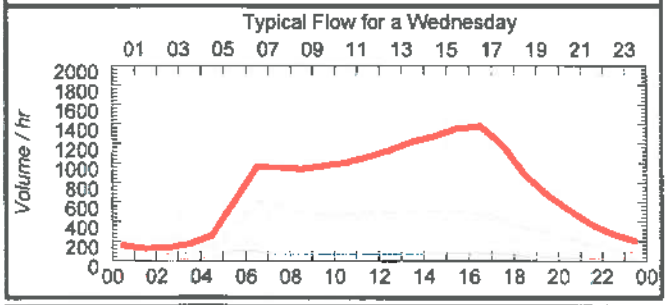
Typical Flow for a Monday



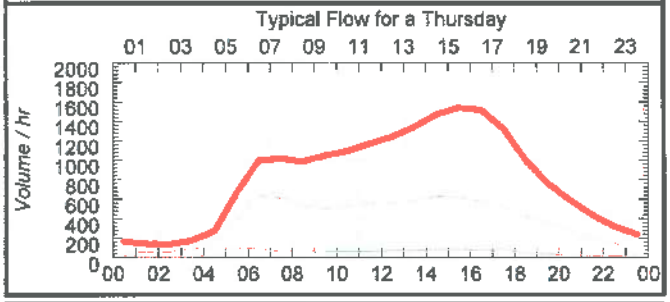
Typical Flow for a Tuesday



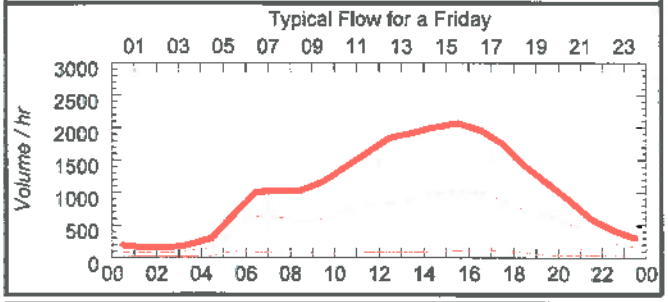
Typical Flow for a Wednesday



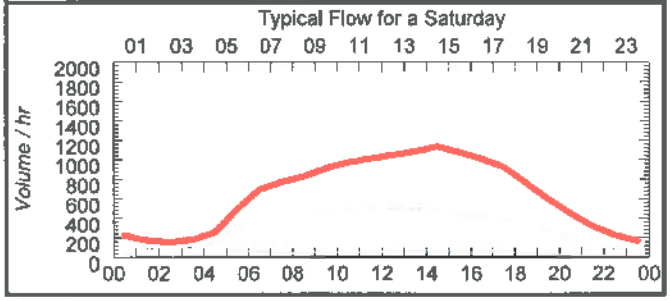
Typical Flow for a Thursday



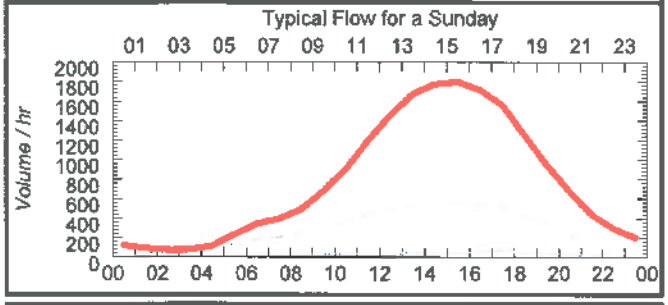
Typical Flow for a Friday



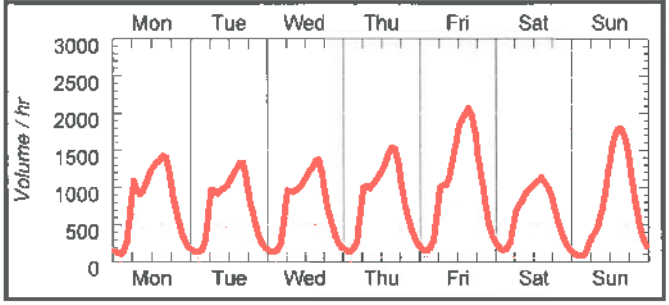
Typical Flow for a Saturday



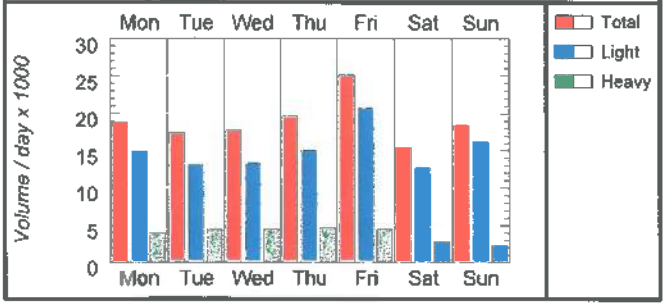
Typical Flow for a Sunday



TYPICAL FLOW FOR A WEEK



TYPICAL DAILY Light/Heavy/Total VARIATIONS



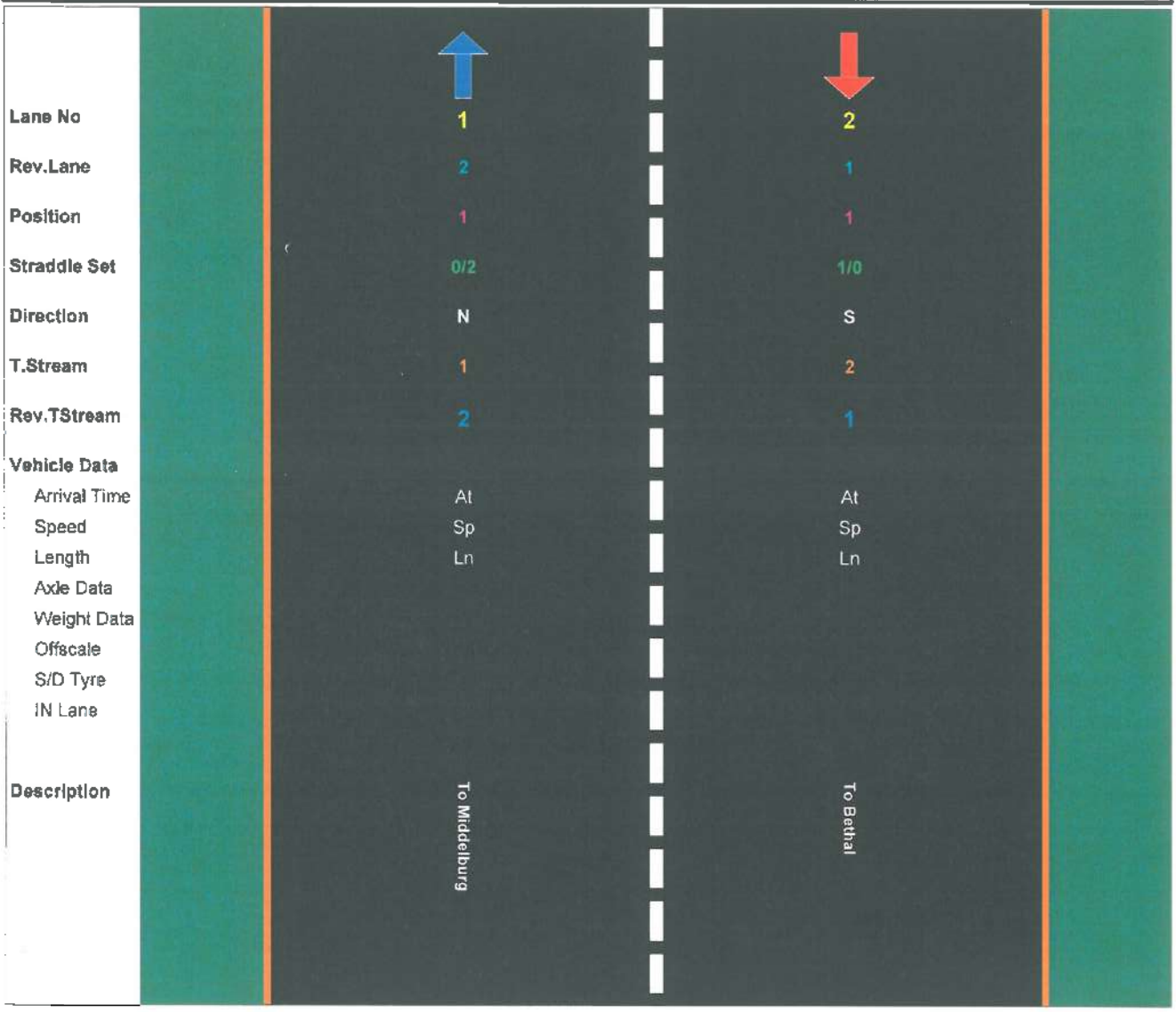
MIKROS TRAFFIC MONITORING

STATION INFORMATION

Site Identifier	: 1121	***Site Number***	: 1121
Site Name	: Nutfield (MS6)		
Site Description	: Between Middelburg and Bethal		
Owner	: SANRAL N4	***Site Type***	: Permanent
Physical Lanes	: 2	***Logical Lanes***	: 2
GPS Longitude	: 29.460447E	***GPS Latitude***	: -25.855953S
Installation Date	: 2001/12/03	***Termination Date***	:
Speed Limit	: 120.0km/hr	***Companion Site***	:
Province	: Mpumalanga	***Municipality***	: (MP) Nkangala
Responsibility	: N/A	***SANRAL Region***	: Northern
Route	: R035	***Road***	: R035
Section	: 02	***Distance***	: 69.100
Road Description	: R035-02 Km 69.1		

LLn	Lane Description	Direction	Pos	Log Info	RLn	Rev.Log Lane Desc.
01	To Middelburg	North	1	AT,Sp,Ln	02	
02	To Bethal	South	1	AT,Sp,Ln	01	

STATION INFORMATION



Site Identifier	: 1121	***Site Number***	: 1121
Site Name	: Nutfield (MS6)		
Site Description	: Between Middelburg and Bethal		
Owner	: SANRAL N4	***Site Type***	: Permanent
Physical Lanes	: 2	***Logical Lanes***	: 2
GPS Longitude	: 29.460447E	***GPS Latitude***	: -25.855953S
Installation Date	: 2001/12/03	***Termination Date***	:
Speed Limit	: 120.0km/hr	***Companion Site***	:
Province	: Mpumalanga	***Municipality***	: (MP) Nkangala
Responsibility	: N/A	***SANRAL Region***	: Northern
Route	: R035	***Road***	: R035
Section	: 02	***Distance***	: 69.100
Road Description	: R035-02 Km 69.1		

No	Direction Description	Direction
01	To Middelburg	North
02	To Bethal	South

ANNEXURE E

TOWN PLANNING EXTRACTS

2019

Hlukani Development Consultants

HLUKANI DEVELOPMENT CONSULTANTS

The integrated development specialists

APPLICATION FOR REZONING OF PORTION 58 OF THE FARM VAALBANK 286 JS

HLUKANI DEVELOPMENT CONSULTANTS
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GIYANI
0826
CONTACT: 083 326 0539
EMAIL: hlukanidc@gmail.com

1. INTRODUCTION

1.1 The application

This memorandum is in support of an application for the rezoning of Portion 58 of the Vaalbank 289 JS to amend the Steve Tshwete Land Use Management Scheme, 2008 in respect of the above mentioned property from "Agricultural" to "Industrial 2".

The application for rezoning is made in terms of Section 62 (1) of the Steve Tshwete Local Municipality Spatial Planning and Land Use Management By-laws, 2018 read together with the provisions of the Spatial Planning and Land Use Management Act, 2013 (Act 16 of 2013).

1.2 Purpose

The owner of the property appointed Hlukani Development Consultants to apply to the Mogalakwena Local Municipality in order to obtain the necessary rights to develop the subject site. The process is necessary in order to enable the owner of the subject property to develop the subject property for mixed use industrial purposes.

1.3 Local Authority

The property is situated within the jurisdiction of the Steve Tshwete Local Municipality. The Municipality is an authorized local authority in terms of the provisions of SPLUMA and has authority to deal with this application.

2. GENERAL PROPERTY DETAILS

2.1 Description of property

The subject property is known as Portion 58 of the farm Vaalbank 289 JS.

2.2 Property Size

The subject property measures 22.6971 ha squares in extent.

2.3 Locality

The subject property is located South of the city/town of Middelburg at the corner of The N4 national road and the R35 road. For detailed locality, see locality plan attached as **Annexure A**.

2.4 Registered Owner

The subject property is held in terms of title deed number T7428/2014 and is registered in the name of Bakkos Projects (Pty) Ltd. The title deed is attached as **Annexure B**.

2.5 Restrictive Title Conditions

There are no restrictive title conditions contained in the relevant Title Deed which restrict the proposed rezoning.

2.6 Mortgage Bonds

There is no bond registered against the subject property.

2.7 Special Power of Attorney & Resolution

Hlukani Development Consultants has been appointed by Bakkos Projects (Pty) Ltd to be their lawful agent and act on their behalf to submit this application. The power of attorney and company resolution giving effect to the appointment are attached as **Annexure C**.

3. EXISTING PHYSICAL FEATURES OF THE PROPERTY

3.1 Existing Zoning

In terms of the Steve Tshwete Local Municipality Land Use Scheme, 2008, the subject property is zoned "Agricultural". See attached Zoning Plan attached as **Annexure D**.

3.2 Land Use

The subject property is currently used as a Truck Stop, General Industry and Light Industrial purposes. See attached Land Use Plan attached as **Annexure E**.

3.3 Proposed Land Use

The proposed land use on the subject property is for Industrial 2 purposes which will include a Service Industry, Workshops, Petrol Filling Station, Warehouse, Parking Garage, Light Industry, General Industry, Business Premises, Kiosk, Canteen and Truck Stop. The proposed zoning is "Industrial 2". See attached Map 3 set attached as **Annexure F**.

3.4 Surrounding Land Uses

The subject property is surrounded by mining, industrial, business and agricultural land uses. The proposed land use on the subject property will not have any adverse effect on the surrounding land uses. The land use map is attached as **Annexure E**.

3.5 Engineering Services

The subject property is located outside the urban edge where no bulk services are available. The development of the subject property though has access to water, sanitation and electricity with the water being sourced from the existing boreholes on the site, the effluent being disposed through a septic tank on the subject property and serviced weekly. The subject property has access to electricity which is provided by Eskom.

In terms of water, it is the intention of the developer though to request the municipality to provide the development with water from the municipality at the cost of the developer. The application will be made in order to supplement the water being sourced from the boreholes. Currently, there are no upgrades that are needed in terms of engineering services for the proposed development. Should there be a need to upgrade the services, the costs thereof will be incurred by the developer.

3.6 Environmental Impact

In terms of the National Environmental Management Act, 1998, the proposed development according to the Mpumalanga Agriculture, Rural Development, land and Environmental Affairs Department doesn't require a Basic Assessment or a full Environmental Impact Assessment. See attached correspondence from the Department attached as **Annexure G.**

3.7 Heritage Impact Assessment

The proposed development is not subject to any heritage impact assessment as may be required by the relevant legislation.

4. PROPOSED DEVELOPMENT

4.1 Proposed Development

The proposed development is for a mixed use development on the subject property. The subject property has existing structures on the property which are used for different purposes including a diesel depot, a truck stop, kiosk and a few industries on the property. The owner of the subject property intends to legalize the land use in order to legally practice the land use rights on the property. After having noted that the current land use on the property are contradicting the Steve Tshwete Land Use Management Scheme, the owner commissioned the application in order to legally practice the land uses on site.

The mixed use development provides an estimated 200 permanent jobs and will further create an additional 300 permanent jobs for the locals in the future through future improvements to the property. Furthermore, the proposed development will provide job opportunities in the area, improve service delivery and boost the economy of the Municipality through the collection of revenue. The rezoning of the property will contribute to achieving the Development Objectives as laid out in the Spatial Planning and Land Use Management Act, 2013 (Act 16 of 2013). Furthermore, the proposed zoning will complement the existing surrounding land uses in the immediate area. The subject property makes provision for ample parking and manoeuvring space, and will have no significant impact on the traffic.

4.2 Proposed Land Use

It is the intention of the developer to develop an Industrial park on the subject property. According to the Land Use Management Scheme, 2008 the zoning that should be granted for the subject property should be "Industrial 2" in terms of the Steve Tshwete Land Use Management Scheme, 2008.

The following development controls would therefore apply to the proposed development:

Use Zone	Industrial 2
Primary Land Use Rights	Service Industry, Industrial Building, Workshops, Motor Workshop, Business Premises, Petrol Filling Station, Parking Site, Warehouse, Parking Garage, Light Industry, General Industry.
Consent Usage	Communications Tower, Canteen, Buildings, Place of refreshment, Kiosk, Factory Shop,

	Retail Warehouse Outlet, Truck Stop.
Height	2 storeys
Parking	6 parking bays per 100 m^2 GLA
Coverage	60%
FAR	1.6
Building Lines	3 m (rear and 1 side) 5 m (street boundaries)

5. DEVELOPMENT MERITS

5.1 Steve Tshwete IDP 2017/18-2021/22

The Steve Tshwete Local Municipality IDP identifies a number of strategic objectives which include Local Economic Development which seeks to facilitate investment and development of strategic infrastructure to unlock growth and job creation. The strategic objective encourages the municipality to focus on LED, Job creation, SMME development and investment which will result in the development of the local economy.

The IDP further introduces an aspect of a long term development plan, the 2040 Growth and Development Strategy with its main focus on two core pillars, namely Economy and Spatial Transformation. The strategy encourages the municipality to focus on developing small businesses, support black owned industrial firms, maximising localisation benefits from the ongoing public infrastructure expansion and the implementation of special economic zones.

The proposed development fits perfectly to what is being articulated in the IDP in that firstly, the proposed development will create over 500 jobs directly from the development as small scale industries will be established on the subject site that will create employment opportunities for the local citizens and directly contributing to the economic growth of the municipality. the proposed development further aligns to the objective of the municipality to encourage the growth of SMME's and black owned industrial firms which are already in existence within the subject property. The IDP identifies industrial development as an opportunity whereby this development application aims to tap into that opportunity as it offers possible jobs and development of SMME's.

The location of the site, which is along the N4 Maputo Development Corridor, further presents an opportunity to the municipality to implement a special economic zones in the area as the site is located along a very strategic corridor, further positively contributing to the maximising of the localisation benefits of the road infrastructure in place. Moreover, the proposed development contributes towards the long term development plan of the municipality in that it contributes to the spatial transformation of the area and therefore maximising the localisation benefits of the industries. The IDP further directs that the focus should be on the establishment of development corridors and the fact that the subject site is located along the N4 national road to Maputo positively contributes to the directives of the IDP. Another directive from the IDP is to reduce poverty and the gap between the rich and the poor whereby the proposed development will play as a catalyst to positively create jobs.

6. CONCLUSION

The development merits of the application have been adequately dealt with in terms of the Steve Tshwete Local Municipality Integrated Development Plan 2017/2018- 2021/2020; the State of the Nation Address 2018 (SONA 2018) by the President of the Republic of South Africa who emphasized the need for Radical Socio-Economic Transformation, the Mpumalanga Vison 2030 strategy, the IUDF which advocated for Spatial Integration, the Regional Industrial Strategy which identifies Middelburg as a strategic economic region of South Africa, the Long Term Development Plan 2040 which focuses on spatial transformation and the economy, the national transportation master plan which emphasises greater integration between land use development and transport routes, the SPLUMA Development Principles and also the objectives of the National Development Plan 2030. The background of the application, details and proposal have also been reflected in the paragraphs above and it has been motivated that the application is worthy and favourable.

It has further been motivated beyond any doubt that the proposed development will be to the benefit of the Municipality, the developer, the republic and the community at large and will improve the economic value of the property and the surrounding areas. The proposed development will also give rise to higher property tax and thus improve the existing engineering services.

In light of the information and motivation provided above, this application is therefore made to the Steve Tshwete Local Municipality for the rezoning of Portion 58 of the farm Vaalbank 289 JS from Agriculture to Industrial 2 for the erection of Service Industry, Industrial Building, Workshops, Motor Workshop, Business Premises, Petrol Filling Station, Parking Site, Warehouse, Parking Garage, Light Industry, General Industry as provided for in the Steve Tshwete Land Use Management Scheme, 2008.