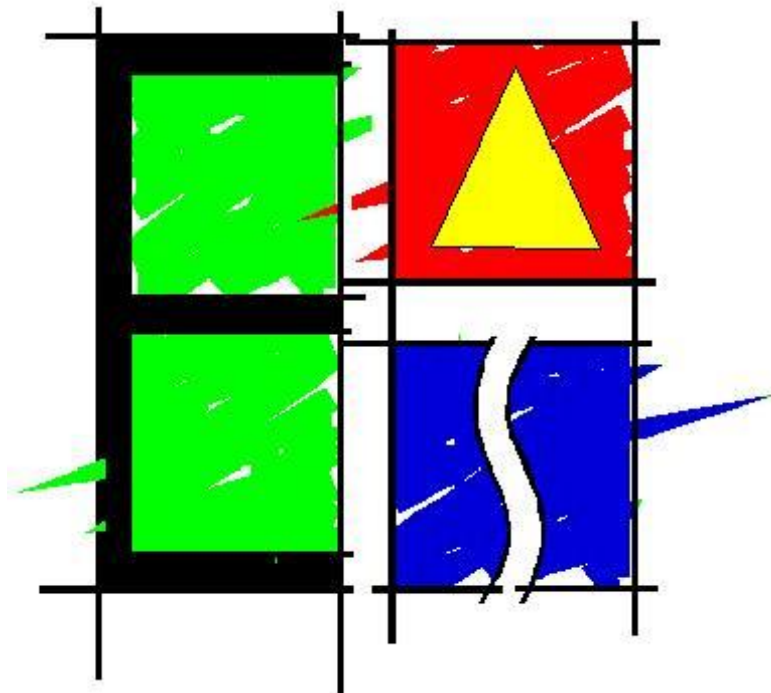


TRAFFIC IMPACT ASSESSMENT

***FOR A RESIDENTIAL DEVELOPMENT ON
ERF 2006, PARSONSVLEI, PORT ELIZABETH***



June 2024

Prepared for: **Singi Properties**

Prepared by: **Engineering Advice and Services (Pty) Ltd**
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DOCUMENT CONTROL SHEET

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PARSONSVLEI, PORT ELIZABETH**

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ABBREVIATIONS

ADT	Average Daily Traffic
ADTT	Average Daily Truck Traffic
EAS	Engineering Advice & Services (Pty) Ltd
ECDOT	Eastern Cape Department of Transport
Km/h	kilometres per hour
LOS	Level of Service
LSDF	Local Spatial Development Framework
NMBM	Nelson Mandela Bay Municipality
TIA	Traffic Impact Assessment
TMH	Technical Methods for Highways
TRH	Technical Recommendations for Highways

1 INTRODUCTION

1.1 BACKGROUND

Engineering Advice & Services (Pty) Ltd was appointed by Singi Properties during March 2024 to prepare a Traffic Impact Assessment for a proposed residential development on erf 2006, Parsonsvei in Port Elizabeth, situated in the Nelson Mandela Bay Municipality. The location of the site is indicated on **Figure 1** overleaf.



1.2 OBJECTIVES OF THE STUDY

In broad terms, the purpose of the traffic assessment is to determine the extent and nature of the traffic generated by the proposed development, assess the impact of this traffic on the operation of the associated road network, and devise solutions for any problems identified. The following key elements, *inter alia*, are addressed in this traffic impact assessment:

- The suitability and safety of proposals for access to and egress from the site;
- The capacity of the existing and future road network within the influence radius; and
- Possible road upgrading measures required to accommodate traffic generated by the proposed development.

In general, this report serves to satisfy the Nelson Mandela Bay Municipality and other relevant authorities that the traffic impact of the envisaged development is within acceptable limits and that the suggested improvements conform to the standards and parameters set by the relevant authority.

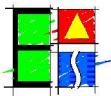
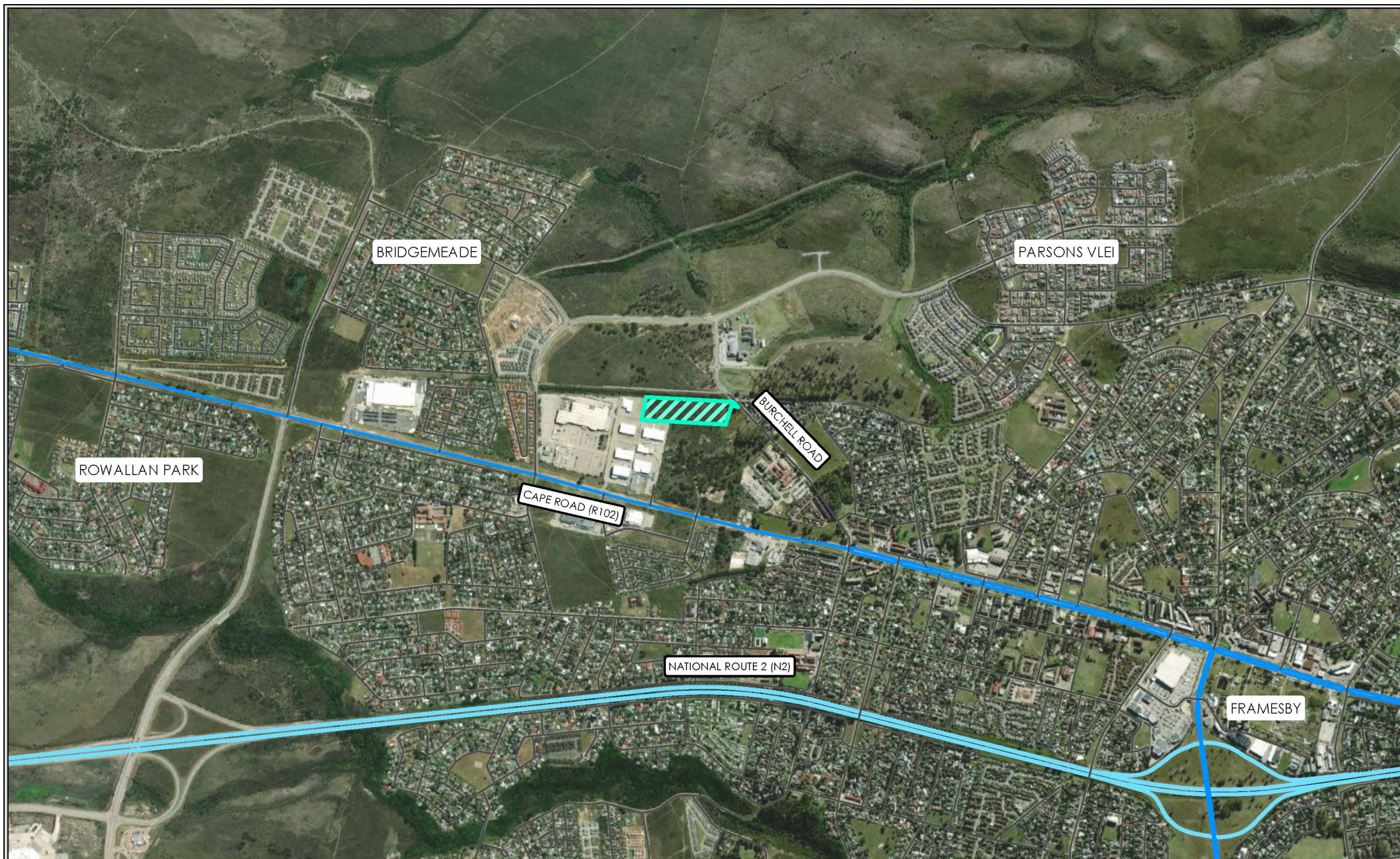
1.3 METHODOLOGY

The approach followed in conducting the traffic impact statement was in accordance with the guidelines set by TMH 16 Volume 1- South African Traffic Impact and Site Assessment Manual ⁽¹⁾.

Given the extent of the proposed development and in terms of the aforementioned guidelines, the development is considered to be a medium-sized development. As such, this assessment considered impact for both the development (assumed to be 2025) and development plus five-year (2030) horizons.

The methodology used was as follows:

- Present traffic flow patterns were obtained and the affected junctions analysed, where after recommendations were made on the present need for road network improvements, without taking the proposed development into account;
- Given the development extent, trips generated by the development were determined using applicable trip generation rates specified in **TMH 17 Volume 1 - South African Trip Data Manual** ⁽²⁾;
- The distribution of the generated trips was estimated where after the generated traffic was assigned to the surrounding road network;
- The proposed access points were assessed from operational and traffic safety perspectives in terms of **TRH26: South African Road Classification and Access Management Manual** ⁽³⁾;
- Operation of affected junctions and the existing access points was analysed to ensure that they operate safely at acceptable levels of service and recommendations made on the need for rationalisation taking cognisance of the proposed development for the 2025 and 2030 planning horizons;
- On-site circulation, parking and delivery aspects were assessed; and
- Taking into account the major findings of the study, conclusions were made regarding the financial responsibilities of the affected parties for required road upgrading measures.



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Legend

- Subject Site
- National Roads
- Provincial Paved Roads
- Provincial Unpaved Roads
- Municipal Paved Roads
- Municipal Unpaved Roads
- Private Roads

Project Title:

Traffic Impact Assessment For A Residential
Development On Erf 2006, Parsonslei,
Port Elizabeth

Drawing Title:

Figure 1: Locality Plan

Drawing No.:

2242-P-001

Drawing Date:

June 2024

0 50 100 200 300 400
Meters

Scale 1:20 000

Prepared by : EAR

Checked by : CH

1.4 STUDY AREA

Based on the type and extent of the development the study area extended to the adjacent junctions of Cape Road and Salerno Road with Burchell Drive as all trips generated by the proposed development will approach along these roads and through these junctions.

1.5 ASSUMPTIONS AND LIMITATIONS

The scope of this TIA is limited to the project as described in this report. The scope only deals with vehicular and pedestrian traffic related impacts in the vicinity of the site and excludes consideration of the following:

- Any vehicular activity outside of a radius of 500m of the site;

The report is based on a number of assumptions and is subject to certain limitations. These are as follows:

- That vehicle trips are based on development information supplied by the site owner / developer;
- That trips generated by the proposed development are distributed to and from the site based on the location of the development site, relative to trip attractors (e.g., employment areas, schools, shops) and the major road network; and
- That the site will be used for the purposes as advised by the developer.

Notwithstanding these assumptions and limitations, it is our view that this Traffic Impact Assessment provides the necessary framework to allow the developer to conduct activities within the necessary legal, planning and operational requirements set by the relevant road authority.

2 LAND USE RIGHTS, DEVELOPMENT AND ENVIRONS

2.1 CURRENT AND PROPOSED LAND –USE RIGHTS

Erf 2006, Parsonsvei measures approximately 3.1076ha in extent, is zoned Special Purposes No 232 (Warehouse/Workshop) and is currently vacant. An application to rezone the property to General Residential Zone 1 purposes will be submitted in due course. This TIA will address the impact of the proposed development on the surrounding road network.

The informal Town Planning Enquiry for erf 2006, Parsonsvei is attached as **Annexure A**.

2.2 DEVELOPMENT ENVIRONS

As can be seen from **Figure 1**, the development is situated on undeveloped land to the west and south of the Francis Evatt Park residential suburb in Parsonsvlei, Port Elizabeth. The land use abutting the site across to the north across the narrow-gauge railway line is vacant. Land use to the east across Burchell Drive is residential in nature and to the south is industrial and commercial (the NMBM Burchell Road depot and other related uses). The Curro Westbrook school is situated to the northeast on the corner of Burchell Road and Salerno Road. In general, further residential areas are situated to the northeast (Westbrook) and the northwest (Bridgemead).

2.3 OVERVIEW OF DEVELOPMENT

The proposed development comprises of 155 Residential apartments aimed at the middle-income residential market.

Access to the subject site is proposed on Burchell Road.

3 DATA COLLECTION

3.1 PEAK HOUR TRAFFIC VOLUMES

Peak hour traffic turning movement counts were conducted during typical weekday morning and evening peak periods on Tuesday, 19 March 2024, at the following intersections:

- Burchell Road / Cape Road
- Salerno Road / Cape Road

The detailed survey data is attached as **Annexure B** and summarised on **Figure 2** overleaf.

3.2 DAILY TRAFFIC VOLUMES

As this study will also analyse the impact of the development in 2030, under normal circumstances historical daily traffic volumes at count stations in the vicinity of the development would be sourced from the NMBM Transportation Planning Sub-Directorate in order to determine average traffic growth per annum.

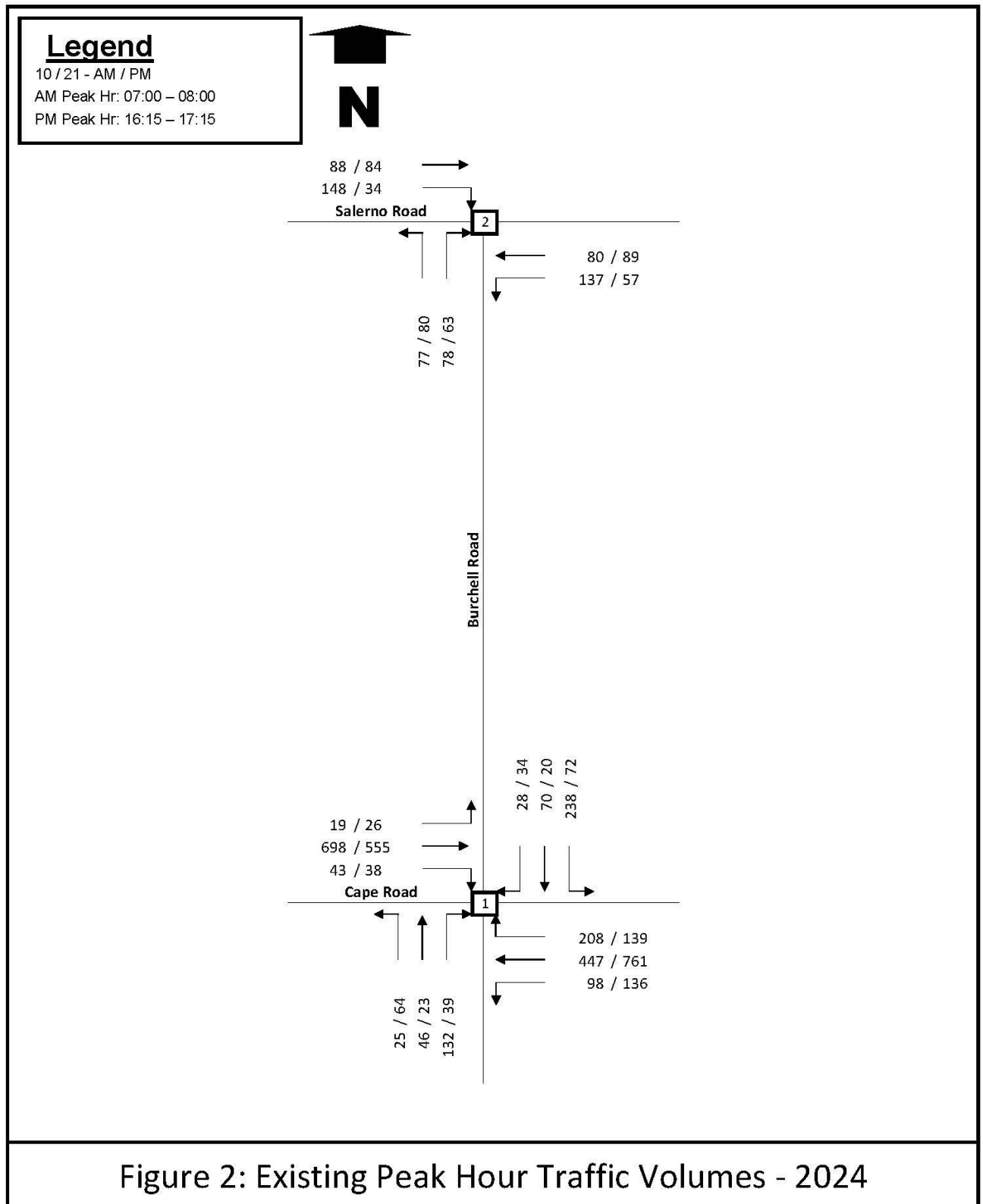
Unfortunately, the most recent counts conducted at the nearest stations – A32 on Cape Road at Papenkuils Street and A61 on Cape Road at Fife Avenue - were during 2007.

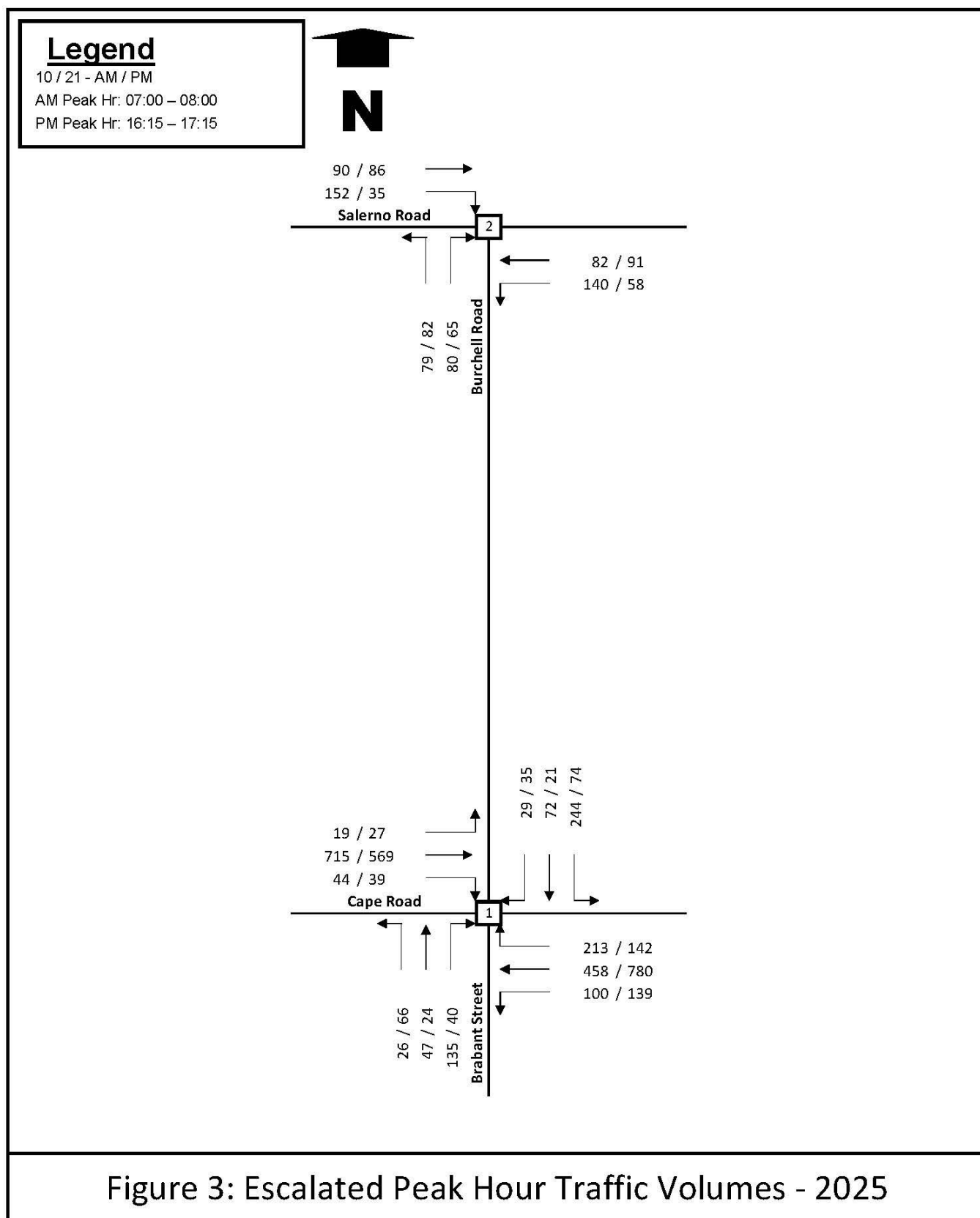
It is thus not possible to determine historic traffic growth given that no counts have been conducted for 17 years.

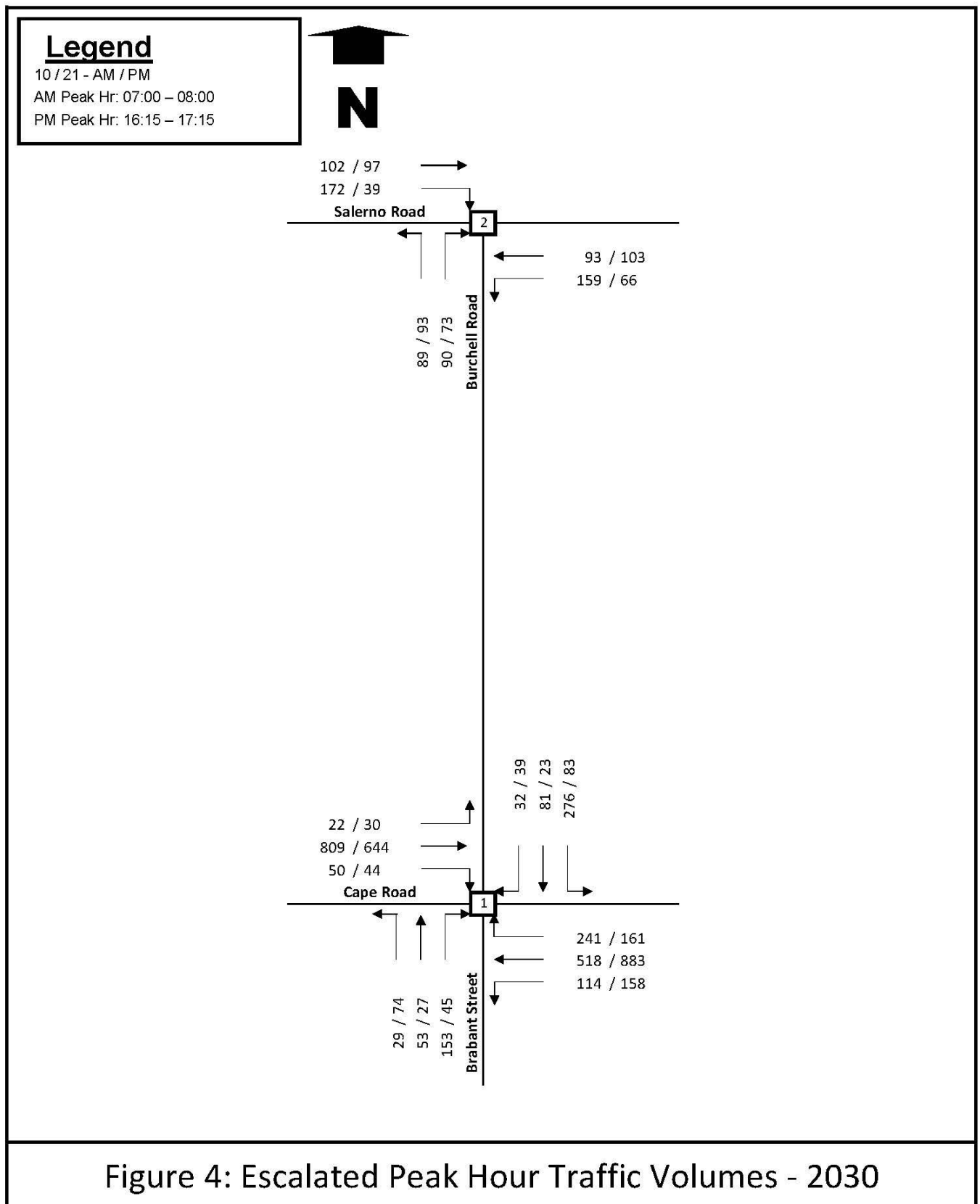
Given that there has been substantial development in the Westbrook and Bridgemean area near the proposed development, and that it is approaching its development potential it is considered that a growth rate of 2.5% per annum is reasonable.

A further consideration for the application of this growth rate is that the provision of the Bay West Boulevard link to the N2 has resulted in traffic volumes from the areas west of the development have relocated from Cape Road to the N2 increasing future capacity on Cape Road.

The background traffic volumes will thus be escalated by 2.5% per annum. The 2025 and 2030 escalated volumes are indicated on Error! Reference source not found. below and **Figure 4** overleaf respectively.







3.3 ROAD NETWORK

3.3.1 Existing

The existing road network and intersection configuration were roughly measured up using a tape measure and aerial photography. The primary road network can briefly be described as follows:

- **Cape Road** is a major east-west class 2 arterial road that serves as the main mobility link between the CBD and the western suburbs of Port Elizabeth. From the Kragga Kamma Road interchange to Burchell Road, Cape Road consists of two 3,7m wide traffic lanes and a 3m wide shoulder per direction separated by a 5m kerbed median with additional right turning lanes in the median on the approaches to intersections including Burchell Road. From Burchell Road to the west, Cape Road reduces to a single lane per direction.

The intersection of Burchell Road is traffic signal controlled.

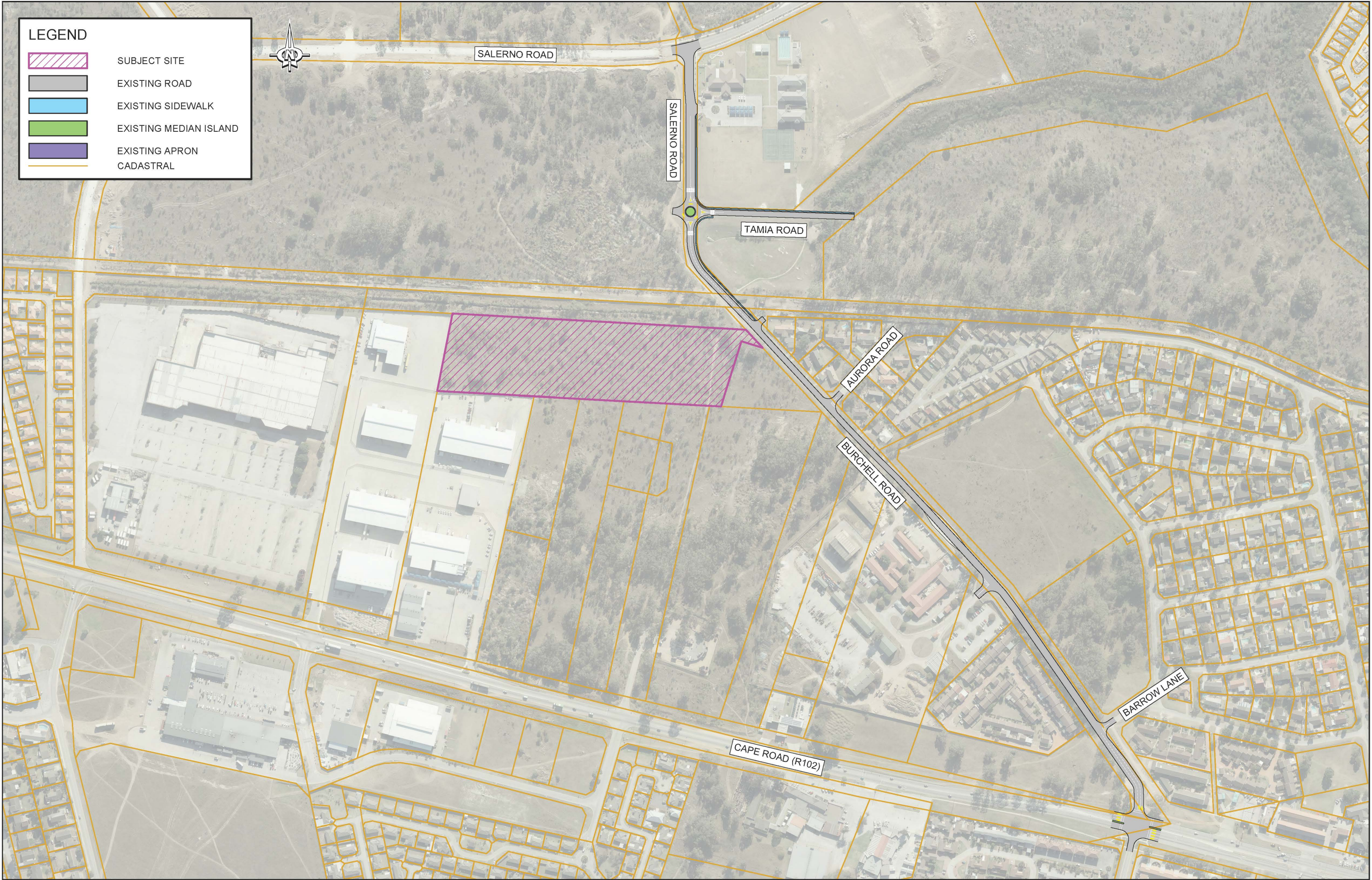
- **Burchell Road** is class 4b residential collector road linking Cape Road with Salerno Road and providing access to residential properties along its length. The road is kerbed and consists of a single 3.7m wide lane per direction with additional right-turn lanes approaching Cape Road and Salerno Road.
- **Salerno Road** is a class 4b residential collector road. The road is kerbed and is surfaced and comprises of a single 3.7m lane per direction with an additional 3.4m turning lane on the approach to Burchell Road.

The existing road and intersection configuration is indicated on **Figure 5**.



3.3.2 Future

The long-term road network proposals as contained in the Draft **NMBM Comprehensive Integrated Transport Plan 2023/2028** ⁽⁴⁾ make provision for the Diaz Road Arterial which follows an alignment to the north of Westbrooke and Bridgmead and will ultimately form part of an east-west corridor parallel with and to the north of Cape Road. The provision of this link will relieve pressure on Cape Road in the years to come.



FOR REPORT	AS BUILT NOTES		AMENDMENTS				SCALE	SCALE ON REDUCED DRAWING	DESIGN	CH	ENGINEERING ADVICE AND SERVICES associated with ULWAZI 73 Hleugh Road, Walmer P.O. Box 13867 Hunnewood Port Elizabeth 6013 tel/fax: (041) 581 2421		APPROVED	APPROVED	PROJECT TRAFFIC IMPACT ASSESSMENT FOR A RESIDENTIAL DEVELOPMENT ON ERF 2006, PARSONSVLEI, PORT ELIZABETH DWG DESCRIPTION FIGURE 5: EXISTING ROAD AND JUNCTION CONFIGURATION	CONTRACT NO.
	NO.	DATE	DESCRIPTION	APPROVED			DRAWN	EAR					DWG. NO.			
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3.4 SPATIAL DEVELOPMENT FRAMEWORK

Figure 6 below is an extract of the **Western Suburbs Spatial Development Framework** ⁽⁵⁾ prepared by Setplan on behalf of the Nelson Mandela Bay Municipality. The SDF provides for residential use in the area where the proposed development is situated.

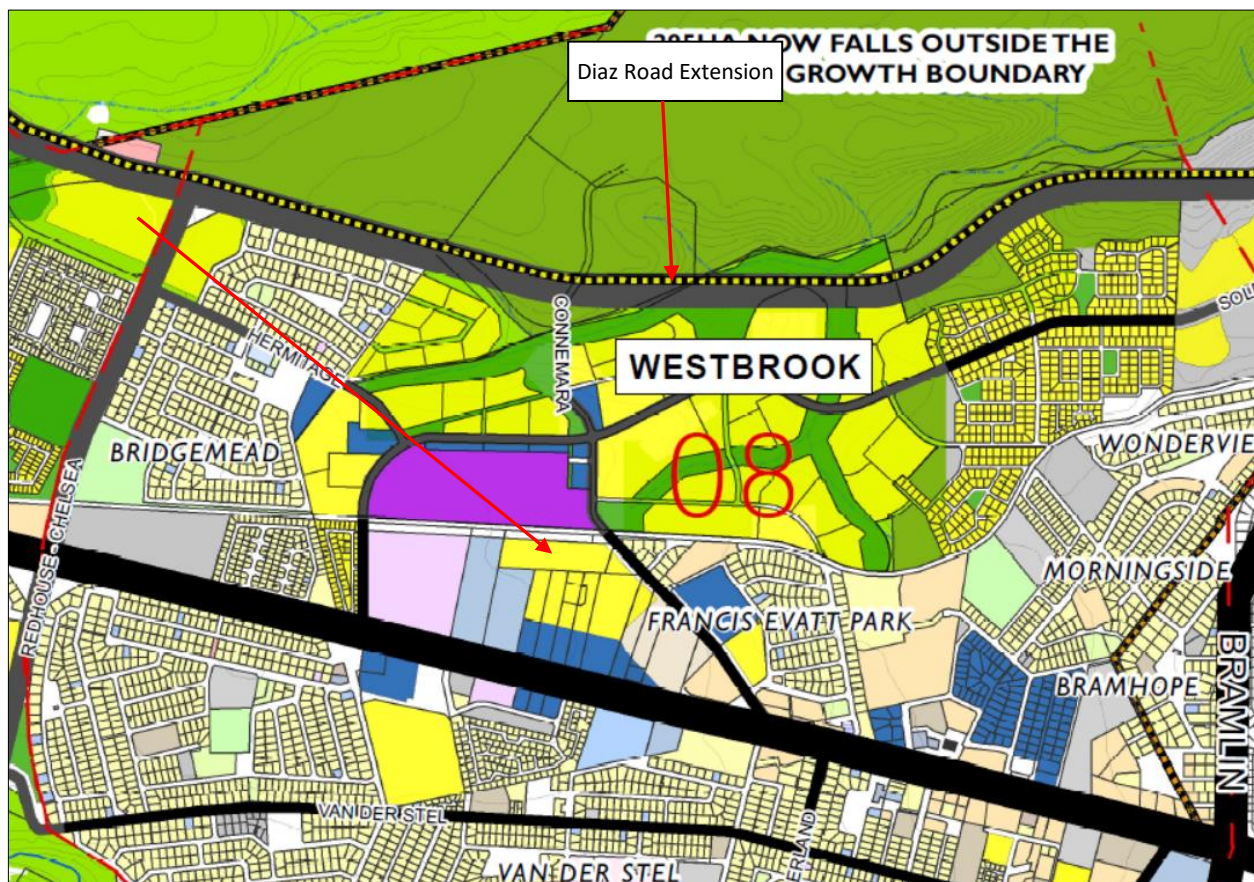


Figure 6: Western Suburbs Spatial Development Framework

3.5 PUBLIC TRANSPORT

No formal public transport facilities are in place in the immediate vicinity of the proposed development. However, public transport services in the form of scheduled bus and informal minibus taxi modes operate along Cape Road and on Salerno Road.

Public Transport stops are located along Cape Road and laybys along Burchell at regular intervals.

3.6 NON-MOTORISED TRANSPORT

Pedestrian sidewalks are provided along the southern side of Cape Road and on a short section of Burchell Road from Salerno Road to just south of the narrow-gauge railway.

A raised pedestrian crossing is also located on Burchell Road to the north of the narrow-gauge railway reserve.

4 CAPACITY ANALYSIS – BEFORE DEVELOPMENT

Level of Service (LOS) is defined as the operating condition that may occur at a junction when it accommodates various traffic volumes. LOS is a qualitative measure of the effect of speed, travel time, traffic interruptions, freedom to manoeuvre, safety, driving comfort and convenience, and operating costs. **LOS D** is considered an acceptable design standard. The LOS applicable to junctions under various control conditions, as defined in the **Highway Capacity Manual** ⁽⁶⁾ are indicated in **Table 1** below:

Table 1: Level of Service definitions for Vehicles (Highway Capacity Manual ⁽⁶⁾ method)

Level of Service	Control delay per vehicle in seconds (d) (Including geometric delay)		LOS Colour Rating
	Signals and Roundabouts	Stop Signs and Yield Signs	
A	$d \leq 10$	$d \leq 10$	Excellent
B	$10 < d \leq 20$	$10 < d \leq 15$	Very Good
C	$20 < d \leq 35$	$15 < d \leq 25$	Good
D	$35 < d \leq 55$	$25 < d \leq 35$	Acceptable
E	$55 < d \leq 80$	$35 < d \leq 50$	Poor
F	$80 < d$	$50 < d$	Very Poor

The traffic situation was analysed in order to determine the Level of Service at which the affected junctions would operate before development occurs for the 2024 and 2025 development horizons.

The capacity analysis was undertaken using the **SIDRA Intersection 9 Network** ⁽⁷⁾ capacity analysis method but applying the **Highway Capacity Manual** ⁽⁶⁾ gap acceptance criteria for unsignalised junctions.

The results are shown in **Table 2** and **Table 3** below and the detailed SIDRA output sheets attached as **Annexure C** and **D**.

Table 2: Results of Junction Capacity Analysis – 2024 Before Development

Intersection	Intersection				Side Road			
	Ave Delay (sec)		LOS *		Ave Delay (sec)		LOS	
	AM	PM	AM	PM	AM	PM	AM	PM
Cape / Burchell	23.4	14.1	C	B	39.0	21.9	D	C
Burchell / Salerno	19.4	16.2	C	C	21.1	17.6	C	C

* - **SIDRA Intersection Network** ⁽⁷⁾ does not calculate junction LOS for priority-controlled junctions. The LOS indicated is sourced from the **Highway Capacity Manual** ⁽⁶⁾ (Table 1 above).

Table 3: Results of Junction Capacity Analysis – 2025 Before Development

Intersection	Intersection				Side Road			
	Ave Delay (sec)		LOS *		Ave Delay (sec)		LOS	
	AM	PM	AM	PM	AM	PM	AM	PM
Cape / Burchell	23.9	14.0	C	B	39.6	22.5	D	C
Burchell / Salerno	19.7	16.3	C	C	21.3	17.7	C	C

* - **SIDRA Intersection Network** ⁽⁷⁾ does not calculate junction LOS for priority-controlled junctions. The LOS indicated is sourced from the **Highway Capacity Manual** ⁽⁶⁾ (Table 1 above).

As can be seen from the results contained in **Table 2** and **Table 3** no capacity problems are experienced at the affected junctions for the 2024 and 2025 before development horizons.

5 TRIP GENERATION AND DISTRIBUTION

5.1 TRIP GENERATION

TMH 17 Volume 1 - South African Trip Data Manual ⁽²⁾ recommends weekday AM and PM peak hour trip generation rates of 0.85 vehicle trips / unit for townhouse complexes

Given the development parameters this relates to the following peak hour trip generation.

$$\begin{aligned}
 \text{Townhouses (231)} &= 0.85 \text{ trip} * \text{no. of units} \\
 &= 0.85 * 155 \\
 &= \mathbf{132 \text{ trips (in and out)}}
 \end{aligned}$$

$$\begin{aligned}
 \text{Split (in / out)} &= 25 : 75 \text{ (AM)} \\
 &= 70 : 30 \text{ (PM)}
 \end{aligned}$$

5.1.1 Summary of Generated Trips

The trips generated by the development components are summarised in **Table 4** below.

Table 4: Summary of Development Generated Trips

Land Use Type	IN		OUT	
	AM	PM	AM	PM
Townhouses (231)	33	92	99	40

5.2 TRIP DISTRIBUTION

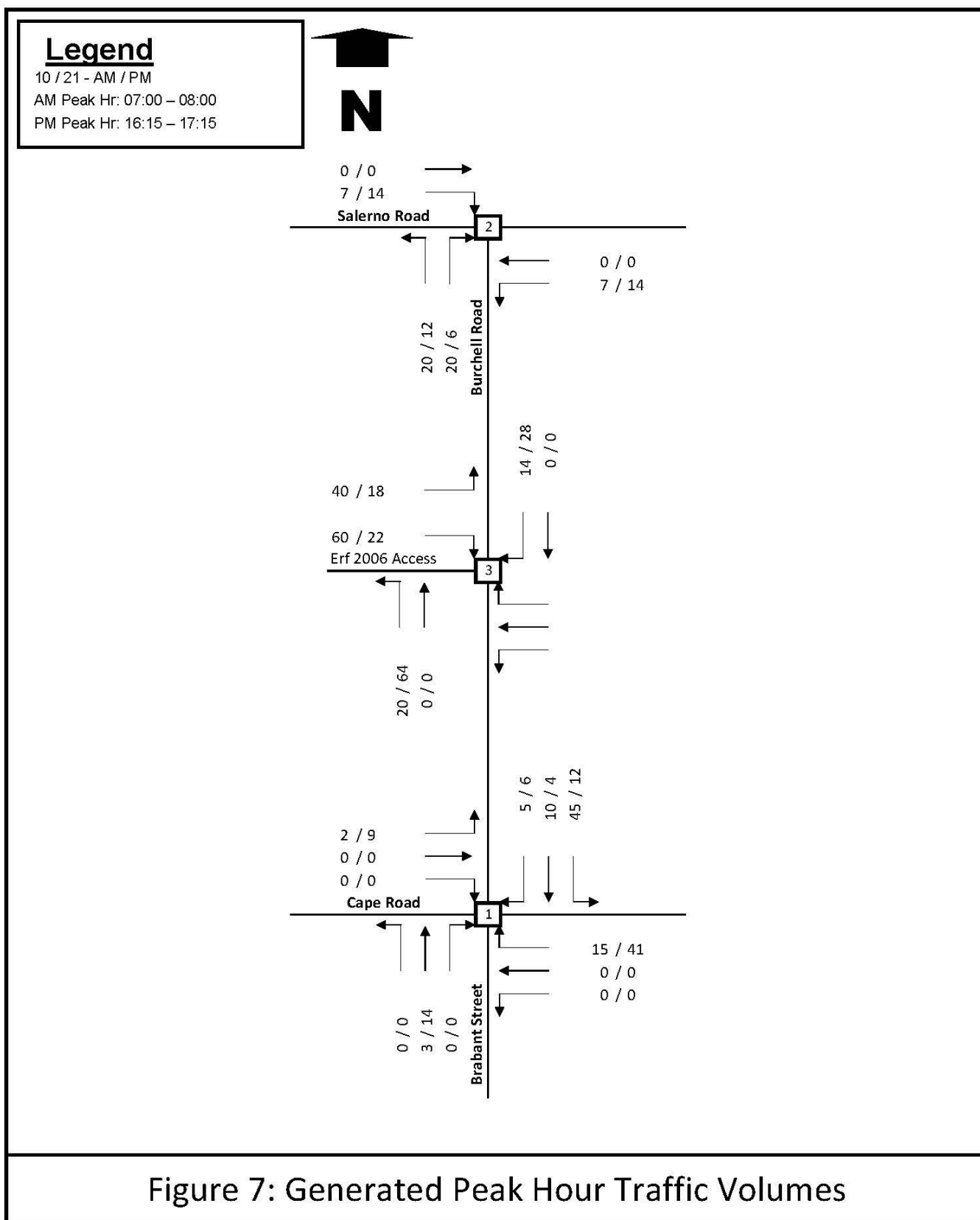
The distribution of trips to and from the development were determined by using the observed traffic flows at the surveyed intersections as a basis, as well as the location of employment areas in relation to the development.

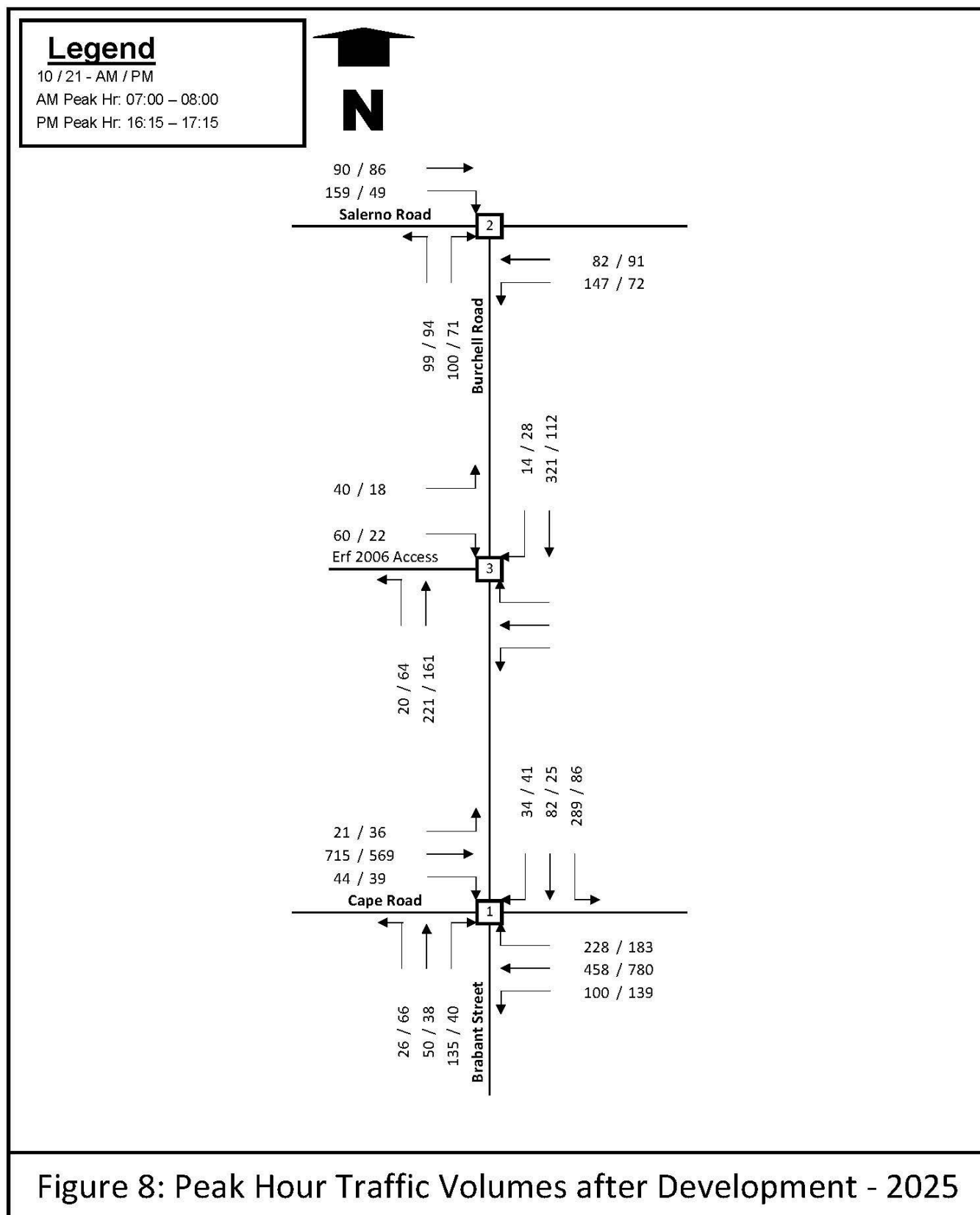
The distribution indicated in **Table 5** has been assumed:

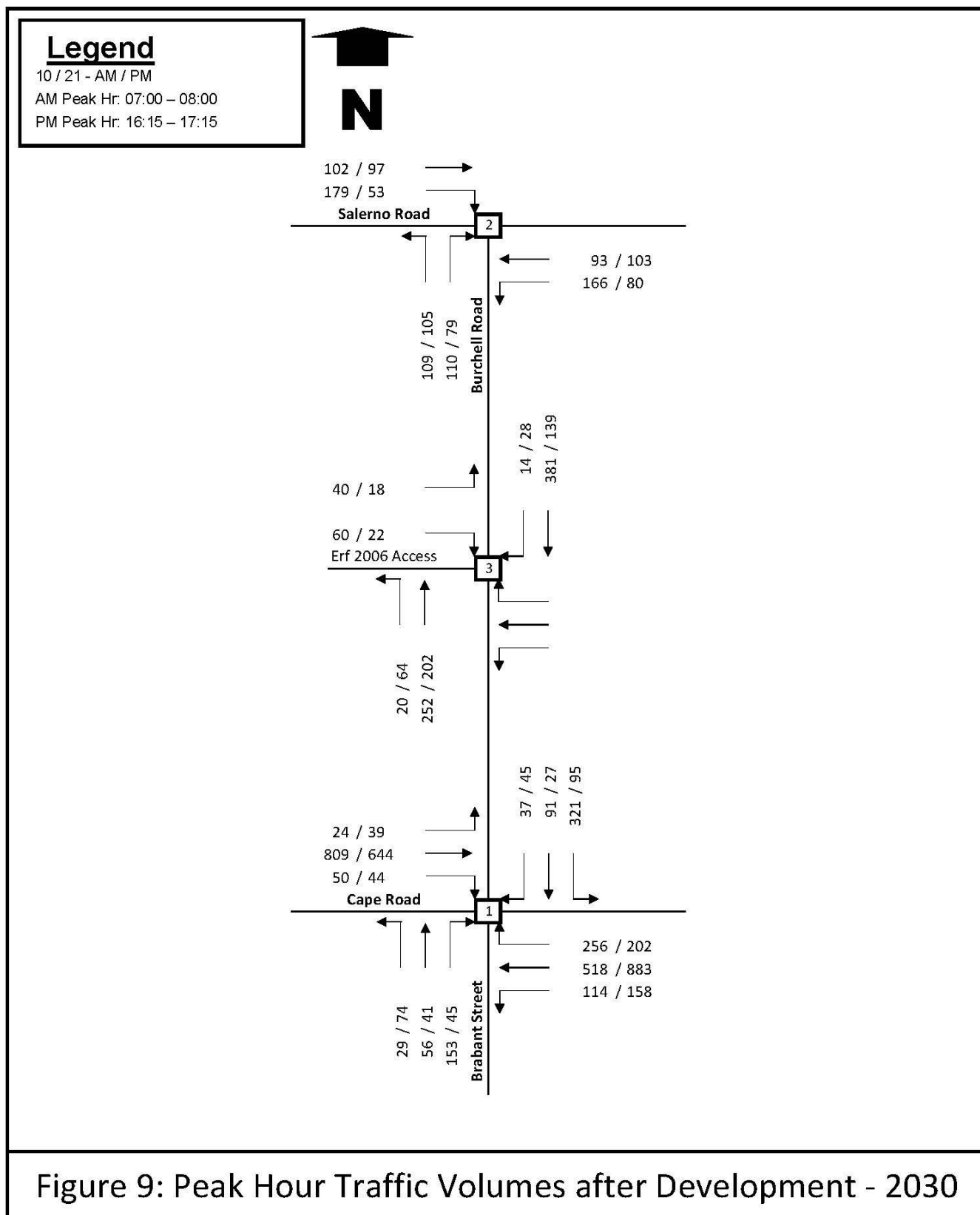
Table 5: Summary of Trip Distribution

Route	AM Peak		PM Peak	
	IN %	OUT %	IN %	OUT %
East via Burchell Road and Cape Road	45	25	45	30
West via Burchell Road and Cape Road	5	10	10	15
South via Burchell Road and Brabant Street	10	5	15	10
East via Burchell Road and Salerno Road	20	30	15	15
West via Burchell Road and Salerno Road	20	30	15	30
Total	100	100	100	100

Using these assignments, the projected traffic volumes generated by the development are indicated on **Figure 7** and the projected volumes added to the escalated 2025 and 2030 background traffic volumes are indicated on **Figure 8** and **Figure 9** respectively overleaf.







6 ACCESS ARRANGEMENTS

6.1 LOCATION AND SIGHT DISTANCE

Access to the development is proposed from Burchell Road as indicated on **Figure 10**.

TRH 26: South African Road Classification and Access Management Manual ⁽³⁾ makes provision for access spacing of 150 to 250m on Class 4b roads. The proposed access is located 150m from Tamia and Aurora Roads and thus meets the requirement.

In terms of the **Geometric Design Guidelines** ⁽⁸⁾ shoulder sight distance for a stop condition to accommodate a semi-trailer vehicle on a road with a posted speed limit of 60km/h is 192m. A passenger car requires 125m.

The available sight distance from the proposed access exceeds 192m –and thus meets the requirements.



6.2 ACCESS CONFIGURATION

The access point was assessed in terms of in terms of TRH26: South African Road Classification and Access Management Manual ⁽³⁾.

Given that a maximum of 132 peak hour trips would be generated by the development, of which a maximum of 92 trips would enter during the PM peak hour, this relates to between 1 and 2 vehicles entering the site every minute (one vehicle every 40 seconds).

Service flow rates at access-controlled entrances in vehicles / hour from Table 30 of **TMH 16 Vol 2 - South African Traffic Impact and Site Assessment Standards and Requirements Manual** ⁽⁹⁾ are indicated in **Error! Reference source not found.** below.

As noted, the flow rates range from the slowest throughput – 50 vph in the case of intercom operated gates to 480 vph in the case of swiping magnetic cards. The higher the service flow rate, the less likely that there will be congestion at the entrance.

Table 6: Access Control Service Flow Rates

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

The number of entry lanes and the number of vehicles queuing in each lane are calculated after determining a Traffic Ratio over all entry lanes using the following formula:

$$\text{Traffic ratio} = \frac{\text{Total Volume / PHF}}{\text{Service flow rate}} \cdot 100$$

The number of lanes and queue length is then determined from **Table 7** below (Table 31 in TM16 Vol 2).

Table 7: Access Control Queue Lengths

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

Given a peak hour volume of 92 vehicles entering the residential development the traffic ratios for each control type are indicated in **Table 8** overleaf.

Table 8: Access Control Queue Lengths for erf 2206, Parsonsvei

Peak Hour Trips - IN	92	Traffic ratio	Table 5	Q- Length Veh	Lanes Required	Q- Length m
Access Control Options	Flow - Vph					
Swipe Magnetic card	480	21.3	23	1	1	6.5
Remote controlled gates	450	22.7	23	1	1	6.
Pin number operated gates	150	68.1	70	2	2	13
Cell-phone operated gates (gate opens when a call is received)	100	102.2	115	3	2	19.5
Manual Recording (Visitor Completes form)	80	127.8	128	4	2	2
Intercom Operated Gates (Visitor contacts resident by Intercom)	50	204	205	4	3	-26

Provision has been made for two lanes with a stacking distance of 4 vehicles per lane.

Table 8Error! Reference source not found. above indicates that 2 lanes with a queue length of 26m (4 vehicles at 6.5m each) is required to ensure that vehicles queueing to enter the proposed development do not impact on Burchell Drive when using any of the access arrangements apart from intercom operation.

The access arrangements and layout are indicated on **Figure 10**.

7 CAPACITY ANALYSIS – AFTER DEVELOPMENT

7.1 2025 AFTER DEVELOPMENT

After adding generated peak hour traffic volumes to the peak hour volumes, the traffic situation was analysed in order to determine the LOS at which the affected junctions and access point would operate during a normal month-end weekend after development occurs.

The results are shown in **Table 9** below and the detailed SIDRA output sheets attached as **Annexure E**.

Table 9: Results of Junction Capacity Analysis – 2025 After Development

Intersection	Intersection				Side Road			
	Ave Delay (sec)		LOS *		Ave Delay (sec)		LOS	
	AM	PM	AM	PM	AM	PM	AM	PM
Cape / Burchell	24.4	14.9	C	B	40.8	24.8	D	C
Burchell / Salerno	21.4	16.8	C	C	28.2	18.0	D	C
Burchell / Erf 2006	1.6	2.1	A*	A*	8.6	7.2	A*	A*

* - **SIDRA Intersection Network** ⁽⁷⁾ does not calculate junction LOS for priority-controlled junctions. The LOS indicated is sourced from the **Highway Capacity Manual** ⁽⁶⁾ (Table 1 above).

As can be seen from the results contained in **Table 9**, the additional traffic generated by the proposed residential development has little or no impact on the operation of the affected junctions in terms of capacity.

7.2 2030 AFTER DEVELOPMENT

After adding generated peak hour traffic volumes to the escalated background peak hour volumes during a typical normal month-end weekend, the traffic situation was analysed in order to determine the LOS at which the affected junctions and access point would operate after development occurs for the 2029 development horizon.

The results are shown in **Table 10** below and the detailed SIDRA output sheets attached as **Annexure F**.

Table 10: Results of Junction Capacity Analysis – 2030 After Development

Intersection	Intersection				Side Road			
	Ave Delay (sec)		LOS *		Ave Delay (sec)		LOS	
	AM	PM	AM	PM	AM	PM	AM	PM
Cape / Burchell	24.5	15.9	C	B	48.6	31.1	D	C
Burchell / Salerno	23.2	26.1	C	D	32.1	44.1	D	E
Burchell / Erf 2006	1.5	1.9	A*	A*	9.4	7.5	A*	A*

* - **SIDRA Intersection Network** ⁽⁷⁾ does not calculate junction LOS for priority-controlled junctions. The LOS indicated is sourced from the **Highway Capacity Manual** ⁽⁶⁾ (Table 1 above).

As can be seen from the results contained in **Table 10**, when considering escalated background traffic and the additional traffic generated by the development has little or no impact on the operation of the affected junctions in terms of capacity.

LEGEND

SUBJECT SITE

EXISTING ROAD

EXISTING SIDEWALK

EXISTING MEDIAN ISLAND

EXISTING APRON

PROPOSED ROAD

CADASTRAL



REFER TO ARCHITECT
LAYOUT FOR DETAILS



FOR REPORT	AS BUILT - NOTES				AMENDMENTS				SCALE	SCALE ON REDUCED DRAWING	DESIGN	CH	ENGINEERING ADVICE AND SERVICES associated with ULWAZI 73 Heugh Road, Walmer P.O. Box 13867 Hunewood Port Elizabeth 6013 tel/fax: (041) 581 2421 	APPROVED	APPROVED	PROJECT TRAFFIC IMPACT ASSESSMENT FOR A RESIDENTIAL DEVELOPMENT ON ERF 2006, PARSONSVLEI, PORT ELIZABETH DWG DESCRIPTION FIGURE 10: PROPOSED SITE LAYOUT AND ACCESS CONFIGURATION	CONTRACT NO.
	NO.	DATE	DESCRIPTION	APPROVED			DRAWN	EAR			ENGINEER	CLIENT		DWG.NO. 2242-P-010 ISSUE </			

8 PUBLIC TRANSPORT OPERATIONS AND PEDESTRIAN ARRANGEMENTS

No additional public transport facilities are required.

Provision for pedestrian movement has been made on the site to access buildings.

The proposals are indicated on Figure 10.

9 PARKING AND SERVICE VEHICLE REQUIREMENTS

9.1 PARKING REQUIREMENTS

The parking requirement as specified in the NMBM Zoning Scheme (based on National Department of Transport standards ^(10Error! Reference source not found.)) for residential developments ranges from 1 to 1.5 bays plus 0.5 bays visitor bays per unit depending on the number of habitable rooms in the unit.

2 bays per unit will be provided for each unit. The required parking bays will be indicated on the site development plan.

9.2 SERVICE VEHICLE REQUIREMENTS

Suitable arrangements have been made to accommodate service vehicles in the development layout vehicles will be able to access the development from Burchell Road.

10 CONCLUSIONS

The following conclusions can thus be drawn from the study:

- Based on historical growth per annum and development potential in the area background traffic can escalate at 2.5% per annum;
- Under existing traffic conditions no problems are experienced at the affected junctions in terms of capacity;
- The proposed development generates a total of 132 peak hour vehicle trips during typical weekday AM and PM peak hours;
- Access to the development can safely be accommodated from Burchell Road as indicated on **Figure 10**;
- Provision for two entering lanes with a stacking distance of 4 vehicles per lane is sufficient to accommodate all control options apart from intercom operation;
- Additional traffic generated by the proposed development has little impact on the affected intersections, thus the additional traffic will not significantly reduce available intersection capacity.
- When considering the traffic generated by the proposed development added to escalated background traffic volumes, the affected intersections and access point all operate at acceptable Levels of Service in terms of capacity for the 2025 development horizon;
- When considering the traffic generated by the proposed development added to escalated background traffic volumes, the affected intersections and access point all operate at acceptable Levels of Service in terms of capacity for the 2030 development horizon apart from the Cape Road / Burchell Road intersection which operates at LOS F during the PM peak hour;
- Thus no improvements are required at the affected intersections due to the additional traffic generated by the proposed development.

11 RECOMMENDATIONS

In view of the findings of this study, it is recommended that:

- This TIA be approved by the Nelson Mandela Bay Municipality;
- The access to the proposed development on Burchell Road be configured as indicated on **Figure 10**; and
- All costs related to the provision of the access points, including the provision of road signs and markings are to be met by the developer.

12 REFERENCES

1. Joubert, Sampson, et al, **TMH 16 Volume 1- South African Traffic Impact and Site Assessment Manual**, COTO, September 2013.
2. Joubert, Sampson, et al, **TMH 17 Volume 1- South African Trip Data Manual**, COTO, September 2013.
3. COTO, **TRH 26 - South African Road Classification and Access Management Manual**, SANRAL, August 2012.
4. RGM Consortium, **NMBM Comprehensive Integrated Transport Plan 2023/2028**, NMBM, November 2023.
5. Setplan, **Western Suburbs Local Spatial Development Framework**, NMBM, 2011.
6. Transportation Research Board, **Highway Capacity Manual**, 2000.
7. Akcelik & Associates (Pty) Ltd, **SIDRA Junction Network 9.1 User Guide**, SIDRA Solutions, April 2023.
8. CSIR, **Geometric Design Guidelines**, National Roads Agency, 2009,
9. Joubert, Sampson, et al, **TMH 16 Volume 2- South African Traffic Impact and Site Assessment Standards and Requirements Manual**, COTO, September 2013.
10. Bruinette Kruger Stoffberg Inc, **Parking Standards (Second Edition)**, Department of Transport, November 1985.

ANNEXURE A
Land Use
Rights

INFORMAL TOWN PLANNING ENQUIRY

Allotment Area:	PARSONSVLEI	Erf Number:	2006	Sub Number:	0
Consolidated:		Subdivided:			
Area:	31076 m2	Proclaimed Main Road:	-	History:	#
Lease:	-	Structure Plan:	0	Registered:	#
Noting Sheet:	DIAGRAM 5971/94	Habital Rooms:		Parking:	#
Consent:	-	N-Tie:	N	Corner:	#
	-	CBD:	N		

Zone Information:

Zone	Building Line	Coverage	Side and Rear Space	Height Restriction	Density	RVA	NCU	FSI	Area (m2)
SPURP	#	50	#	#	#	#	#	0.50	31,076.00

TPA Numbers

| 1374 (Approved) |

Notes:

SEE TPA 1374 FOR MORE DETAILS

CONSOLIDATION OF ERVEN 16 AND 2004.

ZONED SPECIAL PURPOSES NO. 232 (WAREHOUSE/WORKSHOP) ON APPEAL

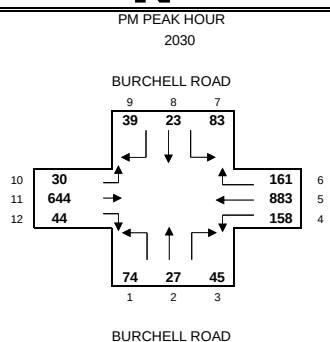
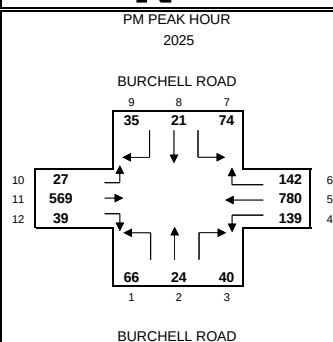
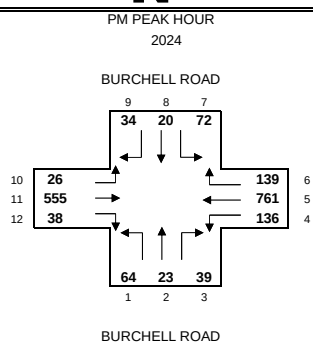
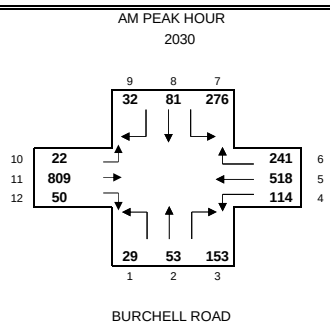
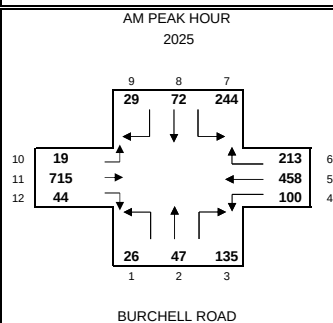
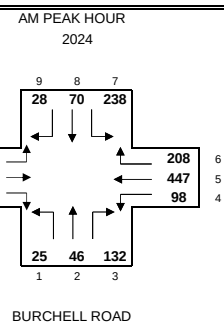
AREA = 3,1076HA

ANNEXURE B
Peak Hour
Traffic Counts

Project : TIA : PROPOSED DEVELOPMENT ON ERF 2006, PARSONSVLEI																Day & date : 19/03/2024			
Intersection : CAPE ROAD / BURCHELL ROAD																NO. 1		Time period: 06:00 - 09:00	
STARTING TIME	BURCHELL ROAD Northbound				CAPE ROAD Westbound				BURCHELL ROAD Southbound				CAPE ROAD Eastbound				INTER-SECTION		
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	Hour	
6:00	2	0	12	14	1	27	2	30	6	1	1	8	2	58	1	61	113		
6:15	2	2	17	21	6	73	7	86	18	2	1	21	3	121	1	125	253		
6:30	3	8	46	57	12	71	14	97	37	7	4	48	5	176	4	185	387		
6:45	8	7	36	51	12	73	21	106	33	10	5	48	6	182	9	197	402	1155	
7:00	7	12	48	67	23	84	59	166	45	13	6	64	5	195	6	206	503	1545	
7:15	7	16	31	54	22	119	70	211	56	22	9	87	5	224	14	243	595	1887	
7:30	6	10	29	45	39	120	58	217	68	22	4	94	2	145	16	163	519	2019	
7:45	5	8	24	37	14	124	21	159	69	13	9	91	7	134	7	148	435	2052	
8:00	6	3	21	30	64	114	15	193	24	2	5	31	3	132	3	138	392	1941	
8:15	4	2	17	23	58	96	10	164	22	11	7	40	4	113	1	118	345	1691	
8:30	3	3	4	10	5	70	5	80	9	0	2	11	2	82	3	87	188	1360	
8:45	2	2	11	15	9	92	8	109	18	3	1	22	3	117	5	125	271	1196	
Total	55	73	296	424	265	1063	290	1618	405	106	54	565	47	1679	70	1796	4403		
Peak hour	25	46	132	203	98	447	208	753	238	70	28	336	19	698	43	760	2052		
Peak 15 min				67				217				94				243	595		
PHF				0.76				0.87				0.89				0.78	0.86		

67

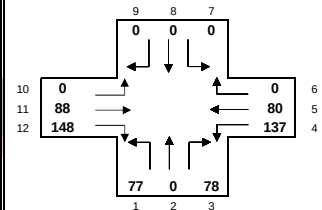
Project : TIA : PROPOSED DEVELOPMENT ON ERF 2006, PARSONSVLEI																Day & date : 19/03/2024							
Intersection : CAPE ROAD / BURCHELL ROAD																NO. 1				Time period: 15:00 - 18:00			
STARTING TIME	BURCHELL ROAD Northbound					CAPE ROAD Westbound					BURCHELL ROAD Southbound					CAPE ROAD Eastbound					INTER-SECTION		
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	Hour					
15:00	15	2	13	30	16	129	23	168	24	6	7	37	7	116	6	129	364						
15:15	14	3	6	23	15	145	21	181	23	3	4	30	7	131	6	144	378						
15:30	8	5	11	24	13	158	18	189	14	5	6	25	6	110	10	126	364						
15:45	7	5	9	21	16	129	25	170	35	6	8	49	3	120	10	133	373	1479					
16:00	4	4	15	23	21	171	25	217	19	4	8	31	3	134	6	143	414	1529					
16:15	15	3	11	29	28	157	29	214	29	5	8	42	6	131	5	142	427	1578					
16:30	14	3	6	23	38	209	30	277	14	6	11	31	4	148	10	162	493	1707					
16:45	19	7	11	37	33	195	49	277	13	6	3	22	2	128	11	141	477	1811					
17:00	16	10	11	37	37	200	31	268	16	3	12	31	14	148	12	174	510	1907					
17:15	8	6	7	21	34	184	19	237	9	6	5	20	5	129	14	148	426	1906					
17:30	11	8	12	31	25	235	38	298	15	11	6	32	8	128	7	143	504	1917					
17:45	8	7	7	22	15	125	6	146	8	3	7	18	8	112	9	129	315	1755					
Total	139	63	119	321	291	2037	314	2642	219	64	85	368	73	1535	106	1714	4730						
Peak hour	64	23	39	126	136	761	139	1036	72	20	34	126	26	555	38	619	1907						
Peak 15 min				37				277				42				174	510						
PHF				0.85				0.94				0.75				0.89	0.93						



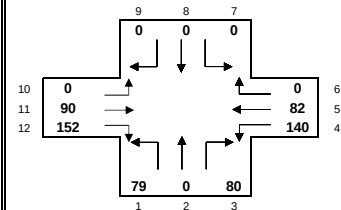
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Intersection : BURCHELL ROAD / SALERNO ROAD NO. 2										Time period: 06:00 - 09:00									
STARTING TIME	BURCHELL ROAD Northbound				SALERNO ROAD Westbound				- Southbound				SALERNO ROAD Eastbound				INTER-SECTION		
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	Hour	
6:00	5	0	1	6	1	3	0	4	0	0	0	0	0	6	5	11	21		
6:15	2	0	5	7	6	17	0	23	0	0	0	0	0	7	18	25	55		
6:30	5	0	7	12	12	16	0	28	0	0	0	0	0	17	14	31	71		
6:45	4	0	5	9	18	15	0	33	0	0	0	0	0	20	25	45	87	234	
7:00	18	0	17	35	34	17	0	51	0	0	0	0	0	32	25	57	143	356	
7:15	15	0	18	33	45	20	0	65	0	0	0	0	0	25	52	77	175	476	
7:30	26	0	23	49	43	23	0	66	0	0	0	0	0	21	51	72	187	592	
7:45	18	0	20	38	15	20	0	35	0	0	0	0	0	10	20	30	103	608	
8:00	5	0	9	14	4	15	0	19	0	0	0	0	0	8	7	15	48	513	
8:15	4	0	3	7	7	9	0	16	0	0	0	0	0	9	9	18	41	379	
8:30	3	0	3	6	3	8	0	11	0	0	0	0	0	2	7	9	26	218	
8:45	5	0	5	10	4	9	0	13	0	0	0	0	0	8	9	17	40	155	
Total	110	0	116	226	192	172	0	364	0	0	0	0	0	165	242	407	997		
Peak hour	77	0	78	155	137	80	0	217	0	0	0	0	0	88	148	236	608		
Peak 15 min				49				66								77	187		
PHF				0.79				0.82				#####				0.77	0.81		

49

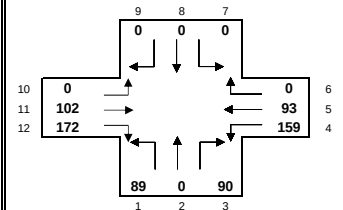
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Intersection : BURCHELL ROAD / SALERNO ROAD										NO. 2										Time period: 15:00 - 18:00									
STARTING TIME	BURCHELL ROAD Northbound				SALERNO ROAD Westbound				- Southbound				SALERNO ROAD Eastbound				INTER-SECTION												
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	Hour											
15:00	12	0	10	22	13	11	0	24	0	0	0	0	0	15	11	26	72												
15:15	10	0	8	18	11	8	0	19	0	0	0	0	0	10	11	21	58												
15:30	10	0	14	24	7	12	0	19	0	0	0	0	0	24	7	31	74												
15:45	11	0	12	23	5	13	0	18	0	0	0	0	0	10	15	25	66	270											
16:00	18	0	4	22	7	22	0	29	0	0	0	0	0	18	11	29	80	278											
16:15	18	0	16	34	17	21	0	38	0	0	0	0	0	22	14	36	108	328											
16:30	16	0	12	28	10	12	0	22	0	0	0	0	0	18	9	27	77	331											
16:45	25	0	14	39	11	33	0	44	0	0	0	0	0	18	7	25	108	373											
17:00	21	0	21	42	19	23	0	42	0	0	0	0	0	26	4	30	114	407											
17:15	12	0	16	28	5	14	0	19	0	0	0	0	0	21	7	28	75	374											
17:30	19	0	7	26	12	18	0	30	0	0	0	0	0	17	10	27	83	380											
17:45	13	0	9	22	10	23	0	33	0	0	0	0	0	15	8	23	78	350											
Total	185	0	143	328	127	210	0	337	0	0	0	0	0	214	114	328	915												
Peak hour	80	0	63	143	57	89	0	146	0	0	0	0	0	84	34	118	407												
Peak 15 min				42				44								36	114												
PHF				0.85				0.83				#####				0.82	0.89												

AM PEAK HOUR
2024

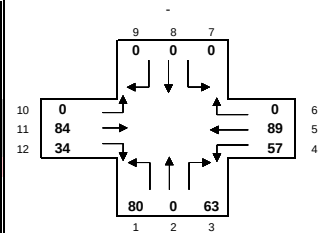
BURCHELL ROAD

AM PEAK HOUR
2025

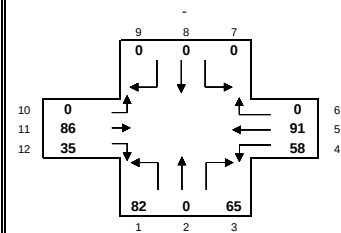
BURCHELL ROAD

AM PEAK HOUR
2030

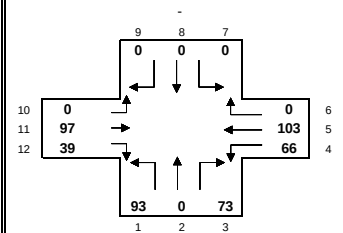
BURCHELL ROAD

PM PEAK HOUR
2024

BURCHELL ROAD

PM PEAK HOUR
2025

BURCHELL ROAD

PM PEAK HOUR
2030

BURCHELL ROAD

ANNEXURE C
SIDRA
OUTPUT
SHEETS 2024
Before
Development

Site: 101 [[01] 01 PM ND (Site Folder: Before Development - 2024)]

TIA for Proposed Residential Development on erf 2006, Parsonsvlei
2024 AM Before Development
Site Category: Base Year
Signals - Actuated Coordinated Cycle Time = 66 seconds (Site Practical Cycle Time)

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
 Vehicle movement LOS values are based on average delay per movement.
 Intersection and Approach LOS values are based on average delay for all vehicle movements.
 Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
 Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
 Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
 Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Brabant Street												
P1	Full	50	53	27.3	LOS C	0.1	0.1	0.91	0.91	181.2	200.0	1.10
East: Cape Road												

P2	Full	50	53	27.3	LOS C	0.1	0.1	0.91	0.91	181.2	200.0	1.10
North: Burchell Drive												
P3	Full	50	53	27.3	LOS C	0.1	0.1	0.91	0.91	181.2	200.0	1.10
West: Cape Road												
P4	Full	50	53	27.3	LOS C	0.1	0.1	0.91	0.91	181.2	200.0	1.10
All		200	211	27.3	LOS C	0.1	0.1	0.91	0.91	181.2	200.0	1.10
Pedestrians												

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY



Site: 101v [[01] 02 AM ND - Conversion (Site Folder: Before Development - 2024)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

TIA for Proposed Residential Development on erf 2006, Parsonsvei
2024 AM Before Development
Site Category: Base Year
Stop (All-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	Dist] m				
			veh/h		veh/h		v/c	sec							km/h
South: Burchell Drive															
1	L2	All MCs	81	2.5	81	2.5	0.269	22.4	LOS C	1.0	7.4	0.96	1.22	2.29	43.5
3	R2	All MCs	82	2.5	82	2.5	0.242	19.9	LOS C	0.9	6.5	0.94	1.21	2.23	44.7
Approach			163	2.5	163	2.5	0.269	21.1	LOS C	1.0	7.4	0.95	1.22	2.26	44.1
East: Salerno Road															
4	L2	All MCs	144	2.5	144	2.5	0.527	23.3	LOS C	2.6	18.9	0.96	1.38	2.99	43.1
5	T1	All MCs	84	2.5	84	2.5	0.527	23.0	LOS C	2.6	18.9	0.96	1.38	2.99	43.1
Approach			228	2.5	228	2.5	0.527	23.2	LOS C	2.6	18.9	0.96	1.38	2.99	43.1
West: Salerno Road															
11	T1	All MCs	93	2.5	93	2.5	0.185	14.6	LOS B	0.6	4.5	0.84	1.22	2.05	47.9
12	R2	All MCs	156	2.5	156	2.5	0.283	15.0	LOS C	1.0	7.5	0.84	1.24	2.21	47.4
Approach			248	2.5	248	2.5	0.283	14.9	LOS B	1.0	7.5	0.84	1.23	2.15	47.6
All Vehicles			640	2.5	640	2.5	0.527	19.4	LOS C	2.6	18.9	0.91	1.28	2.48	45.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: 101 [[01] 02 AM ND (Site Folder: Before Development - 2024)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

TIA for Proposed Residential Development on erf 2006, Parsonsvei
2024 AM Before Development
Site Category: Base Year
Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	Dist] m				
			veh/h		veh/h		v/c	sec							km/h
South: Burchell Drive															
1	L2	All MCs	81	2.5	81	2.5	0.062	8.4	LOS A	0.2	1.8	0.19	0.89	0.19	51.0
3	R2	All MCs	82	2.5	82	2.5	0.129	11.3	LOS B	0.5	3.6	0.51	0.94	0.51	49.3
Approach			163	2.5	163	2.5	0.129	9.9	LOS A	0.5	3.6	0.35	0.91	0.35	50.1
East: Salerno Road															
4	L2	All MCs	144	2.5	144	2.5	0.122	5.6	LOS A	0.0	0.0	0.00	0.37	0.00	54.4
5	T1	All MCs	84	2.5	84	2.5	0.122	0.0	LOS A	0.0	0.0	0.00	0.37	0.00	56.7
Approach			228	2.5	228	2.5	0.122	3.5	NA	0.0	0.0	0.00	0.37	0.00	55.2
West: Salerno Road															
11	T1	All MCs	93	2.5	93	2.5	0.048	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
12	R2	All MCs	156	2.5	156	2.5	0.109	6.3	LOS A	0.5	3.6	0.35	0.59	0.35	51.7
Approach			248	2.5	248	2.5	0.109	4.0	NA	0.5	3.6	0.22	0.37	0.22	54.5
All Vehicles			640	2.5	640	2.5	0.129	5.3	NA	0.5	3.6	0.17	0.51	0.17	53.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: 101v [[01] 02 PM ND - Conversion (Site Folder: Before Development - 2024)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

TIA for Proposed Residential Development on erf 2006, Parsonsvlei
2024 AM Before Development
Site Category: Base Year
Stop (All-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh.]	Dist]				
			veh/h		veh/h		v/c	sec		veh	m				km/h
South: Burchell Drive															
1	L2	All MCs	84	2.5	84	2.5	0.209	17.4	LOS C	0.7	5.3	0.90	1.20	2.14	46.2
3	R2	All MCs	66	2.5	66	2.5	0.182	18.0	LOS C	0.6	4.6	0.91	1.19	2.11	45.7
Approach			151	2.5	151	2.5	0.209	17.6	LOS C	0.7	5.3	0.90	1.20	2.13	46.0
East: Salerno Road															
4	L2	All MCs	60	2.5	60	2.5	0.305	16.3	LOS C	1.2	8.3	0.87	1.25	2.28	47.0
5	T1	All MCs	94	2.5	94	2.5	0.305	16.0	LOS C	1.2	8.3	0.87	1.25	2.28	47.0
Approach			154	2.5	154	2.5	0.305	16.1	LOS C	1.2	8.3	0.87	1.25	2.28	47.0
West: Salerno Road															
11	T1	All MCs	88	2.5	88	2.5	0.178	14.5	LOS B	0.6	4.3	0.84	1.21	2.04	47.9
12	R2	All MCs	36	2.5	36	2.5	0.080	14.7	LOS B	0.3	1.8	0.84	1.17	1.92	47.6
Approach			124	2.5	124	2.5	0.178	14.6	LOS B	0.6	4.3	0.84	1.20	2.00	47.8
All Vehicles			428	2.5	428	2.5	0.305	16.2	LOS C	1.2	8.3	0.87	1.22	2.15	46.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

ANNEXURE D
SIDRA
OUTPUT
SHEETS 2025
Before
Development

Site: 101 [[02] 01 AM ND (Site Folder: Before Development - 2025)]

TIA for Proposed Residential Development on erf 2006, Parsonsvlei
2025 AM Before Development
Site Category: Proposed Design 1
Signals - Actuated Coordinated Cycle Time = 99 seconds (Site Practical Cycle Time)

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Brabant Street												
P1	Full	50	53	43.8	LOS E	0.1	0.1	0.94	0.94	197.6	200.0	1.01
East: Cape Road												

P2	Full	50	53	43.8	LOS E	0.1	0.1	0.94	0.94	197.6	200.0	1.01
North: Burchell Drive												
P3	Full	50	53	43.8	LOS E	0.1	0.1	0.94	0.94	197.6	200.0	1.01
West: Cape Road												
P4	Full	50	53	43.8	LOS E	0.1	0.1	0.94	0.94	197.6	200.0	1.01
All	Pedestrians	200	211	43.8	LOS E	0.1	0.1	0.94	0.94	197.6	200.0	1.01

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Site: 101 [[02] 01 PM ND (Site Folder: Before Development - 2025)]

TIA for Proposed Residential Development on erf 2006, Parsonsvlei
2025 AM Before Development
Site Category: Proposed Design 1
Signals - Actuated Coordinated Cycle Time = 67 seconds (Site Practical Cycle Time)

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
 Vehicle movement LOS values are based on average delay per movement.
 Intersection and Approach LOS values are based on average delay for all vehicle movements.
 Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
 Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
 Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
 Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Brabant Street												
P1	Full	50	53	27.8	LOS C	0.1	0.1	0.91	0.91	181.7	200.0	1.10
East: Cape Road												

P2	Full	50	53	27.8	LOS C	0.1	0.1	0.91	0.91	181.7	200.0	1.10
North: Burchell Drive												
P3	Full	50	53	27.8	LOS C	0.1	0.1	0.91	0.91	181.7	200.0	1.10
West: Cape Road												
P4	Full	50	53	27.8	LOS C	0.1	0.1	0.91	0.91	181.7	200.0	1.10
All		200	211	27.8	LOS C	0.1	0.1	0.91	0.91	181.7	200.0	1.10
Pedestrians												

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 Site: 101v [[02] 02 AM ND (Site Folder: Before Development - 2025)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

TIA for Proposed Residential Development on erf 2006, Parsonsvei
2025 AM Before Development
Site Category: Proposed Design 1
Stop (All-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh.]	Dist]				
			veh/h		veh/h	%	v/c	sec		veh	m				km/h
South: Burchell Drive															
1	L2	All MCs	83	2.5	83	2.5	0.276	22.5	LOS C	1.1	7.6	0.96	1.22	2.31	43.4
3	R2	All MCs	84	2.5	84	2.5	0.249	20.0	LOS C	0.9	6.7	0.94	1.21	2.24	44.6
Approach			167	2.5	167	2.5	0.276	21.3	LOS C	1.1	7.6	0.95	1.22	2.27	44.0
East: Salerno Road															
4	L2	All MCs	147	2.5	147	2.5	0.540	23.8	LOS C	2.8	19.7	0.96	1.39	3.05	42.9
5	T1	All MCs	86	2.5	86	2.5	0.540	23.5	LOS C	2.8	19.7	0.96	1.39	3.05	42.9
Approach			234	2.5	234	2.5	0.540	23.7	LOS C	2.8	19.7	0.96	1.39	3.05	42.9
West: Salerno Road															
11	T1	All MCs	95	2.5	95	2.5	0.190	14.7	LOS B	0.7	4.7	0.84	1.22	2.06	47.9
12	R2	All MCs	160	2.5	160	2.5	0.291	15.1	LOS C	1.1	7.8	0.84	1.24	2.23	47.3
Approach			255	2.5	255	2.5	0.291	14.9	LOS B	1.1	7.8	0.84	1.23	2.17	47.5
All Vehicles			656	2.5	656	2.5	0.540	19.7	LOS C	2.8	19.7	0.91	1.29	2.51	44.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: 101v [[02] 02 PM ND (Site Folder: Before Development - 2025)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

TIA for Proposed Residential Development on erf 2006, Parsonsvei
2025 AM Before Development
Site Category: Proposed Design 1
Stop (All-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh.]	[Dist]				
			veh/h		veh/h		v/c	sec		veh	m				km/h
South: Burchell Drive															
1	L2	All MCs	86	2.5	86	2.5	0.214	17.4	LOS C	0.8	5.5	0.90	1.21	2.15	46.2
3	R2	All MCs	68	2.5	68	2.5	0.188	18.0	LOS C	0.7	4.8	0.91	1.20	2.12	45.7
Approach			155	2.5	155	2.5	0.214	17.7	LOS C	0.8	5.5	0.90	1.20	2.14	46.0
East: Salerno Road															
4	L2	All MCs	61	2.5	61	2.5	0.312	16.5	LOS C	1.2	8.6	0.87	1.26	2.30	46.9
5	T1	All MCs	96	2.5	96	2.5	0.312	16.2	LOS C	1.2	8.6	0.87	1.26	2.30	46.9
Approach			157	2.5	157	2.5	0.312	16.3	LOS C	1.2	8.6	0.87	1.26	2.30	46.9
West: Salerno Road															
11	T1	All MCs	91	2.5	91	2.5	0.182	14.6	LOS B	0.6	4.5	0.84	1.22	2.05	47.9
12	R2	All MCs	37	2.5	37	2.5	0.083	14.7	LOS B	0.3	1.9	0.85	1.17	1.92	47.6
Approach			127	2.5	127	2.5	0.182	14.7	LOS B	0.6	4.5	0.84	1.20	2.01	47.8
All Vehicles			439	2.5	439	2.5	0.312	16.3	LOS C	1.2	8.6	0.87	1.22	2.16	46.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

ANNEXURE E
SIDRA
OUTPUT
SHEETS 2025
After
Development

Site: 101 [[03] 01 AM AD (Site Folder: After Development - 2025)]

TIA for Proposed Residential Development on erf 2006, Parsonsvlei
2025 AM After Development
Site Category: Proposed Design 1
Signals - Actuated Coordinated Cycle Time = 100 seconds (Site Practical Cycle Time)

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
 Vehicle movement LOS values are based on average delay per movement.
 Intersection and Approach LOS values are based on average delay for all vehicle movements.
 Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
 Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
 Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
 Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Brabant Street												
P1	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
East: Cape Road												

P2	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
North: Burchell Drive												
P3	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
West: Cape Road												
P4	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
All		200	211	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
Pedestrians												

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Site: 101 [[03] 01 PM AD (Site Folder: After Development - 2025)]

TIA for Proposed Residential Development on erf 2006, Parsonsvei
2025 AM After Development
Site Category: Proposed Design 1
Signals - Actuated Coordinated Cycle Time = 73 seconds (Site Practical Cycle Time)

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- * Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE [Ped Dist]		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		ped	m			sec	m	m/sec
South: Brabant Street												
P1	Full	50	53	30.8	LOS D	0.1	0.1	0.92	0.92	184.7	200.0	1.08
East: Cape Road												

P2	Full	50	53	30.8	LOS D	0.1	0.1	0.92	0.92	184.7	200.0	1.08
North: Burchell Drive												
P3	Full	50	53	30.8	LOS D	0.1	0.1	0.92	0.92	184.7	200.0	1.08
West: Cape Road												
P4	Full	50	53	30.8	LOS D	0.1	0.1	0.92	0.92	184.7	200.0	1.08
All		200	211	30.8	LOS D	0.1	0.1	0.92	0.92	184.7	200.0	1.08
Pedestrians												

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 Site: 101v [[03] 02 AM AD (Site Folder: After Development - 2025)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

TIA for Proposed Residential Development on erf 2006, Parsonsvei
2025 AM After Development
Site Category: Proposed Design 1
Stop (All-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh.]	Dist]				
			veh/h		veh/h		v/c	sec		veh	m				km/h
South: Burchell Drive															
1	L2	All MCs	104	2.5	104	2.5	0.326	22.7	LOS C	1.3	9.4	0.96	1.24	2.40	43.4
3	R2	All MCs	105	2.5	105	2.5	0.294	20.1	LOS C	1.1	8.2	0.94	1.23	2.32	44.6
Approach			209	2.5	209	2.5	0.326	21.4	LOS C	1.3	9.4	0.95	1.24	2.36	44.0
East: Salerno Road															
4	L2	All MCs	155	2.5	155	2.5	0.606	28.3	LOS D	3.4	24.5	0.99	1.46	3.38	40.8
5	T1	All MCs	86	2.5	86	2.5	0.606	27.9	LOS D	3.4	24.5	0.99	1.46	3.38	40.8
Approach			241	2.5	241	2.5	0.606	28.2	LOS D	3.4	24.5	0.99	1.46	3.38	40.8
West: Salerno Road															
11	T1	All MCs	95	2.5	95	2.5	0.196	15.0	LOS C	0.7	4.9	0.85	1.22	2.08	47.7
12	R2	All MCs	167	2.5	167	2.5	0.313	15.7	LOS C	1.2	8.6	0.85	1.25	2.29	47.0
Approach			262	2.5	262	2.5	0.313	15.4	LOS C	1.2	8.6	0.85	1.24	2.21	47.3
All Vehicles			713	2.5	713	2.5	0.606	21.5	LOS C	3.4	24.5	0.93	1.31	2.65	43.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 Site: 101v [[03] 02 PM AD (Site Folder: After Development - 2025)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

TIA for Proposed Residential Development on erf 2006, Parsonsvei
2025 AM After Development
Site Category: Proposed Design 1
Stop (All-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh.]	Dist]				
			veh/h		veh/h		v/c	sec		veh	m				km/h
South: Burchell Drive															
1	L2	All MCs	99	2.5	99	2.5	0.245	17.9	LOS C	0.9	6.4	0.90	1.22	2.20	45.9
3	R2	All MCs	75	2.5	75	2.5	0.205	18.3	LOS C	0.7	5.3	0.91	1.20	2.15	45.6
Approach			174	2.5	174	2.5	0.245	18.0	LOS C	0.9	6.4	0.91	1.21	2.18	45.8
East: Salerno Road															
4	L2	All MCs	76	2.5	76	2.5	0.355	17.6	LOS C	1.4	10.2	0.89	1.27	2.41	46.2
5	T1	All MCs	96	2.5	96	2.5	0.355	17.3	LOS C	1.4	10.2	0.89	1.27	2.41	46.2
Approach			172	2.5	172	2.5	0.355	17.4	LOS C	1.4	10.2	0.89	1.27	2.41	46.2
West: Salerno Road															
11	T1	All MCs	91	2.5	91	2.5	0.179	14.4	LOS B	0.6	4.4	0.83	1.22	2.04	48.0
12	R2	All MCs	52	2.5	52	2.5	0.114	14.9	LOS B	0.4	2.7	0.85	1.18	1.96	47.5
Approach			142	2.5	142	2.5	0.179	14.6	LOS B	0.6	4.4	0.84	1.20	2.01	47.8
All Vehicles			487	2.5	487	2.5	0.355	16.8	LOS C	1.4	10.2	0.88	1.23	2.21	46.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: 101 [[03] 03 AM AD (Site Folder: After Development - 2025)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

TIA for Proposed Residential Development on erf 2006, Parsonsvei
2025 AM After Development
Site Category: Proposed Design 1
Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh.]	Dist]				
			veh/h		veh/h		v/c	sec		veh	m				km/h
South: Burchell Road															
1	L2	All MCs	21	0.0	21	0.0	0.131	5.6	LOS A	0.0	0.0	0.00	0.05	0.00	37.0
2	T1	All MCs	233	0.0	233	0.0	0.131	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	59.4
Approach			254	0.0	254	0.0	0.131	0.5	NA	0.0	0.0	0.00	0.05	0.00	57.3
North: Burchell Road															
8	T1	All MCs	338	0.0	338	0.0	0.184	0.1	LOS A	0.1	0.8	0.04	0.05	0.04	59.5
9	R2	All MCs	15	0.0	15	0.0	0.184	6.4	LOS A	0.1	0.8	0.04	0.05	0.04	23.7
Approach			353	0.0	353	0.0	0.184	0.3	NA	0.1	0.8	0.04	0.05	0.04	57.8
West: Erf 2006															
10	L2	All MCs	42	0.0	42	0.0	0.141	7.3	LOS A	0.5	3.5	0.46	0.91	0.46	40.6
12	R2	All MCs	63	0.0	63	0.0	0.141	9.6	LOS A	0.5	3.5	0.46	0.91	0.46	45.5
Approach			105	0.0	105	0.0	0.141	8.6	LOS A	0.5	3.5	0.46	0.91	0.46	43.9
All Vehicles			712	0.0	712	0.0	0.184	1.6	NA	0.5	3.5	0.09	0.18	0.09	56.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: 101 [[03] 03 PM AD (Site Folder: After Development - 2025)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

TIA for Proposed Residential Development on erf 2006, Parsonsvei
2025 AM After Development
Site Category: Proposed Design 1
Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh.]	Dist]				
			veh/h		veh/h		v/c	sec		veh	m				km/h
South: Burchell Road															
1	L2	All MCs	67	0.0	67	0.0	0.123	5.6	LOS A	0.0	0.0	0.00	0.17	0.00	36.3
2	T1	All MCs	169	0.0	169	0.0	0.123	0.0	LOS A	0.0	0.0	0.00	0.17	0.00	58.1
Approach			237	0.0	237	0.0	0.123	1.6	NA	0.0	0.0	0.00	0.17	0.00	51.4
North: Burchell Road															
8	T1	All MCs	118	0.0	118	0.0	0.081	0.2	LOS A	0.2	1.4	0.16	0.18	0.16	57.9
9	R2	All MCs	29	0.0	29	0.0	0.081	6.2	LOS A	0.2	1.4	0.16	0.18	0.16	23.1
Approach			147	0.0	147	0.0	0.081	1.4	NA	0.2	1.4	0.16	0.18	0.16	50.3
West: Erf 2006															
10	L2	All MCs	19	0.0	19	0.0	0.044	6.9	LOS A	0.2	1.1	0.33	0.87	0.33	42.2
12	R2	All MCs	23	0.0	23	0.0	0.044	7.4	LOS A	0.2	1.1	0.33	0.87	0.33	46.8
Approach			42	0.0	42	0.0	0.044	7.2	LOS A	0.2	1.1	0.33	0.87	0.33	45.1
All Vehicles			426	0.0	426	0.0	0.123	2.1	NA	0.2	1.4	0.09	0.24	0.09	50.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

ANNEXURE F
SIDRA
OUTPUT
SHEETS 2030
After
Development

Site: 101 [[04] 01 AM AD (Site Folder: After Development - 2030)]

TIA for Proposed Residential Development on erf 2006, Parsonsvlei
2030 AM After Development
Site Category: Future Conditions 1
Signals - Actuated Coordinated Cycle Time = 100 seconds (Site Practical Cycle Time)

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- * Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE [Ped Dist]		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		ped	m			sec	m	m/sec
South: Brabant Street												
P1	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
East: Cape Road												

P2	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
North: Burchell Drive												
P3	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
West: Cape Road												
P4	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
All		200	211	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
Pedestrians												

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Brabant Street												
P1	Full	50	53	35.3	LOS D	0.1	0.1	0.93	0.93	189.1	200.0	1.06
East: Cape Road												

P2	Full	50	53	35.3	LOS D	0.1	0.1	0.93	0.93	189.1	200.0	1.06
North: Burchell Drive												
P3	Full	50	53	35.3	LOS D	0.1	0.1	0.93	0.93	189.1	200.0	1.06
West: Cape Road												
P4	Full	50	53	35.3	LOS D	0.1	0.1	0.93	0.93	189.1	200.0	1.06
All		200	211	35.3	LOS D	0.1	0.1	0.93	0.93	189.1	200.0	1.06
Pedestrians												

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 **Site: 101v [[04] 02 AM AD (Site Folder: After Development - 2030)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

TIA for Proposed Residential Development on erf 2006, Parsonsvei
2030 AM After Development
Site Category: Future Conditions 1
Stop (All-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	Dist] m				
			veh/h		veh/h		v/c	sec							km/h
South: Burchell Drive															
1	L2	All MCs	115	2.5	115	2.5	0.361	23.7	LOS C	1.5	10.7	0.97	1.26	2.49	42.9
3	R2	All MCs	116	2.5	116	2.5	0.326	20.8	LOS C	1.3	9.3	0.94	1.25	2.39	44.2
Approach			231	2.5	231	2.5	0.361	22.2	LOS C	1.5	10.7	0.96	1.25	2.44	43.5
East: Salerno Road															
4	L2	All MCs	175	2.5	175	2.5	0.677	32.2	LOS D	4.4	31.1	1.00	1.57	3.84	39.1
5	T1	All MCs	98	2.5	98	2.5	0.677	31.9	LOS D	4.4	31.1	1.00	1.57	3.84	39.1
Approach			273	2.5	273	2.5	0.677	32.1	LOS D	4.4	31.1	1.00	1.57	3.84	39.1
West: Salerno Road															
11	T1	All MCs	107	2.5	107	2.5	0.221	15.3	LOS C	0.8	5.6	0.85	1.23	2.12	47.5
12	R2	All MCs	188	2.5	188	2.5	0.351	16.2	LOS C	1.4	10.0	0.86	1.27	2.38	46.7
Approach			296	2.5	296	2.5	0.351	15.8	LOS C	1.4	10.0	0.86	1.25	2.28	47.0
All Vehicles			799	2.5	799	2.5	0.677	23.2	LOS C	4.4	31.1	0.94	1.36	2.86	43.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 Site: 101v [[04] 02 PM AD (Site Folder: After Development - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

TIA for Proposed Residential Development on erf 2006, Parsonsvei
2030 AM After Development
Site Category: Future Conditions 1
Stop (All-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	Dist] m				
			veh/h		veh/h		v/c	sec							km/h
South: Burchell Drive															
1	L2	All MCs	111	2.5	111	2.5	0.264	17.8	LOS C	1.0	7.1	0.90	1.22	2.24	46.0
3	R2	All MCs	188	2.5	188	2.5	0.414	19.3	LOS C	1.8	12.8	0.92	1.30	2.58	45.0
Approach			299	2.5	299	2.5	0.414	18.7	LOS C	1.8	12.8	0.91	1.27	2.45	45.4
East: Salerno Road															
4	L2	All MCs	84	2.5	84	2.5	0.690	44.3	LOS E	4.5	32.0	1.00	1.60	3.84	34.6
5	T1	All MCs	108	2.5	108	2.5	0.690	43.9	LOS E	4.5	32.0	1.00	1.60	3.84	34.6
Approach			193	2.5	193	2.5	0.690	44.1	LOS E	4.5	32.0	1.00	1.60	3.84	34.6
West: Salerno Road															
11	T1	All MCs	102	2.5	102	2.5	0.257	17.9	LOS C	1.0	6.8	0.91	1.23	2.23	46.0
12	R2	All MCs	56	2.5	56	2.5	0.158	18.0	LOS C	0.6	3.9	0.91	1.19	2.08	45.7
Approach			158	2.5	158	2.5	0.257	17.9	LOS C	1.0	6.8	0.91	1.21	2.18	45.9
All Vehicles			649	2.5	649	2.5	0.690	26.1	LOS D	4.5	32.0	0.94	1.35	2.80	41.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: 101 [[04] 03 AM AD (Site Folder: After Development - 2030)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

TIA for Proposed Residential Development on erf 2006, Parsonsvei
2030 AM After Development
Site Category: Future Conditions 1
Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh.]	[Dist]				
			veh/h		veh/h		v/c	sec		veh	m				km/h
South: Burchell Road															
1	L2	All MCs	21	0.0	21	0.0	0.147	5.6	LOS A	0.0	0.0	0.00	0.04	0.00	37.1
2	T1	All MCs	265	0.0	265	0.0	0.147	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	59.4
Approach			286	0.0	286	0.0	0.147	0.4	NA	0.0	0.0	0.00	0.04	0.00	57.6
North: Burchell Road															
8	T1	All MCs	401	0.0	401	0.0	0.217	0.1	LOS A	0.1	0.9	0.04	0.04	0.04	59.6
9	R2	All MCs	15	0.0	15	0.0	0.217	6.6	LOS A	0.1	0.9	0.04	0.04	0.04	23.7
Approach			416	0.0	416	0.0	0.217	0.3	NA	0.1	0.9	0.04	0.04	0.04	58.1
West: Erf 2006															
10	L2	All MCs	42	0.0	42	0.0	0.157	7.4	LOS A	0.6	3.9	0.51	0.93	0.51	39.8
12	R2	All MCs	63	0.0	63	0.0	0.157	10.6	LOS B	0.6	3.9	0.51	0.93	0.51	44.9
Approach			105	0.0	105	0.0	0.157	9.4	LOS A	0.6	3.9	0.51	0.93	0.51	43.2
All Vehicles			807	0.0	807	0.0	0.217	1.5	NA	0.6	3.9	0.09	0.16	0.09	56.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: 101 [[04] 03 PM AD (Site Folder: After Development - 2030)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

TIA for Proposed Residential Development on erf 2006, Parsonsvei
2030 AM After Development
Site Category: Future Conditions 1
Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh.]	Dist]				
			veh/h		veh/h		v/c	sec		veh	m				km/h
South: Burchell Road															
1	L2	All MCs	67	0.0	67	0.0	0.145	5.6	LOS A	0.0	0.0	0.00	0.14	0.00	36.5
2	T1	All MCs	213	0.0	213	0.0	0.145	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	58.3
Approach			280	0.0	280	0.0	0.145	1.4	NA	0.0	0.0	0.00	0.14	0.00	52.7
North: Burchell Road															
8	T1	All MCs	146	0.0	146	0.0	0.097	0.3	LOS A	0.2	1.5	0.15	0.17	0.15	58.1
9	R2	All MCs	29	0.0	29	0.0	0.097	6.4	LOS A	0.2	1.5	0.15	0.17	0.15	23.2
Approach			176	0.0	176	0.0	0.097	1.3	NA	0.2	1.5	0.15	0.17	0.15	51.7
West: Erf 2006															
10	L2	All MCs	19	0.0	19	0.0	0.047	7.1	LOS A	0.2	1.1	0.37	0.88	0.37	41.9
12	R2	All MCs	23	0.0	23	0.0	0.047	7.9	LOS A	0.2	1.1	0.37	0.88	0.37	46.5
Approach			42	0.0	42	0.0	0.047	7.5	LOS A	0.2	1.1	0.37	0.88	0.37	44.8
All Vehicles			498	0.0	498	0.0	0.145	1.9	NA	0.2	1.5	0.08	0.22	0.08	51.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.