

George Rex Sport & Adventure Centre, Erf 12403

Transport Impact Assessment

Knysna, Western Cape

October 2018



5th Floor

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SUMMARY SHEET

Report Type	Transport Impact Assessment
Title	George Rex Sport & Adventure Centre, Erf 12403
Location	Knysna, Western Cape
Client	Jazz Spirit 130 (Pty) Ltd
Reference Number	ITS 3475.1
Project Team	Christoff Krogscheepers Pieter Arangie Carla Sequeira
Contact Details	Tel: 021 914 6211
Date	October 2018
Report Status	First Draft
File Name	G:\3475.1 Development Erf 12403, Knysna - TIA Update\12 Reports\Issued\3475.1 Erf12403_Knysna_FirstDraft_Issued_PA 2018-10-23.docx

REPORT - SUMMARY TABLE

This transport impact assessment is reported only in a summary table instead of a lengthy report to assist review and interpretation of the results. This summary table includes all the relevant information that is normally contained in a report. It should be sufficient for review and interpretation of the expected transport impacts as well as the comprehension of the required measures to mitigate the transport impact. If any more detail is required please contact the authors.

ANNEXURES

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Annexure B: Photos
Annexure C: Tables

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ABBREVIATIONS

COTO	Committee of Transport Officials
Ha	Hectare
LOS	Level of Service
NMT	Non-motorised Transport
SATGR	South African Trip Generation Rates
SQM	Square Meters (m ²)
TIA	Transport Impact Assessment
V/C	Volume to Capacity Ratio

Transport Impact Assessment

George Rex Sport & Adventure Centre, Erf 12403, Knysna, Western Cape

1 Purpose of Study	This report assesses the expected transport related impact of the proposed development on Erf 12403 in Knysna, Western Cape. It summarises the existing transportation conditions within the site vicinity and provides an assessment of the transportation impacts of the proposed development on the surrounding transportation systems.																																
2 Locality	The proposed development will be located on Erf 12403 in Knysna. It is situated east of the George Rex Drive between Marlin Road and Howard Street. Refer to Figure 1 for the Locality Map.																																
3 Land Use	<p>Existing Use: The land is currently undeveloped. Proposed Land Use: Mixed use development</p> <p><i>Table 1: Land Use</i></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #4F81BD; color: white;">Land use</th> <th style="background-color: #4F81BD; color: white;">Extent</th> </tr> </thead> <tbody> <tr> <td>General Residential</td> <td style="text-align: center;">1.1845 ha</td> </tr> <tr> <td>Business</td> <td style="text-align: center;">2.6227 ha</td> </tr> <tr> <td>Business & Special Recreation</td> <td style="text-align: center;">1.3834 ha</td> </tr> </tbody> </table> <p>See Figure 2 in Annexure A for the proposed Site Development Plan.</p>	Land use	Extent	General Residential	1.1845 ha	Business	2.6227 ha	Business & Special Recreation	1.3834 ha																								
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4 Existing Roadways in Site Vicinity	<p>Table 2 provides a summary of the existing roadways in the site vicinity. See Photos 1 to 7 in Annexure B for the typical cross sections of these roads.</p> <p><i>Table 2: Existing Roadways in the site vicinity</i></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #4F81BD; color: white;">Roadway</th> <th style="background-color: #4F81BD; color: white;">Road Classification</th> <th style="background-color: #4F81BD; color: white;">Speed Limit (km/h)</th> <th style="background-color: #4F81BD; color: white;">Sidewalks</th> </tr> </thead> <tbody> <tr> <td>N2</td> <td>Provincial Main Road</td> <td style="text-align: center;">60</td> <td>Southern side</td> </tr> <tr> <td>George Rex Drive</td> <td>Collector</td> <td style="text-align: center;">70</td> <td>Western side</td> </tr> <tr> <td>Bokmakierie Street</td> <td>Local Street</td> <td style="text-align: center;">60</td> <td>No</td> </tr> <tr> <td>Vigilance Street</td> <td>Local Street</td> <td style="text-align: center;">60</td> <td>Both sides</td> </tr> <tr> <td>Marlin Road</td> <td>Local Street</td> <td style="text-align: center;">60</td> <td>No</td> </tr> <tr> <td>Howard Street</td> <td>Local Street</td> <td style="text-align: center;">60</td> <td>No</td> </tr> <tr> <td>Wilson Street</td> <td>Local Street</td> <td style="text-align: center;">60</td> <td>No</td> </tr> </tbody> </table>	Roadway	Road Classification	Speed Limit (km/h)	Sidewalks	N2	Provincial Main Road	60	Southern side	George Rex Drive	Collector	70	Western side	Bokmakierie Street	Local Street	60	No	Vigilance Street	Local Street	60	Both sides	Marlin Road	Local Street	60	No	Howard Street	Local Street	60	No	Wilson Street	Local Street	60	No
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5 Analyses Hours	<p>The following weekday peak hours are investigated:</p> <ul style="list-style-type: none"> Weekday AM peak hour: 07:00 to 08:00 Weekday PM peak hour: 16:30 to 17:30 																																

<p>6 Scenarios Analysed</p>	<p>The transport impact of the proposed development was analysed for the following scenarios:</p> <ol style="list-style-type: none"> 1. 2018 Existing conditions 2. 2023 Background traffic conditions (2018 existing traffic volumes plus expected future growth in traffic volumes over a 5-year horizon) 3. 2023 Total traffic conditions (2023 background traffic volumes plus development trips) <p>The traffic growth assumptions used to analyse future scenarios are discussed in Section 9.</p>																											
<p>7 Study Intersections (existing control)</p>	<p>Based on the extent of the proposed development, the following intersections was included in the analysis. Refer to Figure 3 in Annexure A for the lane configuration and intersection controls.</p> <p><i>Table 3: Study Intersections</i></p> <table border="1" data-bbox="565 793 1360 1140"> <thead> <tr> <th>No.</th> <th>Name</th> <th>Existing Control</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>N2/George Rex Drive</td> <td>Priority Controlled</td> </tr> <tr> <td>2</td> <td>George Rex Drive/Bokmakierie Street</td> <td>Priority Controlled</td> </tr> <tr> <td>3</td> <td>George Rex Drive/Vigilance Street</td> <td>Priority Controlled</td> </tr> <tr> <td>4</td> <td>George Rex Drive/Marlin Road</td> <td>Priority Controlled</td> </tr> <tr> <td>5</td> <td>George Rex Drive/Howard Street</td> <td>Priority Controlled</td> </tr> <tr> <td>6</td> <td>George Rex Drive/Wilson Street</td> <td>Priority Controlled</td> </tr> <tr> <td>7</td> <td>George Rex Drive/Development Access</td> <td>Proposed Roundabout</td> </tr> <tr> <td>8</td> <td>Howard Street/Development Access</td> <td>Priority Controlled</td> </tr> </tbody> </table>	No.	Name	Existing Control	1	N2/George Rex Drive	Priority Controlled	2	George Rex Drive/Bokmakierie Street	Priority Controlled	3	George Rex Drive/Vigilance Street	Priority Controlled	4	George Rex Drive/Marlin Road	Priority Controlled	5	George Rex Drive/Howard Street	Priority Controlled	6	George Rex Drive/Wilson Street	Priority Controlled	7	George Rex Drive/Development Access	Proposed Roundabout	8	Howard Street/Development Access	Priority Controlled
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<p>8 Existing Intersection Operations</p>	<p>The 2018 Existing Traffic Conditions are based on existing intersection geometries, controls and counted traffic volumes.</p> <p>Based on the existing traffic capacity analysis results, all the study intersections currently operate acceptably except the N2/George Rex Drive intersection and the George Rex Drive/Bokmakierie Street intersection.</p> <p>N2/George Rex Drive intersection: This intersection experiences operational constraints and a points man is required to control the traffic at this intersection during the weekday peak hours. For the purpose of this report this intersection was analysed as a signalised control for the existing conditions, due to the points man. It is recommended that this intersection be upgraded to a signalised control. The spacing between the N2/Sunvalley Drive intersection and the N2/George Rex Drive intersection is not ideal in terms of the recommended minimum spacing for the signalised intersections. This is however a historic issue and there are no other feasible alternatives to improve operations at this intersection.</p>																											

	<p>George Rex Drive/Bokmakierie Street intersection: No mitigation measures are recommended. The traffic along Bokmakierie Street has alternative routes to access the larger road network. A signal control at this intersection will not be warranted and the relatively low side road traffic volume along Bokmakierie Street compared to the volumes along George Rex Drive does not justify a roundabout. The two adjacent signalised intersections will create platoons of vehicles along George Rex Drive, which will result in acceptable gaps for the side road traffic to enter George Rex Drive.</p> <p>Refer to Figure 3 in Annexure A and Table 5 in Annexure B.</p>
<p>9 Approved Developments/ Latent Rights</p>	<p>No specific approved/latent developments are known in the surrounding area. Any possible latent development trips are therefore associated with an anticipated annual traffic growth of the area.</p>
<p>10 Background Traffic Conditions</p>	<p>The 2023 Background Traffic volumes were calculated by adjusting the existing counted traffic volumes with a three (3) percent growth rate per annum over a five-year period. The existing intersection geometries were used for the background Traffic analyses.</p> <p>Based on the capacity analysis results, all study intersections will continue to operate at acceptable levels-of-service (LOS) except the N2/George Rex Drive intersection and the George Rex Drive/Bokmakierie Street intersection. As for the existing conditions it is recommended that the N2/George Rex Drive intersection be upgraded with signal control. No mitigation measures are recommended George Rex Drive/Bokmakierie Street intersection for the same reasons as stated above for the existing conditions.</p> <p>Refer to Figure 4 in Annexure A and Table 6 in Annexure B.</p>
<p>11 Site Access</p>	<p>There will be 2 vehicular access for the proposed development. These are illustrated in Figure 2 in Annexure A and summarised as follows:</p> <ul style="list-style-type: none"> • Access 1: This access is proposed at the existing The Moorings access off George Rex Drive spaced approximately 150m to the south of Marlin Road. The proposed layout for this access is via a roundabout with a minimum inscribed diameter of approximately 30m. • Access 2: This access is proposed off Howard Street located approximately 90m to the east of the intersection with George Rex Drive. A priority stop control is proposed at this intersection with free flow on Howard Street.

<p>12 Trip Generation Rates and Development Trips</p>	<p>The expected trip generation rates for the different proposed land uses were sourced from various manuals including the South African Trip Generation Rate (DoT, 1995) manual, the Institute for Transportation Engineers trip generation manual (ITE, 1997) as well as the COTO trip data manual (COTO 2013). Refer to Table 7 (Annexure B) for the trip generation rates used for this development and Table 8 (Annexure B) for the trip generation estimate. The proposed development can generate the following number of trips:</p> <p><i>Table 4: Trips generated by the proposed development</i></p> <table border="1" data-bbox="561 541 1364 688"> <thead> <tr> <th>Peak Hour</th> <th>In</th> <th>Out</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>a.m.</td> <td>258</td> <td>180</td> <td>438</td> </tr> <tr> <td>p.m.</td> <td>298</td> <td>369</td> <td>667</td> </tr> </tbody> </table>	Peak Hour	In	Out	Total	a.m.	258	180	438	p.m.	298	369	667
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a.m.	258	180	438										
p.m.	298	369	667										
<p>13 Trip Distribution</p>	<p>The following trip distribution was used:</p> <ul style="list-style-type: none"> • 55% to/from the north along the N2 toward Knysna’s CBD • 15% to/from the north along the N2 towards Plettenberg Bay • 5% to/from the north along Bokmakierie Street • 10% to/from the north along Vigilance Road • 5% to/from the south along Howard Road • 5% to/from the south along Wilson Road • 5% to/from the south along George Rex Drive towards the Heads 												
<p>14 Total Traffic Conditions</p>	<p>The 2023 Total traffic volumes were calculated by adding the development trips to the 2023 Background volumes. Based on the capacity analysis the following intersections have capacity constraints:</p> <p>N2/George Rex Drive: This intersection should be upgraded with signal control. The spacing between the N2/Sunvalley Drive intersection and the N2/George Rex Drive intersection is not ideal in terms of the recommended minimum spacing for the signalised intersections. This is however a historic issue and there are no other feasible alternatives to improve operations at this intersection.</p> <p>George Rex Drive/Bokmakierie Street: A signal control at this intersection will not be warranted and the relatively low side road traffic volume along Bokmakierie Street compared to the volumes along George Rex Drive does not justify a roundabout. The two adjacent signalised intersections will create platoons of vehicles along George Rex Drive, which will result in acceptable gaps for the side road traffic to enter George Rex Drive. A Roundabout can be considered at this intersection in the long term depending on the availability of funding.</p> <p>George Rex Drive/Marlin Road: Long average delays per vehicle will be experienced by the westbound right-turn traffic along Marlin Road. However, the westbound right-turn movement will operate at a volume to capacity ratio of 0.51, which means that right-turn traffic will still find</p>												

	<p>acceptable gaps in the traffic stream along George Rex Drive to safely enter the road.</p> <p>Refer to Figure 8 in Annexure A and Table 9 in Annexure B.</p>
<p>15 Parking</p>	<p>Parking should be provided in accordance to the local zoning scheme requirements.</p>
<p>16 Pedestrians and Cyclists</p>	<p>Existing Facilities:</p> <p>There is a separate sidewalk/cycle paved pathway on the western side of George Rex Drive. This pathway is approximately 2.5m-3m wide and it starts from the George Rex Drive/Howard Street intersection and runs up to 140m south of N2/George Rex Drive intersection. Thereafter, sidewalks are provided along both sides of the road up to the N2.</p> <p>South of the George Rex Drive/Howard Street intersection there are no sidewalks. And except for along Vigilance Street, there are also no sidewalks along the residential streets in the site vicinity and pedestrians walk on the road surface.</p> <p>Proposed Facilities:</p> <p>There are no facilities in the immediate site vicinity to link with and no additional facilities are proposed along the local street network. The current facilities are deemed sufficient. The walkways, however, need careful attention through any proposed intersection upgrades and along the linkage to the internal network on the site. Well defined pedestrian walkways should also be provided on site.</p>
<p>17 Public Transport</p>	<p>The proposed development is not located in close proximity of any public transport facilities. There were also no bus or taxi activities observed during the times of the traffic counts and surveys. Employee trips to the residential and commercial development will probably occur via minibus-taxis. During sporting events, it is expected that buses will be operating to/from the development. A taxi lay-by facility is recommended at the main entrance off George Rex Drive.</p>
<p>18 Conclusion & Recommendations</p>	<p>This report investigates the expected transport related impacts of a sport and adventure centre planned on Erf 12403 in Knysna. Based on the findings of this investigation, the following are concluded:</p> <p>Existing Traffic: N2/George Rex Drive intersection currently operates at capacity. It is recommended that this intersection be upgraded to a traffic signal.</p> <p>Background Traffic: George Rex Drive/Bokmakierie Street operates at capacity. The traffic along Bokmakierie Street has alternative routes to access the larger road network. Signal control at this intersection will not be warranted and the relatively low side road traffic volume along</p>

<p>19 Conclusion & Recommendations (Continued)</p>	<p>Bokmakierie Street compared to the volumes along George Rex Drive does not justify a roundabout.</p> <p>Development Trips: 438 weekday a.m. peak hour trips (258 inbound/180 outbound) and 667 weekday p.m. peak hour trips (298 inbound/369 outbound).</p> <p>Site Access: Access to the development is proposed via a new roundabout on George Rex Drive at The Moorings access and via a stop controlled full access off Howard Street.</p> <p>Total Traffic: George Rex Drive/Bokmakierie Street will operate at capacity. Although traffic along Bokmakierie Street has alternative routes to access the larger road network. Signal control at this intersection will not be warranted and the relatively low side road traffic volume along Bokmakierie Street compared to the volumes along George Rex Drive does not justify a roundabout. A Roundabout should be considered at this intersection in the long term depending on the availability of funding. George Rex Drive/Marlin Road will also operate close to capacity and westbound right-turn traffic along Marlin Road will experience long average delays per vehicle. However, there is still sufficient capacity for side road traffic to safely enter the traffic stream along George Rex Drive.</p> <p>Non-Motorised Traffic/Public Transport: The existing facilities in the site vicinity is sufficient. Well defined walkways should be provided on site.</p> <p>Public Transport: A taxi lay-bye facility is recommended at main entrance off George Rex Drive.</p> <p>Parking: Provided in accordance with the local zoning scheme requirements.</p> <p>Based on the findings in this investigation, it is evident that the expected transport impact associated with the proposed development can be sufficiently mitigated with the upgrades proposed in this report.</p> <p>Hence, it is recommended that the development be approved, from a transportation engineering point of view, subject to the upgrades recommended in this report.</p>
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REFERENCES

1. Highway Capacity Manual (HCM), Quality and Level-of-Service Concepts, Transportation Research Board, 9 March 2015
2. South African Road Classification and Access Management Manual, TRH26, Version 1.0, August 2012
3. South African Trip Data Manual, TMH17, Version 1.1, COTO, September 2013
4. Smec, Kraaibosch Roads Master Plan and Cost Apportionment Rev 03, April 2016
5. Vela VKE, Apportionment of Cost for Improvements and Additions to the Road Infrastructure in the Kraaibosch Area, January 2006

Annexure A

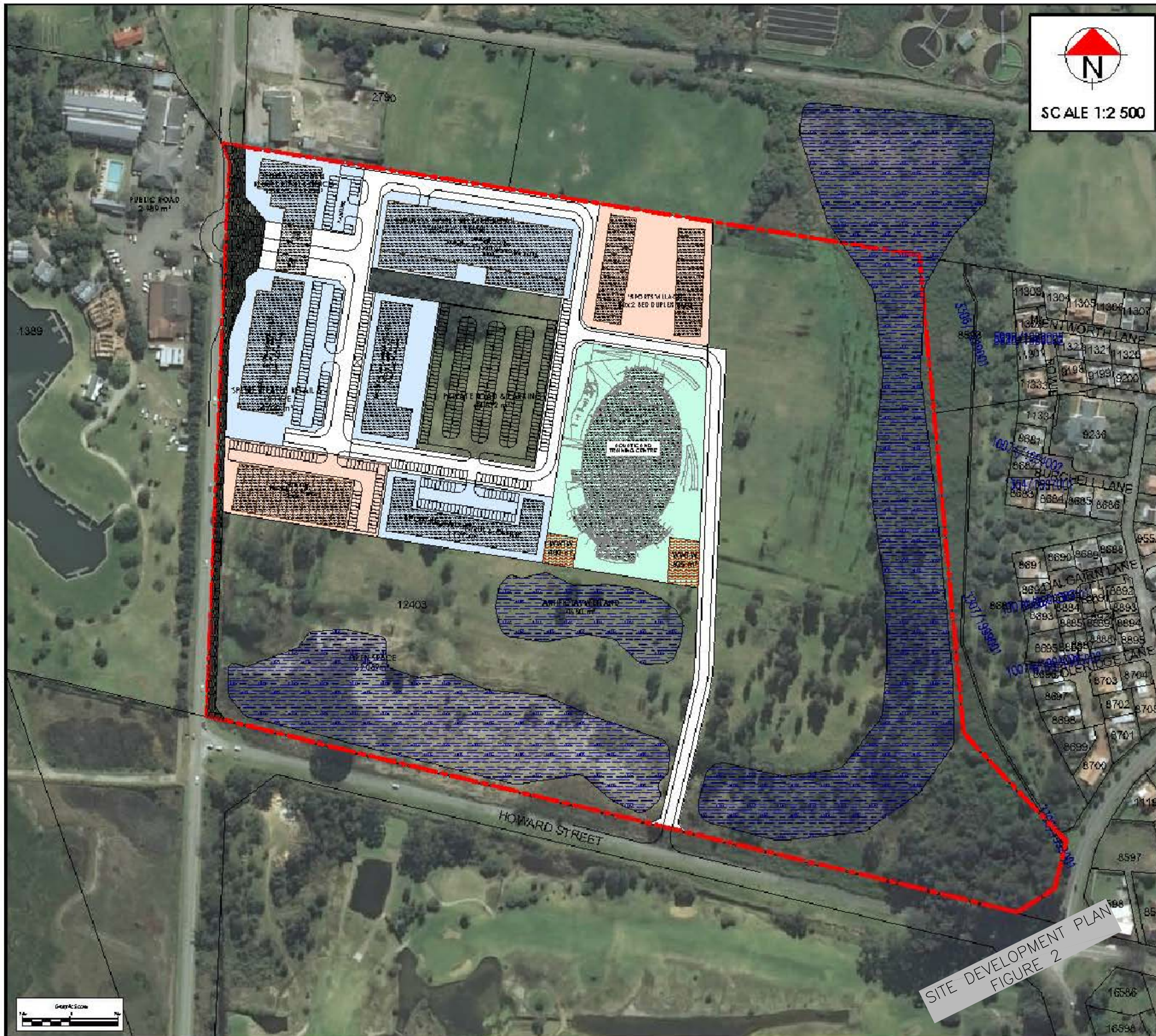
Figures



SCHEMATIC



PROJECT:	DEVELOPMENT ERF 12403, KNYSNA	FIGURE:	LOCALITY PLAN
			NUMBER: 1




 SCALE 1:2 500

PLAN 2

**KNYSNA
ERF 12403**

PREFERRED ALTERNATIVE

LEGEND

ZONING:	QTY	AREA (ha)	%
General Residential Zone	2	1,18,48	6,10
Business Zone	5	2,62,27	13,51
Business & Special Recreation	1	1,36,34	7,13
Private Open Space	4	12,26,66	63,21
Private Roads	2	1,63,30	8,41
Public Road	1	0,21,67	1,03
TOTAL	15	19,40,69	100

- NOTES**
- Sizes and dimensions are approximate and subject to final survey.
 - For property details, refer to S.G. 8203/1996.
 - 7,7ha (40%) of site developed, 60% remain undeveloped.
 - 2x servitudes for a WWF to be created on the Aquatic Centre property (Erf 4).

DRAWN:	MV	CHECKED:	MV
PLAN NO:	Pr1133kny12403sdp07		
PLAN DATE:	April 2018		
STORED:	x:\drawing\Appl\Pr1133kny12403sdp07.dwg		

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This Plan may not be copied or amended without the written consent of M. Vreken

APPROVED IN TERMS OF SECTION 23(1) OF THE KNYSNA MUNICIPALITY'S BY-LAW ON MUNICIPAL PLANNING AS PUBLISHED IN P.N. 7565/2016 ON 12 FEBRUARY 2016

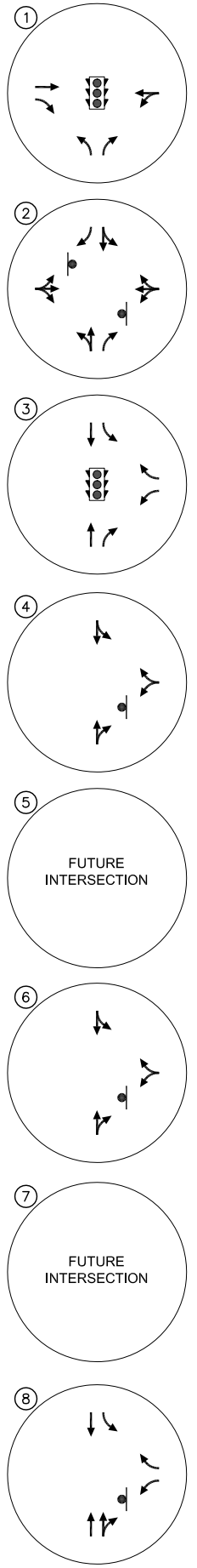
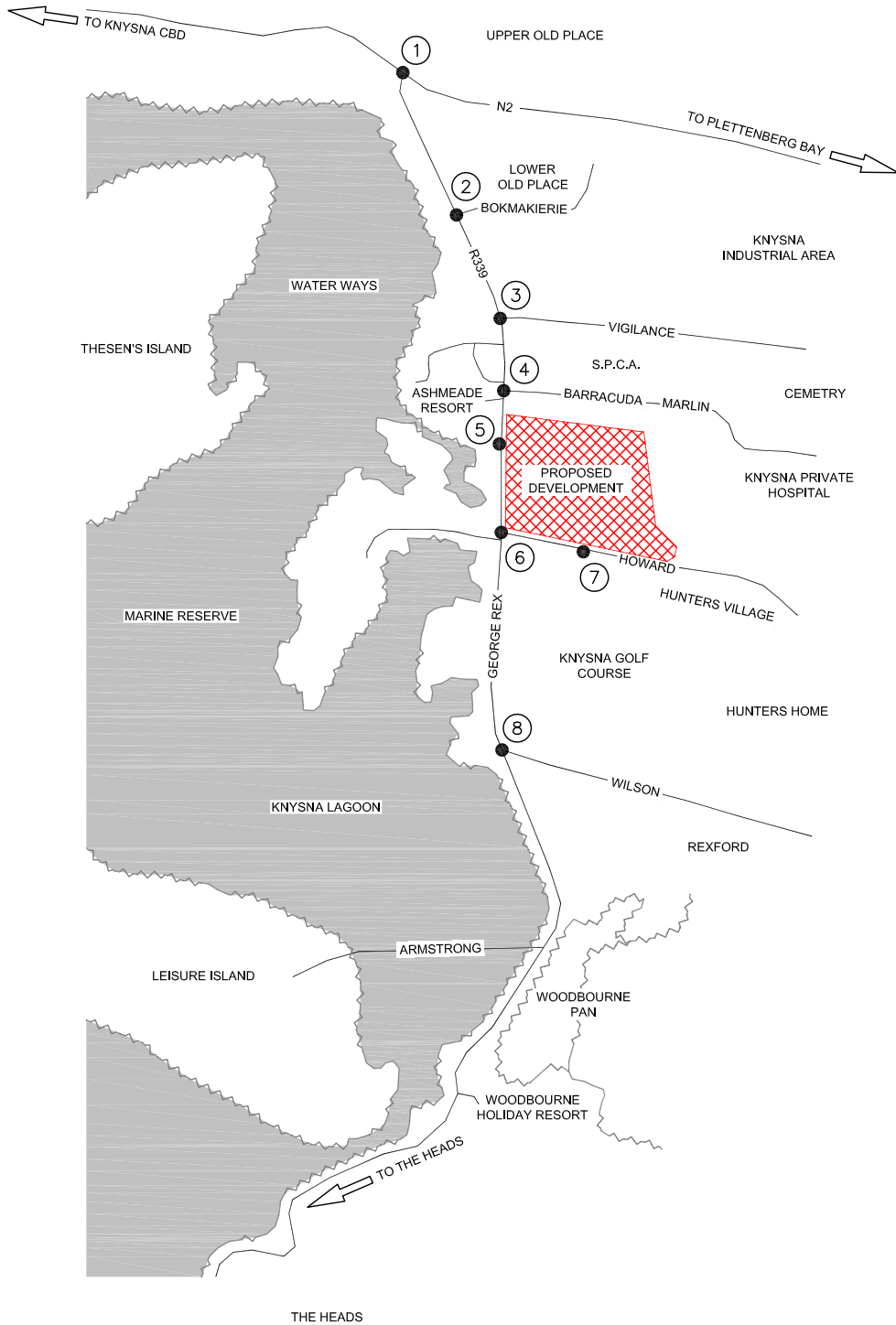
MUNICIPAL MANAGER

DATE: _____

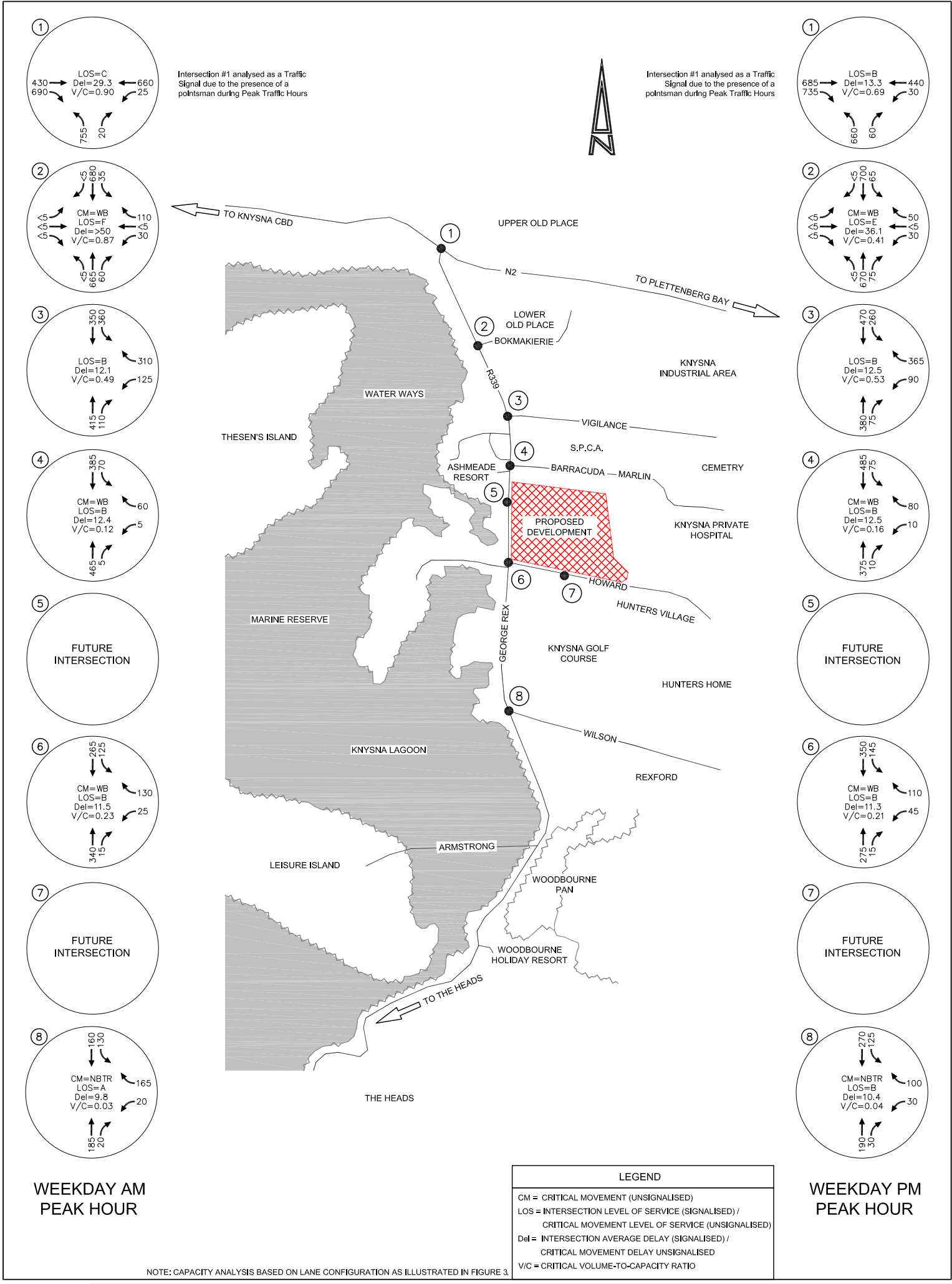
**SITE DEVELOPMENT PLAN
FIGURE 2**

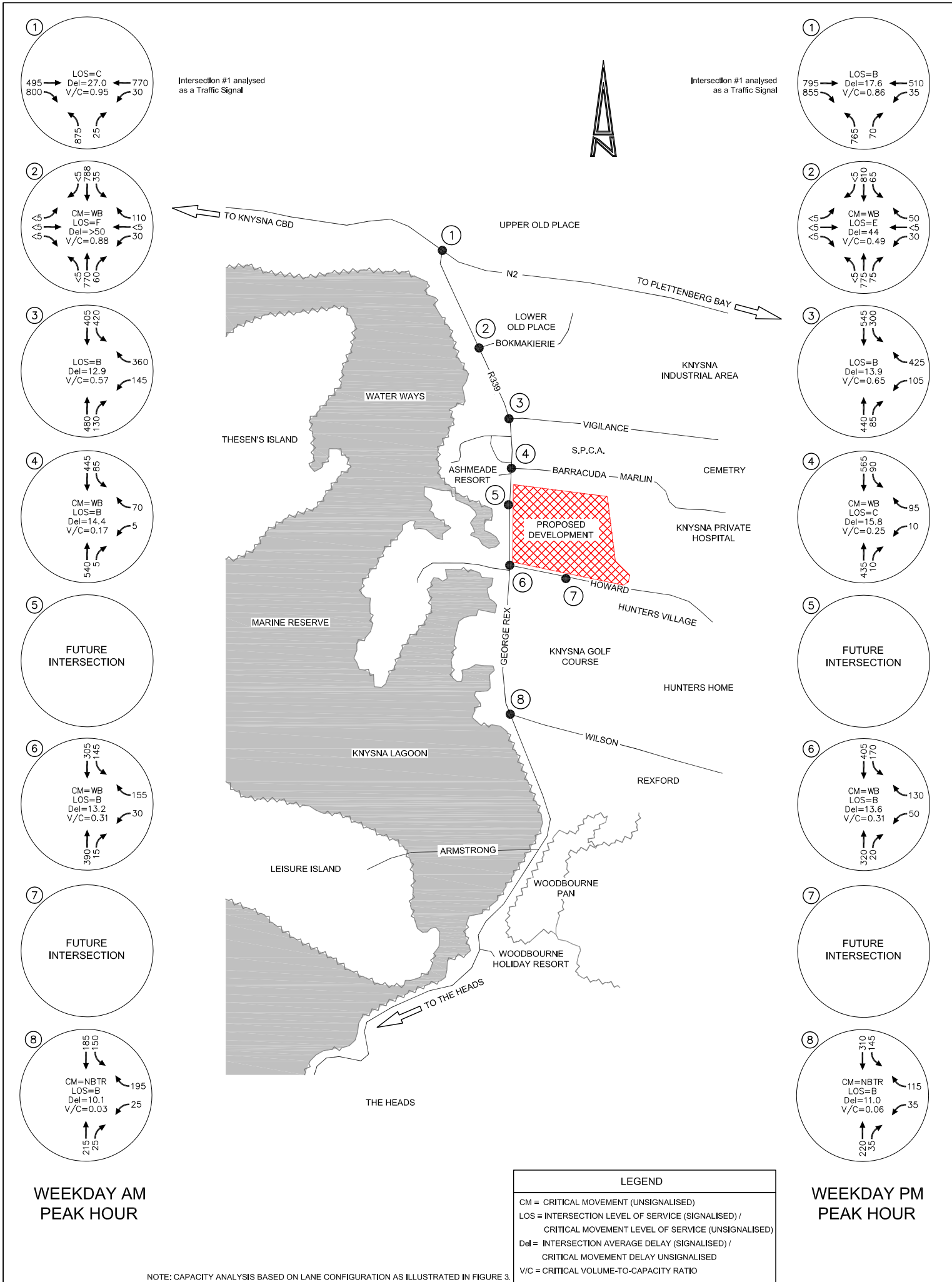


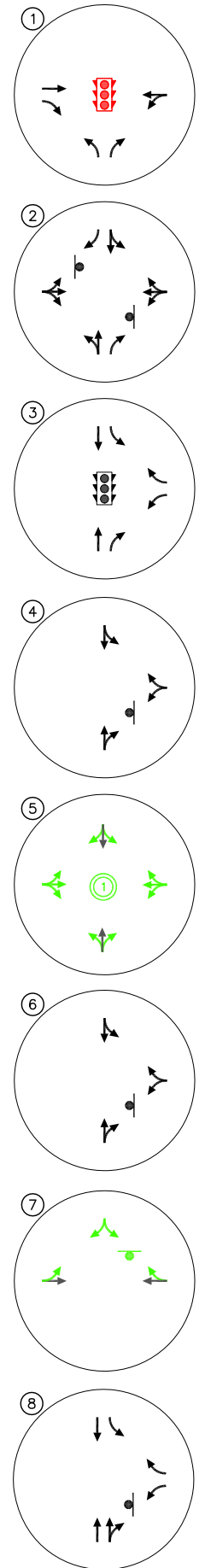
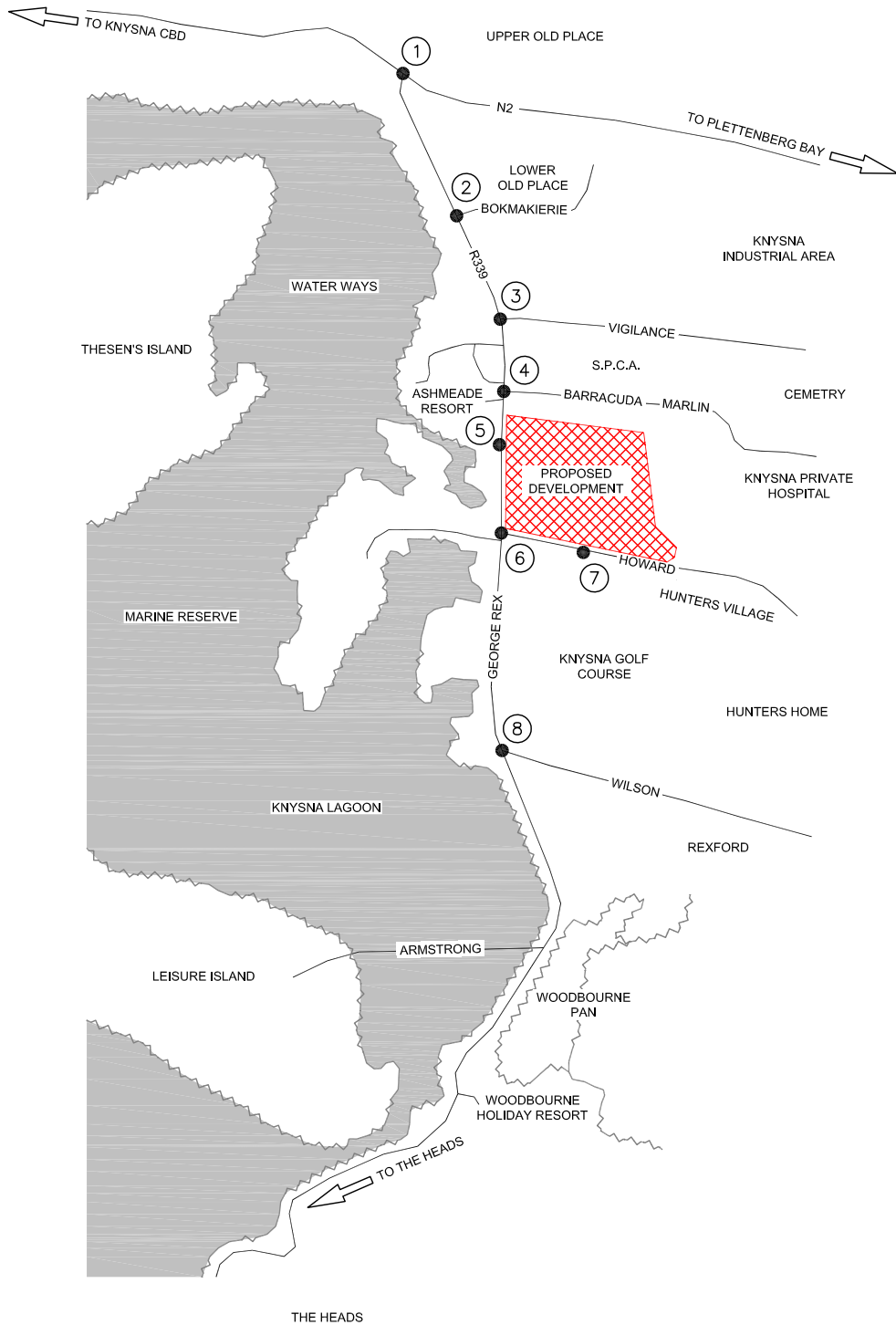

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LEGEND	
	STOP / YIELD CONTROL
	TRAFFIC SIGNAL



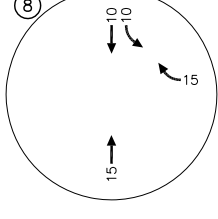
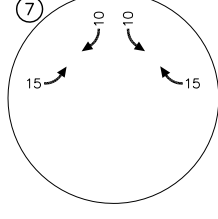
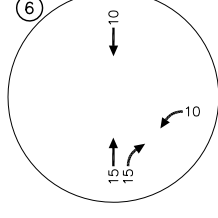
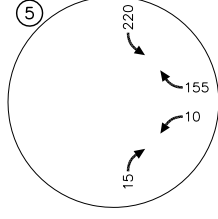
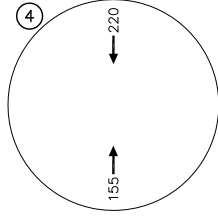
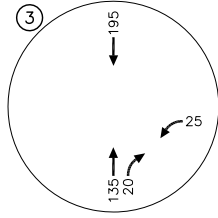
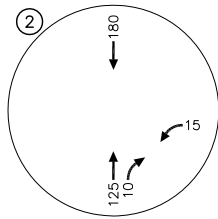
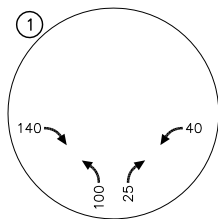




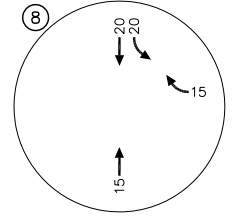
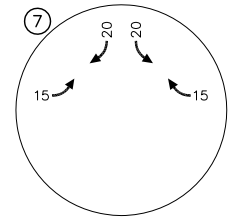
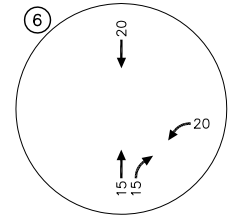
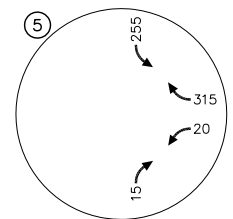
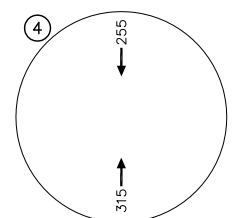
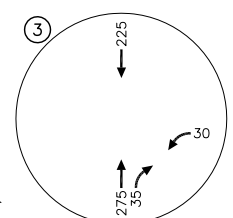
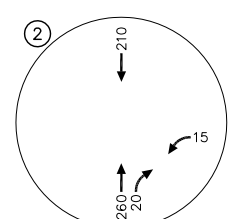
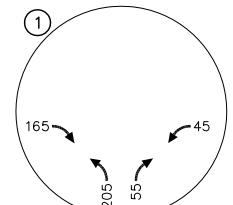
LEGEND

- STOP/ YIELD CONTROL 🚦 TRAFFIC SIGNAL Ⓛ ROUNDABOUT
- ➡ ROAD IMPROVEMENTS PROPOSED FOR EXISTING 2015 TRAFFIC CONDITIONS
- ➡ ROAD IMPROVEMENTS PROPOSED FOR EXPECTED 2020 TOTAL TRAFFIC CONDITIONS

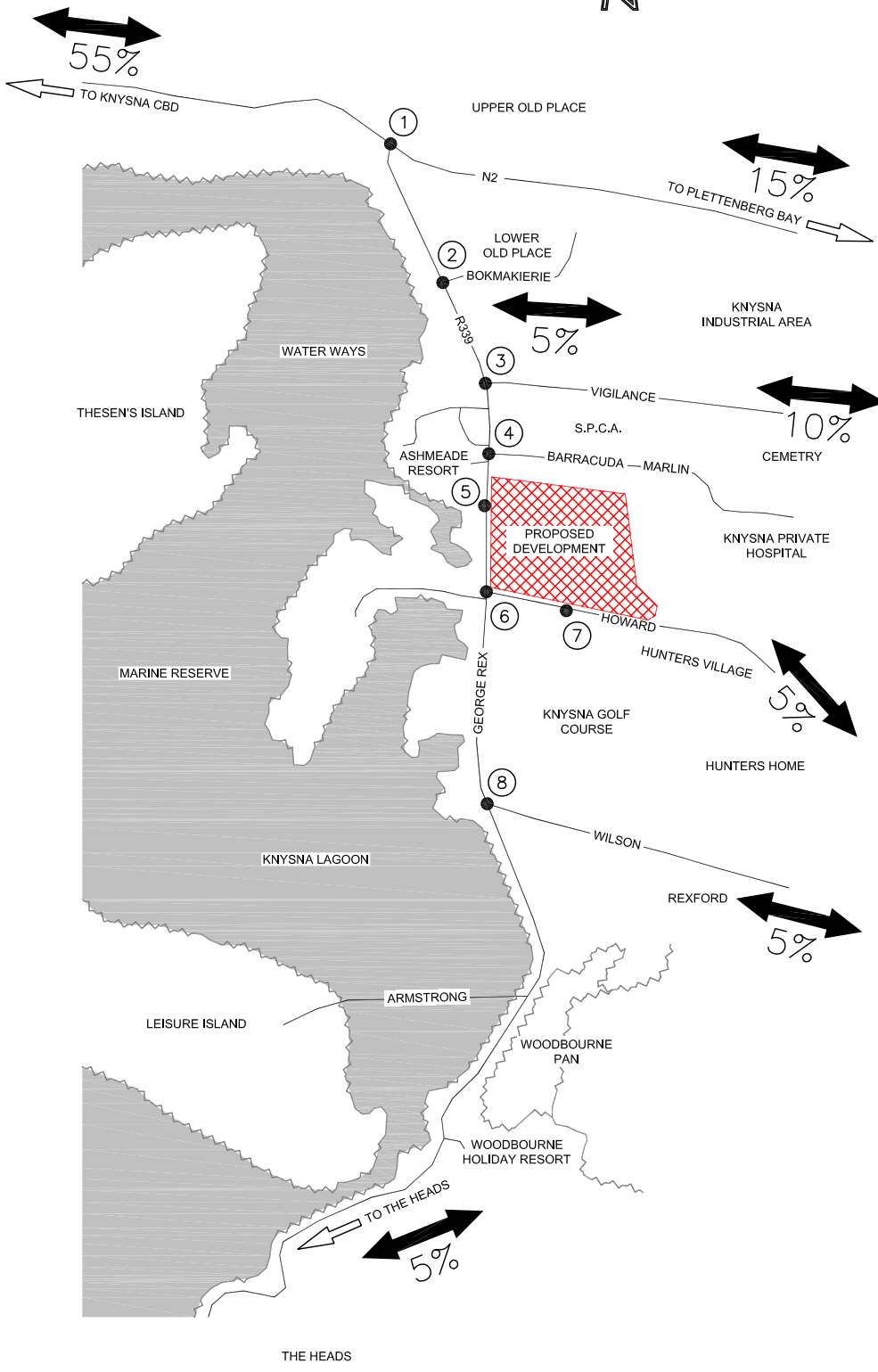




WEEKDAY AM
PEAK HOUR

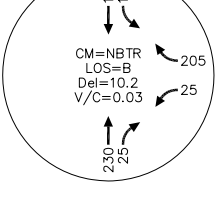
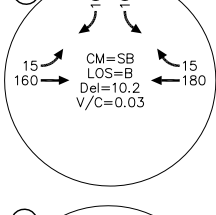
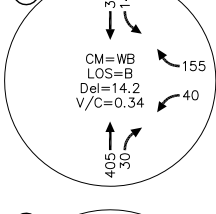
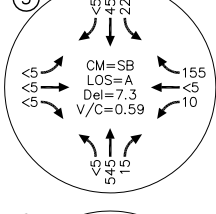
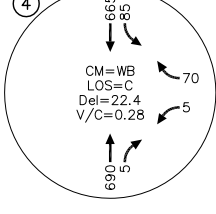
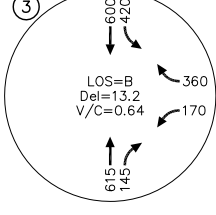
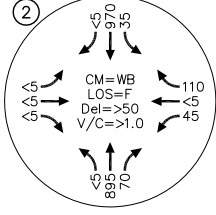
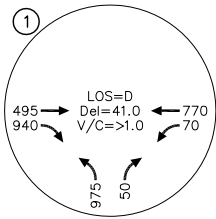


WEEKDAY PM
PEAK HOUR

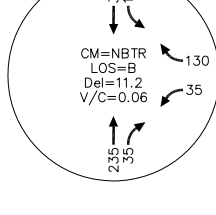
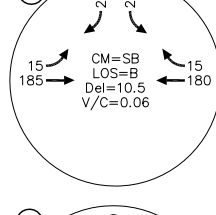
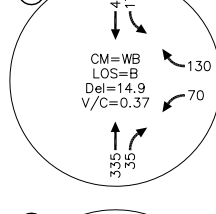
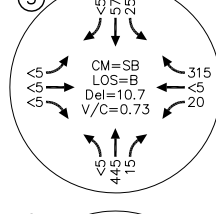
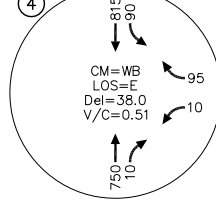
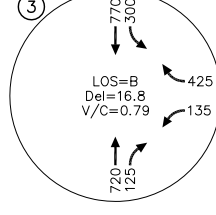
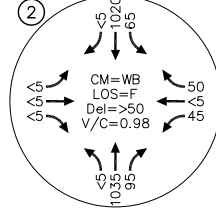
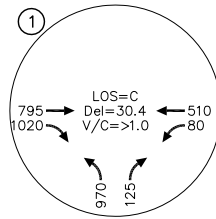


EXPECTED DEVELOPMENT TRIPS			
PEAK HOUR	IN	OUT	TOTAL
WEEKDAY A.M.	258	180	438
WEEKDAY P.M.	298	369	667

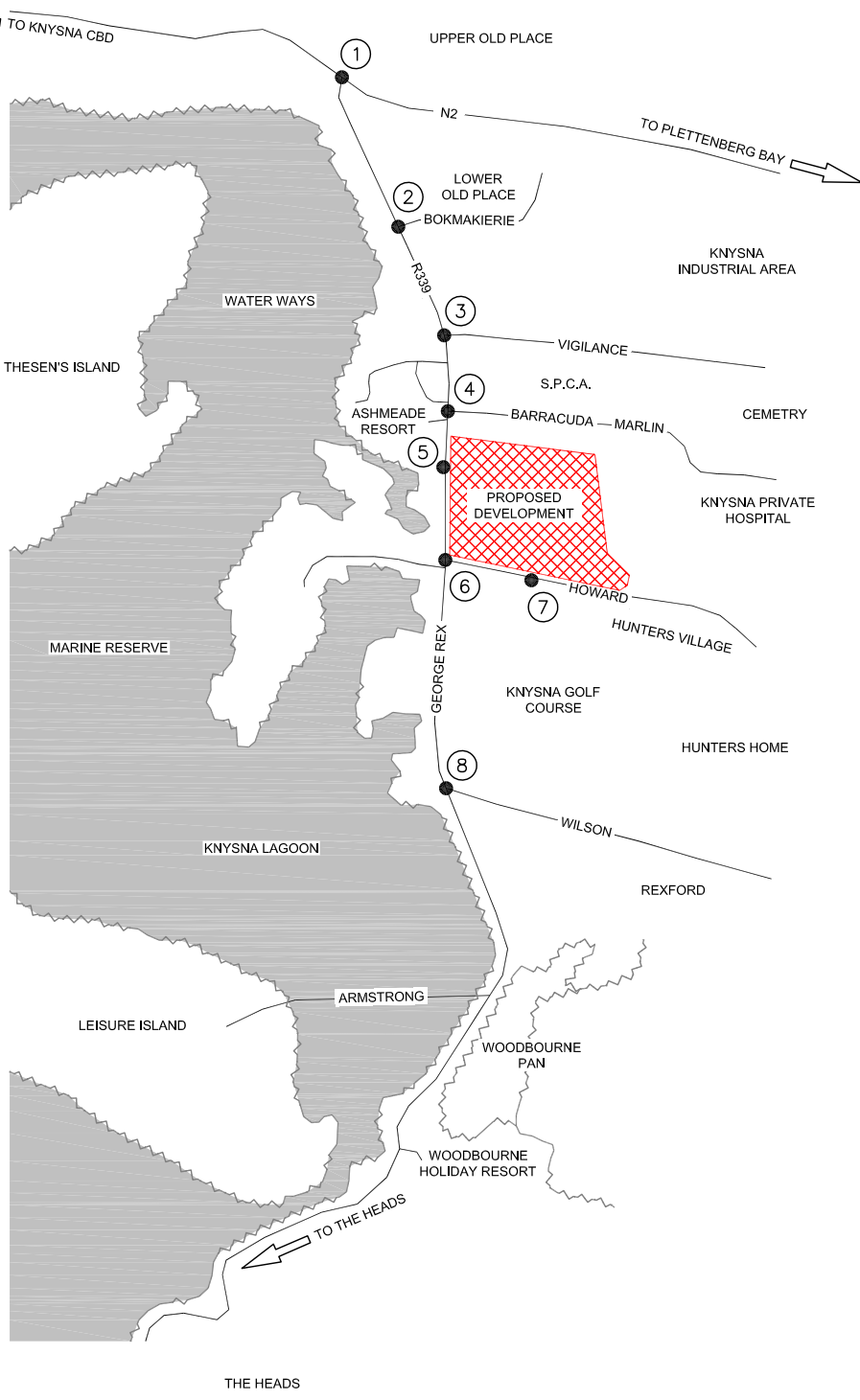




**WEEKDAY AM
PEAK HOUR**



**WEEKDAY PM
PEAK HOUR**



LEGEND	
CM	= CRITICAL MOVEMENT (UNSIGNALISED)
LOS	= INTERSECTION LEVEL OF SERVICE (SIGNALISED) / CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALISED)
Del	= INTERSECTION AVERAGE DELAY (SIGNALISED) / CRITICAL MOVEMENT DELAY (UNSIGNALISED)
V/C	= CRITICAL VOLUME-TO-CAPACITY RATIO

NOTE: CAPACITY ANALYSIS BASED ON LANE CONFIGURATION AS ILLUSTRATED IN FIGURE 3.



Annexure B

Photos



N2 (Westbound)



George Rex Drive (Southbound)



Bokmakierie Street (Eastbound)



Vigilance Drive (Eastbound)



Marlin Road (Eastbound)



Howard Street (Eastbound)



Wilson Street (Eastbound)



Annexure C

Tables

Table 5: Existing Traffic Conditions

Intersection	AM Peak Hour				PM Peak Hour			
	CM	LOS	Delay	V/C	CM	LOS	Delay	V/C
1. N2/George Rex Drive	N/A	C	29.3	0.90	N/A	B	13.3	0.69
2. George Rex Drive/Bokmakierie Street	WB	F	>50	0.87	WB	E	36.	0.41
3. George Rex Drive/Vigilance Street	N/A	B	12.1	0.49	N/A	B	12.5	0.53
4. George Rex Drive/Marlin Road	WB	B	12.4	0.12	WB	B	12.5	0.16
5. George Rex Drive/Access 1	FUTURE INTERSECTION							
6. George Rex Drive/Howard Street	WB	B	11.5	0.23	WB	B	11.3	0.21
7. Howard Street/Access 2	FUTURE INTERSECTION							
8. George Rex Drive/Wilson Street	NBTR	A	9.8	0.03	NBTR	B	10.4	0.04

LOS – Level of Service; CM – Critical Movement; Delay – Seconds per Vehicle; V/C – Volume per Capacity

Table 6: 2023 Background Traffic Conditions

Intersection	Friday PM Peak Hour				Saturday Peak Hour			
	CM	LOS	Delay	V/C	CM	LOS	Delay	V/C
1. N2/George Rex Drive	N/A	C	27.0	0.95	N/A	B	17.6	0.86
2. George Rex Drive/Bokmakierie Street	WB	F	>50	0.88	WB	E	44.0	0.49
3. George Rex Drive/Vigilance Street	N/A	B	12.9	0.57	N/A	B	13.9	0.65
4. George Rex Drive/Marlin Road	WB	B	14.4	0.17	WB	C	15.8	0.25
5. George Rex Drive/Access 1	FUTURE INTERSECTION							
6. George Rex Drive/Howard Street	WB	B	13.2	0.31	WB	B	13.6	0.31
7. Howard Street/Access 2	FUTURE INTERSECTION							
8. George Rex Drive/Wilson Street	NBTR	B	10.1	0.03	NBTR	B	11.0	0.06

LOS – Level of Service; CM – Critical Movement; Delay – Seconds per Vehicle; V/C – Volume per Capacity

Table 7: Proposed Trip Generation Rates

Land Use	Units	Source	Size	Weekday AM Peak Hour			Weekday PM Peak Hour		
				Rate	In	Out	Rate	In	Out
Business Retail	100 m ²	ITE814	11 947	1.00	50%	50%	2.71	50%	50%
Business Office	100 m ²	COTO710	5 409	2.10	85%	15%	2.40	20%	80%
Speciality Retail	100 m ²	ITE814	500	1.00	50%	50%	2.71	44%	56%
Hotel	Room	COTO310	80	0.50	60%	40%	0.50	55%	45%
Aquatic & Training Centre	Seats	Assumption	3 000	0.03	60%	40%	0.03	40%	60%
Sports Village – Group Housing	Units	COTO210	60	1.00	25%	75%	1.00	70%	30%

Table 8: 2023 Background Traffic Conditions

Land Use	Weekday AM Peak Hour			Weekday PM Peak Hour		
	In	Out	Total	In	Out	Total
Business Retail	60	60	119	162	162	324
Business Office	97	17	114	26	104	130
Speciality Retail	3	3	5	6	8	14
Hotel	24	16	40	22	18	40
Aquatic & Training Centre	60	40	100	40	60	100
Sports Village – Group Housing	15	45	60	42	18	60
Total Trips	258	180	438	298	369	667

Table 9: 2023 Total Traffic Conditions

Intersection	Friday PM Peak Hour				Saturday Peak Hour			
	CM	LOS	Delay	V/C	CM	LOS	Delay	V/C
1. N2/George Rex Drive	N/A	D	41.0	>1.0	N/A	C	30.4	>1
2. George Rex Drive/Bokmakierie Street	WB	F	>50	>1.0	WB	F	>50	0.98
3. George Rex Drive/Vigilance Street	N/A	B	13.2	0.64	N/A	B	16.8	0.79
4. George Rex Drive/Marlin Road	WB	C	22.4	0.28	WB	E	38.0	0.51
5. George Rex Drive/Access 1	SB	A	7.3	0.59	SB	B	10.7	0.73
6. George Rex Drive/Howard Street	WB	B	14.2	0.34	WB	B	14.9	0.37
7. Howard Street/Access 2	SB	B	10.2	0.03	SB	B	10.5	0.06
8. George Rex Drive/Wilson Street	NBTR	B	10.2	0.03	NBTR	B	11.2	0.06

LOS – Level of Service; CM – Critical Movement; Delay – Seconds per Vehicle; V/C – Volume per Capacity