VELASKAR PROPERTY INVESTMENTS (Pty)Ltd

New Shopping Centre on Portion 16 of Farm 20 Atlantis, Cape Town

Traffic Impact Assessment

June 2023

Prepared For:

Velaskar Property Investments
92 Flat Road
Rylands Estate
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Compiled by:

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Traffic Impact Assessment for the development of a new Shopping Centre at the corner of Saxonwold and R304 Roads in Atlantis

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1. INTRODUCTION

1.1 Background

Velaskar Property Investment (Pty)Ltd procured portion 16 of Farm 20 in Atlantis and plans the development of a shopping centre. The site was until recently being vacant with many residential units being established around it. Velaskar Property Investment appointed Imodie Projects to do a traffic impact assessment in support of various departures from the Development Management Scheme and the approval of the site development plan for the proposed shopping centre. The location of the site of the proposed development is show in Figure 1.1.

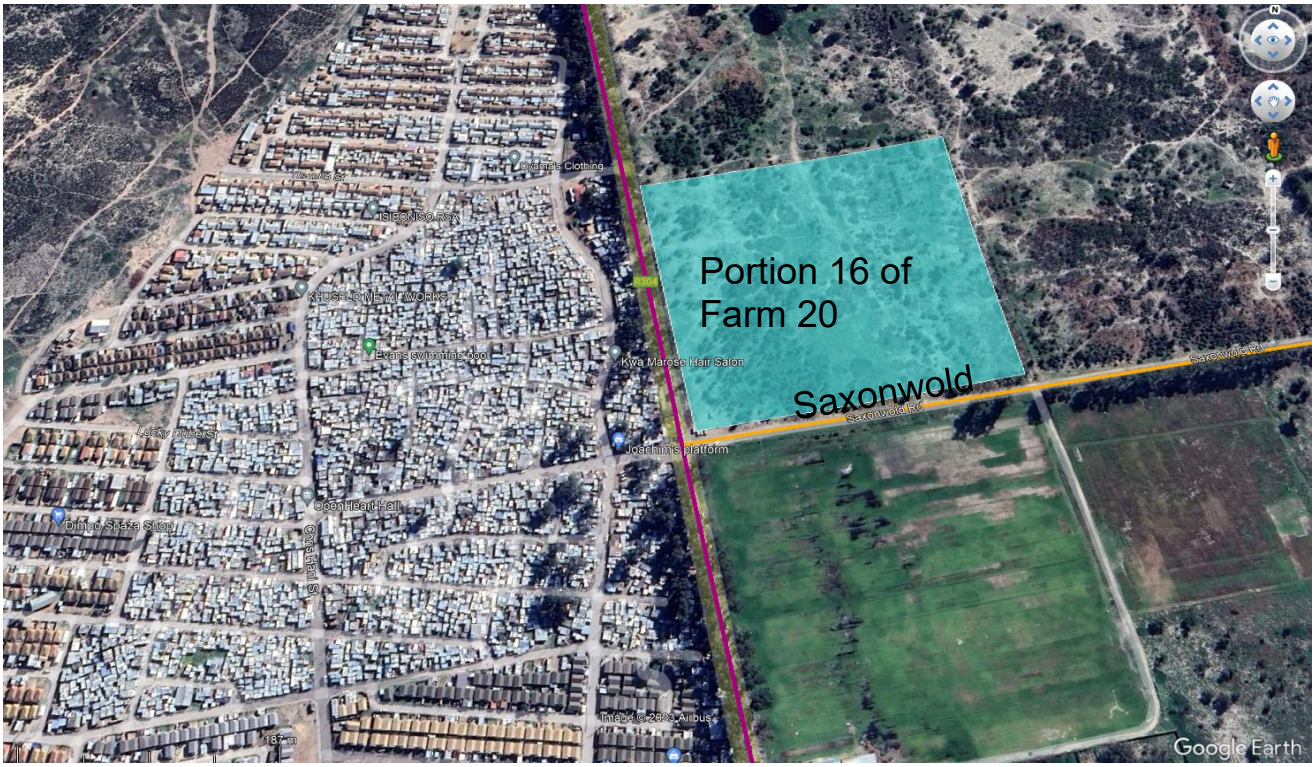


Figure 1.1: Location of Proposed Development and Roads Classification

1.2 Goal and Objectives

The goal of this report is to assess the traffic impact of the proposed development. The specific objectives are:

- To determine the current level of service
- To assess the operating and parking conditions
- Identify upgrading requirements to the adjacent road network to accommodate the proposed development

1.3 Scope

According to TMH16 Volume1, Traffic Impact Assessments are required for a change in land use and departures from the Development Management Scheme where the highest total additional hourly vehicular trips generation because of the application exceed 50 trips per hour. This proposed development requires a change in the land use and will generate more than 50 vehicle trips during the peak hour periods. The trip generation will also be more than 150 during the peak hour period and all intersections where the addition trips on a critical movement is more than 50vph will have to be included in the TIA.

It is also required to assess the expected operational conditions of transport facilities proposed in a Site Development Plan and to establish whether such facilities will be able to safely and efficiently accommodate current and future traffic. The evaluation of the operational efficiency and safety aspects of the access is a critical aspect of the Site Traffic Assessment report.

2. ROAD NETWORK

To assess the impact of the proposed development, it is important to take cognisance of the current road network and any changes that can be expected in the future.

2.1 Existing Road Network

The existing road network is also shown in Figure 1.1 above. The site of the proposed development is bordered by the R304 to the west and Saxonwold Road to the south. Both these roads are surfaced undivided two lane roads. The R304 can be classified as a Class2 Road. Saxonwold is a Class4 Road.

All other roads in the immediate vicinity are two lane single carriageways and are stop controlled at the intersections.

2.2 Future Road Network

No changed to the future road network is planned at this stage or will significantly influence the traffic generated by the proposed development.

3. TRIP GENERATION

The trip generation for the proposed development has been determined in accordance with the South African Trip Data Manual TMH17. The manual makes provision for the reduction of generated trips for the following reasons:

- Developments in areas with mixed land use - 25% reduction
- Areas with low vehicle ownership – 50% reduction
- Areas with very low vehicle ownership – 80% reduction
- Developments along transit nodes or corridors -15% reduction

The proposed development is located alongside a transit route which is served by busses and minibus taxis. It is therefore appropriate to allow for a 15% reduction in the trip generation. A 25% reduction can also be made for the mixed land use nature of the developments and the proximity of other retail facilities. The proposed development is also in an area of low vehicle ownership and a further 50% reduction can also be obtained. The directional split for the proposed land use is different for different peak periods. The morning peak has a split of 65:35, Friday afternoon and Saturday morning peak periods have a directional split of 50:50.

Table 3.1: Trip Generation

Description	Size 100 m^2	Trip Rate			Trips Generated								
		AM	PM	Sat	AM PeakS			Friday PM Peak			Saturday Am Peak		
					In	Out	Total	In	Out	Total	In	Out	Total
Shopping Centre	65,8	0,6 65:35	3,4 50:50	4,5 50:50	26	14	**40**	112	112	**224**	**149**	**149**	**298**

Allowing for trips reduction in accordance with TRH17 and as discussed above, the new final trips generated is as follows:

Pc = 1 – (1-Pm)*(1-Pv)*(1-Pt)

Pc = Combined Reduction factor
Pm = Reduction factor for mixed use development
Pv = Reduction factor for vehicle ownership
Pt = Reduction factor for location next to transport corridor

Pc = 1-(1-0,25)(1-0,5)(1-0,15) = 0,68

The adjusted trips generation for the proposed shopping centre development is shown in Table 3.1.

Table 3.1: Adjusted Trip Generation

Description	Size 100m^2	Trip Rate			Trips Generated								
		AM	PM	Sat	AM PeakS			Friday PM Peak			Saturday Peak		
					In	Out	Total	In	Out	Total	In	Out	Total
Shopping Centre	65,80	0,4 65:35	2,3 50:50	3,1 50:50	18	10	**28**	76	76	**152**	102	102	**204**

The total trips generated during the Friday and Saturday peak periods are more than 50 and a Traffic Impact Assessment is therefore required. The expected trip generation of the proposed development is shown in Figures 4.1 to 4.2 below.

4. TRIP DISTRIBUTION AND ASSIGNMENT

Trip distribution has been done using the gravity model. Although the bulk of the potential clients (90%) of the proposed centre is located to the north of the site, the northern parts of the centre is well served with shopping centres and it is therefore reasonable to estimate that not exactly 90% of the trips will come from the north, but rather a figure closer to 60% due to the existing facilities in the north. Witsand to the west will be the source of 30% of the trips. A further 10% will be coming from the south. The proposed trip distribution is shown in Figure 4.1 and 4.2 for the Friday afternoon and Saturday morning peak periods respectively.

The traffic volumes for the following different peak periods and scenarios are also shown in the following figures:

Figure 4.3: Friday PM Current Traffic Volumes
Figure 4.4: Saturday AM Current Traffic Volumes
Figure 4.5: Friday PM Current with Development
Figure 4.6: Saturday AM Current with Development
Figure 4.7: 2028 Friday PM with Development
Figure 4.8: 2028 Saturday AM with Development

From Figures 4.1 and 4.2 (Trip Generation) it is clear that only intersection 3 need to be further investigated and analysed since only this intersection will have more than 50trips during the peak hour period for the critical movements. I was however decided to also include the analysis of Intersections 2 and 4.

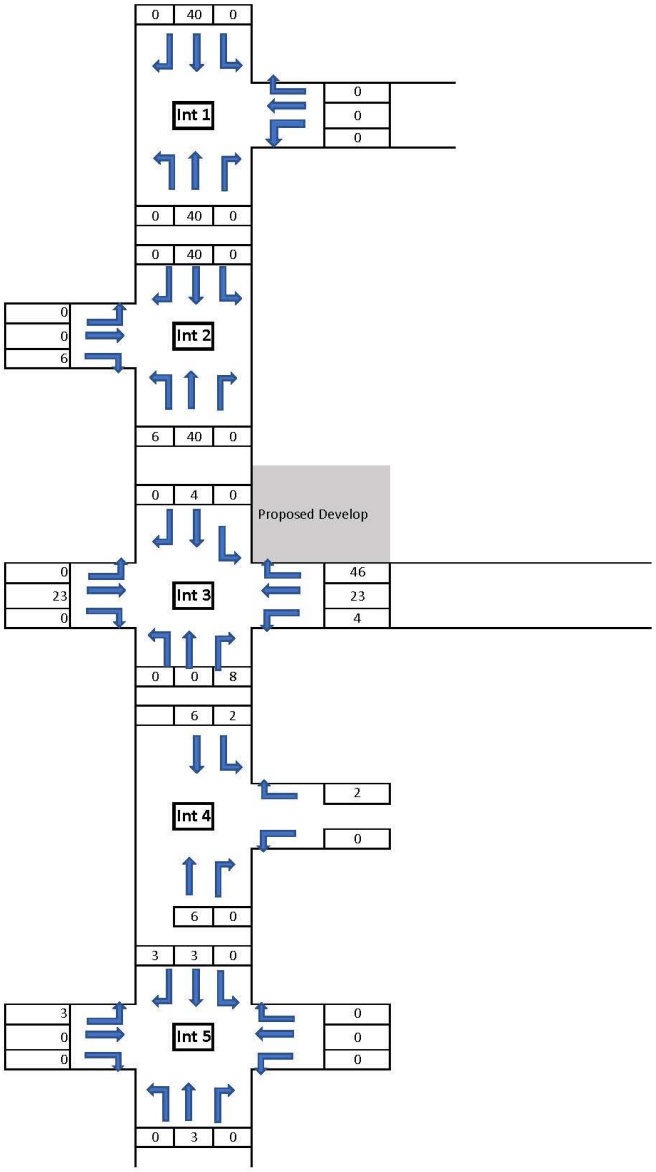


Figure 4.1: Friday Afternoon PH Trip Distribution

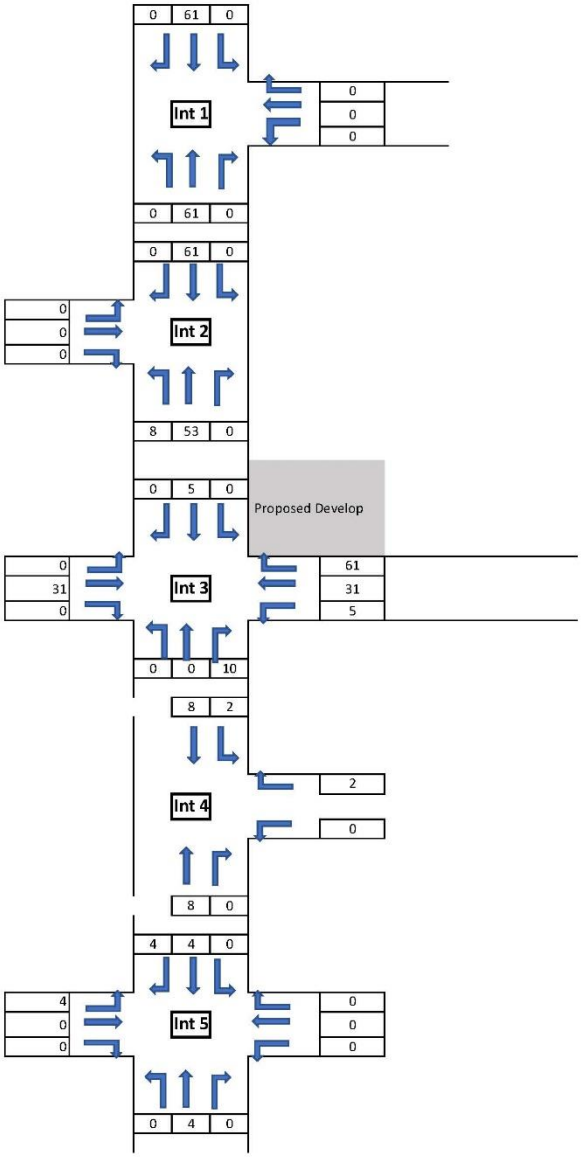


Figure4.2: Saturday Morning PH Trip Distribution

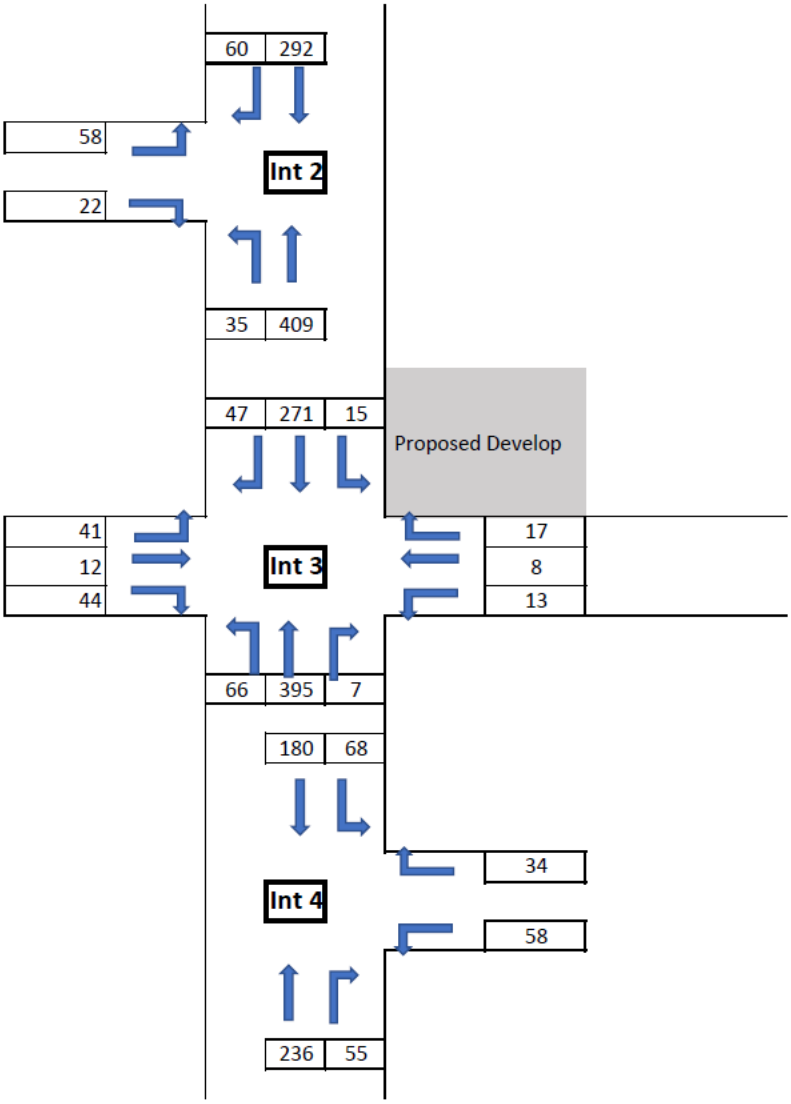


Figure 4.3: Current Friday PM Traffic

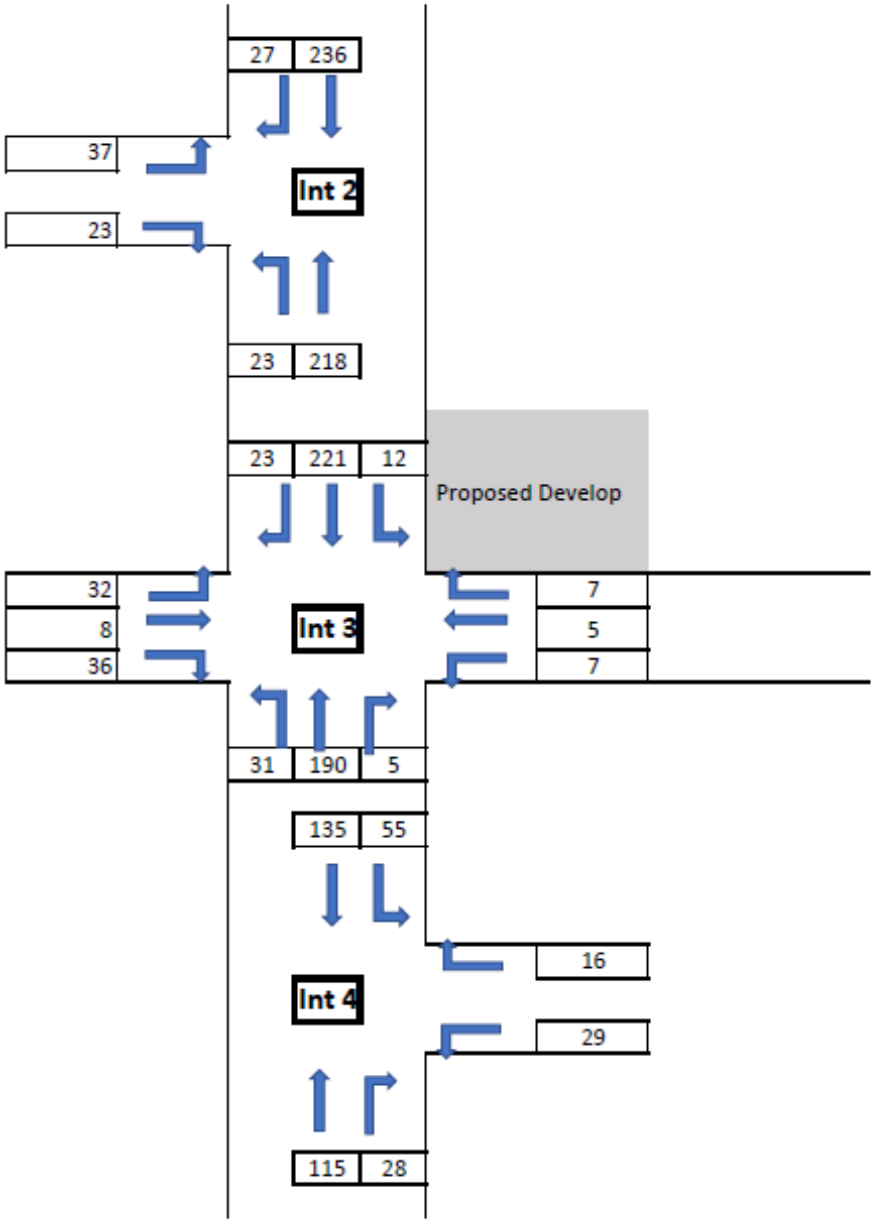


Figure 4.4: Current Saturday AM Traffic

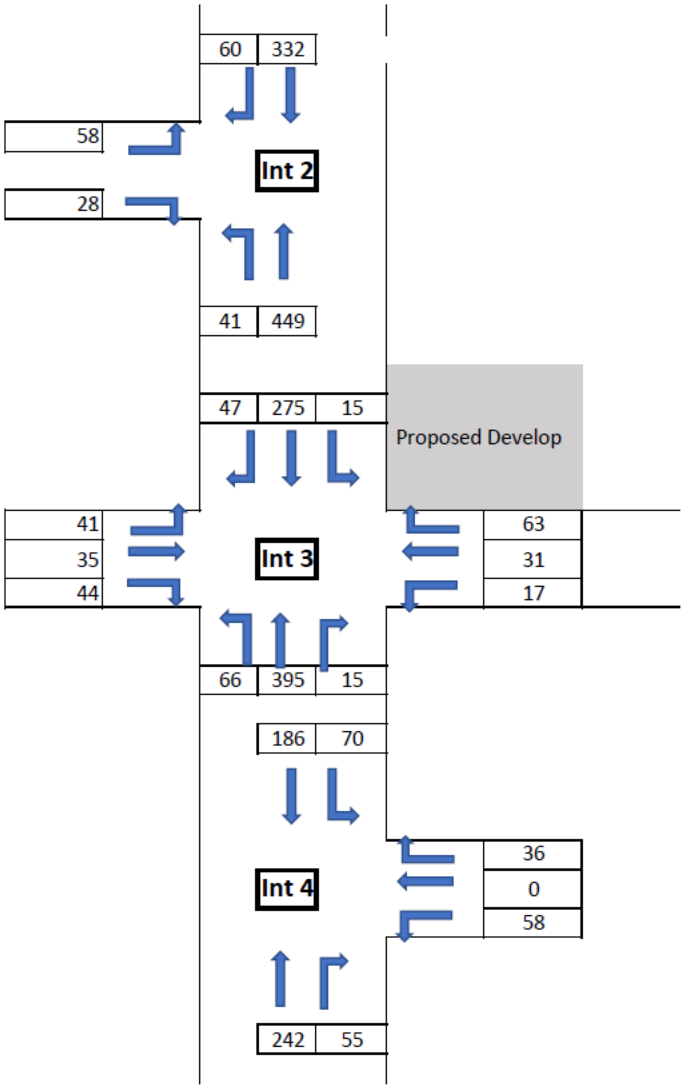


Figure 4.5: Current with Development Friday PM Traffic

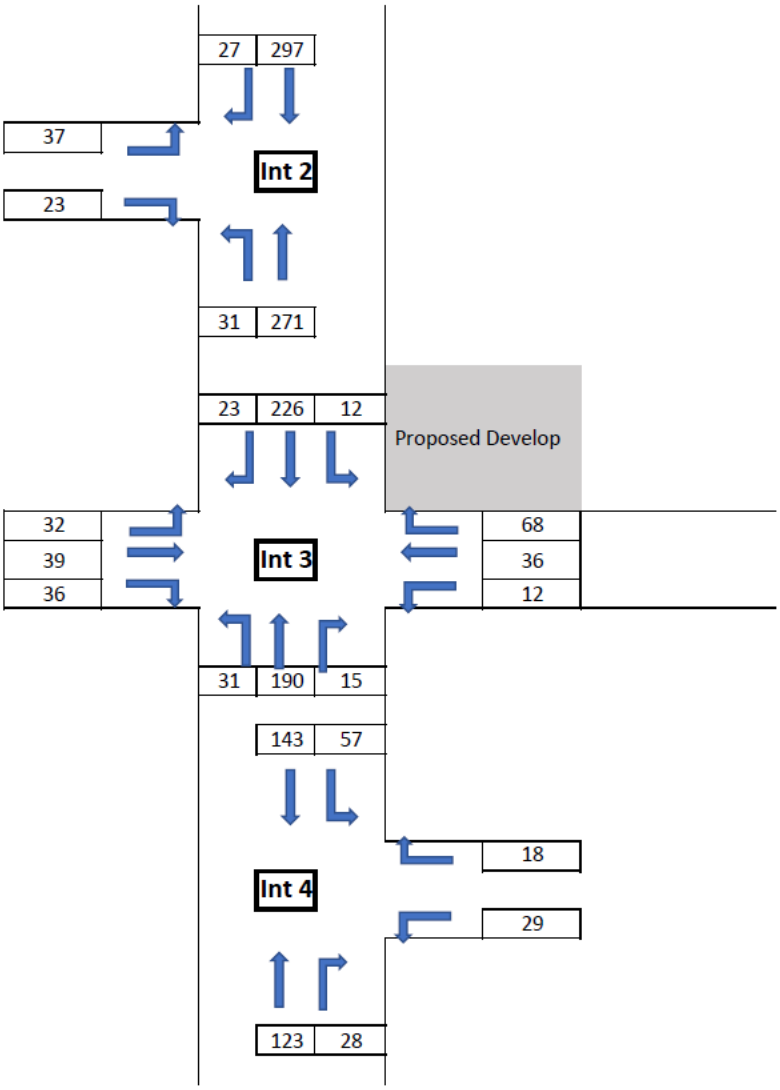


Figure 4.6: Current with Development Saturday AM Traffic

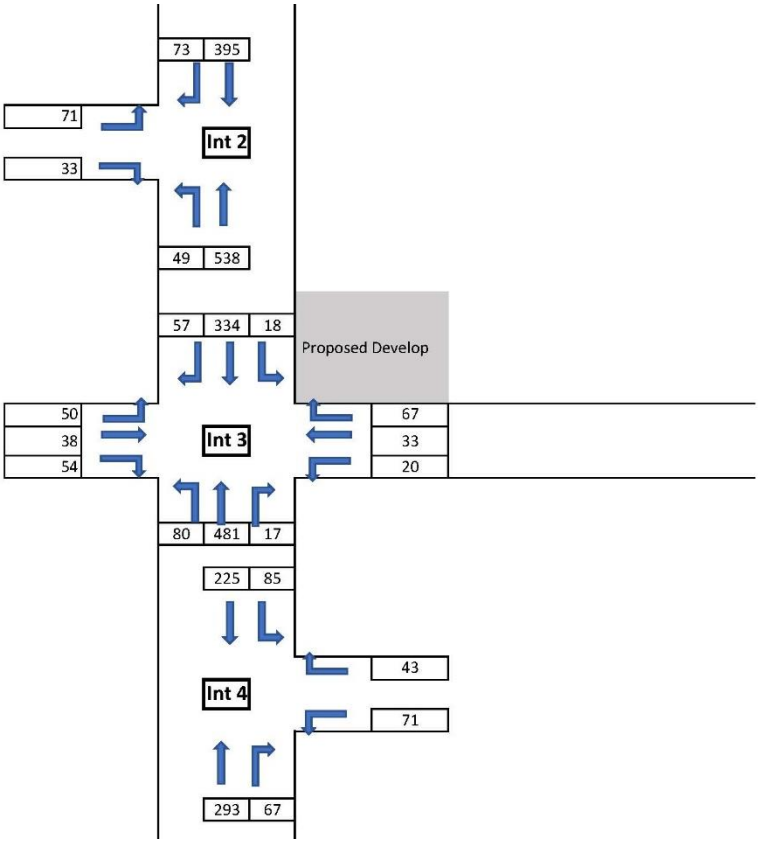


Figure 4.7: 2028 with Development Friday PM Traffic

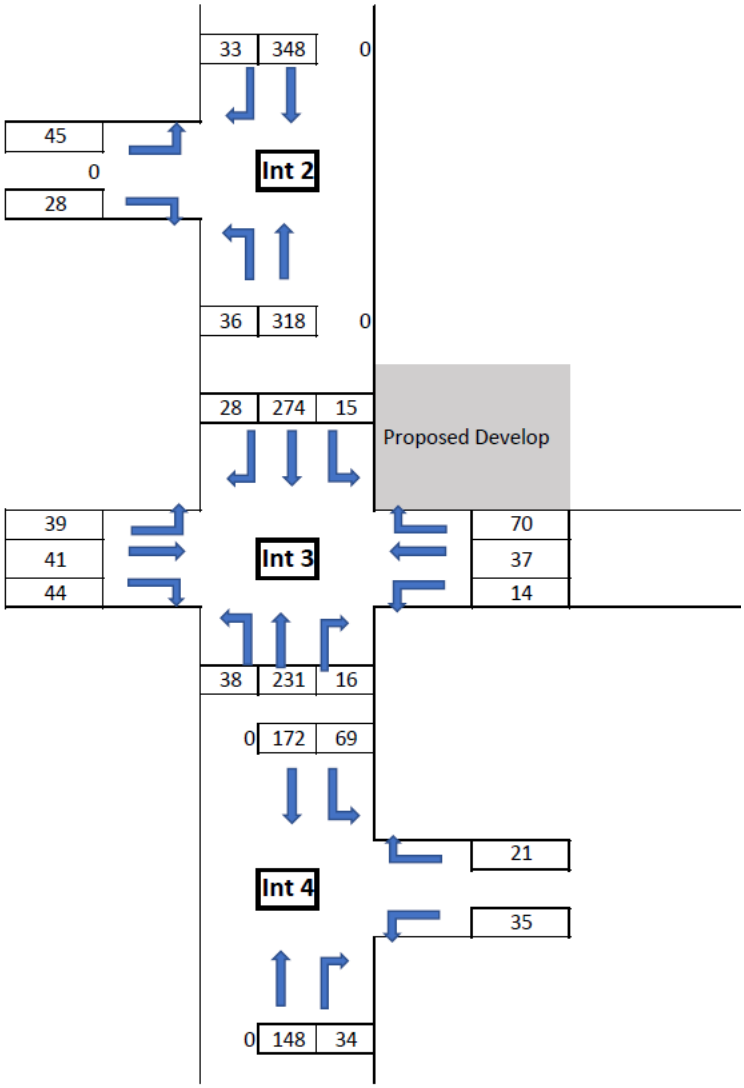


Figure 4.8: 2028 with Development Saturday AM Traffic

5. CAPACITY ANALYSIS.

Capacity analysis were performed for intersections 2 to 3 using the SIDRA program. The results of the analysis is shown in Table 5.1.

5.1 Analysis

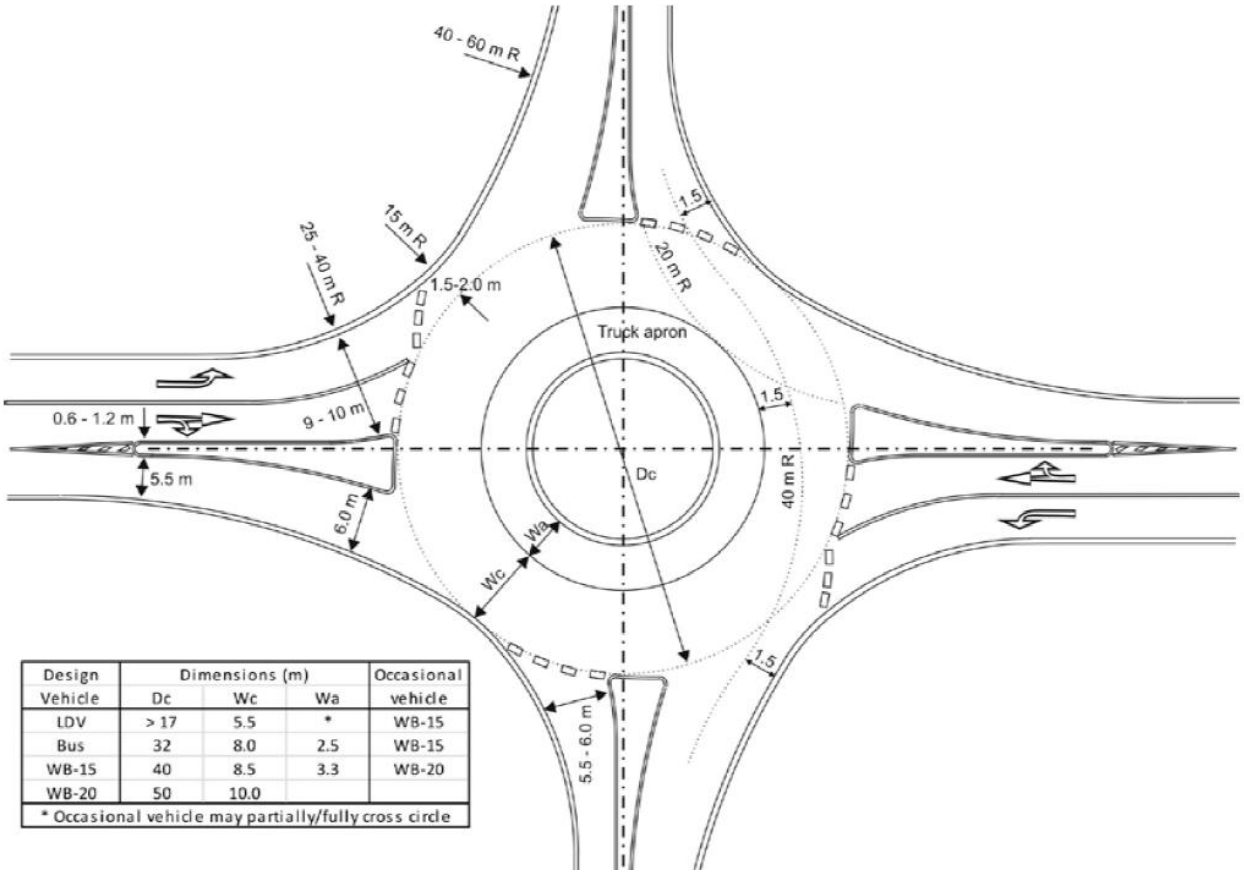
Table 5.1: Sidra analysis Results

Inters ID	**Current Scenario**		**Current plus Development**		**2028 plus Development**	
	Fri PM	Sat AM	Fri PM	Sat AM	Fri PM	Sat AM
Intersection 2						
Southern Approach	B	B	B	B	B	B
Western Approach	C	C	C	C	C	C
Northern Approach	B	B	B	B	B	B
Eastern Approach	-	-	-	-	-	-
Intersection 3						
Southern Approach	C	B	D	C	E	B
Western Approach	**F**	**D**	**F**	**E**	**F**	D
Northern Approach	B	B	C	C	C	B
Eastern Approach	D	D	D	C	**E**	D
Intersection 4						
Southern Approach	B	A	B	B	B	B
Western Approach	-	-	-	-	-	-
Northern Approach	B	B	B	B	B	B
Eastern Approach	C	C	C	C	C	C

From the above analysis it is clear that intersection 3 is already experiencing capacity problems with LOS F being experienced on the western approach. That is worsening with the implementation of the proposed development. All other intersections operate at acceptable LOS for all the planning scenarios.

5.2 Proposed Improvements

Intersection 3 has been analysed introducing more approach lanes to the existing all stops intersection. This did not result in noticeable improvements in the LOS. The introduction of a Traffic Circle resulted in noticeable and substantial improvements in the LOS.



Design Vehicle	Dimensions (m) Dc	Wc	Wa	Occasional vehicle
LDV	> 17	5.5	*	WB-15
Bus	32	8.0	2.5	WB-15
WB-15	40	8.5	3.3	WB-20
WB-20	50	10.0		
* Occasional vehicle may partially/fully cross circle				

Figure 5.1: Proposed improvement to Intersection 3

The circle proposed allows for a Dc= 40m, Wc =8,5 and Wa =3.3. This will allow for busses and trucks to comfortably manoeuvre the circle. The LOS for the improved intersection configuration is LOS A. The results of the analysis is shown in Annexure C.

6. DEVELOPMENT ACCESS

Access to the proposed development is as important aspect of the traffic impact assessment and must meet spacing and level of service requirements

6.1 Existing Access

The site is currently not developed and no formal access exist.

6.2 Proposed Access and Traffic Circulation

The access to the proposed development will be from both the R304 main road and Saxonwold Road. Access from Saxdown Road will mainly be for Servicing trucks and deliveries, although passengers' vehicles and taxis coming from the south will also be able to enter at this access. All accesses will be priority controlled.

Traffic circulation is also shown in the Site Development Plan. The delivery vehicles will be forced to drive on the periphery of the site and interfere as little as possible with the passenger cars and pedestrians.

Traffic volumes at the Saxdown Road access for 2028 with the development is shown in Figures 6.1 and 6.2

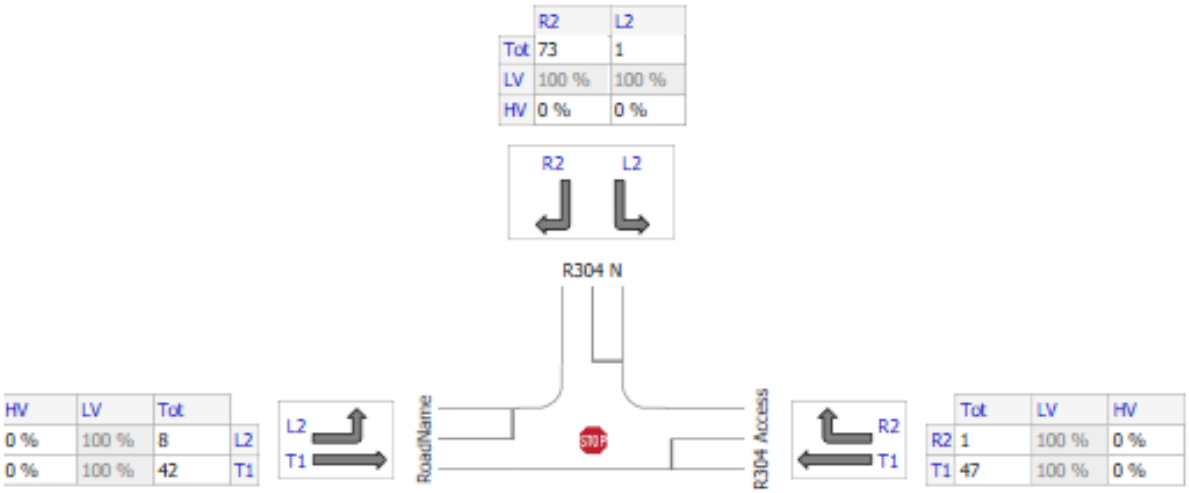


Figure 6.1: Friday Afternoon access volumes

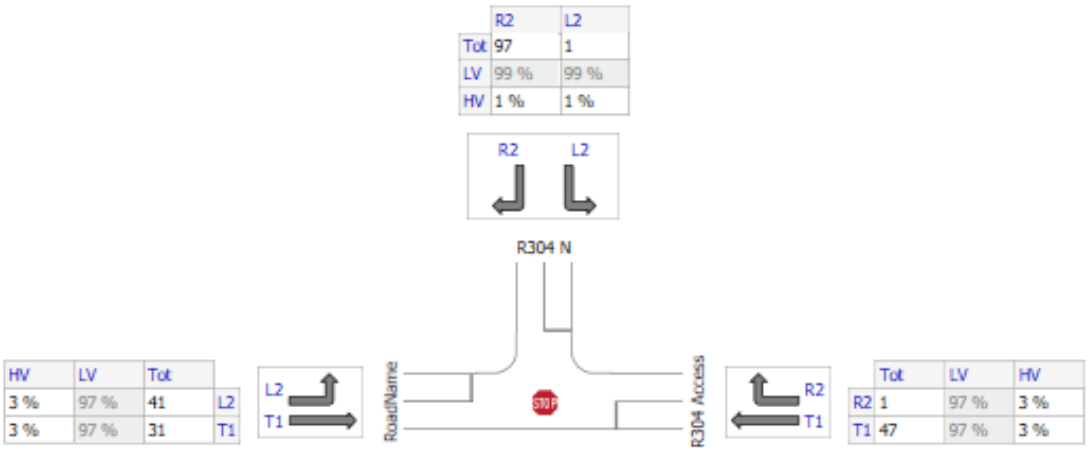


Figure 6.2: Saturday Morning access volumes

The traffic analysis results are shown in Figure 6.3 and 6.4 and it is clear that the access will operate at acceptable Level of Service in 2023 with the development.

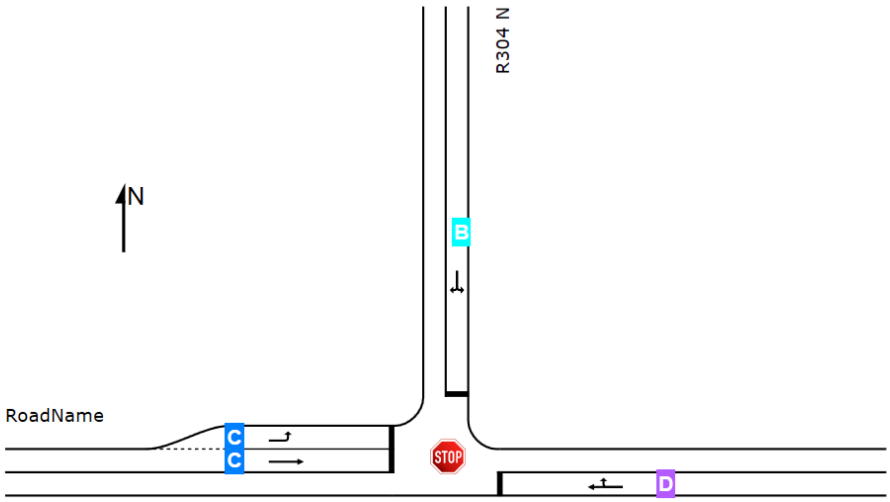


Figure 6.3: Friday Afternoon LOS at Access

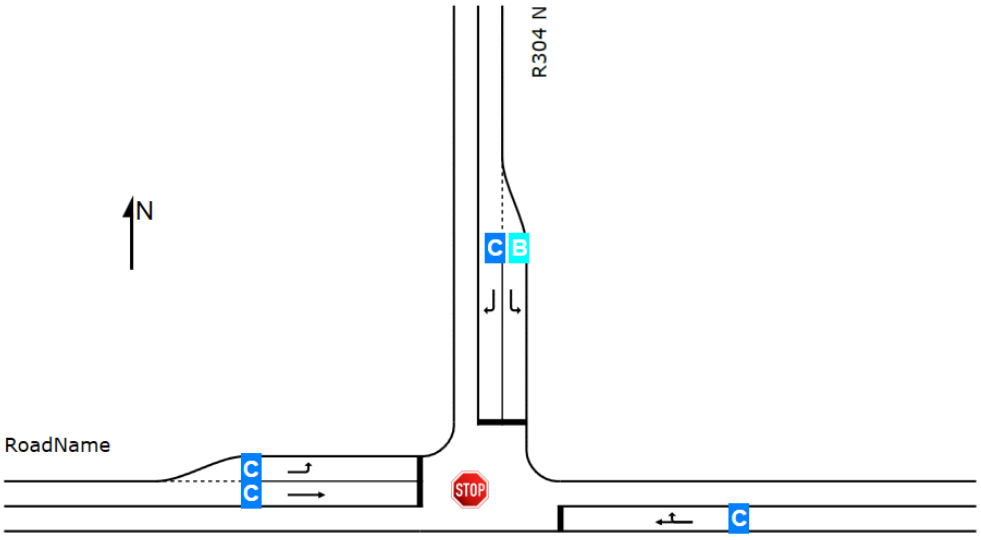


Figure 6.4: Saturday Morning LOS at Access

The entrance and exit are shown on the Site Development Plan in Annexure A. The traffic circulation supports the proposed access points. Sight distances is sufficient with the road being straight and no obstructions being around. A long enough throat length have been provided for vehicles wanting to exit to que up at the exit point. The proposed

access on the R304 will be just over 150m from existing intersections and does therefor comply with the absolute and preferred minimum intersection and access separation as per Table 9 of TMH16 Vol2.

Kerb turning radii of 12m will be provided as a minimum.

7. PARKING

The minimum number of parking bays required is 4 per 100m2, resulting in 264 minimum number of parking that must be provided. The proposed development is provided with a total of 605 parking bays, of which 5 will be for disabled people. The parking bays will be 5m x 2,5m and the bays will be separated by driveways of 7,5m width. The parking layout is shown in Annexure A.

8. PUBLIC TRANSPORT

The location of the proposed development is not in a PT1 or PT2 zone of the City of Cape Town. The need for public transport is however high since the vehicle ownership of the surrounding area is not high and people will make use of public transport, walk or cycle to the facility. It is therefore important that adequate provision be made for public Transport as well as NMT facilities.

International acceptable norm for the maximum distance people should walk to a public transport facility is 500m. Minibus taxi's are the main public transport mode and a facility for minibus taxis must therefore be provided. The minibus taxi facility is shown on the site development plan in Annexure A

9. NON-MOTORISED TRANSPORT

The surrounding streets are not well provided with NMT facilities. All streets in the vicinity have sidewalks where pedestrians can walk. It is only on the local streets in the adjacent residential area that are well protected by barrier kerbs from any potential vehicle conflict. Figure 6.1 indicate the quality of the sidewalks in the entire area.

Figure 9.1: Unprotected Sidewalks along R304

Figure 9.2: Protected Sidewalks in adjacent residential area.

The sidewalks in the residential area are protected and pedestrians can safely walk while being protected from the vehicles. No cycle lanes are provided. The proposed development will for the street directly adjacent to the site provide kerb sidewalks to protect the pedestrians.

10. CONCLUSIONS AND RECOMMENDATIONS

10.1 Conclusions

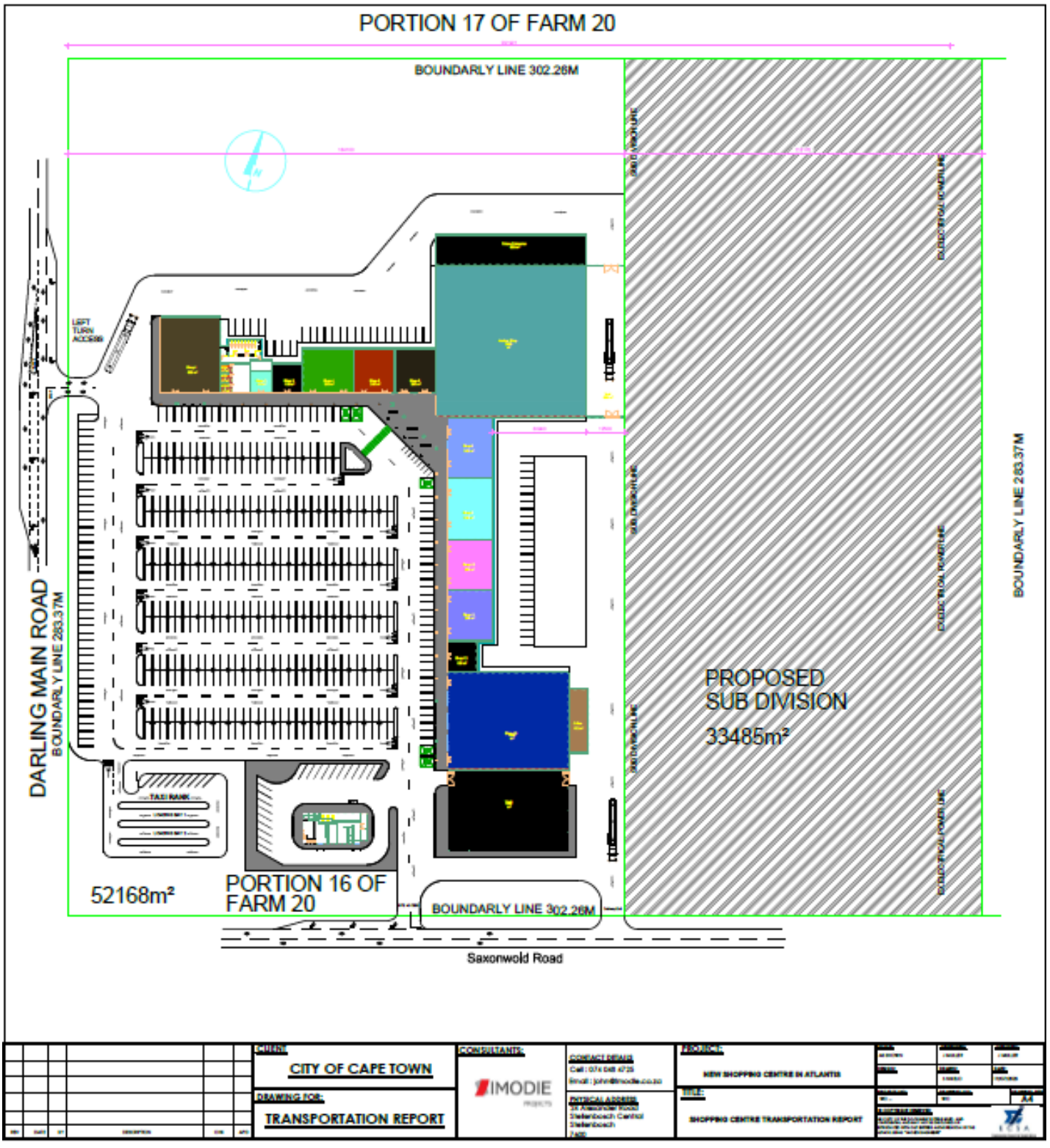
- The proposed development will generate just more than 150 vehicle trips in during the peak hour periods. All intersections that will have an additional 50 peak hour trips on the critical movement were included.
- The access to the proposed development will be from an access from both R304 and Saxdown Road.
- The traffic impact of the proposed development is almost insignificant. Only intersection 3 is operating at LOS E or worse throughout all scenarios.
- The implementation of a circle at intersection 3 will improve the operating conditions and intersection 3 will operate at improved LOS.
- Pedestrian facilities must be provided when the development is implemented. Raised kerb sidewalks must be provided to the immediate adjacent streets.
- Public transport facilities must be provided on the site. The location of the minibus taxi rank is shown on the site development plan.
- A total of 600 parking bays are provided while only 264 parking bays are required at a rate of 4 bays per 100m2.
- The minimum requirements for parking dimensions are well met with the ample space available.

10.2 Recommendation

Based on this Site Traffic Assessment and the findings listed in the conclusions above, it is recommended that the proposed development be approved from a traffic engineering point of view.

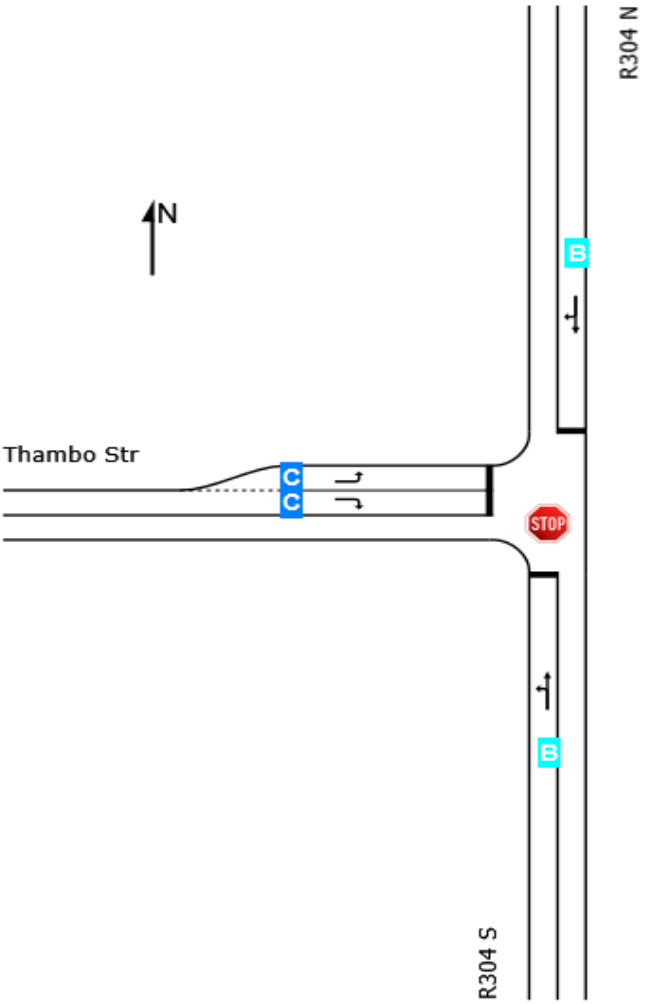
ANNEXURE A

SITE DEVELOPMENT PLAN

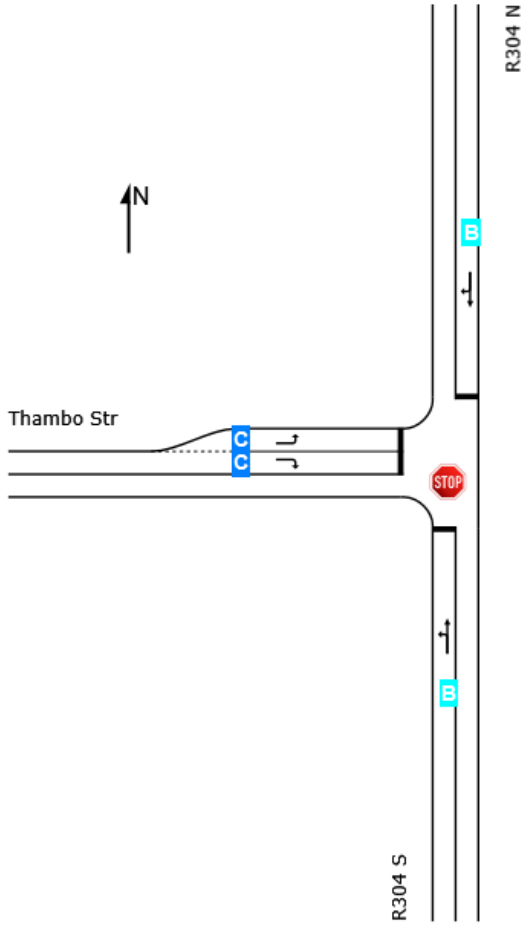

PORTION 17 OF FARM 20
BOUNDARLY LINE 302.26M
LEFT TURN ACCESS
DARLING MAIN ROAD
BOUNDARLY LINE 283.37M
TAXI RANK
52168m²
PORTION 16 OF FARM 20
BOUNDARLY LINE 302.26M
Saxonwold Road
PROPOSED SUB DIVISION
33485m²
BOUNDARLY LINE 283.37M
ELECTRICAL POWER LINE
SUB DIVISION LINE
CLIENT:
CITY OF CAPE TOWN
DRAWING FOR:
TRANSPORTATION REPORT
CONSULTANTS:
IMODIE
PROJECT:
NEW SHOPPING CENTRE IN ATLANTIS
TITLE:
SHOPPING CENTRE TRANSPORTATION REPORT

ANNEXURE B

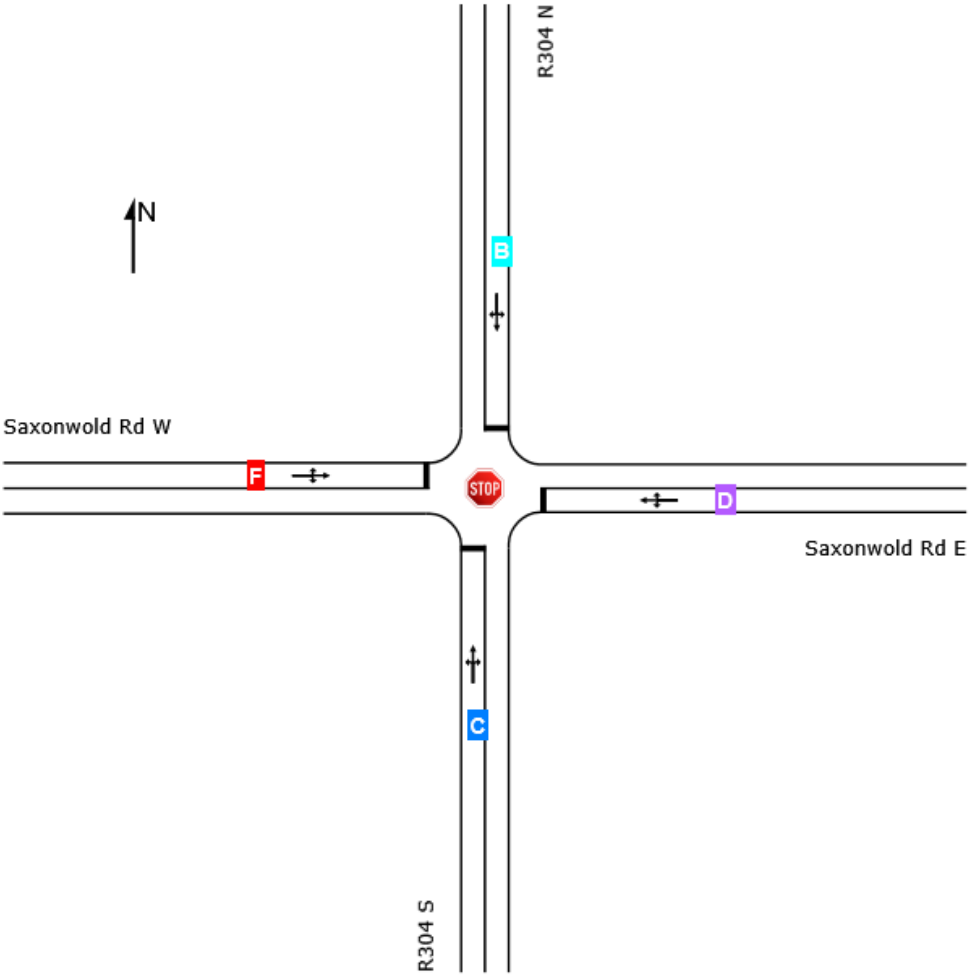
INTERSECTION LAYOUT AND SIDRA RESULTS



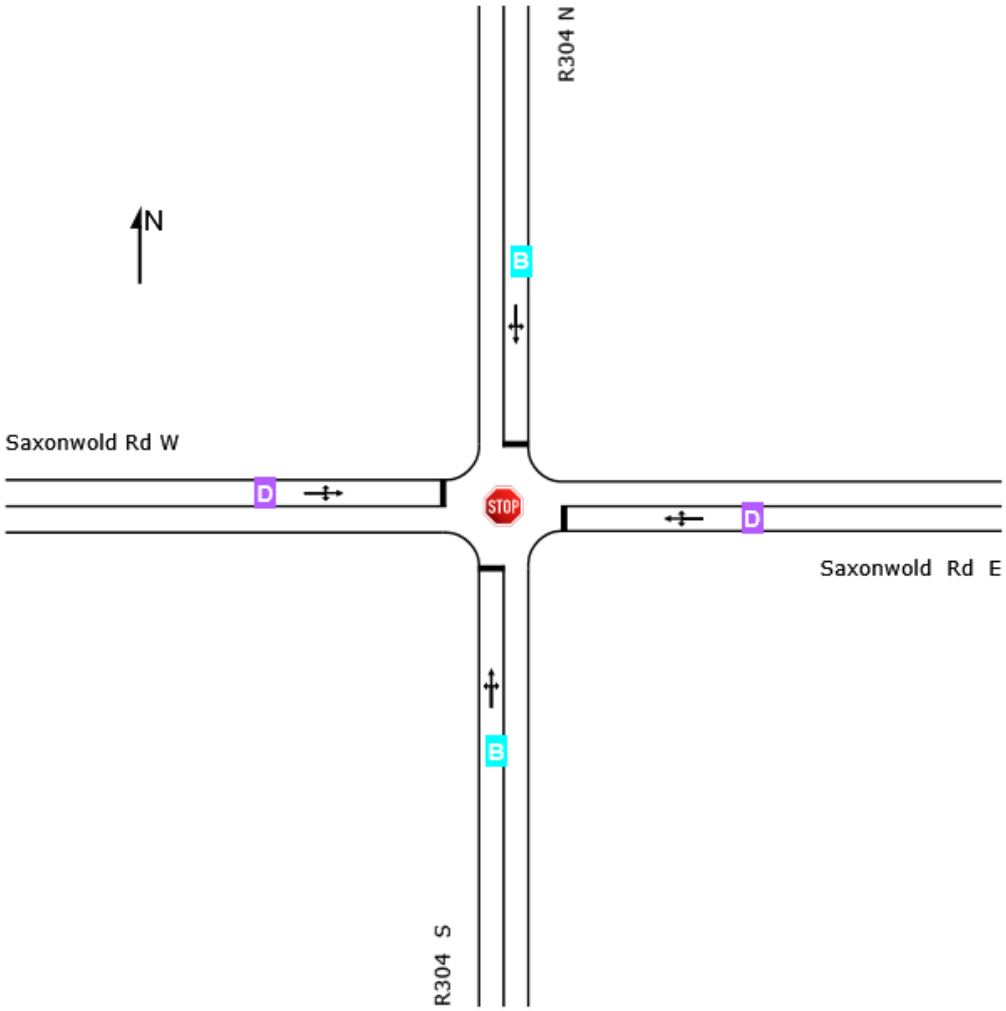
Intersection 2: Current Friday afternoon LOS



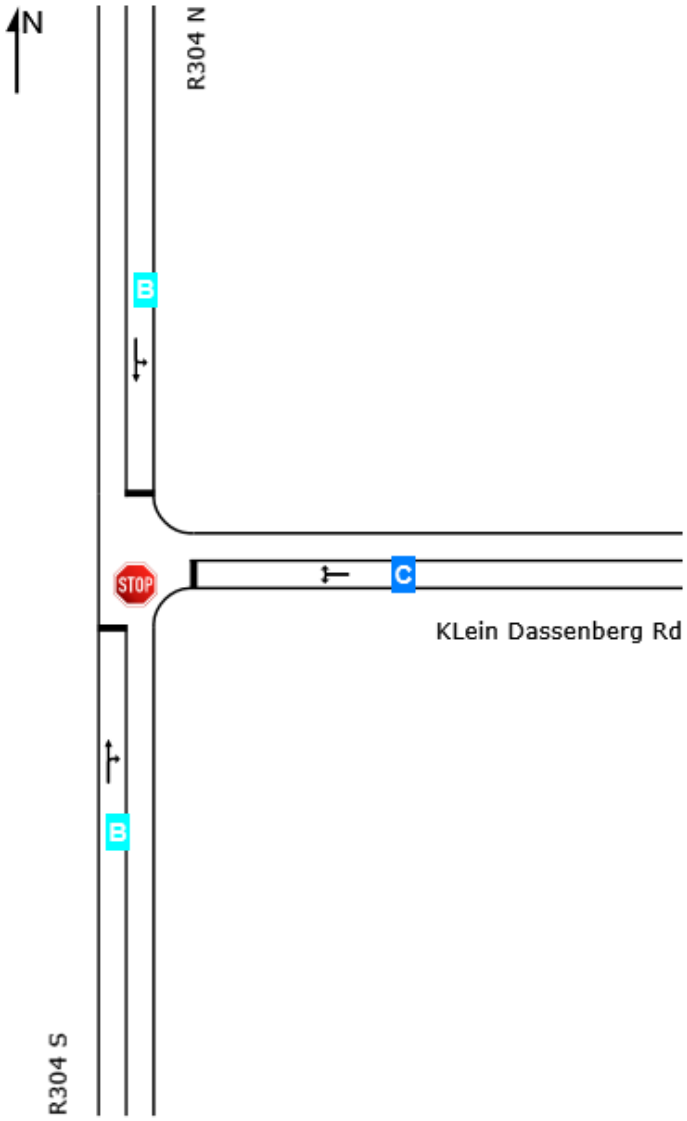
Intersection 2: Current Saturday Morning LOS



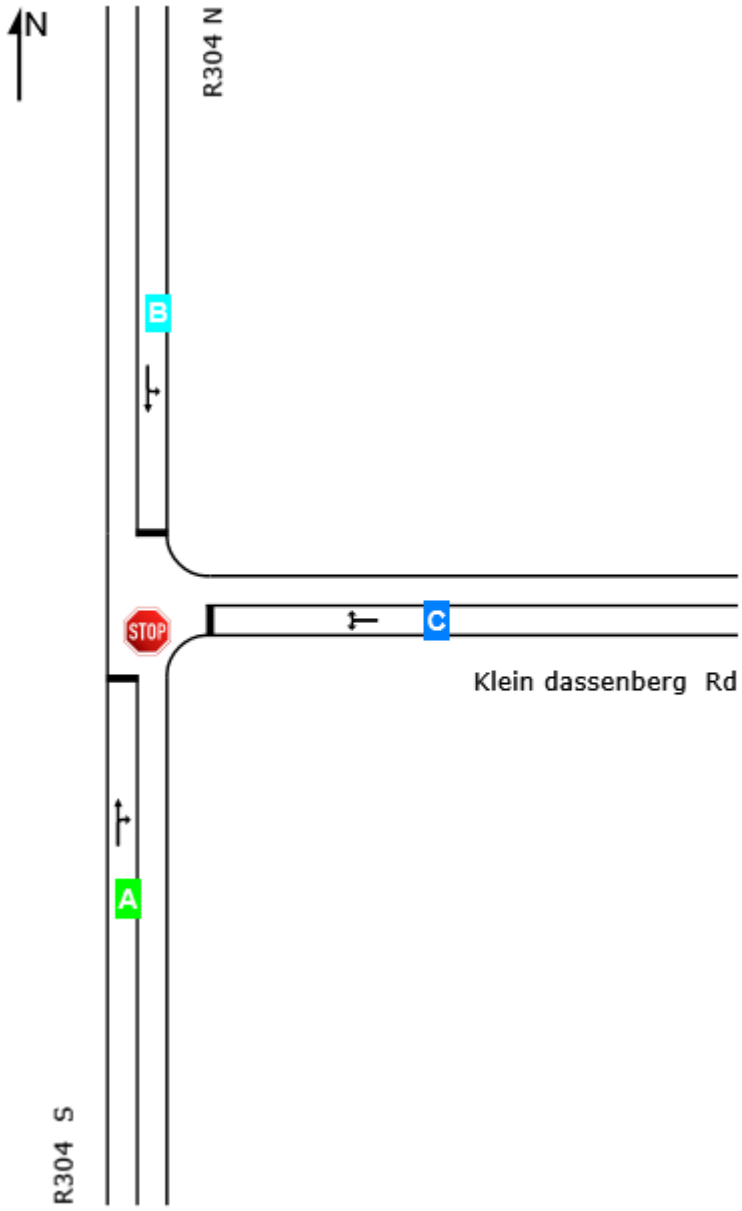
Intersection 3: Current Friday afternoon LOS



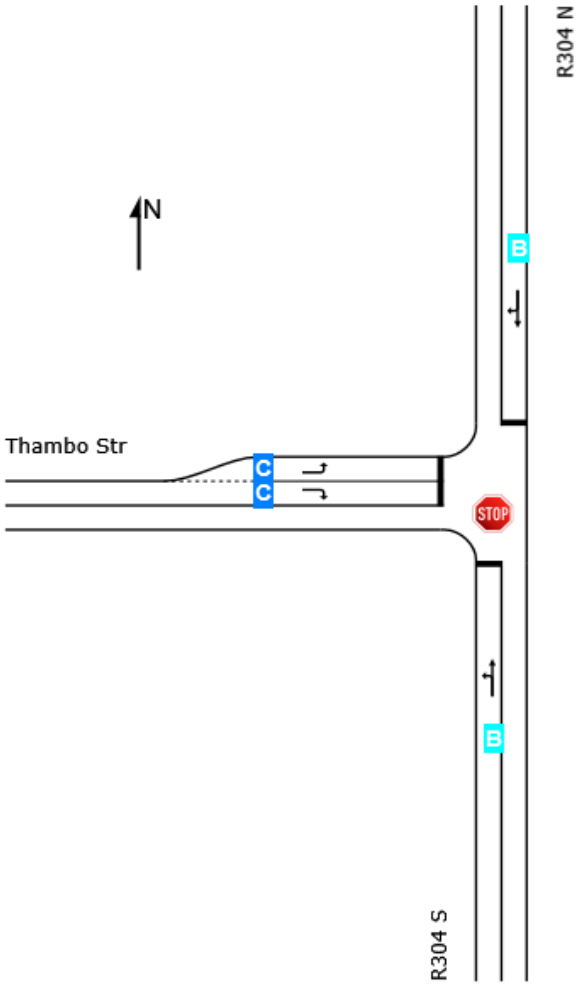
Intersection 3: Current Saturday Morning LOS



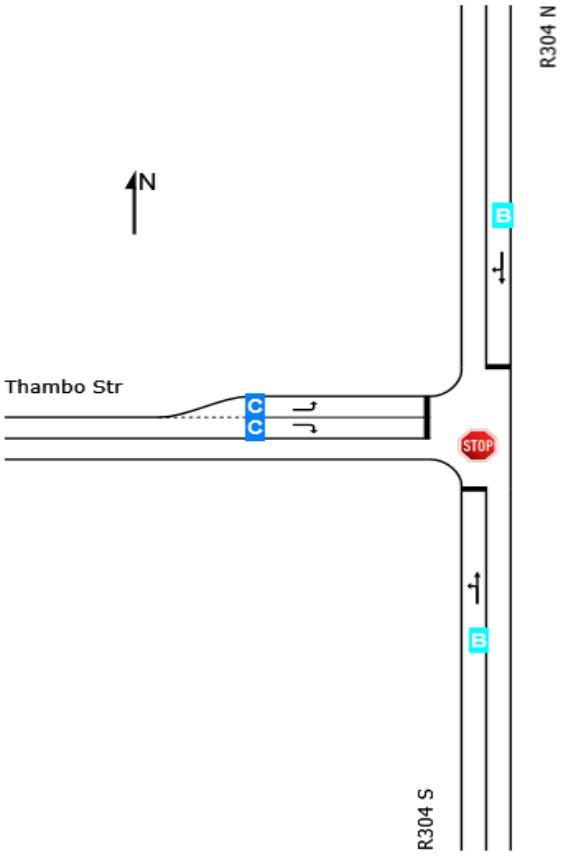
Intersection 4: Current Friday afternoon LOS



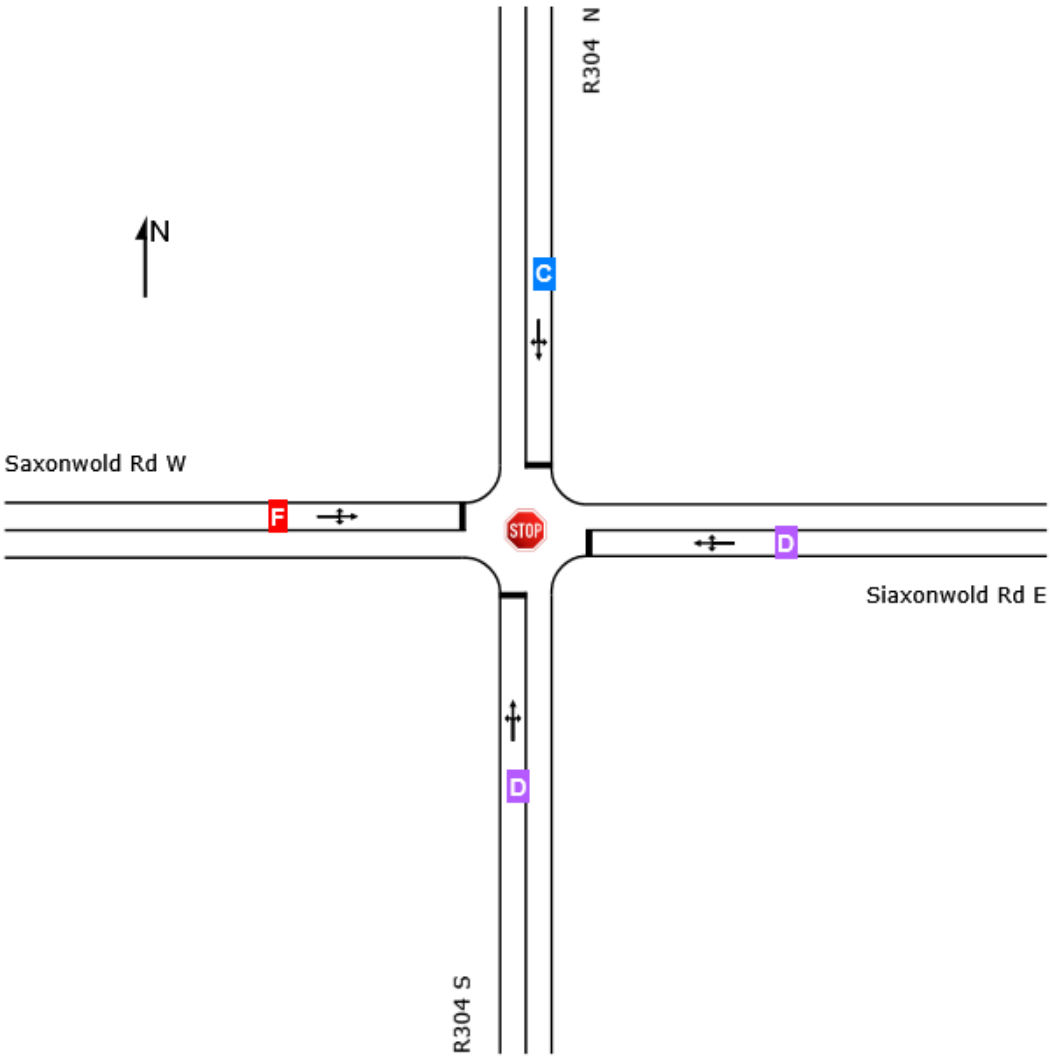
Intersection 4: Current Saturday Morning LOS



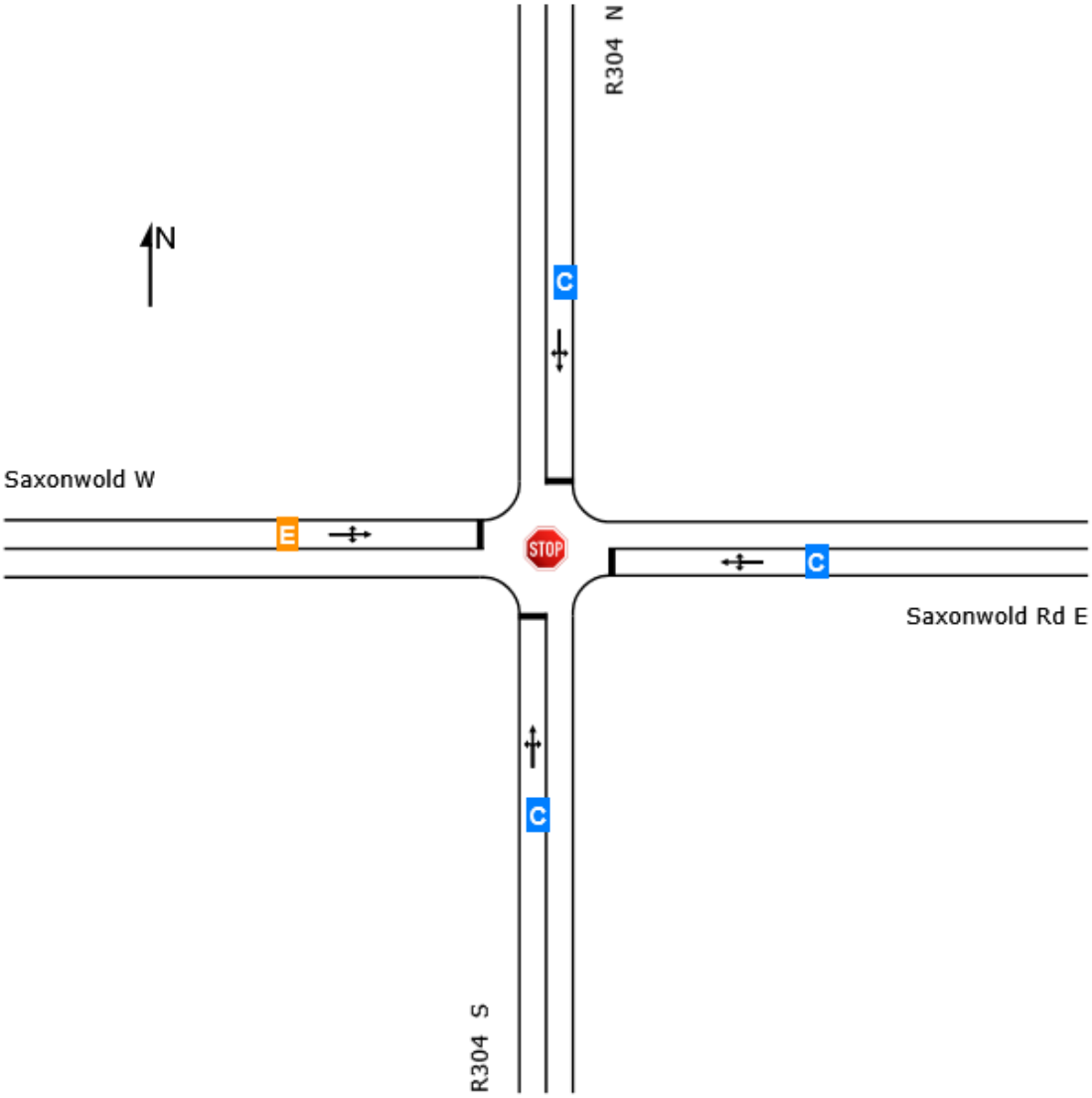
Intersection 2: Current + Development Friday Afternoon LOS



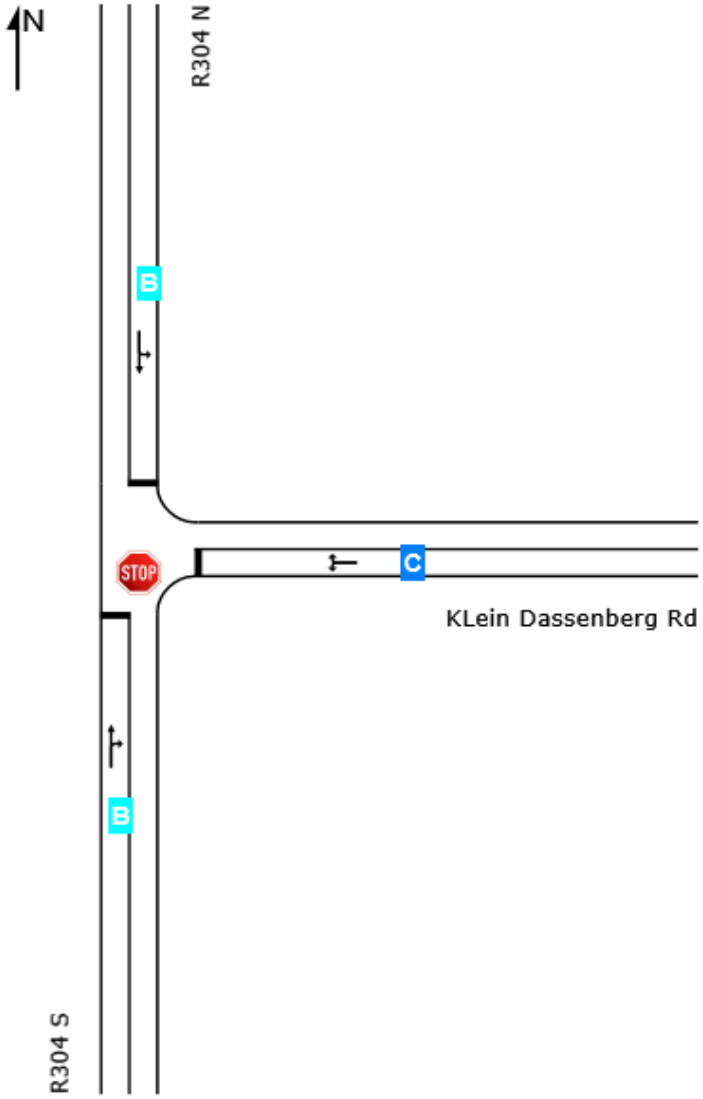
Intersection 2: Current + Development Saturday Morning LOS



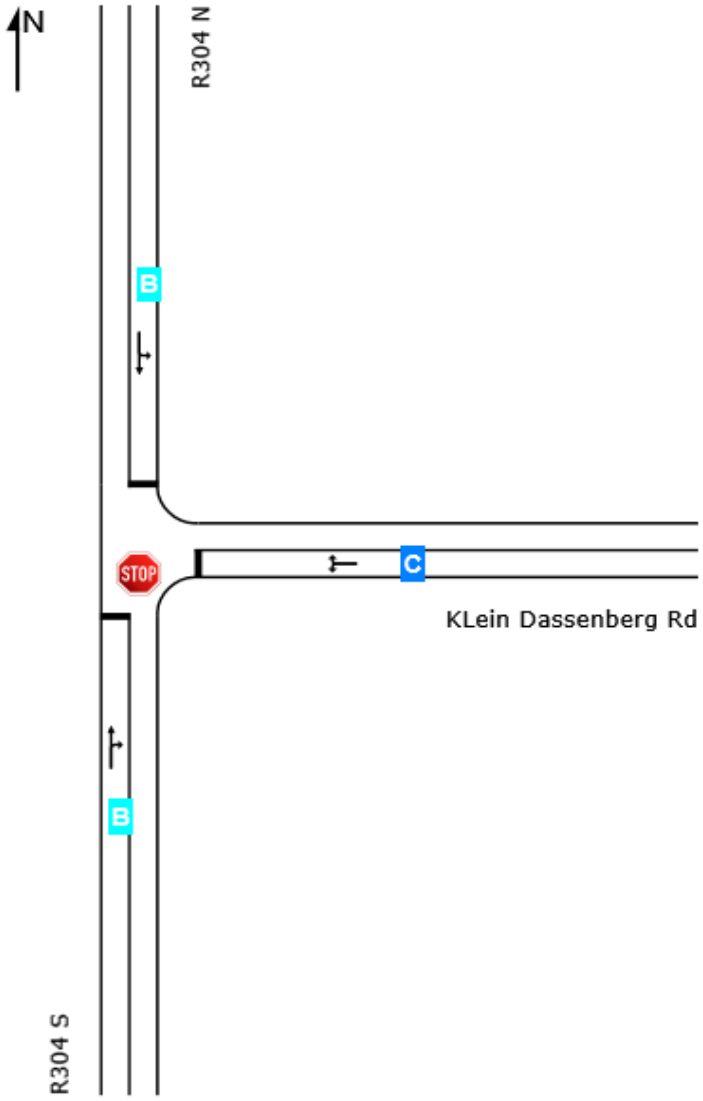
Intersection 3: Current + Development Friday afternoon LOS



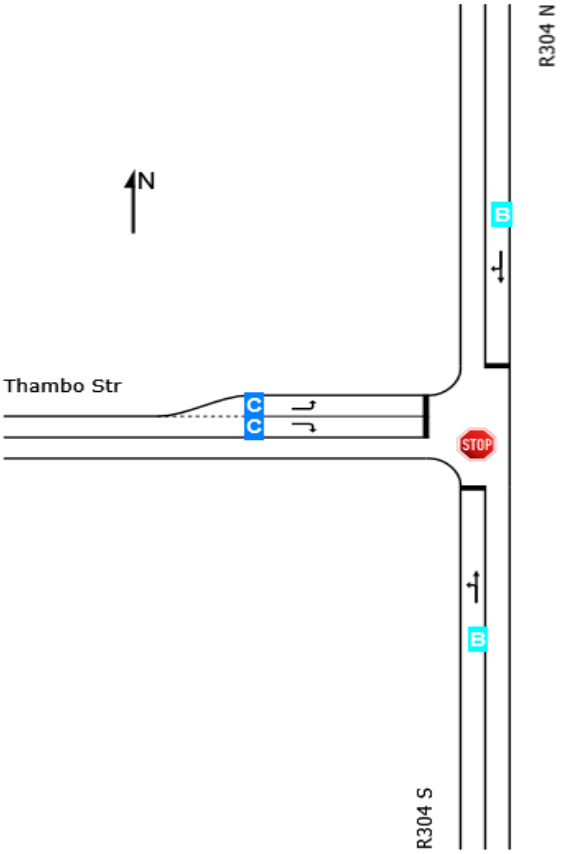
Intersection 3: Current + Development Saturday Morning LOS



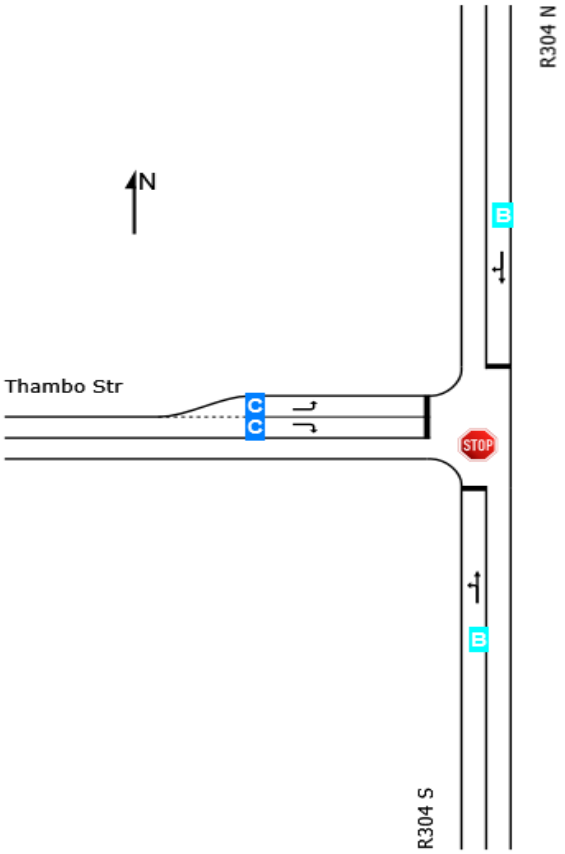
Intersection 4: Current + Development Friday afternoon LOS



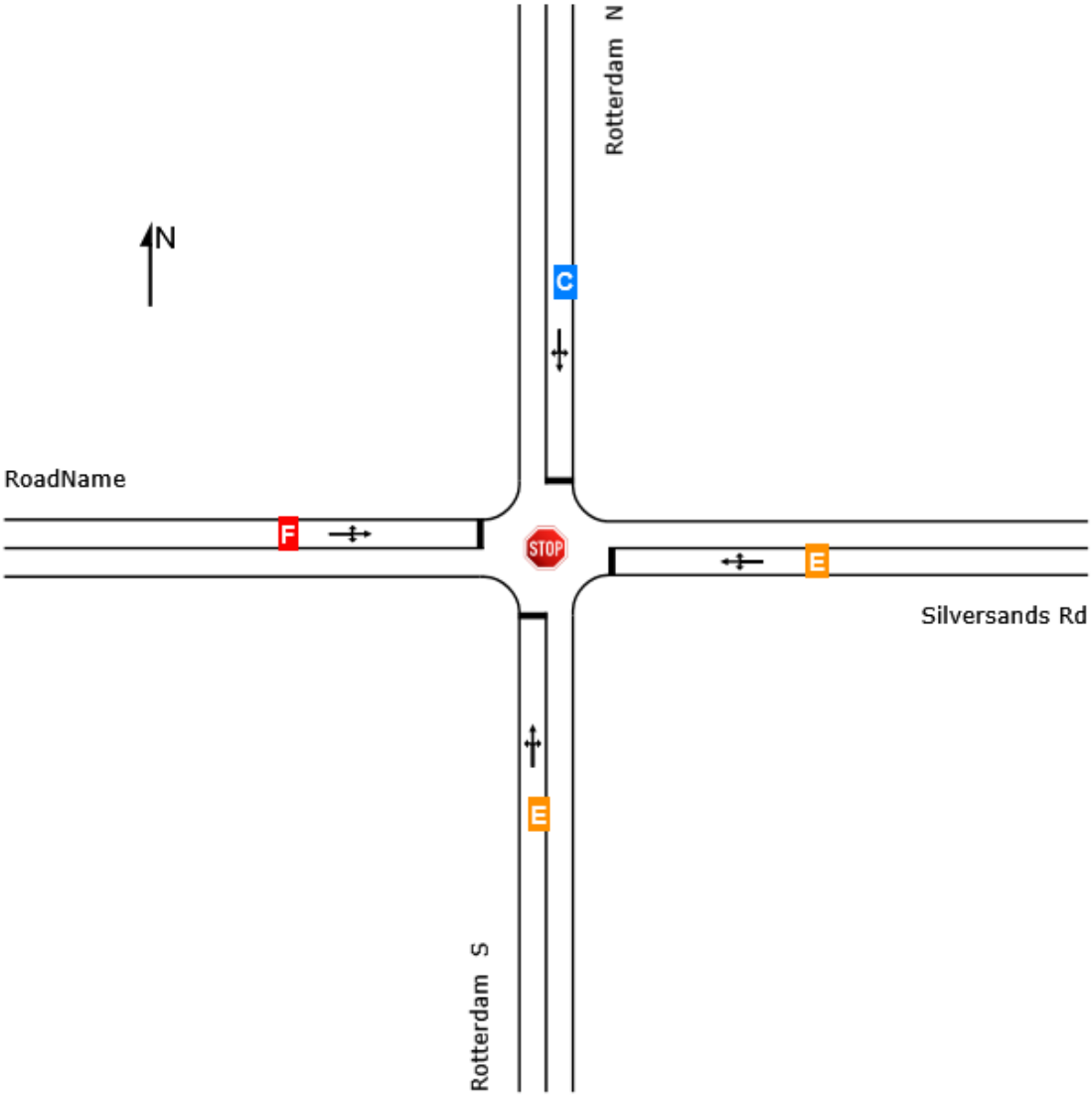
Intersection 4: Current + Development Saturday Morning LOS



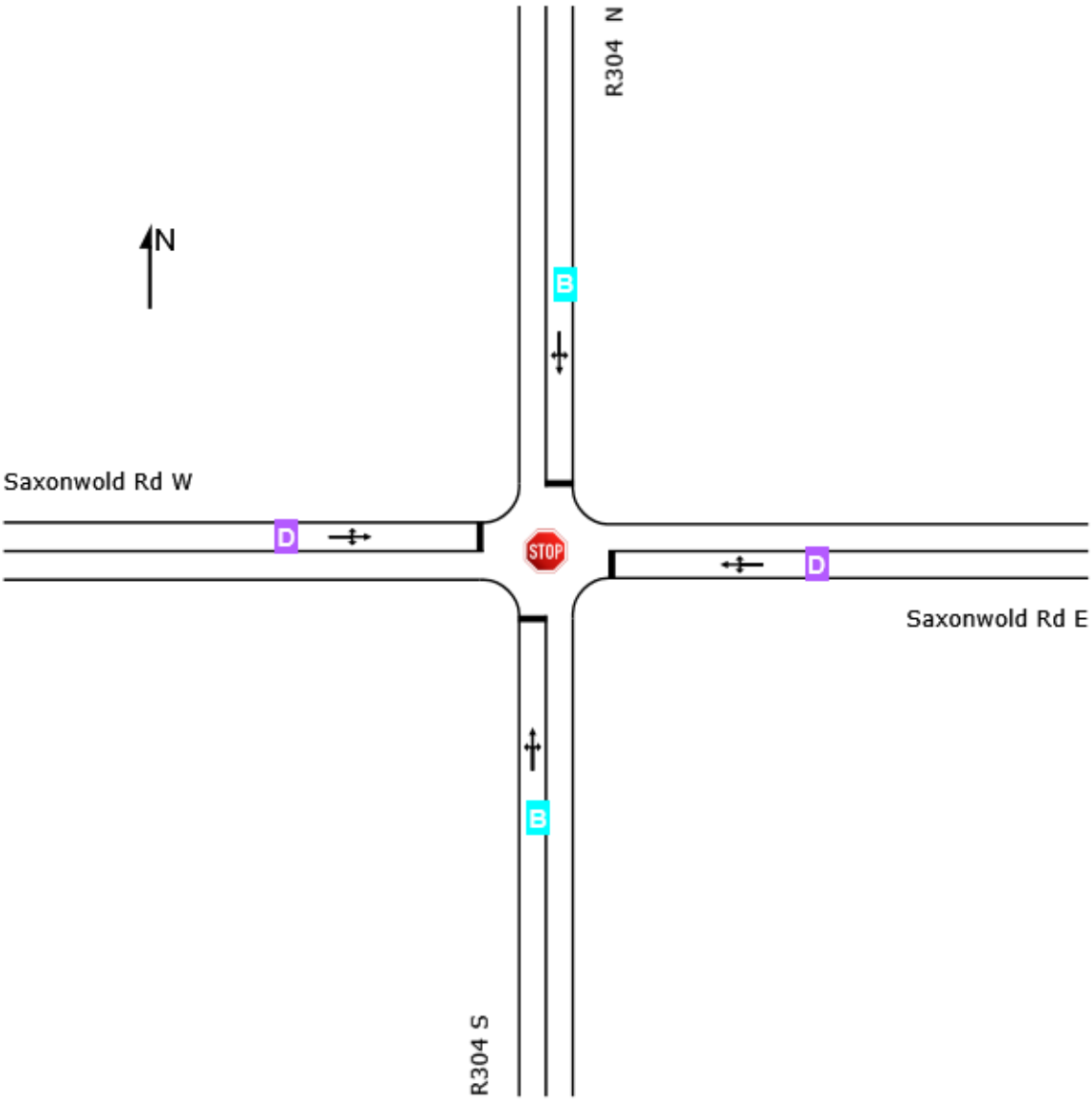
Intersection 2: 2028 + Development Friday Afternoon LOS



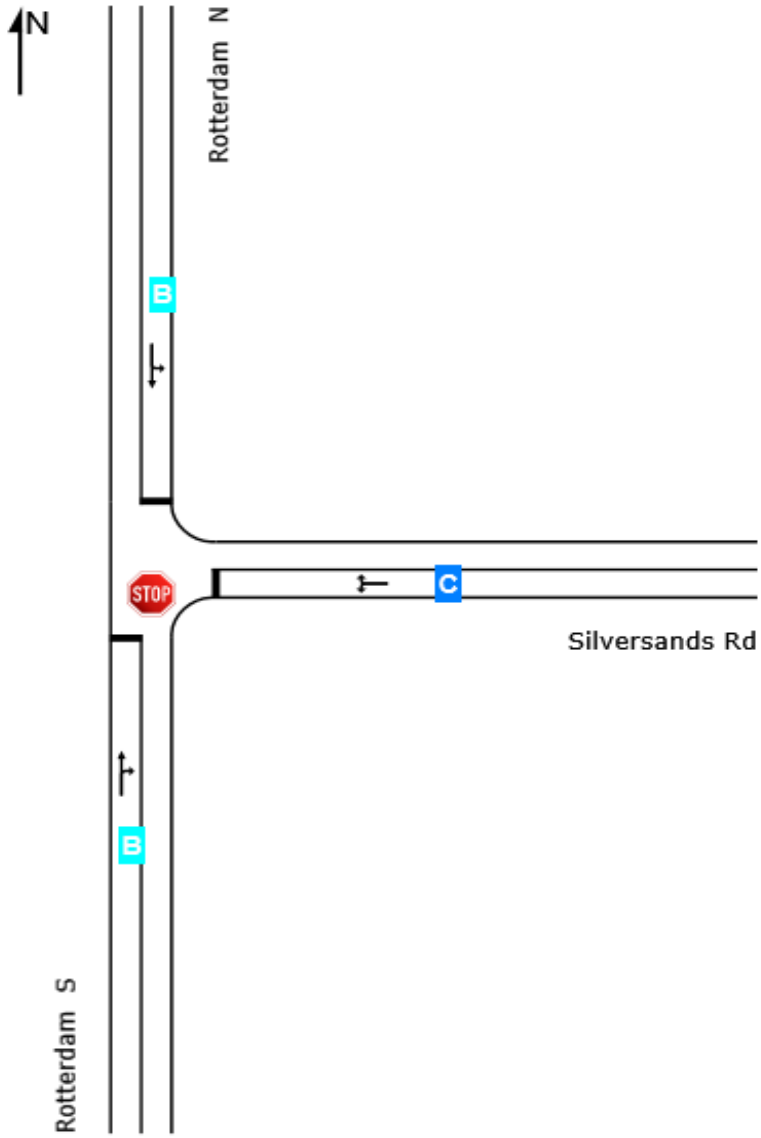
Intersection 2: 2028 + Development Saturday Morning LOS



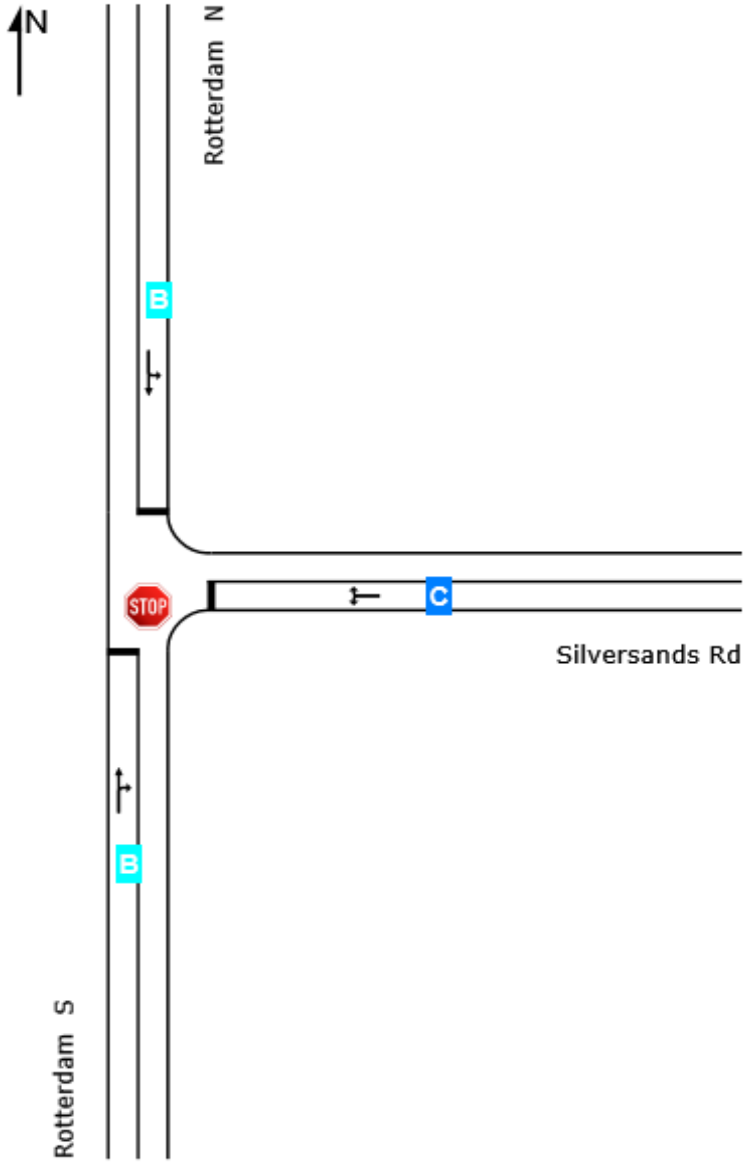
Intersection 3: 2028 + Development Friday Afternoon LOS



Intersection 3: 2028 + Development Saturday Morning LOS



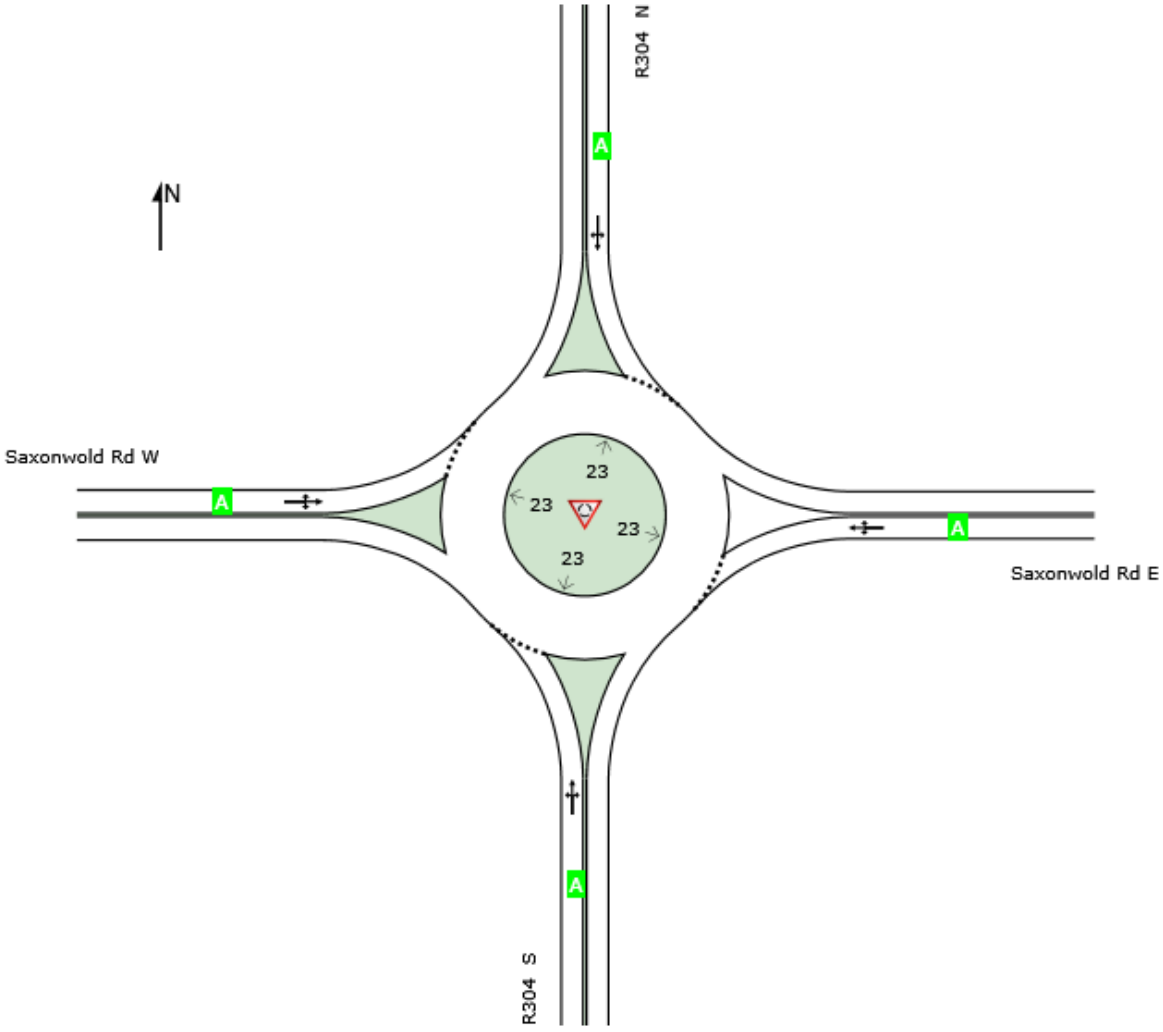
Intersection 4: 2028 + Development Friday Afternoon LOS



Intersection 4: 2028 + Development Saturday Morning LOS

ANNEXURE C

IMPROVED INTERSECTION LAYOUT



Improved Intersection 3: Convert to circle