

RESIDENTIAL PROJECT LA MOTTE

Traffic Impact Study

FEBRUARY 2014

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1 EXECUTIVE SUMMARY

The proposed extension of the La Motte residential area comprises 329 affordable housing units towards the North West, and 106 GAP units towards the South East of the existing town (see Appendix C). The development is situated off the R45, on the Robertsvlei Road, near Franschhoek in the greater Stellenbosch area.

The site development plan makes provision for the existing access routes to service the development of 16.92ha. In accordance with the *South African Trip Generation Rates*, the additional traffic to be generated by the low income residential areas is computed to be 1no Peak Hour Vehicle Trips per unit. Based on the traffic counts, the actual Peak Hour Vehicle Trip Rate was found to be 0.6 Trips per unit. For this traffic analysis we have decided that the actual traffic generation rate of 0.6 Peak Hour Vehicle Trips per Unit should be used for a more realistic simulation of the additional traffic to be generated. This decision can further be motivated by the fact that public transport is increasingly used by the occupants of the development.

Access to the development will be obtained from Robertsvlei Road (DR01343). The Robertsvlei Road is a link road between the R45 and Franschhoek. The road is mainly used by the La Motte residents and farms in the area. A 4.0km section of the road has a gravel surface. Between the La Motte development and the R45 intersection, the road is reduced to a single lane at the bridge crossing the Franschhoek River. In this traffic study, the R45 intersection (Intersection 1), the single lane bridge, as well as the La Motte/Robertsvlei Road intersection (Intersection 2) was analysed.

Three peak traffic situations were analysed, one for the normal peak situation, one for a mitigated peak situation and a horizon peak situation.

The normal peak situation was analysed, using the base traffic with the generated traffic split in the same proportions as was observed in the base counts. We are of the opinion that this will not remain the case as traffic continually redistributes the load to operate at a better level of service.

The current split at the Robertsvlei/La Motte intersection indicates that 30% of the vehicles travelling from the La Motte development towards Franschhoek in the AM peak, do so via the Robertsvlei Road (South). A possible reason for this is that the level of service of the vehicles entering the R45 intersection is fairly poor (currently an E). In our mitigated traffic situation for the AM peak traffic, we have assumed that the vehicles using the Robertsvlei Road travelling to Franschhoek will increase from 30% to 50%.

Our analysis indicates that the level of service of the Robertsvlei Road leg of Intersection 1 will be reduced from an E to a F for the normal peak and five year horizon peak situations. The level of service of the through traffic on the R45 will however reduce from an A to a B for the peak and mitigated peaks. When the horizon traffic is analysed, the level of service of this leg reduces to a C.

The level of service of the Robertsvlei Road Bridge will reduce from a C to a F during the peak hours. The off peak level of service is an A. We are of the opinion that no mitigation measure is justified in the short term but that a signalised stop control can be considered in the medium to long term. The widening of the bridge cannot be justified in the foreseeable future.

The level of service of the Robertsvlei/La Motte Intersection (Intersection 2) will remain a B for the peak traffic as well as for the mitigated traffic situation.

Our assessment indicates that the additional traffic generated by the development does not warrant the upgrading of the intersections.

Traffic from the La Motte township only affects the level of service of the major intersections at peak hours. The use of pointsmen can be considered as a mitigation measure during peak hours.

2 DEVELOPMENT DESCRIPTION

The existing La Motte Village has 211 residential units. The proposed development comprises an additional 329 low cost housing units towards the North West of the town, and 106 GAP units towards the South East. The existing access to the development is taken off the Robertsvlei Road, a district road. This road forms a link road between the R45 and Franschhoek. The major roads in the area are shown on DWG W1519-01 in Chapter 6. The site development layout is shown in Appendix C.

3 TRAFFIC ANALYSIS

The R45 (MR00191)/Robertsvlei Road (DR01343) (referred to as Intersection 1 in the analysis), the Robertsvlei Road Bridge, and the Robertsvlei Road/La Motte Road (DR01351) (referred to as Intersection 2 in the analysis), were identified as intersections that are affected by the development. The impact of the development on the level of services of the affected intersections was analysed. Due to the relatively small development, the additional traffic generated will have a negligible effect on the surrounding major road networks.

3.1 Intersection Data

The geometry and traffic volumes were used to calculate the capacities of the intersections. A traffic count was done on 20 June 2013 of all the intersections analysed. A summary of the peak hour background traffic of the intersections are shown in Appendix A and Appendix B. Photos of the two intersections and bridge crossing can be seen in Appendix D.

Intersection 1 is on the R45 and Robertsvlei Road. Both roads have 3.7m wide lanes although the R45 has a 1.0m wide tarred shoulder on either side. Intersection 1 is a two-way minor road with stop control on Robertsvlei Road. It was found that the AM peak traffic split 60% towards Paarl and 40% towards Franschhoek. See Photo 1 to Photo 3 of Intersection 1.

The Robertsvlei Bridge was also analysed, as the road reduces from a two to a one (3m wide) lane with a stopped control on either side of the bridge. The bridge crossing has the potential for a traffic bottleneck occurring. The bridge has a pedestrian sidewalk as seen in the Photos attached. The maximum no of cars queuing on either side of the bridge at normal peak traffic was 7 vehicles.

Intersection 2 is a T-Junction and has 3.7m wide lanes. The La Motte leg of the intersection is stop-controlled. See Photo 6 to Photo 8 of Intersection 2.

A summary of the peak hour background traffic is shown in Appendix A and B for the investigated intersections.

The nodal split used for the AM and PM peak traffic was 65:35 in accordance with the *Trip Generation Guidelines*. The current AM peak traffic at Intersection 2 indicates that 25% of the vehicles travel the Robertsvlei Road towards Franschhoek and 75% travel towards the R45. The peak AM generated traffic was split in the same proportions.

The PM peak traffic indicates that an insignificant amount of vehicles use the Robertsvlei Road from Franschhoek. We are of the opinion that the AM level of service at the R45 intersection deters motorists travelling to Franschhoek via this intersection.

We have analysed a mitigated traffic situation, where we assumed that more vehicles will use the Robertsvlei Road to Franschhoek, as the level of service of the Robertsvlei Road leg downgrades to an F with the additional AM traffic generated by the development.

3.2 Trip Generation

In order to determine the trip generation rate for our analysis, we compared the *South African Trip Generation Rates* to actual existing traffic generation rates based on our traffic counts.

3.2.1 Trip Generation as per the South African Trip Generation Rates:

The traffic generated by this development was calculated using the recommended peak hour vehicle trip rates in the document: *South African Trip Generation Rates*, published by The Department of Transport. It was assumed that five residents will be occupying each dwelling. These values were then compared to the actual counted traffic for the existing township.

The trip generation rates were calculated as follows:

a) Residential: Low income (Table 3.1.2)

$$\begin{aligned}\text{i) Peak Rate: PVT/hr} &= 0.5 \times (\text{No. units}) + 94.2 \times (\text{No. of Residents}/1000) \\ &= 0.5 \times (329) + 94.2 \times (1,645) \\ &= 320 \text{ Trips}\end{aligned}$$

This computes to a Peak Trip Generation rate of:

$$\begin{aligned}&= 320/329 \\ &= 0.973 \\ &\approx \mathbf{1 \text{ Peak Hour Trips per Unit}}\end{aligned}$$

3.2.2 Trip generation based on traffic counts:

a) Counted Actual Rate of traffic of the existing development

$$\begin{aligned}\text{i) Actual Rate: Peak Hourly Trips/Existing Units} &= 123/211 \\ &= 0.583 \\ &\approx \mathbf{0.6 \text{ Peak Hour Trips per Unit}}\end{aligned}$$

3.2.3 Conclusion

Interpretation of the above, and recognizing that the additional residents are going to be of the same or lower income class as the current residents, the rate of 0.6 Peak Hour Trips per unit was used in the traffic analysis.

3.3 Nodal Split

The La Motte development traffic was split in accordance with the *Trip Generation Manual Guidelines*, which gives a split of 65:35. The total number of development trips generated by the proposed residential area, was split accordingly to and from the development as per the *Guideline*.

The development peak traffic allocations are shown on the attached drawings in Appendix B.

3.4 Capacity Analysis

The capacity analysis of the intersections was done, using the *SIDRA Solutions Computer Programme*. The impact on the intersections as result of the additional traffic generated by the development was assessed using the level of service calculation as measurement of the impact that the additional traffic might have on the road network.

Three peak traffic situations were analysed for Intersection 1, namely the normal peak, a mitigated peak and a five year horizon peak.

Two peak traffic situations were analysed for Intersection 2, namely the normal peak and the mitigated peak.

The normal peak situation was analysed for the base traffic with the added development traffic allocated in the same proportions as was observed in the base counts. It was recognised that this will not remain the case as traffic continually redistributes the load to operate at a better level of service.

The mitigated traffic situation was analysed for the base traffic with the added development traffic allocated in a more realistic split, up to 50% towards the R45 and towards Robertsvlei. The route towards Franschoek via Robertsvlei has a 4km gravel section, but this does not deter motorists from using the route to save time.

3.4.1 Intersection 1 (R45 and Robertsvlei Road)

The attached level of service diagram indicates that the AM level of service on the R45 leg of the intersection is a B for the normal and mitigated peaks. For the horizon peak, the level of service reduces to a C for the incoming traffic to Franschoek. The level of service of the outgoing traffic remains an A for all the peaks. The additional traffic generated by the development will therefore not have a negative impact on the R45 through traffic along this route. The incoming right turn traffic crossing the intersection has a level of service D for the horizon case. Although not ideal, the level of service is still acceptable. The AM level of service of the outgoing traffic on the Robertsvlei road, the minor leg of the intersection, reduces from an E to a F for the normal peak situation, and is unchanged for the mitigated case.

The degree of saturation of this leg of the intersection is 69% for the mitigated case.

A summary of all the relevant data on the intersection is attached in Appendix A. See Photo 1 to Photo 3 (Appendix D) depicting the intersection legs.

3.4.2 Intersection 2 (Robertsvlei Road and La Motte Road)

The level of service on the La Motte leg of the intersection is unchanged for all situations, at a B. This is acceptable.

The level of service on the Robertsvlei Road leg of this intersection remains an A during the peak traffic. The through traffic will therefore be mostly unaffected by the increased traffic. See Photo 6 to Photo 8 (Appendix D) depicting intersection legs. A summary of all the relevant data on the intersection is attached in Appendix B.

3.4.3 Bridge crossing

The bridge crossing currently has a 3m wide road, with yield signs at each of the ends. Our analysis indicates that the section is operating at a level of service of C, as in Table 10.5 of the *Manual for Traffic Impact Studies*, which is acceptable for the existing development.

If the normal peak development traffic is added to the un-signalised bridge crossing, the level of service reduces to an F. The average delay per vehicle increases from 17 to 48 seconds.

When the mitigated peak development traffic is added the level of service reduces to an E. The average delay per vehicle is 41 seconds. See Photo 4 to Photo 5 (Appendix D) depicting the bridge approaches.

3.5 Sight Distances

The sight distance on the Robertsvlei road leg of Intersection 1, is 300m. The speed limit on this road is 60km/h. Table 6.4.2 of the *Road Access Guidelines* stipulates an interpolated minimum stopping distance of 95m for this speed. The sight distance on this leg of the intersection is therefore safe.

The sight distance on the R45 leg of the intersection is more than 300m. The maximum speed limit on this road is 100km/h. The minimum stopping distance at this speed is approximately 185m. The sight distance on this leg of the intersection is therefore safe.

The minimum sight distance for Intersection 2 is 160m on the Robertsvlei road in the direction of Intersection 1. The minimum stopping distance required by the *Guideline* is 95m. The sight distances for this intersection are therefore safe.

3.6 Turning Lanes and Tapers

Turning lanes and tapers at Intersections 1 and 2, were considered in accordance with the *Road Access Guidelines*.

3.6.1 Intersection 1

The *Guideline* indicates that a left turn lane be introduced for outbound traffic on the R45 turning off onto the Robertsvlei Road towards the development. In accordance with Figure 8.3.2a of the *Road Access Guidelines*, the PM peak outbound traffic of 385 vehicles/hour and the left turn traffic of 129 vehicles/hour, warrants a left turn lane. The level of service of the outbound through traffic is however an A and therefore a turn-off lane is in our opinion unjustified.

The right turn movement from the R45 into the Robertsvlei Road was analysed using Figure 8.3.3 of the *Guideline*. The PM peak traffic approaching the intersection, is 379 vehicles/hour and the right turn vehicles crossing the intersection is 150 vehicles/hour. This warrants a right turn lane on the R45. The level of service of the through traffic is an A and therefore the introduction of this lane is in our opinion not justified.

3.6.1 Intersection 2

Intersection 2 requires no additional lanes.

4 ACCESS TO DEVELOPMENT

Calculations indicate that minimal traffic will back up in La Motte Road in the direction of the development, during peak hour AM traffic.

The queue towards the development in the peak hour PM traffic is also simulated to be acceptable. This will thus not affect the access to the development.

5 MITIGATION MEASURES

The following mitigation measures were investigated:

5.1 Intersection 1:

a) Turning lanes

Turning lanes were considered as discussed in Item 3.6, but we are of the opinion that this measure will not drastically improve the overall levels of service at the intersection.

b) Signalisation of the intersection

The level of service of the peak am traffic on the Robertsvlei Road entering the intersection is a F in some instances. This level of service warrants mitigation to improve the level of service.

The signalisation of the intersection was considered using *The South African Road Traffic Signals Manual Volume 3*.

The Robertsvlei Road leg of the intersection has very low traffic volumes in relation to the R45 (less than 30%). During off peak periods the level of service of this leg is a C. A traffic signal will therefore only be warranted during the AM peak hour traffic. The signalisation of this intersection cannot in our opinion be justified as there will be serious disadvantages incurred on the R45 leg of the intersection.

5.2 Robertsvlei Bridge:

Our calculations show that the level of service of vehicles crossing the bridge will reduce to a F during the morning peak hour and an E during the afternoon peak. The off peak level of service will be an A.

Implementation of a signalised stop control will improve the level of service during the peak hour, but will not have any benefit during the off peak periods. In our opinion we do not foresee that signal control can be justified in the short term.

In the long term the implementation of a signalised stop control may be justified before the widening of the bridge is considered.

5.3 Intersection 2:

This intersection operates at a level of service A and therefore requires no mitigation measures.

5.4 Upgrade of the Robertsvlei Road:

A 4.0km section of the Robertsvlei road between La Motte and Franschoek (towards the South) is a gravel road. The surfacing of this section of road will in the future result in a major redistribution of traffic on the road network. This redistribution should increase the level of service of the worst affected intersections.

6 CONCLUSION

The impact of the traffic generated by this development was assessed in accordance with the *Manual for Traffic Impact Studies*, published by the Department of Transport. Professional Engineering judgement was also used to give a realistic outcome of simulated traffic situations.

Our assessment indicates that the additional traffic generated by the development does not warrant the upgrading of the intersections.

Traffic from the La Motte township only affects the level of service of the major intersections at peak hours. The use of pointsmen can be considered as mitigation during peak hours.



MPJ LOUBSER Pr Eng
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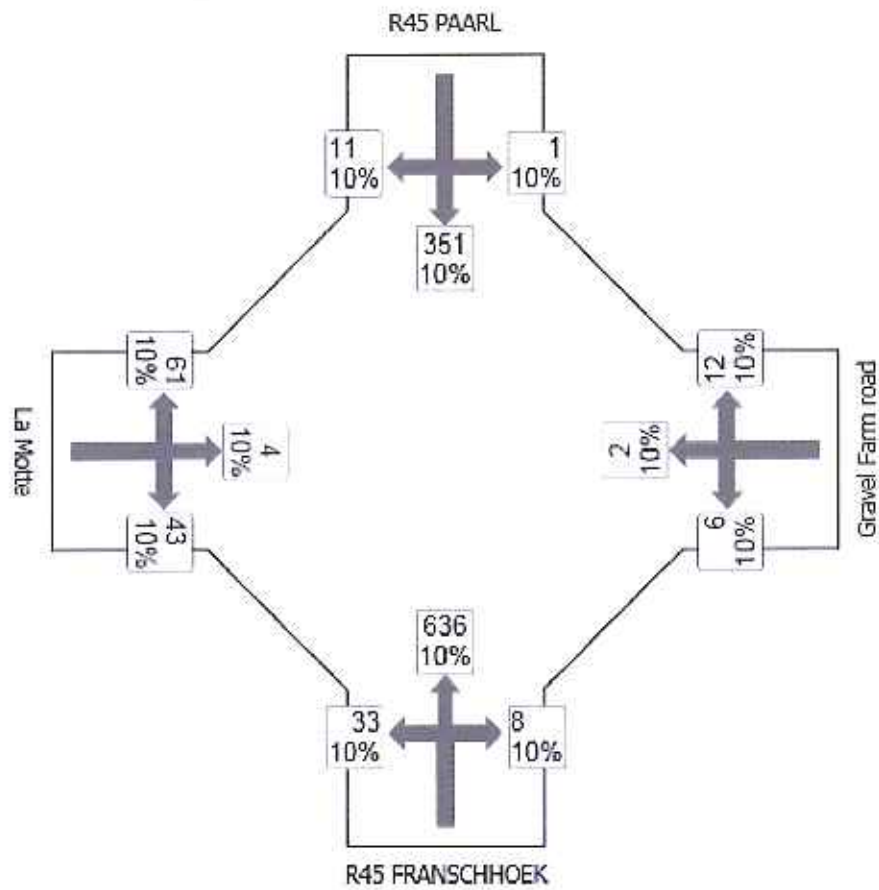
25 February 2014

7. DRAWINGS

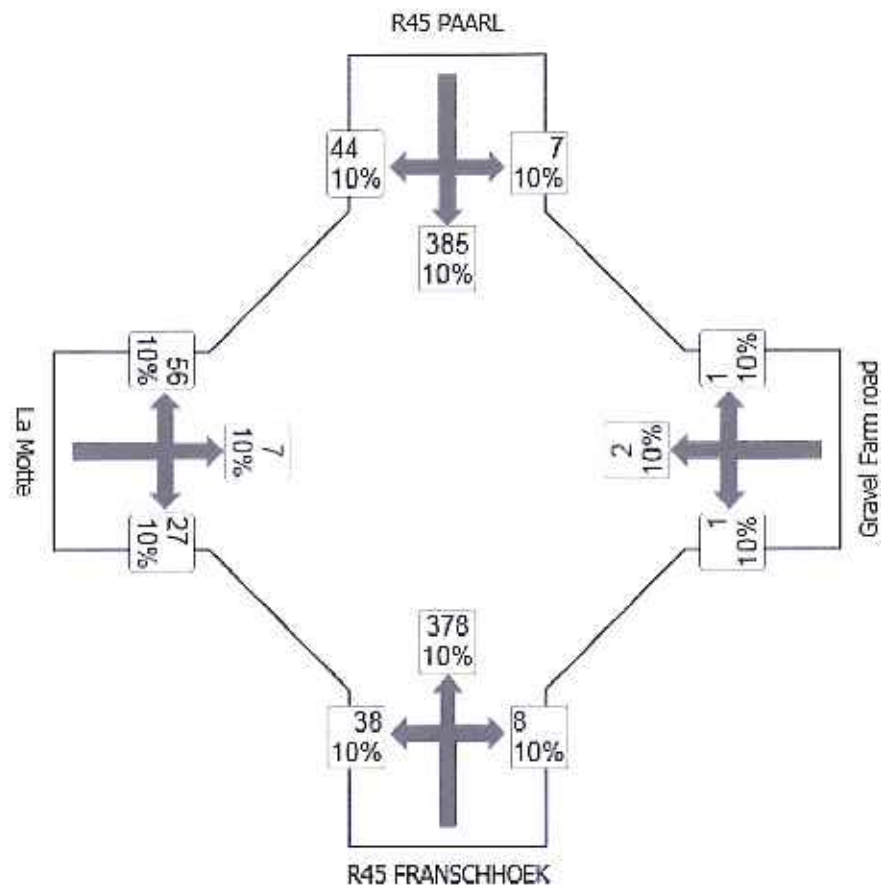
8. APPENDICES

8.1) Appendix A: Intersection 1

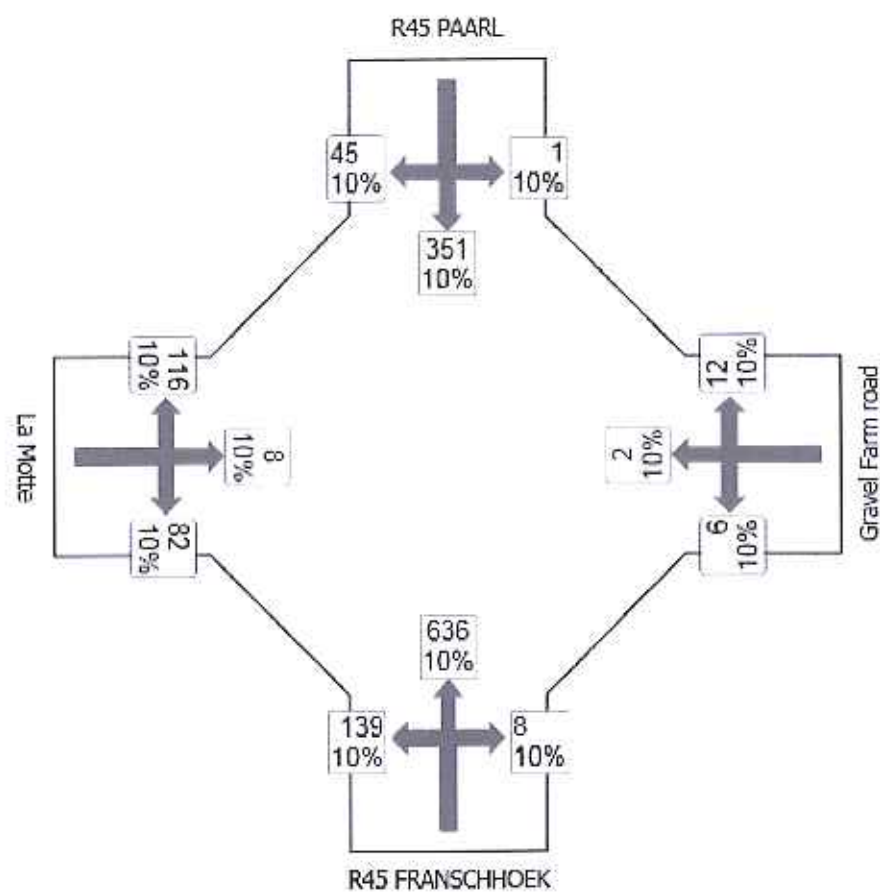
Intersection 1: Base AM Traffic



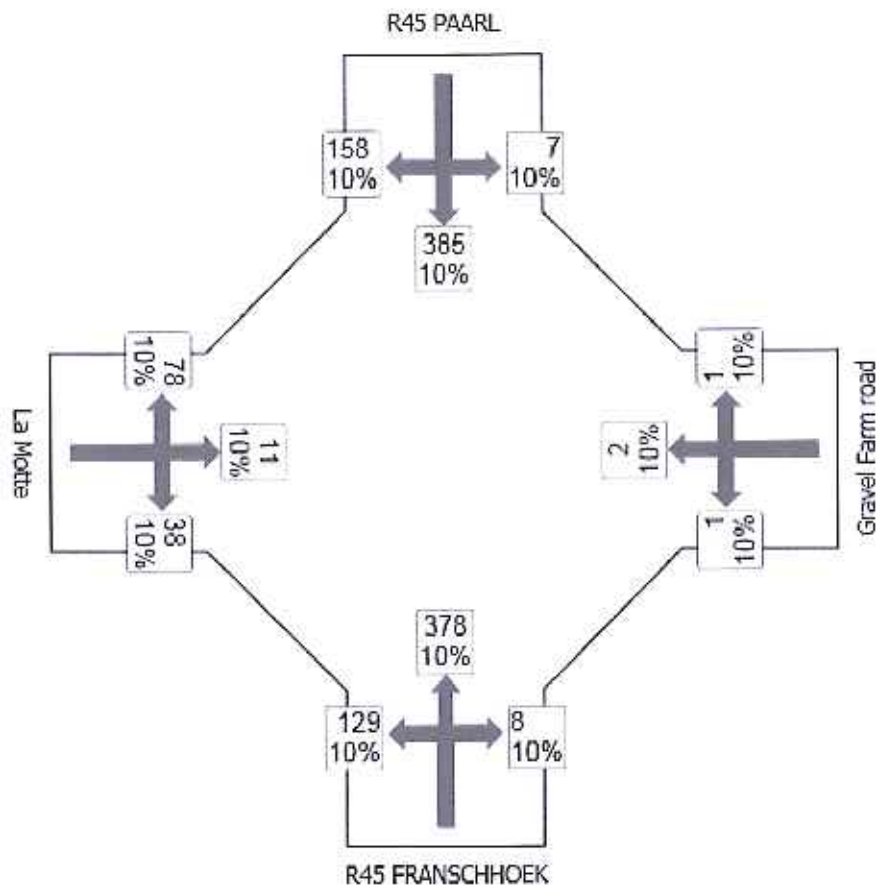
Intersection 1: Base PM Traffic



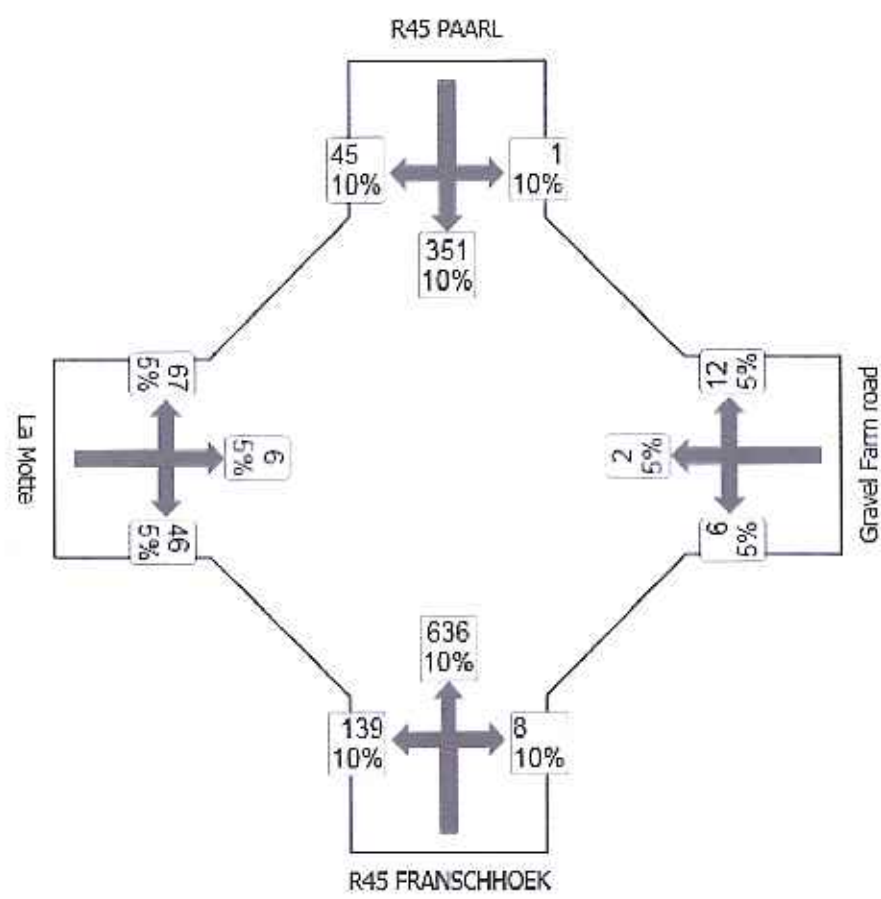
Intersection 1: Normal AM Peak Traffic



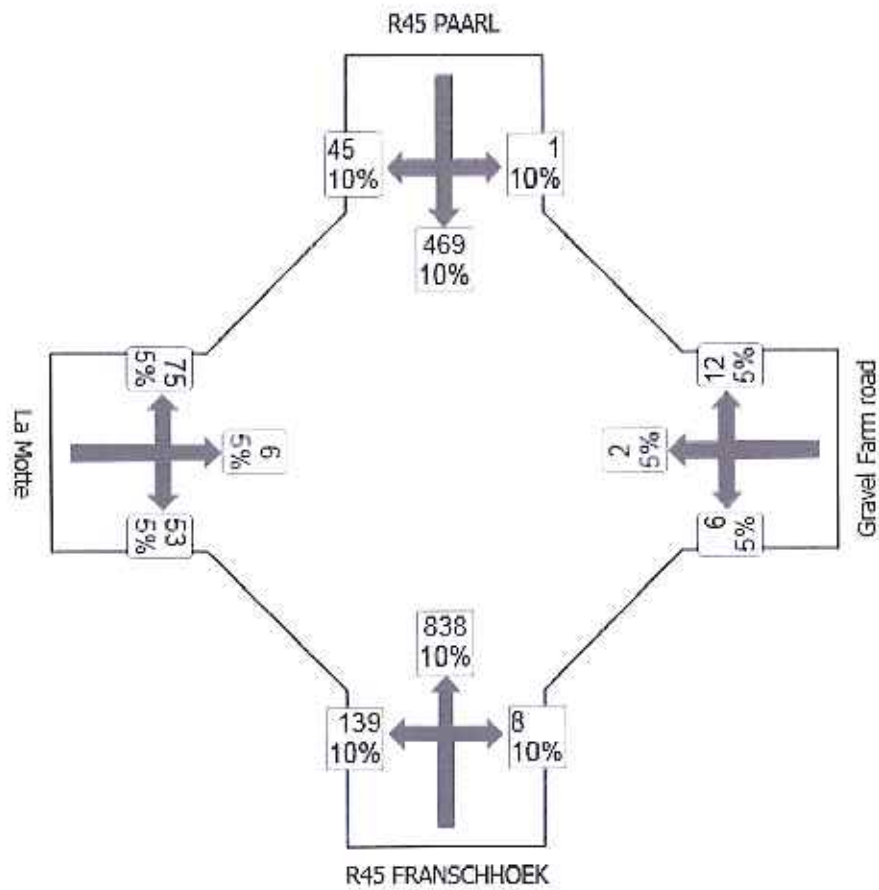
Intersection 1: Normal PM Peak Traffic



Intersection 1: Mitigated AM Peak Traffic



Intersection 1: Horison AM Peak Mitigated Traffic



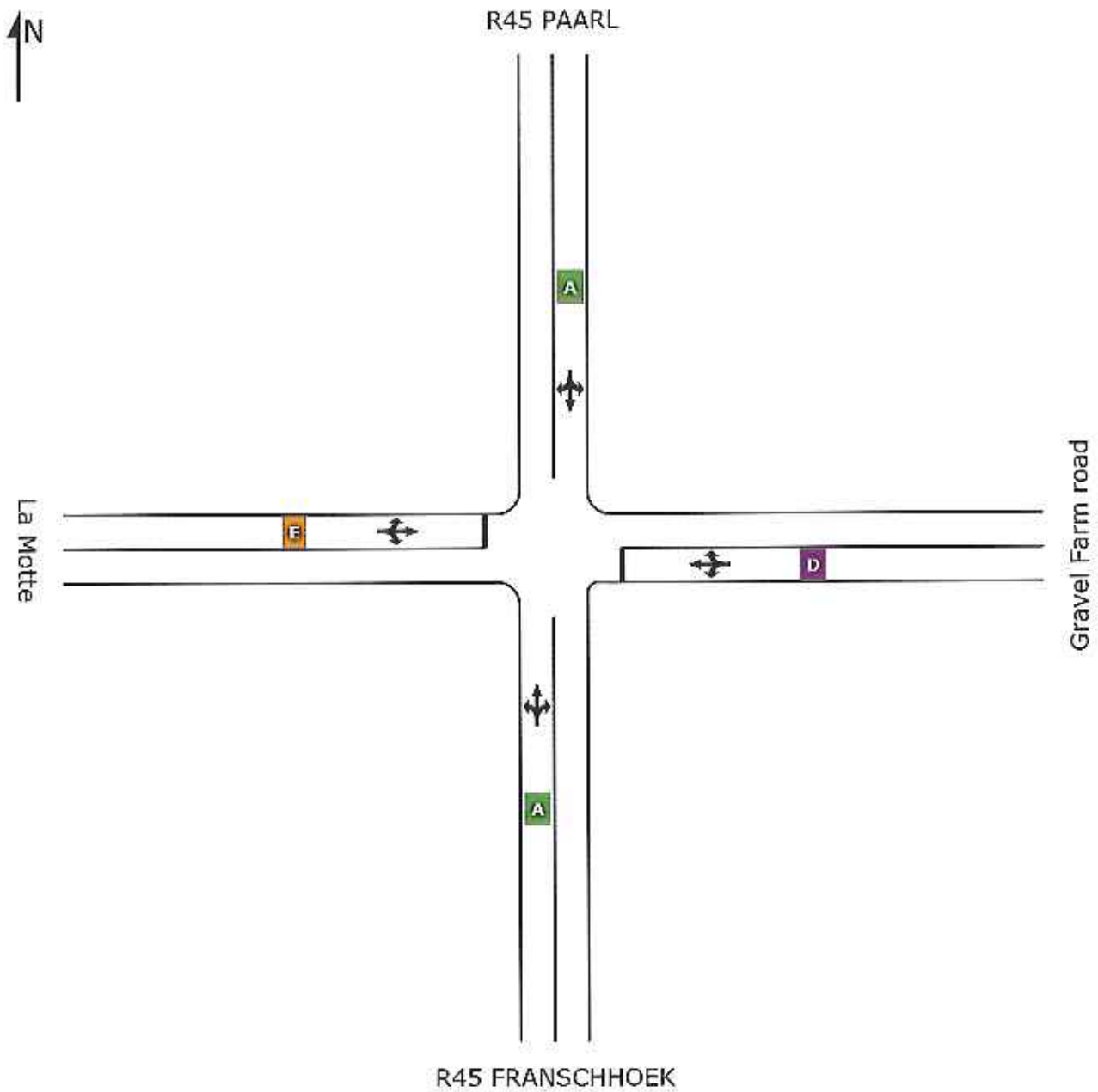
LEVEL OF SERVICE SUMMARY

Site: R45 INTERSECTION AM BASE

AM BASE TRAFFIC

Intersection 1

Stop (Two-Way)



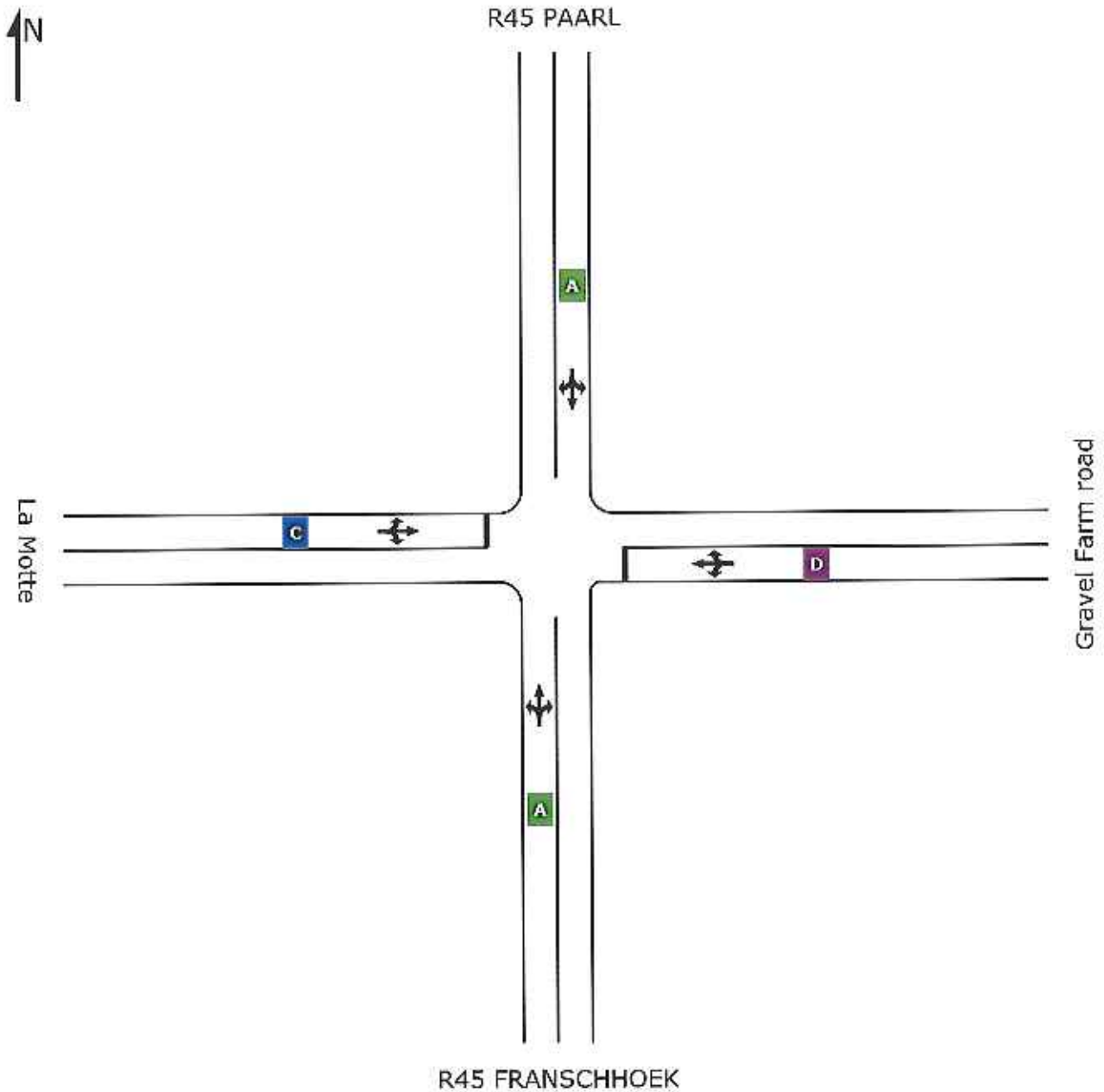
LEVEL OF SERVICE SUMMARY

Site: R45 INTERSECTION PM BASE

PM BASE TRAFFIC

Intersection 1

Stop (Two-Way)



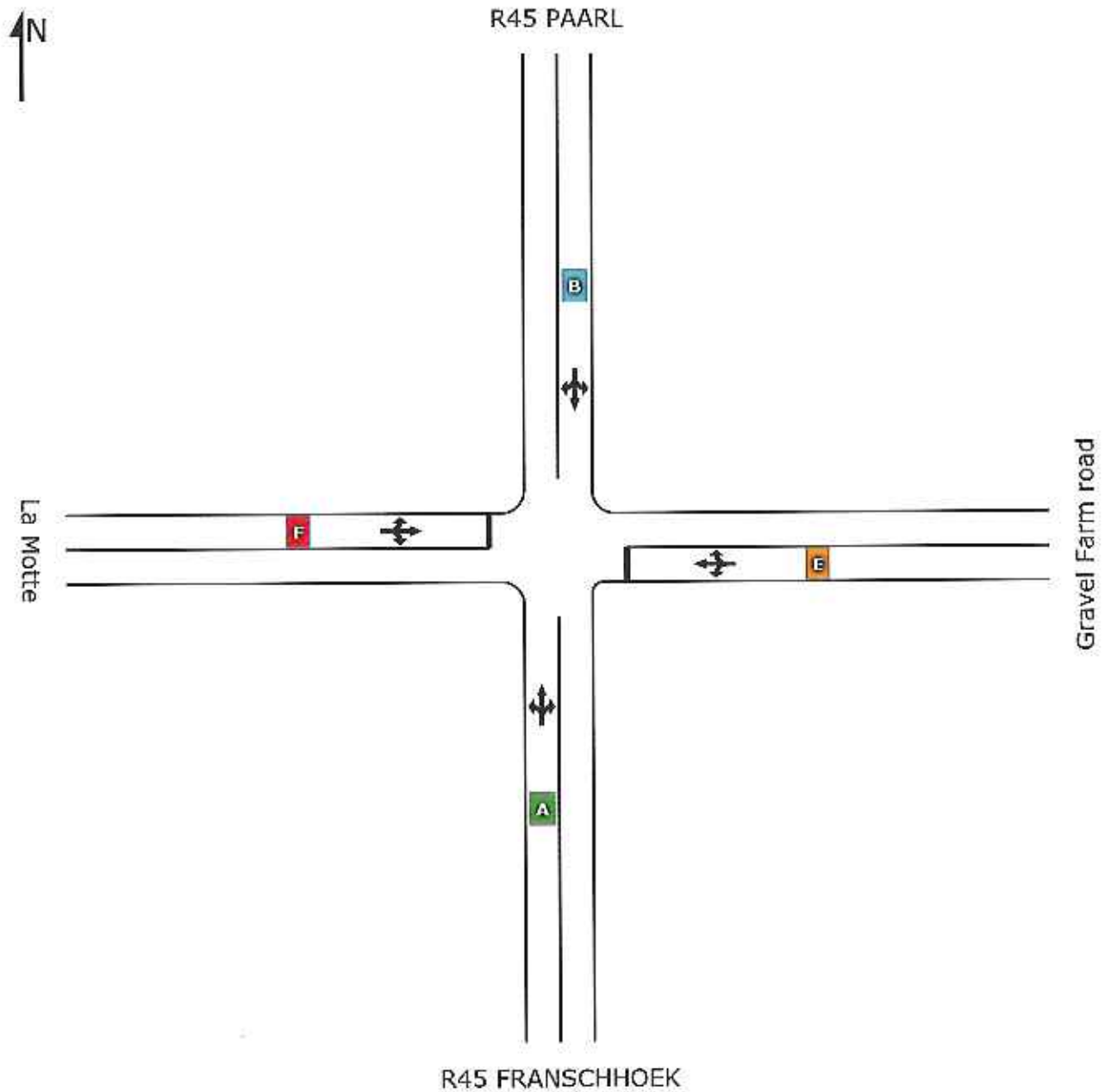
LEVEL OF SERVICE SUMMARY

Site: R45 INTERSECTION AM PEAK

AM PEAK TRAFFIC

Intersection 1

Stop (Two-Way)



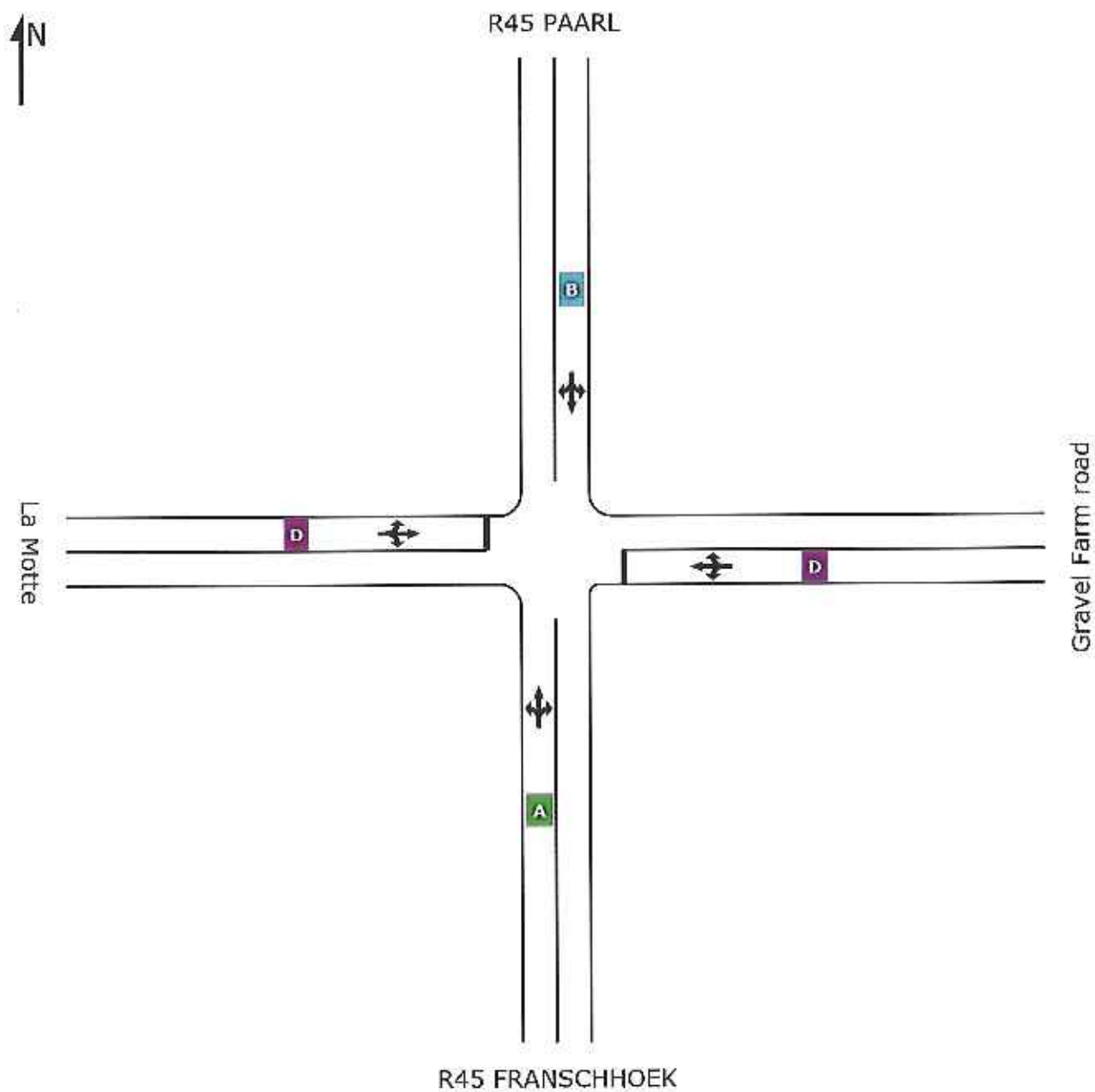
LEVEL OF SERVICE SUMMARY

Site: R45 INTERSECTION PM PEAK

PM PEAK TRAFFIC

Intersection 1

Stop (Two-Way)

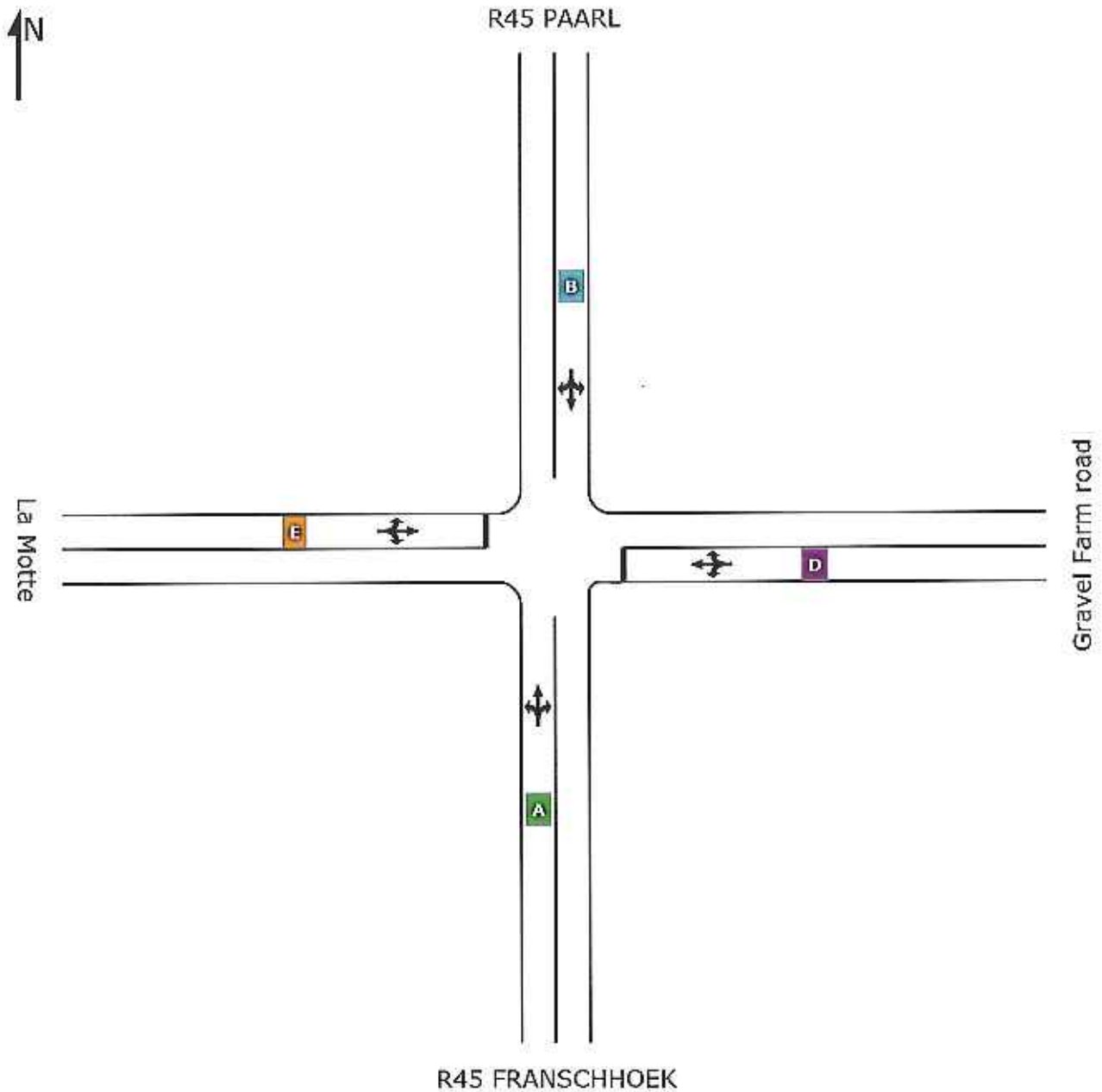


LEVEL OF SERVICE SUMMARY

Site: R45 INTERSECTION AM PEAK
MITIGATED)

AM PEAK TRAFFIC MITIGATED
Stop (Two-Way)

Intersection 1



LEVEL OF SERVICE SUMMARY

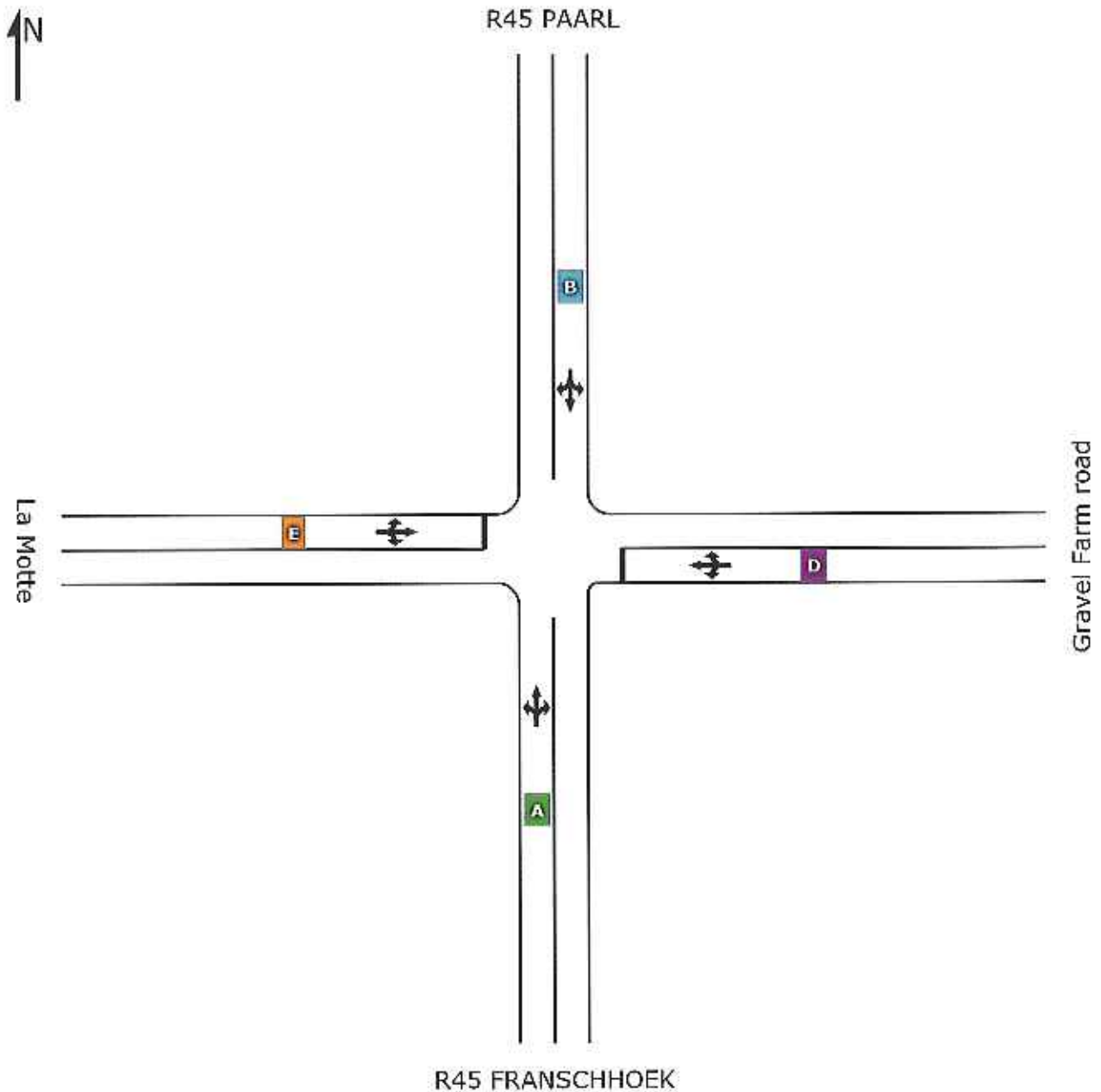
Site: R45 INTERSECTION AM PEAK

alt MITIGATED

AM PEAK TRAFFIC MITIGATED

Intersection 1

Stop (Two-Way)



LEVEL OF SERVICE SUMMARY

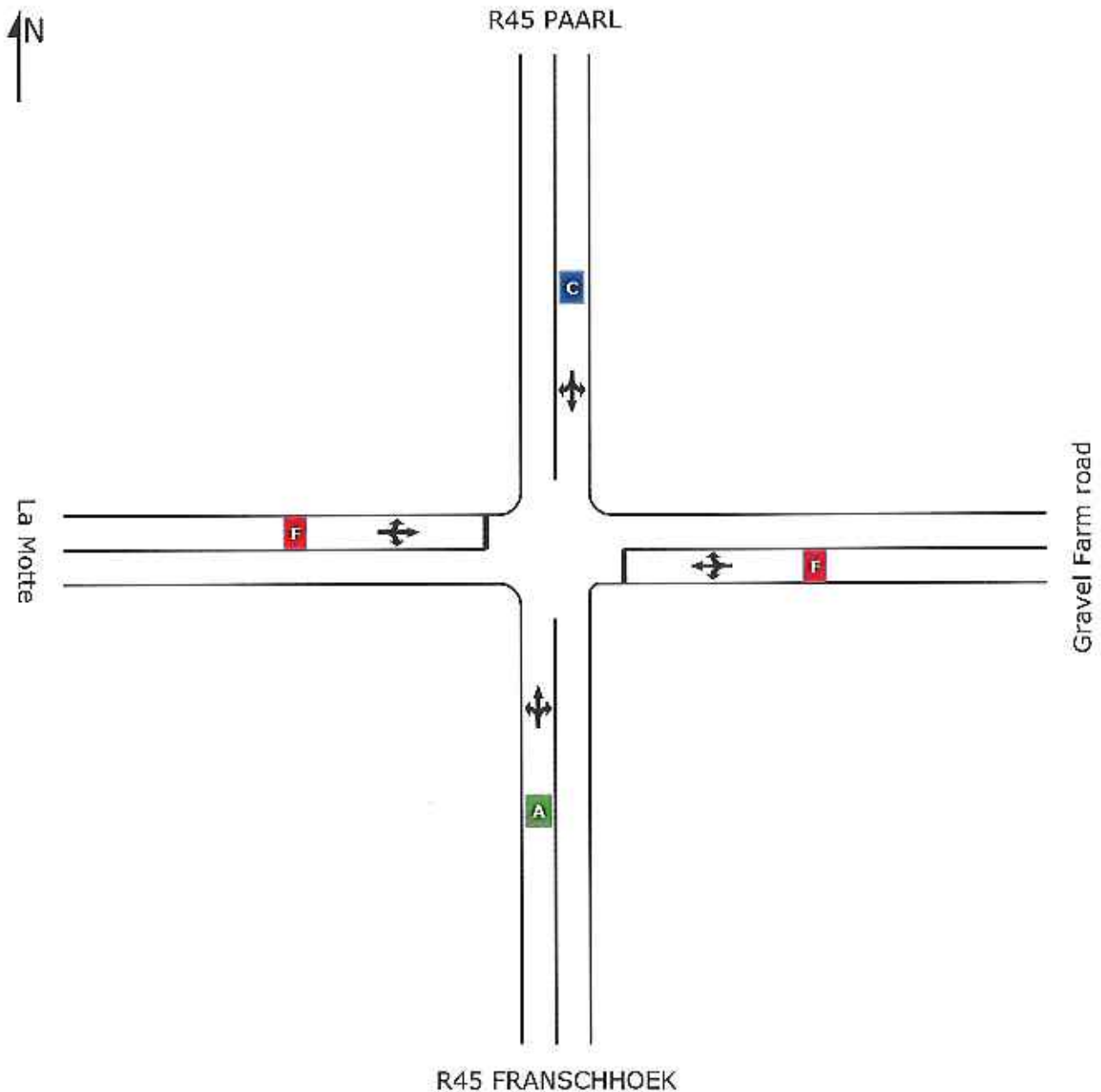
Site: R45 INTERSECTION AM

HORISON PEAK

AM PEAK TRAFFIC

Stop (Two-Way)

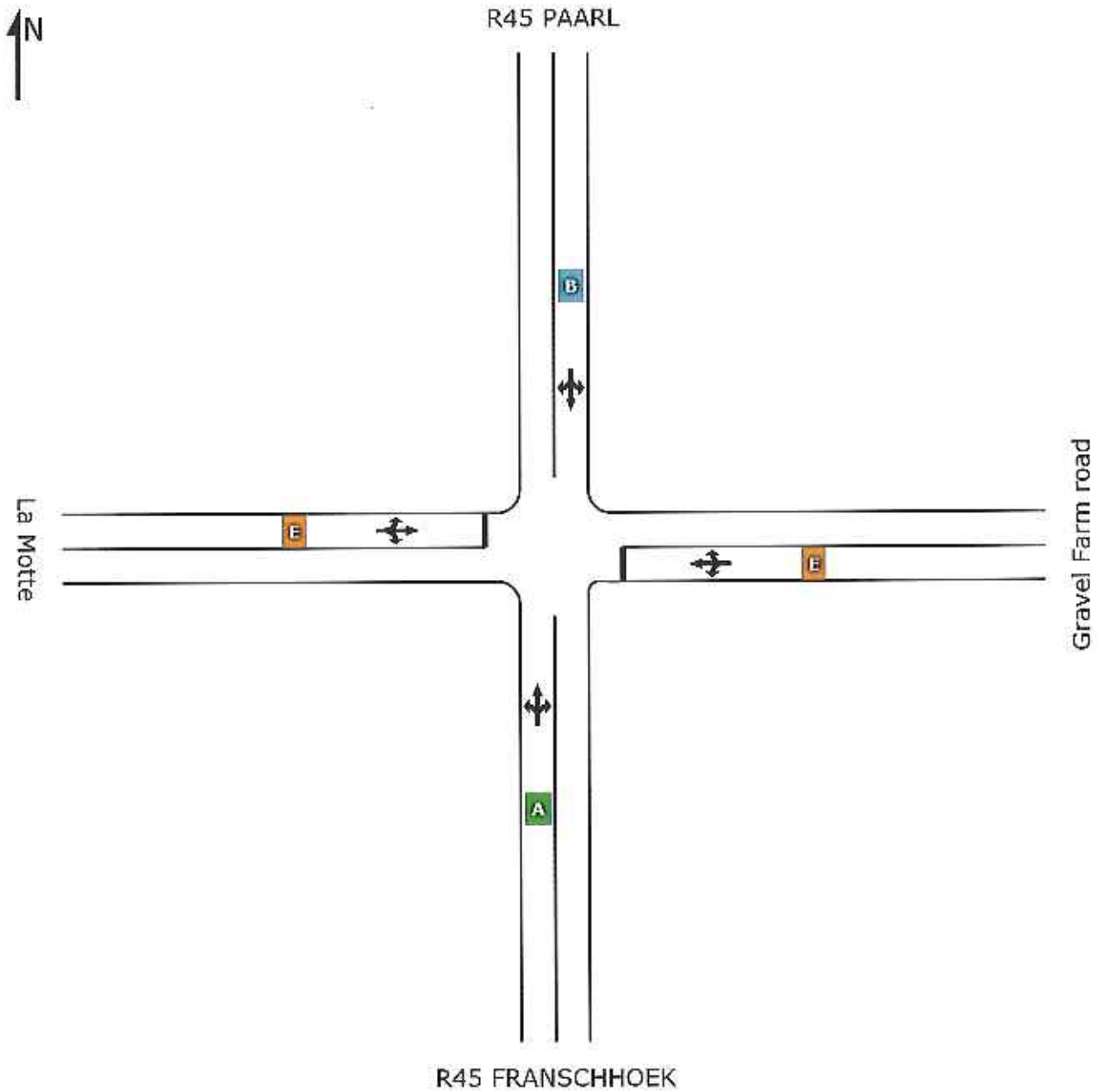
Intersection 1



LEVEL OF SERVICE SUMMARY

Site: R45 INTERSECTION PM
HORISON PEAK
Intersection 1

PM PEAK TRAFFIC
Stop (Two-Way)

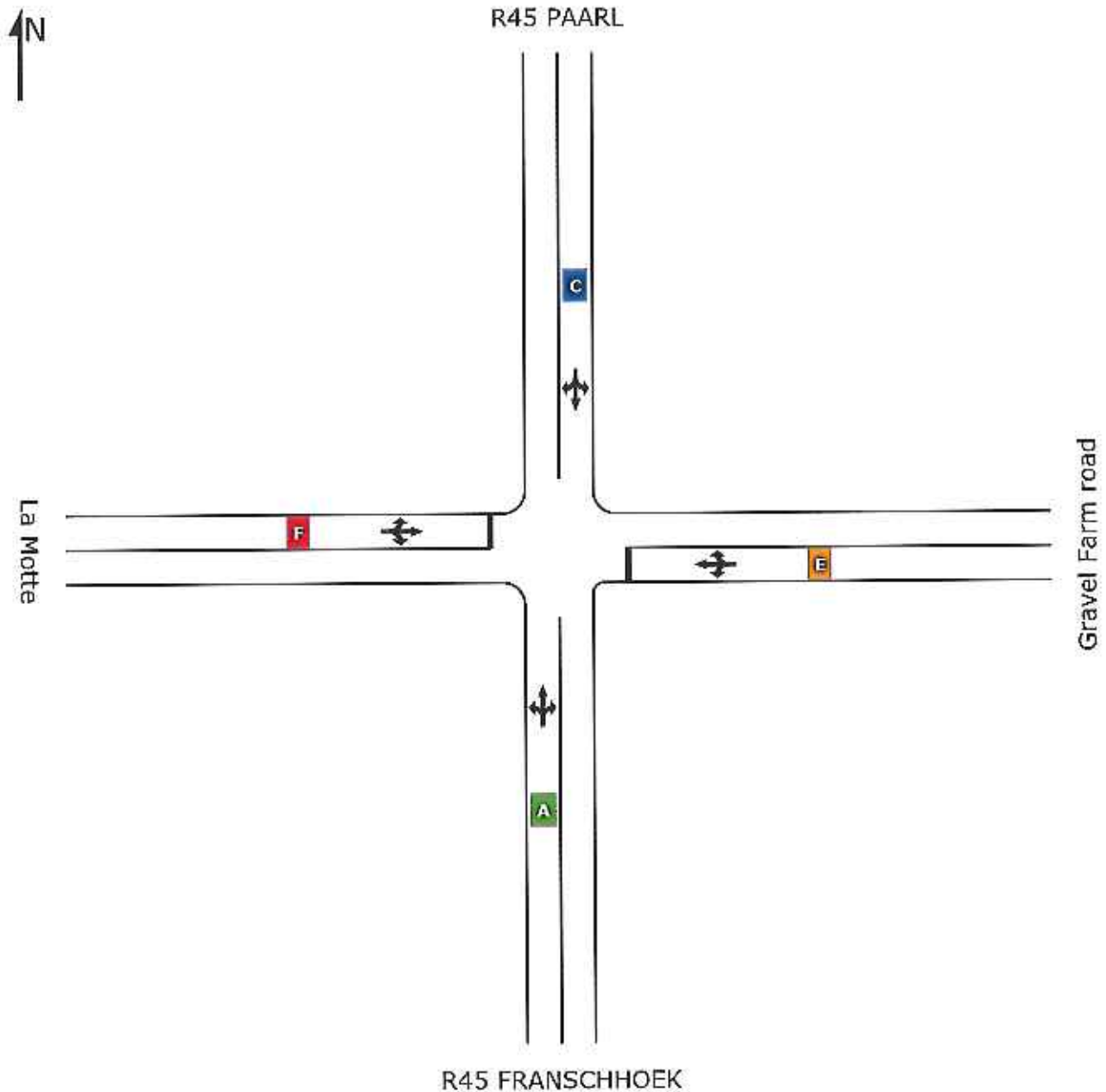


LEVEL OF SERVICE SUMMARY

Site: R45 INTERSECTION AM
HORISON PEAK MITIGATED - Copy

AM PEAK TRAFFIC MITIGATED
Stop (Two-Way)

Intersection 1



LEVEL OF SERVICE

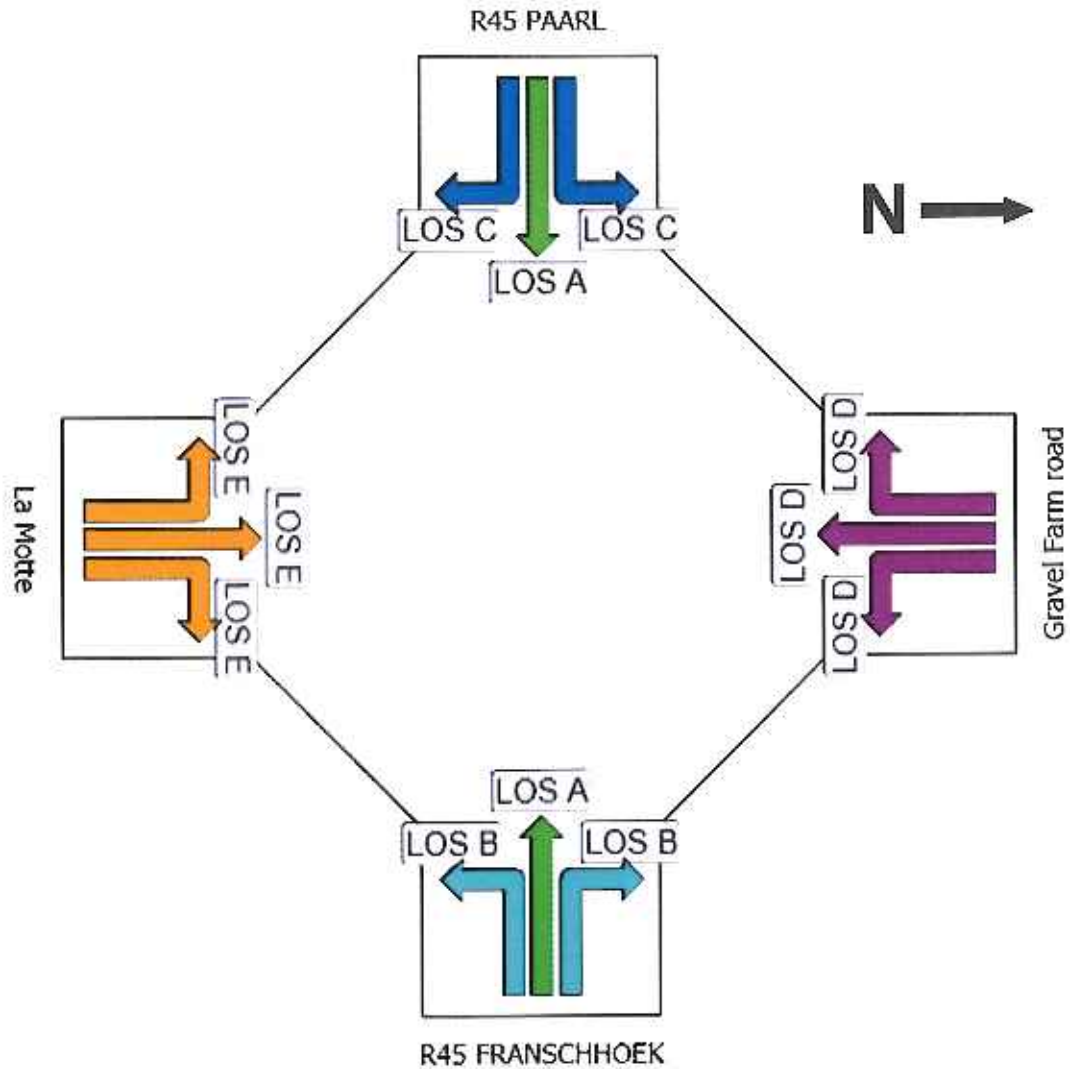
Site: R45 INTERSECTION AM BASE

Level of Service Method: Delay (HCM 2000)

Intersection 1

AM BASE TRAFFIC

Stop (Two-Way)



LEVEL OF SERVICE

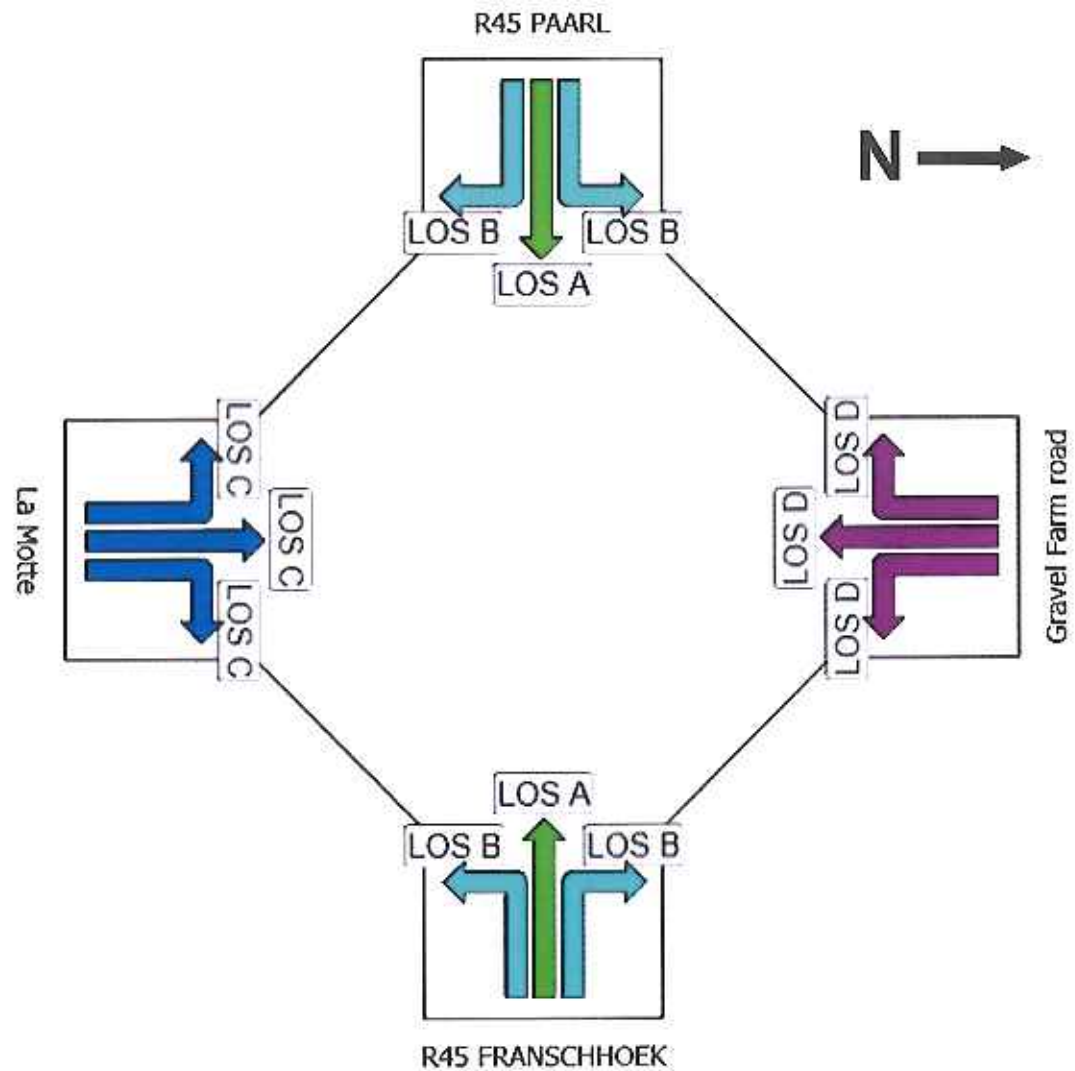
Site: R45 INTERSECTION PM BASE

Level of Service Method: Delay (HCM 2000)

Intersection 1

PM BASE TRAFFIC

Stop (Two-Way)



LEVEL OF SERVICE

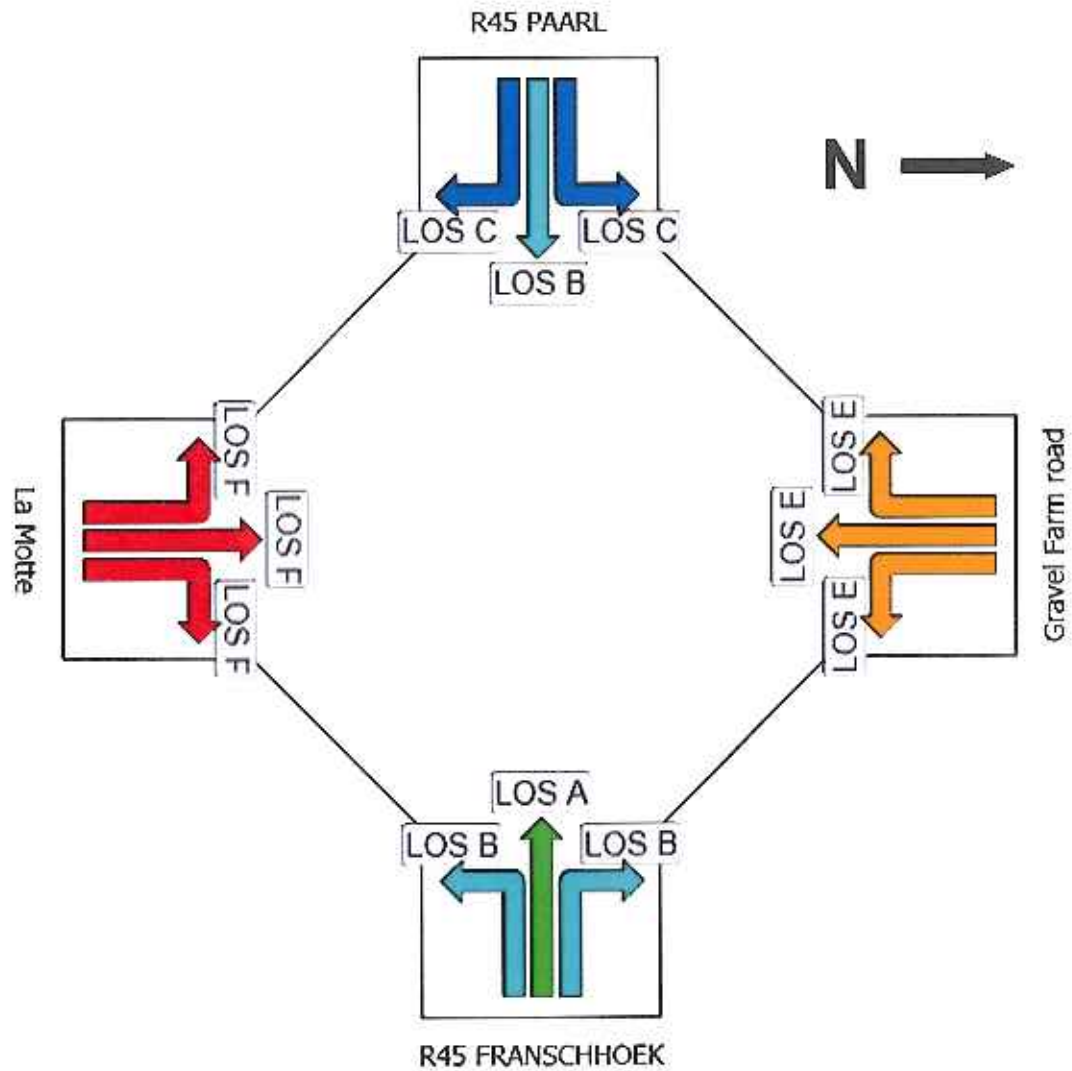
Site: R45 INTERSECTION AM PEAK)

Level of Service Method: Delay (HCM 2000)

Intersection 1

AM PEAK TRAFFIC

Stop (Two-Way)



LEVEL OF SERVICE

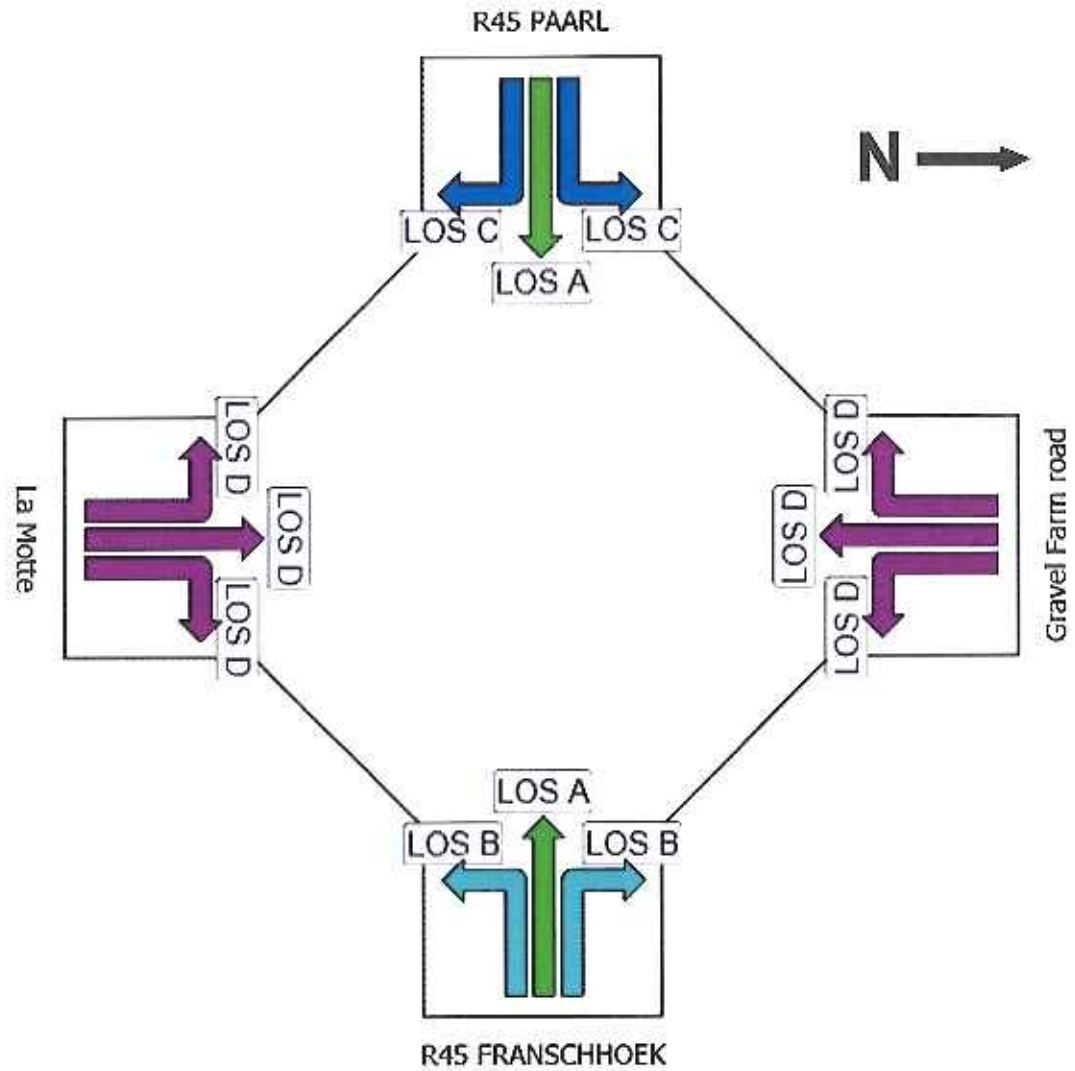
Site: R45 INTERSECTION PM PEAK

Level of Service Method: Delay (HCM 2000)

Intersection 1

PM PEAK TRAFFIC

Stop (Two-Way)



LEVEL OF SERVICE

Site: R45 INTERSECTION AM PEAK

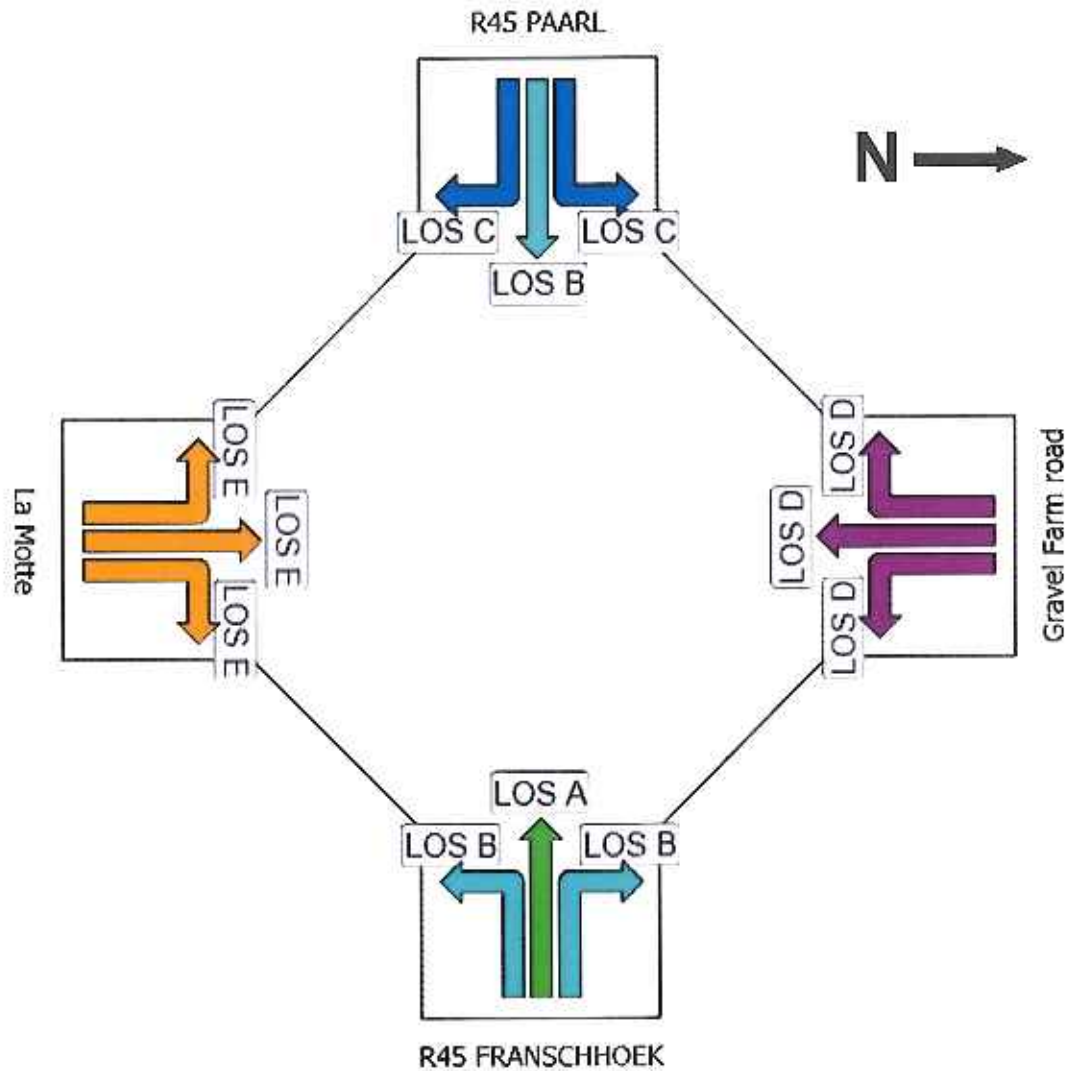
alt MITIGATED - Copy

Level of Service Method: Delay (HCM 2000)

Intersection 1

AM PEAK TRAFFIC MITIGATED

Stop (Two-Way)



DEGREE OF SATURATION

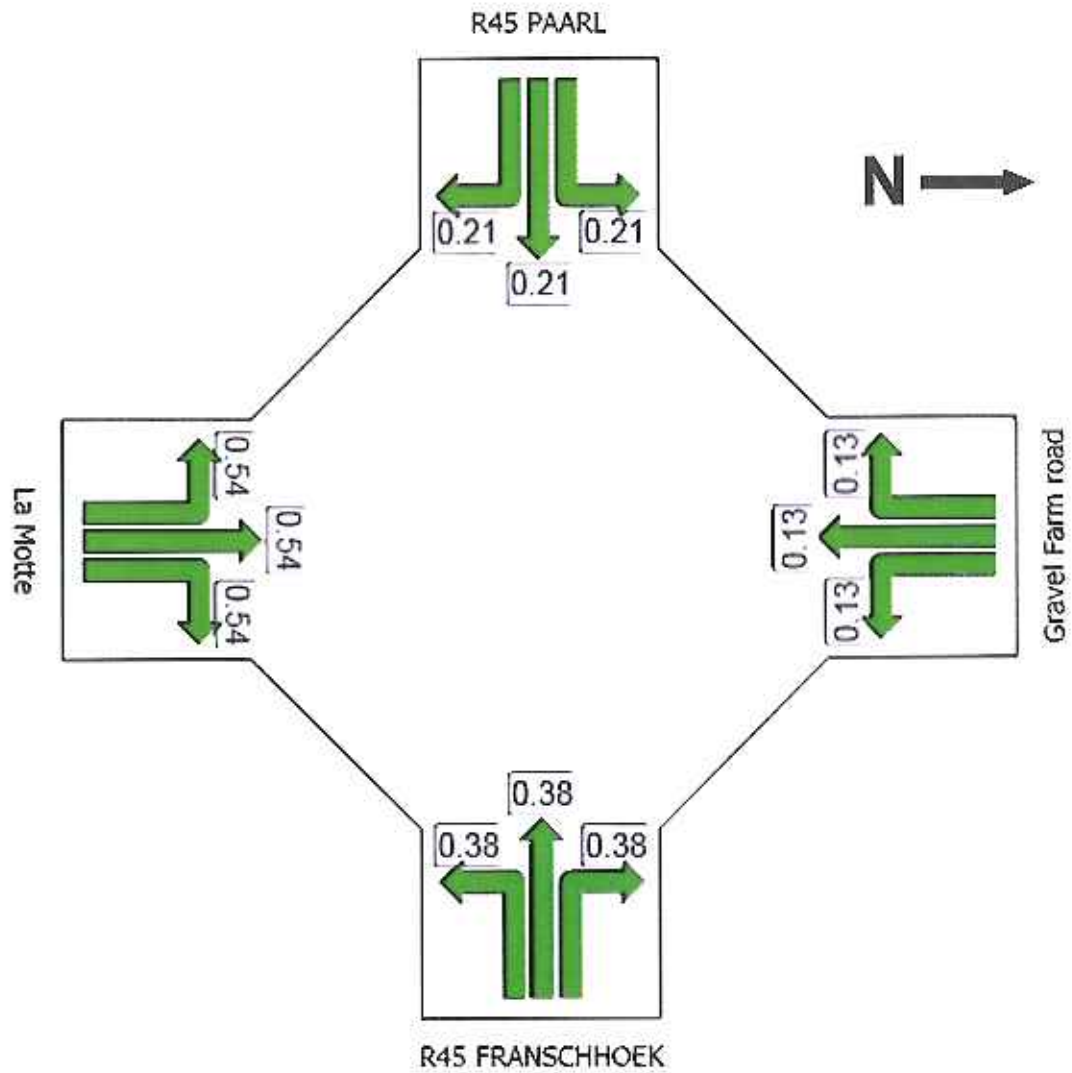
Site: R45 INTERSECTION AM BASE

Ratio of Demand Volume to Capacity (v/c ratio)

Intersection 1

AM BASE TRAFFIC

Stop (Two-Way)



DEGREE OF SATURATION

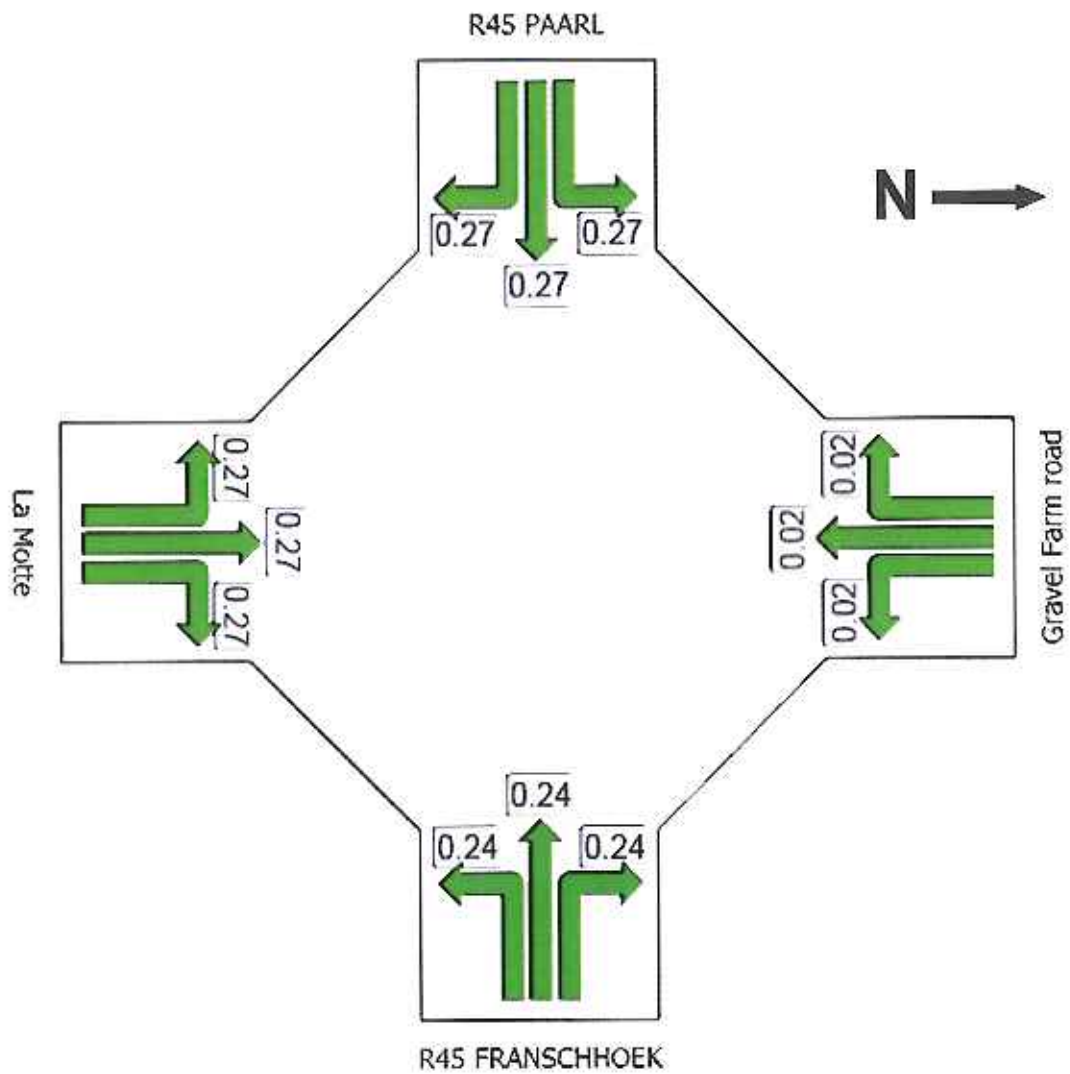
Site: R45 INTERSECTION PM BASE

Ratio of Demand Volume to Capacity (v/c ratio)

Intersection 1

PM BASE TRAFFIC

Stop (Two-Way)



DEGREE OF SATURATION

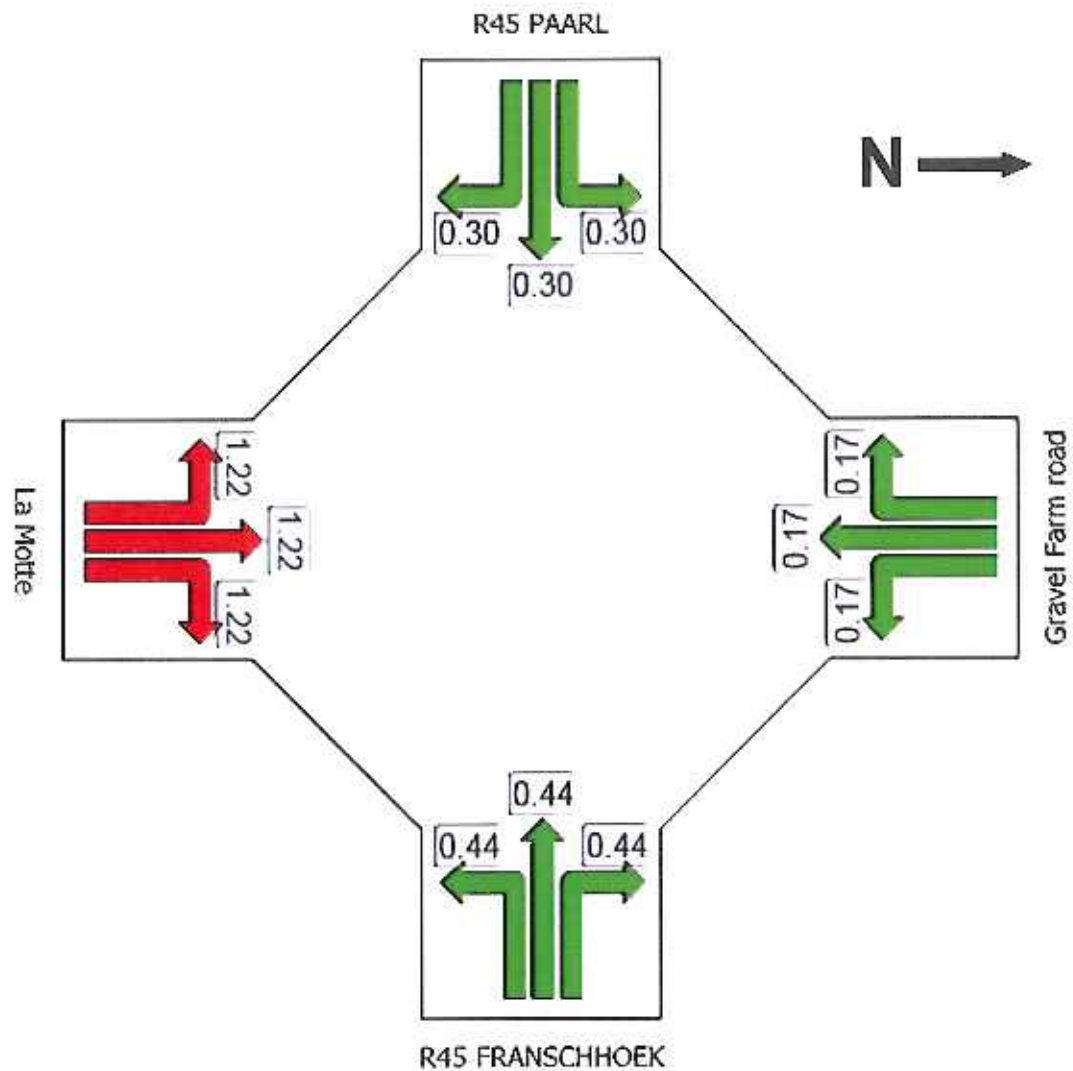
Site: R45 INTERSECTION AM PEAK

Ratio of Demand Volume to Capacity (v/c ratio)

Intersection 1

AM PEAK TRAFFIC

Stop (Two-Way)



DEGREE OF SATURATION

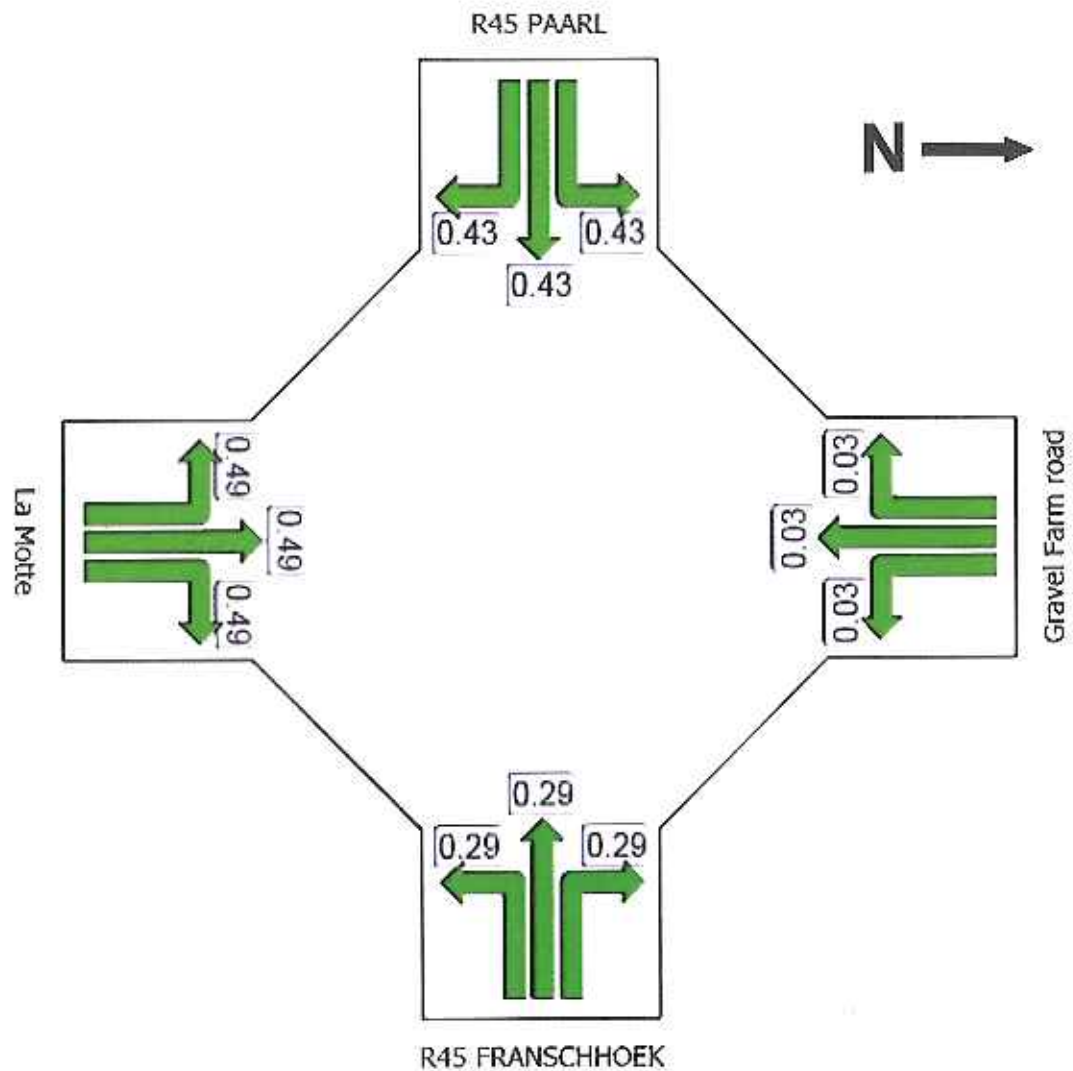
Site: R45 INTERSECTION PM PEAK

Ratio of Demand Volume to Capacity (v/c ratio)

Intersection 1

PM PEAK TRAFFIC

Stop (Two-Way)



DEGREE OF SATURATION

Site: R45 INTERSECTION AM PEAK

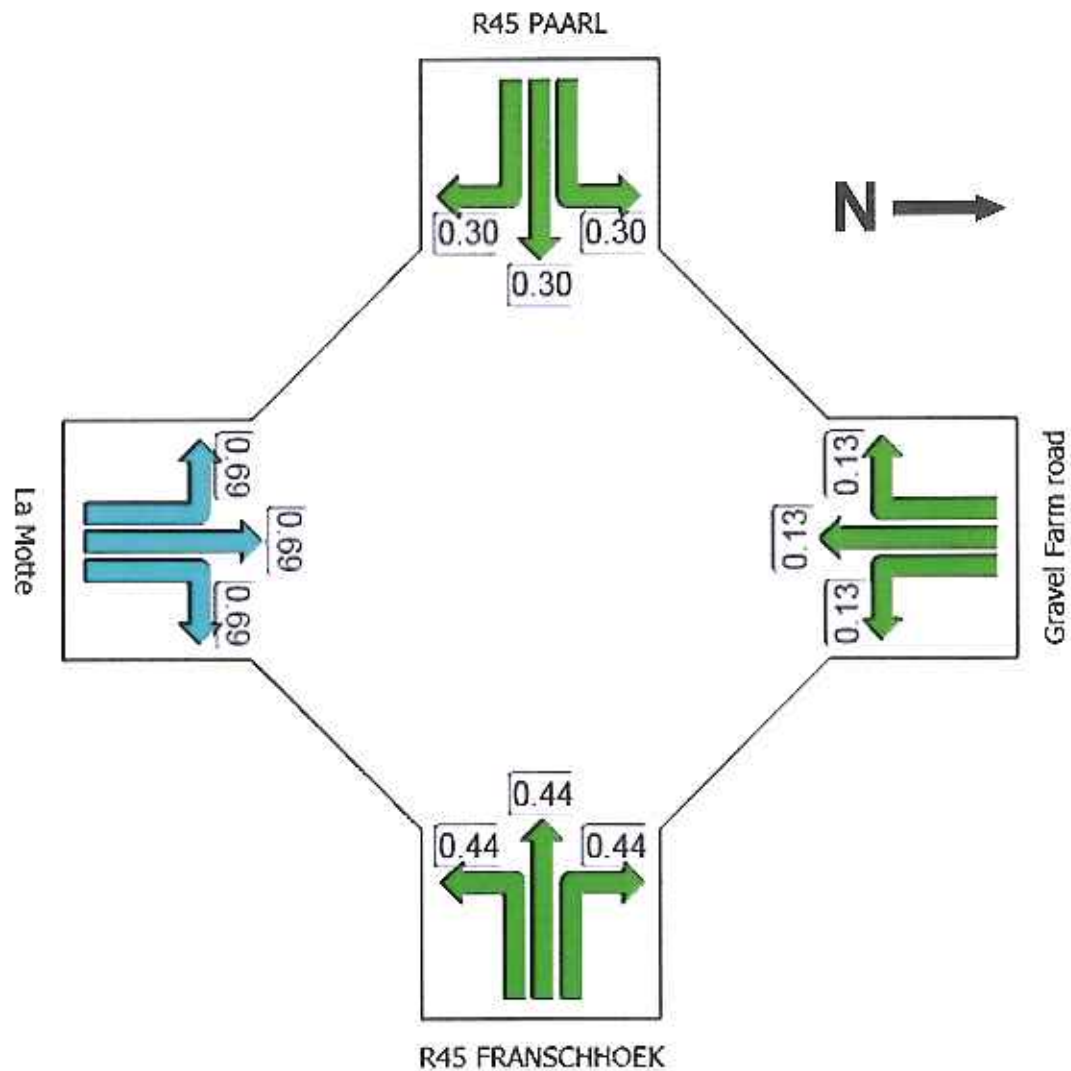
MITIGATED

Ratio of Demand Volume to Capacity (v/c ratio)

Intersection 1

AM PEAK TRAFFIC MITIGATED

Stop (Two-Way)



DELAY (AVERAGE)

Site: R45 INTERSECTION AM PEAK

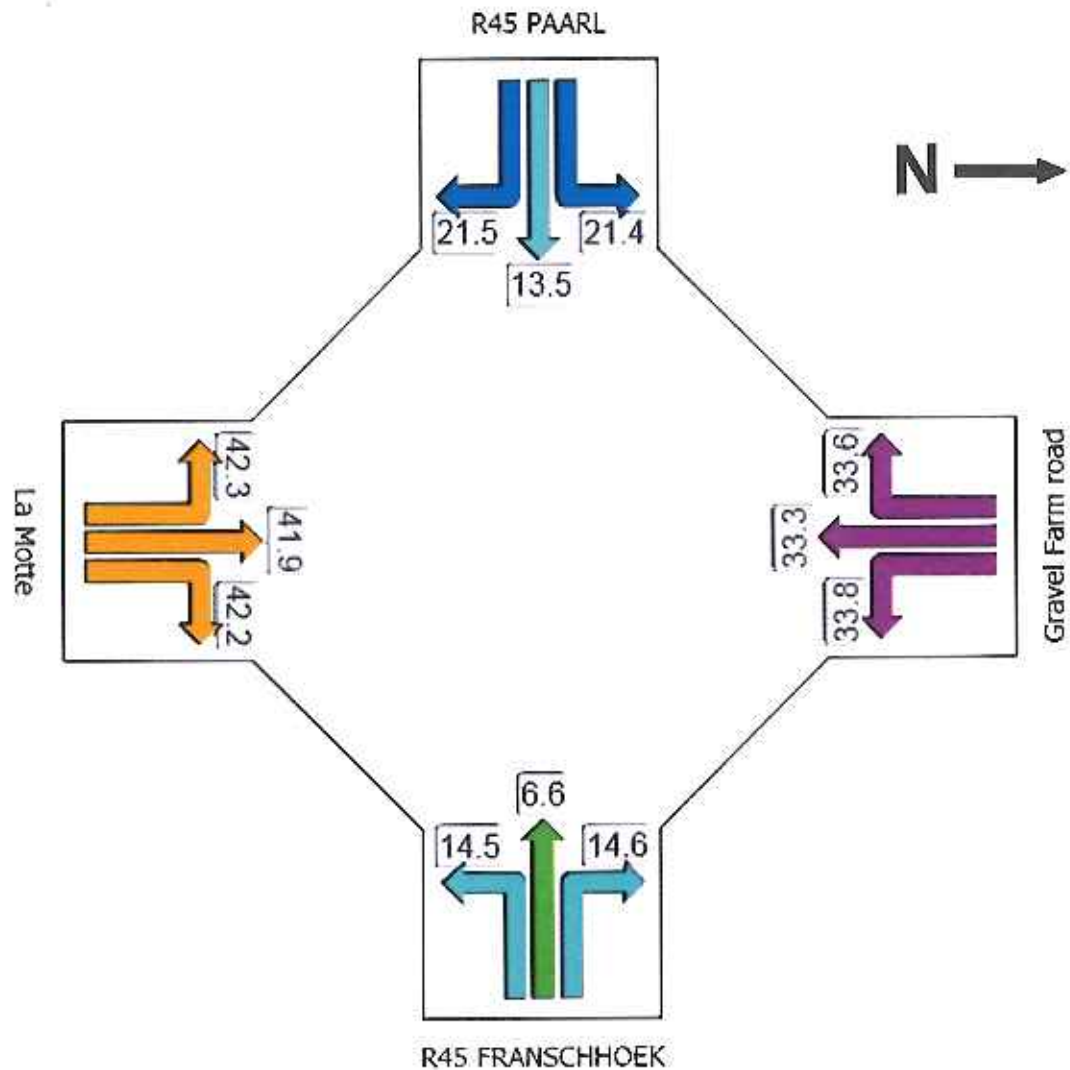
alt MITIGATED - Copy

Intersection 1

Average control delay per vehicle, or average pedestrian delay (seconds)

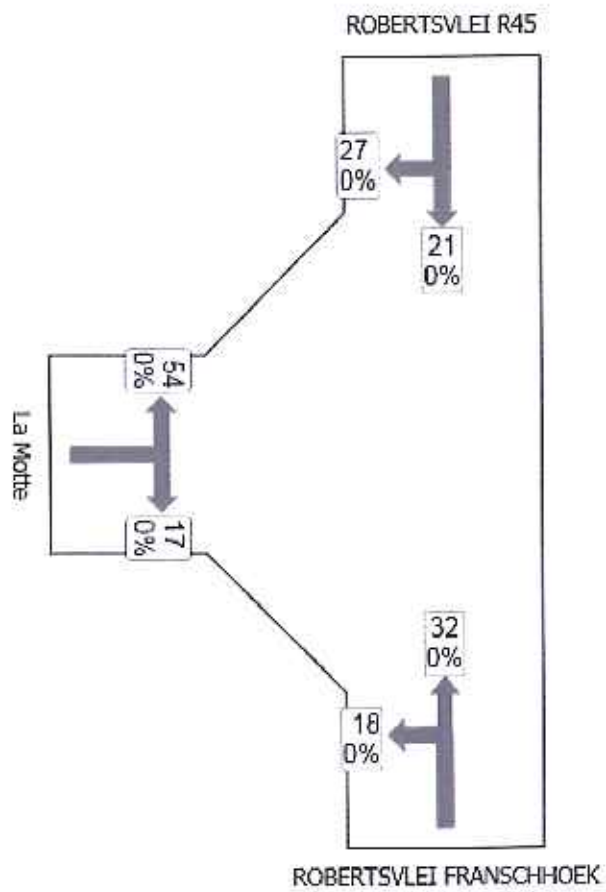
AM PEAK TRAFFIC MITIGATED

Stop (Two-Way)

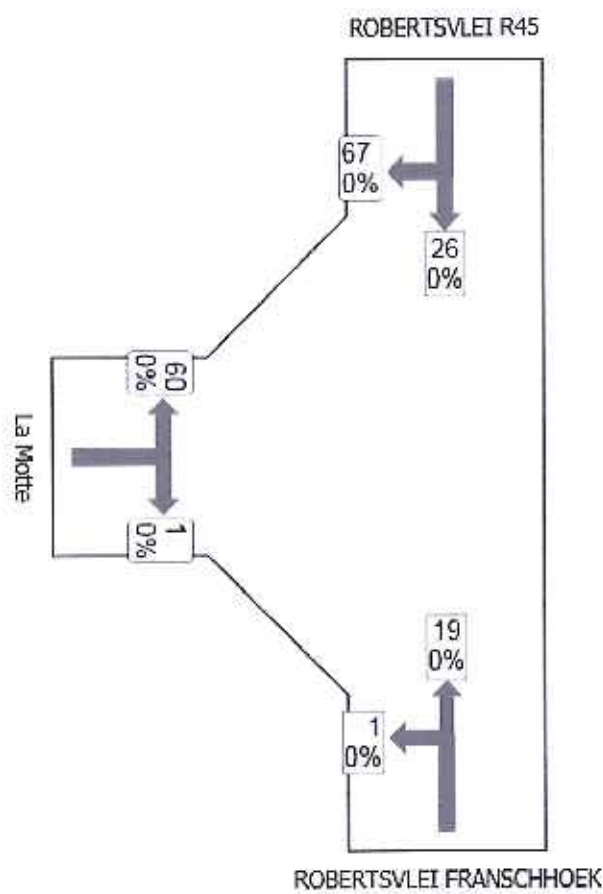


8.1) Appendix B: Intersection 2

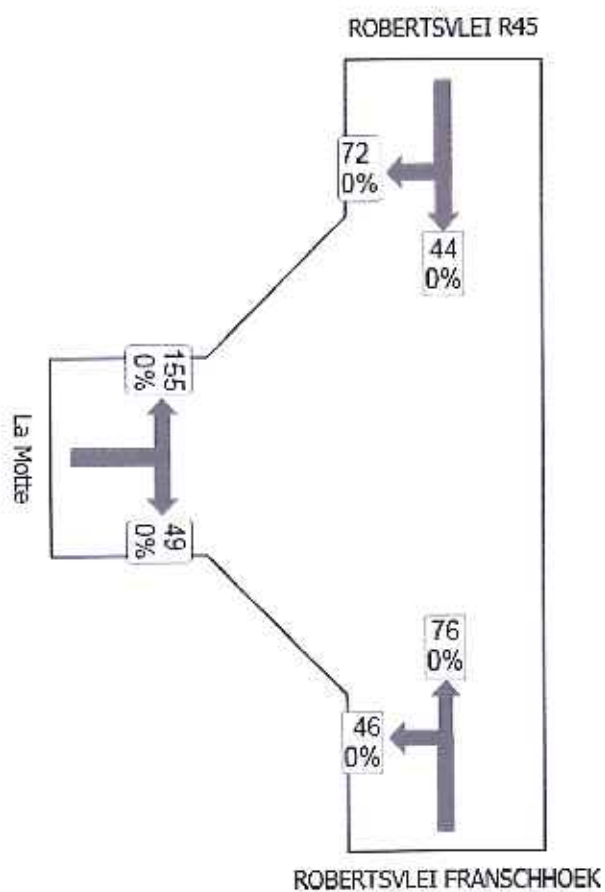
Intersection 2: Base AM Traffic



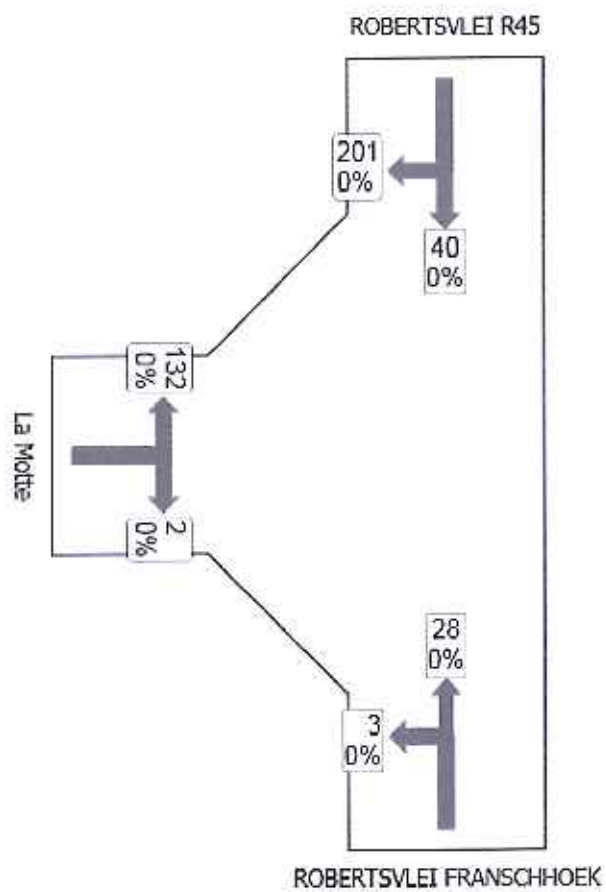
Intersection 2: Base PM Traffic



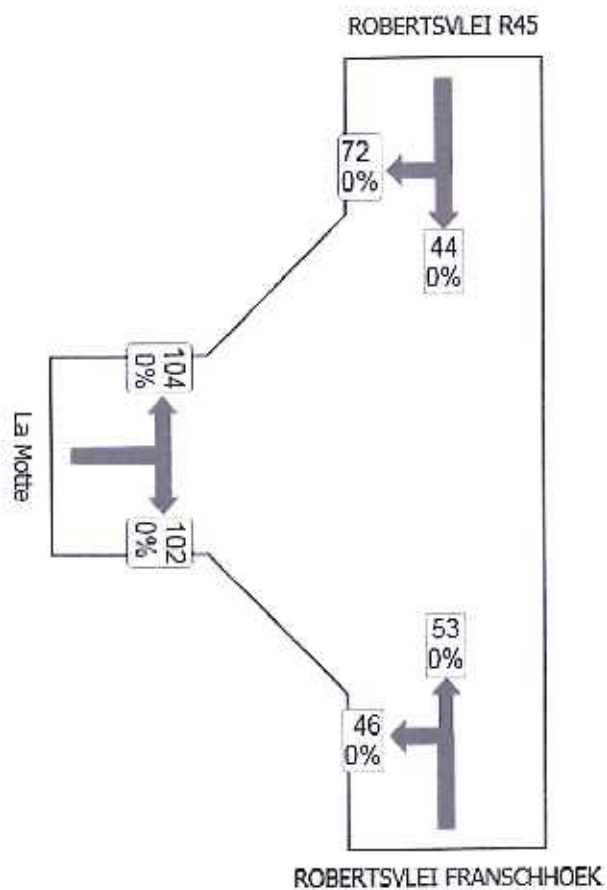
Intersection 2: Normal AM Peak Traffic



Intersection 2: Normal PM Peak Traffic



Intersection 2: Mitigated AM Peak Traffic



LEVEL OF SERVICE

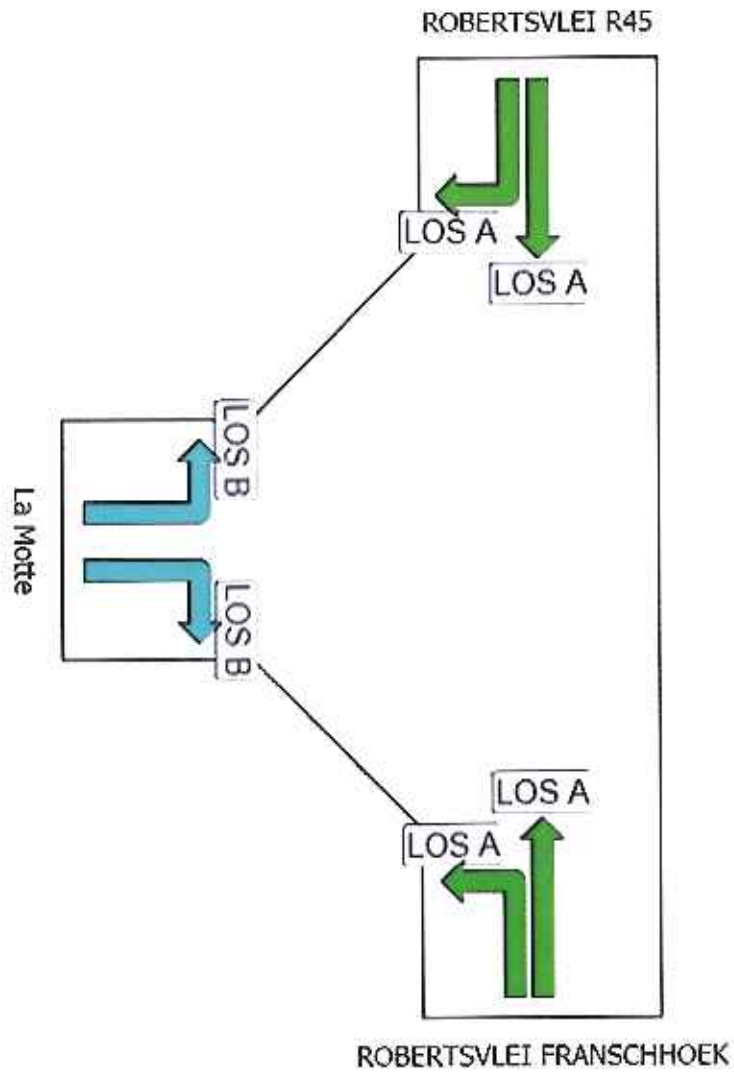
Level of Service Method: Delay (HCM 2000)

La Motte Robertsvlei

Stop (Two-Way)

Site: AM BASE TRAFFIC

Intersection 2



LEVEL OF SERVICE

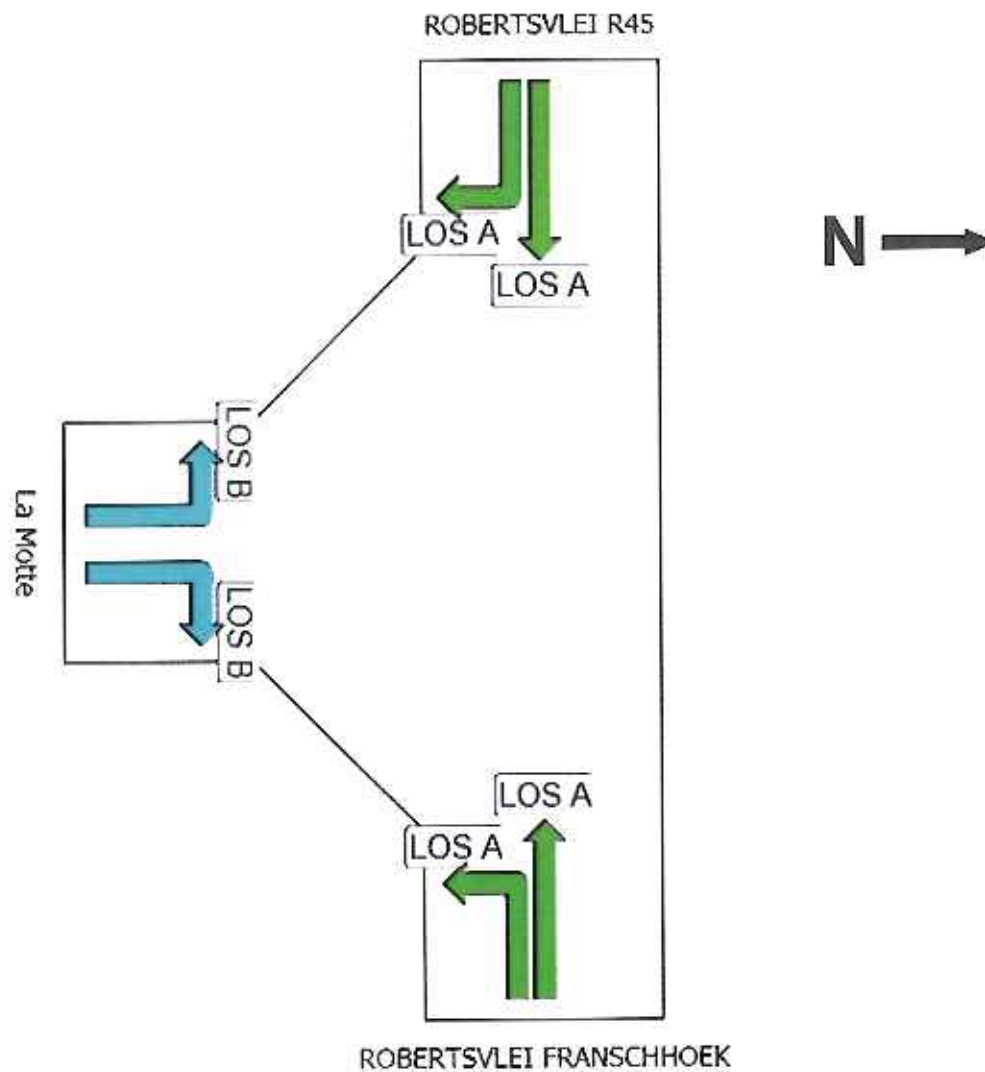
Level of Service Method: Delay (HCM 2000)

La Motte Robertsvlei

Stop (Two-Way)

Site: PM BASE TRAFFIC

Intersection 2



LEVEL OF SERVICE

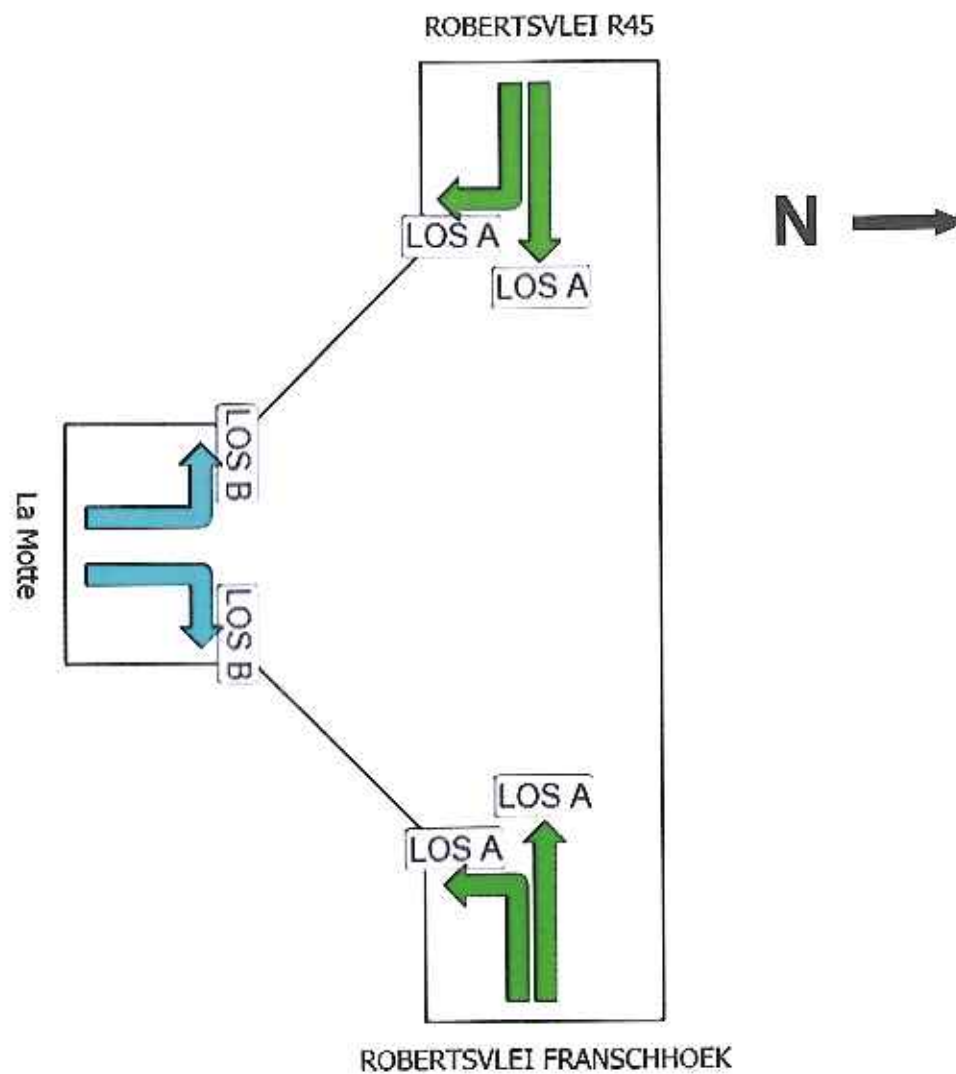
Site: AM PEAK TRAFFIC (NORMAL)

Level of Service Method: Delay (HCM 2000)

Intersection 2

La Motte Robertsvlei

Stop (Two-Way)



LEVEL OF SERVICE

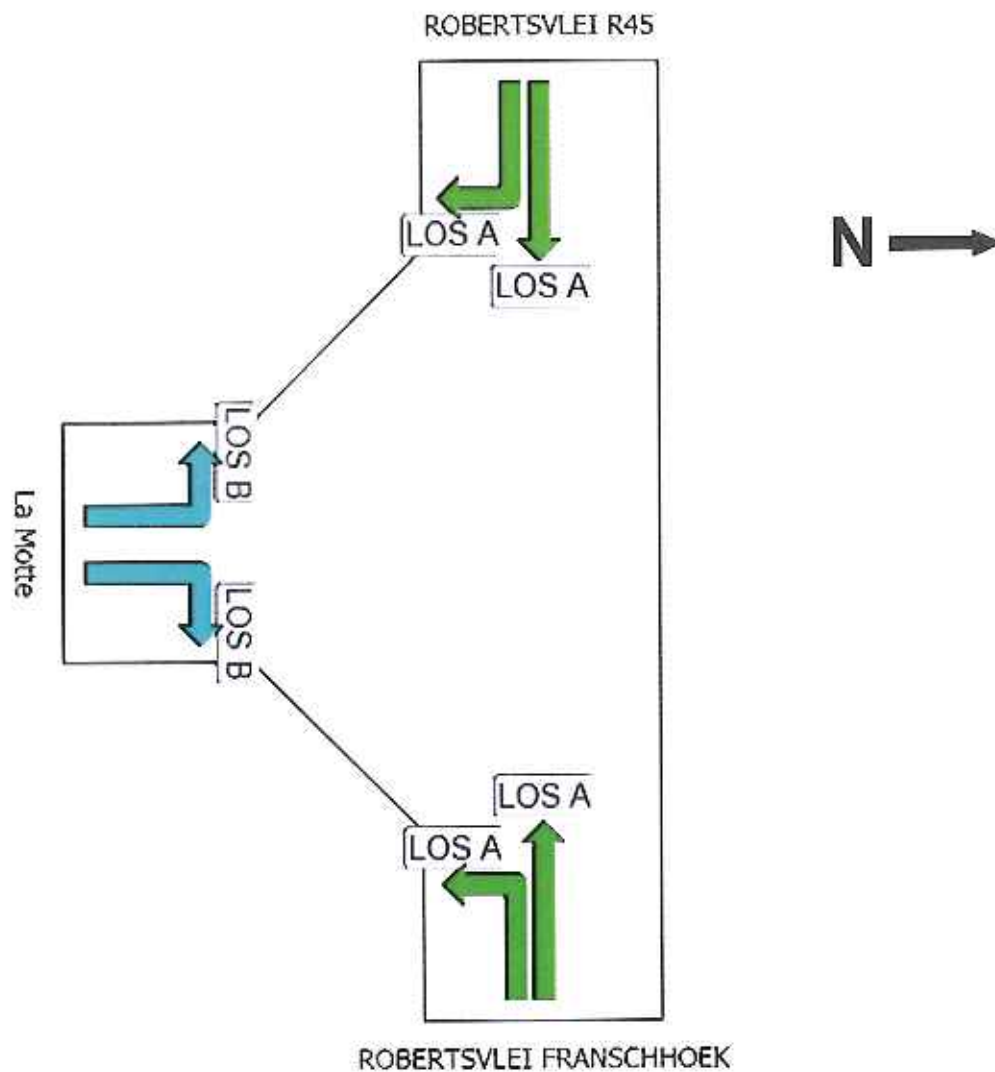
Site: PM PEAK TRAFFIC

Level of Service Method: Delay (HCM 2000)

Intersection 2

La Motte Robertsvlei

Stop (Two-Way)



LEVEL OF SERVICE

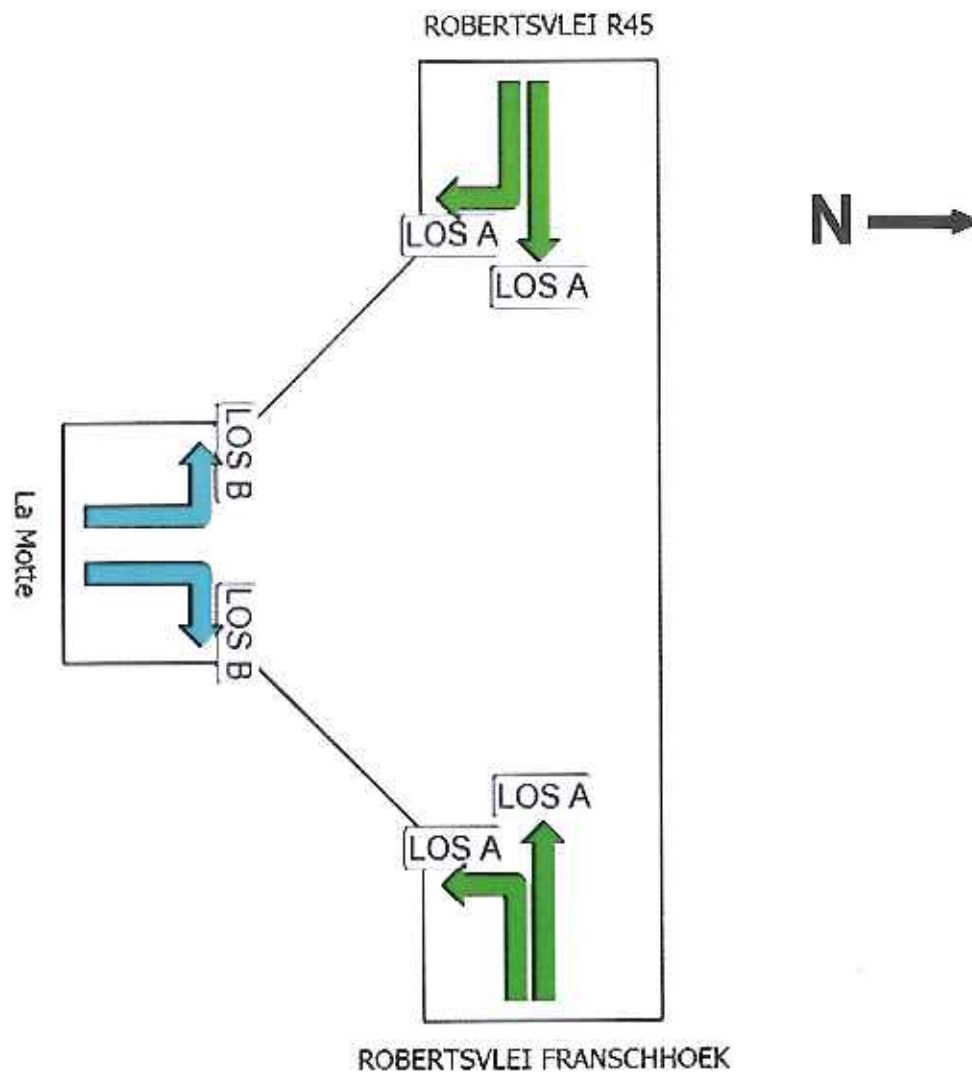
Level of Service Method: Delay (HCM 2000)

La Motte Robertsvlei

Stop (Two-Way)

Site: AM PEAK ALT
MITIGATED TRAFFIC - Copy

Intersection 2



DEGREE OF SATURATION

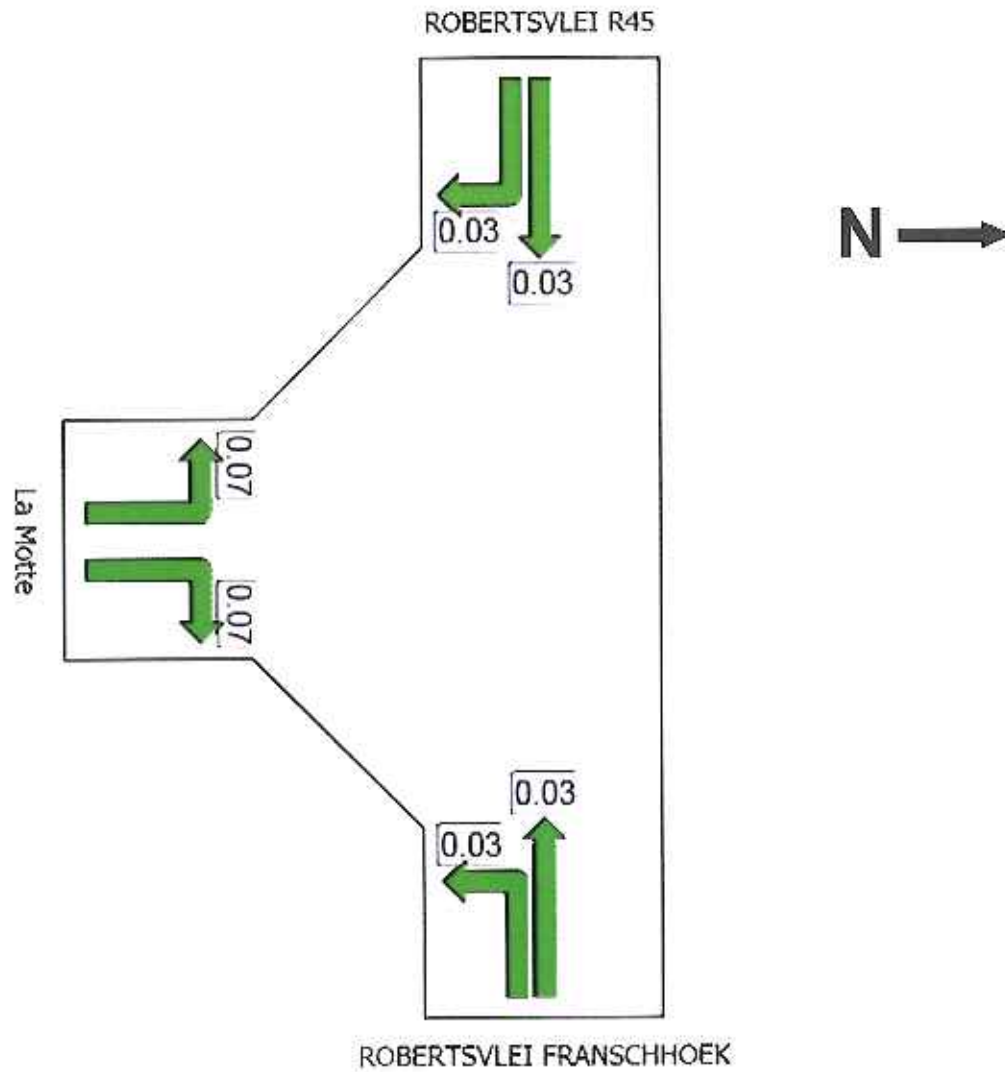
Ratio of Demand Volume to Capacity (v/c ratio)

La Motte Robertsvlei

Stop (Two-Way)

Site: AM BASE TRAFFIC

Intersection 2



DEGREE OF SATURATION

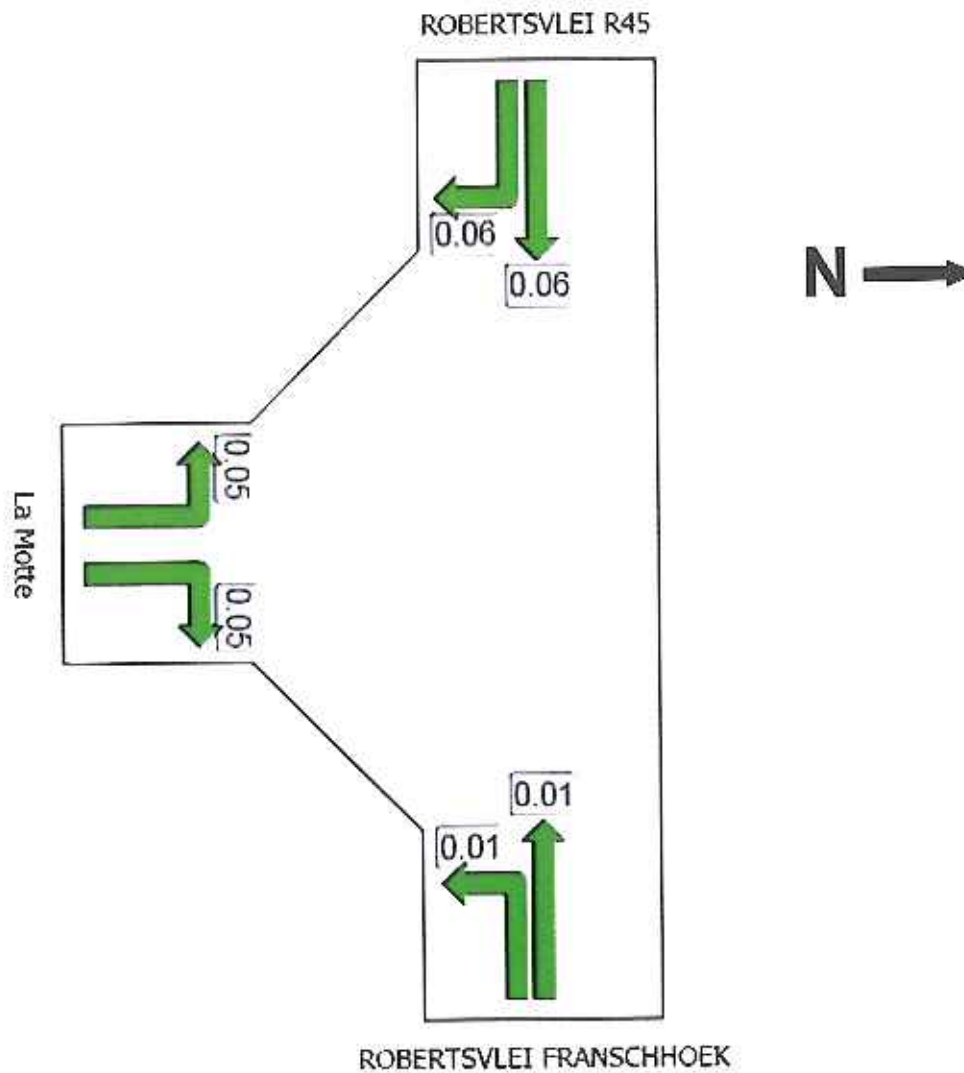
Ratio of Demand Volume to Capacity (v/c ratio)

La Motte Robertsvlei

Stop (Two-Way)

Site: PM BASE TRAFFIC

Intersection 2



DEGREE OF SATURATION

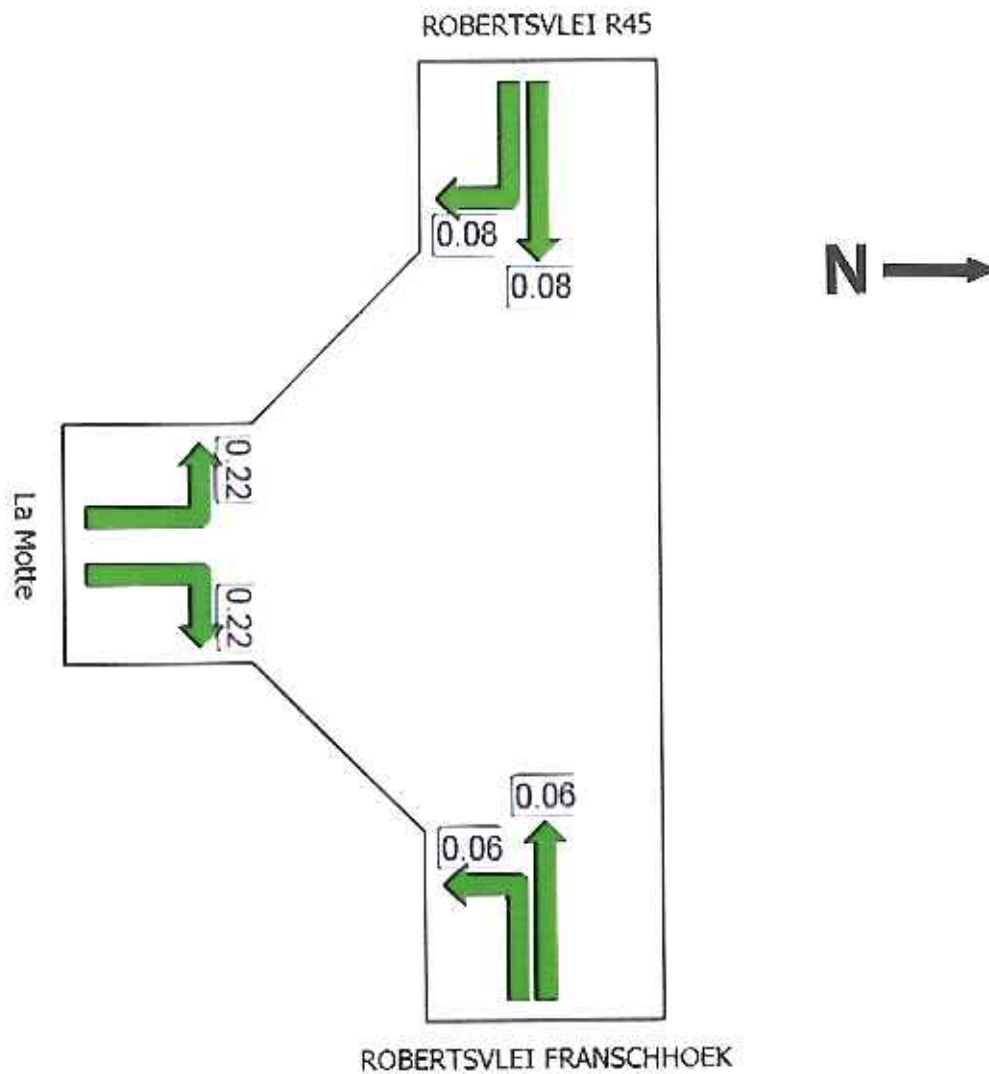
Ratio of Demand Volume to Capacity (v/c ratio)

Site: AM PEAK TRAFFIC

Intersection 2

La Motte Robertsvlei

Stop (Two-Way)



DEGREE OF SATURATION

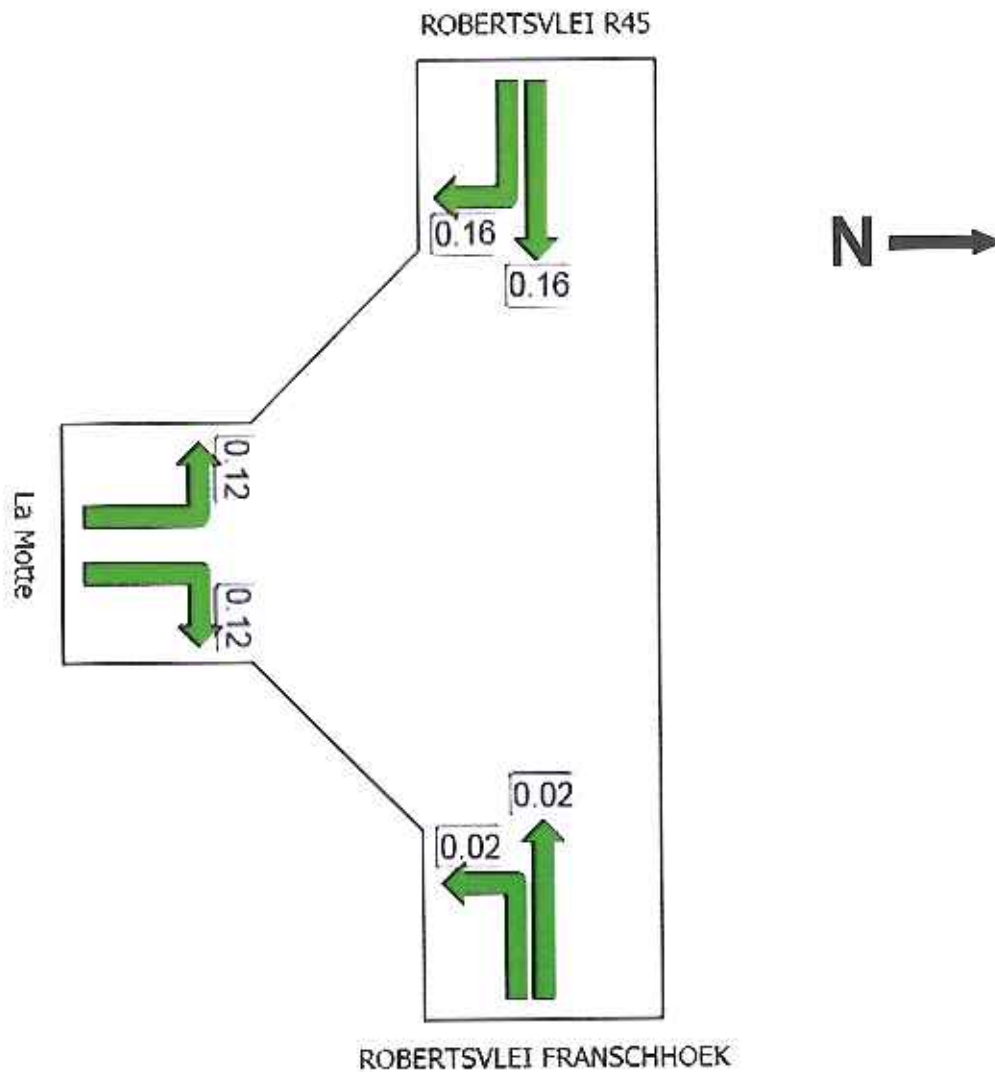
Site: PM PEAK TRAFFIC (NORMAL)

Ratio of Demand Volume to Capacity (v/c ratio)

Intersection 2

La Motte Robertsvlei

Stop (Two-Way)



DEGREE OF SATURATION

Site: AM PEAK ALT MITIGATED

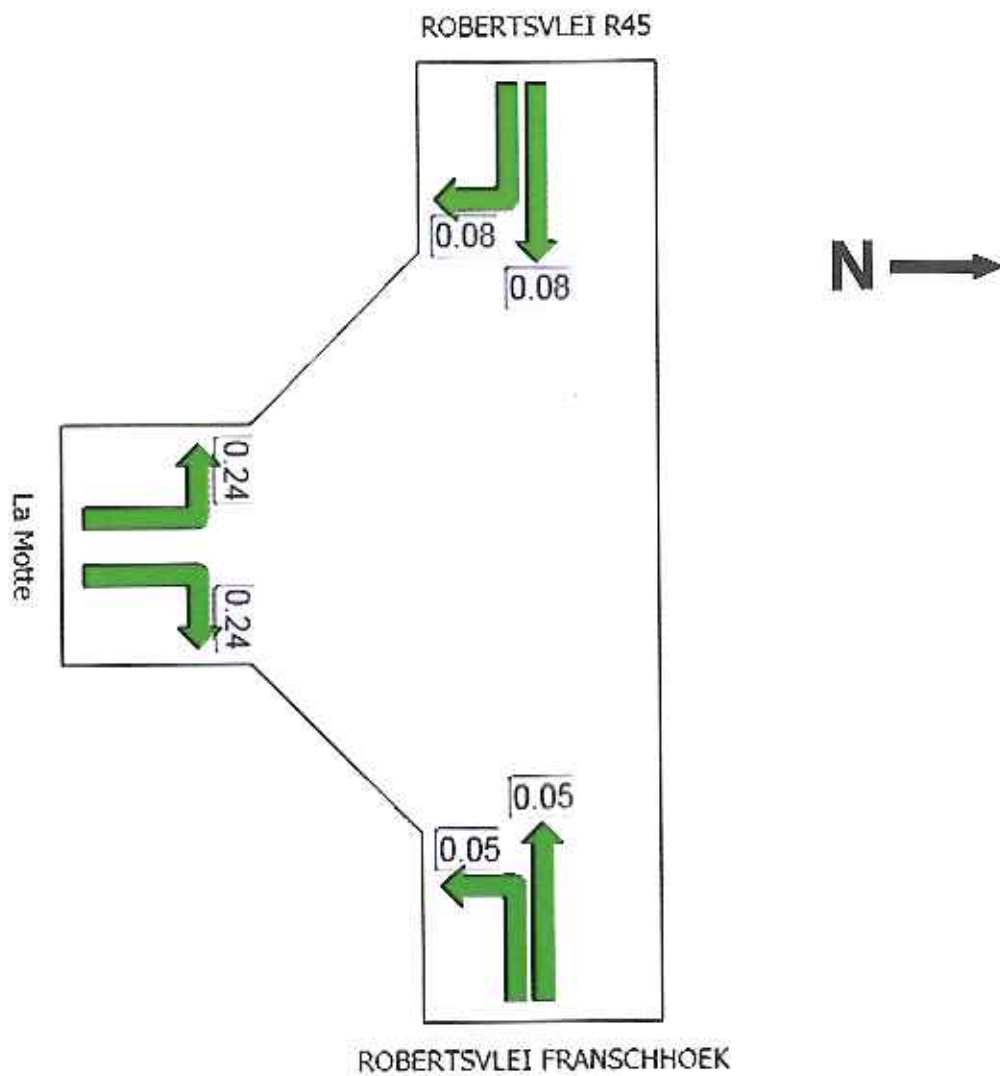
TRAFFIC - Copy

Intersection 2

Ratio of Demand Volume to Capacity (v/c ratio)

La Motte Robertsvlei

Stop (Two-Way)



DELAY (AVERAGE)

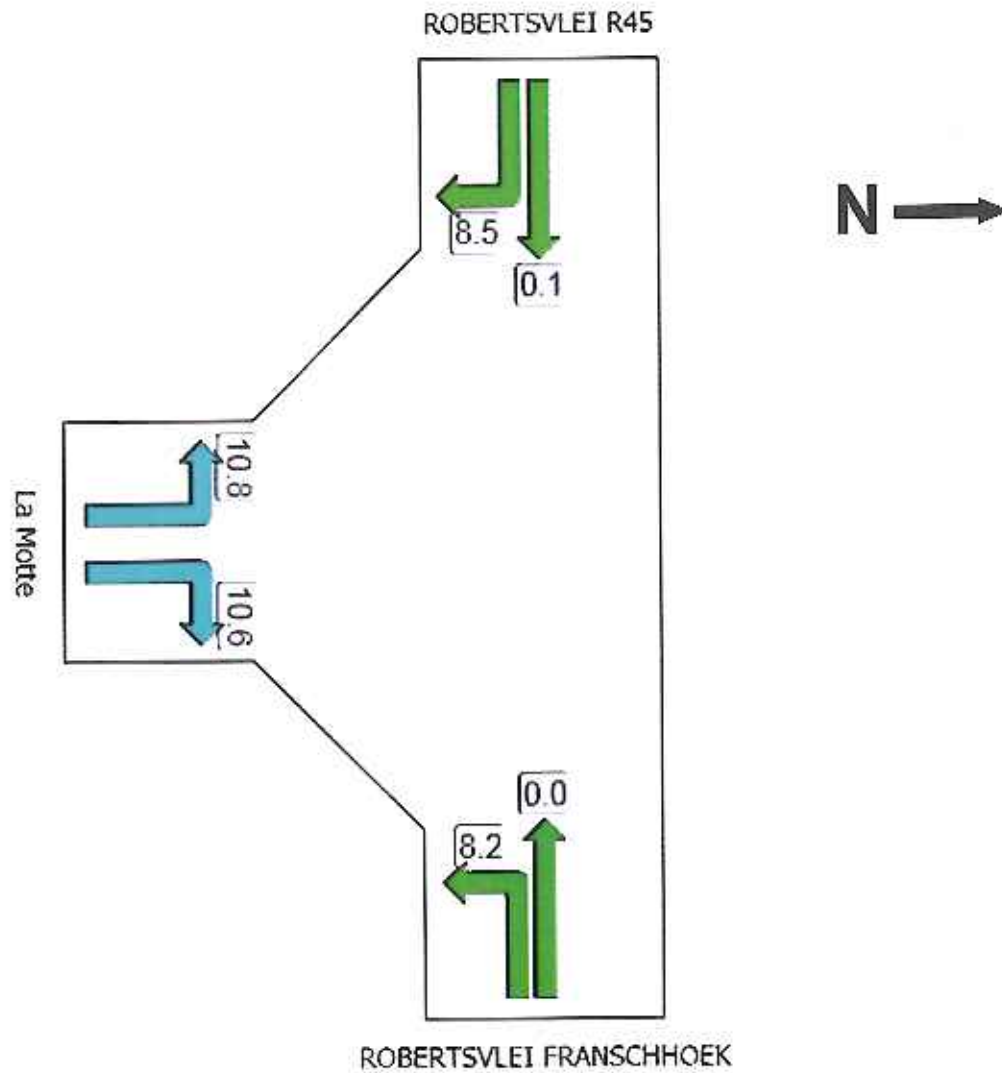
Average control delay per vehicle, or average pedestrian delay (seconds)

La Motte Robertsvlei

Stop (Two-Way)

Site: PM BASE TRAFFIC

Intersection 2



DELAY (AVERAGE)

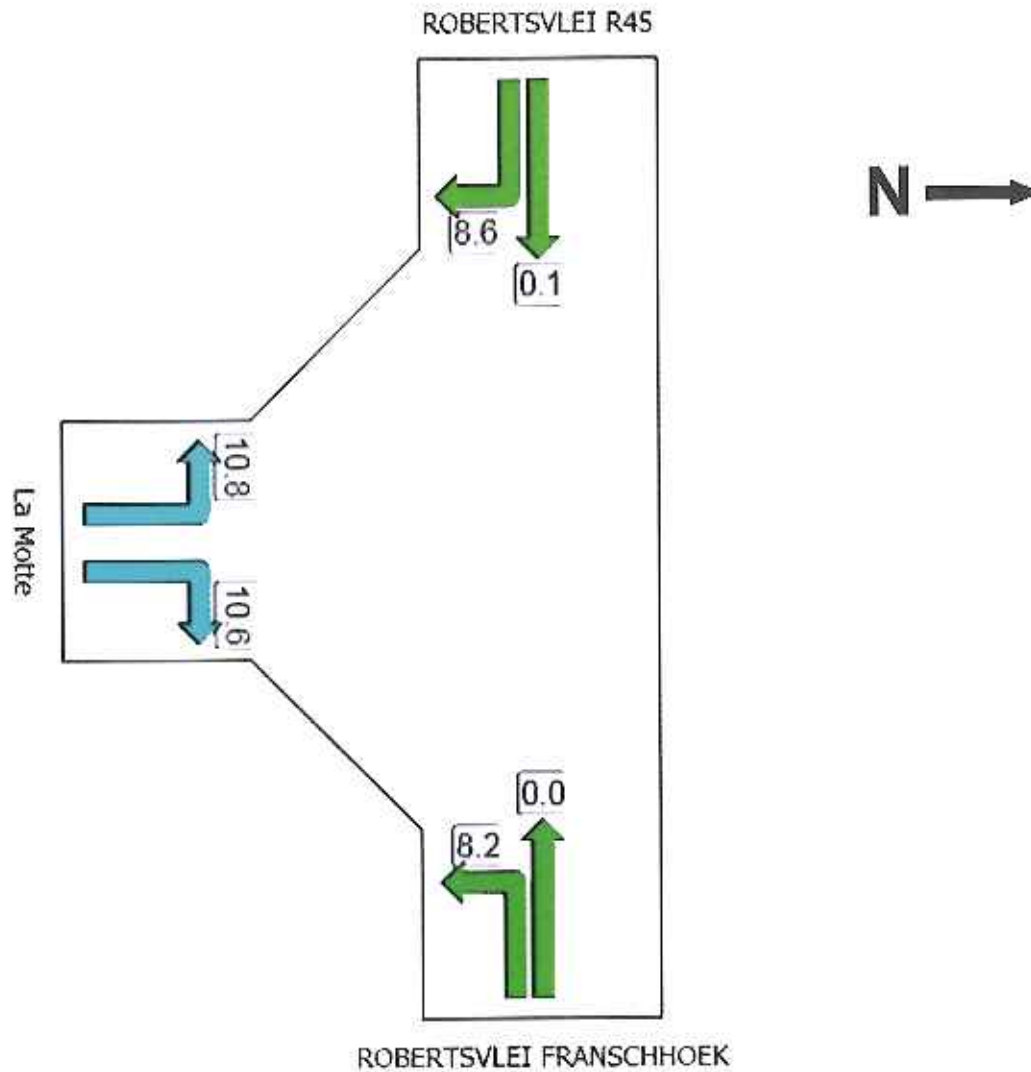
Site: PM PEAK TRAFFIC (NORMAL)

Average control delay per vehicle, or average pedestrian delay (seconds)

Intersection 2

La Motte Robertsvlei

Stop (Two-Way)



DELAY (AVERAGE)

Site: AM PEAK ALT MITIGATED

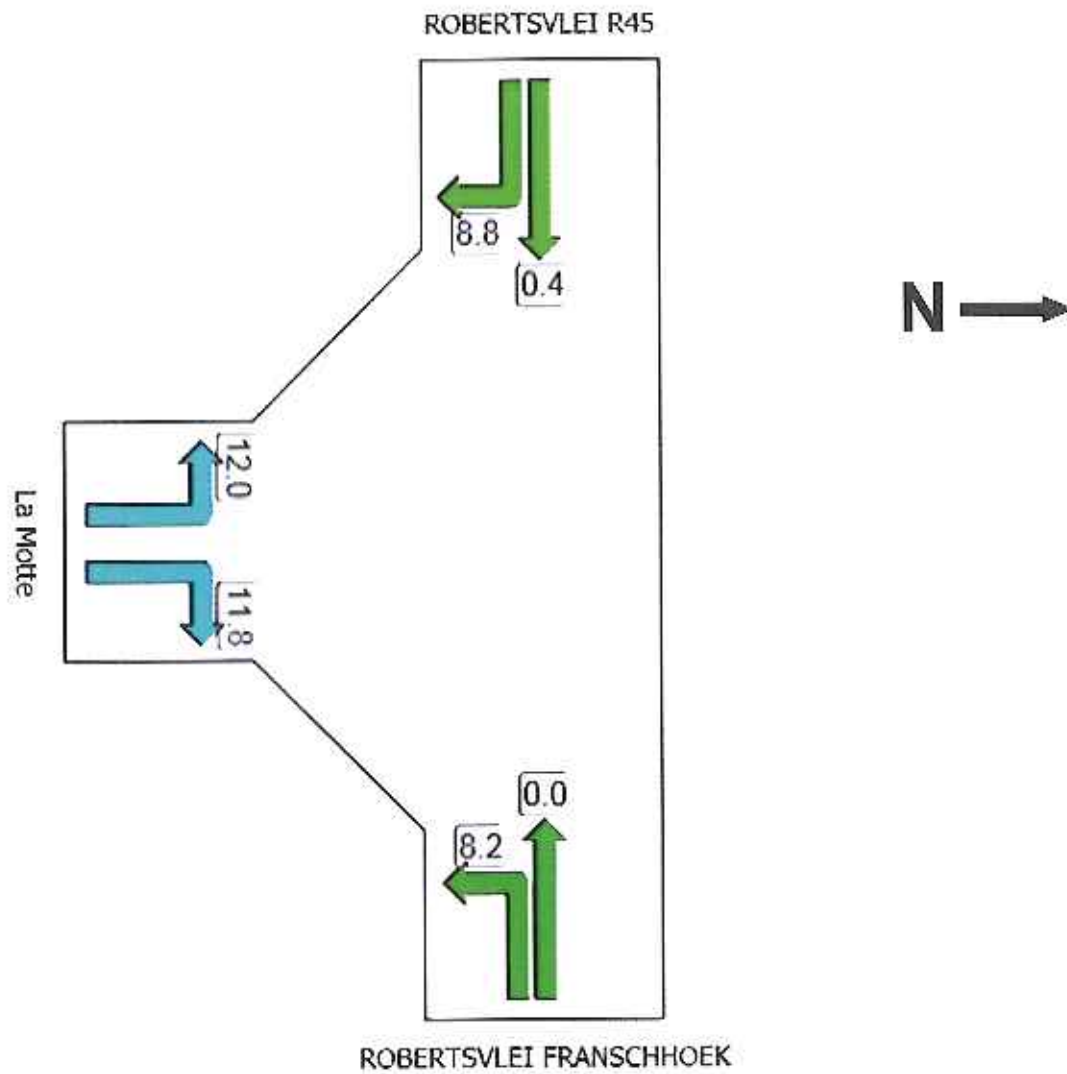
TRAFFIC - Copy

Average control delay per vehicle, or average pedestrian delay
(seconds)

La Motte Robertsvlei

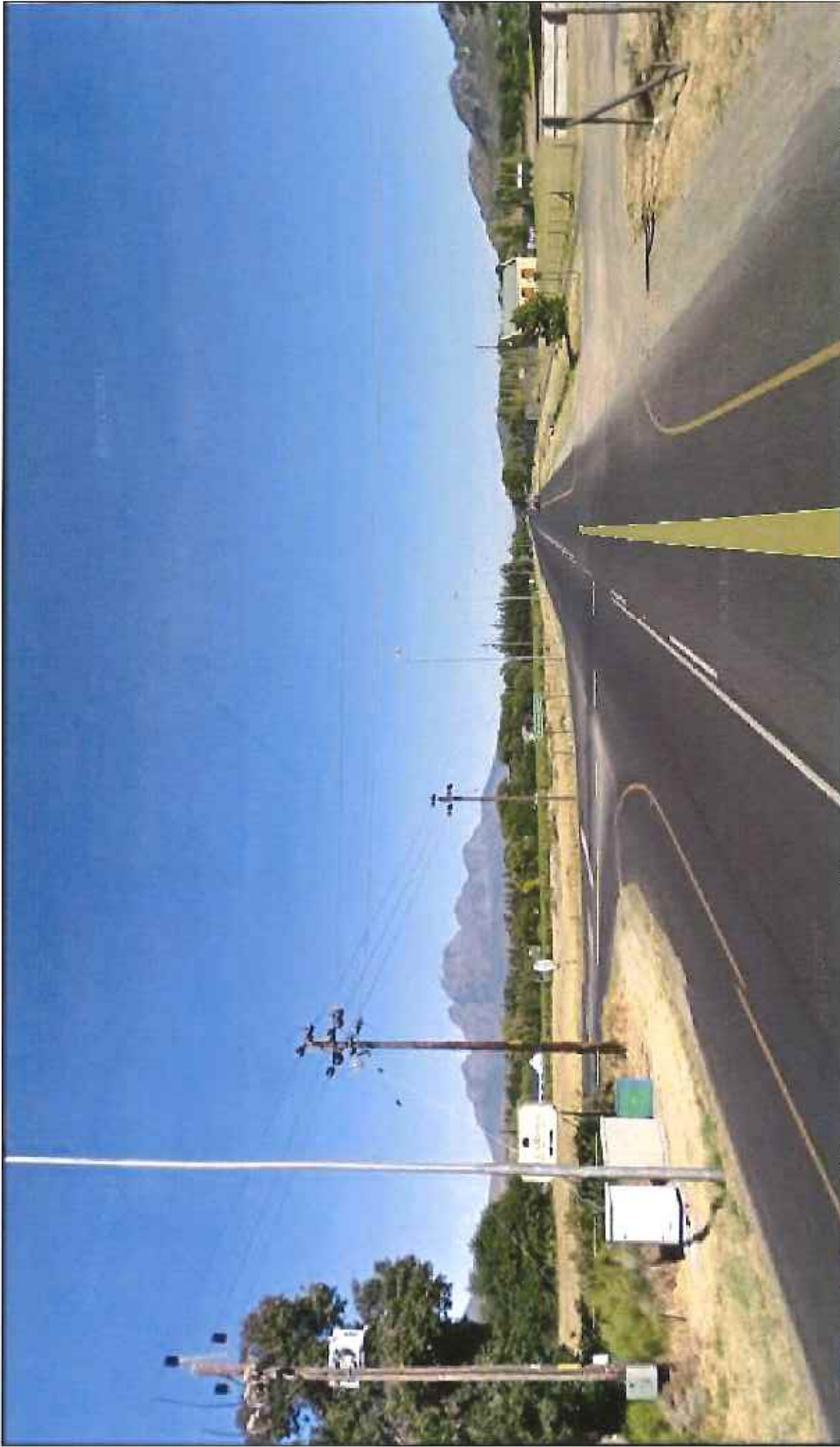
Stop (Two-Way)

Intersection 2



8.3) Appendix C: Development Layout

8.4) Appendix D: Photos



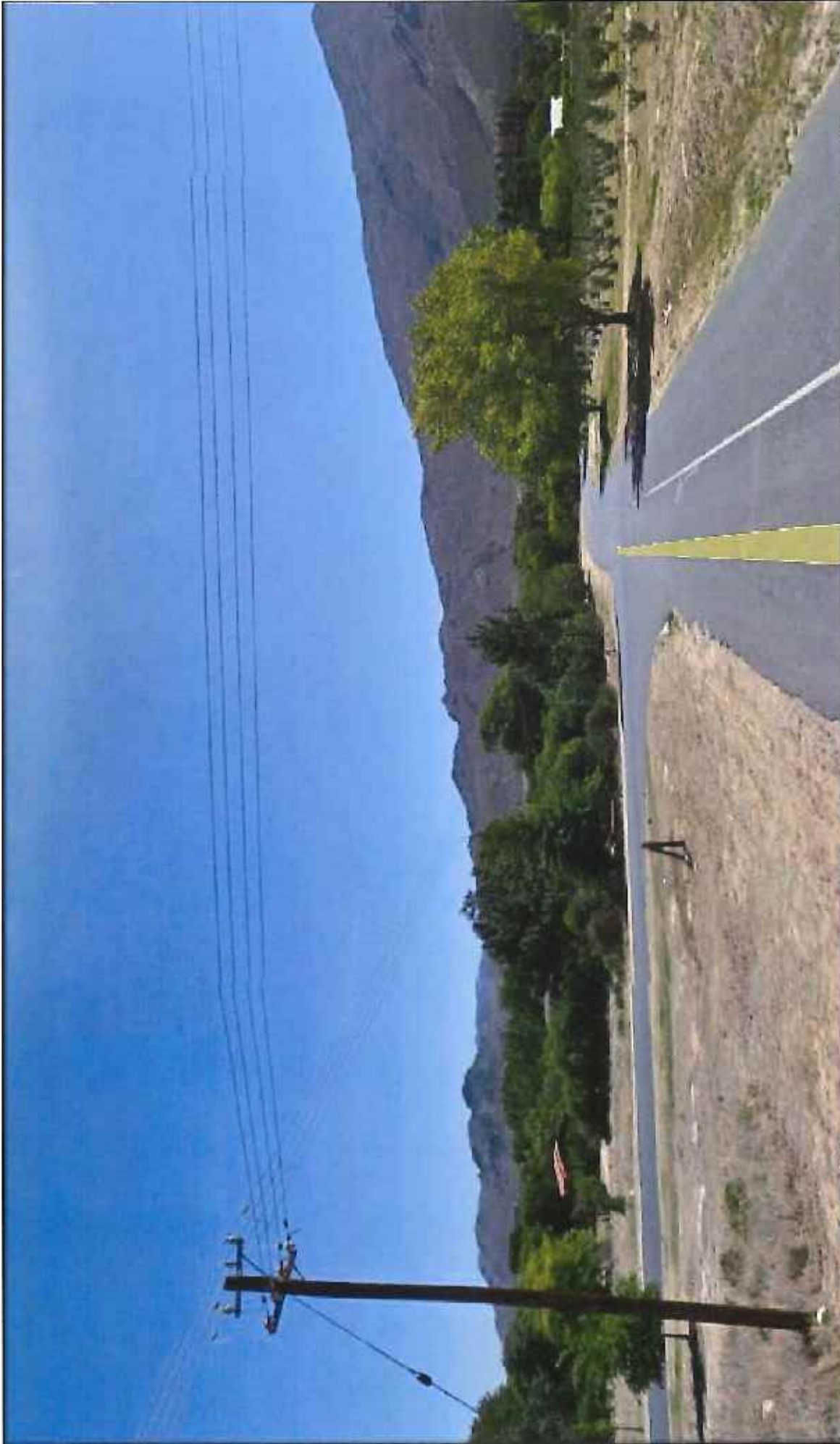
 SKC Masakhizwe Engineers (Pty) Ltd CONSULTING ENGINEERS TO B.L.T. THE NATION 17-18, 20th Avenue P.O. Box 100 Midrand 2008 TOLL FREE 0800 400 400 FAX 011 461 4000		PROJECT PHOTO 2		TITLE RESIDENTIAL PROJECT LA MOTTE		DESIGNED DRAWN TRACED		SY	DATE	CH
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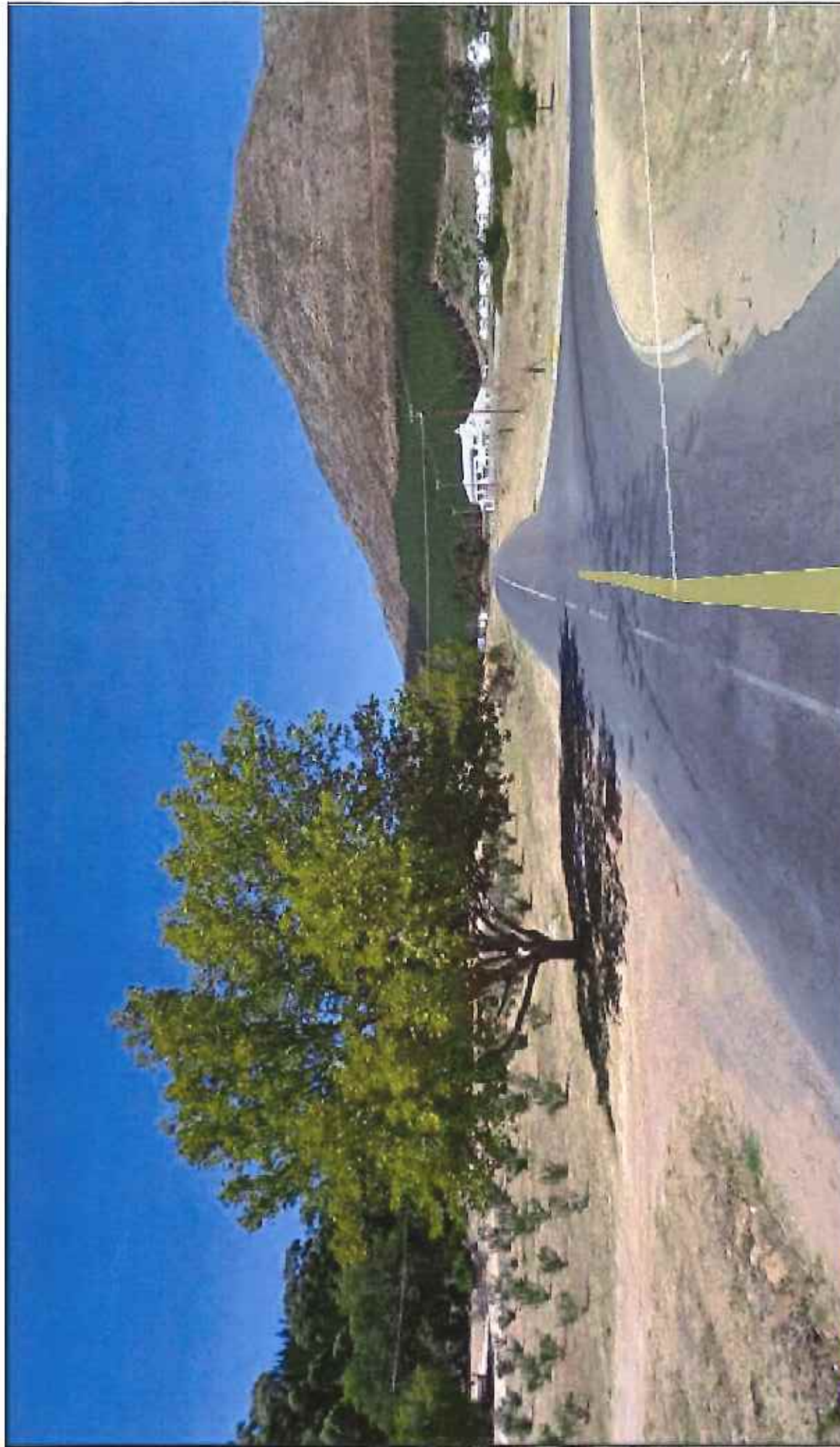
 SKCM SKCMasakhzwe Engineers (Pty) Ltd CONSULTING ENGINEERS TO BUILD THE FUTURE 15 RUSTOPELA DRIVE 7530 BOKSBOOM PRETORIA TEL: 011 571 4222 FAX: 011 571 4222 EMAIL: info@skcm.co.za		PHOTO 3		J.L.S.		RESIDENTIAL PROJECT LA MOTTE		DATE: REFERENCE: BY:		SCALE: DRAWING NO.: W1519-04 REVISION: 0	
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 SKCN SKCMasakhazwe Engineers (Pty) Ltd <small>CONSULTING ENGINEERS TO BUILD THE FUTURE</small> <small>PO BOX 22</small> <small>ROYAL</small> <small>23100100-0053</small> <small>Tel: (011) 231-0053</small> <small>Fax: (011) 231-7790</small>	PHOTO 7	RESIDENTIAL PROJECT LA MOTTE	DESIGNED: DRAWN: SA TRACE: SCALE: DRAWING NO: W1519-08 REVISION: 0
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