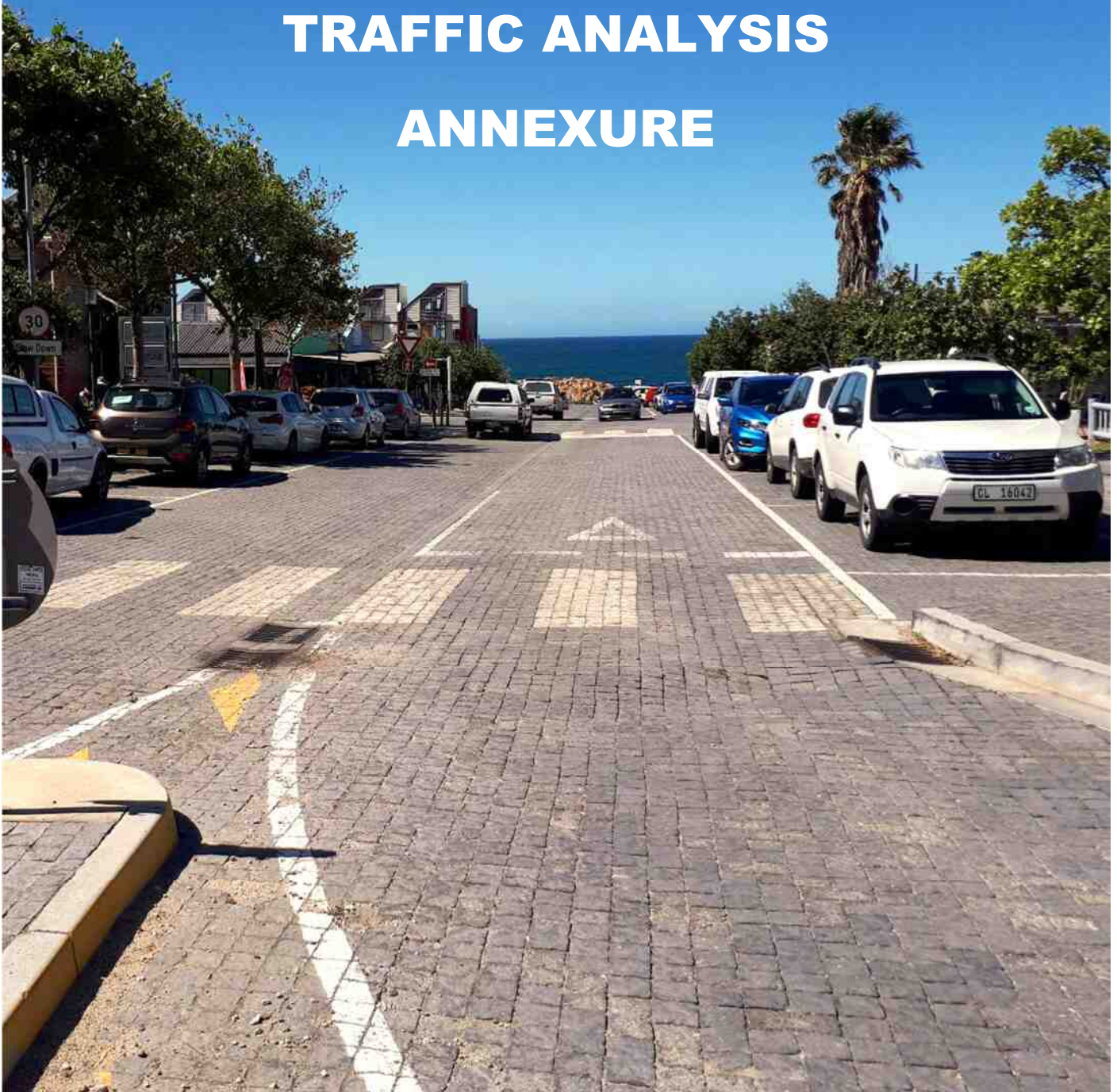


KLEINMOND URBAN UPGRADE

TRAFFIC ANALYSIS

ANNEXURE



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Figure 1: Affected intersections along the corridor

Drawing D371/TP01/01: Transport Town Concept – Option 1 (adjusted from the *Overstrand Transport Master Plan*)

Drawing 5: Kleinmond to Hawston (from the *Overstrand Transport Master Plan*)

Figure 2: Existing 2019 AM and PM peak hour traffic volumes and level of service

Figure 3: Existing 2019 10-hour pedestrian volumes

Drawing D371/TL01/01: Neighbourhoods and important transportation links

Drawing D371/AREA01/01: Focus Area 1 – Proposed Road Network

Drawing D371/AREA01/02: Focus Area 1 – Proposed Road Network

Drawing D371/AREA01/03: Focus Area 1 – Proposed Botrivier Road / Main Road / 2nd Street Traffic Circle

Drawing D371/AREA01/04: Focus Area 1 – Proposed bus waiting area – Option 1

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Drawing D371/AREA02/01: Focus Area 2 – Proposed Harbour Road / Main Road intersection Option 1

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Drawing D371/AREA03/01: Focus Area 3 – DF Malherbe Street Layout

1. **BACKGROUND**

The Kleinmond Urban Upgrade study was commissioned by Overstrand Municipality to create a framework plan outlining development possibilities for the greater Kleinmond and then zooming into more detail for three focus areas as identified by the community stakeholders. The three focus areas that were identified include: The Lagoon Precinct (eastern entrance to Kleinmond), Harbour Road Precinct (biggest tourist node) and DF Malherbe Street Precinct (western entrance to Kleinmond).

Deca Consulting Engineers were appointed to investigate the transport-related challenges within these focus areas and propose solutions that will fit in with the landscaping and urban design objectives that will optimise pedestrian and non-motorised transport and create a Kleinmond that is safe and development friendly.

This annexure reports on the investigations and proposed improvements from the traffic point of view and was incorporated into the Kleinmond CBD Upgrading Plan compiled by *GAPP Architects and Urban Designers*.

2. **PROBLEM STATEMENT**

Kleinmond is another of South Africa's most visited summer holiday destinations and holds within it a lot more natural beauty and potential than just the white beach, lagoon and generations of holiday houses. The problem with Kleinmond currently is that the street network is testament of the town's development throughout the past century with mainly a grid pattern and Main Road as a 'central spine' so to speak. The problem with such a street network is that there are no streets other than the 'central spine' that provide a continuous route from east to west, which leads to congestion on this 'central spine'. Because the Main Road becomes the quickest and most appealing route for motorists it becomes unfriendly for pedestrian and other modes of non-motorised transport and it causes a monotonous look with vehicle dominated areas. See **Photo 1**.

Photo 1: Vehicle dominated Main Road



The Main Road through Kleinmond is classified as a Minor Arterial (Class 3) and its main function is mobility, but since it also forms an enormous part of the character of Kleinmond, the challenge was to create traffic proposals that will balance mobility with an inviting environment for

development with safe spaces for pedestrians and other modes of non-motorised transport. Main Road is currently a two-way road with a 3,4-metre wide lane in each direction and a 2,5-metre wide shoulder with parallel parking on either side.

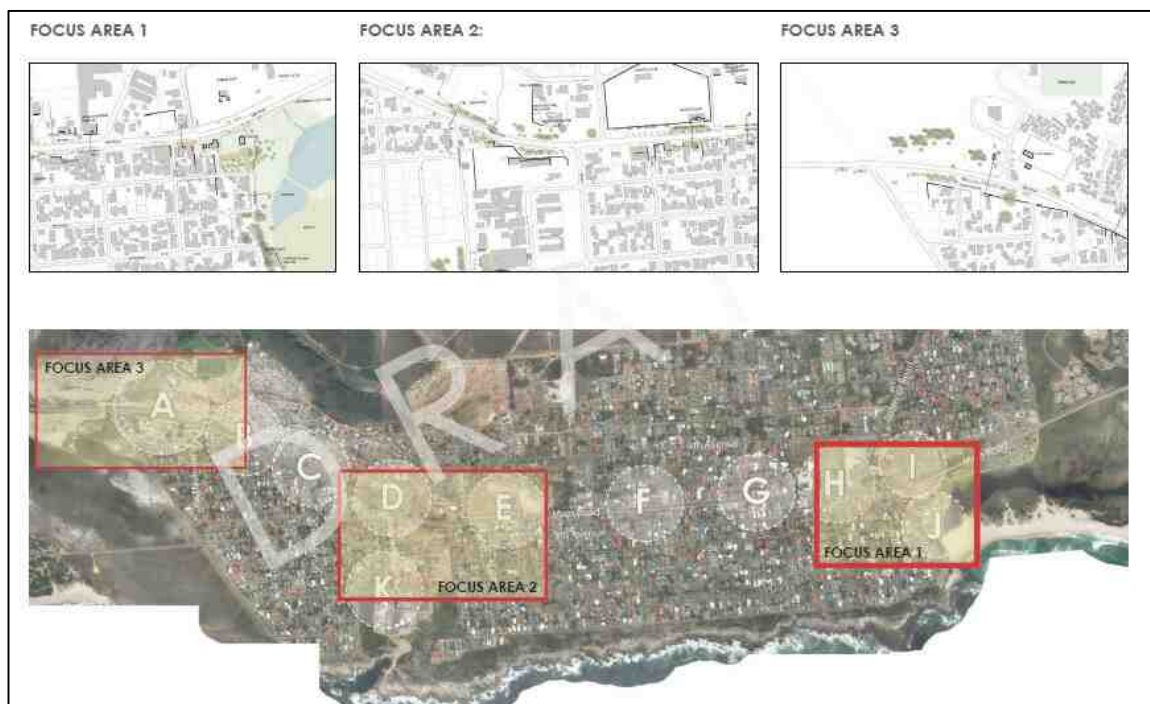
3. **SCOPE OF WORK**

The consultants' brief was to investigate the current situation with regards to land-use, zoning, vehicle and pedestrian movement and parking as well as urban design, and to use this information to determine shortcomings and opportunities.

During a site visit in December 2019, the traffic situation in Kleinmond as a whole was investigated and analysed. See **Figure 1** for the intersections and pedestrian areas that were analysed within the original study area and will henceforth be referred to as the corridor. Preliminary proposals were presented to the community stakeholders from where they identified three focus areas. See the identified focus areas as shown by *GAPP Architects and Urban Designers* in **Diagram 1**.

The purpose of this annexure is to report in more detail on the investigation, results and the recommendations for improvements of these focus areas with regards to the transport-related challenges. Drawings and illustrations give a visual representation of information and ideals.

Diagram 1: Identified focus areas



Source:
KLEINMOND CBD UPGRADING PLAN Draft for comment
by GAPP Architects and Urban Designers

4. **PLANNING BACKGROUND**

4.1 **Historical planning documents consulted**

A number of town planning, roads and transport studies have been undertaken in the Overstrand area over the past number of years. On the transport side, the 2012 *Overstrand Transport Master Plan* by iCE Group / EFG and the *Overstrand Sustainable Transport Programme* for Western Cape Government and Overstrand Municipality done by HHO Consulting Engineers are directly relevant.

The *Overstrand Transport Master Plan* looked at the main roads connecting towns within the Overstrand Municipal area and measures to ensure mobility on the R44 and R43. The section applicable to this annexure is the R43 from Arabella to Harold Porter Botanical Gardens. The *Overstrand Transport Master Plan*, with its main focus on mobility, proposed traffic circles at nine intersections along Kleinmond Main Road. See **Drawing D371/TP01/01**, an adjusted presentation of the *Overstrand Transport Master Plan* proposals for the section of the R43 that runs through Kleinmond.

On the urban design side, the 2020 *Investigation into available and developable land in Kleinmond and Overhills Upgrade* report by Lyners was consulted.

Ideas from all these planning documents were taken into consideration during the improvement proposal process.

4.2 **Current Planning**

Current planning proposals for the study area is addressed in the main report by *GAPP Architects and Urban Designers*.

5. **CURRENT CHARACTERISTICS ALONG THE CORRIDOR**

Kleinmond is situated between the Kogelberg mountain range and the coast and falls within the Overstrand jurisdiction. The area referred to as the corridor includes the original study area along Main Road and the three high pedestrian activity nodes shown in **Figure 1**.

The existing transport and non-motorised transport characteristics of the corridor are discussed in the following paragraphs.

5.1 **Traffic**

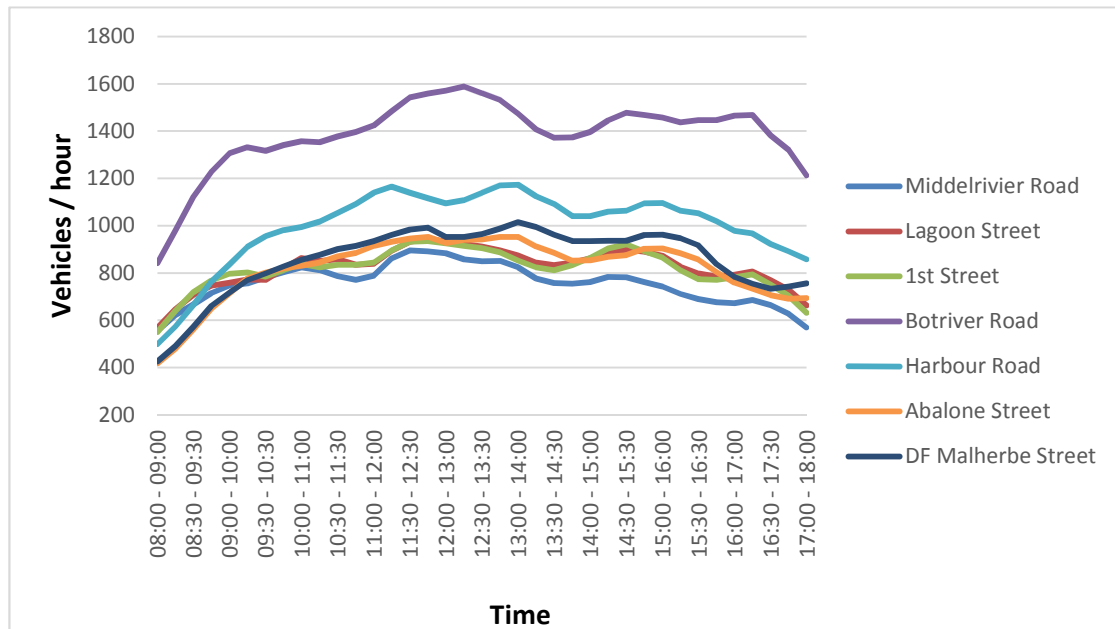
The existing traffic situation along the corridor was determined through observations and quantified through traffic counts and the computer analysis of intersections. Ten-hour traffic counts were conducted on Saturday 28 December 2019 at a number of intersections (see list below). Because Kleinmond is a well-known December holiday destination, this date was specifically chosen in order to capture peak holiday season traffic. The 2019 holiday preceded the Covid-19 pandemic and subsequent changes in traffic flow patterns and volumes. Counts were conducted at the following intersections:

- Main Road (R43) / Middelrivier Road
- Main Road / Lagoon Street
- Main Road / First Street
- Main Road / Botrivier Road / Second Street
- Main Road / Harbour Road
- Main Road / Abalone Street
- Main Road / DF Malherbe Street
- Luckhoff Street / Harbour Road
- 3rd Avenue / Strand Street

- 2nd Avenue / Strand Street

The counted volumes are shown in **Figure 2. Diagram 2** shows the daily traffic profiles at each of these intersections.

Diagram 2: Daily Traffic Profiles for December 2019

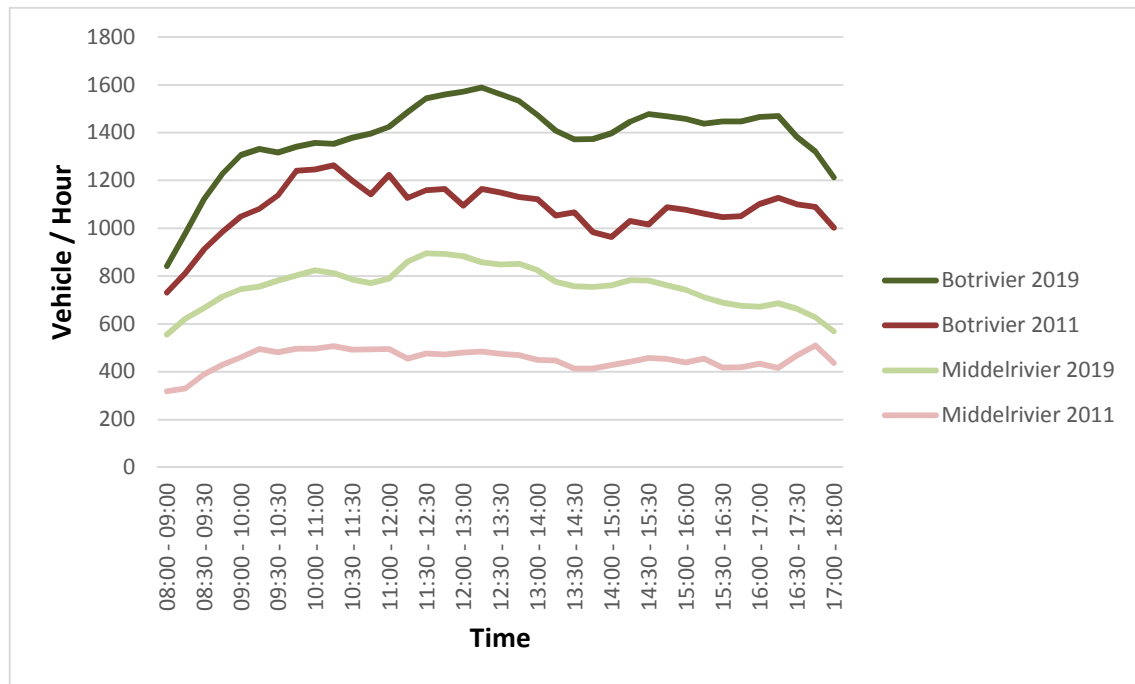


The results clearly show that the Main Road / Botriver Road / Second Street intersection is the busiest along this corridor, followed by the Harbour Road intersection. The majority of the intersections however have remarkably similar traffic profiles. All of these intersections show an absence of an early morning commuting peak. This is common during holiday times. The *Overstrand Transport Master Plan* was consulted for out of season counts. The Augustus 2013 peak hour traffic counts at the Main Road / Botriver Road / Second Street intersection, indicated that even out of season there is no early morning peak hour but rather a late morning peak, from 10:00 to 11:00 (refer to **Drawing 5: Kleinmond to Hawston** from the *Overstrand Transport Master Plan*).

Existing 2019 traffic (as shown in **Diagram 2**) indicates that the traffic increases at a constant rate throughout the morning, reaching a peak between 09:00 and 10:00. Thereafter the traffic slowly increases further to a midday peak, with the time of midday peak period differing for each intersection. The traffic profiles indicate that from the midday peak the traffic decreases before a small third peak (afternoon peak hour) occurs between 14h30 and 15h30. The traffic profile from the 2011 December traffic counts was compared to the 2019 December traffic counts for the Main Road / Botriver Road / Second Street and Main Road / Middelrivier Road intersections and is shown in **Diagram 3**.

Diagram 3 indicates that the peak hour from 2011 to 2019 moved to a more midday peak than a late morning peak. The growth from 2011 to 2019 is also shown in **Diagram 3**. The Main Road / Middelrivier Road intersection has grown from 2011 to 2019 with 5.4% and the Main Road / Botriver Road / Second Street intersection with only 2%.

Diagram 3: Daily Traffic Profiles of December 2011 vs December 2019



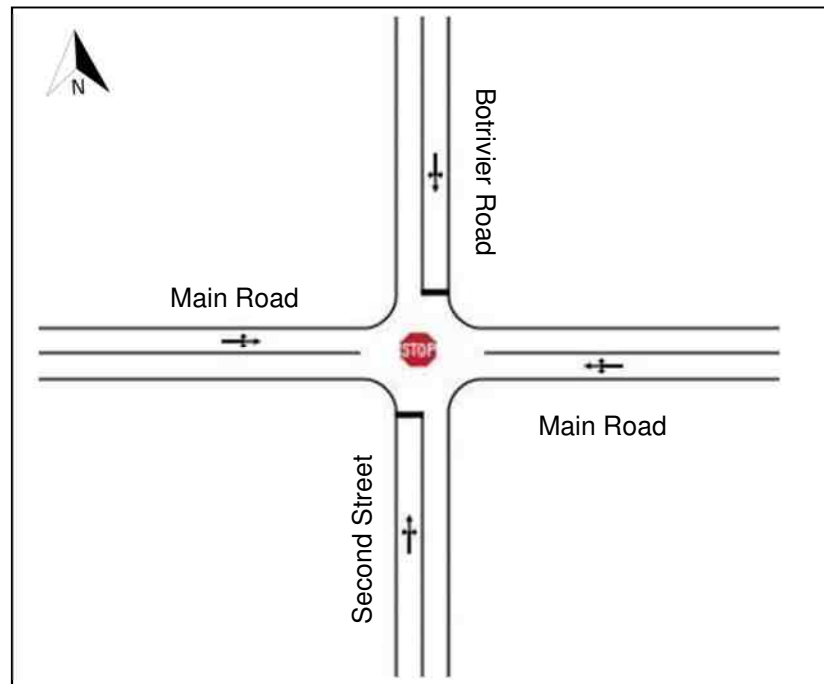
The existing 2019 peak hour traffic volumes for each of the above mentioned intersections are shown in **Figure 2**. The intersections were analysed with the SIDRA computer program to obtain the service level at which each intersection operates. Intersection service levels vary from A to F, with a level of service A representing a very short delay and level of service F representing unacceptably long delays. A level of service D is generally taken as the lowest acceptable standard.

The analysis indicates that all of the intersections along the corridor, with the exception of the Main Road / Botrivier Road / Second Street intersection, operate at good service levels, even during the peak holiday season. The Main Road / Botrivier Road / Second Street intersection is all way stop controlled, with one approach lane per leg and parallel parking bays on both sides of Main Road (eastern and western approaches), as well as parallel parking along the western side of the Botrivier Road approach. Main Road has a black top width of 12 metres, Botrivier Road a width of 10 metres and Second Street a width of 6 metres. With the existing 2019 traffic volumes the SIDRA analysis shows that the western Main Road approach operates at a level of service E during the morning peak hour. During the afternoon peak hour, both the western Main Road approach and Second Street approach operate at a level of service F.

Two options were considered to improve the service levels at this intersection:

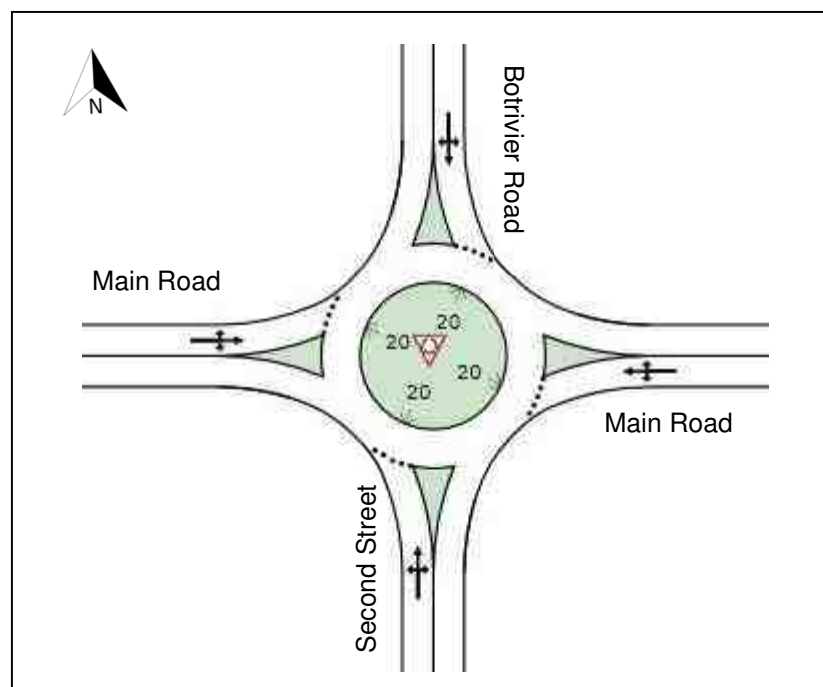
- a) Two-way stop control with free flow on Main Road: This proposed layout is shown in **Diagram 4**. With this layout, all movements will improve to a level of service A during both the morning and afternoon peak hours.

Diagram 4: Main Road / Botrivier Road / Second Street intersection proposed layout 1



- b) Roundabout with one circulating lane: This proposed layout is shown in **Diagram 5**. All movements will operate at a level of service A during both the morning and afternoon peak hours with this proposed layout. The improvement of the intersection falls under focus area 1 and will be discussed in more detail in **Paragraph 7**.

Diagram 5: Main Road / Botrivier Road / Second Street intersection proposed layout 2



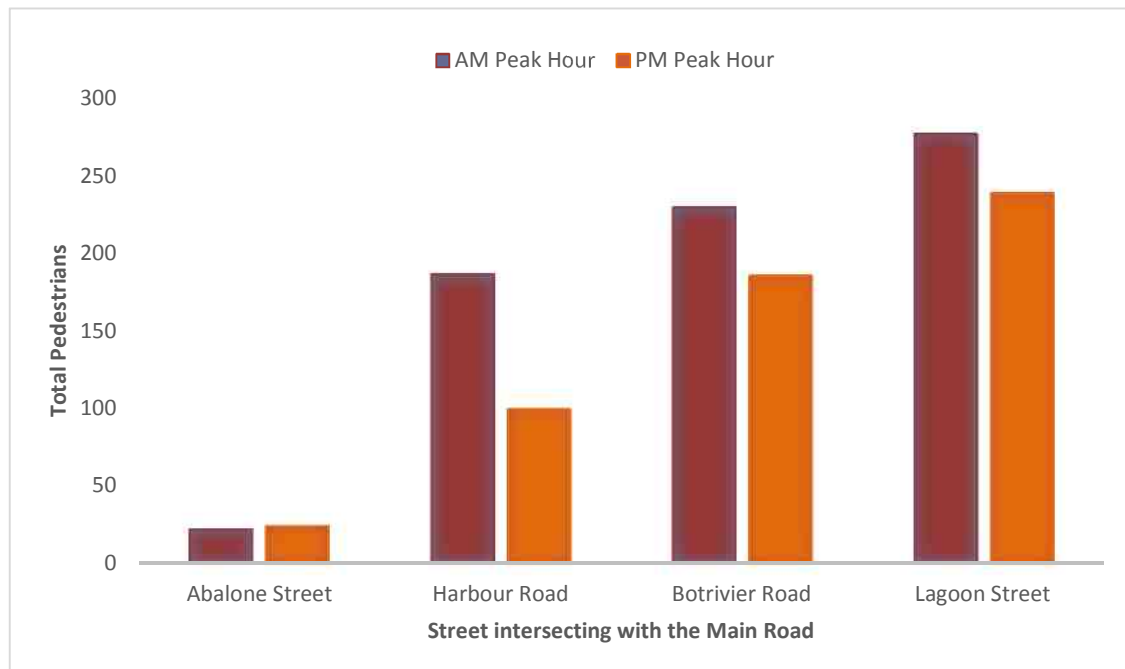
5.2 Pedestrian traffic

Pedestrian counts were done on the same day in December 2019 as the traffic counts to determine peak holiday pedestrian flow. Pedestrian counts were done at the following intersections along the corridor:

- Main Road / Lagoon Street
- Main Road / Botrivier Road / Second Street
- Main Road / Harbour Road
- Main Road / Abalone Street

From **Diagram 6**, which indicates the AM and PM peak hour pedestrian counts at each intersection, it is clear that Main Road / Lagoon Street intersection accommodates the most pedestrians with a total of 1 924 pedestrians during the ten-hour count. The total number of pedestrians at each of the above mentioned intersections is shown in **Figure 3**.

Diagram 6: AM and PM peak hour pedestrian counts at intersections along the corridor



The Main Road / Lagoon Street intersection has free-flow on Main Road and stop control on Lagoon Street. The northern leg of Lagoon Street is an exit lane only. Main Road has a blacktop width of 7,5 metres and Lagoon Street has a blacktop width of 5 metres. There are no pedestrian facilities on any of the approaches and this, combined with the high number of pedestrians at this intersection raises some concern. According to the Overstrand Zoning Scheme, the erven in the vicinity of this intersection are mostly Business Zone erven and explains the high density of pedestrians. Lagoon Street also gives access to a parking area next to the lagoon and access to the beach.

The Main Road / Botrivier Road / Second Street intersection has the second highest number of pedestrians. The current layout of this intersection does accommodate pedestrians with crossings on Botrivier Road, Second Street and the western Main Road approach.

The Main Road / Harbour Road intersection also has a high number of pedestrians, however the larger number of pedestrians are east and west bound and only a small number cross the Main Road at this intersection. There is a sidewalk along both the northern and southern sides of Main Road.

The proposed pedestrian improvements will be discussed in each applicable focus area.

5.3 Parking

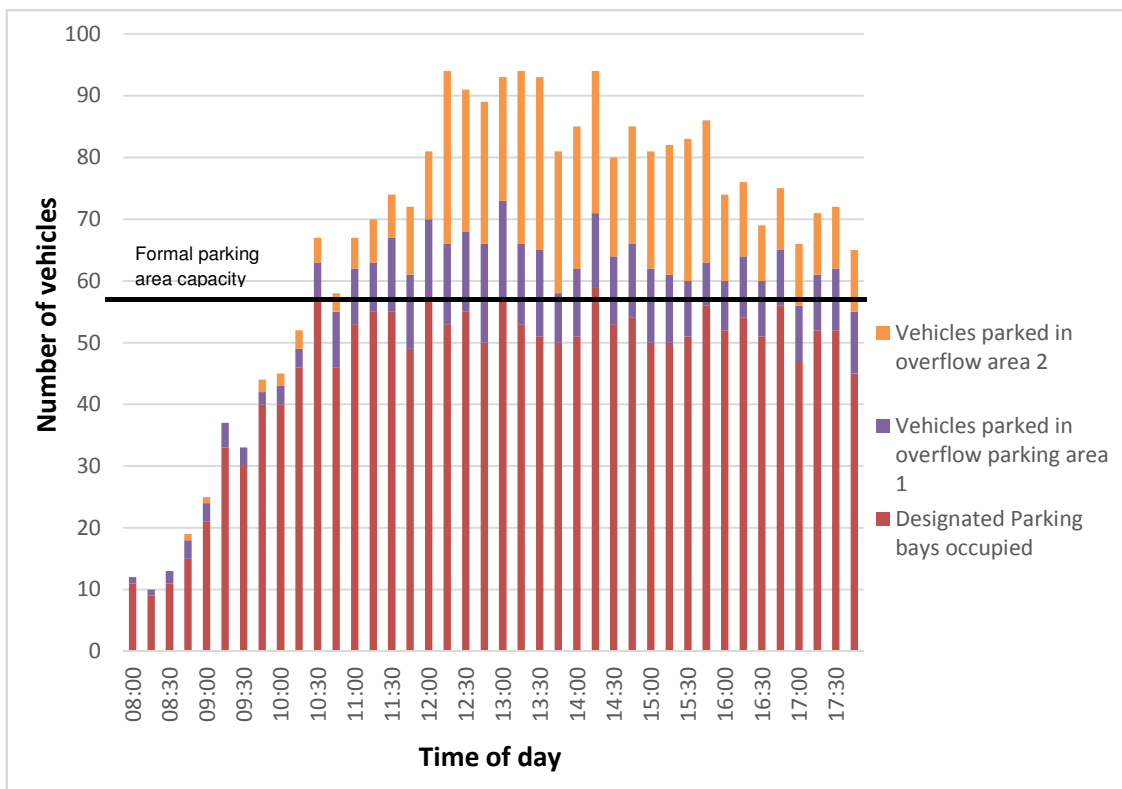
Parking surveys were also done on the 28th of December 2019, at the two main tourist nodes: the Harbour and the beachfront, as shown in **Figure 1**. The parking area at the Harbour consists of three pockets: the demarcated parking area (shown in red), the gravel area to the east (shown in purple) and the gravel area to the north (shown in orange). These parking areas serve a number of restaurants and curio shops situated along Harbour Road south of the Luckhoff Street intersection. The location of the parking areas are indicated in **Diagram 7**. The purple and orange areas are used during peak season as overflow parking; the demarcated parking area has a total of 59 parking bays. **Diagram 8** indicates the number of vehicles parked during a specific time of the day.

It is interesting to note that the overflow parking areas are not only used when the demarcated parking area is full. The average occupation rate of the demarcated parking area between 11:00 and 17:30 was 80%. Utilisation of the overflow parking started when the formal parking area was approximately 60% full.

Diagram 7: Harbour parking areas



Diagram 8: Number of vehicles parked at the Harbour parking areas between 8:00 and 18:00 on 28 December 2019

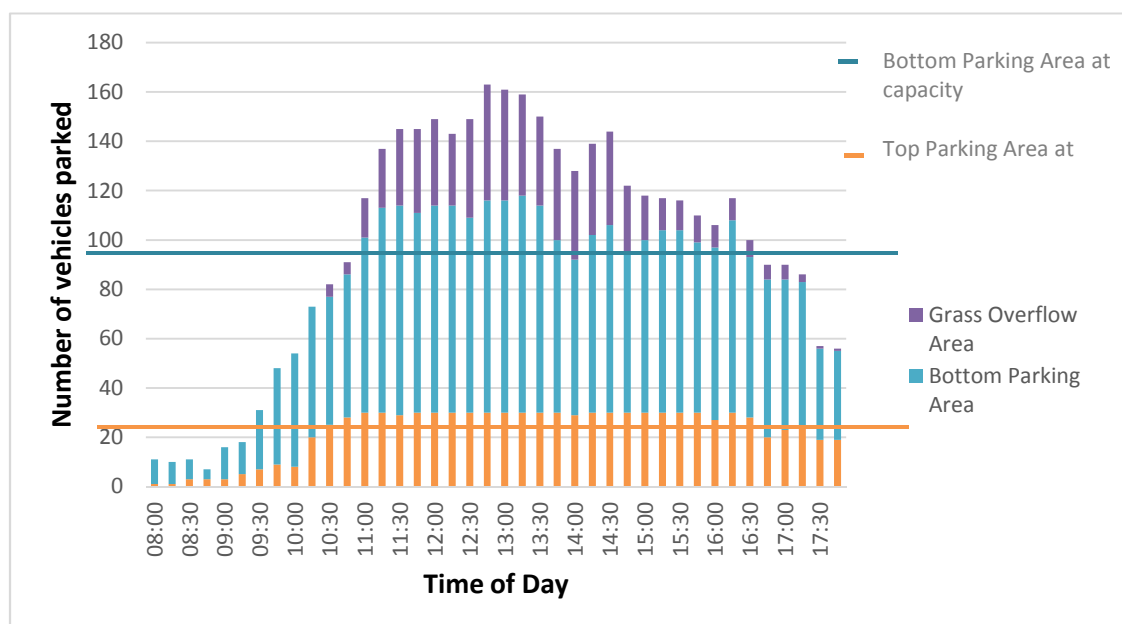


The beachfront parking area (at the lagoon) has two demarcated parking areas; the top parking area has 30 parking bays and the bottom area has 69 parking bays. The grass field adjacent to the top parking area is also used during season as overflow parking. During the survey it was observed that between 11:00 to 16:00 vehicles started parking illegally on the paving and landscape areas. See **Photo 2**. The total number of vehicles parked at the beachfront during the survey can be seen in **Diagram 9**.

Photo 2: Illegal parking on the paving and landscaping areas



Diagram 9: Vehicles parked at the beachfront any given time during 28 December 2019



The parking occupation of both these parking nodes was more than 80% for most of the day during the survey, but it must be noted that the survey was done during peak season and represents the exception rather than the rule.

It was also noted during the corridor study that the parallel parking bays along both the northern and southern side of Main Road was underutilised

5.4 Accidents

Accident data on Main Road (R43) were obtained from the Western Cape Government for the period from January 2010 to December 2017. A summary of the reported accidents is shown in **Table 1** and the cause and type of these accidents are shown in **Table 2**. The accidents reported are within the Kleinmond urban area from kilometre mark 5 to kilometre mark 20. In the past 7 years there have been 19 accidents, of which two were fatal. The most common type of accident (37%) was where a single vehicle left the road because the driver lost control of the vehicle.

Table 1: Accident statistics for Main Road (R43) along Kleinmond

Km mark	No. of Accidents	Number of persons involved			
		No Injury	Slight Injury	Serious Injury	Fatalities
5.1 - 6.0	0	0	0	0	0
6.1 - 7.0	3	6	1	0	0
7.1 - 8.0	0	0	0	0	0
8.1 - 9.0	0	0	0	0	0
9.1 - 10.0	0	0	0	0	0
10.1 - 11.0	0	0	0	0	0
11.1 - 12.0	0	0	0	0	0
12.1 - 13.0	0	0	0	0	0
13.1 - 14.0	0	0	0	0	0
14.1 - 15.0	1	0	1	0	0
15.1 - 16.0	12	13	4	1	2
16.1 - 17.0	1	0	1	0	0
17.1 - 18.0	0	0	0	0	0
18.1 - 19.0	1	1	0	0	0
19.1 - 20.0	1	0	0	0	0
	19	19	7	1	2

Table 2: Causes of accidents at the intersections along Main Road (R43)

ACCIDENT TYPE		ACCIDENT CAUSE	
Total	Description	Total	Description
1	Accident with Animal	1	Animals in Road
3	Accident with fixed object	1	Falling asleep
		1	Slippery Road (wet)
		1	Parking on-road
1	Head / Rear-end	1	Bicycle
1	Reversing	1	Insufficient following distance
1	Side Swipe - Opposite Direction	1	Turn in face of on-coming traffic
2	Side Swipe - Same Direction	1	No sign of turning
		1	Park in dangerous space
7	Single vehicle - Left the road	7	Lost Control
3	Single vehicle - overturned	1	Lost control
		1	Mechanical Problems
		1	Tyre Burst
TOTAL accidents within the Kleinmond urban area : 19			

6. IDENTIFIED FOCUS AREAS

6.1 Focus Area 1

Focus Area 1 was identified around the eastern entrance into Kleinmond and is associated with the lagoon and beach precinct, as well as the business district. The road network that falls into Focus Area 1 is between Lagoon Street in the east and 4th Street in the west; and between 9th Avenue in the north and 2nd Avenue in the south. See **Diagram 10**.

Diagram 10: Focus Area 1



The transport-related challenges that was identified within this area is the confusing flow of traffic along Lagoon Street and the underutilised space along the lagoon. It is proposed that this area becomes a beach sport precinct. The traffic-related proposals had to accommodate the influx of vehicles and pedestrians that will make use of the proposed sport facilities. Another challenge is the Main Road / Botrivier Road / 2nd Street intersection that operates at unacceptable levels of service but is also not pedestrian friendly. The *Overstrand Transport Master Plan* was consulted to improve this challenge. The community stakeholders highlighted the fact that the Telkom site is currently being used as a bus waiting area and that there was a need form the formalisation of the drop-and-go system for the Primary and pre-school, both of which gain access off of Main Road.

6.2 Focus Area 2

Focus Area 2 is based around the intersection of Harbour Road with Main Road. This focus area focusses on municipal amenities such as the sport centre and adoption facility as well as the tourist node of Kleinmond. See **Diagram 11**.

Transport-related challenges identified in Focus Area 2 are the poorly defined Harbour Road / Main Road intersection and the lack of non-motorised facilities to accommodate tourists.

Diagram 11: Focus Area 2



6.3 Focus Area 3

The last focus area is the western entrance to Kleinmond, based around the DF Malherbe Street / Main Road intersection and the proposed new municipal precinct to the west of DF Malherbe Street. See **Diagram 12**. This focus area had more urban design-related challenges but one transport-related challenge that was highlighted was the intersection at DF Malherbe Street and Main Road, which, as the western entrance to Kleinmond, should be better defined.

Diagram 12: Focus Area 3



7. ROAD INFRASTRUCTURE IMPROVEMENT PROPOSALS

As mentioned in *Chapter 2* the roads in the older part of Kleinmond follow a grid pattern with Main Road as its 'central spine'. At the moment, the hierarchy with a strong Class 3 mobility route carrying the majority of through traffic, supported by a grid of Class 5 roads that keep inter- and intra-neighbourhood traffic off Main Road, works relatively well. A number of routes has, however, been identified to serve as potential secondary (Class 4) east-west routes if traffic volumes increase to such an extent that the capacity of the current hierarchy is exceeded. The potential links are shown in the attached **D371/TL01/01**. Third Avenue and Ninth Avenue were identified as potential east-west links and Swartrivier Road, Botrivier Road, 2nd Street, 6th Street North, 11th Street North, Harbour Road, Fynbos Street (Heuningkloof), Abalone Street (Overhills) and DF Malherbe Street as north-south links.

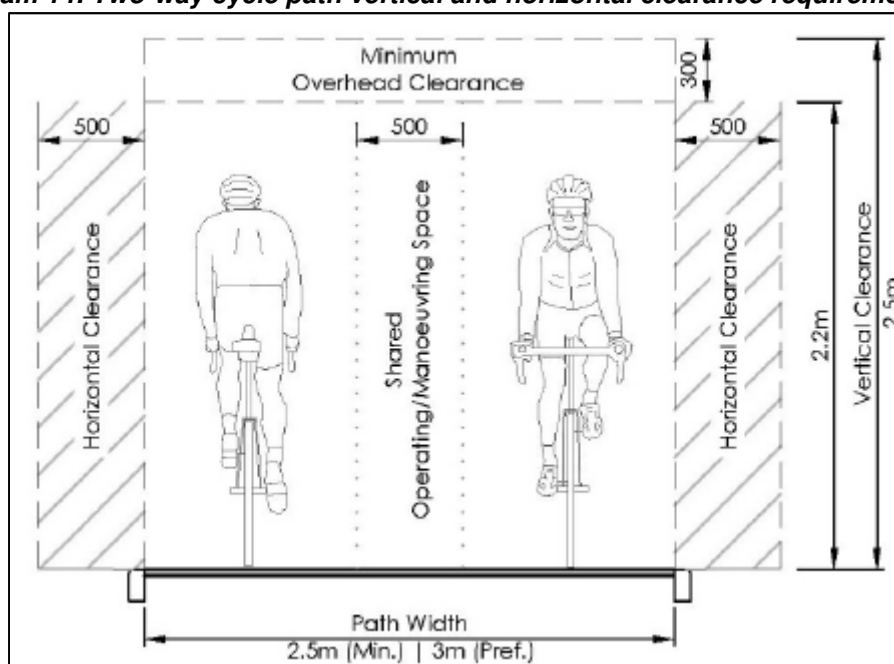
A number of transport-related infrastructure improvements are proposed for each focus area. The one proposal that is constant in all of the focus areas is a new cross-section for Main Road. It is proposed that the cross section should be changed as shown in **Diagram 13**, with a 3,6-metre wide vehicle lane in each direction, a 2,5-metre wide two-way cycle lane along the northern side, 2,5-metre wide parallel parking bays interspersed with landscaping along the southern side and a 2-metre wide sidewalk on both sides. With this cross-section mobility is retained but provision is made for a more non-motorised friendly environment.

Diagram 13: Proposed Main Road cross-section along the corridor



The two-way cycle lane design is based on the Class 3 Cycle Facility (*An exclusive cycle way located within the road carriageway. The route is demarcated by exclusive bicycle lane road markings*) as per the latest edition of the City of Cape Town's Standards and Guidelines for Roads & Stormwater Manual (Version 2.0 – June 2021) and should be in accordance with **Diagram 14**.

Diagram 14: Two-way cycle path vertical and horizontal clearance requirements



Source: City of Cape Town's Standards and Guidelines for Roads & Stormwater Manual (Version 2.0 – June 2021)

7.1 Road infrastructure improvement proposals for Focus Area 1

The first road infrastructure improvement proposal for Focus Area 1 is to implement a one-way couplet along Lagoon Street (southwards) and First Street (northwards). A left out only is proposed at the First Street / Main Road intersection to minimise conflict points and to encourage eastbound traffic to travel along Second Street. This proposal is shown in **Drawing D371/AREA1/01** and **D371/AREA1/02**. The proposed improvements will eliminate confusion and will attract motorists that want to return eastbound to make use of 2nd Street. It is further proposed that the Main Road / Botrivier Road / 2nd Street intersection be upgraded to a traffic circle with a 10-metre diameter central island with apron, and an inscribed diameter of 28 metres. In **Chapter 5** the option of a two-way stop controlled intersection was also discussed. Both the layouts shown in **Diagram 4** and **5** will improve the traffic service levels. The two-way stop controlled intersection indicates an improvement in traffic service levels but pedestrian service levels will deteriorate, because free-flow on Main Road would increase traffic speed on the Main Road and safe crossing for pedestrians will become more difficult. If the intersection is changed to a roundabout, pedestrians will be accommodated on all four approaches. It is therefore proposed that the Main Road / Botrivier Road / Second Street intersection layout be changed to a roundabout. The central island can be used for landscaping to create a sense of arrival. The new proposed traffic circle layout can be seen in **Drawing D371/AREA1/03**.

The last road infrastructure proposal for Focus Area 1 is a new bus waiting area for the Primary and pre-school. Two options are proposed. The first is to formalise the area that the busses currently use on the Telkom erf adjacent to the pre-school. This option is most desirable because it is accessible to parents, the pre-school and the primary school buses as well as buses transporting learners to Curro Hermanus. The parking area is adjacent to the pre-school and makes provision for formalised bus parking as well as private vehicle parking. If a pedestrian gate is installed along the eastern fence of the pre-school it would yield a much safer drop-and-go area for toddlers than the existing one off of Main Road. This option is shown in **Drawing D371/AREA1/04**.

The second option is to create a ring route for the buses along Fourth Street and onto the Primary school property, where a holding area will be provided. This option is less desirable for third parties such as Curro Hermanus and the pre-school but negotiations can be undertaken with the Primary School. See Drawing **D371/AREA1/05** for this proposal.

7.2 Road infrastructure improvement proposals for Focus Area 2

As mentioned in *Paragraph 6* there was only one transport-related challenge identified in Focus Area 2. To improve the poorly defined intersection of Harbour Road with Main Road two options were considered.

The first option is to construct a small traffic circle with a 6-metre diameter central island and an inscribed diameter of 20.5 metres. This traffic circle will be much smaller than the one proposed in Focus Area 1 and it is because its main function would be to slow down traffic and make motorists aware of their surroundings, with improved intersection functionality as a secondary goal. The island of this traffic circle ought to be traversable for heavy vehicles and can therefore not be used for landscaping. Mini roundabouts are not generally supported by the Provincial Roads Engineer on provincial roads, but the design proposal will be workshopped when this specific project proposal approaches the implementation stage. The proposed layout of the traffic circle can be seen in **Drawing D371/AREA2/01**. A pedestrian crossing is provided on the eastern Main Road approach only and will be discussed further in *Paragraph 8*. The access to the cemetery will have to be moved westwards as the traffic circle encroaches on the existing access.

The second option to make the intersection more prominent, and to make motorists aware of their surroundings is to extend the cobbled surface on Harbour Road northwards into the intersection with Main Road, as shown in **Drawing D371/AREA2/02**. With this proposal the access to the cemetery remains unchanged.

7.3 Road infrastructure improvement proposals for Focus Area 3

The DF Malherbe Street / Main Road intersection has the same challenge as the Harbour Road / Main Road intersection in Focus Area 2. The intersections are gateways to important nodes within Kleinmond but are not currently identifiable as such. It is proposed that a traffic circle should also be constructed at the DF Malherbe Street / Main Road intersection. This circle will be larger, with a centre island diameter of 12 metres with apron, and an inscribed diameter of 28 metres, as shown in **Drawing D371/AREA3/01**. This proposed layout will accentuate the sense of arrival, while maintaining mobility.

The municipality is considering making the vacant land to the west of DF Malherbe Street available for development. If this realises, access should be given off of DF Malherbe Street approximately 177 metres south of the DF Malherbe Street / Main Road intersection, aligned with Piet Le Roux Street, as shown in **Drawing D371/AREA3/01**.

8. NON-MOTORISED INFRASTRUCTURE IMPROVEMENT PROPOSALS

As shown in **Diagram 13** the new proposed Main Road cross-section is a lot more non-motorised transport friendly than the existing cross-section as it provides a two-way cycle lane on one side of the road and sidewalks on both sides of the Main Road.

The non-motorised infrastructure improvement proposals for each focus area are discussed below.

8.1 Non-motorised infrastructure improvement proposals for Focus Area 1

The processed 2019 pedestrian counts showed that the two intersections with the highest pedestrian volumes both fall within Focus Area 1. The second highest pedestrian volumes were

observed at the Main Road / Botrivier Road / 2nd Street intersection and the non-motorised improvement proposals go hand-in-hand with the proposed intersection upgrade to a traffic circle. The proposed new traffic circle layout provides pedestrian crossings on all four approaches (see **Drawing D371/AREA1/03**). The cycle lane is also accommodated and goes through the traffic circle, east and west bound. Cyclists can use the pedestrian crossings on the eastern or western Main Road approaches should they wish to cross the Main Road.

The highest number of pedestrians was however observed crossing the Main Road (north-south) at the Lagoon Street / Main Road intersection. With the new proposed one-way couplet along Lagoon Street it is proposed that pedestrian crossings be provided on the northern and southern Lagoon Street approaches and a pedestrian crossing on the eastern Main Road approach.

The pedestrian crossing proposal on Main Road entails the construction of a red brick or coloured paving pedestrian crossing as shown in **Photo 3** and **Photo 4** below. **Photo 4** is from another Western Cape city, Worcester and on a provincial road, High Street. Studies have shown that a pedestrian crossing with a red colour causes motorists to be more alert than a normal zebra crossing.^[1] A raised pedestrian crossing will not be appropriate on Main Road, which is an inter-district Provincial Main Road of which the main function is mobility. It should also be noted that the pedestrian crossing is only really needed during the peak holiday season, whereas a raised pedestrian crossing will inconvenience motorists through the whole year.

Photo 3: Example of proposed red brick pedestrian crossing to be implanted on Main Road



1. <https://www.sciencedirect.com/science/article/pii/S0386111216300024>

Photo 4: Example of red brick pedestrian crossing on High Street, Worcester looking east



A sidewalk is also proposed along Lagoon Street, following the southward one-way couplet to guide pedestrians towards the new proposed sports precinct. These proposals are shown in **Drawing D371/AREA1/01**.

8.2 Non-motorised infrastructure improvement proposals for Focus Area 2

The existing pedestrian infrastructure at the staggered Protea Road / Main Road / 13th Street intersection will not adequately serve the anticipated pedestrian desire lines. It is proposed that the existing signalised pedestrian crossing east of Protea Road should be moved to between Protea Road and 13th Street.

The reason for moving the existing pedestrian crossing is to connect to the proposed 13th Street pedestrian route that will run along the water course connecting the mountain and the sea. This is an urban design proposal for a tourist attraction in Focus Area 2. Another urban design proposal is the upgrading of the existing park on the north-eastern corner of the intersection. This means that the pedestrian desire lines will move to the west of Protea Road southbound. The 2-metre sidewalks north and south of Main Road are proposed to terminate at this pedestrian crossing. The northern sidewalk will connect to the existing walkway that runs through the park and the cemetery westward and the southern sidewalk will follow the new proposed watercourse walk, as proposed by *GAPP Architects and Urban Designers*.

A pedestrian crossing is also proposed at the Harbour Road / Main Road intersection on the eastern Main Road approach. This will connect to the existing walkway that runs through the park and cemetery, as mentioned above. These proposals are shown in **Drawing D371/AREA2/01 and D371/ AREA2/02**.

8.3 Non-motorised infrastructure improvement proposals for Focus Area 3

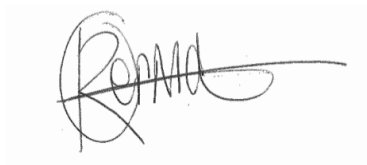
No pedestrian infrastructure improvements are proposed at the new DF Malherbe Street / Main Road intersection as pedestrian volumes west of Overhill Road (which is located east of DF Malherbe Road) are extremely low. It is proposed that the cycle lane continues along Main Road, through the proposed traffic circle as shown in **Drawing D371/AREA03/01**.

9. CONCLUSION

These transport and non-motorised transport infrastructure improvement proposals addresses all the challenges that were identified during the analysis of the Kleinmond Urban Upgrade. It is recommended that these proposals should be incorporated into the development requirements for future developments in the Kleinmond Urban area and that all detail design should be in accordance with the standards of the Western Cape Province Roads Engineer.

We trust that you will find this traffic analysis annexure in order. Please contact the undersigned should there be any queries.

Yours truly,



Renette Opperman (B. Eng Civil)
On behalf of Deca Consulting Engineers

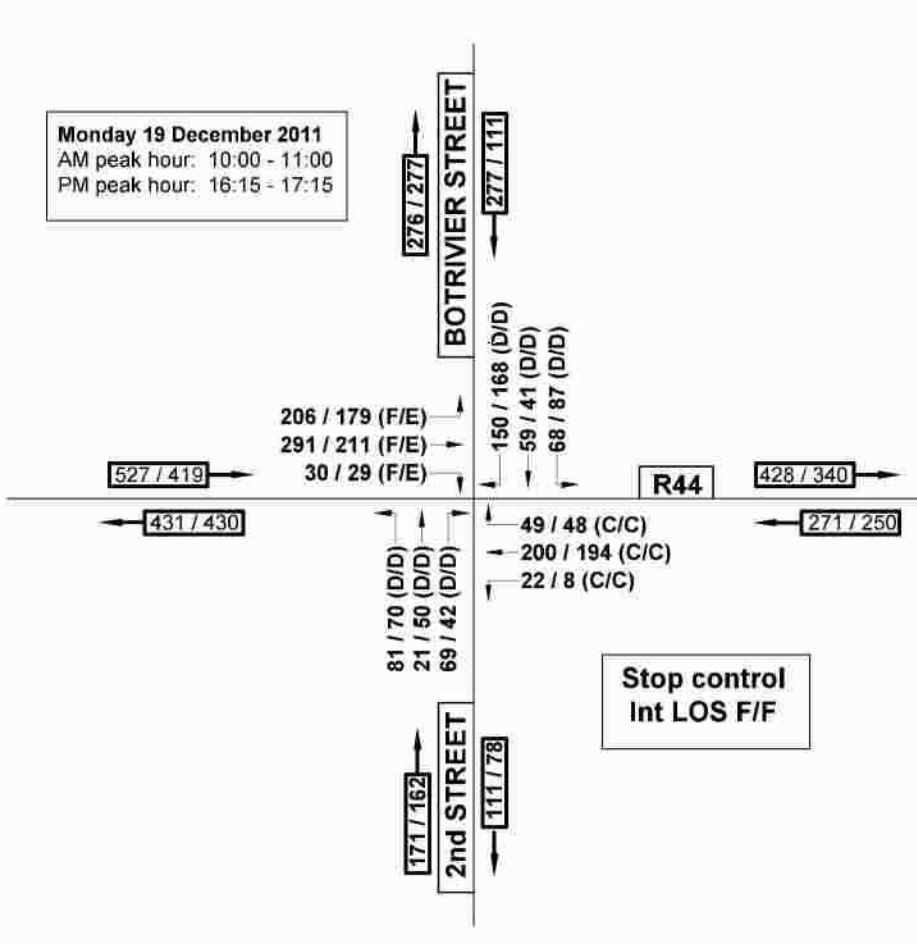
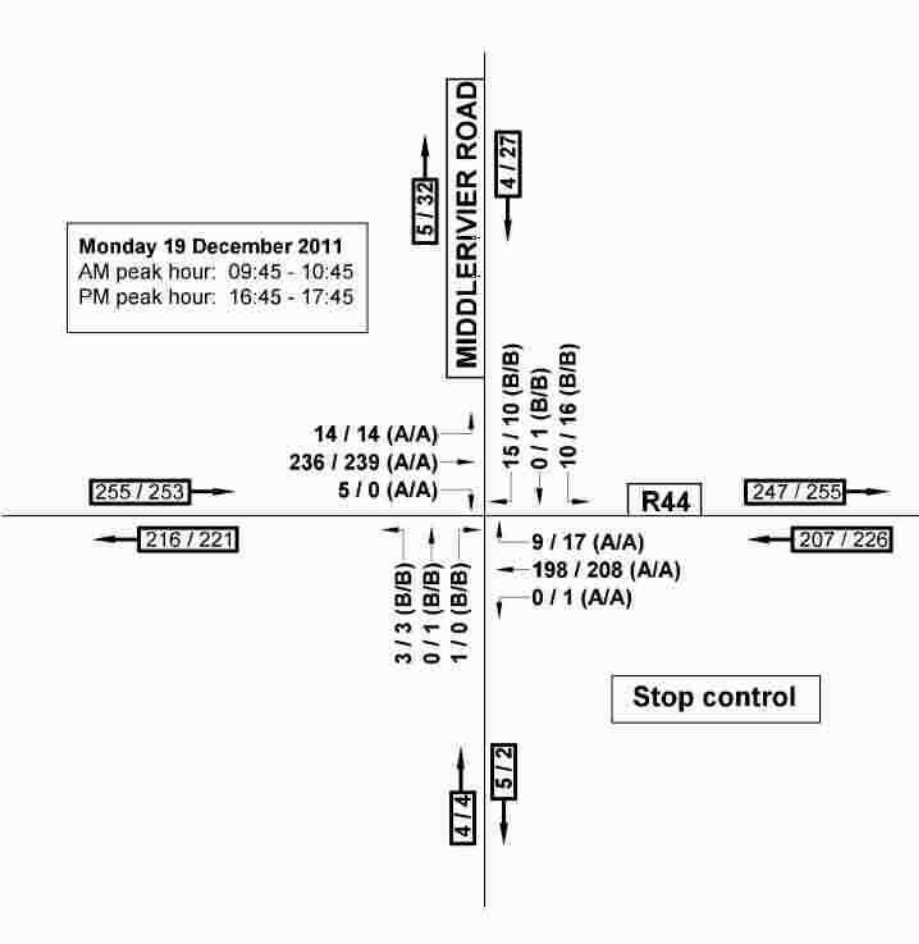
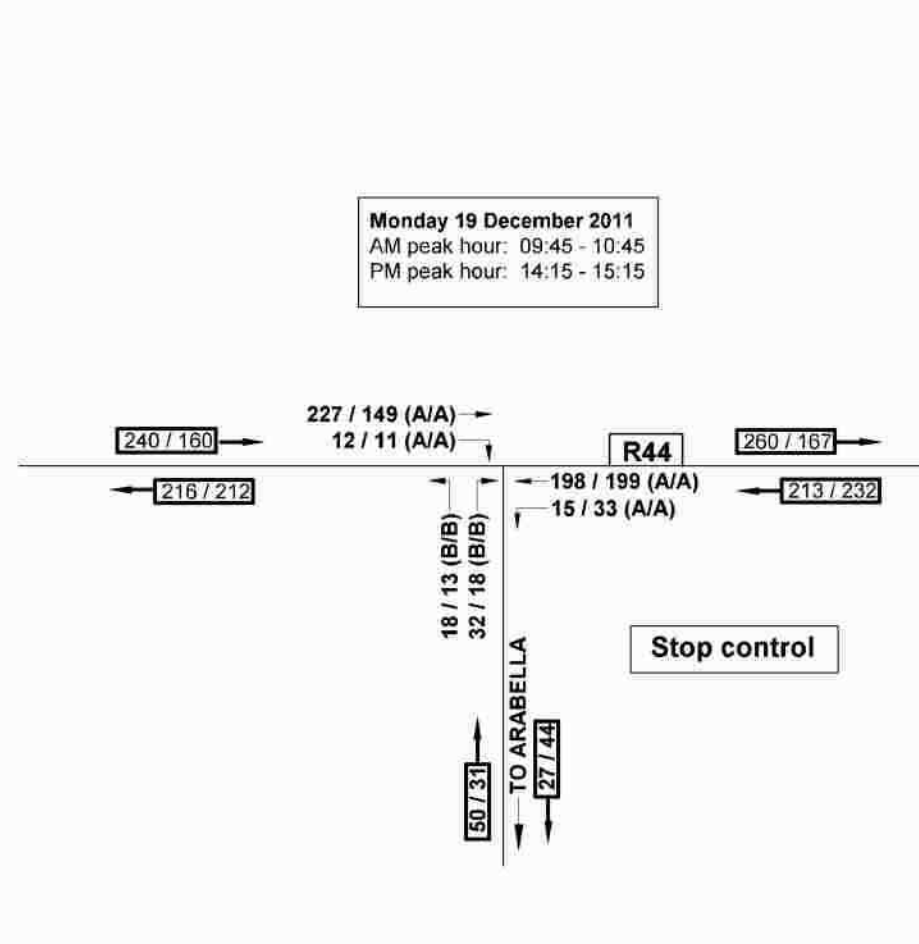
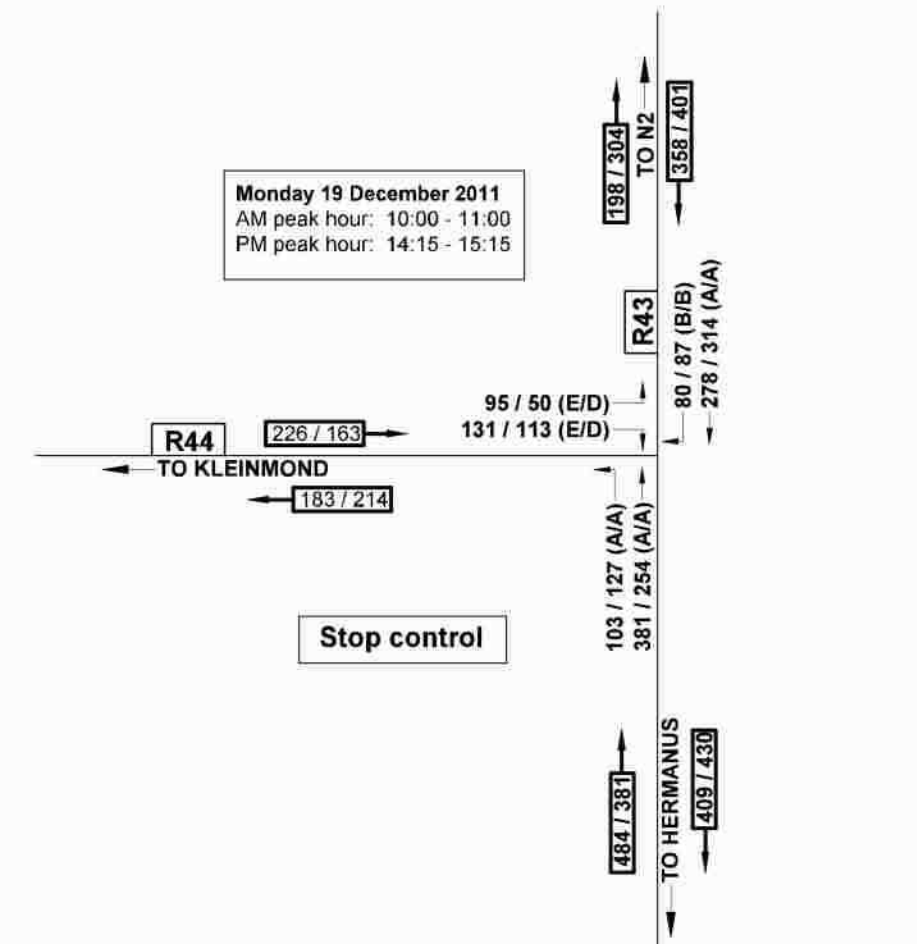
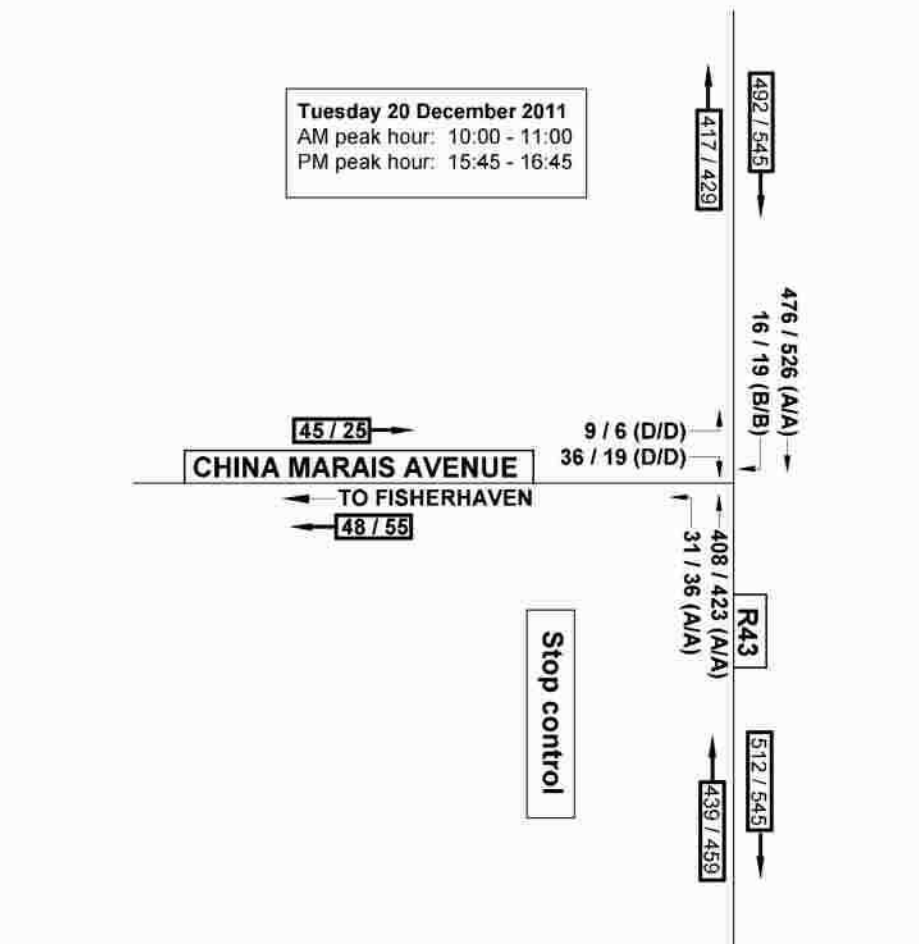
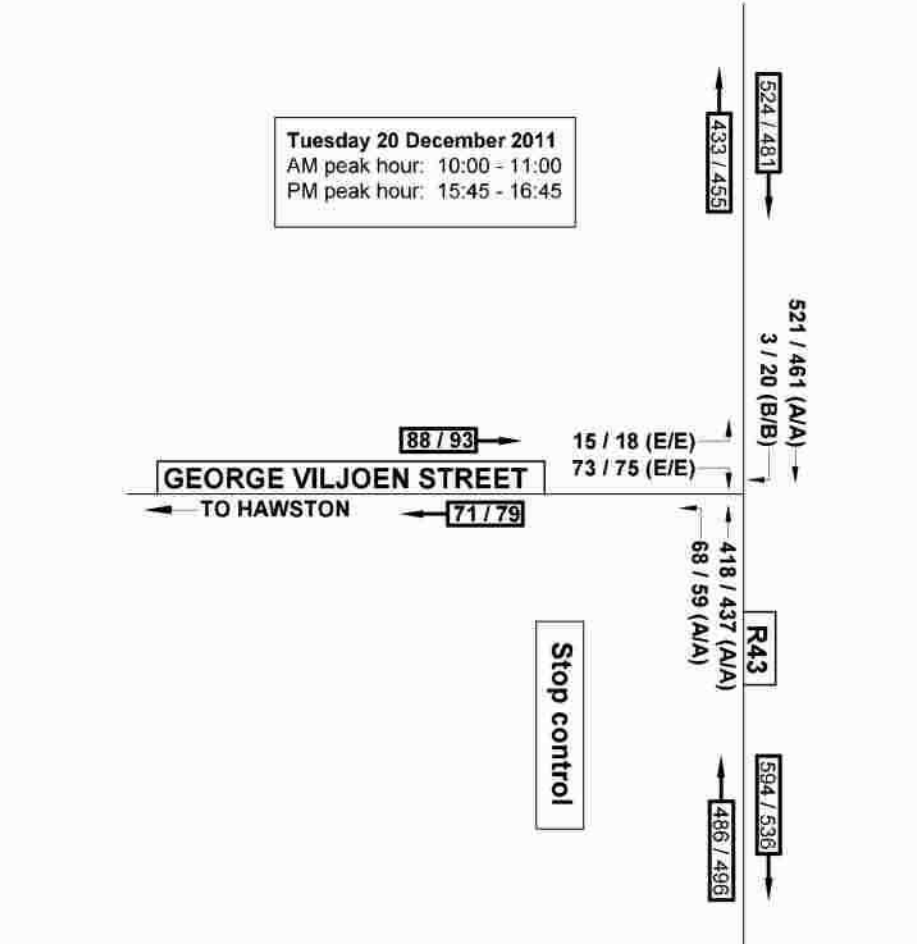
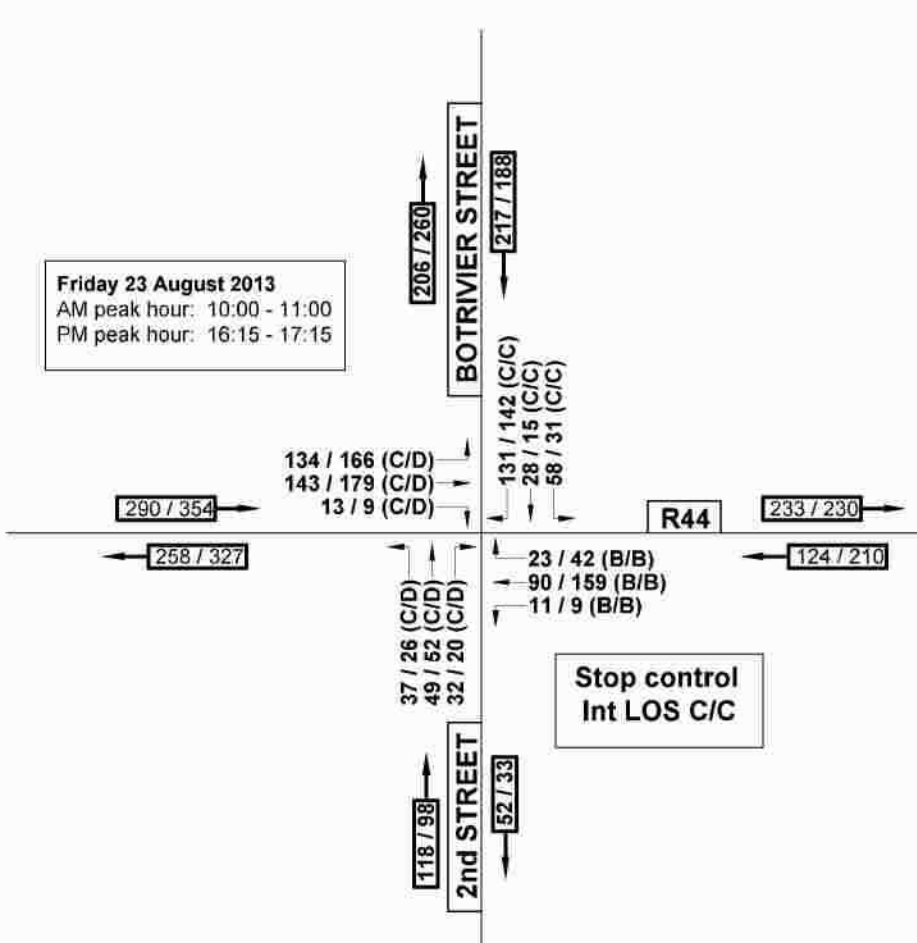
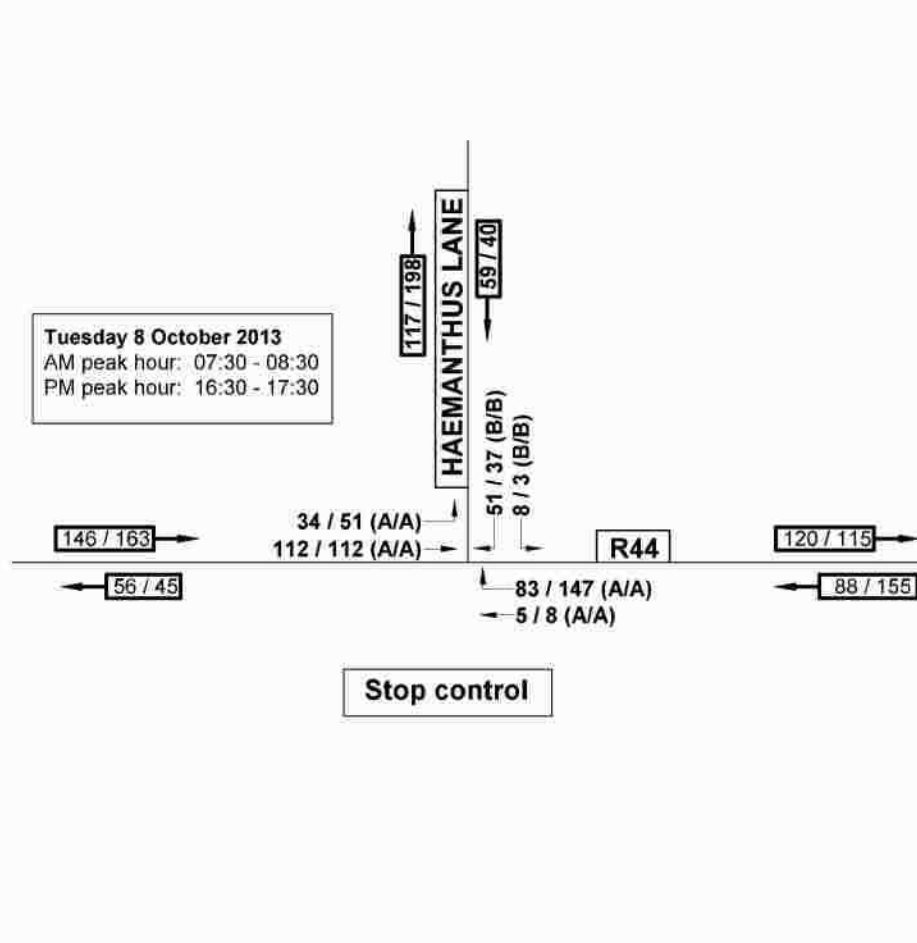
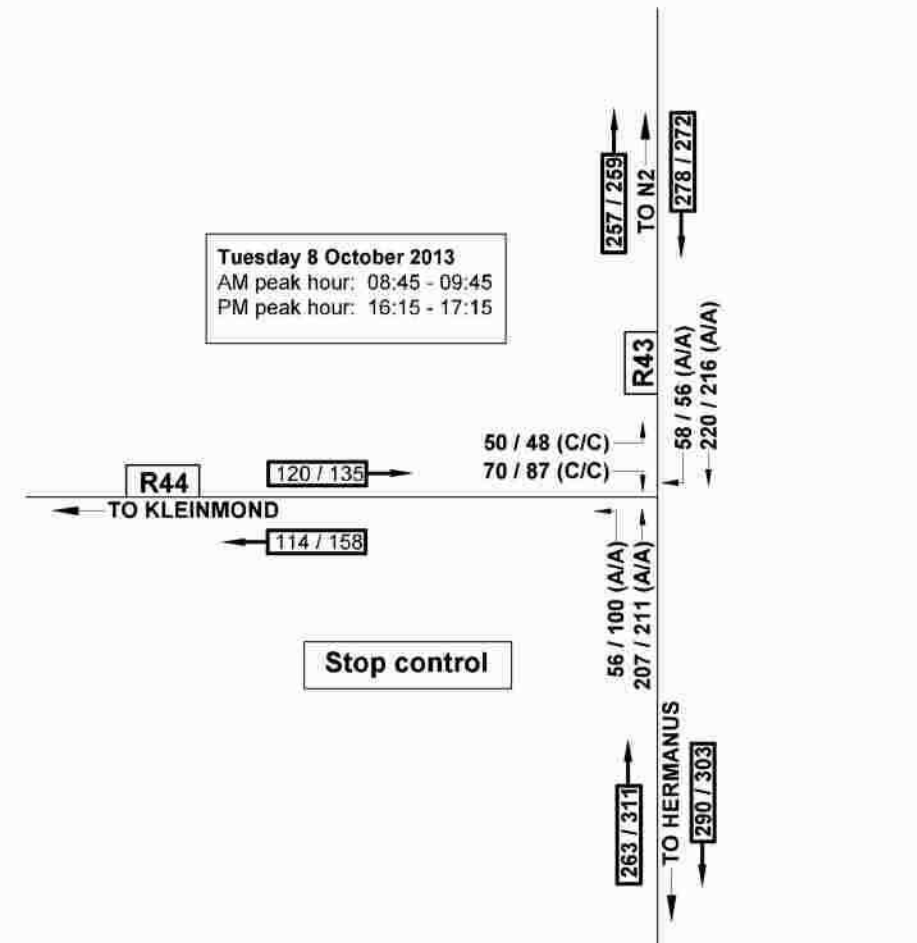
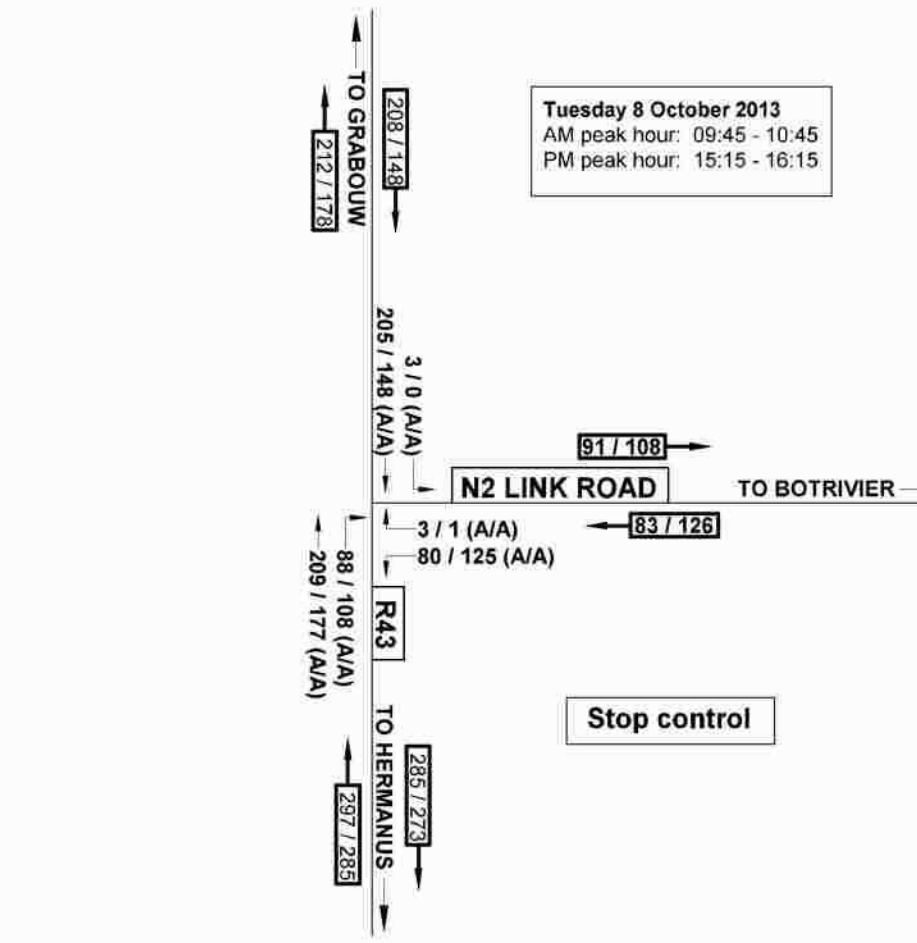
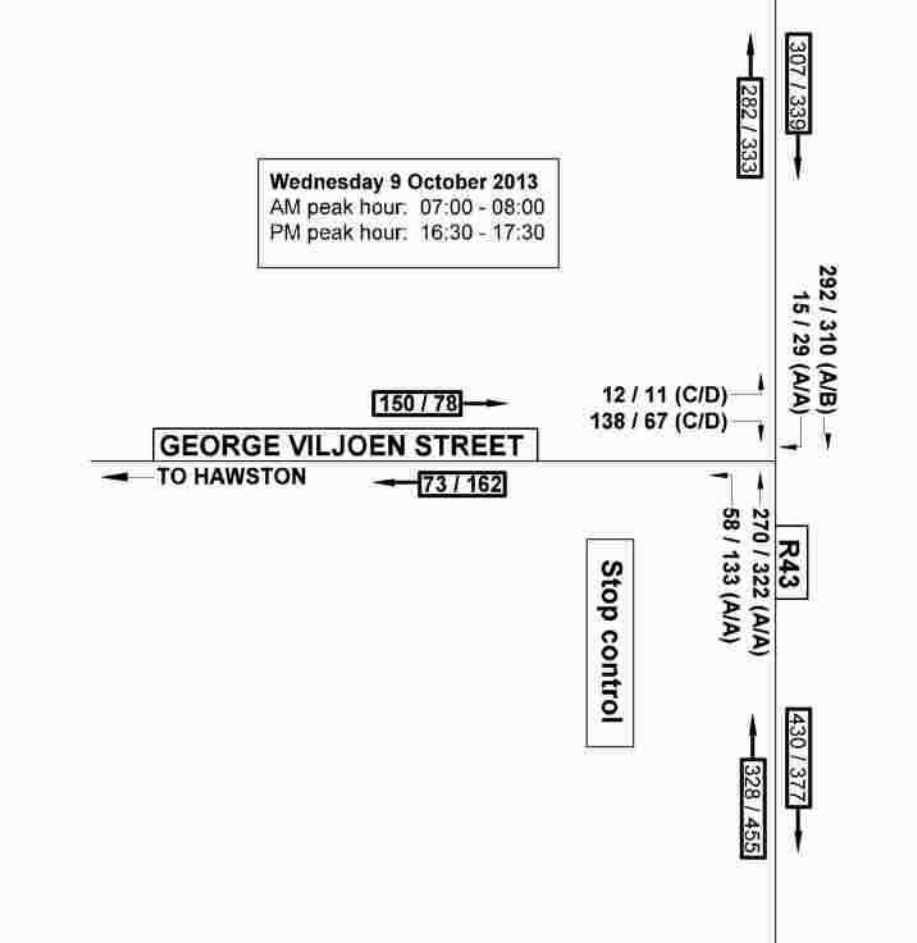


Liezl Stodart (M.Eng Pr.Eng)

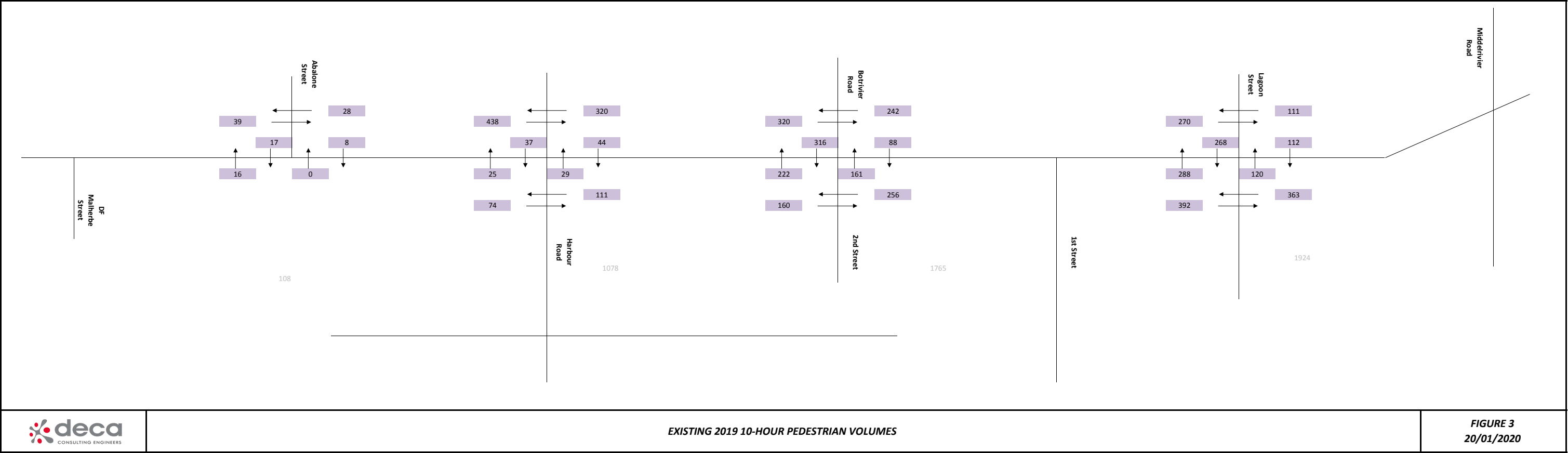


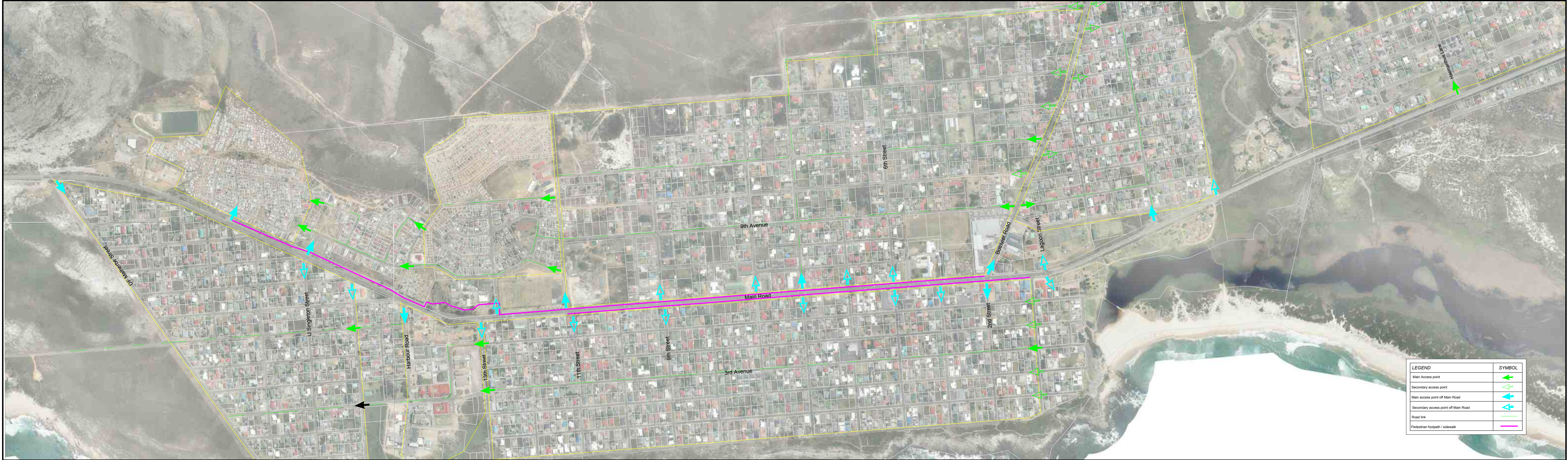
LEGEND		
NUMBER	INTERSECTION	CONTROL MEASURE
1	Main Rd / Middelrivier Rd	●
2	Main Rd / Lagoon St	●
3	Main Rd / First St	●
4	Main Rd / Botrivier Rd / 2nd St	●
5	Main Rd / Harbour Rd	●
6	Main Rd / Abalone St	●
7	Main Rd / DF Malherbe St	●
8	Luckhoff St / Harbour Rd	▲
9	3rd Ave / Strand St	●
10	2nd Ave / Strand St	●



Layout									Layout
December 2011			Not counted			Not counted			December 2011
October 2013		Not counted		Not counted			Not counted		October 2013

10 20 30 40 50 60 Original scale in mm NOTES 960 / 1844 (B/D) 960: Number of vehicles during AM peak hour 1844: Number of vehicles during PM peak hour B: Level of service during AM peak hour D: Level of service during PM peak hour Int LOS D / E D: Intersection service level during AM peak hour E: Intersection service level during PM peak hour	Amend. Date Description EFG Engineers (Pty) Ltd PO Box 5805 Durbanville 7551 Tel No: (021) 975 3880 Fax No: (021) 975 3859 e-mail: info@efg.co.za ICE Group (Pty) Ltd PO Box 131 Stellenbosch 7659 Tel No: +27 (0) 21 880 0443 Fax No: +27 (0) 21 880 0390 e-mail: pel@icgroup.co.za CLIENT WESTERN CAPE GOVERNMENT DEPARTMENT OF TRANSPORT AND PUBLIC WORKS P.O. Box 2603 Cape Town 8000 Tel: (021) 453 2177 PROJECT CONTRACT C968 OVERSTRAND TRANSPORT PLAN PLAN DESCRIPTION KLEINMOND TO HAWSTON AM / PM PEAK HOUR TRAFFIC VOLUMES AND LEVELS OF SERVICE (DECEMBER 2011 AND OCTOBER 2013) Scale NOT TO SCALE Date 29 AUGUST 2014 Plan number DRAWING 5 Amendment A B C D E F G
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LEGEND	SYMBOL
Main Access point	➔
Secondary access point	➞
Main access point off Main Road	➞
Secondary access point off Main Road	➞
Road link	—
Pedestrian footpath / sidewalk	—

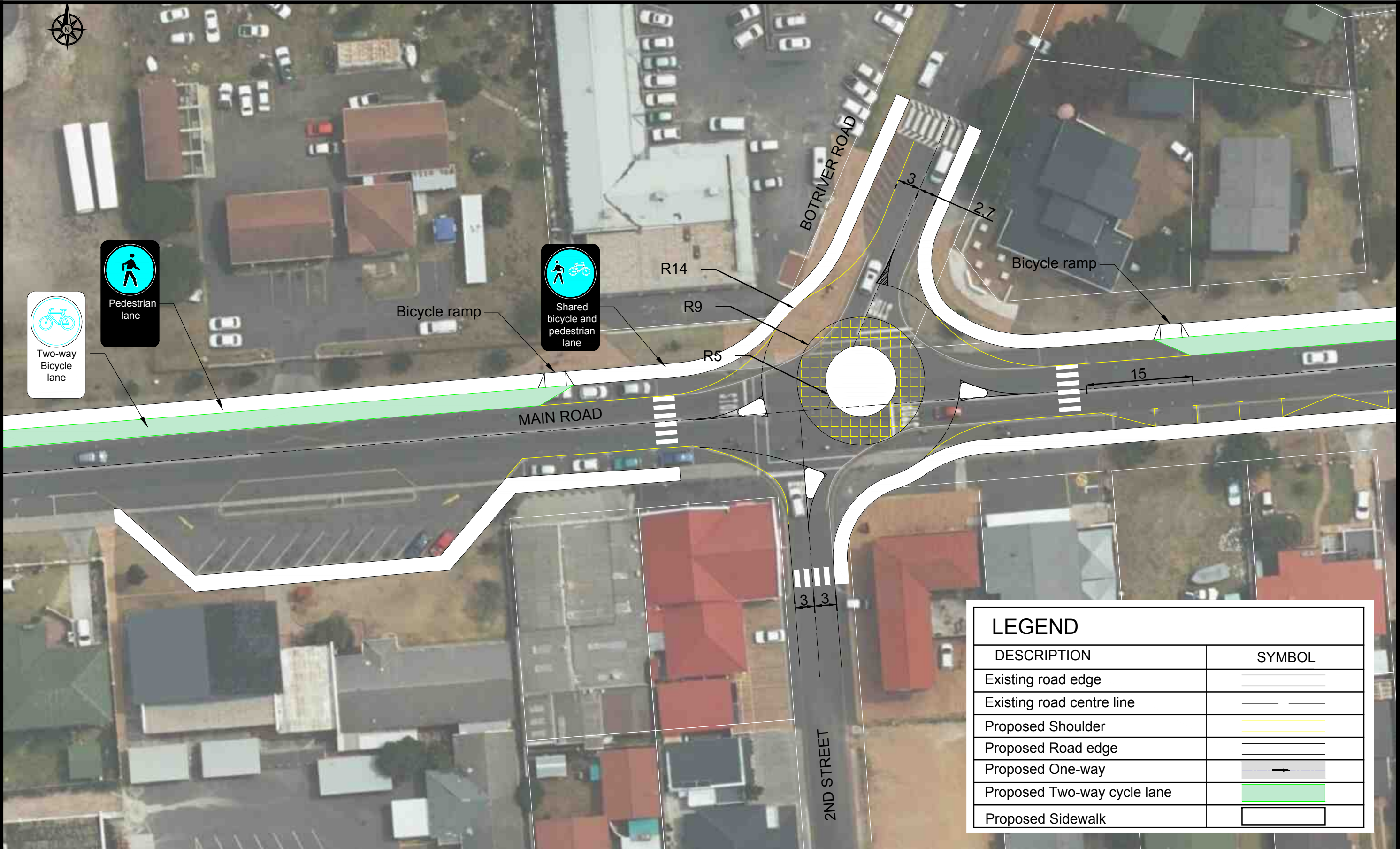


LEGEND

DESCRIPTION	SYMBOL
Existing road edge	—
Existing road centre line	—
Proposed Shoulder	—
Proposed Road edge	—
Proposed One-way	—
Proposed Two-way cycle lane	—
Proposed Sidewalk	—



LEGEND	
DESCRIPTION	SYMBOL
Existing road edge	
Existing road centre line	
Proposed Shoulder	
Proposed Road edge	
Proposed One-way	
Proposed Two-way cycle lane	
Proposed Sidewalk	





LEGEND

DESCRIPTION	SYMBOL
Existing road edge	_____
Existing road centre line	_____
Proposed Shoulder	_____
Proposed Road edge	_____
Proposed One-way	_____
Proposed Two-way cycle lane	_____
Proposed Sidewalk	_____



LEGEND	
DESCRIPTION	SYMBOL
Bus Front Wheel Tracks	
Bus Back Wheel Tracks	
Bus Body Tracks	
Existing Road Edge	
Proposed Bus road markings	

2m Sidewalk
2.5 m Two-way Cycle Lane
3.6m Lane
3.6m Lane
2.5m Shoulder
2m Sidewalk

2m Sidewalk
2.5 m Two-way Cycle Lane
3.6m Lane
3.6m Lane
2.5m Shoulder
2m Sidewalk

LEGEND

DESCRIPTION	SYMBOL
Existing road edge	
Existing road centre line	
Proposed Shoulder	
Proposed Road edge	
Proposed Two-way cycle lane	
Proposed Sidewalk	



LEGEND

DESCRIPTION	SYMBOL
Existing road edge	
Existing road centre line	
Proposed Shoulder	
Proposed Road edge	
Proposed Two-way cycle lane	
Proposed Sidewalk	
Proposed Paved intersection	



LEGEND

DESCRIPTION	SYMBOL
Existing road edge	
Existing road centre line	
Proposed Shoulder	
Proposed Road edge	
Proposed Two-way cycle lane	
Proposed Sidewalk	

