

## **MAFOLO PARK – R37**

**PROPOSED NEW FILLING STATIONS ON THE R37, APPROXIMATELY 40KM FROM BURGERSFORT TOWARD LEBOWAKGOMO AND POLOKWANE, LIMPOPO PROVINCE**

ESTIMATED MONTHLY SALES AND IMPACT ON SURROUNDING SITES

## **FEASIBILITY & TRAFFIC ENGINEERING STUDY**

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PREPARED BY:

WSP SA CIVIL AND STRUCTURAL ENGINEERS (PTY) LTD

POSTNET SUITE 113

PRIVATE BAG X844

SILVERTON

0127

TEL. No. : +27 12 361-4141

FAX No. : +27 12 361-4142



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Signature				
Checked by				
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Signature				
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## 1. BACKGROUND

Two filling stations are envisaged in the proposed township of Mafolo Park. The Township is located on both the northern and southern sides of the R37, with the residential and business portion being north and the industrial portion south. One filling station is proposed on each side of the R37.

For the purpose of this study, only one filling station, the northern side, will be studied. The reason that the proposed filling station on the southern side is not being considered at this point is due to its proposed location. The southern filling station is located a significant distance away from access to the R37 and will consequently attract only a very small percentage of traffic from the transient route. This filling station could become viable when the industrial area is fully developed.

The filling station on the northern side of the R37 will be on the road subject to the normal building lines, and will have good visibility from the R37 in both directions. The added advantage of this site is that additional traffic volumes will become exposed to the site over time as the retail and residential sites become developed. Access to the site will be from the side road, a local distributor, and not from the main arterial.

A site location is indicated on the attached **Figure 1**.

### 1.1 STUDY AREA

A large study area is considered to thoroughly consider the transient aspect of the R37. A low competitor density is encountered in the study area, which includes the R37 between Lebowakgomo and Burgersfort. The sites on the western side of Burgersfort were studied, and two sites on the ring road through Lebowakgomo were studied.

### 1.2 SUBJECT SITE

The subject site is approximately 7'000m<sup>2</sup> in extent, which will allow for a large filling station and convenience store and would also be able to accommodate fast food outlets.



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The R37 is a single carriageway road, and the site is situated at the entrance of the northern township with approximately 6'000 residential erven, and scope for approximately 5'000m<sup>2</sup> of business. The residential erven are small, and a number have been set aside for high density developments.

## 2. ESTIMATED SALES OF PROPOSED SITE

The empiric formula used by the fuel industry to calculate the expected average litres of fuel to be sold in a month is:

$$\begin{aligned} \text{Litres per month} = & \text{ Vehicles per day passing the site} \times \\ & \text{Average fill per vehicle} \times \\ & \text{Percentage vehicles of passer-by traffic turning into the site} \times \\ & \text{Average full normal trading days in a month} \end{aligned}$$

It has further been established that there is a relationship between the fuel sales and the sales in the convenience shop. The fuel and shop sales are used as the basis to determine whether a site is feasible or not.

### 2.1 TRAFFIC DEMAND

#### 2.1.1 Existing Traffic Demand

Classified traffic counts were used to estimate traffic demand and traffic volume. A traffic count was conducted by WSP on Tuesday 5 May 2009 at the proposed site on the R37. Detail of the traffic count is provided in **Appendix A**. The Average Daily Traffic (ADT) exposed to the site is approximately 6'623 vehicles per day. Light vehicles comprise the majority of the traffic, taxis about a quarter, and heavy vehicles about 10%.

The future demand has also been calculated (from the proposed development plans) and this is added to the existing demand on the R37.

### **2.1.2 Traffic Growth**

Various intersections along the route have been counted by WSP, other consultants and road authority agencies in the recent years. It is expected that the national traffic growth rate will slow down to 1% for the next five years. The economic downturn, the higher fuel price and the fact that traffic growth will be from a much higher base forms the main reasons for the lower growth rate. This low growth rate is assumed nationally where additional information can not supplement normal traffic growth assumptions.

Because of the mining activities and its associated growth of the towns of Steelpoort and Burgersfort, it has been assumed that the original growth rates will be maintained.

For the purposes of this volume prediction it is assumed that the traffic will grow by **3%** per annum on the R37. The volume for the proposed developments will be added to this.

### **2.1.3 Future Road Changes**

There are no expected changes to the present road infrastructure in the foreseeable future. The R37 in the study area is surrounded by mountainous terrain and consequently little route variation can occur due to the area's topography. It is assumed that no significant changes to R37 will occur within the estimated operational life cycle of the filling station.

## **2.2 Average Fill**

The average fill per vehicle, facilities provided at the various sites, and estimated current monthly sales were surveyed at all sites within the study area. The average fill expected from the subject site was consequently estimated, given the location, expected increase in amount and quality of facilities. These particulars are summarised in Table 1.

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**Table 1: On Site Facilities, Average Fill and Current Fuel Sales Survey**

	Brand	C-store	Food outlet	A.T.M	Avg. Fill (Litres)	Current Sales (Litres)
<b>Burgersfort</b>						
1	Exel North	Yes	Yes	Yes	18.3	380'000
2	Exel South	No	No	Yes	19.8	370'000
3	Engen Burgersfort	Yes	Yes	Yes	24.6	650'000
4	Platinum Petroleum	No	No	No	0	0
<b>R 37</b>						
5	Shell Baird SS	No	No	No	19.4	80'000
6	Total R37 (Driekop)	Yes	No	Yes	28.9	200'000
7	Total Chuniespoort	Yes	Yes	Yes	29.3	260'000
<b>Lebowakgomo</b>						
8	Shell Lebowakgomo	Yes	No	Yes	23.1	400'000
9	Engen Lebowakgomo	Yes	Yes	Yes	21.8	450'000

The average fill of all the sites within the study area varies dramatically due to the differing nature of the demographics surrounding the sites, their location in relation to competition and distances travelled by the motorists. The traffic utilising these sites is a mixture of local, township and transient traffic.

The average fill at the proposed site is comprised of two very different elements, being the transient traffic using the route to access the towns in the area, and the traffic which will be generated by the new developments, which will be travelling much shorter distances most of the time and will therefore tend to have a lower average fill. It is suggested that an average fill of **28.6 litres** be used for the **existing**, mostly transient traffic. For the **new developments** a proposed **21.8 litres** is assumed.

## 2.3 Interception Rates

The turn-in percentage (interception rate) is determined by the following factors:

- ◆ Convenience (clean new facility and easily accessible);
- ◆ Visibility (good-long time to decide whether to use the facility or not);
- ◆ The amount of passer-by traffic (fixed, as per traffic count);
- ◆ Type of traffic (Transient, Commuter and residential);
- ◆ Other nearby filling stations (competitor sites);
- ◆ Service provided to public (car wash, convenience shop, A.T.M etc);
- ◆ Good accesses (proper deceleration and acceleration lanes);
- ◆ Location(homebound and work bound);
- ◆ Site layout (large enough to have proper site circulation)

The expected interception rates for the proposed development are indicated in **Table 2**.

**Table 2: Expected Interception Rates**

<b>Mafolo Park – R37</b>	
<b>Traffic Source</b>	<b>Interception Rate</b>
R37 – to Burgersfort	2.8%
R37 - to Lebowakgomo	2.0%
New Developments	5.8%

As outlined above there are a number of factors affecting the percentage interception achieved from any given traffic flow. Interception rates are achieved by matching historical analysis of similar traffic flows with expected traffic patterns and facilities once the service station conversion is completed. The present interception rates are fairly low because of the competition from Total Driekop which is about 3km away. The interception will be fairly high from the proposed new development as this will be a captive market for whom this service station will be the most convenient.

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**2.4 FULL TRADING DAYS IN A MONTH**

The definition of full normal trading days in a month is the number of typical weekday sales in a month. A typical weekday is a Tuesday, Wednesday or a Thursday during a week with no holidays or public holidays. If there was no variation in the traffic there would have been 30.5 (365/12) full normal trading days in a month. If, for example, the weekend traffic demand is lower than during the week, the full normal trading days in a month become less. It is thus wrong to assume that a default value of 30.5 days should be used due to the fact that a 24 hour facility will be operated for each day of the month. Traffic patterns have an impact on the number of trading days per month.

To allow for higher Friday volumes and the lower Saturday, Sunday and holiday volumes, it is suggested that **26 trading days** be used.

**2.5. EXPECTED MONTHLY SALES**

**2.5.1 Fuel Sales**

The estimated fuel sales are calculated in **Table 3**. A general rule of thumb is used when estimating fuel sales for future years. Upon the first two years of operation a filling station's fuel sales reach a high percentage of their full potential, but only during the third year the full (100%) potential is usually reached.

**Table 3: Expected fuel sales in a month (Existing Traffic)**

Mafolo Park		
Movement	Southbound (To Burgersfort)	Northbound (To Lebowakgomo)
Traffic flow (vehicles per day)	3221	3102
Average fill (liter per vehicle)	28.6	28.6
Trading days (days in a month)	26	26
Interception rate (%)	2.80%	2.00%
	67 064	46 133
<b>Total Current Potential</b>	<b>113 197</b>	
Total litres (year 1 [2010] @ 80% of potential sales)	93 274	
Total litres (year 2 [2011] @ 95% of potential sales)	113 989	
Total litres (year 3 [2012] @ 100% of potential sales)	<b>123 384</b>	

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The volume prediction of **Table 3** is based on the existing traffic through the growth phase of the service station to 2012.

**Table 4: Expected Fuel Sales from the New Developments**

<b>Mafolo Park - New developments</b>	
Movement	New Traffic
Traffic flow (vehicles per day)	6'180
Average fill (liter per vehicle)	21.8
Trading days (days in a month)	26
Interception rate (%)	5.80%
<b>Total Potential</b>	<b>203'164</b>
Total litres (year 1 [2010] @ 80% of potential sales)	± 167'000
Total litres (year 2 [2011] @ 95% of potential sales)	± 205'000
Total litres (year 3 [2012] @ 100% of potential sales)	± 222'000

When the two sources of volume are looked at individually, neither is viable on its own. The total sales volume from both sources for a three year horizon period is estimated as **345'000 litres per month** which together make a viable service station from a fuel sales point of view.

### 2.5.2 Shop Sales

A relationship between the sales of the convenience store and the fuel sales has been established. This relationship is founded on the logic that a customer purchasing fuel will also make purchases from the convenience store (40-60% of the time). Another factor that also influences sales considerably is loyal/dedicated customers who frequent only a specific filling station.

The ratio of fuel sold to Rands generated in the convenience store is a function of the type of traffic which the site attracts and the area which it is located within. The proposed site will have a combination of local/retail traffic and transient traffic (from the R37). It is assumed that the site will have a branded convenience store with a minimum of an in store food offer. There is limited competition for new image convenience store shopping

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among the competitor sites. It is therefore proposed that the convenience store would generate about **R1.10** for every litre of fuel sold.

The estimated shop sales are the following:

Year 3:           ± **R379 500** per month

### **3. IMPACT ON EXISTING SITES**

#### **3.1 COMPETITOR SITES**

Competitor sites that were studied in this survey were at the western exit from Burgersfort, on, or close to, the R37 and on the Lebowakgomo bypass.

##### **3.1.1 Engen Burgersfort about 40km East**

The site is located on the R37 exiting Burgersfort, but on the opposite side from the proposed site. The site is large with full facilities including a Quickshop, Barcelo's fast food and ATM. Access to the site is good, as is visibility. Refer to **Photo 1**.

##### **3.1.2 Exel North - Burgersfort, 40km East**

The site is located off the main R37 opposite a large Shopping Centre. Associated with the site is a KFC, a convenience store and ATM. The site is located within a large taxi rank and is likely to draw almost exclusively taxi commuters as a result. Refer to **Photo 2**.

##### **3.1.3 Exel South Burgersfort, 40km East**

The site is located second last on the way out of town on the western side, before the Engen above. The site has no convenience shop or fast food and is associated with a strip shopping centre, including cellular and spares shops, it has an ATM, and access is fairly good from one traffic stream only as a result of a median. Refer to **Photo 3**.

##### **3.1.4 Platinum Petroleum, approximately 38km East**

Located on the corner of the Steelpoort turn-off and the R37. The site appears unfinished and is selling only Diesel at present. It has a good location and could sell petrol in future. This site has not been included in the feasibility, but is highlighted as it may compete in future in the petrol market. Refer to **Photo 4**.

##### **3.1.5 Shell Baird Service Station, approximately 22km East**

Located on the northern side of the R37, this site is very small and about 50m off the road. It only has two pumps and no facilities. It is closed at night. Refer to **Photo 5**.

##### **3.1.6 Total Driekop R37 – approximately 3km East**

The site is only partially branded as a Total, and located on the southern side of the R37. It is the closest competition, but on the opposite side of the road. At present it

appears to be mostly a taxi site with its own brand of convenience and food. The site is however large and could be upgraded in the future. Refer to **Photo 6**.

### **3.1.7 Total Chuniespoort – 6km from Lebowakgomo – West**

The site is very large with picnic area and plenty of parking. It has its own brand of food and convenience shopping, and is on the same side of the road as the proposed site. The site is fairly old, and has minimal facilities, but could easily be upgraded. Refer to **Photo 7**.

### **3.1.8 Shell Lebowakgomo – approximately 85km West**

The site is located on the ring road through Lebowakgomo, and will therefore pose very little competition to the proposed site. The site has a shop and ATM and access is good. The site is large and has a new image. Refer to **Photo 8**.

### **3.1.9 Engen Lebowakgomo – approximately 88km West**

Located at the south western exit to Lebowakgomo, the site is expected not to pose much competition. The site has a new image with a Quickshop and associated with a medium sized shopping centre, access is from the shopping centre parking. Refer to **Photo 9**.

## **3.2 CATCHMENTS MARKETS**

Physical man made barriers such as freeways, railway lines, airports or natural barriers such as mountains, rivers and dams create different markets (catchment areas for a site). Different types of commuters also represent different markets, such as transient commuters that are travelling long distances, and local commuters that are travelling within a town over much shorter distances.

In this study three markets were studied:

1. The transient market which is represented by motorists using the R37 as a carrier between towns
2. The local market that are living in the townships surrounding the site and are almost exclusively transported in taxis.
3. The market which will become established as the development takes place and will be local traffic using the service station.

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**3.3 SHARED TRAFFIC VOLUMES**

To assess the impact of the proposed filling station on adjacent filling stations, the shared traffic streams were determined. The shared volumes were determined from 24-hour counts done by WSP in the same area in recent years as well as estimates after visiting the sites. The volumes are summarised in **Table 3.3.1**.

**Table 5: Shared Traffic of Existing Competitors**

Filling Station		Potential Pass- by traffic	Traffic shared with new filling station	% of potential traffic shared	General comment
<b>Burgersfort</b>					
1	Excel North	7'300	1'300	17.8%	New site associated with large taxi rank, Branded shop, KFC and ATM
2	Excel South	6'900	1'200	17.4%	New site, associated with strip shops, no convenience or fast food
3	Engen Burgersfort	6'900	1'200	17.4%	New site at western exit, Quickshop, Barcelo's, and ATM
4	Platinum Petroleum			0.0%	Diesel only at present
<b>R 37</b>					
5	Shell Baird SS	6'400	5'200	81.3%	Old small, no facilities, about 50m off the road
6	Total R37 (Driekop)	6'500	6'400	98.5%	Semi branded, large, own brand fast food and shop includes ATM. Closest competition
7	Total Chuniespoort	6'400	5'300	82.8%	About 6km from Lebowakgomo, Very large site with Own brand food and convenience shopping

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Filling Station		Potential Pass- by traffic	Traffic shared with new filling station	% of potential traffic shared	General comment
<b>Lebowakgomo</b>					
8	Shell Lebowakgomo	7'200	750	10.4%	Off the R37, so lower competition, full facilities
9	Engen Lebowakgomo	8'600	530	6.2%	South Eastern exit from Lebowakgomo, associated with medium sized shopping centre.

### 3.4. MOVING MARKET FACTOR BETWEEN FILLING STATIONS

A new, or rebranded filling station can have an impact on adjacent or nearby filling stations that serve the same traffic stream. Most filling stations attract between 1% and 8% of the passing traffic stream. The remaining traffic (between 92% and 99%) must fill up somewhere else along their route, outside the critical area of influence. This area of influence, sometimes defined by a 3km radius, can be made more specific by investigating the traffic streams that are served.

Little knowledge is available on how drivers make their decision at which filling station to fill up, but it is influenced by the same factors determining the turn-in percentage (interception rate) mentioned in section 4 above. The number of filling stations in an area determines the percentage impact of a new filling station on the remaining filling stations. If, for example, there is only one filling station in an area, an extra filling station close to the existing one will take away a large percentage of its customers. If however there are 20 filling stations in the area, a new filling station will take away a much smaller percentage of the market of each of the existing filling stations.

These factors will determine the moving market factor. If an existing filling station captures 3% of the passing traffic, and a new filling station upstream or downstream opens, also capturing 3% of the passing traffic, it will not capture the same 3% of the passing traffic stream. There will be an overlapping or moving market that will use the new filling station due to one of the factors outlined above.

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Limited figures are available on what percentage of traffic will move, but the following guideline is proposed in **Table 6**.

**Table 6: Moving Market Factor**

Description	Moving Market Factor
New filling station much better located, good accesses, many more facilities, etc.	20 - 40%
Location similar, accesses similar, same service, etc.	10 - 20 %
New site has poor access , no additional facilities, located far away from the existing filling stations.	0 - 10 %

In combining the different aspects described above, an assessment can be made of the impact of the proposed new filling station on the adjacent filling stations. This assessment is summarised in **Table 7**.

An analogy can be made of the fuel using population in the study area by comparing it to baking and sharing a cake. Assuming a cake is being baked in an oven, it will rise and expand almost uniformly per time unit (i.e. per minute). Currently, nine competitor sites have a proportional slice of the cake (the cake represents the study area). By allowing another person to have a slice of the cake does not result in a larger cake, but shifts each person's proportional cake slice to allow everyone now to have their slice of the cake. The only manner in which the cake can expand is in baking it longer (i.e. growing over time).

Determining each person's slice of the cake is summarised in **Table 7**. **Table 7** consists of 4 columns of calculated values. These values are defined as the following:

1. *Present Estimated Fuel Sale Volume*: This value represents how many litres of fuel per month the site in question currently sells, without considering the effect of the proposed filling station. This value is calculated by considering the following:
  - o Potential Pass-By Traffic per day (ADT) as stated in **Table 3**;

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- Trading days per month (Assume a value of 26 days);
  - Average Fill for sites in the area;
  - Average Interception rate for traffic passing the site (ranging from 2-8%);
2. *Moving Market Factor*: Refer to **Table 6**;
  3. *Lost Fuel sales if development is built*: This value represents how many litres of fuel per month the site in question will sell less of if the proposed filling station is built. It is calculated by multiplying the moving market factor with the present sale volumes;
  4. *(Present Fuel Sales) – (Lost Fuel)*: This value is the estimated fuel sales volume of the site in question when the moving market factor is taken into account;
  5. *Three Year Future Sales from Lost Fuel sales*: The fuel sales of the previous column are grown at the 1.5% growth rate per annum for 3 years to determine what the impact is on a competitor site once the proposed development reaches its assumed potential. For the future scenario it can be assumed that the fuel sales for the area can increase by 2-5% per annum depending on the new developments affecting specific sites. This growth will be driven by the completed new developments as well as various planned developments in the area. Due to the current economic downturn, the minimum growth rate (1.5% p.a.) is assumed for the following 3 years at all sites.

**Table 7: Impact of the proposed site on the surrounding sites**

	Filling Station	Present Volume	Moving market factor	Lost in monthly sales	Filling Station (with new site)	Filling Station (future sales)
	<b>Burgersfort</b>					
1	Exel North	380'000	3.0%	± 11'400	368'600	± 400'000
2	Exel South	370'000	2.5%	± 9'250	360'750	± 390'000
3	Engen Burgersfort	650'000	2.5%	± 16'250	633'750	± 690'000
4	Platinum Petroleum	0	0.0%		0	0
	<b>R 37</b>					
5	Shell Baird SS	80'000	4.0%	3'200	76'800	± 84'000
6	Total R37 (Driekop)	200'000	30.0%	60'000	140'000	± 150'000

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Filling Station		Present Volume	Moving market factor	Lost in monthly sales	Filling Station (with new site)	Filling Station (future sales)
7	Total Chuniespoort	260'000	8.0%	20'800	239'200	± 260'000
	<b>Lebowakgomo</b>					
8	Shell Lebowakgomo	400'000	1.5%	6'000	394'000	± 430'000
9	Engen Lebowakgomo	450'000	1.5%	6'750	443'250	± 480'000
<b>TOTAL MONTHLY LOSS IN SALES</b>				<b>± 130'000</b>		

The proposed site will have a minimum impact on the surrounding sites in the long term, as it will be generating at least two thirds of its own volume through the new developments. The only site that will be negatively affected in the long term will be Total Driekop, and the main reason is the present facilities. Should the site be upgraded to a modern station with a new image it is estimated that it would compete favourably under the new market conditions.

It is estimated, however, that the operation of the proposed filling station **will not irreparably jeopardise the business** of any competitor filling stations in the study area.

## 4. FEASIBILITY OF SITE CONSTRUCTION

The potential income and financial feasibility were analysed in Chapter 2. This Chapter is concerned with the feasibility of construction and related civil engineering work. Such works are large capital expenditures and impact on the overall feasibility of the development. The cost of the filling station, canopy and forecourt is very similar from site to site. The costs which differ are the value of the land and the cost of the civil engineering work (access, bulk earthworks, etc.). These variable capital costs are important when considering the site development feasibility.

### 4.1. COST OF BULK EARTHWORKS AND ACCESSES

A cost element that has a large influence on the feasibility of a filling station is the cost of the road and bulk earthworks. A cost estimate was done of the external road network and the internal roads and parking areas. The detail is provided in **Table 8**.

**Table 8: Cost of civil engineering works for proposed Filling Station**

SECTION	DESCRIPTION	ACCESS	INTERNAL ROADS & PARKING	TOTAL
A	Preliminary & General	R 80'000.00	R 100'000.00	R 180'000.00
B	Site clearance	R 50'000.00	R 50'000.00	R 100'000.00
C	Roadworks	R 460'000.00	R 300'000.00	R 760'000.00
D	Ancillary roadworks	R 210'000.00	R 250'000.00	R 460'000.00
E	Protection and provision of services	R 50'000.00	R 200'000.00	R 250'000.00
<b>Sub Total</b>		R 850'000.00	R 900'000.00	R 1'750'000.00
5% Contingencies				R 100'000.00
Professional fees				R 150'000.00
<b>TOTAL</b>				<b>R 2'000'000.00</b>

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## 4.2 FEASIBILITY

At this stage, a full life cycle evaluation of the feasibility of the filling station has not been completed due to certain unknowns such as full geotechnical investigations. However, an assessment can be made based on the following:

- The land cost, building and other fixed costs will be similar to that of an average filling station.
- The cost of the road works will be above average as shown in **Table 8**.
- Based on the expected fuel and convenience store sales (345'000 litres per month and R 379'000 in year 3 of operation), the monthly income will be adequate to obtain an acceptable minimum attractive rate of return. The potential incomes of other amenities such as carwash and/or fast food restaurants have not been taken into account.

A qualitative statement can therefore be made that at this time, the proposed R37 Mafolo Park filling station will be feasible from a traffic engineering and filling station development point of view, once the new development has taken place.

## **5. OTHER TRAFFIC ENGINEERING CONSIDERATIONS AT A FILLING STATION**

### **5.1 IMPACT ON TRAFFIC FLOW PAST THE SITE (ROAD SAFETY)**

The road authorities have identified the possible negative impact a filling station can have on the traffic flow past a site. Therefore, a design manual (BB2)<sup>1</sup> was compiled after proper research and input from various experienced traffic engineers to ensure that road safety is not negatively affected when establishing a site next to a provincial road.

The proposed site does comply with the minimum standards of the BB2 design document. The necessary preceding deceleration lanes and turning lanes at the accesses ensure vehicles entering and exiting the sites will do so safely.

The site is big enough to accommodate the required minimum distances as recommended in the BB2 document. Sight distance, which is a key factor in determining traffic safety at any intersection, is good at the proposed site due to the geometry of the existing roads (no horizontal curves).

It is concluded that the impact of the sites on the existing traffic past them will not be negatively affected by the proposed filling station traffic. In fact, the road authority (SANRAL) will not allow access to the site if road safety was negatively affected by the proposed filling station.

### **5.2 DELIVERY VEHICLE PATH**

Similar to road safety, the paths of the delivery vehicle are evaluated by the road authority as well. The geometric standards adopted in the design manuals allow for the delivery vehicle entering and exiting the sites safely. E.g., the entrance lane width is 5m to accommodate especially heavy vehicles. For light vehicles only, the width would need to be 3.5m.

It is concluded the proposed filling station will be able to accommodate the delivery vehicle.

---

<sup>1</sup> GAUTRANS, 2002. BB2: *Guidelines for Filling Stations Accesses*. May 2002 Revised Draft Edition

## 6. CONCLUSIONS

It is expected that the proposed site conversion will sell 345'000 liters per month in 2012 (after a three year horizon period), which will make it feasible from a petrol sale viewpoint. The convenience shop should sell goods to the value of about R 379'000 per month at the same stage.

The proposed site conversion will not affect the long term sales of the opposition sites within the study area (Refer to **Table 7**).

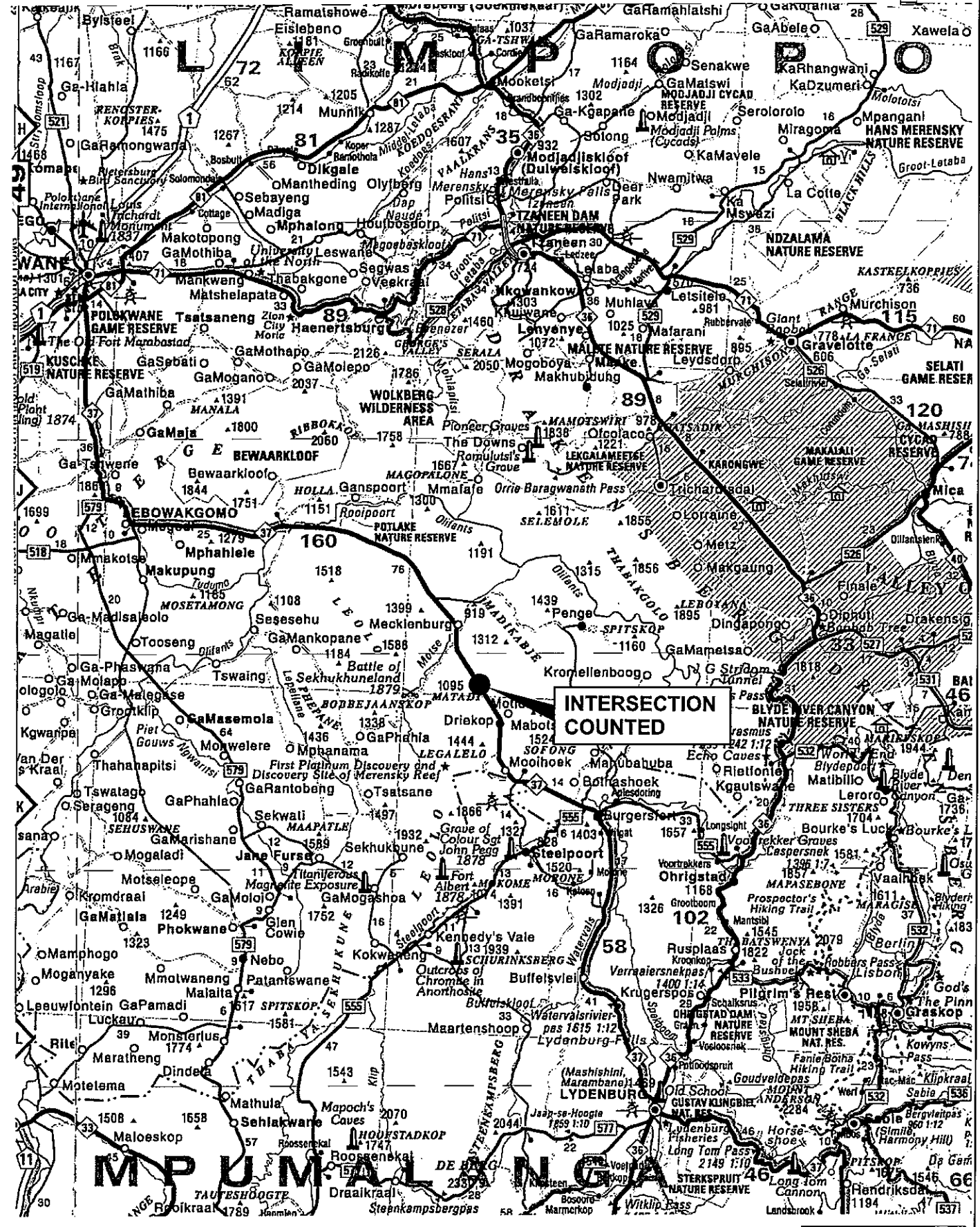
The proposed **R37 Mafolo Park site** and new development has the support from a traffic engineering viewpoint.

Yours faithfully,

**HARM SCHREURS: Pr Eng**  
**WSP SA CIVIL & STRUCTURAL ENGINEERS (PTY) LTD**

# Figure

**Figure 1: Locality Plan**



Checked by : H Schreurs Pr Eng

326582\_Mafolopark Polokwane R37\_Locality Plan\_1.cdr



Project:  
**MAFOLOPARK POLOKWANE R37**

Figure:  
**LOCALITY PLAN**

No.  
**1**

# Photos

## Competitor Sites

**Photo 1: Engen Burgersfort**

**Photo 2: Exel North Burgersfort**

**Photo 3: Exel South Burgersfort**

**Photo 4: Platinum Petroleum**

**Photo 5: Shell Bairds Service Station**

**Photo 6: Total R37 Driekop**

**Photo 7: Total Chuniespoort**

**Photo 8: Shell Lebowakgomo**

**Photo 9: Engen Lebowakgomo**



Engen Lebowakgomo



Project:

**MAFOLOPARK POLOKWANE R37**

Figure Description:

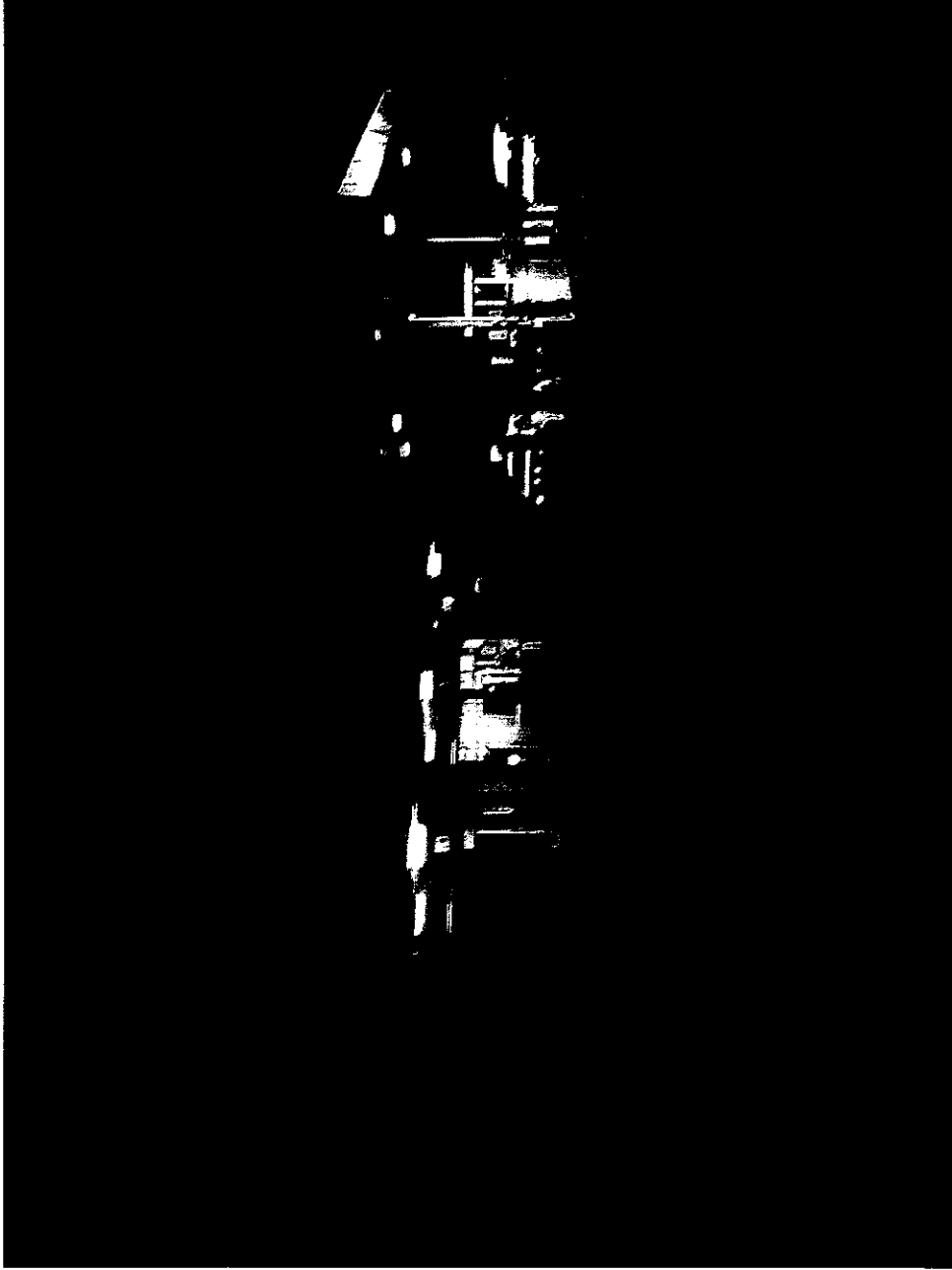
**SURROUNDING FILLING STATIONS**

No.

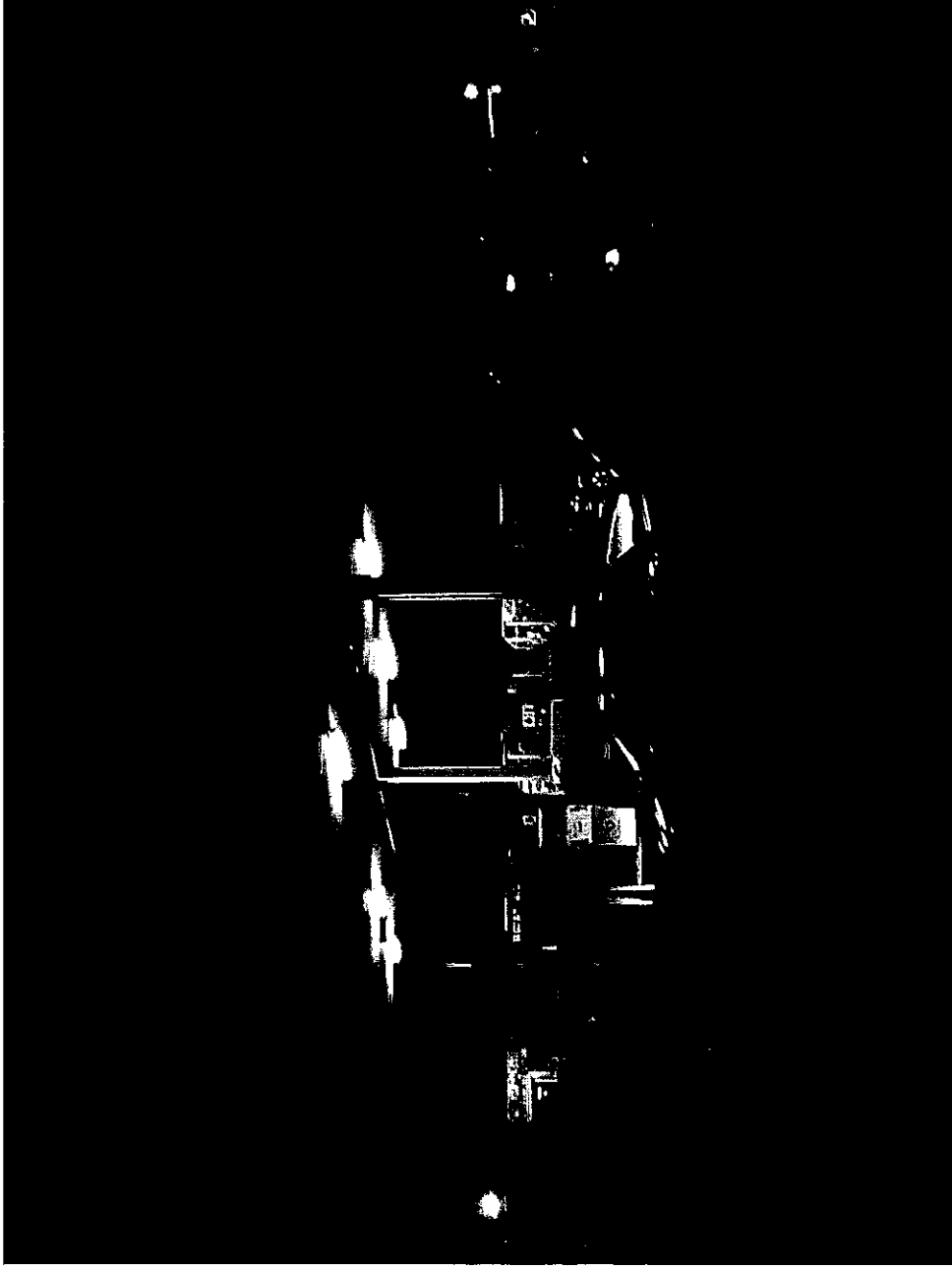
**9**



Shell Lebowakgomo



Total Chuniespoort



Total R37 Driekop



Project:

**MAFOLOPARK POLOKWANE R37**

Figure Description:

**SURROUNDING FILLING STATIONS**

No.

**6**



Shell Bairds Service Station



Project:

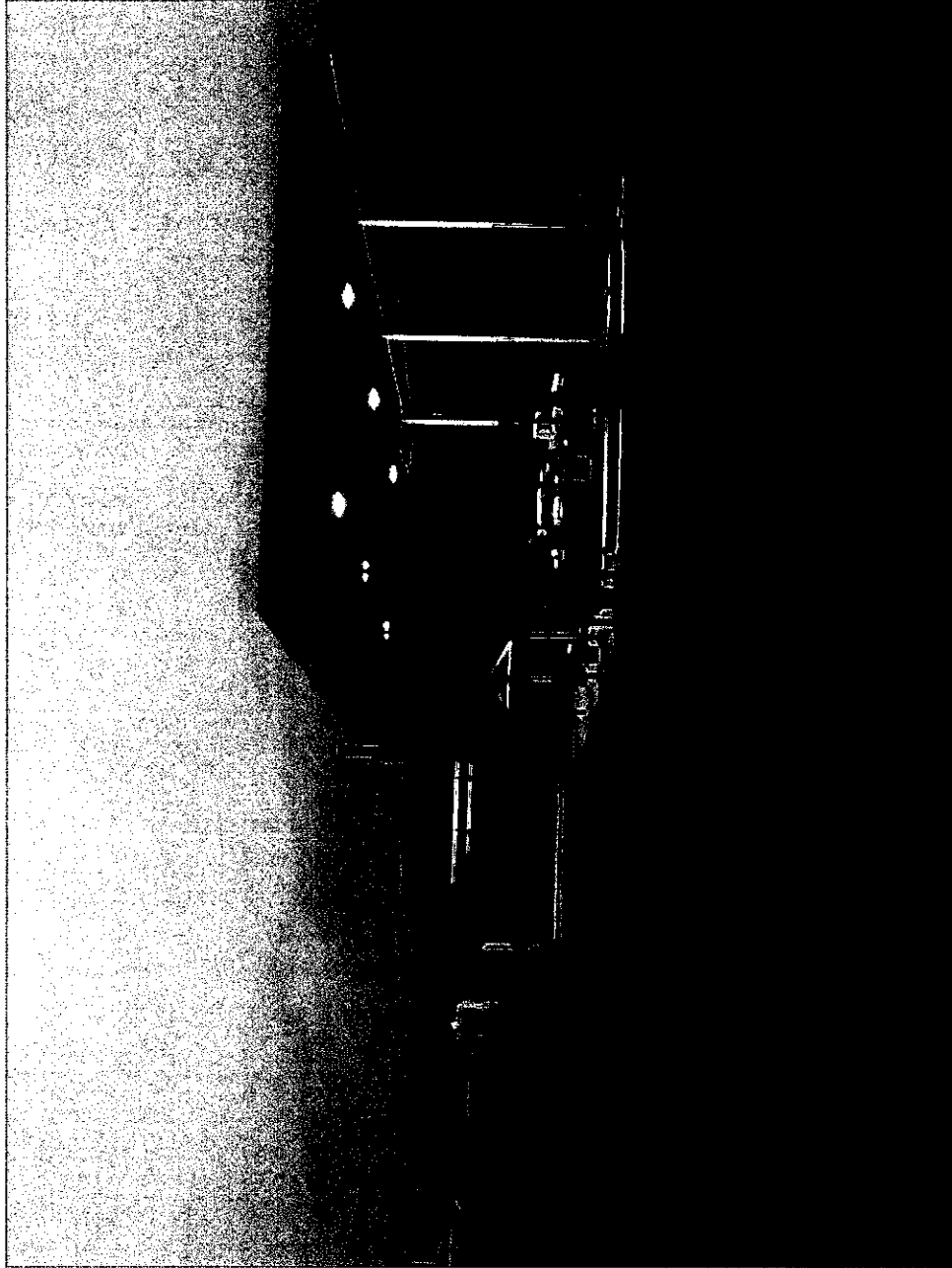
**MAFOLOPARK POLOKWANE R37**

Figure Description:

**SURROUNDING FILLING STATIONS**

No.

**5**



Platinum Petroleum



Exel South Burgersfort



Project:

**MAFOLOPARK POLOKWANE R37**

Figure Description:

**SURROUNDING FILLING STATIONS**

No.

**3**



Exel North Burgersfort



Project:

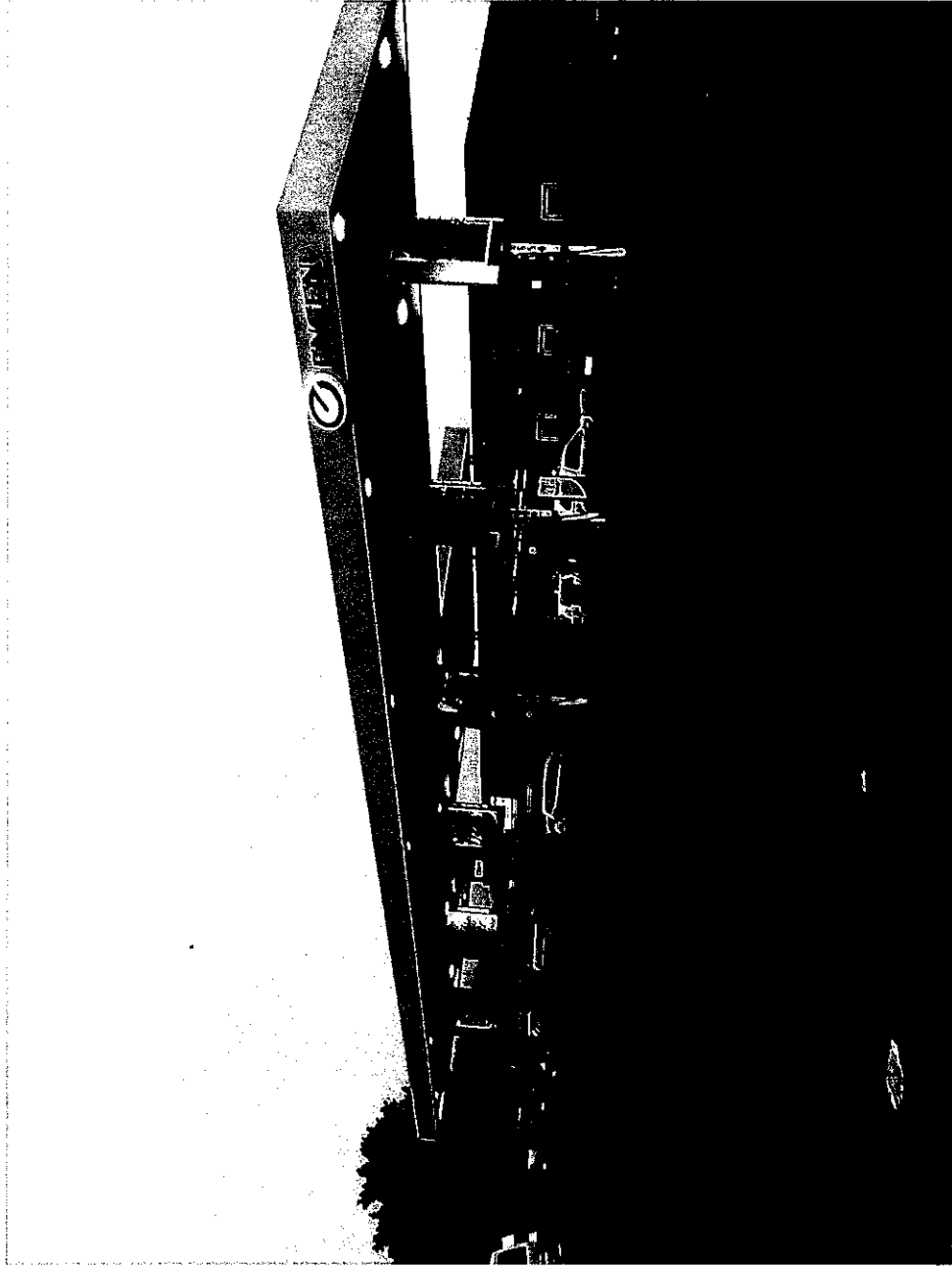
**MAFOLOPARK POLOKWANE R37**

Figure Description:

**SURROUNDING FILLING STATIONS**

No.

**2**

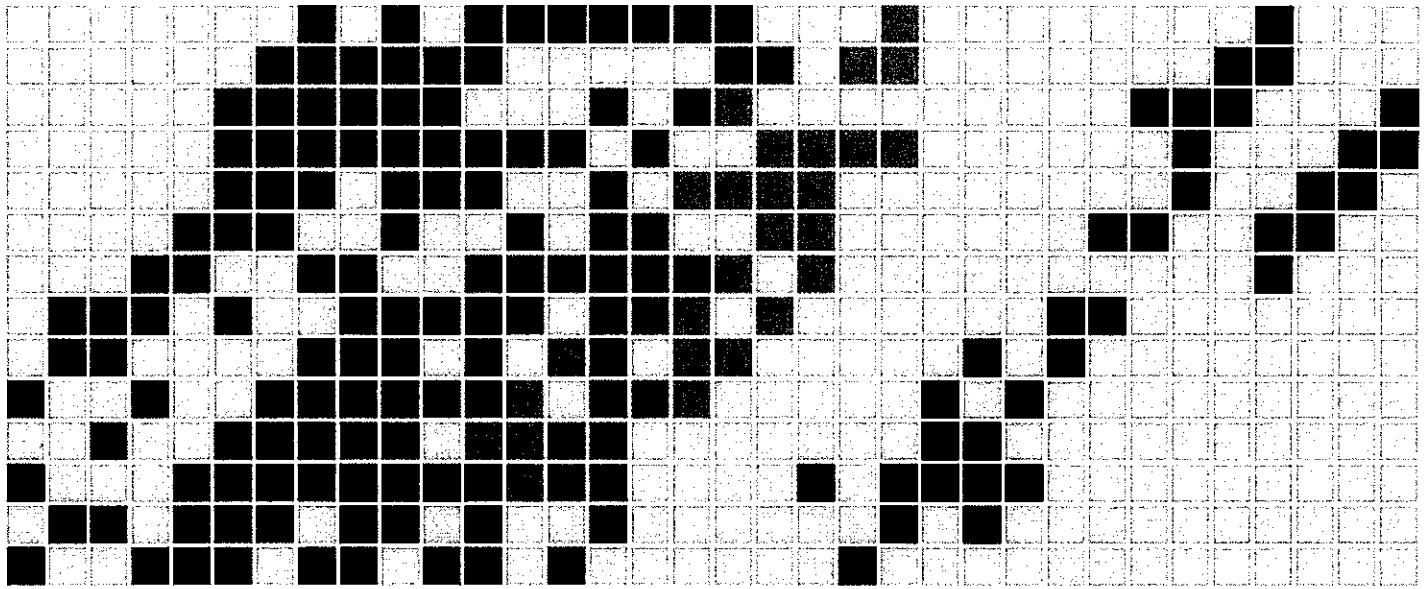


Engen Burgersfort



# Annexure

## Annexure A: Detail of Traffic Survey



**MAFOLOPARK POLOKWANE R37**

# **TRAFFIC COUNT**

**MAY 2009**

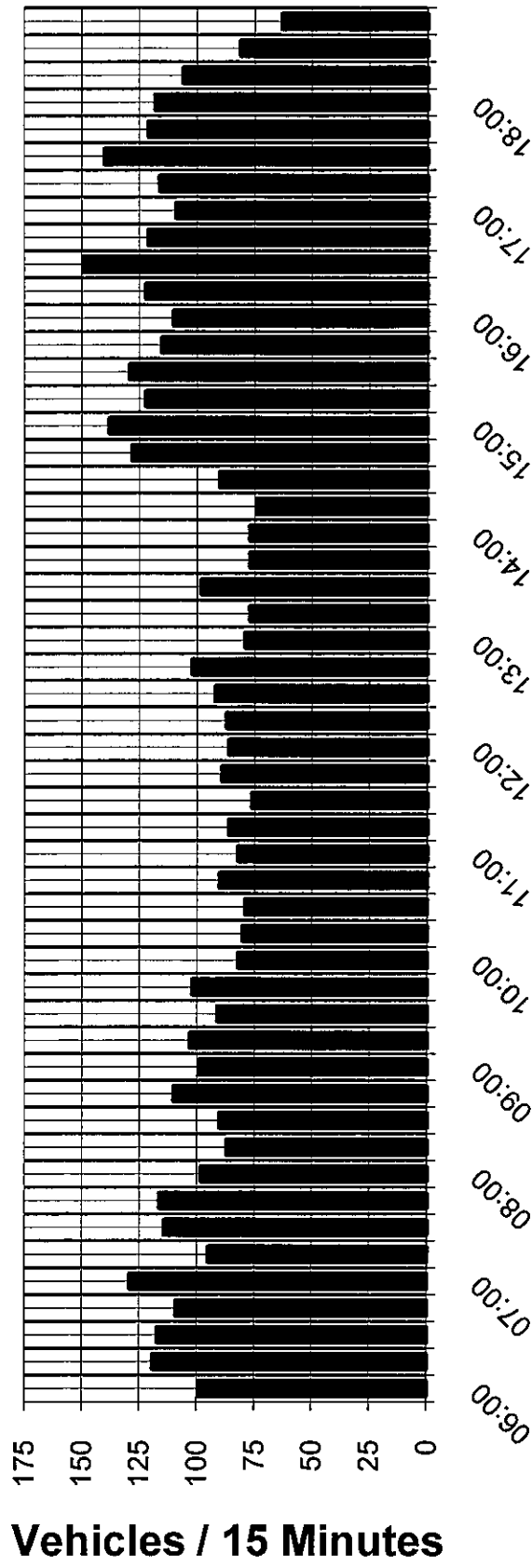
PREPARED BY:



**WSP SA CIVIL AND STRUCTURAL  
ENGINEERS (PTY) LTD  
POSTNET SUITE 13  
PRIVATE BAG X844  
SILVERTON  
0127**

**TEL. No. : +27 12 361 4141  
FAX No. : +27 12 361 4142**

**MAFOLOPARK TRAFFIC COUNT**  
**MAFOLOPARK TWO WAY TRAFFIC COUNT**



**TIME OF THE DAY**

**TRAFFIC COUNT: MAFOLOPARK**  
**INTERSECTION: MAFOLOPARK TWO WAY TRAFFIC COUNT**  
**PEAK HOUR PERIOD: 13 HOUR**  
**DATE: TUESDAY 5 MAY 2009** **LIGHT**

TIME		TRAFFIC MOVEMENTS												TOTAL
Start	End	1	2	3	4	5	6	7	8	9	10	11	12	
06:00	06:15	0	52	0	0	0	0	0	17	0	0	0	0	69
06:15	06:30	0	50	0	0	0	0	0	36	0	0	0	0	86
06:30	06:45	0	38	0	0	0	0	0	36	0	0	0	0	74
06:45	07:00	0	53	0	0	0	0	0	22	0	0	0	0	75
07:00	07:15	0	42	0	0	0	0	0	40	0	0	0	0	82
07:15	07:30	0	27	0	0	0	0	0	36	0	0	0	0	63
07:30	07:45	0	34	0	0	0	0	0	37	0	0	0	0	71
07:45	08:00	0	33	0	0	0	0	0	33	0	0	0	0	66
08:00	08:15	0	23	0	0	0	0	0	32	0	0	0	0	55
08:15	08:30	0	24	0	0	0	0	0	25	0	0	0	0	49
08:30	08:45	0	24	0	0	0	0	0	26	0	0	0	0	50
08:45	09:00	0	39	0	0	0	0	0	24	0	0	0	0	63
09:00	09:15	0	33	0	0	0	0	0	27	0	0	0	0	60
09:15	09:30	0	28	0	0	0	0	0	30	0	0	0	0	58
09:30	09:45	0	22	0	0	0	0	0	28	0	0	0	0	50
09:45	10:00	0	29	0	0	0	0	0	32	0	0	0	0	61
10:00	10:15	0	22	0	0	0	0	0	21	0	0	0	0	43
10:15	10:30	0	22	0	0	0	0	0	24	0	0	0	0	46
10:30	10:45	0	23	0	0	0	0	0	25	0	0	0	0	48
10:45	11:00	0	28	0	0	0	0	0	26	0	0	0	0	54
11:00	11:15	0	22	0	0	0	0	0	28	0	0	0	0	50
11:15	11:30	0	21	0	0	0	0	0	32	0	0	0	0	53
11:30	11:45	0	14	0	0	0	0	0	27	0	0	0	0	41
11:45	12:00	0	36	0	0	0	0	0	21	0	0	0	0	57
12:00	12:15	0	31	0	0	0	0	0	27	0	0	0	0	58
12:15	12:30	0	32	0	0	0	0	0	27	0	0	0	0	59
12:30	12:45	0	32	0	0	0	0	0	30	0	0	0	0	62
12:45	13:00	0	35	0	0	0	0	0	28	0	0	0	0	63
13:00	13:15	0	28	0	0	0	0	0	18	0	0	0	0	46
13:15	13:30	0	26	0	0	0	0	0	29	0	0	0	0	55
13:30	13:45	0	37	0	0	0	0	0	27	0	0	0	0	64
13:45	14:00	0	14	0	0	0	0	0	22	0	0	0	0	36
14:00	14:15	0	21	0	0	0	0	0	24	0	0	0	0	45
14:15	14:30	0	22	0	0	0	0	0	25	0	0	0	0	47
14:30	14:45	0	33	0	0	0	0	0	28	0	0	0	0	61
14:45	15:00	0	41	0	0	0	0	0	49	0	0	0	0	90
15:00	15:15	0	40	0	0	0	0	0	58	0	0	0	0	98
15:15	15:30	0	36	0	0	0	0	0	33	0	0	0	0	69
15:30	15:45	0	39	0	0	0	0	0	54	0	0	0	0	93
15:45	16:00	0	32	0	0	0	0	0	51	0	0	0	0	83
16:00	16:15	0	33	0	0	0	0	0	43	0	0	0	0	76
16:15	16:30	0	30	0	0	0	0	0	52	0	0	0	0	82
16:30	16:45	0	50	0	0	0	0	0	62	0	0	0	0	112
16:45	17:00	0	39	0	0	0	0	0	41	0	0	0	0	80
17:00	17:15	0	27	0	0	0	0	0	41	0	0	0	0	68
17:15	17:30	0	42	0	0	0	0	0	41	0	0	0	0	83
17:30	17:45	0	60	0	0	0	0	0	33	0	0	0	0	93
17:45	18:00	0	50	0	0	0	0	0	26	0	0	0	0	76
18:00	18:15	0	46	0	0	0	0	0	24	0	0	0	0	70
18:15	18:30	0	39	0	0	0	0	0	19	0	0	0	0	58
18:30	18:45	0	27	0	0	0	0	0	19	0	0	0	0	46
18:45	19:00	0	21	0	0	0	0	0	17	0	0	0	0	38
<b>TOTAL</b>		0	1702	0	0	0	0	0	1633	0	0	0	0	3335
<b>EST. 24 HR</b>		0	2042	0	0	0	0	0	1960	0	0	0	0	4002

**TRAFFIC COUNT: MAFOLOPARK**  
**INTERSECTION: MAFOLOPARK TWO WAY TRAFFIC COUNT**  
**PEAK HOUR PERIOD: 13 HOUR**  
**DATE: TUESDAY 5 MAY 2009**

**TAXIS**

TRAFFIC MOVEMENTS														
TIME		1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
Start	End													
06:00	06:15	0	5	0	0	0	0	0	21	0	0	0	0	26
06:15	06:30	0	10	0	0	0	0	0	18	0	0	0	0	28
06:30	06:45	0	13	0	0	0	0	0	20	0	0	0	0	33
06:45	07:00	0	10	0	0	0	0	0	15	0	0	0	0	25
07:00	07:15	0	16	0	0	0	0	0	26	0	0	0	0	42
07:15	07:30	0	12	0	0	0	0	0	17	0	0	0	0	29
07:30	07:45	0	11	0	0	0	0	0	22	0	0	0	0	33
07:45	08:00	0	19	0	0	0	0	0	19	0	0	0	0	38
08:00	08:15	0	17	0	0	0	0	0	21	0	0	0	0	38
08:15	08:30	0	14	0	0	0	0	0	17	0	0	0	0	31
08:30	08:45	0	11	0	0	0	0	0	20	0	0	0	0	31
08:45	09:00	0	14	0	0	0	0	0	25	0	0	0	0	39
09:00	09:15	0	11	0	0	0	0	0	22	0	0	0	0	33
09:15	09:30	0	11	0	0	0	0	0	22	0	0	0	0	33
09:30	09:45	0	15	0	0	0	0	0	17	0	0	0	0	32
09:45	10:00	0	15	0	0	0	0	0	21	0	0	0	0	36
10:00	10:15	0	16	0	0	0	0	0	17	0	0	0	0	33
10:15	10:30	0	16	0	0	0	0	0	12	0	0	0	0	28
10:30	10:45	0	14	0	0	0	0	0	7	0	0	0	0	21
10:45	11:00	0	10	0	0	0	0	0	19	0	0	0	0	29
11:00	11:15	0	11	0	0	0	0	0	12	0	0	0	0	23
11:15	11:30	0	12	0	0	0	0	0	11	0	0	0	0	23
11:30	11:45	0	10	0	0	0	0	0	16	0	0	0	0	26
11:45	12:00	0	12	0	0	0	0	0	10	0	0	0	0	22
12:00	12:15	0	8	0	0	0	0	0	15	0	0	0	0	23
12:15	12:30	0	11	0	0	0	0	0	10	0	0	0	0	21
12:30	12:45	0	11	0	0	0	0	0	9	0	0	0	0	20
12:45	13:00	0	15	0	0	0	0	0	15	0	0	0	0	30
13:00	13:15	0	11	0	0	0	0	0	18	0	0	0	0	29
13:15	13:30	0	10	0	0	0	0	0	5	0	0	0	0	15
13:30	13:45	0	14	0	0	0	0	0	15	0	0	0	0	29
13:45	14:00	0	19	0	0	0	0	0	11	0	0	0	0	30
14:00	14:15	0	15	0	0	0	0	0	10	0	0	0	0	25
14:15	14:30	0	14	0	0	0	0	0	9	0	0	0	0	23
14:30	14:45	0	13	0	0	0	0	0	9	0	0	0	0	22
14:45	15:00	0	13	0	0	0	0	0	16	0	0	0	0	29
15:00	15:15	0	12	0	0	0	0	0	18	0	0	0	0	30
15:15	15:30	0	29	0	0	0	0	0	17	0	0	0	0	46
15:30	15:45	0	5	0	0	0	0	0	21	0	0	0	0	26
15:45	16:00	0	17	0	0	0	0	0	12	0	0	0	0	29
16:00	16:15	0	18	0	0	0	0	0	10	0	0	0	0	28
16:15	16:30	0	15	0	0	0	0	0	13	0	0	0	0	28
16:30	16:45	0	18	0	0	0	0	0	13	0	0	0	0	31
16:45	17:00	0	22	0	0	0	0	0	7	0	0	0	0	29
17:00	17:15	0	15	0	0	0	0	0	18	0	0	0	0	33
17:15	17:30	0	18	0	0	0	0	0	5	0	0	0	0	23
17:30	17:45	0	16	0	0	0	0	0	16	0	0	0	0	32
17:45	18:00	0	25	0	0	0	0	0	9	0	0	0	0	34
18:00	18:15	0	27	0	0	0	0	0	12	0	0	0	0	39
18:15	18:30	0	25	0	0	0	0	0	9	0	0	0	0	34
18:30	18:45	0	18	0	0	0	0	0	7	0	0	0	0	25
18:45	19:00	0	12	0	0	0	0	0	7	0	0	0	0	19
<b>TOTAL</b>		0	751	0	0	0	0	0	763	0	0	0	0	1514
<b>EST. 24 HR</b>		0	901	0	0	0	0	0	916	0	0	0	0	1817

TRAFFIC COUNT: MAFOLOPARK  
 INTERSECTION: MAFOLOPARK TWO WAY TRAFFIC COUNT  
 PEAK HOUR PERIOD: 13 HOUR

DATE: TUESDAY 5 MAY 2009

HEAVY VEHICLES

TIME		TRAFFIC MOVEMENTS												TOTAL
Start	End	1	2	3	4	5	6	7	8	9	10	11	12	
06:00	06:15	0	2	0	0	0	0	0	2	0	0	0	0	4
06:15	06:30	0	3	0	0	0	0	0	2	0	0	0	0	5
06:30	06:45	0	4	0	0	0	0	0	6	0	0	0	0	10
06:45	07:00	0	6	0	0	0	0	0	3	0	0	0	0	9
07:00	07:15	0	4	0	0	0	0	0	1	0	0	0	0	5
07:15	07:30	0	1	0	0	0	0	0	2	0	0	0	0	3
07:30	07:45	0	4	0	0	0	0	0	6	0	0	0	0	10
07:45	08:00	0	4	0	0	0	0	0	8	0	0	0	0	12
08:00	08:15	0	3	0	0	0	0	0	2	0	0	0	0	5
08:15	08:30	0	3	0	0	0	0	0	4	0	0	0	0	7
08:30	08:45	0	4	0	0	0	0	0	5	0	0	0	0	9
08:45	09:00	0	4	0	0	0	0	0	4	0	0	0	0	8
09:00	09:15	0	3	0	0	0	0	0	3	0	0	0	0	6
09:15	09:30	0	6	0	0	0	0	0	6	0	0	0	0	12
09:30	09:45	0	2	0	0	0	0	0	7	0	0	0	0	9
09:45	10:00	0	1	0	0	0	0	0	4	0	0	0	0	5
10:00	10:15	0	3	0	0	0	0	0	3	0	0	0	0	6
10:15	10:30	0	3	0	0	0	0	0	3	0	0	0	0	6
10:30	10:45	0	2	0	0	0	0	0	8	0	0	0	0	10
10:45	11:00	0	2	0	0	0	0	0	5	0	0	0	0	7
11:00	11:15	0	4	0	0	0	0	0	5	0	0	0	0	9
11:15	11:30	0	4	0	0	0	0	0	6	0	0	0	0	10
11:30	11:45	0	4	0	0	0	0	0	5	0	0	0	0	9
11:45	12:00	0	5	0	0	0	0	0	5	0	0	0	0	10
12:00	12:15	0	3	0	0	0	0	0	2	0	0	0	0	5
12:15	12:30	0	5	0	0	0	0	0	2	0	0	0	0	7
12:30	12:45	0	5	0	0	0	0	0	5	0	0	0	0	10
12:45	13:00	0	5	0	0	0	0	0	4	0	0	0	0	9
13:00	13:15	0	1	0	0	0	0	0	3	0	0	0	0	4
13:15	13:30	0	4	0	0	0	0	0	3	0	0	0	0	7
13:30	13:45	0	3	0	0	0	0	0	2	0	0	0	0	5
13:45	14:00	0	8	0	0	0	0	0	3	0	0	0	0	11
14:00	14:15	0	5	0	0	0	0	0	2	0	0	0	0	7
14:15	14:30	0	2	0	0	0	0	0	2	0	0	0	0	4
14:30	14:45	0	3	0	0	0	0	0	4	0	0	0	0	7
14:45	15:00	0	5	0	0	0	0	0	4	0	0	0	0	9
15:00	15:15	0	6	0	0	0	0	0	4	0	0	0	0	10
15:15	15:30	0	2	0	0	0	0	0	5	0	0	0	0	7
15:30	15:45	0	8	0	0	0	0	0	2	0	0	0	0	10
15:45	16:00	0	1	0	0	0	0	0	2	0	0	0	0	3
16:00	16:15	0	3	0	0	0	0	0	3	0	0	0	0	6
16:15	16:30	0	8	0	0	0	0	0	4	0	0	0	0	12
16:30	16:45	0	3	0	0	0	0	0	3	0	0	0	0	6
16:45	17:00	0	8	0	0	0	0	0	4	0	0	0	0	12
17:00	17:15	0	6	0	0	0	0	0	2	0	0	0	0	8
17:15	17:30	0	6	0	0	0	0	0	4	0	0	0	0	10
17:30	17:45	0	12	0	0	0	0	0	3	0	0	0	0	15
17:45	18:00	0	8	0	0	0	0	0	3	0	0	0	0	11
18:00	18:15	0	7	0	0	0	0	0	2	0	0	0	0	9
18:15	18:30	0	11	0	0	0	0	0	3	0	0	0	0	14
18:30	18:45	0	8	0	0	0	0	0	2	0	0	0	0	10
18:45	19:00	0	4	0	0	0	0	0	2	0	0	0	0	6
<b>TOTAL</b>		0	231	0	0	0	0	0	189	0	0	0	0	420
<b>EST. 24 HR</b>		0	277	0	0	0	0	0	227	0	0	0	0	504

TRAFFIC COUNT:  
 INTERSECTION:  
 PEAK HOUR PERIOD:  
 DATE:

MAFOLOPARK  
 MAFOLOPARK TWO WAY TRAFFIC COUNT  
 13 HOUR  
 TUESDAY 5 MAY 2009

All VEHICLES

TIME		MOVEMENT NUMBER												TOTAL
BEGIN		1	2	3	4	5	6	7	8	9	10	11	12	
06:00	06:15	0	59	0	0	0	0	0	40	0	0	0	0	99
06:15	06:30	0	63	0	0	0	0	0	56	0	0	0	0	119
06:30	06:45	0	55	0	0	0	0	0	62	0	0	0	0	117
06:45	07:00	0	69	0	0	0	0	0	40	0	0	0	0	109
07:00	07:15	0	62	0	0	0	0	0	67	0	0	0	0	129
07:15	07:30	0	40	0	0	0	0	0	55	0	0	0	0	95
07:30	07:45	0	49	0	0	0	0	0	65	0	0	0	0	114
07:45	08:00	0	56	0	0	0	0	0	60	0	0	0	0	116
08:00	08:15	0	43	0	0	0	0	0	55	0	0	0	0	98
08:15	08:30	0	41	0	0	0	0	0	46	0	0	0	0	87
08:30	08:45	0	39	0	0	0	0	0	51	0	0	0	0	90
08:45	09:00	0	57	0	0	0	0	0	53	0	0	0	0	110
09:00	09:15	0	47	0	0	0	0	0	52	0	0	0	0	99
09:15	09:30	0	45	0	0	0	0	0	58	0	0	0	0	103
09:30	09:45	0	39	0	0	0	0	0	52	0	0	0	0	91
09:45	10:00	0	45	0	0	0	0	0	57	0	0	0	0	102
10:00	10:15	0	41	0	0	0	0	0	41	0	0	0	0	82
10:15	10:30	0	41	0	0	0	0	0	39	0	0	0	0	80
10:30	10:45	0	39	0	0	0	0	0	40	0	0	0	0	79
10:45	11:00	0	40	0	0	0	0	0	50	0	0	0	0	90
11:00	11:15	0	37	0	0	0	0	0	45	0	0	0	0	82
11:15	11:30	0	37	0	0	0	0	0	49	0	0	0	0	86
11:30	11:45	0	28	0	0	0	0	0	48	0	0	0	0	76
11:45	12:00	0	53	0	0	0	0	0	36	0	0	0	0	89
12:00	12:15	0	42	0	0	0	0	0	44	0	0	0	0	86
12:15	12:30	0	48	0	0	0	0	0	39	0	0	0	0	87
12:30	12:45	0	48	0	0	0	0	0	44	0	0	0	0	92
12:45	13:00	0	55	0	0	0	0	0	47	0	0	0	0	102
13:00	13:15	0	40	0	0	0	0	0	39	0	0	0	0	79
13:15	13:30	0	40	0	0	0	0	0	37	0	0	0	0	77
13:30	13:45	0	54	0	0	0	0	0	44	0	0	0	0	98
13:45	14:00	0	41	0	0	0	0	0	36	0	0	0	0	77
14:00	14:15	0	41	0	0	0	0	0	36	0	0	0	0	77
14:15	14:30	0	38	0	0	0	0	0	36	0	0	0	0	74
14:30	14:45	0	49	0	0	0	0	0	41	0	0	0	0	90
14:45	15:00	0	59	0	0	0	0	0	69	0	0	0	0	128
15:00	15:15	0	58	0	0	0	0	0	80	0	0	0	0	138
15:15	15:30	0	67	0	0	0	0	0	55	0	0	0	0	122
15:30	15:45	0	52	0	0	0	0	0	77	0	0	0	0	129
15:45	16:00	0	50	0	0	0	0	0	65	0	0	0	0	115
16:00	16:15	0	54	0	0	0	0	0	56	0	0	0	0	110
16:15	16:30	0	53	0	0	0	0	0	69	0	0	0	0	122
16:30	16:45	0	71	0	0	0	0	0	78	0	0	0	0	149
16:45	17:00	0	69	0	0	0	0	0	52	0	0	0	0	121
17:00	17:15	0	48	0	0	0	0	0	61	0	0	0	0	109
17:15	17:30	0	66	0	0	0	0	0	50	0	0	0	0	116
17:30	17:45	0	88	0	0	0	0	0	52	0	0	0	0	140
17:45	18:00	0	83	0	0	0	0	0	38	0	0	0	0	121
18:00	18:15	0	80	0	0	0	0	0	38	0	0	0	0	118
18:15	18:30	0	75	0	0	0	0	0	31	0	0	0	0	106
18:30	18:45	0	53	0	0	0	0	0	28	0	0	0	0	81
18:45	19:00	0	37	0	0	0	0	0	26	0	0	0	0	63
		0	2684	0	0	0	0	0	2585	0	0	0	0	5269
EST. 24 HR		0	3221	0	0	0	0	0	3102	0	0	0	0	6323

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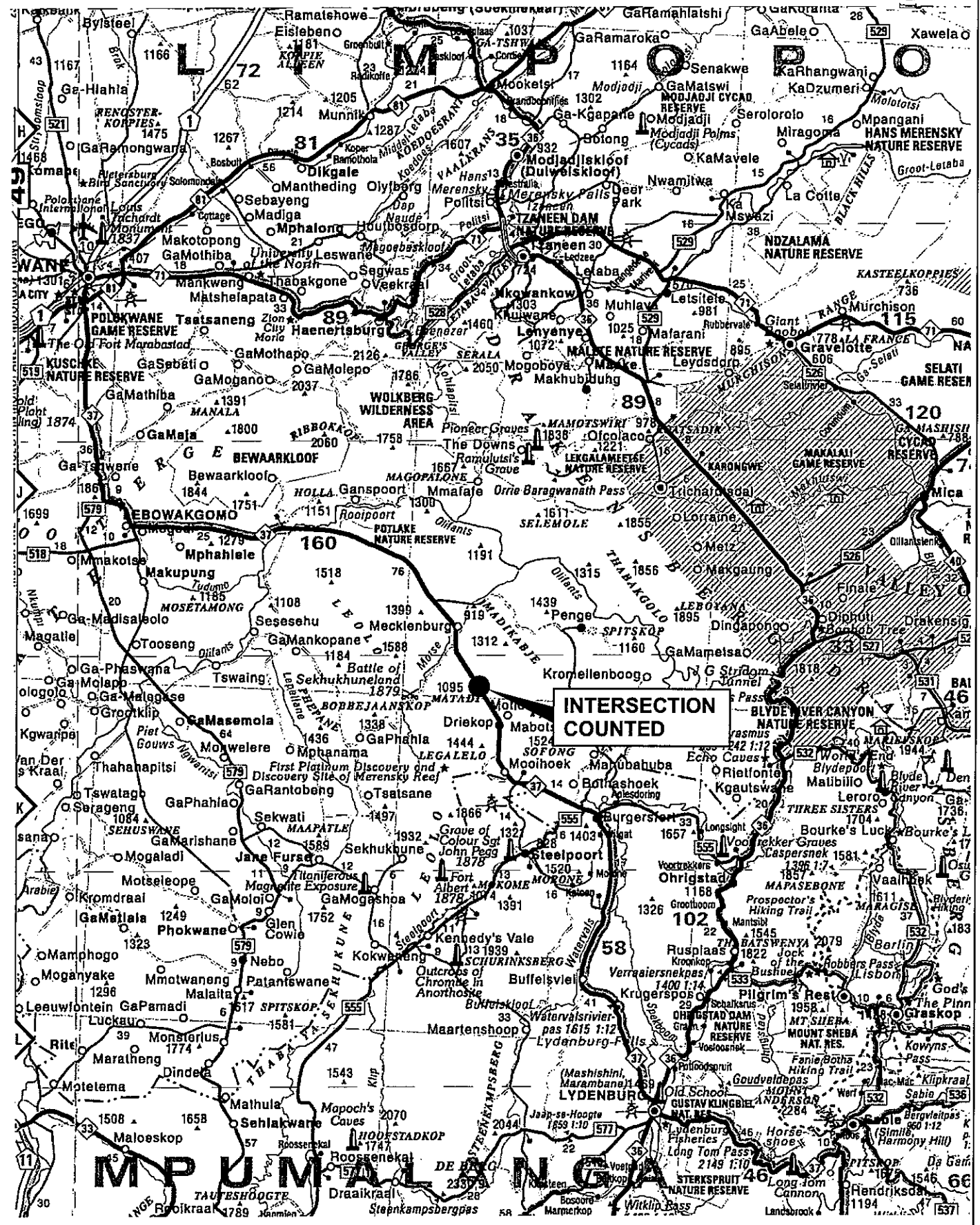
**Title:** Mafolopark Polokwane R37 Traffic Count:  
Traffic Count at the intersection of:  
120km on R37 from Polokwane to Burgersfort 40km

**Project Team:** H Schreurs Pr Eng  
Marika Bodde

**Project no.:** 326582

**Date:** May 2009

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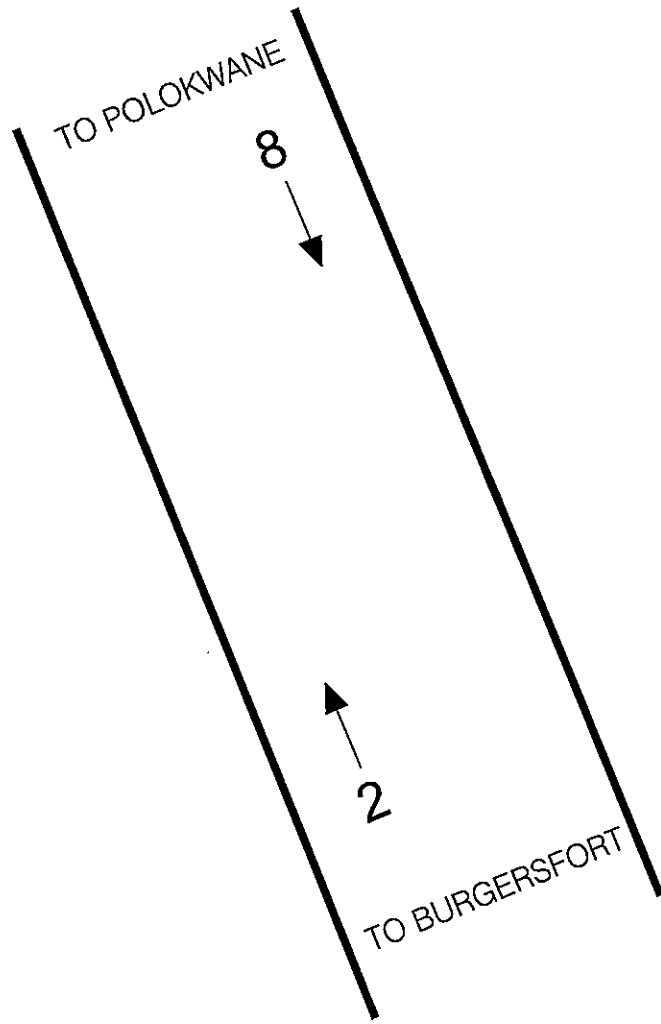


Checked by : H Schreurs Pr Eng

326582 Mafoelopark Polokwane R37 Locality Plan 1.cdr



Project:	Figure:	No.
MAFOLOPARK POLOKWANE R37	LOCALITY PLAN	1



Checked by : H Schreurs Pr Eng

326582\_Mafolopark Polokwane R37\_Traffic movement\_2.cdr



Project:

MAFOLOPARK POLOKWANE R37

Figure:

TRAFFIC MOVEMENT

No.

2