

## **CHAPTER SIX: TRAFFIC IMPACT ASSESSMENT ADDENDUM**

### **6.1 INTRODUCTION**

#### **6.1.1 Background**

This Chapter of the report has been prepared as an Addendum to the *Traffic Impact Assessment (TIA) for the Proposed Development on Erf 1082 Fairview, Port Elizabeth* (dated 28 September 2010), which was prepared by SSI (company name has subsequently changed to Royal HaskoningDHV) and subsequently submitted to the Nelson Mandela Bay Municipality (NMBM) for approval.

The 2010 TIA was prepared for the proposed development of residential, light industrial / wholesale and retail land uses on Erf 1082 in Fairview, Port Elizabeth, as shown on the locality plan in Figure 6.1. The site (Erf 1082), which is partially developed, is located on the north-east corner of the Circular Drive / Willow Road intersection. Figure 6.2 presents the development's latest overall Site Development Plan (SDP), dated May 2014 as well as the subject sites, Phases 5 and 6, highlighted.

Since the completion of the 2010 TIA, an update was prepared in August 2014 in the form of an additional appendix (Appendix F), which focussed on the consolidation of erven in Phase 1 of the development, as well as the phased implementation of road upgrades.

#### **6.1.2 Purpose of the Report**

The Client has recently commenced an Amendment Application process to the existing Environmental Authorisation (ECm1/387/M/07-169) for the proposed rezoning of Phases 5 and 6 (only) of the Erf 1082 Fairview development. The proposed land use change is from Residential 2 (townhouses), Private Open Space and Special Purposes (Access) to Special Purposes (high tech/ industrial business park) and Transportation 1 (roads), as shown in Figure 6.3.

With consideration of the development's TIA, the EIA Amendment Application process requires that the following aspects be considered from a traffic and transportation perspective:

- Assessment of all impacts related to the proposed change of land use;
- Advantages and disadvantages associated with the proposed change; and
- Measures to ensure avoidance, management and mitigation of impacts associated with the proposed change.

This report, as an addendum to the 2010 TIA, has been prepared to meet the above-mentioned requirements. The study focuses on an assessment and comparison of the vehicle trip generation for the proposed rezoning; comment on the traffic characteristics associated with the proposed change; and the assessment and rating of traffic impacts and mitigation measures associated with the proposed rezoning in accordance with Appendix 6 of the 2014 EIA Regulations (as amended).

#### **6.1.3 Study Area**

The study is focussed on Phases 5 and 6 only, within Erf 1082 Fairview, as shown in Figure 6.2 and Figure 6.3.

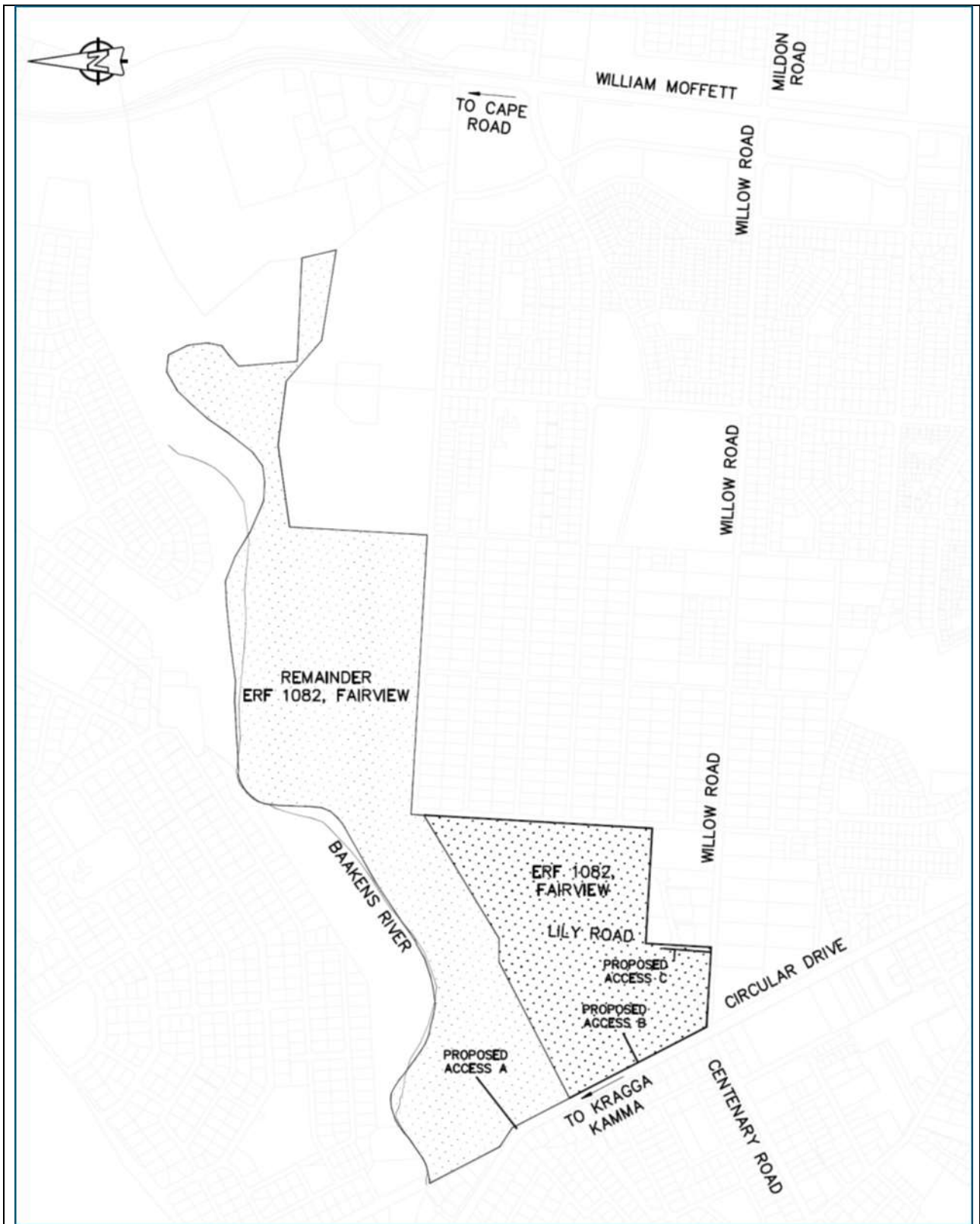


Figure 6.1: 2010 TIA Locality Plan and Study Area (Source: SSI, 2010).



Figure 6.2: Site Development Plan: Erf 1082 Fairview (Source: Metroplan). Phases 5 and 6 indicated with red circle.



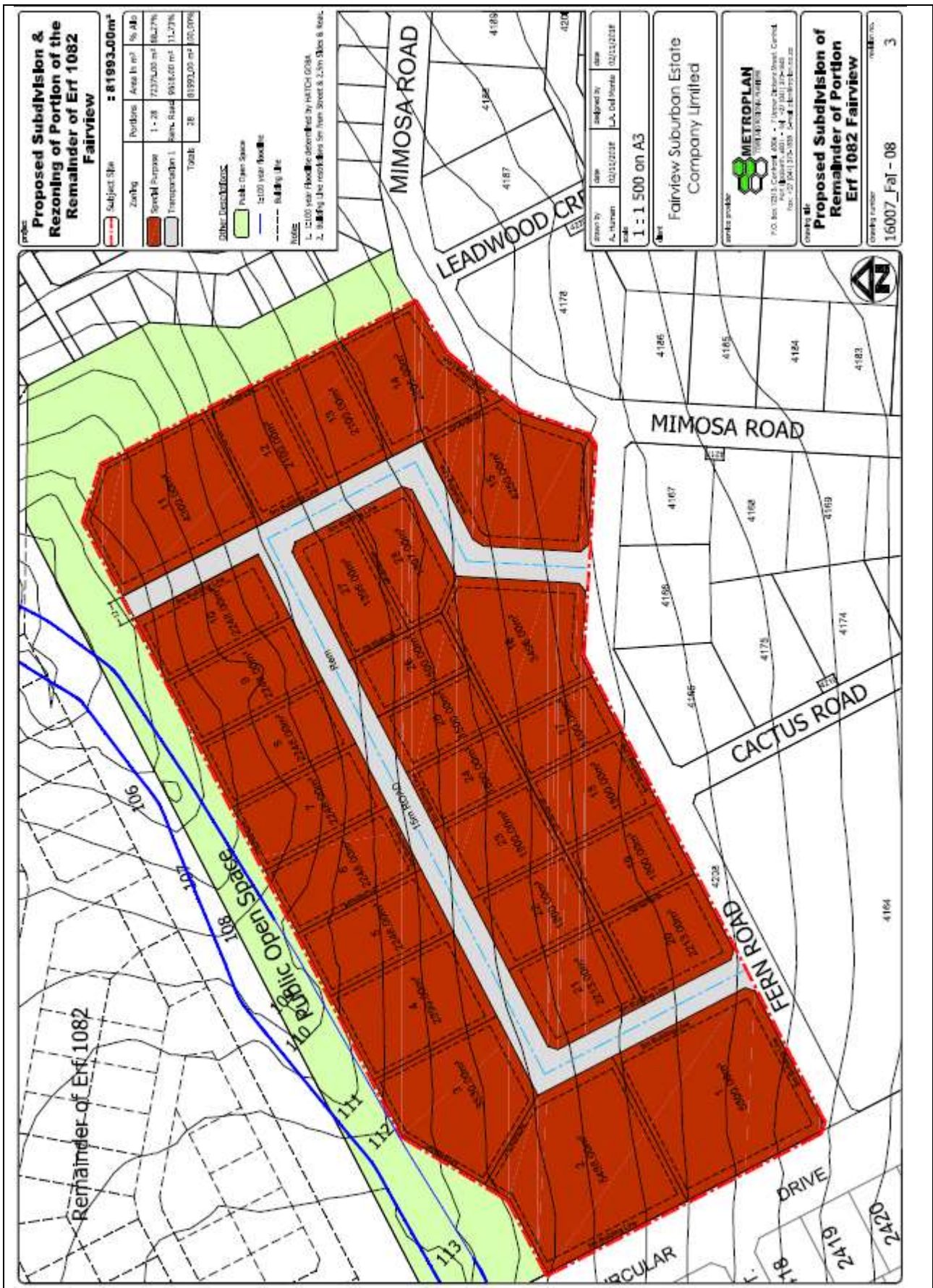


Figure 6.3: Study Area: Phase 5 & 6 of Erf 1082 Fairview, Rev 3, 02/11/2018 (Source: Metroplan).

## 6.2 STUDY METHODOLOGY

This study was approached and conducted in a systematic manner, as indicated by the following adopted methodology:

- Collection and analysis of relevant information (land use information; existing road layout; traffic studies relevant to the development; and any previous relevant correspondence).
- Liaison with the Client to confirm the development parameters and proposed changes.
- Assess vehicle trip generation for the proposed rezoning (calculation and comparison with the 2010 TIA).
- Comment on traffic characteristics of the proposed rezoning (identify advantages / disadvantages and mitigation measures).
- Assess and rate traffic impacts and mitigation measures associated with the proposed rezoning (Appendix 6 of the 2014 EIA Regulations).
- Compile a report, as an addendum to the 2010 TIA report, on the findings, conclusions and recommendations of the study.

### 6.2.1 Proposed Changes

Figure 6.3 presents the proposed rezoning of Phases 5 and 6 of the Erf 1082 Fairview development from Residential 2 to Special Purpose.

According to the 2014 SDP (Figure 6.2), each of these phases originally consisted of the following land-use zoning:

- **Phase 5** - Residential 2 (28 073m<sup>2</sup>); Private Open Space (2 322m<sup>2</sup>); Special Purpose: Access (6 506m<sup>2</sup>)
- **Phase 6** - Residential 2 (34 416m<sup>2</sup>); Private Open Space (2 917m<sup>2</sup>); Special Purpose: Access (7 712m<sup>2</sup>)
- Total Residential 2 land-use extent for Phase 5 and 6 = 62 489m<sup>2</sup>

The proposed rezoning involves the introduction of the following land-use zoning, which replaces the above:

- Special Purpose: high tech/ industrial business park (72 375m<sup>2</sup>); Transportation 1 (9 618m<sup>2</sup>)

The proposed (high tech/ industrial business park) land-use consists of 28 individual erven totalling 72 375 m<sup>2</sup>. This will be 9 886m<sup>2</sup> larger in size than the original Residential 2 land-use, which consisted of 109 individual erven. The increase in developable area is primarily due to a reduction in the road reserve space and private open space associated with the residential erven. The original development footprint for Phase 5 and 6 remains the same as assessed in the original EIA (8.19ha). The residential road layout internal to Phases 5 and 6 will be changed in accordance with the new erf layout, with two access intersections proposed on Fern Road (refer to **Figure 6.3**). The road reserve width will also be increased from 10m to 15m.

## 6.3 TRIP GENERATION

This chapter presents a comparison of the peak hour vehicle trip generation characteristics for the proposed rezoning change from Residential 2 to Special Purpose in Phases 5 and 6 of the Erf 1082 Fairview development.

### 6.3.1 2010 TIA

In the 2010 TIA, the Department of Transport's (DOT) guideline document *South African Trip Generation Rates* (RR92/ 228, June 1995) was used to calculate the peak hour vehicle trip

generation for the proposed development. The vehicle trip generation information relevant to the Residential 2 land-use in Phases 5 and 6 is summarised in Table 6.1.

Table 6.1: Phases 5 and 6: Residential Peak Hour Vehicle Trip Generation (Source: SSI, 2010).

Land-Use	No. of Units/ GLA	Peak Hour Trip Generation Rate	No. of Vehicle Trips	Weekday Peak			
				AM		PM	
				In	Out	In	Out
Phase 5: Residential 2 (Cluster Housing)	49 units	1.1 / unit	54	14	40	40	14
Phase 6: Residential 2 (Cluster Housing)	60 units	1.1 / unit	66	17	49	49	17
<b>Totals</b>			<b>120</b>	<b>31</b>	<b>89</b>	<b>89</b>	<b>31</b>

It was calculated that the Residential 2 land-use in Phases 5 and 6 would generate a total of 120 vehicle trips in both the weekday AM and PM peak hours, based on the trip generation rate for Residential: Cluster Housing. A 75:25 inbound: outbound split was applied to this land use, as recommended by the DOT.

### 6.3.2 Proposed Rezoning

The calculation of the peak hour vehicle trip generation for the proposed Special Purpose erven can be approached in two ways, as explained below.

The 2010 TIA based the calculation of the gross leasable area (GLA) and the vehicle trip generation characteristics for the development's light industrial land-use on the GLA and traffic movements observed at the existing businesses located along Willow Road (Erf 3977, 3976, 4018, 3973, 3972 and 3971). These existing businesses were (and still are) of a similar land-use type and therefore serve as good localised example.

According to the 2010 TIA, the average building coverage of the existing businesses was found to be approximately 30.5%. Applying the same value to the proposed Special Purpose erven, which totals 72 375m<sup>2</sup> in size, the total GLA is estimated to be approximately 22 075m<sup>2</sup>. The 2010 TIA calculated the weekday AM and PM peak hour vehicle trip generation rates as being 1.38 and 1.18 trips/100m<sup>2</sup> GLA, respectively, with a 60:40 inbound : outbound split. It should be noted that subsequent changes to the applicable Town Planning Zoning Scheme may allow erf coverages in excess of the 30.5% average building coverage measured by the 2010 TIA, in which case the developable GLA and generated vehicle trips could be higher than what is calculated by this study. Alternatively, as a second approach, the vehicle trip generation rate (0.9 trips/100m<sup>2</sup> GLA) and directional split (75:25) for an industrial land-use contained in the DOT's guideline document *South African Trip Generation Rates* (RR92/ 228, June 1995) can be used, as was done for the Residential 2 land-use in the preceding section.

The peak hour vehicle trip generation for the proposed Special Purpose erven has been calculated using both methods discussed above, with the results shown in Table 6.2.

Table 6.2: Special Purposes Land-Use: Estimated Peak Hour Vehicle Trip Generation.

Land-Use	No. of Units / GLA	Peak Hour Trip Generation Rate	No. of Vehicle Trips	Weekday Peak			
				AM		PM	
				In	Out	In	Out
<b>Approach 1: Trip Generation based on existing businesses in study area, as per 2010 TIA</b>							
Special Purpose: high tech/ industrial business park	22 075m <sup>2</sup>	Weekday AM 1.38 / 100m <sup>2</sup>	305	183	122	-	-
		Weekday PM 1.18 / 100m <sup>2</sup>	260	-	-	104	156
Totals				183	122	104	156
<b>Approach 2: Trip Generation based on South African Trip Generation Rates (RR92/ 228, June 1995)</b>							
Special Purpose: high tech/ industrial business park	22 075m <sup>2</sup>	0.9 / 100m <sup>2</sup>	199	149	50	50	149
Totals				149	50	50	149

It is concluded that the proposed Special Purpose erven will generate a total number of vehicle trips ranging from 199 vehicles to 305 vehicles during the weekday peak traffic hours, depending on the calculation approach adopted, for a GLA of 22 075m<sup>2</sup> and a 30.5% coverage. This value range is considered to represent best case (199 trips) and worst case (305 trips) scenarios.

### 6.3.3 Comparison

A comparison of the peak hour vehicle trip generation results for the Residential 2 land-use in Phases 5 and 6 versus the newly proposed Special Purpose erven yielded the following findings, as supported by Table 6.3:

- The Residential 2 land-use would generate a total of 120 vehicle trips in both the weekday AM and PM peak hours.
- The Special Purpose erven would generate a total number of vehicle trips ranging from 199 vehicles to 305 vehicles during the weekday peak traffic hours, depending on the calculation approach adopted, for a GLA of 22 075m<sup>2</sup> and a 30.5% coverage.
- In a 'worst case' scenario (calculation approach 1), the Special Purpose erven would generate 185 more (+154%) vehicles during the weekday AM peak, and 140 more (+117%) vehicles during the weekday PM peak, in comparison to the Residential 2 erven.
- In a 'best case' scenario (calculation approach 2), the Special Purpose erven would generate 79 more (+66%) vehicles during the weekday peak traffic hours than the Residential 2 erven.
- The directional split of vehicle traffic for both land-use types is 75:25 inbound : outbound during weekday peak traffic hours.
- The proposed change in land-use in Phases 5 and 6, from Residential 2 to Special Purpose, will therefore lead to an increased vehicle trip generation to/from this part of the development.

Table 6.3: Peak Hour Vehicle Trip Generation Comparison.

Weekday Peak	Residential 2 Land-use: Vehicle Trips from 2010 TIA	No. of Vehicle Trips Estimated			
		Special Purpose Land-use (Approach 1)	Change in values compared to Res 2	Special Purpose Land-use (Approach 2)	Change in values compared to Res 2
AM	120	305	+185 (+154%)	199	+79 (+66%)
PM	120	260	+140 (+117%)	199	+79 (+66%)

## 6.4 ASSESSMENT OF PROPOSED CHANGES

Based on the preceding information, this section considers the advantages, disadvantages and mitigation measures associated with the traffic characteristics of the proposed rezoning change from Residential 2 to Special Purpose in Phases 5 and 6 of the Erf 1082 Fairview development.

### 6.4.1 Advantages

The following advantages associated with the proposed change have been identified:

- Both Circular Drive and Willow Road have been upgraded recently to accommodate the future traffic associated with the Erf 1082 Fairview development, as recommended by the 2010 TIA. Both these roads have been widened, along with intersection upgrades, and the introduction of double lane traffic circles at the Circular Drive / Fern Road and Willow Road / Mimosa Road intersections.
- The directional split of vehicle traffic for both land-use types (residential or special purpose) is the same during weekday peak traffic hours (i.e. 75:25 inbound: outbound).
- Two access intersections are proposed on Fern Road, although the position of the western access intersection has moved west from Cactus Road and is now located midway between Circular Drive and Cactus Road.

### 6.4.2 Disadvantages

The following disadvantages associated with the proposed change have been identified:

- The proposed change in land-use will result in increased vehicle trips (ranging from 79 to 185 more vehicles) travelling to/from this part of the development during weekday peak traffic hours.
- It is anticipated that the Special Purpose land-use will attract more heavy vehicle traffic (e.g. trucks and goods vehicles) to the area, in comparison to the Residential 2 land-use, which has to be taken into consideration by the road design standards.

### 6.4.3 Mitigation Measures

The following mitigation measures have been considered as a result of the proposed change in land-use:

- Inspection of the SIDRA capacity analysis results contained in the 2010 TIA for the 2020 ultimate scenario (all Erf 1082 land-uses fully developed) indicate that the newly upgraded traffic circles at Circular Drive / Fern Road (Access B) and Willow Road / Mimosa Road would operate at a Level of Service (LOS) A during the weekday AM and PM peak traffic hours. The results therefore indicate that these traffic circles will operate with **minimal traffic congestion and delay**, and that spare capacity will be available in the 2020 ultimate scenario.
- Given the development's internal road layout and access points, traffic travelling to/from the proposed Special Purpose erven will make use of the Circular Drive / Fern Road and Willow Road / Mimosa Road traffic circles. In a 'worst case' scenario, when it is assumed that 185 more vehicles will travel to/from the Light Industrial erven during the weekday AM peak (refer to Section 3.3 Comparison), these trips can be split between the two traffic circles that provide access, resulting in approximately 93 additional trips at each traffic circle.

Considering the total volume of traffic analysed at each traffic circle in the 2010 TIA's 2020 ultimate scenario for the weekday AM peak (i.e. 1785 vehicles at Circular Drive / Fern Road and 2576 vehicles at Willow Road / Mimosa Road), the additional 93 trips are 5.2% and 3.6%, respectively, of the total volume of traffic forecasted, which should have a **minimal to low impact on the LOS of each traffic circle**.

The 2010 TIA indicates that in the 2010 base year the total volume of traffic for the weekday AM peak is 894 vehicles at the Circular Drive / Fern Road traffic circle, and 1351 vehicles at Willow Road / Mimosa Road traffic circle. This indicates the extent to which 2010 base year traffic



volumes have been increased to allow for normal background traffic growth and Erf 1082 Fairview development traffic.

Based on the information at hand, **no further upgrading is considered necessary to accommodate the additional traffic at the Circular Drive / Fern Road and Willow Road / Mimosa Road traffic circles.** This conclusion can be verified through more detailed traffic surveys and analysis work, should it be required in the future.

- Another factor that may affect the operation of the abovementioned traffic circles is the actual annual growth of background traffic on the surrounding road network, in comparison to the 3% annual growth rate applied in the 2010 TIA. A higher or lower actual traffic growth rate will affect the estimated volumes of background traffic on the road network analysed in the 2010 TIA's 2020 ultimate scenario. The actual annual growth rate of background traffic can be verified through new traffic surveys in the study area, should it be required in the future, followed by a comparison with the traffic data collected for the 2010 TIA.
- The residential road layout internal to Phases 5 and 6 is to be changed in accordance with the new erf layout for special purpose use, with two access intersections provided on Fern Road.
- The road reserve width is to be increased from 10m to 15m to accommodate a wider road width and the turning movements for larger heavy vehicles.

## 6.5 TRAFFIC IMPACT RATINGS

This section presents the assessment and rating of traffic impacts and mitigation measures associated with the proposed rezoning change from Residential 2 to Special Purpose (high tech/ industrial business park) in Phases 5 and 6 of the Erf 1082 Fairview development, in accordance with Appendix 6 of the 2014 EIA Regulations, as amended.

### 6.5.1 Potential Traffic Impacts

#### 6.5.1.1 Impact Rating System

The impact rating system used for the study is indicated in the tables below. The assessment of impacts is based on the professional judgement of traffic and transportation Specialists at Royal HaskoningDHV, fieldwork, and desk-top analysis. The significance of potential impacts that may result from the proposed rezoning has been determined to assist decision making processes related to this project.

The significance of an impact is defined as a combination of the consequence of the impact occurring and the probability that the impact will occur. The criteria used to determine impact consequences are presented in the following table.

Table 6.4: Criteria used to determine the Consequence of the Impact.

Rating	Definition of Rating	Score
<b>A. Extent– the area over which the impact will be experienced</b>		
None		0
Local	Confined to project or study area or part thereof (e.g. site)	1
Regional	The region, which may be defined in various ways, e.g. cadastral, catchment, topographic	2
(Inter) National	Nationally or beyond	3
<b>B. Intensity– the magnitude of the impact in relation to the sensitivity of the receiving environment</b>		
None		0
Low	Site-specific and wider natural and/or social functions and processes are negligibly altered	1
Medium	Site-specific and wider natural and/or social functions and processes continue albeit in a modified way	2

High	Site-specific and wider natural and/or social functions or processes are severely altered	3
<b>C. Duration– the time frame for which the impact will be experienced</b>		
None		0
Short-term	Up to 2 years	1
Medium-term	2 to 15 years	2
Long-term	More than 15 years	3

The combined score of these three criteria corresponds to a **Consequence Rating**, as follows:

Table 6.5: Method used to determine the Consequence Score.

Combined Score (A+B+C)	0 – 2	3 – 4	5	6	7	8 – 9
Consequence Rating	Not significant	Very low	Low	Medium	High	Very high

Once the consequence has been derived, the probability of the impact occurring will be considered using the probability classifications presented in the following table.

Table 6.6: Probability Classification.

Probability– the likelihood of the impact occurring	
Improbable	< 40% chance of occurring
Possible	40% - 70% chance of occurring
Probable	> 70% - 90% chance of occurring
Definite	> 90% chance of occurring

The overall significance of impacts will be determined by considering consequence and probability using the rating system prescribed in the following table.

Table 6.7: Impact Significance Ratings.

Significance Rating	Possible Impact Combinations		
	Consequence		Probability
Insignificant	Very Low	&	Improbable
	Very Low	&	Possible
	Very Low	&	Probable
	Very Low	&	Definite
Low	Low	&	Improbable
	Low	&	Possible
	Low	&	Probable
	Low	&	Definite
Medium	Medium	&	Improbable
	Medium	&	Possible
	Medium	&	Probable
	Medium	&	Definite
High	High	&	Improbable
	High	&	Possible
	High	&	Probable
	High	&	Definite
Very High	Very High	&	Improbable
	Very High	&	Possible
	Very High	&	Probable
	Very High	&	Definite

Finally, the impacts will also be considered in terms of their status (positive or negative impact) and the confidence in the ascribed impact significance rating. The system for considering impact status and confidence (in assessment) is laid out in the following table.

Table 6.8: Impact status and confidence classification.

Status of impact	
Indication whether the impact is adverse (negative) or beneficial (positive).	+ ve (positive – a 'benefit')
	– ve (negative – a 'cost')
Confidence of assessment	
The degree of confidence in predictions based on available information, Royal HaskoningDHV's judgment and/or specialist knowledge.	Low
	Medium
	High

The impact significance rating should be considered by authorities in their decision-making process based on the implications of ratings ascribed below:

- **Insignificant:** the potential impact is negligible and will not have an influence on the decision regarding the proposed activity/development.
- **Very Low:** the potential impact is very small and should not have any meaningful influence on the decision regarding the proposed activity/development.
- **Low:** the potential impact may not have any meaningful influence on the decision regarding the proposed activity/development.
- **Medium:** the potential impact should influence the decision regarding the proposed activity/development.
- **High:** the potential impact will affect the decision regarding the proposed activity/development.
- **Very High:** The proposed activity should only be approved under special circumstances.

Practicable mitigation measures will be recommended and impacts will be rated in the prescribed way both with and without the assumed effective implementation of mitigation measures. Mitigation measures will be classified as either:

- **Essential:** must be implemented and are non-negotiable; or
- **Optional:** must be shown to have been considered and sound reasons provided by the proponent, if not implemented.

#### 6.5.1.2 Traffic Impacts

As discussed in Section 3 and 4 above, the traffic characteristics of the proposed rezoning change from Residential 2 to Light Industrial in Phases 5 and 6 of the Erf 1082 Fairview development were assessed to determine the resulting impact during the weekday morning (AM) and afternoon (PM) peak traffic hours.

A general assessment has been undertaken of impacts on various factors as subsequently described. Note that this assessment does not deal with issues relating to noise, emissions, job creation or environmental matters, as the author is not qualified to comment on these issues.

The following potential impacts relating to traffic operations have been identified.

#### Operational Traffic Impacts

##### a) Increased traffic volumes on surrounding roads

The proposed change in land-use will lead to increased vehicle trips (ranging from 79 to 185 more vehicles) travelling to/from this part of the development during weekday peak traffic hours.

The most directly affected roads include Fern Road, Mimosa Road, Circular Drive and Willow Road.

b) Operational Capacity

Based on the SIDRA capacity analysis results contained in the 2010 TIA, no geometric upgrading is considered necessary to accommodate the resulting additional traffic at the Circular Drive / Fern Road and Willow Road / Mimosa Road traffic circles, from which access will be obtained to the proposed Special Purpose erven.

c) Access

Two access intersections are proposed on Fern Road, similar to the previous proposal, but with a slight change in the position of the western access intersection.

d) Traffic Safety

Possible collisions occurring because of increased vehicle movements and a higher presence of heavy vehicles (e.g. trucks and goods vehicles) on the surrounding road network.



### 6.5.2 Impact Assessment

This impact assessment has been carried out for the proposed rezoning change from Residential 2 to Special Purpose in Phases 5 and 6 of the Erf 1082 Fairview development.

#### 6.5.2.1 Operational Traffic Impacts

The following table summarises the assessment of the potential Operational Traffic Impacts identified and discussed in the preceding section.

Table 6.9: Impact Assessment: Operational Traffic Impacts.

Assessment		Prior Mitigation									Post Mitigation										
Impact Description	Phase	Extent	Intensity	Duration	Combined Score	Consequence Rating	Probability	Significance	Confidence	Status (+0-)	Mitigation Measures	Classification	Extent	Intensity	Duration	Combined Score	Consequence Rating	Probability	Significance Rating	Confidence	Status (+0-)
Increased traffic volumes on surrounding roads	Operational	1 – Local	1 – Low	3 – Long Term	5	Low	Definite	Low	High	- ve	Both Circular Drive and Willow Road have recently been upgraded to accommodate the future traffic associated with the Erf 1082 Fairview development, as recommended by the 2010 TIA. Both these roads have been widened, along with intersection upgrades, and the introduction of double lane traffic circles at the Fern Road and Mimosa	Optional	1 – Local	1 – Low	3 – Long term	5	Low	Definite	Low	High	+ ve

											Road intersections. No further upgrading is considered necessary to accommodate the increased traffic volumes.										
Operational Capacity	Operational	1 – Local	1 – Low	3 – Long Term	5	Low	Definite	Low	High	- ve	No geometric upgrading is considered necessary to accommodate the resulting additional traffic at the Circular Drive / Fern Road and Willow Road / Mimosa Road traffic circles, from which access will be obtained to the proposed Special Purpose erven.	Optional	1 – Local	1 – Low	3 – Long term	5	Low	Definite	Low	High	+ ve
Access	Operational	1 – Local	1 – Low	3 – Long Term	5	Low	Definite	Low	High	- ve	Two access intersections remain on Fern Road, similar to the previous proposal for Phases 5 and 6 in the 2010 TIA, but with a slight change in the position of the western access intersection	Essential	1 – Local	1 – Low	3 – Long term	5	Low	Definite	Low	High	+ ve
Traffic Safety	Operational	1 – Local	3 – High	3 – Long Term	7	High	Definite	High	High	- ve	Provided adequate transport infrastructure, including the maintenance thereof, in the	Essential	1 – Local	1 – Low	3 – Long term	5	Low	Definite	Low	High	+ ve

											vicinity of the site to ensure road user safety, e.g. sidewalks, pedestrian crossings, adequate roadway width, street lighting, public transport facilities and services, traffic law enforcement and speed monitoring, etc.									
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## 6.6 CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations of this study are summarised as follows:

- This study has been prepared in support of the Amendment Application to the Environmental Authorisation for the proposed rezoning of Phases 5 and 6 only of the Erf 1082 Fairview development from Residential 2 land-use to Special Purpose (high tech/ industrial business park) land-use.
- The proposed Special Purpose land-use, consisting of 28 individual erven, will be 9 886m<sup>2</sup> larger in size than the Residential 2 land-use originally proposed, which consisted of 109 individual erven. However, the original development footprint for Phase 5 and 6 remains the same as assessed in the original EIA (8.19ha).
- The Residential 2 land-use would generate a total of 120 vehicle trips in both the weekday AM and PM peak hours. The Special Purpose erven would generate a total number of vehicle trips ranging from 199 vehicles to 305 vehicles during the weekday peak traffic hours, depending on the calculation approach adopted, for a GLA of 22 075m<sup>2</sup> and a 30.5% coverage. The proposed change in land-use will therefore lead to an increased vehicle trip generation to/from this part of the development.
- Inspection of the SIDRA capacity analysis results contained in the 2010 TIA for the 2020 ultimate scenario (all Erf 1082 land-uses fully developed) indicate that the newly upgraded traffic circles at Circular Drive / Fern Road (Access B) and Willow Road / Mimosa Road would operate with minimal traffic congestion and delay, and that **adequate spare capacity should be available to accommodate the additional traffic generated by the proposed change in land-use. No further upgrading is therefore considered necessary at these two traffic circles.**
- The directional split of vehicle traffic for both land-use types is 75:25 inbound : outbound during weekday peak traffic hours.
- The residential road layout internal to Phases 5 and 6 will be changed in accordance with the new erf layout, with two access intersections proposed on Fern Road.
- The road reserve width will be increased from 10m to 15m to accommodate wider roads capable of accommodating the turning movements of larger heavy vehicles.
- All identified traffic impacts can be sufficiently mitigated.

## 6.7 REFERENCES

- Committee of Transport Officials (COTO), 2012. *South African Traffic Impact and Site Traffic Assessment Manual* (TMH 16). Pretoria: The South African National Roads Agency Limited.
- Department of Transport, 1995. *Manual for Traffic Impact Studies* (RR 93/635). Pretoria: Department of Transport.
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