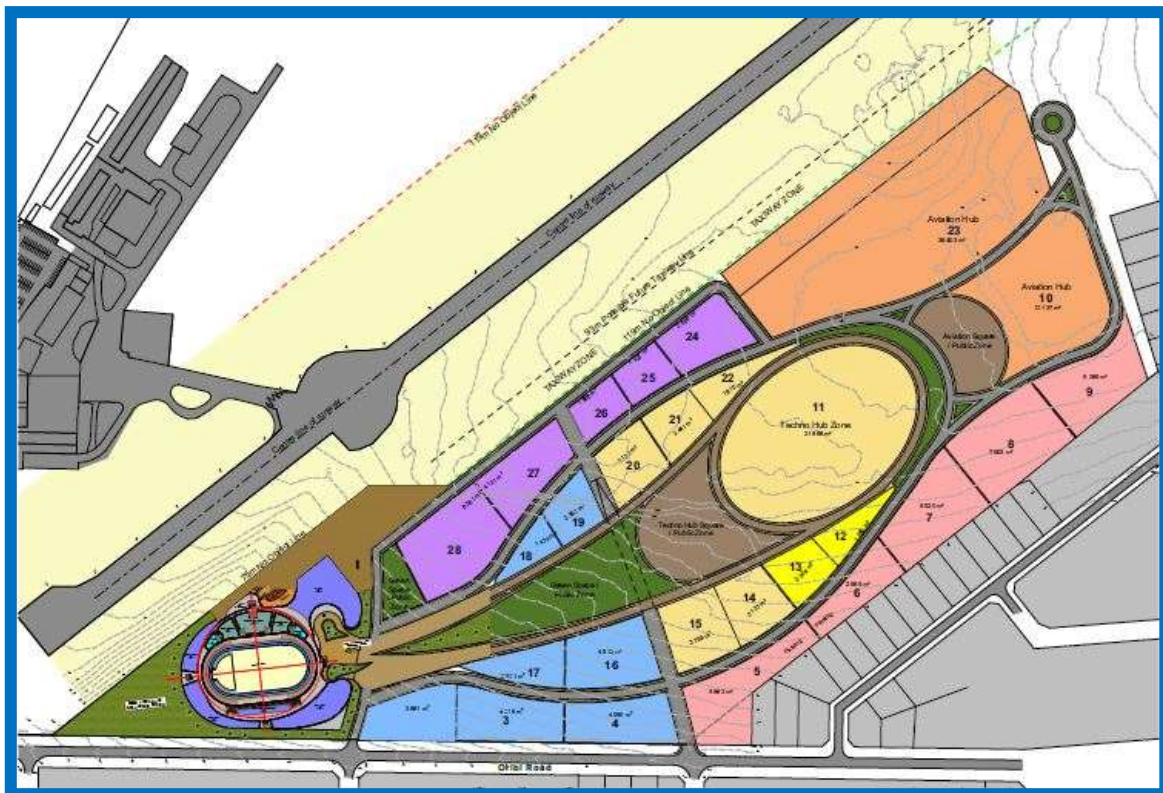


## PIETERMARITZBURG AIRPORT PRECINCT

### PHASE 1

### TRAFFIC IMPACT ASSESSMENT



Prepared by:  
Project Manager:

**ROYAL HASKONINGDHV**  
*Derek McGuigan*  
Tel: 033-328 1185  
Fax: 033-328 1006  
E-mail: [derek.mcguigan@rhdhv.com](mailto:derek.mcguigan@rhdhv.com)

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## VERIFICATION PAGE

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<b>CARRIED OUT BY:</b> Royal HaskoningDHV  P O Box 1066 PIETERMARITZBURG 3201  TEL: 033-328 1000 FAX: 033-328 1006		<b>COMMISSIONED BY:</b> VNA Consulting  10 Kyalami Road, Westmead PINETOWN 3610  TEL: 031-700 2500 FAX: 031-700 2550		
<b>AUTHOR:</b> Derek McGuigan		<b>CLIENT CONTACT PERSONS:</b> Preven Naicker		
<b>SYNOPSIS:</b> This report details the traffic implication emanating from the proposal to expand the Pietermaritzburg Airport and construct a precinct incorporating specialist airside facilities, associated aviation support services and a mixed-use development together with a Techno Hub (incorporating Velodrome) development on land adjacent to the existing airport and Oriibi Road, Pietermaritzburg.				
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<b>QUALITY VERIFICATION</b> This report has been prepared under the controls established by a quality management system that meets the requirements of ISO 9001: 2000.				
<b>Verification</b>	<b>Capacity</b>	<b>Name</b>	<b>Signature</b>	<b>Date</b>
<b>By Author</b>	Principal Associate	Derek McGuigan		September 2016
<b>Checked by</b>	Principal	Rob Barker		September 2016
<b>Authorised by</b>	Principal	Rob Barker		September 2016

**TRAFFIC IMPACT ASSESSMENT**  
**ON**  
**PHASE 1 OF THE**  
**PIETERMARITZBURG AIRPORT PRECINCT**

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## 1 INTRODUCTION

### 1.1 Purpose of Report

The purpose of this report is to present the background, analysis, results and recommendations of a traffic engineering investigation in the form of a traffic impact assessment for the proposal to expand the Pietermaritzburg Airport and construct a precinct incorporating specialist airside facilities, associated aviation support services and a mixed-use element together with a Techno Hub (incorporating a Velodrome) development on land adjacent to the existing airport, Pietermaritzburg.

**This Traffic Impact Assessment addresses the proposed Phase 1 development of Pietermaritzburg Airport Precinct and the full adjacent Techno Hub (including Velodrome) proposal. This report presents the traffic generation, distribution, assignment and analysis results.**

### 1.2 Study Objectives

The study objectives are:

- (i) Assess the traffic conditions on the existing road network.
- (ii) Assess the traffic generation effects of the proposal.
- (iii) Superimpose (ii) on (i) and reassess traffic operations on the road network.
- (iv) Assess the interface conditions between the road network and the site.
- (v) Highlight any traffic concerns resulting from the proposed development.
- (vi) Make recommendations.

### 1.3 Executive Summary

The traffic impact assessment comprising the subject of this report has been undertaken according to accepted procedures in the field of traffic engineering.

The analysis has shown that traffic impacts are significant with regard to the localised road system for the Phase 1 development. The following summary was drawn:

- The proposed extension of the Market Road and additional two accesses (Accesses A and B) will provide good accessibility for the Airport Expansion.
- The upgrading of the section of Washington Road between Gladys Manzi and Market Roads to four lanes with accompanying turning lanes is warranted at present and we recommend that this be implemented as soon as practicable.

- Major capacity improvements are necessary to the three Washington Road intersections under review, viz: Gladys Manzi Road, Market Road and Oribi Road.
- The addition of a fourth leg to both Oribi Road intersections with Powell and Stubbs Roads, to accommodate the proposed Techno Hub, will require signalisation of the intersections when the Techno Hub is approaching full development.
- It is recommended to closely monitor the progress of both the Techno Hub development as well as the Airport Expansion and their cumulative impact on the intersections of Gladys Manzi with Oldfield Road and Oribi Roads. This monitoring also applies to the existing intersection of Oribi Road and Pharazyn Way. These intersections will operate satisfactorily in the short to medium term but will require signalisation and associated reconfiguration when warranted by traffic volumes.
- Public transport facilities to be provided.
- Pedestrian and non-motorised transport facilities will have to be provided.

#### 1.4 Study Area

The definition of the study area for the purposes of this investigation is as recommended in the *Department of Transport Report RR93/635 Manual for Traffic Impact Studies*.

#### **Defining the Study Area for the Traffic Impact Study**

##### **Recommended Study Area**

- i) *All elements of the road infrastructure included in the TISm.*
- ii) *All further elements of the road infrastructure where 75 additional <sup>(a)</sup> development trips are added to the sum of the critical lane volumes.*
- iii) *In the case of denser urban road networks a cut-off distance of 1 to 1,5 km from the site along the road network (not as the crow flies) can be considered to limit the extent of the study.*
- iv) *Discretion of the responsible authority <sup>(b)</sup>.*

<sup>(a)</sup> *In the case of a development where a percentage of the trips attracted are bypass trips (e.g. retail), this refers to **primary** trips, i.e. total trips generated by the development minus bypass trips where applicable.*

<sup>(b)</sup> *The responsible authority can require that intersections beyond 1 to 1,5km from the site be included, based on site-specific issues or to include intersections where less than 75 additional trips are added to the sum of the critical lane volumes.*

For the purpose of this assessment the study area is selected to cover the following elements of the localised road network (refer Figure 2):

#### Road Sections

- Washington Road
- Gladys Manzi Road
- Oribi Road
- Market Road (and Extension)

#### Intersections

- Washington Road / Oribi Road / Ritchie Road intersection
- Washington Road / New Access A intersection
- Washington Road / Market Road / Market Road Extension intersection
- Washington Road / CB Downes Road / Gladys Manzi Road intersection
- Gladys Manzi Road / New Access B intersection
- Gladys Manzi / Oldfield Road intersection
- Gladys Manzi Road / Oribi Road intersection
- Oribi Road / Stubbs Road intersection
- Oribi Road / Powell Road intersection
- Oribi Road / Pharazyn Way intersection

### 1.5 General

The traffic impact assessment forming the subject of this report has been carried out generally in accordance with report *RR93/635, Manual for Traffic Impact Studies* published by the Department of Transport and the recommended guidelines for trip generation, *TMH 17 South African Trip Data Manual, Version 1.01, September 2013 published by COTO*. Both these documents being the accepted norm for this country.

Furthermore, the analysis procedures have been undertaken using the methodology of the *Highway Capacity Manual* and the computer programme "SIDRA Intersection" developed by Akcelik and Associates and which is recognized as one of the foremost traffic analysis tools in the world today.

## 2 PROPOSED DEVELOPMENT

### 2.1 Development details

The following details describe the land-use for the proposed development.

**TABLE 1: DEVELOPMENT DETAILS**

Land Use	GLA Estimate (85% of Bulk)
110 Service Industry	16673
151 Mini-Warehousing	58643
770 Business Park	21539
	<b>96855</b>

#### **AIRPORT EXPANSION**

Land Use	GLA Estimate (85% of Bulk)
130 Industrial Area (Park)	30066
150 Warehousing & Distribution	17386
220 Apartments and Flats	11816
231 Townhouses (Simplexes and Duplexes)	3988
310 Hotel, Residential	4434
770 Business Park	9441
860 Wholesale Market (Fresh produce)	1918
	<b>79049</b>

#### **TECHNO HUB**

Land Use	GLA Estimate (85% of Bulk)
492 Health & Fitness Centre	460
770 Business Park	3260
820 Shopping Centre	2083
	<b>5803</b>

#### **Velodrome**



## 2.2 Development Phasing

The proposed development may be phased in response to financial availability.

## 2.3 Development Access

Access to the sites is proposed via the following accesses (refer Figure 2).

Techno Hub (incorporating Velodrome)

- A fourth leg to the Powell Road intersection with Oribi Road.
- A fourth leg to the Stubbs Road intersection with Oribi Road.

Phase 1 – Pietermaritzburg Airport Precinct

- A 'T' intersection onto Washington Road approximately 100 metres south-east of the Pilot Road intersection (Access A).
- A continuation of the existing Market Road Extension.
- A 'T' intersection onto Gladys Manzi Road approximately 800 metres south-west of the Washington Road / CB Downes / Gladys Manzi Roads intersection (Access B).

### 3 EXISTING CONDITIONS

#### 3.1 Roads

Only those roads which are likely to be impacted by the traffic associated with the proposed development are discussed below (refer Figure 2 for clarity).

The existing main road network consists of the following:

##### (i) Washington Road

Washington Road is a significant and essential link on both the Provincial (R103) and Municipal road networks. Washington Road forms the northern edge of the proposed Airport Precinct and is a two-lane road from the Gladys Manzi / CB Downes signalised intersection in the east to the Oribi Road / Ritchie Road signalised intersection in the west and incorporates the major signalised intersection with Market Road.



**Washington Road – at Gladys Manzi / CB Downes intersection**



**Oribi Road approaching Washington Road / Ritchie intersection**



**Oribi Road approaching Washington Road / Ritchie intersection**

**(ii) Gladys Manzi Road**

Gladys Manzi Road is another significant and essential link in the Municipal major road network. Gladys Manzi Road forms the southern and eastern edges of the proposed Airport Precinct and is a two-lane road from the Washington / CB Downes signalised intersection in the northeast to the Oribi Road in the southwest and incorporates the intersection with Oldfield Road.



**Gladys Manzi Road – at Washington / CB Downes intersection**



**Gladys Manzi Road – at Oldfield intersection**



**Gladys Manzi Road – at Oribi Road intersection**

**(iii) Oribi Road**

Oribi Road is a significant and essential link in the Municipal major road network. Oribi Road forms the western edge of the proposed Airport Precinct and is a two-lane road from the Washington / Ritchie signalised intersection in the north to the Gladys Manzi Road intersection in the south and incorporates intersections with Stubbs Road, Powell Road and Pharazyn Way among others.



**Oribi Road – at Gladys Manzi Road intersection**



**Oribi Road – at Stubbs Road intersection**



**Oribi Road – at Powell Road intersection**



**Oribi Road – at Pharazyn Way intersection**



**Oribi Road – Washington / Ritchie Road intersection**

#### **(iv) Market Road (and Extension)**

Market Road connects the National Road network (N3) to the local Municipal road system and is therefore a significant and essential link in the Municipal major road network. Market Road connects the N3 interchange to the east to Washington Road and incorporates the major signalised intersection with Van Eck Place.

Market Road Extension is a cul-de-sac at present but could be extended directly into the Airport Precinct.



**Market Road – Washington / Market Road Extension intersection**



**Market Road Extension– Washington / Market Road intersection**

### 3.2 Traffic

Traffic conditions can be categorised into four different types:

- Peak hour traffic flows – morning and afternoon;
- Off-peak weekday flows;
- After work hours flows; and
- Weekend flows.

Existing traffic activity is at its most intense during the morning and afternoon commuter peaks and on a Saturday morning. The selection of a period for analysis should be based on an assessment of when the combined effects of the traffic generated by the proposed development and the existing traffic are at their worst on a regular basis. For a development of this nature (mixed-use) a regularly repeated worst case condition would be either the morning or afternoon peak hour. For the purposes of this study both the morning and afternoon peaks will be used for analysis and assessment (refer Figure 3).

The performance of the intersections with present day (2016) traffic is summarised in the table below:

TABLE 2: EXISTING INTERSECTION PERFORMANCE

Intersection / Movement		AM Peak			PM Peak		
		Vol veh/h	LOS	V/C Ratio	Vol veh/h	LOS	V/C Ratio
<b>Washington Road / Oribi Road / Ritchie Road Intersection</b>							
Oribi Road NB	LT	128	A	0.138	61	A	0.073
	ST	940	F	1.366	332	A	0.358
	RT	148	B	0.438	120	C	0.382
Washington Road WB	LT	95	D	0.963	87	C	0.694
	ST	377	D	0.963	242	C	0.694
	RT	252	F	1.120	147	D	0.855
Oribi Road SB	LT	175	A	0.200	157	A	0.162
	ST	442	B	0.713	624	C	0.912
	RT	181	C	0.806	275	C	0.705
Ritchie Road EB	LT	178	A	0.097	98	A	0.053
	ST	431	C	0.870	334	C	0.693
	RT	164	C	0.731	122	D	0.708
<b>Washington Road / Market Road / Market Road Extension Intersection</b>							
Washington Road WB	LT	2	A	0.248	1	A	0.153
	ST	336	A	0.248	216	A	0.153
	RT	767	B	0.788	858	F	1.134
Market Road SB	LT	896	A	0.500	808	A	0.451
	ST	14	C	0.065	6	C	0.029
	RT	288	F	1.446	259	F	1.427
Washington Road EB	LT	468	F	1.558	284	F	1.361
	ST	514	F	1.558	551	F	1.361
	RT	1	A	0.001	1	A	0.001
Market Road Ext. NB	LT	1	C	0.040	9	D	0.127
	ST	7	C	0.040	18	D	0.127
	RT	1	C	0.005	8	D	0.042
<b>Washington Road / CB Downes Road / Gladys Manzi Road Intersection</b>							
CB Downes Road WB	LT	93	C	0.844	59	C	0.739
	ST	476	C	0.844	393	C	0.739
	RT	32	C	0.170	88	C	0.422
Gladys Manzi Road SB	LT	51	C	0.735	55	B	0.286
	ST	308	C	0.735	120	B	0.286
	RT	308	C	0.727	46	C	0.149
Washington Road EB	LT	97	F	1.264	187	D	0.944
	ST	820	F	1.264	455	D	0.944
	RT	537	F	1.690	374	F	1.305
Gladys Manzi Road NB	LT	408	F	1.177	511	F	1.187
	ST	144	F	1.177	424	F	1.187
	RT	172	C	0.696	203	C	0.350

<b>Gladys Manzi Road / Oldfield Road Intersection</b>							
Oldfield Road WB	LT	47	A	0.043	128	A	0.115
	RT	81	D	0.433	272	D	0.798
Gladys Manzi Road SB	LT	118	A	0.268	43	A	0.217
	ST	381	A	0.268	365	A	0.217
Gladys Manzi Road NB	ST	462	A	0.245	269	A	0.143
	RT	208	A	0.203	118	A	0.102
<b>Gladys Manzi Road / Oribi Road Intersection</b>							
Gladys Manzi Road WB	ST	414	A	0.215	349	A	0.182
	RT	71	B	0.168	117	A	0.100
Oribi Road	LT	189	B	0.332	63	A	0.060
	RT	195	F	2.017	136	C	0.407
Gladys Manzi Road EB	LT	320	A	0.546	123	A	0.221
	ST	714	A	0.546	296	A	0.221
<b>Oribi Road / Stubbs Road Intersection</b>							
Oribi Road NB	LT	4	A	0.215	29	A	0.149
	ST	409	A	0.215	256	A	0.149
Oribi Road SB	ST	243	A	0.129	201	A	0.108
	RT	3	A	0.129	4	A	0.108
Stubbs Road EB	LT	9	A	0.014	13	A	0.013
	RT	2	B	0.014	1	B	0.013
<b>Oribi Road / Powell Road Intersection</b>							
Oribi Road NB	LT	3	A	0.205	8	A	0.166
	ST	391	A	0.205	312	A	0.166
Oribi Road SB	ST	414	A	0.244	200	A	0.148
	RT	34	A	0.244	56	A	0.148
Powell Road EB	LT	64	A	0.071	17	A	0.034
	RT	1	B	0.071	11	B	0.034
<b>Oribi Road / Pharazyn Way Intersection</b>							
Oribi Road NB	ST	473	A	0.264	347	A	0.193
	RT	22	A	0.264	17	A	0.193
Pharazyn Way WB	LT	9	B	0.117	14	A	0.185
	RT	39	C	0.117	96	B	0.185
Oribi Road SB	LT	65	A	0.240	44	A	0.153
	ST	382	A	0.240	237	A	0.153

Inspection of the values in Table 2 (refer to Figure 3) indicates the following:

- Washington Road / Oribi Road / Ritchie Road Intersection (signalised)**  
 In the analysed existing situation certain movements have v/c ratios greater than 1 and this manifests itself with long queues especially in the morning peak periods notably on Oribi Road (south) and right turning vehicles on Washington Road (east).

At present this intersection needs capacity improvements to accommodate the existing traffic volumes.



- **Washington Road / Market Road Intersection / Market Road Extension**

In the analysed existing situation certain movements have v/c ratios greater than 1 and this manifests itself with long queues especially in the morning peak periods notably on Washington Road (northwest) and right turning vehicles on Market Road (northeast). In the evening peak period long delays are experienced especially for vehicles turning right from Washington Road (southeast).

At present this intersection needs capacity improvements to accommodate the existing traffic volumes.

- **Washington Road / CB Downes Road / Gladys Manzi Road Intersection**

In the analysed existing situation certain movements have v/c ratios greater than 1 and this manifests itself with long queues especially in the morning peak periods notably on Washington Road (northwest) and on Gladys Manzi Road (southwest). In the evening peak period long delays are experienced especially for vehicles from Gladys Manzi Road (southwest).

At present this intersection needs capacity improvements to accommodate the existing traffic volumes.

- **Gladys Manzi Road / Oldfield Road Intersection**

In the analysed existing situation the intersection operates satisfactorily although delays are experienced for vehicles turning right from Oldfield Road during both morning and afternoon peak periods.

- **Gladys Manzi Road / Oribi Road Intersection**

In the analysed existing situation the intersection generally operates satisfactorily although significant delays are experienced for vehicles turning right from Oribi Road during the morning peak period.

- **Oribi Road / Stubbs Road**

In the analysed existing situation this three-legged intersection operates satisfactorily.

- **Oribi Road / Powell Road**

In the analysed existing situation this three-legged intersection operates satisfactorily.

- **Oribi Road / Pharazyn Way Intersection**

In the analysed existing situation the intersection operates satisfactorily during both morning and afternoon peak periods.

## 4. FUTURE CONDITIONS

### 4.1. Roads

The most significant adaptation on the major road network in the vicinity of the proposed Airport Precinct development will be the reconfiguration of the Market Road Interchange on the N3. Although the design of this interchange is still in the early stages, the envisaged connection of the interchange to the Hayfields area (Cleland Road) is significant as there will be a change in local traffic patterns. Ideally, in order to fully assess the effects of the reconfigured intersection on the wider network a macro-model is required. However due to various constraints, no suitable model is available at present.

At present the Market Road Extension is approximately 550 metres in length from the intersection with Washington Road to the northeast terminating in a turning circle to the southwest. Planning for this road has envisaged the Extension of the road, continuing into the Airport Precinct area.

In the absence of a reliable macro-model for the wider network, the existing road network is assessed at its present status and condition but with the appreciation that there may be amendments when the wider network is assessed.

It is envisaged that the Airport Precinct be accessed from:

- Existing access from Pharazyn Way
- Extension of Market Road
- New Access A on Washington Road
- New Access B on Gladys Manzi Road

Two accesses are proposed to the Techno Hub (incorporating Velodrome):

- Forming a four-legged intersection with the existing 'T' intersection of Oribi / Stubbs Roads
- Forming a four-legged intersection with the existing 'T' intersection of Oribi / Powell Roads

### 4.2. Traffic

Traffic growth has been steady in recent times and a traffic growth factor of 3% per year has been applied for this assessment in all directions for the horizon year, 2021.

### **4.3. New Developments**

There are several potential developments in the wider surrounds (e.g. Burton Heights, Hilcove Hills, municipal Caravan Park etc) on which proposals have been mooted over recent years. In addition Mkhondeni has steadily grown in recent years with development of vacant plots.

The low growth rates being experienced in the country make the imminent significant development of any of the new proposals unlikely in the envisaged time horizon.

Therefore it is assumed the 3% growth rate used to assess 2021 traffic volumes is probably more than adequate to cover actual additional traffic volumes.

## 5. DEVELOPMENT TRAFFIC GENERATION

### 5.1 Traffic Generation

The basis of the estimation of the traffic generation potential of the proposed development is based on TMH 17 the South African Trip Data Manual, Committee of Transport Officials, Version 1.01 September 2013 as required by Msunduzi Municipality.

The Generation Rate is produced by into consideration pertinent development type and applying appropriate reduction factors dependant on proposed use, predicted vehicle ownership and provision (or not) of transit nodes or corridors.

**TABLE 3: TRAFFIC GENERATION SCHEDULE TOTAL DEVELOPMENT**

#### TECHNO HUB (including Velodrome)

Land Use	Area/Units	Gen Rate	Split	AM Peak		Split	PM Peak	
			AM	In	Out	PM	In	Out
Health & Fitness	460m <sup>2</sup>	5.00 9.50	50:50	12	11	60:40	26	18
Business	3 260m <sup>2</sup>	1.50	85:15	42	7	20:80	10	39
Sales outlet	2 083m <sup>2</sup>	0.60	65:35	8	4	50:50	6	6
Industrial	30 066m <sup>2</sup>	0.80	70:30	169	72	25:75	60	181
Warehousing	17 386m <sup>2</sup>	0.50	60:40	52	35	45:55	39	48
Apartments	11 816m <sup>2</sup>	0.65	25:75	26	76	70:30	71	31
Townhouses	3 988m <sup>2</sup>	0.85	25:75	6	17	70:30	16	7
Hotel	4 434m <sup>2</sup>	0.50	60:40	38	25	55:45	35	28
Business	9 441m <sup>2</sup>	1.50	85:15	121	21	20:80	28	114
Wholesale	1 918m <sup>2</sup>	0.45 0.10	50:50	5	4	33:67	1	1
<b>TOTAL</b>				<b>479</b>	<b>272</b>		<b>292</b>	<b>473</b>

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Land Use	Area/Units	Gen Rate	Split	AM Peak		Split	PM Peak	
			AM	In	Out	PM	In	Out
Service Industry	16 673m <sup>2</sup>	0.90	75:25	113	37	25:75	37	113
Mini - Warehousing	58 643m <sup>2</sup>	0.15 0.25	60:40	53	35	50:50	74	73
Business Park	21 539m <sup>2</sup>	1.50	85:15	275	48	20:80	65	258
<b>TOTAL</b>				<b>441</b>	<b>120</b>		<b>176</b>	<b>444</b>

## 5.2 Trip Distribution

The distribution of the generated trips to the surrounding areas is assumed to be as shown on Figures 5 and 7.

## 5.3 Traffic Assignment

The assignment of the distributed trips to the various road elements are as depicted in Figures 6, 8 and 9 for the selected peak period using the distribution pattern of the previous sub-section.

## 6. TRAFFIC IMPACT ANALYSIS

### 6.1 Traffic Operations

The assessment of the traffic impact is based on the quantification of the change in the traffic operational quality as a result of the additional traffic generated by the proposal. The assessment of the traffic impact is based on the quantification of the change in the traffic operational quality as a result of the additional traffic generated by the proposal.

#### 6.1.1 Roads

The impact on the existing main road sections is as following:

(i) Washington Road

Washington Road between Gladys Manzi Road and Market Road is at present experiencing significant congestion during peak periods. This is due to several factors including traffic volumes (1 400 vehicles on one lane in morning peak), large percentage of heavy vehicles, numerous businesses with direct access and side roads.

The proposed Techno Hub and Airport Expansion will add pressure on this section of road and increase delays and frustrations.

The upgrading of this section of Washington Road to four lanes with accompanying turning lanes is warranted at present and we recommend that this be implemented as soon as practicable.

Washington Road between Market Road and Oribi Road is again punctuated by intersections and direct access to several properties. However traffic volumes are lower than the other section under review and the existing two lanes are sufficient to cater for predicted 2021 traffic with the proposed development.

(ii) Gladys Manzi Road

Gladys Manzi Road between Washington Road and Oldfield Road is punctuated by intersections and direct access to several properties. However projected traffic volumes can be accommodated on the existing two lanes for predicted 2021 traffic with the proposed development.

Gladys Manzi Road between Oldfield Road and Oribi Road is generally free flowing with no major intersections and a few accesses to small-holding type properties. Projected traffic volumes can be accommodated on the existing two lanes for predicted 2021 traffic with the proposed development.

(iii) Oribi Road

Oribi Road between Galdys Manzi Road and Stubbs Road is through a residential neighbourhood punctuated by intersections and direct access to many properties on both sides. However projected traffic volumes can be accommodated on the existing two lanes for predicted 2021 traffic with the proposed development.

Oribi Road between Stubbs Road and Powell Road is also through the residential neighbourhood punctuated by direct access to several properties on the west side only. Projected traffic volumes can be accommodated on the existing two lanes for predicted 2021 traffic with the proposed development.

Oribi Road between Powell Road and Pharazyn Way is also through the residential neighbourhood punctuated by an intersection and direct access to several properties on the west side only. Projected traffic volumes can be accommodated on the existing two lanes for predicted 2021 traffic with the proposed development.

Oribi Road between Pharazyn Way and Washington Road is through a significant activity zone incorporating the Oribi Village and Acacia Park residential areas, Fire Station, school and access to other amenities. The area in the vicinity of the access to Oribi Village also acts as a public transport hub. However projected traffic volumes can be accommodated on the existing two lanes for predicted 2021 traffic with the proposed development.

(iv) Market Road (and Extension)

The proposed development requires that the existing Market Road (southwest) from the Washington Road intersection be extended into the Airport Expansion area. Projected traffic volumes can be accommodated on the existing two lanes of Market Road Extension for predicted 2021 traffic with the proposed development.

The section of Market Road between the N3 and the Washington Road intersection is at present being designed, by SANRAL, to accommodate predicted traffic well beyond 2021.

### 6.1.2 Intersections

The procedure in assessing change at intersections, is to analyse the existing situation using accepted methods the results of which are depicted in Table 2 above and to repeat the process with the addition of the predicted future traffic. The differences in the results of the two processes and the interpretation thereof represent the traffic impact.

Table 5 below summarises the results of the analysis of the intersections with the annual traffic growth (5 year time horizon ie 2021) and the predicted development traffic added to the existing traffic (refer Figure 4) and a comparison of these results with those of Table 2 essentially represents the traffic impact.

The predicted traffic levels at full development stage with the generated traffic added to the existing traffic are as indicated on Figures 10 and 11. Table 5 also includes the results of the analysis of new intersections Access A and Access B.

It will be seen by inspection that the generated traffic volumes significant when compared to the existing traffic volumes. Annual traffic growth has been factored into the 2021 traffic growth volumes.



**TABLE 5: TRAFFIC CONDITIONS –  
LEVEL OF SERVICE (LOS) SCENARIOS**

INTERSECTION / MOVEMENT	2016				2021			
	Existing		Exist.+ Phase 1		Exist+growth		Ex+Grow+Ph1	
	AM	PM	AM	PM	AM	PM	AM	PM

<b>Washington Road / Oribi Road / Ritchie Road Intersection (signalised)</b>									
Oribi Road NB	LT	A	A	A	A	A	B	A	B
	ST	F	A	F	B	F	A	F	B
	RT	B	C	F	F	C	C	F	F
Washington Road WB	LT	D	C	F	F	F	E	F	F
	ST	D	C	F	F	F	D	F	F
	RT	F	D	F	C	F	C	F	C
Oribi Road SB	LT	A	A	B	A	A	A	B	A
	ST	B	C	E	F	B	F	F	F
	RT	C	C	C	C	C	B	C	E
Ritchie Road EB	LT	A	A	A	A	A	A	A	A
	ST	C	C	B	B	D	D	C	C
	RT	C	D	F	C	C	C	F	C

<b>Washington Road / Access A Intersection - Signalised</b>									
Access A NB	LT			D	D			E	D
	RT			D	D			E	D
Washington Road WB	LT			B	B			B	B
	ST			B	B			B	B
Washington Road EB	ST			C	C			C	C
	RT			E	D			E	E

<b>Washington Road / Market Road Intersection / Market Road Extension</b>									
Washington Road WB	LT	A	A	B	B	A	A	B	B
	ST	A	A	A	A	A	A	A	A
	RT	B	F	B	F	D	F	F	F
Market Road SB	LT	A	A	A	A	A	A	A	A
	ST	C	C	F	B	D	D	B	B
	RT	F	F	F	F	F	F	F	F
Washington Road EB	LT	F	F	F	F	F	F	F	F
	ST	F	F	F	F	F	F	F	F
	RT	A	A	B	B	A	A	B	B
Market Road Ext. NB	LT	C	D	C	C	E	E	B	C
	ST	C	D	C	B	D	D	B	B
	RT	C	D	C	B	E	E	B	B

INTERSECTION / MOVEMENT	2016				2021			
	Existing		Exist.+ Phase 1		Exist+growth		Ex+Grow+Ph1	
	AM	PM	AM	PM	AM	PM	AM	PM

Washington Road / CB Downes Road / Gladys Manzi Road Intersection									
CB Downes Road WB	LT	C	C	D	D	C	C	F	C
	ST	C	C	D	C	C	C	F	C
	RT	C	C	C	C	C	C	C	C
Gladys Manzi Road SB	LT	C	B	C	C	C	B	C	C
	ST	C	B	C	B	C	B	C	B
	RT	C	C	E	C	C	C	C	C
Washington Road EB	LT	F	D	F	E	F	F	F	F
	ST	F	D	F	E	F	F	F	F
	RT	F	F	F	F	F	F	F	F
Gladys Manzi Road NB	LT	F	F	F	F	F	F	F	F
	ST	F	F	F	F	F	F	F	F
	RT	C	C	C	C	C	C	F	C

Gladys Manzi Road / Access B Intersection - Signalised									
Gladys Manzi Road NB	LT			B	B			B	B
	ST			C	C			C	C
Gladys Manzi Road SB	ST			C	B			C	B
	RT			D	D			D	D
Access B EB	LT			D	D			D	D
	RT			D	D			D	D

Gladys Manzi Road / Oldfield Road Intersection									
Oldfield Road WB	ST	A	A	A	A	A	A	A	A
	RT	D	D	E	F	F	F	F	F
Gladys Manzi Road SB	LT	A	A	A	A	A	A	A	A
	RT	A	A	A	A	A	A	A	A
Gladys Manzi Road NB	LT	A	A	A	A	A	A	A	A
	ST	A	A	A	A	A	A	A	A

Gladys Manzi Road / Oribi Road Intersection									
Gladys Manzi Road WB	LT	A	A	A	A	A	A	A	A
	ST	B	A	C	A	C	A	E	A
Oribi Road SB	ST	B	A	C	A	C	A	C	A
	RT	F	C	F	D	F	D	F	F
Gladys Manzi Road EB	LT	A	A	A	A	A	A	A	A
	RT	A	A	A	A	A	A	A	A

INTERSECTION / MOVEMENT	2016				2021			
	Existing		Exist.+ Phase 1		Exist+growth		Ex+Grow+Ph1	
	AM	PM	AM	PM	AM	PM	AM	PM

Oribi Road / Stubbs Road / Techno Hub South Intersection									
Oribi Road NB	LT	A	A	A	A	A	A	A	A
	ST	A	A	A	A	A	A	A	A
	RT			A	A			A	A
Techno Hub WB	LT			A	A			A	A
	ST			D	C			D	C
	RT			E	D			F	E
Oribi Road SB	LT			A	A			A	A
	ST	A	A	A	A	A	A	A	A
	RT	A	A	A	A	A	A	A	A
Stubbs Road EB	LT	A	A	B	A	B	A	B	B
	ST			D	C			E	C
	RT	B	B	D	C	B	B	E	C

Oribi Road / Powell Road / Techno Hub North Intersection									
Oribi Road NB	LT	A	A	A	A	A	A	A	A
	ST	A	A	A	A	A	A	A	A
	RT			B	A			B	A
Techno Hub WB	LT			B	A			C	B
	ST			F	D			F	E
	RT			F	F			F	F
Oribi Road SB	LT			A	A			A	A
	ST	A	A	A	A	A	A	A	A
	RT	A	A	A	A	A	A	A	A
Powell Road EB	LT	A	A	C	B	B	A	E	B
	ST			F	D			F	E
	RT	B	B	F	D	C	B	F	E

Oribi Road / Pharazyn Way Intersection									
Oribi Road NB	ST	A	A	A	A	A	A	A	A
	RT	A	A	B	A	A	A	B	A
Pharazyn Way WB	LT	B	A	C	C	B	A	D	D
	RT	C	B	E	D	C	B	F	F
Oribi Road SB	LT	A	A	A	A	A	A	A	A
	ST	A	A	A	A	A	A	A	A

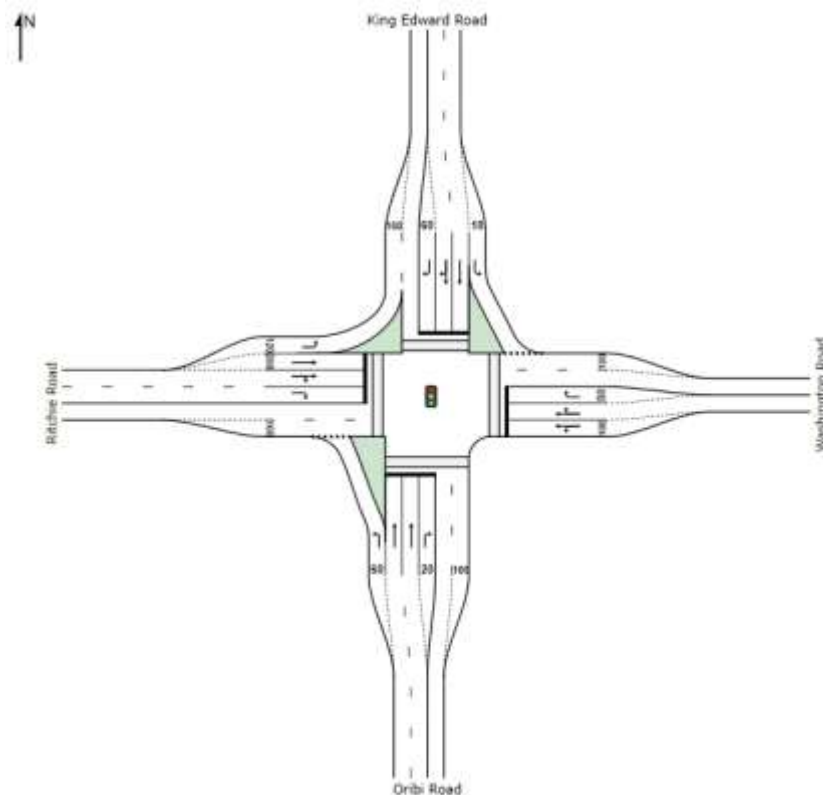
The following observations are made with regard to the various traffic operational scenarios:

- **Washington Road / Oribi Road / Ritchie Road Intersection (signalised)**

In the analysed existing situation certain movements have v/c ratios greater than 1 and this manifests itself with long queues especially in the morning peak periods notably on Oribi Road (south) and right turning vehicles on Washington Road (east). The additional traffic generated by the proposals will exacerbate this problem and render operations on the existing configuration unacceptable.

At present this intersection needs capacity improvements to accommodate the existing traffic volumes. It is recommended that any new proposed improvement take cognisance of the proposed development of the Airport and is designed accordingly to achieve acceptable levels of service.

**Shown below is a suggested potential reconfigured layout to improve the intersection performance to an acceptable level.**



- **Washington Road / Access A Intersection - Signalised**

This is a new intersection onto Washington Road from the new Airport Expansion proposals. This intersection will need to be signal controlled and configured appropriately.

- **Washington Road / Market Road Intersection / Market Road Extension**

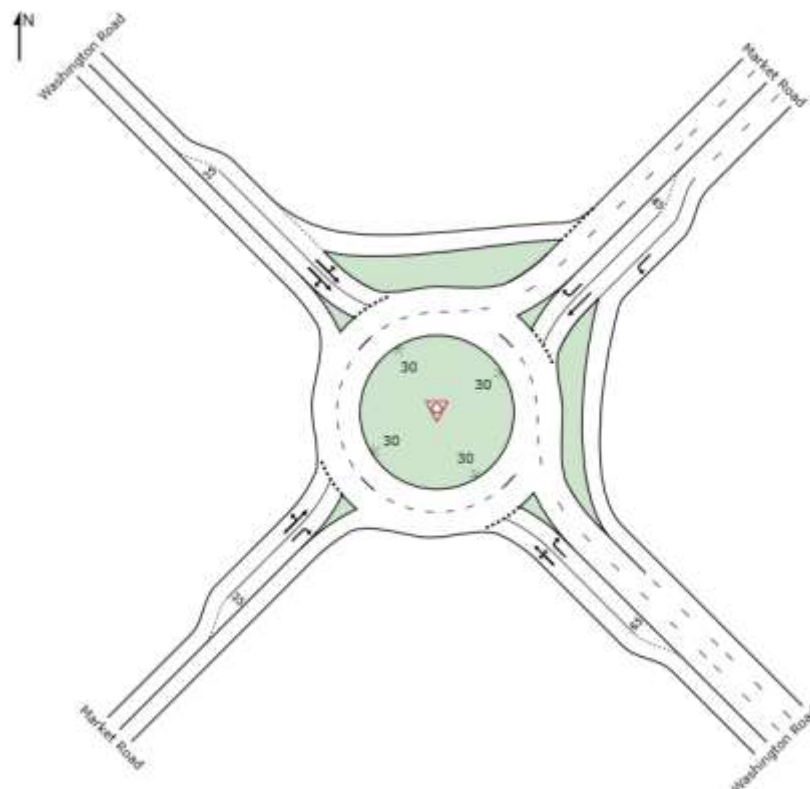
In the analysed existing situation certain movements have v/c ratios greater than 1 and this manifests itself with long queues especially in the morning peak periods notably on Washington Road (northwest) and right turning vehicles on Market Road (northeast). In the evening peak period long delays are experienced especially for vehicles turning right from Washington Road (southeast).

The proposed extension of the Airport facilities necessitates the extension of Market Road (southwest) into the development.

The additional traffic generated by the proposals will extend delays and render operations on the existing configuration unacceptable.

At present this intersection needs capacity improvements to accommodate the existing traffic volumes. As discussed earlier, SANRAL are in the process of designing an upgraded Market Road interchange on the N3 that incorporates this intersection. It is recommended that any new proposed improvement take cognisance of the proposed development of the Airport and is designed accordingly to achieve acceptable levels of service.

**Shown below is a suggested potential reconfigured layout to improve the intersection performance to an acceptable level.**



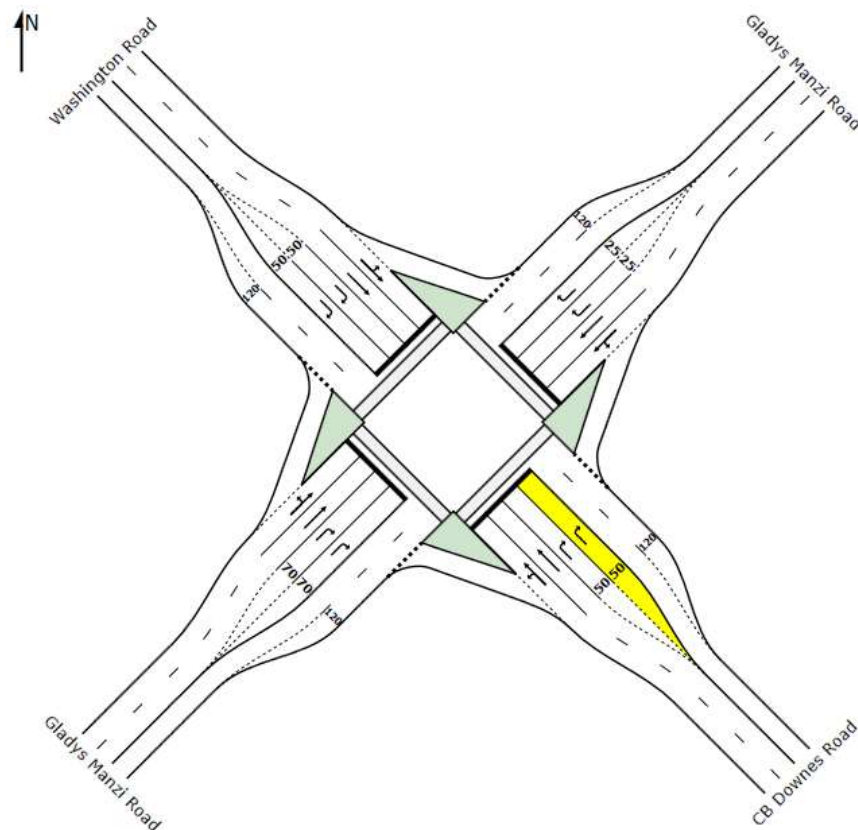
- Washington Road / CB Downes Road / Gladys Manzi Road Intersection**

In the analysed existing situation certain movements have v/c ratios greater than 1 and this manifests itself with long queues especially in the morning peak periods notably on Washington Road (northwest) and on Gladys Manzi Road (southwest). In the evening peak period long delays are experienced especially for vehicles from Gladys Manzi Road (southwest).

The additional traffic generated by the proposals will exacerbate this problem and render operations on the existing configuration unacceptable.

At present this intersection needs capacity improvements to accommodate the existing traffic volumes. It is recommended that any new proposed improvement take cognisance of the proposed development of the Airport and is designed accordingly to achieve acceptable levels of service.

**Shown below is a suggested potential reconfigured layout to improve the intersection performance to an acceptable level. A roundabout solution is also feasible but may not be achievable due to land constraints.**



- Gladys Manzi Road / Access B Intersection - Signalised**

This is a new intersection onto Gladys Manzi Road from the new Airport Expansion proposal. This intersection will need to be signal controlled and configured appropriately.

- **Gladys Manzi Road / Oldfield Road Intersection**

In the analysed existing situation the intersection operates satisfactorily although delays are experienced for vehicles turning right from Oldfield Road during both morning and afternoon peak periods.

According to analysis, these right turning delays will become unacceptable through normal growth by the year 2021 or if the proposed development was implemented during 2016.

This intersection needs capacity improvements to accommodate the future predicted traffic volumes. It is recommended that any new proposed improvement take cognisance of the proposed development of the Airport and is designed accordingly to achieve acceptable levels of service.

This intersection will need to be signal controlled and configured appropriately.

- **Gladys Manzi Road / Oribi Road Intersection**

In the analysed existing situation the intersection generally operates satisfactorily although significant delays are experienced for vehicles turning right from Oribi Road during the morning peak period.

According to analysis, these right turning delays will become unacceptable through normal growth by the year 2021 or if the proposed development was implemented during 2016.

This intersection needs capacity improvements to accommodate the future predicted traffic volumes. It is recommended that any new proposed improvement take cognisance of the proposed development of the Airport and is designed accordingly to achieve acceptable levels of service.

This intersection will need to be signal controlled and configured appropriately.

- **Oribi Road / Stubbs Road / Techno Hub South Intersection**

In the analysed existing situation this three-legged intersection operates satisfactorily. This intersection will continue to operate satisfactorily beyond 2021 assuming forecasted growth rates and without the proposed development.

However the addition of a fourth leg to accommodate the proposed Techno Hub will require signalisation of the intersection when the Techno Hub is approaching full development.

This intersection will need to be monitored regularly, as development progresses, and suitable capacity upgrades implemented when warranted (eg signalize the intersection and introduce separate left and right turning lanes).

- **Oribi Road / Powell Road / Techno Hub North Intersection**

In the analysed existing situation this three-legged intersection operates satisfactorily. This intersection will continue to operate satisfactorily beyond 2021 assuming forecasted growth rates and without the proposed development.

However the addition of a fourth leg to accommodate the proposed Techno Hub will require signalisation of the intersection when the Techno Hub is approaching full development.

This intersection will need to be monitored regularly, as development progresses, and suitable capacity upgrades implemented when warranted (eg signalize the intersection and introduce separate left and right turning lanes).

- **Oribi Road / Pharazyn Way Intersection**

In the analysed existing situation the intersection operates satisfactorily during both morning and afternoon peak periods. This intersection will continue to operate satisfactorily beyond 2021 assuming forecasted growth rates and without the proposed development.

However, with the proposed development, according to analysis right turning delays would be unacceptable.

This intersection needs capacity improvements to accommodate the predicted traffic volumes generated by the proposed development.

This intersection will need to be monitored regularly, as development progresses, and suitable capacity upgrades implemented when warranted (eg signalize the intersection and introduce separate left and right turning lanes).

## 6.2 Access

### 6.2.1 Intersection Performance

Both proposed Access A and Access B must be sited and designed to comfortably accommodate the predicted volumes of vehicles.



### 6.2.2 *Safety Considerations*

A review of all regulatory and warning signage should be undertaken. Appropriate signage and road marking should be installed on the impacted road network.

### 6.2.3 *Traffic Flow Profile*

Heavy vehicle activity that would be associated with a development of this nature include delivery vehicles, refuse collection vehicles and furniture removals vehicles. The needs of these vehicles should be taken cognisance of in addressing all of the items mentioned above as well as in the design of the road infrastructure.

### 6.2.4 *Parking Ratios*

Internal parking should be provided in accordance with the town planning scheme.

## 6.3 **Public Transport**

Bus and taxi lay-bys should be provided at the proposed development accesses on Oribi, Washington and Gladys Manzi Roads downstream of the intersections in each direction. These should conform to the standards envisaged in the Municipality's Integrated Rapid Public Transport Network proposals with accompanying pedestrian waiting areas.

This is especially relevant for employees of the proposed 'Techno Hub' development who may utilise public transport, predominantly taxis. It is recommended that public transport needs be accommodated by the installation of lay-bys either side of Oribi Road in the vicinity of the 'Techno Hub' intersections. Public transport lay-bys should also be constructed in the vicinity of the access (Oribi Road/ Pharazyn Way) to the Airport.

## 6.4 **Pedestrian and Non-motorised Transport Facilities**

There are intermittent pedestrian and non-motorised transport facilities to cater for the large number of pedestrians on all the roads under review. Pedestrians and non-motorised transport users need to be adequately catered for and facilities should be provided as per proposals contained in the "Non-motorised Transport Plan for the Msunduzi Municipality".

## 6.5 **Construction Traffic**

During construction of the main infrastructure additional signage is recommended to be erected on all major roads in the vicinity of the proposed development intersections.

## 7 CONCLUSIONS

The following conclusions can be drawn from this assessment of the likely traffic impact of the proposal to establish a Techno Hub and establishment of Phase 1 of the Pietermaritzburg Airport Precinct.

- (i) The local road system is generally in fair condition but needs capacity improvements to accommodate the proposed development.
- (ii) The proposed extension of the Market Road and additional two accesses (Accesses A and B) will provide good accessibility for the Airport Expansion.
- (iii) The generation potential of the development is significant and will have a varying impact on the localised existing road system.

Sections 6.1.1 and 6.1.2 details required upgrades to the roads and intersections, the more important aspects are summarised as:

- The upgrading of the section of Washington Road between Gladys Manzi and Market Roads to four lanes with accompanying turning lanes is warranted at present and we recommend that this be implemented as soon as practicable.
- Major capacity improvements to the three Washington Road intersections under review, viz: Gladys Manzi Road, Market Road and Oribi Road.
- The addition of a fourth leg to both Oribi Road intersections with Powell and Stubbs Roads, to accommodate the proposed Techno Hub, will require signalisation of the intersections when the Techno Hub is approaching full development. These intersection will need to be monitored regularly, as development progresses, and suitable capacity upgrades implemented when warranted (eg signalize the intersection and introduce separate left and right turning lanes).
- It is recommended to closely monitor the progress of both the Techno Hub development as well as the Airport Expansion and their cumulative impact on the intersections of Gladys Manzi with Oldfield Road and Oribi Roads. In due time reconfiguration and signalisation of these intersection layouts will be necessary to maintain acceptable levels of service.
- This monitoring also applies to the existing intersection of Oribi Road and Pharazyn Way which will operate satisfactorily in the short to

medium term but will require signalisation when warranted by traffic volumes.

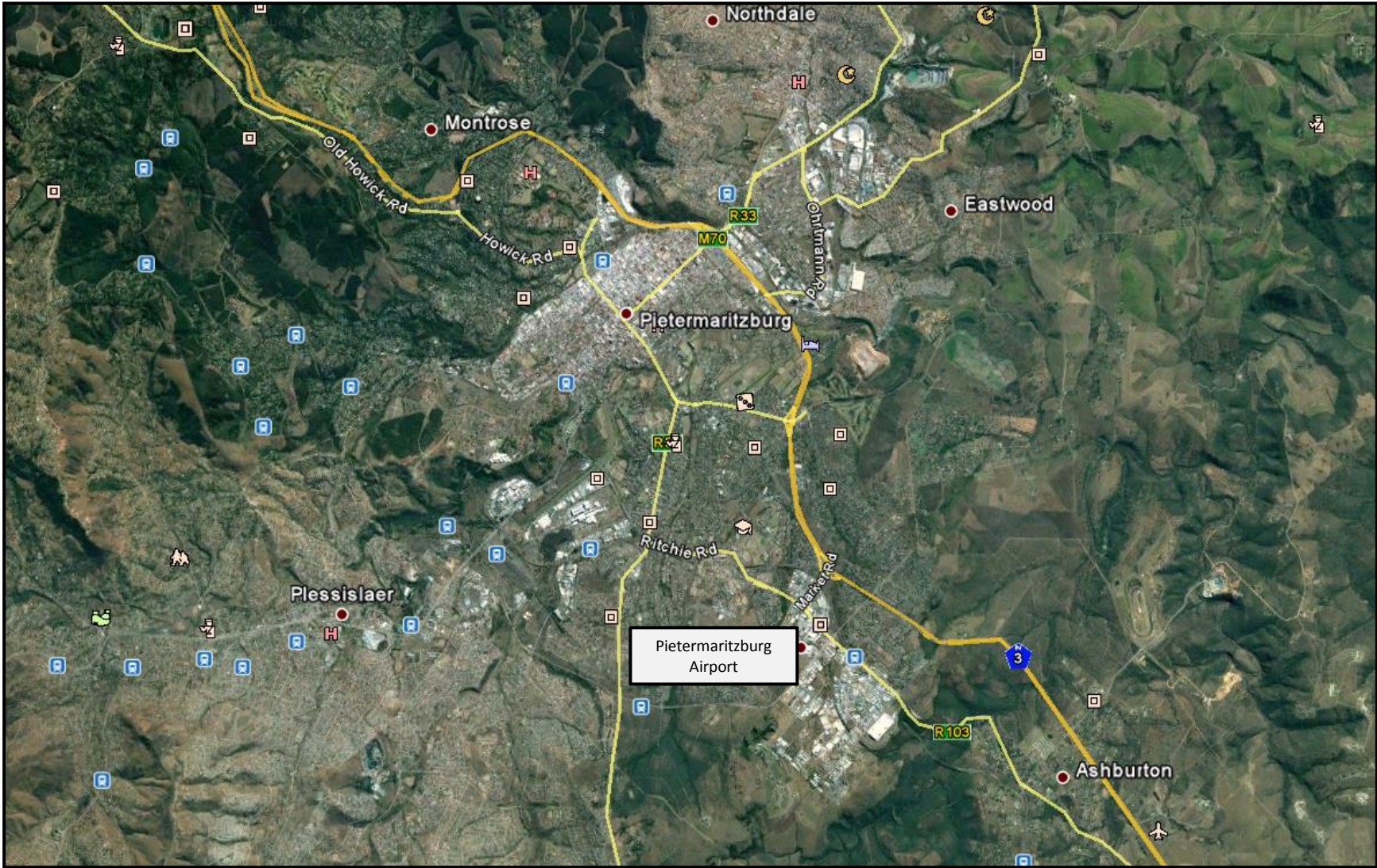
- (iv) The proposed access points to the Techno Hub development (opposite Powell and Stubbs Roads) are in suitable positions relative to existing road geometry.
- (v) Public transport facilities to be provided as described in sub-section 6.3.
- (vi) Pedestrian and non-motorised transport facilities will have to be provided as described in sub-section 6.4.
- (vii) During construction additional signage to be provided where appropriate to warn of the presence of construction vehicles.

**DJ McGuigan PrEng**  
**Royal HaskoningDHV**

**September 2016**

## FIGURES

1. Locality Plan
2. Site Plan
3. 2016 Traffic (without proposed development) Traffic Diagram AM & PM peaks
4. 2021 Traffic (without proposed development) Traffic Diagram AM & PM peaks
5. Techno Hub – Trip Distribution
6. Techno Hub – Trip Assignment
7. Airport Expansion – Phase 1 - Trip Distribution
8. Airport Expansion – Phase 1 - Trip Assignment
9. Combined Traffic Assignment Diagrams – AM & PM Peaks
10. 2016 Traffic (with proposed development) Traffic Diagram AM & PM peaks
11. 2021 Traffic (with proposed development) Traffic Diagram AM & PM peaks



**PIETERMARITZBURG AIRPORT PRECINCT TIA**

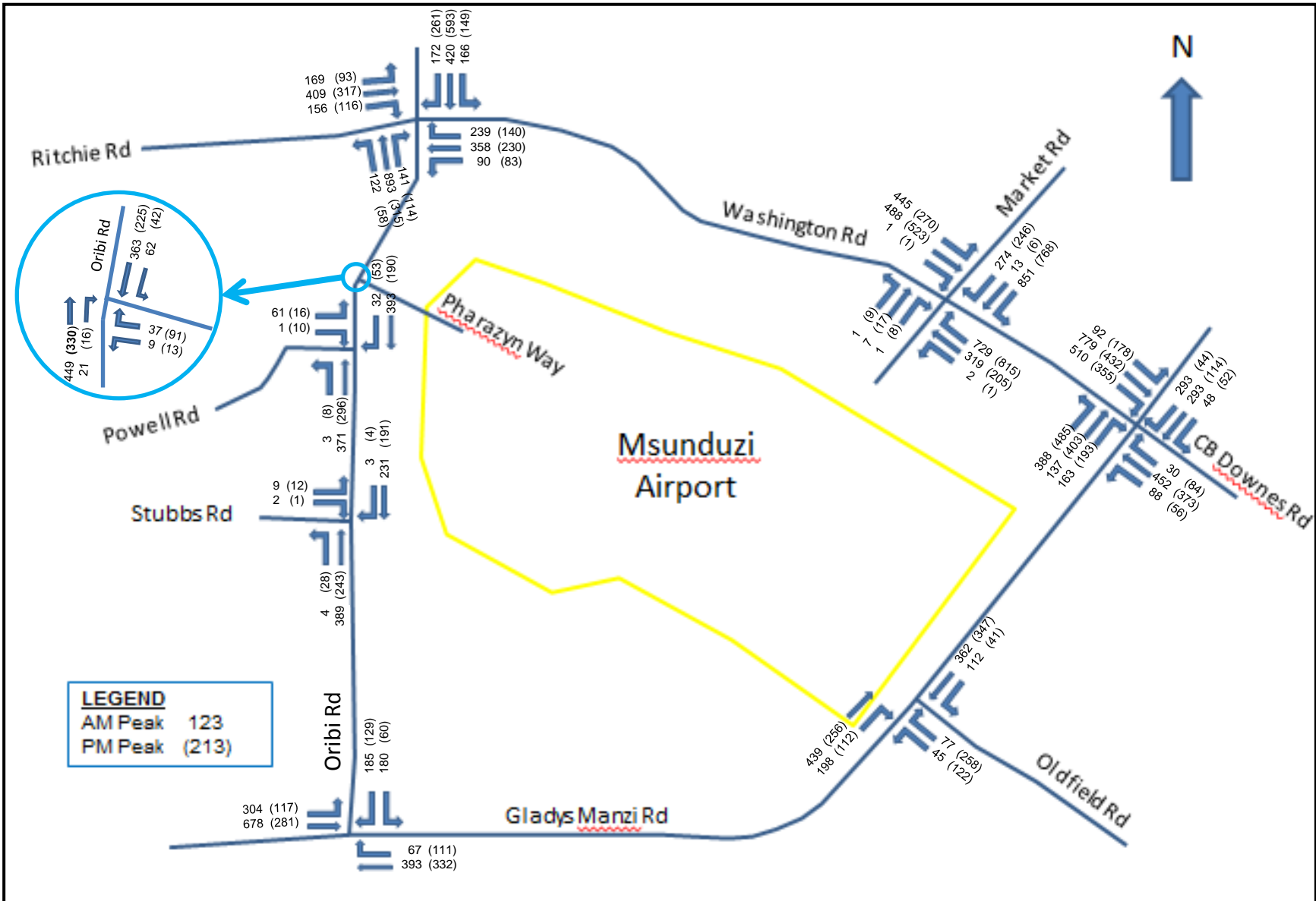
LOCALITY PLAN

Figure: 1	
Scale: NTS	
Date: Aug-16	
Dwg/Project No. MD2584	Rev.



PIETERMARITZBURG AIRPORT PRECINCT TIA

Figure: 2  
Scale: NTS



**PIETERMARITZBURG AIRPORT PRECINCT TIA**

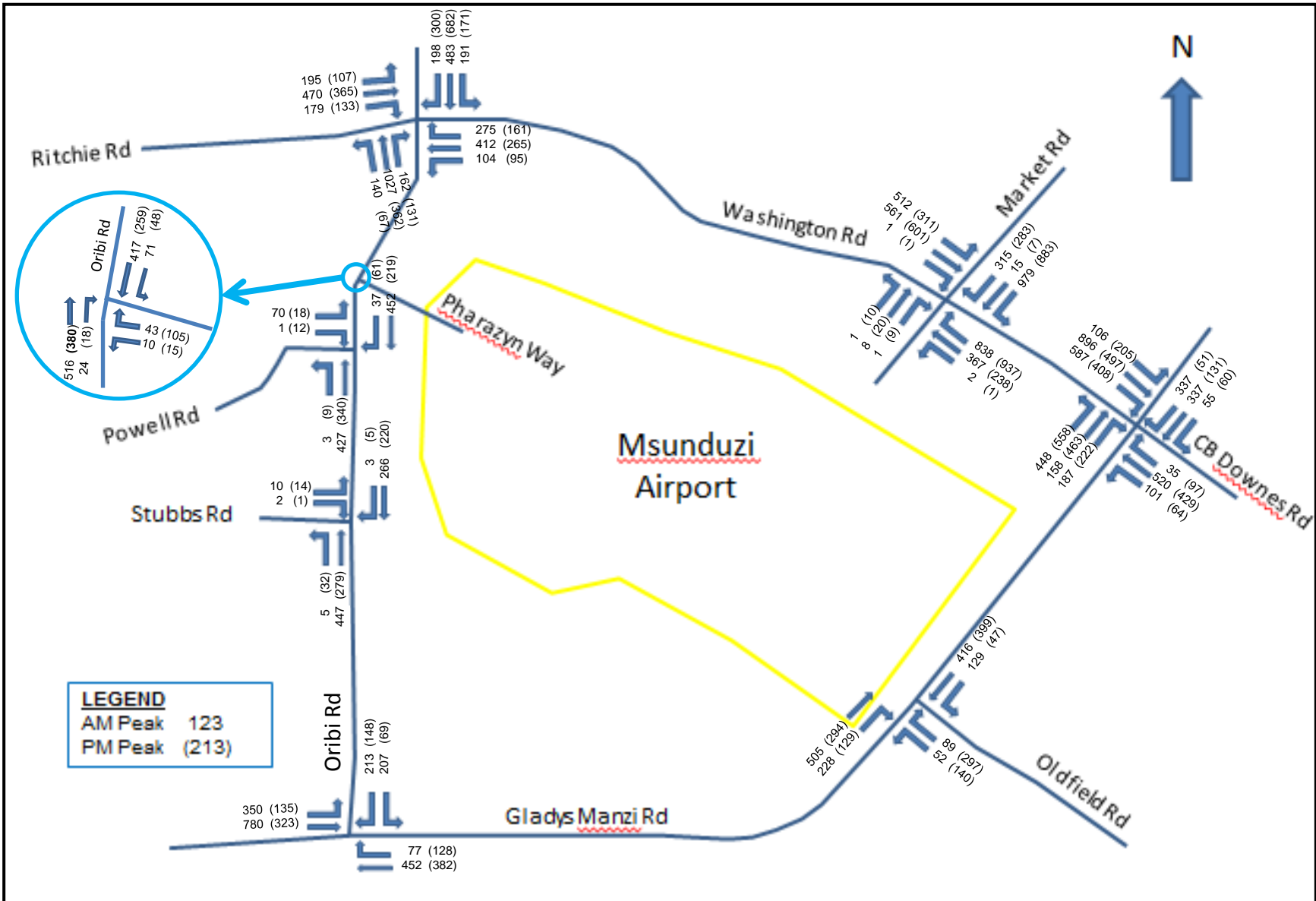
Existing Traffic – 2016  
 (WITHOUT PROPOSED DEVELOPMENT)


TRAFFIC DIAGRAM - AM & PM PEAKS

Figure: 3  
 Scale: NTS

Date: Aug-16  
 Dwg/Project No. MD2584  
 Rev.

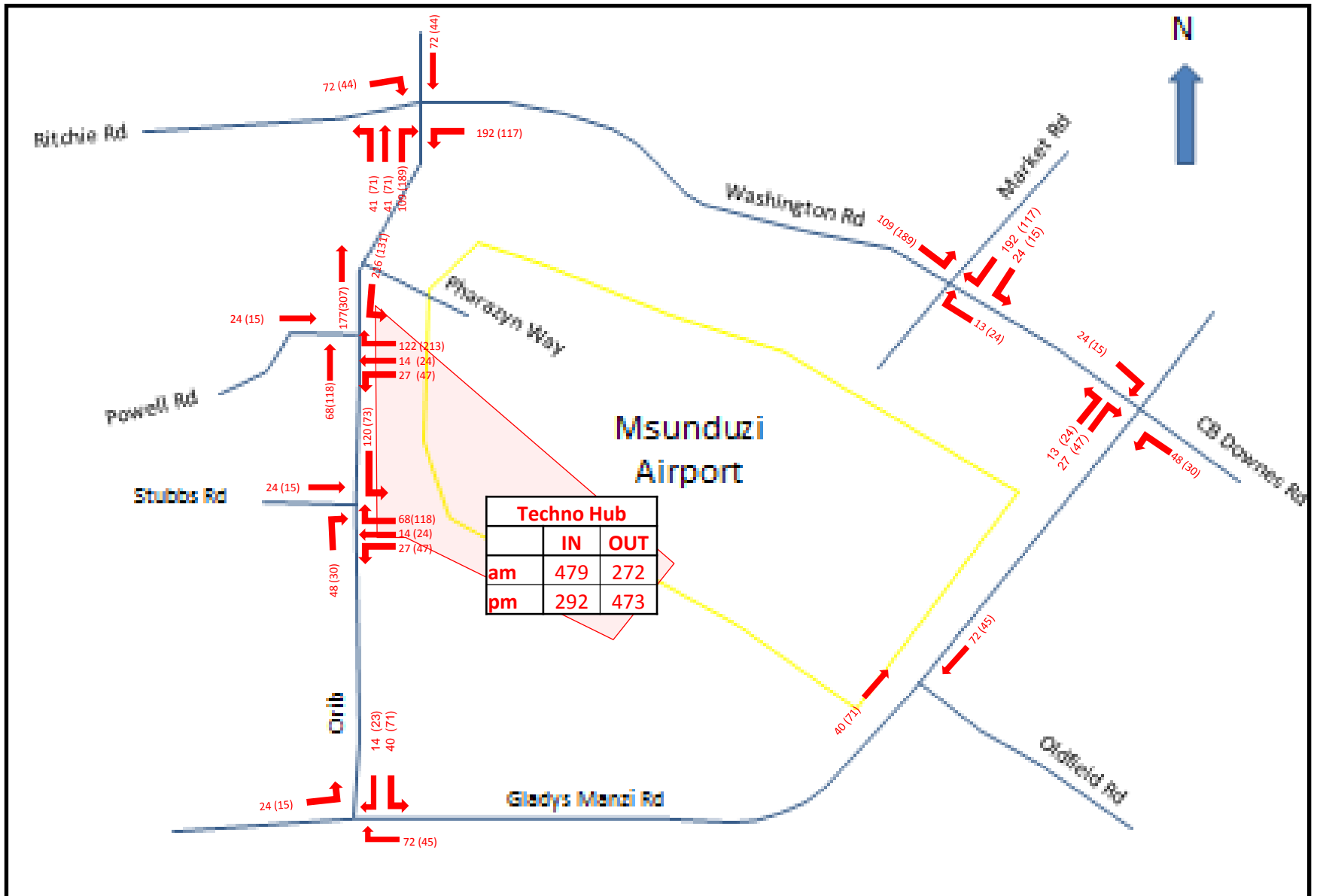


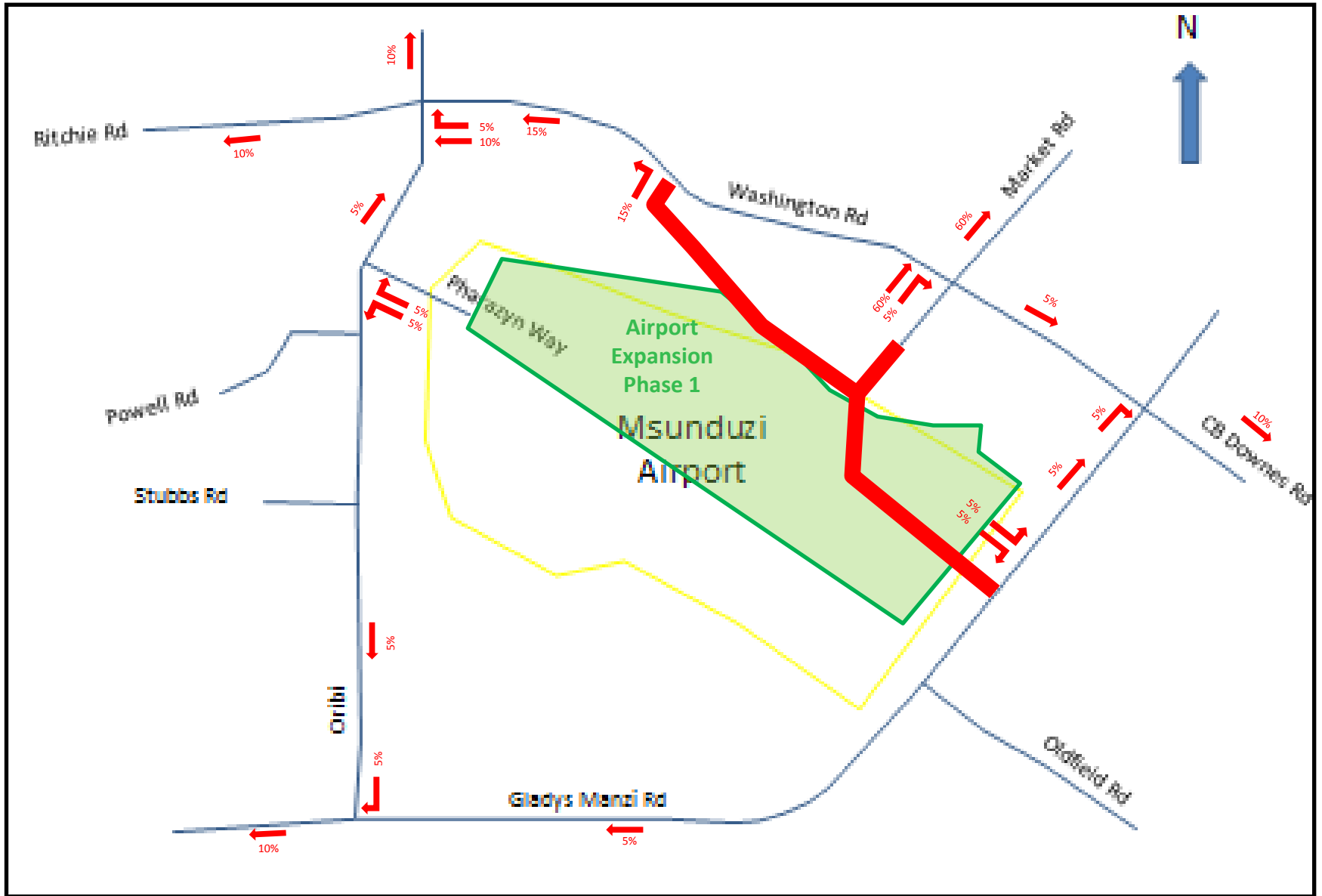


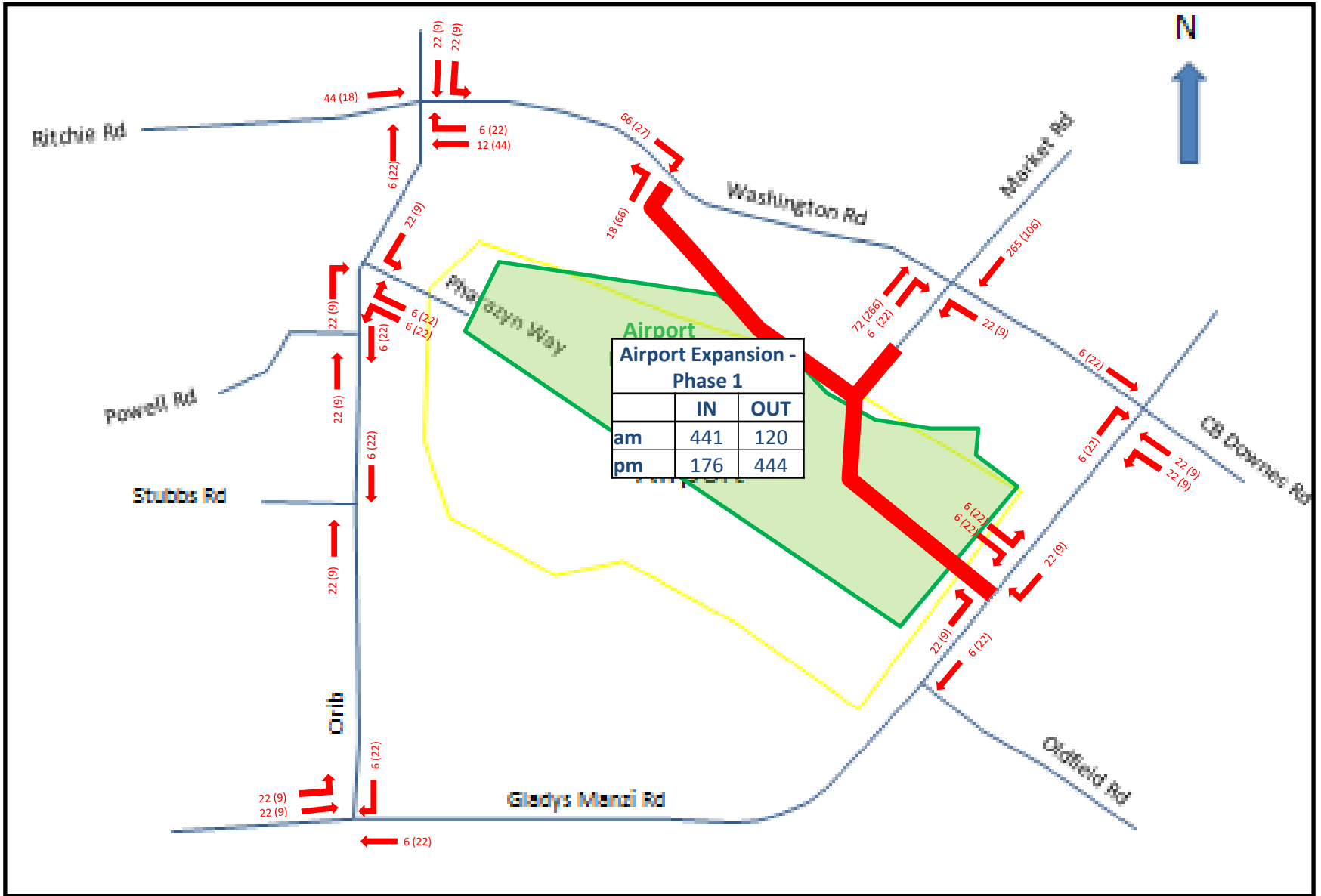
 <p>Royal HaskoningDHV Enhancing Society Together</p>	<b>PIETERMARITZBURG AIRPORT PRECINCT TIA</b>		Figure: 4
	Predicted Traffic – 2021 (WITHOUT PROPOSED DEVELOPMENT)		Scale: NTS
	TRAFFIC DIAGRAM - AM & PM PEAKS		Date: Aug-16
		Dwg/Project No. MD2584	Rev.

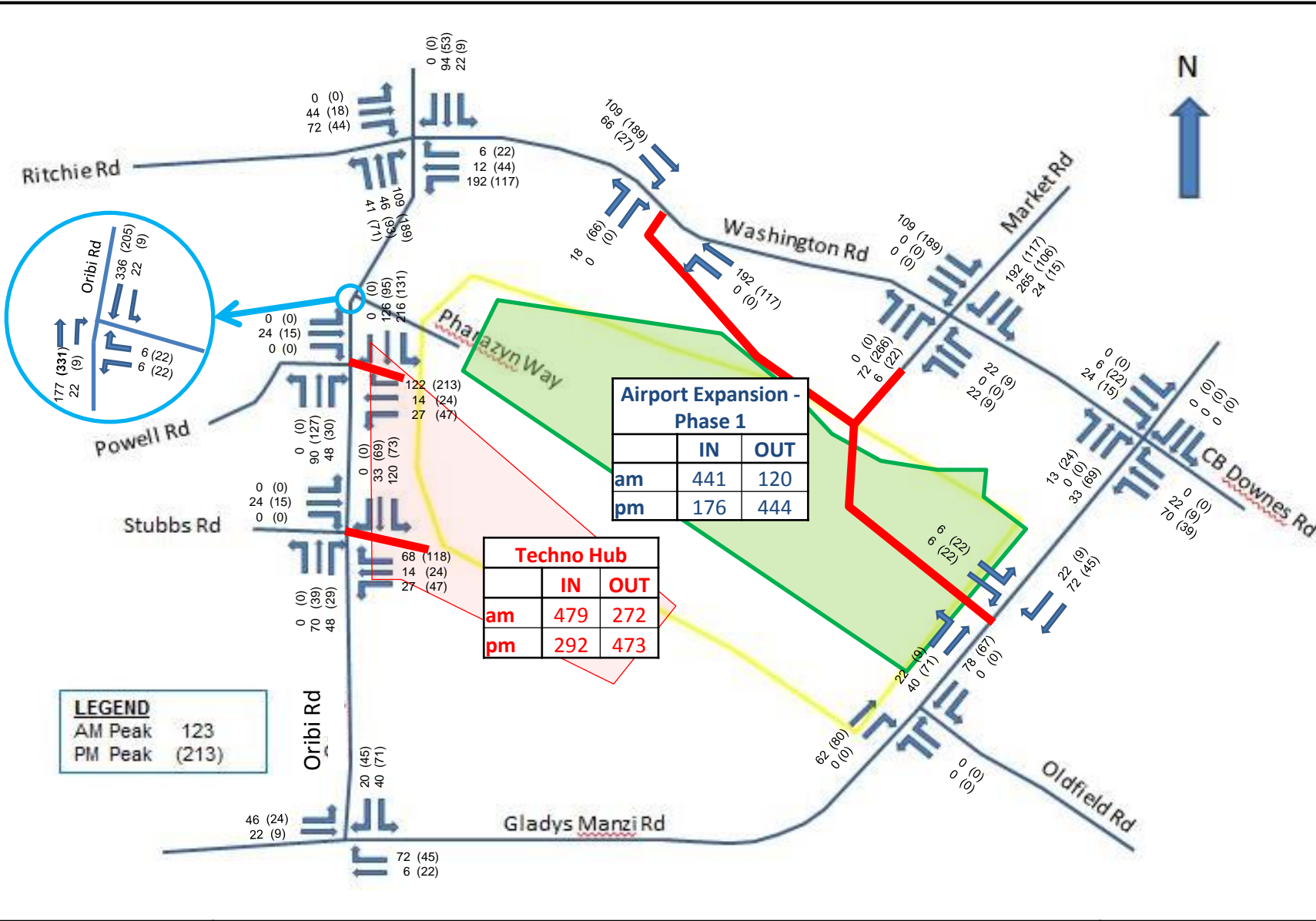












Airport Expansion - Phase 1		
	IN	OUT
am	441	120
pm	176	444

Techno Hub		
	IN	OUT
am	479	272
pm	292	473

LEGEND	
AM Peak	123
PM Peak	(213)

PIETERMARITZBURG AIRPORT PRECINCT TIA

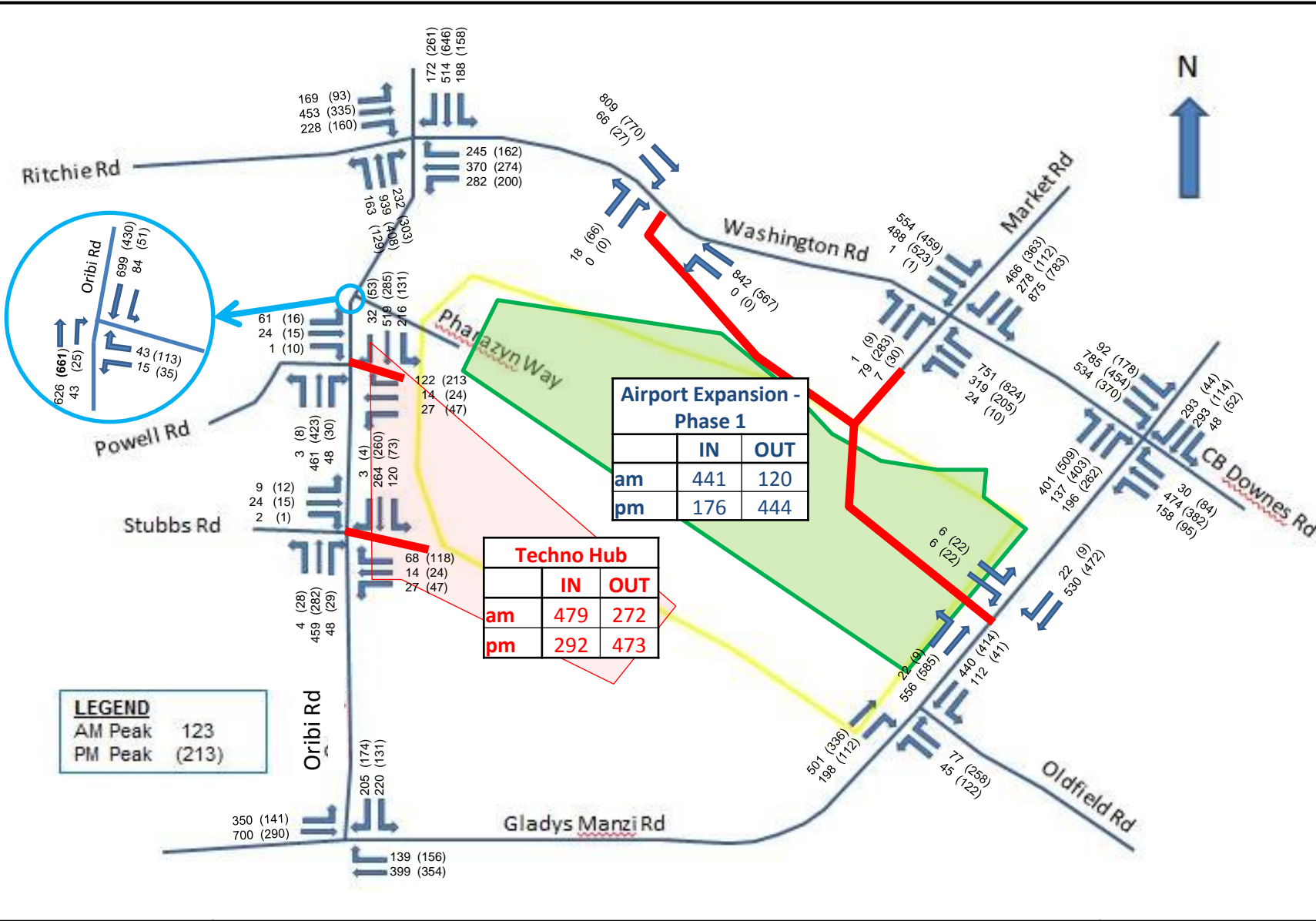
PROPOSED DEVELOPMENT  
(Techno Hub and Airport Expansion)

COMBINED TRAFFIC ASSIGNMENT DIAGRAM - AM & PM PEAKS

Figure: 9  
Scale: NTS

Date: Aug-16  
Dwg/Project No. MD2584  
Rev.





**PIETERMARITZBURG AIRPORT PRECINCT TIA**

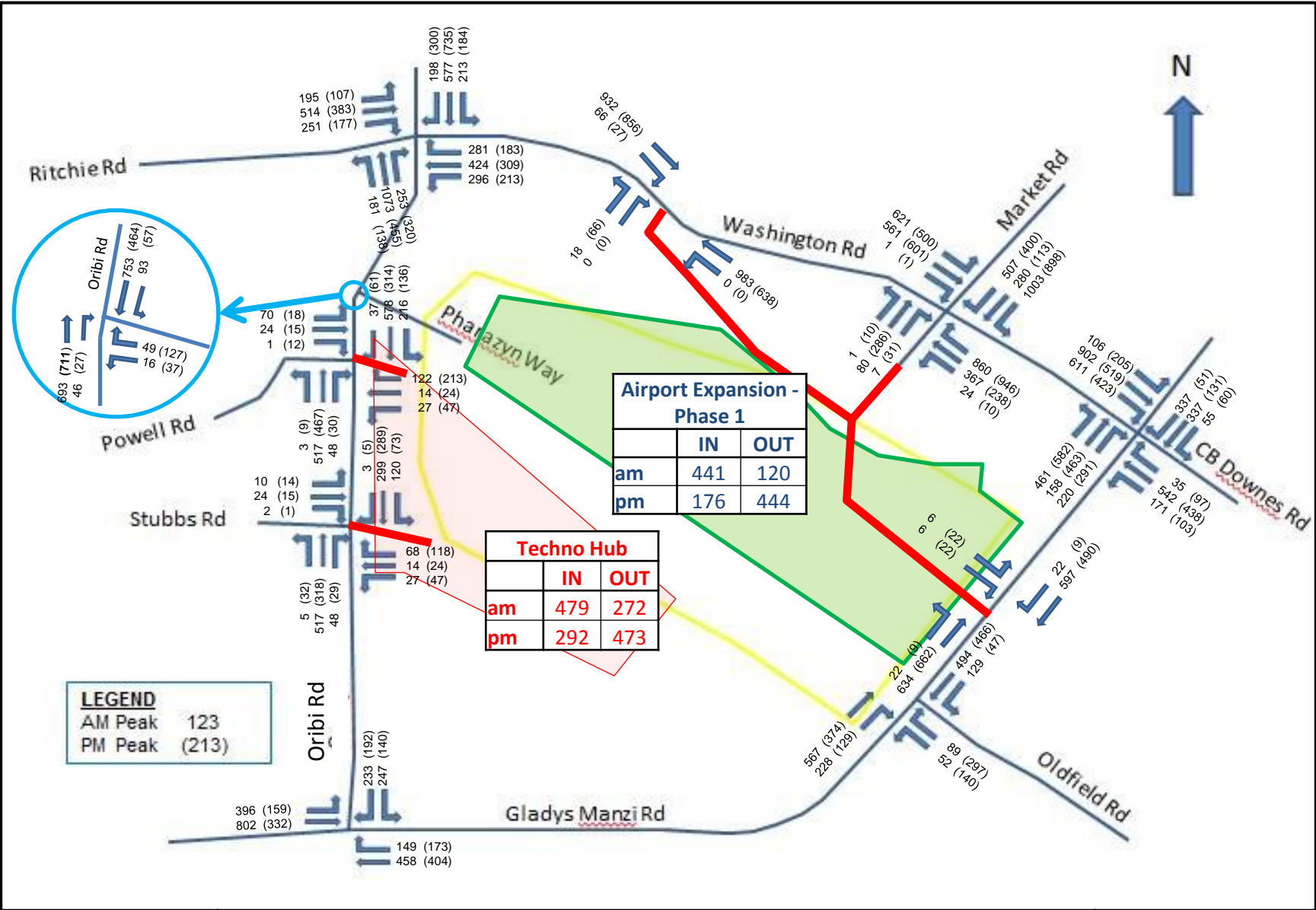
Figure: 10  
 Scale: NTS



Existing Traffic – 2016  
 (WITH PROPOSED DEVELOPMENT)

TRAFFIC DIAGRAM - AM & PM PEAKS

Date: Aug-16  
 Dwg/Project No. MD2584  
 Rev.



PIETERMARITZBURG AIRPORT PRECINCT TIA

Figure: 11  
 Scale: NTS



Predicted Traffic – 2021  
 (WITH PROPOSED DEVELOPMENT)

TRAFFIC DIAGRAM - AM & PM PEAKS

Date: Aug-16  
 Dwg/Project No. MD2584  
 Rev.





- 1995 to 1996**      **Bradford, Conning and Partners (now Royal HaskoningDHV), Pietermaritzburg, South Africa**  
Associate and Civil Engineer
- 1986 to 1994**      **Bradford, Conning and Partners (now Royal HaskoningDHV), Pietermaritzburg, South Africa**  
Civil Engineer
- 1983 to 1985**      **Ninham Shand Incorporated, South Africa**  
Civil Engineer
- 1978 to 1982**      **Strathclyde Regional Council, United Kingdom**  
Civil Engineer

**Professional Experience:**

- 2016**              **Pietermaritzburg Airport Precinct Plan, KwaZulu-Natal, South Africa**  
Client: Msunduzi Municipality  
Position: Traffic & Transportation Engineer  
Brief Description: Transportation input into the reconfiguration of Airport operations.  
Assigned Tasks: Undertake strategic assessment of traffic and transportation needs associated with the upscaling of operations at the proposed extension of the Pietermaritzburg Airport Precinct.  
Project Value: R1,490,000.00  
Services Value: R150,000.00  
Project Number: T01.DUR.000402
- 2015**              **Ethekwini Road Safety Audit, KwaZulu-Natal, South Africa**  
Client: eThekweni Municipality  
Position: Road Safety Audit Team  
Brief Description: Stage 6 Road Safety Audit  
Assigned Tasks: Undertake Road Safety Audits on two sections of the Metropolitan road network with particularly poor safety records. Mentor and empower technical staff in the principles of Road Safety Auditing.  
Project Value: R149,112.00  
Services Value: R127,800.00  
Project Number: T01.DUR.000425
- 2015**              **N3 New England to Twickenham, KwaZulu-Natal, South Africa**  
Client: South African National Roads Agency SOC Limited  
Position: Traffic Engineer, Transportation Engineer  
Brief Description: The upgrading of the N3 from New England Road to Twickenham  
Assigned Tasks: Assess the necessary upgrades to the local network in the vicinity of the Pietermaritzburg CBD as related to future National Road capacity improvements.  
Project Value: R1,191,000,000.00  
Services Value: R41,293,854.00  
Project Number: T01.PZB.000466

- 2015**                    **NR R 730 Road Safety Audit, Free State, South Africa**  
Client: South African National Roads Agency SOC Limited  
Position: Road Safety Audit Team, Project Manager  
Brief Description: Undertake a Stage 3 Roads Safety Audit on the Detailed Design of the proposed upgrade to the Thabong Interchange, Welkom, Free State  
Assigned Tasks: Road Safety Audit Team Leader in assessing the safety implications of a major upgrade to the National road network.  
Project Value: R14,000,000.00  
Services Value: R166,190.00  
Project Number: T01.PZB.000485
- 2015**                    **Stockowners Business Park : Erf 3142 Howick, KwaZulu-Natal, South Africa**  
Client: ET Bramwell  
Position: Traffic Engineer  
Brief Description: Traffic Impact Assessment and statutory approvals  
Assigned Tasks: Prepare a traffic report detailing the implications of a major development adjacent to the National Road network and providing appropriate amelioration measures.  
Project Value: R143,850.00  
Services Value: R75,968.75  
Project Number: T01.PZB.000495
- 2014**                    **TIA for Proposed Woodburn Boulevard, KwaZulu-Natal, South Africa**  
Client: Shanbar Property Development (Pty) Ltd  
Position: Project Manager, Traffic Engineer  
Brief Description: Traffic impact assessment for the development of a significant commercial development on the major road network in central Pietermaritzburg.  
Assigned Tasks: Undertake a complex traffic report with dynamic modelling detailing the implications of a major development adjacent to the Pietermaritzburg CBD and providing appropriate upgrade measures.  
Project Value: R87,347.00  
Services Value: R122,448.58  
Project Number: T01.PZB.000464
- 2014**                    **N11 Newcastle Road Safety Audit, KwaZulu-Natal, South Africa**  
Client: Leo Consulting (Pty) Ltd  
Position: Road Safety Audit Team, Project Manager  
Brief Description: Road safety audit for the realignment, rehabilitation and upgrade of the Newcastle Bypass on National Route 11 Section 3 (km 52.30) to Section 4 (km 6.10)  
Assigned Tasks: Lead the road safety audit team in assessing the safety implications of a major upgrade to the National Road network from route location stages through to detailed design.  
Project Value: R211,600.00  
Services Value: R203,962.45  
Project Number: T01.PZB.000443

- 2014**                    **N1/17 Ventersburg to Kroonstad : Road Safety Audit, South Africa**  
Client: SMEC South Africa (Pty) Ltd  
Position: Road Safety Audit Team, Project Manager  
Brief Description: Undertake a Stage 1 Road Safety Audit on the Upgrade of the N1 between Kroonstad and Ventersburg  
Assigned Tasks: Road Safety Audit Leader  
Project Value: R120,000.00  
Services Value: R110,651.00  
Project Number: T01.PZB.000428
- 2014**                    **RBM - Zulti South Access Roads, Richards Bay, South Africa**  
Client: Richards Bay Minerals  
Position: Traffic Engineer  
Brief Description: Rehabilitation of existing surfaced roads, upgrading of gravel roads to surfaced roads, provide pedestrian facilities and upgrading of intersections to form a new access route to the new Zulti South Mine for RBM.  
Assigned Tasks: Prepare several traffic reports relating to various options to service a major mining operation.  
Project Value: R150,000,000.00  
Services Value: R6,876,496.00  
Project Number: T01.PZB.000415
- 2013**                    **R61 Upgrade between Mpenjati River & Mbizana River, KwaZulu-Natal, South Africa**  
Client: South African National Roads Agency SOC Limited  
Position: Traffic Engineer  
Brief Description: Upgrading and widening of the R61 from the Mpenjati River to Southbroom interchange.  
Assigned Tasks: Analysing and assessing existing and projected traffic patterns and recommend infrastructural needs.  
Project Value: R850,000,000.00  
Services Value: R32,338,651.77  
Project Number: T01.PZB.000322
- 2013**                    **Zulti South: Haul & Access Road Investigations, KwaZulu-Natal, South Africa**  
Client: Richards Bay Minerals  
Position: Traffic Engineer  
Brief Description: Investigation into the feasibility of alternative access and haul roads at the proposed Zulti South Mine.  
Assigned Tasks: Analysing and assessing existing and projected traffic patterns and infrastructural needs.  
Project Value: R367,000.00  
Services Value: R312,680.00  
Project Number: T01.DUR.000275

- 2013**                    **R61 Upgrade of Port Edward Interchange, KwaZulu-Natal, South Africa**  
Client: South African National Roads Agency SOC Limited  
Position: Traffic Engineer  
Brief Description: Detailed design and construction monitoring of the Port Edward Interchange on National Route R61 Section 1 (km 3.50)  
Assigned Tasks: Traffic and pedestrian studies and design recommendations.  
Project Value: R500,000,000.00  
Services Value: R4,644,403.03  
Project Number: T01.PZB.000307
- 2013**                    **Willowton Park, KwaZulu-Natal, South Africa**  
Client: Steinhoff Properties (Pty) Ltd  
Position: Traffic Engineer  
Brief Description: Prepare and submit a development application in terms of the Planning and Development Act No. 6 of 2008 to secure a Special Area Zone allowing for multiple uses.  
Assigned Tasks: Analysing and assessing existing and projected traffic patterns and infrastructural needs.  
Project Value: R175,000,000.00  
Services Value: R274,253.75  
Project Number: T01.DUR.000205
- 2013**                    **Local Area Plan for South Eastern District, Pietermaritzburg, South Africa**  
Client: Msunduzi Municipality  
Position: Transportation Specialist  
Brief Description: Preparation of a Local Area Plan for the South Eastern District of Msunduzi Municipality  
Assigned Tasks: Analysing and assessing existing and projected traffic patterns and infrastructural needs for a vibrant local area within a municipality  
Project Value: R850,000.00  
Services Value: R926,880.97  
Project Number: T01.DUR.000129
- 2013**                    **Pietermaritzburg Central Business District and Local Area Plan, KwaZulu-Natal, South Africa**  
Client: Msunduzi Municipality  
Position: Traffic Engineer, Transportation Engineer  
Brief Description: Preparation of a Regeneration Strategy for the CBD and Central Expansion Area for the Msunduzi Municipality  
Assigned Tasks: Assessment of existing transportation infrastructure and projection of needs to establish future requirements.  
Project Value: R756,650.00  
Services Value: R795,837.50  
Project Number: T01.DUR.000127

- 2012**                    **Alford Avenue Signalisation, Ramsgate, KwaZulu-Natal, South Africa**  
Client: KwaZulu-Natal Department of Transport  
Position: Project Manager  
Brief Description: Design and installation of traffic signalisation at the intersection of MR395 and MR351, Alfred Avenue, Ramsgate  
Assigned Tasks: Design and review of drawings, project management  
Project Value: R620,866.30  
Services Value: R640,981.00  
Project Number: T01.PZB.000293
- 2012**                    **Classification of Road Network, KwaZulu-Natal, South Africa**  
Client: KwaZulu-Natal Department of Transport  
Position: Transportation Specialist  
Brief Description: The Road Infrastructure Strategic Framework for South Africa (RISFSA) that has been adopted at a national level is the blueprint for the planning and development of the road infrastructure. Chapter 3 of RISFSA details a functional road classification system that is to be adopted and implemented by all road authorities. In terms of this system, public roads are to be grouped into functional classes.  
Assigned Tasks: Traffic surveys, project management, road safety, data gathering and review of reports.  
Project Value: R3,156,000.00  
Services Value: R11,301,553.64  
Project Number: T02.PZB.000080
- 2012**                    **Weenen PT Facilities, KwaZulu-Natal, South Africa**  
Client: KwaZulu-Natal Department of Transport  
Position: Project Manager  
Brief Description: Design and contract supervision of public transport facility in Weenen from inception through to completion.  
Assigned Tasks: Management & control  
Project Value: R7,200,000.00  
Services Value: R1,492,922.58  
Project Number: T01.PZB.000254
- 2012**                    **Construction Phase for the Improvements of the Zululand University, KwaZulu-Natal, South Africa**  
Client: South African National Roads Agency SOC Limited  
Position: Traffic Engineer  
Brief Description: Contract administration and site supervision of the traffic circles at the intersection of R102 with two provincial main road P743 and P535 and the University of Zululand entrance as well as roadworks required for safety improvements.  
Assigned Tasks: Analysing and assessing existing and projected traffic patterns and infrastructural needs.  
Project Value: R26,000,000.00  
Services Value: R5,143,332.74  
Project Number: T02.PZB.000214

- 2011**                    **Liberty Midlands Mall - Traffic Operational Study, KwaZulu-Natal, South Africa**  
Client: Liberty Life Properties (Pty) LTD  
Position: Project Principal  
Brief Description: Liberty Midlands Mall - Traffic Operational Study  
Assigned Tasks: Manage the project  
Project Value: R108,000.00  
Services Value: R874,804.76  
Project Number: T01.PZB.000253
- 2011**                    **uMzimkhulu Public Transport Facilities, uMzimkhulu, South Africa**  
Client: KwaZulu-Natal Department of Transport  
Position: Traffic Engineer  
Brief Description: The provision of an Integrated Intermodal Public Transport Interchange.  
Assigned Tasks: Establish the existing conditions and assess the future needs before designing the most appropriate public transport facility.  
Project Value: R36,000,000.00  
Services Value: R1,936,663.07  
Project Number: T01.PZB.000226
- 2011**                    **N3 Capacity Improvement & PMB Bypass Study, Pietermaritzburg, South Africa**  
Client: South African National Roads Agency SOC Limited  
Position: Traffic Engineer  
Brief Description: Preliminary design for the capacity upgrade to section 2 and 5 of the N3 near Pietermaritzburg (KwaZulu-Natal) entailing the provision of additional lanes, interchange upgrades, land acquisition, etc.  
Assigned Tasks: Investigate and analyse existing and predicted traffic on the national freeway before assessing and providing recommendations on the most appropriate solution.  
Project Value: R15,000,000,000.00  
Services Value: R12,800,000.00  
Project Number: T01.PZB.000207
- 2011**                    **Hilcove Hills Development, Pietermaritzburg, South Africa**  
Client: Treasure Cove Trust  
Position: Traffic Engineer  
Brief Description: Infrastructure planning for private residential development of 1000 units.  
Assigned Tasks: Assess the traffic needs to service the proposed development including linkages with the local road network as well as the national road.  
Project Value: R402,400.00  
Services Value: R606,720.01  
Project Number: W01.DUR.000096

- 2011**                    **Improvements of the Zululand University Interchange on National Route 2, Section 28 at Km 60.2, Empangeni, South Africa**  
Client: South African National Roads Agency SOC Limited  
Position: Design Engineer, Traffic Engineer  
Brief Description: Detailed design, construction monitoring and site supervision of a turbo roundabout at an intersection of two provincial main roads as well as an upgraded access at the entrance to the University of Zululand. The project included the provision of sidewalks (NMT facilities).  
Assigned Tasks: Assess traffic and recommend the most appropriate solution.  
Project Value: R26,000,000.00  
Services Value: R2,262,687.27  
Project Number: T01.PZB.000214
- 2011**                    **Traffic Impact Assessment Copesville, Areas 2 and 3, Pietermaritzburg, South Africa**  
Client: Umpheme Development (Pty) Ltd  
Position: Project Manager  
Brief Description: Perform a traffic impact assessment for a proposed development in Copesville, Pietermaritzburg  
Assigned Tasks: Undertake the Project  
Project Value: R63,798.68  
Services Value: R63,798.68  
Project Number: T01.PZB.000213
- 2010**                    **Hayfields Superspar, Pietermaritzburg, South Africa**  
Client: Mr C Christodoulou Family Trust  
Position: Traffic Engineer  
Brief Description: Sewer system for a new 6 000m<sup>2</sup> SUPERSPAR  
Assigned Tasks: Prepare presentation, attend public hearing, review of report and objections.  
Project Value: R60,000,000.00  
Services Value: R592,000.00  
Project Number: W01.PZB.000200
- 2009**                    **N3 Epworth Interchange to Athlone, Pietermaritzburg, South Africa**  
Client: South African National Roads Agency SOC Limited  
Position: Traffic Engineer  
Brief Description: The detailed assessment, analysis and design for the strengthening and road widening of the N3 from Epworth Interchange to Athlone.  
Assigned Tasks: Modelling of forecasted traffic flows through various configurations.  
Project Value: R1,150,000,000.00  
Services Value: R4,931,652.33  
Project Number: T01.PZB.000163

- 2008**                    **Development of the Non-Motorised Transport Plan : Contract No. PU50 of 07/08, Msunduzi, South Africa**  
Client: Msunduzi Municipality  
Position: Project Manager  
Brief Description: Investigate, analyse, report and make recommendations relating to the development of non-motorised transport throughout the Msunduzi Municipal Area.  
Assigned Tasks: Client liaison and project planning.  
Project Value: R404,500.00  
Services Value: R404,500.00  
Project Number: T01.PZB.000147
- 2008**                    **Vumuthando Taxi Rank, KwaZulu Natal, South Africa**  
Client: uMshwathi Municipality  
Position: Project Manager  
Brief Description: Professional services for design of and tender documentation for Taxi Rank near Vumuthando, Swayimane.  
Assigned Tasks: Analysis/Design/Oversee technical content  
Project Value: R100,000.00  
Services Value: R108,095.44  
Project Number: T01.PZB.000150
- 2008**                    **Enhancement of Public Transport Operations, Pietermaritzburg, South Africa**  
Client: Msunduzi Municipality  
Position: Project Manager  
Brief Description: Actively engage in the process of determining an appropriate and effective model for the management of public transport interchanges/facilities in the municipal area.  
Assigned Tasks: Analysis, design, oversee technical content.  
Project Value: R399,100.00  
Services Value: R347,100.00  
Project Number: T01.PZB.000148
- 2008**                    **Traffic Engineering Small Projects, KwaZulu Natal, South Africa**  
Client: BCP Engineers (Pty) Ltd  
Position: Project Manager, Traffic Engineer  
Brief Description: Traffic engineering and transportation input to shopping centre  
Assigned Tasks: Researcher, analyst.  
Project Value: R150,000.00  
Services Value: R2,029,286.00  
Project Number: T01.PZB.000145



- 2008**                    **D1017 - Upgrade to Blacktop Standard, Wartburg, South Africa**  
Client: uMshwathi Municipality  
Position: Project Manager  
Brief Description: Widen and blacktop an existing route serving approximately 300 dwellings in a very rural environment. Potential to unlock tourism opportunities.  
Assigned Tasks: Project Management & reporting  
Project Value: R24,000,000.00  
Services Value: R1,400,000.00  
Project Number: T01.PZB.000137
- 2008**                    **Development of integrated intermodal public transport facility, Pietermaritzburg, South Africa**  
Client: Translog  
Position: Project Manager  
Brief Description: Assess existing public transport operations in Pietermaritzburg and design appropriate intermodal interchange(s).  
Assigned Tasks: Project management.  
Project Value: R2,200,000.00  
Services Value: R792,923.60  
Project Number: T01.PZB.000136
- 2008**                    **Traffic Impact Assessment Otto's Bluff to Connor Road, Pietermaritzburg, South Africa**  
Client: Msunduzi Municipality  
Position: Project Manager  
Brief Description: The execution of a traffic impact assessment for the new road link between Connor road and Otto's Bluff Road in Pietermaritzburg  
Assigned Tasks: Economic evaluation of alternative alignments for major arterial road linkage.  
Project Value: R165,400.00  
Services Value: R188,556.00  
Project Number: T01.PZB.000113
- 2008**                    **Liberty Midlands Mall Phase 3, Pietermaritzburg, South Africa**  
Client: Liberty Life Properties (Pty) LTD  
Position: Project Manager  
Brief Description: Establishment of a provincial shopping complex on the periphery of the CBD of Pietermaritzburg.  
Assigned Tasks: Design the most suitable network to serve the development.  
Project Value: R150,000,000.00  
Services Value: R265,000.00  
Project Number: TA1.BCP.105100

2007

**Design of the upgrade of the Epworth Interchange, Pietermaritzburg, South Africa**

Client: South African National Roads Agency SOC Limited

Position: Transportation Engineer

Brief Description: The project is located on the N3, Section 3 from km 6,8 to km 8,8 on the outskirts of Pietermaritzburg. The design includes two new road structures as well as the re-alignment of the north and south bound carriageways in order to reduce the current weaving of traffic.

Assigned Tasks: Prepare a traffic report incorporating predicted traffic volumes on the interchange network and recommending appropriate layout configurations. Undertake a Road Safety Audit for the designed interchange.

Project Value: R400,000,000.00

Services Value: R8,089,291.16

Project Number: T01.PZB.000098

2005

**Construction of Main Road P496 (including the Nseleni Floodplain, Link and Nsezi River Bridges), Richards Bay, South Africa**

Client: KwaZulu-Natal Department of Transport

Position: Traffic Engineer

Brief Description: Geometric, drainage and intersection design for the doubling of the existing 15km long 2 lane provincial main road to a 4 lane dual carriageway provincial main road between Empangeni and the major port of Richards Bay. The Nseleni Floodplain, Link and Nsezi River Bridges comprise a 1,2 km long portion of this project. Construction of roadworks, doubling of rail grade separations and numerous box culverts are also included.

Assigned Tasks: Traffic analysis, assessment and recommendation of infrastructure requirements for the upgrade of the provincial main road between Empangeni and the major port of Richards Bay.

Project Value: R910,000,000.00

Services Value: R19,099,056.12

Project Number: TA1.BCP.102480



## DETAILS OF SPECIALIST AND DECLARATION OF INTEREST

Application for authorisation in terms of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment (EIA) Regulations, 2014.

<b>Project Title:</b>	Proposed expansion of the Pietermaritzburg Airport
<b>Specialist:</b>	TRAFFIC & TRANSPORTATION
<b>Contact person:</b>	DEREK MCGUIGAN
<b>Postal address:</b>	30 MONTROSE PARK BOULEVARD, VCCE, Pmb.
<b>Postal code:</b>	3201
<b>Telephone:</b>	033 328 1185
<b>E-mail:</b>	derek.mcguigan@rhdhv.com
<b>Professional affiliation(s) (if any):</b>	Pr Eng; C Eng; MSAICE; MICE
<b>Project Consultant:</b>	Institute of Natural Resources NPC
<b>Contact person:</b>	David Cox
<b>Postal address:</b>	P O Box 100396, Scottsville, Pietermaritzburg
<b>Postal code:</b>	3209
<b>Telephone:</b>	033 346 0796
<b>E-mail:</b>	dcox@inr.org.za

The specialist appointed in terms of the Regulations\_

I, DEREK MCGUIGAN declare that -

General declaration:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;

- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Derek M<sup>e</sup> Guerin  
Signature of the specialist

ROYAL HASKONINGDHV  
Name of company (if applicable)

16 January 2017  
Date