

**ENVIRONMENTAL IMPACT REPORT FOR THE
PROPOSED EXPANSION OF THE PIETERMARITZBURG
AIRPORT**

Draft Report for Comment



Institute of
Natural Resources

Environmental Impact Report for the Proposed Expansion of the Pietermaritzburg Airport

DRAFT REPORT FOR COMMENT

Prepared for



Prepared by



P.O. Box 100396, Scottsville, 3209
Tel: +27 33 3460 796, info@inr.org.za

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EXECUTIVE SUMMARY

Introduction

The Msunduzi Municipality (MM) owns and runs the Pietermaritzburg Airport (PMBA) which serves Pietermaritzburg (PMB) and the broader region. Based on various drivers, the MM has proposed the expansion of the PMBA with the following aims:

- Improve the service provision to both operators and the public at large,
- Effectively meet the increasing growth in passenger and cargo volumes and air traffic movements,
- Improve the financial sustainability of the PMBA which is currently subsidized by the MM ratepayers.

The proposed expansion is captured in the 2014 Master Plan which provides for a 3 phased approach to expansion covering then 50 years. This investigation focusses on Phase 1 of the expansion and specifically the infrastructure required to meet expected increase in scheduled flights to a total of 250 000 passengers per annum, along with demand for general aviation services. This phase also includes development of various land parcels within the Airport boundary for a range of uses including industrial and commercial/mixed uses. The Airport properties are currently zoned as Airport Reserve. The properties will need to be rezoned via the Spatial Planning and Land Use Management Act 16 of 2013 (SPLUMA) process because the current zoning does not account for all proposed uses.

Proposed Activities

The proposed infrastructural and land-uses are summarized below and shown in the following figure to follow.

- **Airside Infrastructure:** Extension of the taxiway to service an extension of the aircraft apron.
- **General Aviation:** Reconfiguration of existing hangars, and expanded facilities for aircraft maintenance and repair.
- **Terminal Building:** Site allocated for future expansion of the terminal building.
- **Landside Infrastructure:** Improved access via a link to Washington and/or Market Roads and associated link through the Industrial Zone to Gladys Manzi Road. Site for new parking area and drop off zone; an industrial zone, and mixed commercial zones.
- **Technology Hub:** Located between the runway and western boundary of the airport (Oribi Road) that provides for the following zones: special sports, mixed use/commercial, mixed use residential/hotel, aviation hub, education/techno-hub, and light industrial.
- **Open Space/Conservation:** Assigned to sensitive riparian systems and open space.



Environmental Scoping and Impact Assessment Process

Various land-uses and proposed infrastructure trigger several listed activities within the National Environmental Management Act (NEMA – Act No. 107 of 1998) Environmental Impact Assessment (EIA) 2014 regulations, based on which the MM is required to make application for environmental authorisation. The activities triggered in Listing Notice 2 require that the application is supported by the full Scoping and Environmental Impact Assessment (S&EIA) process. The MM appointed the Institute of Natural Resources NPC (INR) as the Environmental Assessment Practitioner (EAP) to manage the application and process on their behalf. The scoping process identified several key issues and associated impacts warranting investigation in the EIA phase. The following table lists the key issues and the specialists appointed to investigate them.

Key Issues	Specialist Assessment	Specialist
<p>Impact on wetlands: Loss of wetland biodiversity and ecosystem function.</p> <p>Impact on terrestrial biodiversity: Loss/degradation of grassland and thornveld habitat and associated plant and animal species.</p>	Ecological Report	<p><i>Organization:</i> Institute of Natural Resources <i>Principal Specialist:</i> Ian Bredin <i>Qualifications:</i> MSc, Pr.Sci.Nat</p> <p><i>Organization:</i> University of KwaZulu-Natal <i>Principal Specialist:</i> Christina Curry <i>Qualifications:</i></p>
<p>Risk to infrastructure: From unstable geology and soils</p>	Geotechnical Assessment	<p><i>Organization:</i> Terratest Geotechnical and Environmental Consultants <i>Principal Specialist:</i> Keval Singh (Engineering Ecologist) <i>Qualifications:</i> BSc, Bsc Honours, Pr.Sci.Nat.</p>
<p>Economic impact: On the regional and local economic benefits, and the financial sustainability of the Airport.</p>	Economic Impact Assessment	<p><i>Organization:</i> Private Consultant <i>Principal Specialist:</i> George Oldham George <i>Qualifications:</i> M. Sc. Economics</p>

Key Issues	Specialist Assessment	Specialist
Impact of noise on property values	Property Valuation Study	<i>Organization</i> : Mills Fitchet (Natal) Pty Ltd <i>Principal Specialist</i> : Stephen de Klerk (Professional Valuer) <i>Qualification</i> : MSc, BSc Bldg, Pr. CPM, MCIQB, NDPV,
Aircraft noise - change in noise levels and associated nuisance impact arising from increased commercial air traffic.	Environmental Noise Impact Baseline and Impact Assessment	<i>Organization</i> : IMA Trader 20 cc <i>Principal Specialist</i> : Andrew Simpson (Environmental Noise Specialist) <i>Qualification</i> : MSc, Pr.Sci.Nat.
Traffic Impact - Cumulative impact of the project traffic on traffic operations, access and safety.	Traffic Impact Assessment	<i>Organization</i> : Royal Haskoning DHV <i>Principal Specialist</i> : Derek McGuigan (Civil Engineer) <i>Qualification</i> : BSc, PrEng
Heritage Resources - Impact on archaeological and heritage assets including historical assets.	Heritage Impact Assessment	<i>Organization</i> : eThembeni Cultural Heritage <i>Principal Specialist</i> : Len van Schalkwyk (Archaeologist; Heritage Practitioner) <i>Qualification</i> : Archaeology, MA Archaeology

Impact Statement

The following table provides a summary of the impacts assessed and provides a consolidated overview of the nature of the impacts (positive/negative) and the level of significance.

BIOPHYSICAL ENVIRONMENT						
Impact	Status	Magnitude	Likelihood	Significance	Confidence	
Impact 1: Transformation and disturbance of natural habitat						
- Loss of wetland and stream habitat	-ve	Medium	Likely	Moderate	Medium	
<i>with enhancement</i>	+ve	Medium	Likely	Moderate	High	
- Loss of grassland and associated red data plant and faunal species	-ve	Medium	Definite	Moderate	Medium	
<i>with enhancement</i>	+ve	Medium	Definite	Moderate	High	
- Increased infestation of alien invasive plant species	+ve	Medium	Likely	Moderate	Medium	
<i>with enhancement</i>	-ve	Low	Definite	Minor	High	
Impact 2: Risk of erosion from uncontrolled storm-water						
- Altered volume and intensity of storm-water flow off increased hardened surfaces	-ve	Medium	Likely	Moderate	Medium	
<i>With enhancement</i>	-ve	Low	Likely	Minor	High	
Impact 3: Risk of Pollution						
- Water quality impacts from construction activities and risk of spills of harmful substances such as fuels caused by accidents.	+ve	Medium	Likely	Minor	High	
<i>With enhancement</i>	+ve	Low	Likely	Negligible	Medium	
SOCIO-ECONOMIC ENVIRONMENT						
Impact	Status	Magnitude	Likelihood	Significance	Confidence	
Impact 1: Direct and indirect effects on employment and income (construction phase)						
- Road network extension	+ve	Medium	Likely	Moderate	Medium	
<i>with enhancement</i>	+ve	Medium	Likely	Moderate	High	
- Airport landside and airside infrastructure	+ve	Medium	Likely	Moderate	Medium	
<i>with enhancement</i>	+ve	Medium	Likely	Moderate	High	
- Techno Hub	+ve	Medium	Likely	Moderate	Medium	
<i>with enhancement</i>	+ve	Medium	Likely	Moderate	High	
Impact 2: Significance of investment in and stimulation of the economy						
- Road network extension	+ve	Medium	Likely	Moderate	Medium	
<i>with enhancement</i>	+ve	Medium	Likely	Moderate	High	
- Airport landside and airside infrastructure: Aeronautical Activity	+ve	Medium	Likely	Moderate	High	
<i>with enhancement</i>	+ve	Medium	Likely	Moderate	High	
- Airport landside and airside infrastructure: GA Zone	+ve	High	Definite	Major	High	
<i>with enhancement</i>	+ve	High	Definite	Major	High	
- Airport landside and airside infrastructure: New Business Zones	+ve	Low	Likely	Minor	Medium	
<i>with enhancement</i>	+ve	Low	Likely	Minor	High	
- Techno Hub	+ve	Medium	Likely	Moderate	Low	
Impact	Status	Magnitude	Likelihood	Significance	Confidence	

<i>with enhancement</i>	+ve	Medium	Likely	Moderate	Medium
Impact 3: Sustainability of the airport					
- All proposed developments	+ve	Medium	Likely	Moderate	Medium
<i>with mitigation/enhancement</i>	-ve	Medium	Definite	Major	High
Impact 4: Traffic operations, access and safety					
- Access	+ve	High	Definite	Major	High
<i>with mitigation</i>	+ve	High	Definite	Major	High
- Traffic Operations (flow)	-ve	Medium	Definite	Moderate	High
<i>with mitigation</i>	+ve	High	Definite	Major	High
- Safety	-ve	Medium	Likely	Moderate	Likely
<i>with mitigation</i>	+ve	Medium	Likely	Moderate	High
Impact 5: Aircraft induced noise					
- Zone 1 (Hilton and Worlds View)	-ve	Low	Likely	Minor	Medium
<i>with mitigation</i>	-ve	Low	Likely	Minor	Low
- Zone 2 (Clarendon and Wembley)	-ve	Medium	Likely	Moderate	Medium
<i>with mitigation</i>	-ve	Low	Likely	Minor	Low
- Zone 3 (Pelham and Scottsville Extension)	-ve	Low	Likely	Minor	Medium
<i>with mitigation</i>	-ve	Low	Likely	Minor	Low
- Zone 4 (Bisley)	-ve	High	Likely	Major	Medium
<i>with mitigation</i>	-ve	Medium	Likely	Moderate	Low
- Zone 5 (Mkondeni and Oribi)	-ve	Medium	Likely	Moderate	Medium
<i>with mitigation</i>	-ve	Low	Likely	Minor	Low
Impact 6: Impact on property values					
- Zone 1 (Athlone and Worlds View)	-ve	Low	Likely	Negligible	Medium
<i>with mitigation</i>	-ve	Low	Likely	Negligible	Medium
- Zone 2 (Clarendon and Wembley)	-ve	High	Likely	Moderate	High
<i>with mitigation</i>	-ve	High	Likely	Moderate	High
- Zone 3 (Pelham and Scottsville Extension)	-ve	Low	Likely	Minor	High
<i>with mitigation</i>	-ve	Low	Likely	Minor	High
- Zone 4 (Bisley)	-ve	Low	Likely	Minor	High
<i>with mitigation</i>	-ve	Low	Likely	Minor	High
- Zone 5 (Oribi)	-ve	Low	Likely	Minor	High
<i>with mitigation</i>	-ve	Low	Likely	Minor	High
Impact 7: Impact on archaeological and heritage resources					
- All proposed developments	-ve	Negligible	Unlikely	Negligible	High
<i>with mitigation</i>	-ve	Negligible	Unlikely	Negligible	High

The concluding recommendation from the EAP is that the project should be implemented in the preferred layout.

This recommendation is based on the following analysis of the full suite of impacts assessed:

- i. None of the impacts on the **biophysical environment** are rated to be of major significance post mitigation. In addition, the project provides for investment (rehabilitation plan) in the ecological infrastructure, notably the aquatic (wetland and stream) systems which are currently degraded and not functioning to optimal levels. This is an important potential positive given that:
 - a. As established in the Msunduzi EMF, water quality is an issue in this catchment and the improved condition of wetlands will assist in managing pollution/run/off from the airport site.
 - b. From a biodiversity perspective, the river is an important corridor linking Bisley Nature Reserve, ultimately with the Duzi River. It should be noted that this benefit and conclusion is dependent on the development and implementation of the restoration plan (which is provided for the Precinct Plan).
- ii. The **economic benefits** at a local scale in terms (in terms of employment during construction) and regional economy from the construction of the various elements is also positive, at a significant level in certain instances.

- iii. Importantly, the Phase 1 developments will result in the **airport becoming financially sustainable**, thereby alleviating the need for ratepayers to subsidize it.
- iv. There are existing traffic congestion and safety issues. While the expansion will exacerbate these, the **recommended interventions** will address the current issues - **resulting in a net positive outcome**.
- v. In the case of **noise impacts**, only Bisley (and then only a few sensitive receptors in close proximity to the end of the runway on the northerly departure direction) are affected at a significant level. This is again an existing issue. The increased air traffic arising from the expansion will not worsen the situation, but it does/along with the Precinct Plan provide a mechanism for addressing the issue through the proposed mitigation.
- vi. In terms of the **impact on property values**, it is only in the **Clarendon/Wembley area** where the impact is considered **moderate**, and this mainly accounts for pockets are sensitive areas within those suburbs. Importantly, while the proposed mitigation does not reduce the conclusion for this area, it **does not worsen** either.
- vii. In terms of alternatives considered:
 - a. The **No-go alternative is not a sustainable option** in **terms of the socio-economic context**, because it does not generate the significant benefits for the local and regional economy that the proposed expansion does. A continuation of the status quo will also not address the financial sustainability of the Airport.
Furthermore, apart from a reduced impact on the grassland (and associated biodiversity) which is regionally significant in terms of conservation value, the No-Go alternative does not mitigate any significant issues to any level of consequence. In fact, in several cases, the No-Go option results in the perpetuation of existing negative issues – such as the traffic congestion and safety issues.
 - b. The **preferred road alignment** (Option 1) for the proposed market Road extension is **should be implemented** because it is approximately R30 million cheaper than the alternative (Option 2) which runs in parallel with the service rail line. This also reduces the land required for infrastructural development.

As a summary, the positive economic impacts far outweigh any of the less significant impacts on the receiving social, economic or biophysical components of the environment. In addition, the assessment has highlighted several existing issues and provided improved understanding of these and measures for addressing them. **This statement and conclusions only hold if the specialist recommendations and the mitigation measures described in the EMPR are implemented.**

Way Forward

This a DRAFT report for comment. All registered Interested and Affected Parties (I&APs) are required to submit written comment by 16 February 2017. The report will be finalised based on the comments received and submitted to the KwaZulu-Natal (KZN) Department of Economic Development Tourism and Environmental Affairs (EDTEA) with a summary of inputs received and how they have been address. The EDTEA will make a decision based on the final Environmental Impact Report (EIR) which the INR will advertise along with details of the appeal process.

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LIST OF ACRONYMS

ABM	Area Based Management
ACSA	Airports Company South Africa
AMP	Airport Master Plan
APP	Airport Precinct Plan
ATM	Air Traffic Management
ATNS	Air Traffic Navigation Services
BID	Background Information Document
BPT	Break Pressure Tank
C&RR	Comments and Response Register
CA	Competent Authority
CAA	Civil Aviation Authority
CAO	Civil Aviation Organisation
CBD	Central Business District
CoB	Chamber of Business
CSIR	Council for Scientific and Industrial Research
DBSA	Development Bank of South Africa
DEDTEA	Department of Economic Development, Tourism and Environmental Affairs
DTP	Dube Trade Port
DUT	Durban University of Technology
DWA	Department of Water Affairs
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECA	Environmental Conservation Act
ECH	eThembeni Cultural Heritage
EDTEA	Economic Development, Tourism and Environmental Affairs
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMF	Environmental Management Plan
EMPr	Environmental Management Programme
ESR	Environmental Scoping Report
FGM	Focus Group Meeting
GA	General Aviation
GNNS	Global Navigation Satellite System
GNR	Government Notice Regulation
GVA	Gross Value Added
ha	Hectares
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
ICAO	International Civil Aviation Organization
ICT	Information Communication and Technology
IDP	Integrated Development Plan
IEMP	Msunduzi Municipality Integrated Environmental Management Policy
INM	Integrated Noise Model
INR	Institute of Natural Resources
JD	Jurassic-aged Dolerite
KSIA	King Shaka International Airport
KZN	KwaZulu-Natal
MM	Msunduzi Municipality
MSA	Municipal Systems Act
NCAP	National Civil Aviation Policy

NEM: BA	National Environmental Management: Biodiversity Act
NEMA	National Environmental Management Act
NHRA	National Heritage Resources Act
NPC	Non Profit Company
NWA	National Water Act
PES	Present Ecological State
PMB	Pietermaritzburg
PMBA	Pietermaritzburg Airport
PP	Public Participation
PPP	Public Participation Process
RoD	Record of Decision
S&EIA	Scoping and Environmental Impact Assessment
SACAA	South African Civil Aviation Authority
SANRAL	South African National Roads Agency
SANS	South African National Standards
SARPs	Standards and Recommended Practices
SEA	Strategic Environmental Assessment
SEIA	Socio-Economic Impact Assessment
SEIA	Socio-Economic Impact Assessment
SEMP	Strategic Environmental Management Plan
SIA	Social Impact Assessment
SPLUMA	Spatial Planning and Land Use Management Act
TIA	Traffic Impact Assessment
TMRP	The Markewicz and Redman Partnership
ToR	Terms of Reference
UKZN	University of KwaZulu-Natal
VNACON	VNA Consortium
WULA	Water Use License Application

1. INTRODUCTION

Pietermaritzburg Airport (previously known as Oribi Airport) was first licensed by the Civil Air Board in March 1931 and is owned by the Msunduzi Municipality (MM). The 1996 Airport Master Plan indicated that the airport had operational constraints which restrict the expansion of services¹. Since this finding, there have been significant changes in the aviation environment with the commissioning of King Shaka International Airport (KSIA) and DubeTradeport (DTP) in line with the emergence of the Aerotropolis concept, the shift to low cost airlines business models, and the continued growth in the aviation industry.

To improve the service provision of the both operators and the public at large, and to effectively meet the increasing growth in passenger and cargo volumes and air traffic movements, the MM has proposed the expansion of the Pietermaritzburg Airport (PMBA). The operation of the PMBA is currently subsidized by the Municipality. In addition to growth in aviation sector, expansion plans include the development of industrial, commercial and other complimentary land-uses within the Municipal owned land within the current Airport property, thereby optimizing income with the aim of making the airport financially sustainable in its own right. The expansion plans are documented in the 2014 Airport Master Plan, which takes a three phased approach to the expansion. Phase 1 of the expansion considers infrastructure needs required to meet expected increase in scheduled flights to a total of 185 000 passengers per annum and existing demand for general aviation services. This phase also includes development of various land parcels within the Airport boundary. The application for environmental assessment relates only to Phase 1 of the expansion plans².

In terms of the National Environmental Management Act (No. 107 of 1998) (NEMA) the proposed expansion will trigger various listed activities which demand an application for authorisation supported by the full Environmental Scoping and Impact Reporting (SE&IR) process. The MM has accordingly made application to the KwaZulu-Natal (KZN) Department of Economic Development, Tourism and Environmental Affairs (EDTEA) for environmental authorisation. The MM appointed the Institute of Natural Resources NPC (INR) as the Independent Environmental Assessment Practitioner (EAP) to prepare the application and manage the associated EIA process.

¹ Pietermaritzburg Master Plan: Master Plan Report, August 2014. Delta Built Environment Consultants.

² The layouts and detail of specific elements for phase 1 as presented in the Master Plan have been refined based on subsequent planning and feasibility investigations. The application is therefore specific to Phase 1 as described in this report.

PURPOSE OF THIS REPORT

This draft report presents the findings of the Environmental Impact Assessment of the EIA process. It is a draft report for comment circulated to all I&APs for a period of 30 days. All comments must be submitted in writing to Mrs. Sian Oosthuizen at the INR by **16 February 2017**. Any comments submitted post this date will not be considered. The findings of the assessment will also be presented at a public meeting (to be held on **2 February 2017 from 5:30pm at the Bisley Park Primary School**, Pietermaritzburg). The EIA documentation will be finalised based on the inputs received during the comment period and submitted to EDTEA for consideration. Please contact the INR should have any queries regarding the content of this report or the EIA process that would assist you to comment.

Email: soosthuizen@inr.org.za Post: P.O. Box 100396, Scottsville, 3209 Tel: 033 346 0796

Table 1 EIR Structure

CHAPTER	CONTENT
1	Introduction
2	Describes the EIA process
3	Outlines the relevant policies, the legal and institutional Framework taken into account
4	Establishes the context within which the expansion of the airport was proposed
5	Describes the proposed infrastructural development as per the Phase 1 of development
6	Describes the existing baseline environment
7	Are the inputs and outcomes of the active engagement with the public and other Interested and Affected Parties (I&APs) about the proposed expansion of the PMB airport
8	Outlines the alternatives considered
9	Details the scoping of impacts
10	Outlines the Terms of Reference for the EIA study
11	References
12	Appendixes

2. THE SCOPING AND ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

This process is being undertaken in accordance with the EIA regulations promulgated in December 2014 in GNR 982, 983, 984, 985 in Government Gazette 38282, in terms of Section 24 of the National Environmental Management Act (NEMA), Act 107 of 1998. This section:

- Summarizes the EIA process including the phases and timeframes.
- Defines the relationship between the EIA and other regulatory processes.
- Describes the Public Participation Process (PPP) and role of Interested and Affected Parties (I&APs) in the process
- Defines the role of this document in the process and the way forward to the conclusion of the process.

2.1. Overview

The proposed development triggers listed activities (see section 3.1) in “Listing Notice II” of the EIA Regulations. As such, the application for environmental authorisation is required to follow the full Scoping and Environmental Impact Reporting Process (S&EI). The S&EI Process (referred to as the Process from here on) comprises of two main phases, namely Scoping and the Environmental Impact Reporting phases. The Process, the specific timing associated with the different phases and the alignment of the Process with other regulatory processes is summarized in Figure 1. This graphic summary is referred to in the description of the various elements that follows.

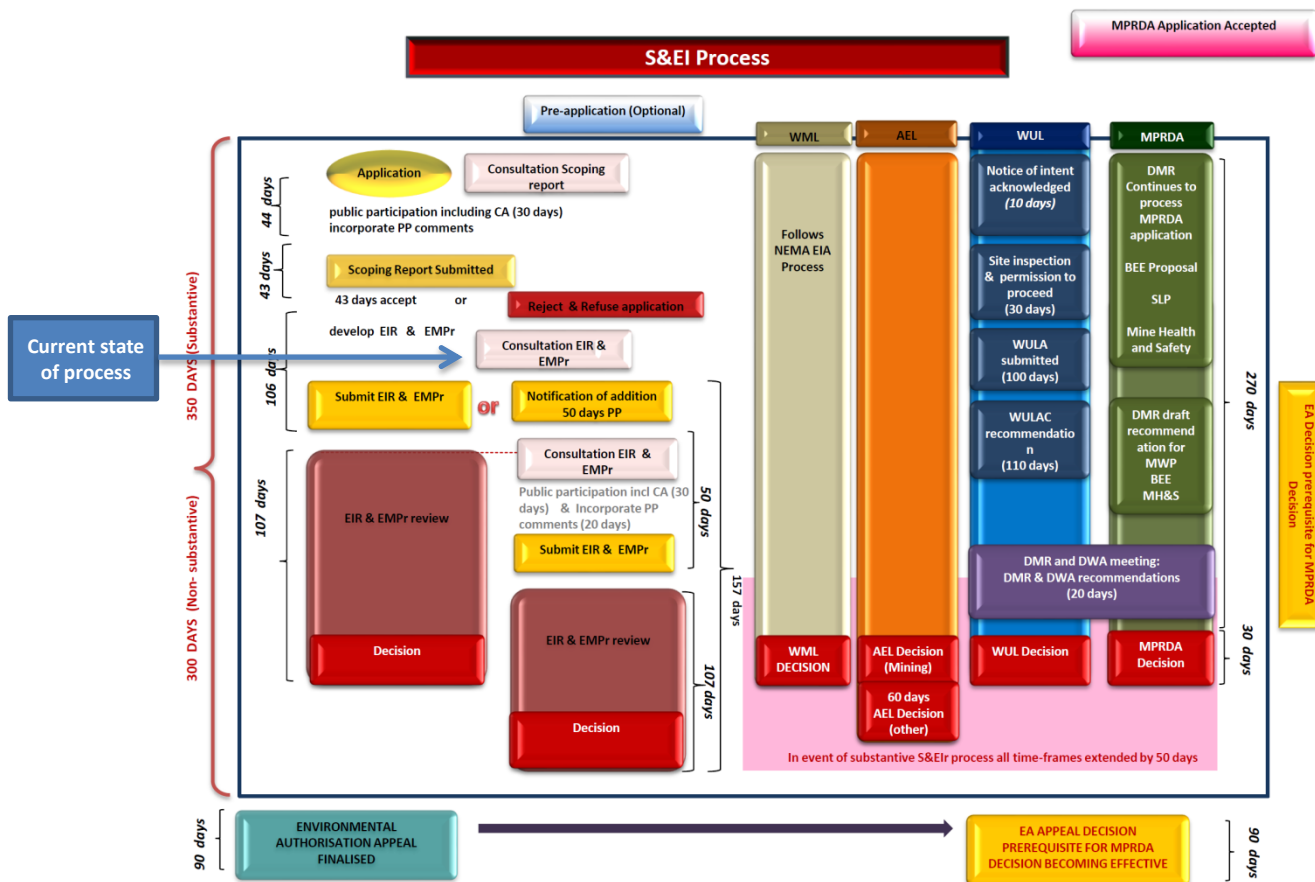


Figure 1 Overview of the SEIR process, the current state and alignment with other regulatory processes (Source: DEA, 2014)

As indicated in Figure 1, the EIA phase at the point where the draft EIR (this document) and EMPR have been circulated for comment. The process to this point and way forward is summarized below.

2.2. Role-players

The key role-players in this EIA process are as follows:

- **Applicant**
As the landowner and project proponent, the Msunduzi Municipality is the applicant. They are responsible for making the application and complying with/implementing any conditions associated with a positive decision. The MM is represented by Mr David Gengan.
- **Competent Authority (CA)**
The competent authority is the Umgungundlovu regional office of KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs (EDTEA).
- **Directly Affected Landowner**
In terms of the requirements of sub-regulation 39(1) of the EIA regulations, permission is required from a landowner on whose property the activity is proposed, if the applicant is not the owner or person in control of the land. Transnet owns the property Erf 1910, which is the servitude within which the railway line is located and is directly affected by the proposed new access roads that forms part of the development application. The MM has obtained formal landowner consent on the appropriate form from Transnet in terms of this requirement. As required by the regulations, this formal permission has been included with the application submitted to the competent authority.
- **Environmental Assessment Practitioner (EAP)**
In terms of Section 12 (1) of the EIA regulations, the applicant is required to appoint an independent Environmental Assessment Practitioner (EAP) to manage the application and process. The EAP is the Institute of Natural Resources NPC (INR), a locally based non-profit company, represented by David Cox. As required in terms of the EIA regulations, a CV for the EAP is included as Appendix 1. The INR is supported by its team of specialists appointed to investigate the issues and impacts identified in the scoping process. These specialists and the investigations they have undertaken and included as specialist reports. The specialists' details, their CVs and signed declaration of interest are included in as appendixes to each specialist report.
- **Registered Interested and Affected Parties (I&APs)**
The EIA regulations define "registered I&APs" as all interested and affected parties whose name is recorded in the register opened for the application in terms of regulation 24. The register of I&APs is included in the Public Participation Report.

2.3. Pre-Application Meeting

A pre-application meeting was held with the CA on 19 June 2015 at which the project was described to the CA. It was explained that the Municipality will provide the bulk infrastructure but that the specific elements of the project will be developed by private investors, and that the uptake of these opportunities will take place over an extended period of between 10-15 years. Consequently, the different land-uses and infrastructure are described at a high level (low level of detail). The CA

confirmed that this was acceptable with the understanding that any significant deviation in development type or specifications may trigger an application for amendment. The detailed designs, building plans and EMPR would be subject to authorisation by the MM, the CA and any other relevant Government Department. At the meeting and in subsequent correspondence it was further confirmed that:

- The listed activities to be triggered required that the S&EIR process would apply.
- In terms of the PPP “As indicated, according to Reg 41(2)(b)(ii) (2014 Regs), owners , persons in control of and occupiers of the land adjacent to the site must be given a written notice. Adjacent = bordering onto the site”. This confirmed that landowners’ of all adjacent properties to the Airport needed to be formally notified.

2.4. Application

The INR submitted the application on behalf of the MM along with the Scoping Report to the CA on 18 August 2017. The application was processed and allocated the following reference number: DC22/0036/2016.

2.5. Scoping Phase

Scoping involves consultation with government authorities, the proponent and stakeholders during which the objectives are to:

- Raise awareness of the project.
- Describe the status of the receiving environment prior to the commencement of the proposed developments for the expansion of the airport.
- Identify and describe issues and potential impacts to the receiving environment.
- Identify and select feasible alternatives for further assessment.
- Define other regulatory processes for which authorisation is required and the alignment between these processes with the EIA process in terms of specialist investigations, consultation and decision making.
- Define the terms of reference for the EIA assessment phase and the methodology for assessing the significance of the impacts identified.

Draft ESR

The overall output of the Scoping Phase is the Environmental Scoping Report. A Draft ESR was circulated to I&APs for comment for a period of 30 days on 18 August 2016. The Final ESR was amended based on consideration of the inputs received and submitted to the EDTEA with the following supporting documentation:

- A Public Participation Process (PPP) report which documented the process followed and outcomes of the consultation process.
- A Comments and Response Register (C&RR) which indicated how each comment made on the Draft ESR had been dealt with.

Site Visit and Meeting with the Competent Authority

A site visit and meeting was held with the CA on Wednesday 5 October 2016 with the aim of providing an overview of the project, the receiving environment, the issues raised in scoping and the proposed specialist studies identified for investigating these issues. The minutes of this meeting are included in the PPP Report (Appendix 18).

Based on this meeting and consideration of the Final ESR, the CA authorised the commencement of the EIA process via correspondence dated 18 October 2016. This letter is included as Appendix 3 to this report. The EAP and proponent met with the CA on 3 November 2016 to clarify certain requirements in the letter relating to specialist investigations. The EIR has been undertaken based on the understanding provided by the CA at this meeting.

2.6. The EIA Phase

The EIA phase is concerned with the detailed assessment of the issues and associated impacts identified in the scoping phase for which additional understanding of the nature of the impact (noise levels etc.) and/or the sensitivity of the receiving environment or receptor is required to make an informed assessment of the relationship between the two i.e. the impact.

A methodology is applied to this understanding in assessing the significance of the impacts and concluding whether the project is sustainable or not. The findings of the EIA form the basis for a decision by the relevant authorities regarding whether or not to approve the proposed activity or elements thereof, and if it is approved, what conditions are attached to this approval.

Draft Environmental Impact Report

This Draft EIR and supporting document consolidate the findings of the assessment. This draft Report is available for comment for a period of 30 days from Wednesday 18 January - Thursday 16 February 2017. All registered I&APs are invited to submit comments in writing to the INR by the within this period, noting that no comments submitted post the closing date will be considered. The information and understanding generated as well as conclusions drawn in the EIR will be presented, providing I&APs to query the information and thereby support them in making informed comment.

Appendix 2 of the EIA regulations defines the required content of an EIR. Table 2 summaries these requirements and indicates where they are addressed in this report and/or the supporting documentation.

Table 2 Information requirements for an EIR and an indication of where they are provided for in the report

INFORMATION	LOCATION IN EIR DOCUMENTATION
Scoping and Environmental Impact Assessment Process – summary of the process to date, the current stat, and further steps.to the point of decision.	Section 2
Legal and Policy Framework – List of the relevant policy and laws and the specific requirements they impose on the project or assessment process.	Section 3
Project Need and Desirability - A summary of the need and desirability for the proposed development of the activity in the context of the preferred	Section 4

location.	
Project Description - A description of the project and alternatives for assessment including maps indicating the location and layout as well as cadastral information.	Section 5
Receiving Environment - Description of the receiving social, economic, cultural and biophysical components of the affected environments.	Section 6
Issues and impacts – A summary of the issues and impacts identified in the scoping process (how the project will impact on the different elements of the receiving environment during different phases of development (planning, construction and operation).	Section 7.1 & 7.3
Specialist investigations - list of the investigations, the specialist contributors and the methodology applied in undertaking the assessment.	Section 7.2 Appendix X – Specialist studies
Impact Assessment - Assessment of the significance of each major impact based on the assessment methodology applied and the specialist studies, structured according to the various aspects of the receiving environment. The assessment is made pre/post mitigation. These mitigation and management measures are documented in the Draft EMPR	Section 7.4 – 7.6 Draft Environmental Management Programme
Impact Statement - Concluding statement regarding the sustainability of the project based on the integrated assessment of all the impacts assessed. It also indicates the recommendations from the conclusions/specialist investigations that should be taken forward into any decision.	Section 8

Final EIR and Decision

The INR will update submit the final EIR by 22 February 2017 to EDTEA for consideration, along with a comments and response document that shows how each comment received has been dealt with/responded to. As indicated in Figure 1, should EDTEA conclude that certain material issues have not been adequately assessed they will require that these are addressed, for which the process allows a further 50 days. From submission of the final EIR, EDTEA have a maximum period of 107 days to issue an Environmental Authorisation (EA). The CA may either refuse permission in the case that the assessment shows the project to be sustainable, or issue a positive EA with conditions.

Appeal Process

The EAP will advertise the EA to all I&APs and via public notices, at which point there is an opportunity for any registered I&AP, or the proponent to appeal the decision of aspects thereof i.e. conditions. The appeal process is 90 days and the details of this process will be advertised with the decision.

2.7. The Public Participation Process

A primary principle of the EIA process is “open public participation in the decision-making process”. The Public Participation Process (PPP) is an important aspect of the EIA process as it provides the mechanism through which I&APs are able to participate in the EIA and inform the resulting decision. Section 41 of the 2014 NEMA regulations list the requirements governing the PPP, such as the conduction of PPP, that the activities undertaken as part of the PPP are recorded, and that the outcomes of the process are documented. The PPP for this project has been conducted in

accordance with the NEMA regulations. A summary of the PPP is provided below with the full detail and in the PPP report.

2.7.1 Scoping Phase PPP

To effectively engage I&APs in the Scoping Phase of the S&EIA for the proposed PMB Airport expansion, numerous methods were applied, ranging from initial notification and a Public Meeting, to Focus Group Meetings and individual comment. The PPP consisted of three main components: i) Notification, ii) Engagement, and iii) Comments and Response, as elaborated below. The final component of this phase was the circulation of the Draft Environmental Scoping Report (ESR) for comment, from which the ESR was revised and finalised. Refer to the PPP Report for further details and all records (minutes, adverts, email communication) and the Comment and Response Register (Appendix 20 of the PPP Report).

Notification

- *I&AP Register*

An initial I&AP register was developed, using records from previous engagements regarding the proposed developments, as well as municipal data pertaining to those land owners within the precinct. Through advertisements, notifications and meetings, this register was expanded to ensure that I&APs were notified with information and engagement meetings where relevant. This register has updated continuously throughout the PPP in the EIA Phase. I&APs were able to register via the following means:

- Attendance at meetings
- Email
- Facsimile
- INR webpage¹
- Phone (land line and cell)
- SMS portal

- *Background Information Document (BID)*

The BID was distributed digitally via email and made available on the INR's website. Registered letters with a printed copy of the BID were sent to adjacent land owners. In addition, the document was presented and distributed at the Scoping Phase Public Meeting, and was made available at publicly accessible locations surrounding the airport², namely:

- Emily's Supermarket (20 Emily Rd, Scottsville Extension)
- Kalinke Educational and SAVF Welfare Organisation (Oribi Village)
- Scottsville Clinic (1 Oribi Rd, Scottsville)

¹ <http://inr.org.za/scoping-and-eia-for-the-proposed-expansion-of-the-pietermaritzburg-airport-2/>

² Local I&APs were notified via SMS and email that hard copies of the BID were available at those locations

- *Adjacent Land Owners*

Land owners adjacent to the PMB Airport (neighbouring the Airport property boundary) were directly notified of the SEIA for the proposed development. Using municipal data, a total of 75 land owners were identified (this excludes property owned by the Natal Housing Board and the Msunduzi Municipality). Land owners were provided with a covering letter and a copy of the BID. Initially, letters were delivered through a 'Drop and Sign' process to 39 land owners, and several hand delivered at the Scoping Phase Public Meeting (8 December 2015). The outstanding notification letters were sent via registered mail to land owners, of which 15 were delivered, and 21 were unclaimed.

- *Public Notices and Advertisements*

Suitable locations to display public notices were identified, and 15 notices were placed in publically accessible and visible locations in the area surrounding the airport on 2 December 2015. These locations were:

- Bisley Park Primary School
- Emily's Supermarket
- Kalinka Educare Pre-school
- Mndeni Meats (Market Road)
- NCF Church (Alexandra Rd Extension)
- Pelham Senior Primary School
- Pelham Supermarket
- Pick 'n Pay in Polly Shorts Centre
- Spar in Southgate Shopping Centre
- St Vincent's Church
- PMB Airport (five notices)

In addition, advertisements were placed in the following newspapers:

- Natal Witness Echo (19 November 2015)
- Echo (19 November 2015)
- Eyethu (26 November 2015)

The public notices provided I&APs with information about the proposed development and the SEIA, and with the contacts and details for registering as an I&AP.

- *Inform Councilors and Key Interested Parties*

The Ward Councillors of wards 24 (Bisley) and 36 (Mkondeni, Cleland) were consulted in the initial stages of the PPP, as well as the Councillors of the adjacent wards and wards along the flight corridor. Surrounding (adjacent) landowners and key I&APs, such a relevant government departments, were also notified and engaged in the PPP.

Engagement

To obtain comment, perceptions, concerns and opportunities from I&APs, a series of public engagement meetings were conducted. In addition, I&APs were able to submit written comment via email, post, facsimile and the INR website until 15 February 2016.

A typical challenge of public consultation and engagement is that the opinions and perceptions of the 'loudest voice' dominate conversation, resulting in an unrealistic representation of all I&AP types. To mitigate this, a series of smaller engagements were conducted after an initial public meeting, with focus groups based on types of I&APs. This enabled each focus group (whose members are likely to have similar perceptions and visions) to have their comments captured. This also provides the opportunity for stakeholders to focus on concerns or issues that may only be applicable to them, therefore providing a more in-depth engagement process that resulted in a greater level of understanding.

- *Public Meeting*

An initial public meeting was conducted on 8 December 2015 at the Bisley Park Primary School. This provided I&APs with the opportunity to register (if they had not done so already). The purpose of the Scoping Phase Public Meeting was to:

- Create awareness and meet I&APs
- Introduce assessment team
- Identify headline concerns and opportunities

The minutes of this meeting were distributed electronically to all those who attend the meeting as well as registered I&APs, while hard copies of the minutes were made publicly available at the following communal locations:

- Oribi Clinic (Oribi Road)
- SAVF Centre (Oribi Village)
- Emily's Supermarket (Emily Road)

- *Focus Group Meetings*

The Focus Group Meetings (FGMs) were conducted in a workshop format, using a participatory mapping exercise (maps and images of the proposed expansion options) to enable I&APs to provide informed insight into the Scoping Phase. This informal process, conducted with relatively small groups of stakeholders, enabled stakeholders to 'map-out' their thoughts, ideas, concerns and opportunities in a constructive manner. The key aim of the FGMs was to understand the relationship between the anticipated impact/s and the receiving environment, and identify the concerns and opportunities as identified and perceived by I&APs. This provided stakeholders with the confidence that their 'voice has been heard', and thus provides a suitable benchmark for the PPP going forward. Based on engagements with various stakeholders and the outcomes of the Public Meeting, the following 7 FGMs were conducted:

- Airport Operators and Tenants
- Industrial Sector
- Oribi Village Residents
- Bisley and Scottsville Extension Residents
- Flight Path – Hilton, Wembley and Surrounds

- Broader PMB business sector
- Authorities and Government Agencies

Registered I&APs were notified via email and/or SMS of the details of the FGMs, and digital versions of the minutes circulated via email. Hard copies of the local residents FGMs were made available to publically accessible locations and relevant I&APs notified via SMS.

- *Airport Information Stand*

In addition to the Focus Group Meetings, two INR team members were stationed at the PMB Airport during peak hours (a Monday morning and Friday evening) to provide information to public airport users and capture any comments they may have. Several passengers informally discussed the proposed expansion with the project team members and registered as I&APs, but no formal comment was submitted.

- *Additional Meetings*

To gain further insight and clarification on queries and comments raised by I&APs, various meetings and email correspondences were conducted. The outcomes of these engagements were fed into the Environmental Scoping Report. Records of these correspondences are as follows:

- Transnet meeting to confirm their position on the future of the 'market' railway service line (Appendix 15 of the PPP Report)
- Airport tenant meeting to discuss the Draft Environmental Scoping Report - 12 September 2016 (Appendix 16 of the PPP Report)
- Meeting and communications with ATNS and Airlink to determine the flight path noise impact areas and gain clarity on future scheduled flight – 1 September 2016 (Appendix 17 of the PPP Report)

- *Comment and Response Register*

All of the comments received were compiled in a Comment and Response Register (C&RR), listing the details of the I&AP that made the comment, what the comment pertains to and the response. The C&RR (Appendix 20 of the PPP Report) was a vital tool in preparing the Scoping Report and the Plan of Study for the EIA phase that followed, as it provides a list against which to check that all issues of concern have been, or will be, addressed.

- *Environmental Scoping Report*

All I&APs were notified of the availability of the Draft ESR for comment via sms, email and on the INR website. Hard copies of all the reports were placed at three locations within the broader Airport Precinct and sent to key I&APs as required by the regulations. A PPP report was circulated with the Draft ESR. The C&RR was updated with all inputs received on the Draft ESR and submitted to EDTEA along with the final ESR for consideration.

2.7.2 EIR Phase PPP

Comments

The EIA process is an open one, in that registered I&APs can submit comments at any stage. During the EIA phase several, I&APs have submitted comments via email on an ad hoc basis. Responses have been provided by the EAP and these interactions are summarized in the C&RR included as Appendix to this report. The original comment (emails) are provided in Appendix 20 of the PPP Report.

Public Meeting

A EIA Phase public meeting is planned for **5:30pm, Thursday 2nd February, 2017** to be held at the Bisley Park Primary School.

Draft Environmental Impact Report

All I&APs have been notified of the availability of the Draft EIR for comment via SMS, email and on the INR website. Hard copies of all the reports have been placed at three locations within the broader Airport Precinct and sent to key I&APs as required by the regulations. I&APs have been notified that comments on the Draft EIR must be submitted in writing to the INR by the closing date of Thursday 16 February, 2017. All comments received at the public meeting and in writing will be collated in a final C&RR that forms part of the final PPP report that accompanies the final EIR to be submitted to EDTEA on 22 February 2017.

3. LEGAL AND POLICY FRAMEWORK

Sustainable development is governed by a legal framework which encompasses guiding legislation in the form of the NEMA which defines the principles of sustainability and integrated environmental management, and then a range of Acts under the themes of land-use planning and development, resource conservation and utilisation, and waste management and pollution control. This structure includes a range of Policies, Acts and associated Regulations which are applicable at a National, Provincial and Local (municipal) scale. It is a requirement in the EIA process that all other relevant legislation is identified and that the process, information requirements and decision making is aligned with the EIA process. Given the extensive nature of the legal framework, only the Acts, policies and regulations relevant to this project are listed in this section. Relevance was established through:

- i. A review of project activities against the legislation to identify if the proposed infrastructure or activities 'trigger' the need for authorisation or a license under the Act.
- ii. Engagement with the government Departments and agencies responsible for the administration of the Act.

The relevance/requirements of each policy, act or associated regulation in terms of:

- How they are relevant i.e. whether they merely provide guidance, or whether licensing/authorisation is required and the process to be followed.
- The alignment with the EIA process in terms of specialist investigation, consultation, decision making, timing.

3.1. Environmental Legislation

This section describes the purpose of the relevant Acts with a summary of the specific requirements for the projects defined in Table 3 below.

- **The National Environmental Management Act No. 107 of 1998**

The National Environmental Management Act No. 107 of 1998 (NEMA) provides principles and guidelines to be considered in environmental planning and development. It provides for cooperative environmental governance by confirming governments role in ensuring sustainable development and the role of society in participating in environmental governance. Chapter 5 of NEMA provides for integrated environmental management and promotes 'the application of appropriate environmental management tools in order to ensure the integrated environmental management of activities' such as EIAs. An EIA is being conducted to analyse and predict the nature and extent of the consequences of particular activities associated with the proposed development on the receiving environment. In general, NEMA is the parent statute under which a suite of environmental laws and regulations have been developed, as detailed below.

- **National Water Act (NWA) No. 36 of 1998**

The Act provides for Water Resource planning; the classification of water resources and setting of associated management objectives; Prevention and remedy of pollution and emergency incidents; Licensing of water use; Establishment and operation of water management institutions; Monitoring, assessment and information management; Offences and remedies.

- **National Environmental Management: Waste Act, No. 59 of 2008**

Seeks to reform the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development; to provide for institutional arrangements and planning matters; to provide for national norms and standards for regulating the management of waste by all spheres of government; to provide for specific waste management measures; to provide for the licensing and control of waste management activities; to provide for the remediation of contaminated land; to provide for the national waste information system; to provide for compliance and enforcement; and to provide for matters connected therewith. In support of the Waste Act of 1998 is the National Waste Information Regulations of 2012 guiding the documentation and maintenance of a waste information data base.

- **Environmental Conservation Act (ECA) Act No. 73 of 1989**

The Act provides for the effective protection and controlled utilization of the environment and for matters incidental thereto. Section 25 promotes the development of Noise Control Regulations. The administering the noise control regulations were devolved to provincial and local authorities. However, of the nine provinces, only three provinces namely, Free State, Gauteng and Western Cape have developed Noise Regulations.

- **National Environmental Management: Biodiversity Act (NEM: BA) No. 10 of 2004**

The Act make provision for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that are threatened or in need of protection to ensure the maintenance of their ecological integrity; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith.

- **National Heritage Resources Act (NHRA) No. 25 of 1999**

The Act introduces an integrated and interactive system for the management of the national heritage resources; promotes good government at all levels, and empower civil society to nurture and conserve their heritage resources so that they may be bequeathed to future generations; lays down general principles for governing heritage resources management throughout the Republic; introduces an integrated system for the identification, assessment and management of the heritage resources of South Africa; establishes the South African Heritage Resources Agency together with its Council to co-ordinate and promote the management of heritage resources at national level; sets norms and maintain essential national standards for the management of heritage resources in the Republic and to protect heritage resources of national significance; enables the provinces to establish heritage authorities which must adopt powers to protect and manage certain categories of heritage resources; provides for the protection and management of conservation-worthy places and areas by local authorities; and also provides for matters connected therewith.

- **Spatial Planning and Land Use Management Act (SPLUMA), No. 16 of 2013**

The purpose of Act is to provide a framework for spatial planning and land use management in the Republic; to specify the relationship between the spatial planning and the land use management system and other kinds of planning; to provide for the inclusive, developmental, equitable and efficient spatial planning at the different spheres of government; to provide a framework for the

monitoring, coordination and review of the spatial planning and land use management system; to provide a framework for policies, principles, norms and standards for spatial development planning and land use management; to address past spatial and regulatory imbalances; to promote greater consistency and uniformity in the application procedures and decision-making by authorities responsible for land use decisions and development applications; to provide for the establishment, functions and operations of Municipal Planning Tribunals; to provide for the facilitation and enforcement of land use and development measures; and to provide for matters connected therewith. The Act is supported by the 2014 Draft Regulations in Terms of the Spatial Planning and Land Use Management Act, 16 of 2013.

- **Municipal Systems Act (MSA) No. 32 of 2000**

The Municipal Systems Act sets out legislation that enables municipalities to uplift their communities by ensuring access to essential services. The Act defines the legal nature of a municipality as including the community and clarifies the executive and legislative powers of municipalities. It seeks to boost effective local government by establishing a framework for municipal planning, performance management and use of resources.

- **Civil Aviation Act No. 13 of 2009**

The CAA provides for the regulation and control of aviation in South Africa, and provides for additional measures directed at more effective control of the safety and security of aircraft, airports and the like. Section 155(m)(iv) makes provision for the general operating rules, flight rules and air traffic rules in respect of civil aviation, including the prevention of nuisances arising from air navigation, aircraft factories, aerodromes or other aircraft establishments, including the prevention of nuisance due to noise or vibration originating from the operation of machinery in aircraft on or above aerodromes, whether by the installation in aircraft or on aerodromes of means for the prevention of such noise or otherwise.

Table 3 Summary of the key legal sections applicable to the project

NATIONAL LEGISLATION	KEY SECTION
National Water Act, No 36 of 1998 (NWA)	Chapter 3 - Protection of Water Resources Chapter 4 - Use of Water <i>21 (c) impeding or diverting the flow of water in a watercourse.</i> <i>21 (i) altering the bed, banks, course or characteristics of a watercourse.</i>
National Environmental Management: Waste Act, No. 59 of 2008	Chapter 2 - National Waste Management Strategy, Norms and Standards Chapter 4 - Waste Management Measures Chapter 6 - Waste Information Chapter 7 - Compliance and Enforcement Regulations
Environmental Conservation Act (ECA), Act No. 73 of 1989	Part 1 - Policy For Environmental Conservation Part 3 - Protection of Natural Environment Part 4 - Control Of Environmental Pollution Part 5 - Control Of Activities Which May Have Detrimental Effect On the Environment Part 6 - Regulations
National Environmental Management: Biodiversity Act No. 10 of 2004 (NEMBA)	Chapter 4: Threatened or protected ecosystems and species Part 1 - Protection of threatened or protected ecosystems
National Heritage Resources Act, No 25 of 1999 (NHRA)	Chapter 1 - National Environmental Management Principles Chapter 4 - Fair Decision-Making and Conflict Management

	Chapter 5 - Integrated Environmental Management Chapter 7 - Compliance And Enforcement
Spatial Planning and Land Use Management Act (SPLUMA), No. 16 of 2013	Chapter 5 - Land Use Management
Municipal Systems Act, No 32 of 2000 (MSA)	Chapter 4 - Community Participation Chapter 5 - Integrated Development Planning
Civil Aviation Act 13 of 2009	Section 6 addresses the acquisition of land and rights in connection with airports Section 155(m)(iv) CAA Regulations

3.2. Regulations

- **The National Environmental Management Act, EIA Regulations**

The NEMA EIA Regulations of December 2014, are administered by the Department of Economic Development, Tourism and Environmental Affairs in the KwaZulu-Natal province. These regulations have been promulgated in terms of NEMA and identify three lists of activities which may not commence without an environmental authorisation from the relevant competent authority. While all the activities listed in the regulations ('the listed activities') require an environmental authorisation, the lists distinguish between two classes of activities, those requiring a basic assessment and those requiring a full scoping and environmental impact report. Listing Notice 3 identifies activities which may not commence without an environmental authorisation in specifically identified geographical areas only. A further set of regulations (the EIA Regulations) set out the procedure to be followed in compiling, submitting, processing and considering an application for an environmental authorisation. These regulations stipulate who may conduct EIAs, what EIAs must consist of, the decision-making criteria and timelines, public participation requirements and the procedure for lodging appeals against decisions taken. While the EIA regulations govern those activities listed under NEMA, not all environmentally detrimental activities associated with the proposed project are included in the lists.

- **EIA Listed Activities**

To efficiently screen and identify the listed activities, it is essential to understand the project development requirements. The process to be followed and list of activities triggered primarily depends on the final layout, infrastructure requirements and their specifications.

Table 4 below gives an overview of the identified listed activities in Listing Notice 1 and Listing Notice 2 activities are those "that may have a substantial detrimental effect on the environment." These listed activities are subject to the EIA process, the EIA regulations of 2014 were promulgated in terms of Section 25 of the NEMA. In terms of these regulations, authorisation is required before one can proceed with such an activity, and for which an application needs to be made to the relevant authority.

Table 4 Listed activities applied for

Listing Notice 1 – GNR 983 – Activities Requiring that a Basic Assessment process if followed		
Activity	Description	Relevant Activity
19	<i>The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5</i>	<i>Construction of the new access road from Market road at the point the railway line crosses the stream/riparian area.</i>

	<i>cubic metres from- (i) a watercourse;</i>	
27	<i>The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation</i>	<i>Development of combined new infrastructure on grassland areas.</i>
61	<i>The expansion of airports where the development footprint will be increased.</i>	<i>Expansion of an airport; Any of the new planned infrastructures will result in physical alteration beyond the existing footprint.</i>
Listing Notice 2 – GNR 984 – Activities Requiring that an Environmental Impact Assessment process if followed		
Activity	Description	Relevant Activity
15	<i>The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for- (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.</i>	<i>Expansion of an airport; Any of the new planned infrastructures will result in physical alteration beyond the existing footprint.</i>
Listing Notice 3 – GNR 985 – Activities Requiring that an Environmental Impact Assessment process if followed		
Activity	Description	Relevant Activity
12(b) xi & xii	<i>12 The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. (b) In KwaZulu-Natal: (xi) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose;</i>	<i>The clearance of an area of more than 300m² of indigenous vegetation in an area reserved for conservation use.</i>
14 (iii) and (xii) 14 (d) (viii)	<i>14 The development of- (iii) bridges exceeding 10 square metres in size; (xii) infrastructure or structures with a physical footprint of 10 square metres or more; 14 The development of- (d) In KwaZulu-Natal: (viii) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</i>	<i>Construction of the new access road from Market road at the point the railway line crosses the stream/riparian area, particularly bridges and infrastructure.</i>

- **The Civil Aviation Regulations**

The Civil Aviation Regulations, 2011 Part 139.02.25 provides for the maintenance of aerodrome environment management programme in accordance with the provisions of the Environment Conservation Act, 1989 and the regulations made thereunder.

- **Noise Regulations**

Section 25 of the Environmental Conservation Act (ECA) Act No. 73 of 1989 promotes the development of Noise Regulations. The administration of the regulations was devolved to provincial

and local authorities. However, of the nine provinces, only three provinces namely, Free State, Gauteng and Western Cape have developed Noise Regulations. KwaZulu-Natal does not have any binding Noise regulations, noise management of aviation activities is guided by the international standards of the International Civil Aviation Organization (ICAO).

- **International Civil Aviation Organization (ICAO) codes**

The ICAO developed a range of standards, policies and guidance material for the application of integrated measures to address aircraft noise and engine emissions embracing technological improvements, operating procedures, proper organization of air traffic, appropriate airport and land-use planning, and the use of market-based options. ICAO adopted three major environmental goals, to:

- a. limit or reduce the number of people affected by significant aircraft noise;
- b. limit or reduce the impact of aviation emissions on local air quality; and
- c. limit or reduce the impact of aviation greenhouse gas emissions on the global climate.

- **ICAO Annex 16**

The Annex has a set of Standards and Recommended Practices (SARPs) for Environmental Protection. It further makes reference to applicable ICAO documentation dealing with the management of environmental impacts from aviation and associated activities.

- **ICAO: Guidance on Environmental Assessment of Proposed Air Traffic Management Operational Changes**

The purpose of the guidelines is to provide airport operators, air navigation service providers and other stakeholders with environmental assessment guidance to support decision making when analysing proposed air traffic management (ATM) operational changes. The guidance provides high-level environmental assessment principles intended to facilitate the use of a consistent approach for assessing the environmental impacts of operational changes.

- **ICAO: Aerodrome standards**

The aerodrome code describes the criteria used to categorise airports; that is the type of activities at the airport, including commercial service, primary, cargo service, reliever, and general aviation airports and by the size of aircraft the airport has been designed to handle. PMB airport has been classified as a 2c airport based on the provision of a 190m stopway bringing the full structural pavement to a total length of 1 787m (PMB Master plan, 3.1.1, 2014)

3.3. Policy Framework

- **Climate Change Policy**

The Climate Change Policy for Msunduzi Municipality of 2014¹ primarily provides a well-defined direction for responding to climate change risks and challenges. The main goal is to ensure that Msunduzi's Carbon footprint is reduced and the city is able to adapt to climate change related impacts and ensure the availability of preferences when decisions need to be made regarding

¹ Climate Change Policy for Msunduzi Municipality, 2014

adaptation and mitigation. The relevance, effectiveness and implementation of this policy is managed through on-going monitoring, evaluation and review to ensure it reflects the most recent developments in climate change science and technology, and delivers on the Municipality's statutory responsibilities.

- **Environmental Management Framework**

The gazetting and adoption of the Msunduzi Municipality Environmental Management Framework (EMF) of 2010¹ as per Chapter 8 of the EIA Regulations of 2014 promulgated in terms of NEMA brings Listing Notice 3, GNR 985 into effect. In principle, the EMF informs development planning that supports sustainable development within the Municipality. Through specialist studies, it provides a good indication of the existing environmental conditions within the municipal area. Its broad objectives include the identification of opportunities and constraints that guide site specific studies such as EIA and will also be used to inform decision making and the development application process for the proposed expansion of the PMB airport. The development and adoption of EMF is detailed in Part 1 of Chapter 8: General Matters of the EIA Regulations of 2014 promulgated in terms of NEMA.

- **White Paper on National Civil Aviation Policy, 2015**

Airport activities in general and aircraft operations in particular could have a major impact on the local environment as a whole. The National Civil Aviation Policy (NCAP) is focused more on the metropolitan and urban areas to facilitate the integration of the airport into its built environment and to ensure optimal utilisation of the development opportunities which the airport presents. Chapter 7 of the NCAP addresses the interaction between an airport and its environment and vice versa, and attempts to deal with all the aspects of land-use, which are not directly related to the operation of the airport. The airport environment in broad terms refers to the vicinity or area of influence of an airport. As such, the area of influence of an airport includes the airside as well as the landside of the airport. It also includes the geographic areas surrounding the airport, which are directly or indirectly affected by the airport or airport operation and vice versa. It therefore follows that the policy under this theme includes integrated development planning, land use on and around the airport and local emergency- and bulk municipal services, and development of the airport precinct and surrounding areas. Chapter 12 particularly deals with the environmental impact of aircraft operations. This impact includes noise and air pollution as well as human-induced climate change.

¹ Msunduzi Municipality Environmental Management Framework, 2010

4. PROJECT CONTEXT, NEED AND DESIRABILITY

This section provides a short summary of the Airport's history which notes the various stages of growth and challenges in its development and which have negatively affected the sustainability of the Airport. It summarizes the numerous investigations into options and analysis for 'turning the Airport around' and the positive outcomes of implementing several of these in the past 5 years.

This background then provides context for understanding the proposed additional expansion that is necessary to sustain the 'turn around' and forms the focus of the application for environmental authorisation i.e. the need for and desirability of the proposed expansion.

4.1. Development Context

Construction of the Airport was completed in March 1931 when the municipality also received a license to operate from the Civil Air Board¹. A flying school was opened in 1938, and the Aerodrome was then leased to the Defence Authorities for the duration of the war and for a year afterwards. The City Engineer took over the Aerodrome in 1945 from the Defence Authorities. Over time, concern about the state of the runway led to extensive investment by the Defence Department and the city council, culminating in an official ceremony marking the opening of the Oribi Aerodrome in July 1967. While the Airport provides a service to General Aviation (GA) and there has been significant demand for increase in the GA facilities so this revenue stream will increase, the sustainability of the airport and its contribution to the regional economy² depends on the scheduled passenger services and associated "belly" freight.

The Municipality has continued to run the airport but not without subsidizing the provision of this service. This subsidy was estimated to be approximately R 5.5 million in 2007³. Various factors have limited the ability to increase the primary revenue stream in the past, notably:

- The short runway which limits the regular use by low cost, short haul aircraft. The passenger aircraft used were historically low capacity twin propeller aircraft.
- The topography of the area (specifically World's view Ridge), which affects the approach from the North-West which is the primary approach given the prevailing wind. The terrain caused the final approach to be offset from the runway, and the height from which landing decision was made to be relatively high. This made it difficult to obtain visual contact, particularly in poor weather conditions.
- The use of ground based Non-directional Beacons and their susceptibility to transmission inaccuracies, especially during thunderstorm activities.

The combination of these factors limited the number of passengers that could be transported per flight and resulted in frequent diversions to Durban particularly in summer, reducing passenger

¹ The history presented in this section is a summary drawn from the historical overview of the airport presented in the 2007 Economic Impact study by Coetzee and Oldham.

² Coetzee, C. and Oldham, G. 2007 calculated the total revenue accruing from Airport related activities to be R65.8million (direct, indirect and induced) and that 189 jobs were derived from the operation of the airport. The roughly estimated value add to the GDP was R23.9 million.

³ Coetzee, C. and Oldham, G. 2007. Economic Impact Study of the Pietermaritzburg Airport. University of KwaZulu-Natal.

confidence in using Pietermaritzburg Airport. It also limited the amount of airlines able or willing to operate from the Airport which reduced competition. This has a negative impact on ticket prices.

An analysis of aircraft arrivals at the Airport showed a generally declining trend between January 2003 and March 2010 (Internal feasibility and Economic Assessment Study, 2010).

Further factors identified in the various investigations as limitations to reversing the declining use of the Airport included:

- Need for additional parking.
- Resurfacing of the runway.
- Development of a parallel taxiway.
- Upgrade of the terminal facilities.
- Amendments to the institutional and business arrangements for managing the Airport.
- Optimization of the unutilized municipal land adjacent to the airport.

The municipality has commissioned various studies over the years to establish how to optimize this asset and reverse the increasing subsidization resulting from declining use of the Airport. These investigations even considered alternative sites for the Airport and selling the facility.

The outcomes of these studies were reviewed in the 2010 Feasibility and Economic Study conducted in 2010. The Municipality made a decision to retain the Airport and implement the recommendations coming out of this investigation. This included the development of a Master Plan for the Airport as an update to the previous Master Plan, dated 1996. The outcomes of the study also served as motivation for securing R40 million from Provincial Treasury to address requirements for improving the sustainability of the Airport.

The investment from Provincial Government and additional private sector inputs resulted in among others, the following improvements in the infrastructure and operations of the Airport which were completed by 2013:

- Upgrade of the terminal building.
- Resurfacing of the runway and apron.
- Construction of new parking facilities by a private service provider through a concession. The car park also houses several car hire services.
- The implementation of the Global Navigation Satellite System (GNSS) system by Airlink.
- Further navigational improvements and new runway lighting.
- Rebranding of the Airport from Oribi to Pietermaritzburg coupled with improved signage

These various improvements importantly enabled the use of the Airlink BAE/146/200, 97 seater aircraft with a capacity more than double the Turboprop aircraft previously employed. These improvements have resulted in:

- i. A significant reduction in the number of flight diversions (65 in 2006 – 6 in 2015) as safety and reliability issues have largely been overcome.
- ii. Increase in total passenger use (arriving and departing) - almost doubled from 2006 (77 832) to 129 848 (2015).
- iii. A positive impact on the Net Cash flow of the Airport from a negative position (-R 2 989 000) in 2008/9 to a positive position in 2016/17 (R 2 888 000).

In summary, there has been a significant improvement in the use and sustainability of the Pietermaritzburg Airport.

The following additional factors and trends further support the MMs further optimization of the Airport through the proposed development:

- i. The emergence of the aerotropolis or airport city concept, which identifies major airports as engines of local economic development, attracting aviation-linked businesses of all types to their environs. These include, among others, time-sensitive manufacturing and distribution facilities; hotel, entertainment, retail, convention, trade and exhibition complexes; and office buildings that house air-travel intensive executives and professionals. While not a 'major' airport, the vacant land surrounding the airport has been identified with several investors expressing interest in:
 - a. *Industrial land* - There has been considerable interest from industrial developers for the land adjoining the airport which is approximately 17ha and already zoned for industrial use.
 - b. *The technology-hub* - During the master plan process, the KZN Cabinet approved the establishment of four Technology Hubs in the province at Margate, Richards Bay, Newcastle and Pietermaritzburg, with the Airport being identified as the most suitable site in the Msunduzi Municipality. Provincial Treasury secured International funding for the design and bulk infrastructure costs at each hub. The concept plan was completed for the PMB Techo-hub along with costing and full tender documents for Phase 1 (see section 5.6.7). The remaining funds available for implementation of the various plans have been dispersed amongst the four centres based on the readiness of each site. Given that the other centres had all approvals in place, Pietermaritzburg has not received any of this funding. The municipality is consequently investigating other options for financing the Hub. The municipality has received letters of intent from four prospective tenants, including the Durban University of Technology (DUT) who is planning to establish an Aviation Academy, and an aircraft engine manufacturer. One of the prospective tenants is a consortium that proposes to build a multi-sports complex with a velodrome, with the initial focus being its use for the 2022 Commonwealth Games.
 - c. *Commercial Business* - options such as shopping, restaurants etc on areas within the Airport precinct. Given the demand for increased accommodation in Pietermaritzburg, the establishment of a small hotel on the open area adjacent the current entrance road (Pharazyn Way), is proposed.
 - d. *General Aviation* - There is a long standing waiting list of private and commercial operators who are seeking to store their aircraft at Pietermaritzburg Airport and or operate related business from the airport. The closure of Virginia Airport may further increase this demand.
- ii. The inconvenience of travel to King Shaka International Airport (KSIA) which has increased the user catchment for Pietermaritzburg Airport.
- iii. The establishment of a new entity to manage the airport and the adjacent precinct. The revenue from this will be ring fenced to improve the sustainability of the airport and reduce the financial burden on the municipal budget and ratepayers.

4.2. Need and Desirability

While the current situation is far improved, the **need** remains to further improve the sustainability of the Pietermaritzburg Airport through continued growth in the scheduled flights and GA activity as well as harnessing opportunities presented by vacant unutilized municipal land adjoining the Airport.

The further development is considered as **desirable** as it aims to reduce/alleviate current subsidization; generate increased job and economic activity at a local scale and to the broader Municipal GDP. Further, the Airport properties are owned by the municipality and are zoned for airport and related uses. In summary, while aviation related constraints such as topography, and various other etc. may curtail expansion into phases 2 and 3 of the Master Plan, it is considered desirable to optimize this asset in the medium term.

5. PROJECT DESCRIPTION

As described in chapter 4, the MM is considering the development of the Airport more broadly than in just in terms of Air traffic. The MM has commissioned a range of investigations to inform the optimal development of the Airport and adjoining municipal land in relation to the surrounding Airport 'precinct'. These investigations have been drawn from in defining the project description. Their purpose and outcomes are therefore summarised as context to the project description.

5.1. Feasibility Investigations and Planning

Since the conception of the proposal to expand the Pietermaritzburg airport, numerous studies have been conducted to investigate the feasibility of and develop high level plans. These studies have informed the high level planning and costing of the extent and layout of the various project elements. It is therefore important to understand the background to and purpose of each as context to the project description that follows.

5.1.1 Airport Master Plan

The master plan was commissioned in 2011 and finalised in 2014¹. The Master Plan (MP) process involved a Status Quo analysis and a demand analysis in defining three development phases namely Phase 1 (2025); Phase 2 (2040), and Phase 3 (2050). These phases were determined by the demand projections which drive when addition/expansion of infrastructure is required to cope with increased aircraft and passenger traffic. The MP presents requirements for each phase in terms of:

- Airside infrastructure
- Landside infrastructure
- Terminal building
- Utilities and other Airport facilities
- Land-use for the rest of the site and other developments

It is important to note that:

- The EIA is only being undertaken for elements defined in Phase 1 of the Master Planning process.
- The layout and elements for Phase 1 in the MP are not what is being applied for. The location, layout and elements for phase 1 have been amended from the initial MP proposal based on:
 - Interaction with and the outcomes of the various studies described in this section.
 - Engagement with Interested and I&APs in the Scoping process.

¹ Delta Built Environment Consultants. August 2014. Pietermaritzburg Airport Master Plan, Final Report. Ref P13096/R2584.

5.1.2 Airport Precinct Plan

The Airport Precinct Plan (APP) of 2016¹ was commissioned by the Municipality in line with the Aerotropolis concept taken forward in larger cities around the world. Smaller cities are pursuing the concept through smaller “Airport City” or Airport Precinct” hybrid models. In these instances these smaller airports are linked to the Central Business District and regional economies. In their quest for finding new ways to increase economic growth, city and airport authorities have recognized that commercial real estate development through Airport Precincts development is useful for maximizing non-aeronautical revenue and stimulating growth.

The Precinct Plan was initiated with this context and aim in mind. The PP was undertaken over the following phases:

- *Phase 1a: Inception Report*
- *Phase 1b: Status Quo and Strategic Assessment* – critical success factors required to be leveraged/created to establish a sustainable precinct.
- *Phase 2a: Airport Precinct Concept* – The identification and testing of preferred airport precinct development concept.
- *Phase 2b: Draft Airport Precinct Plan* – Which translates the concept plan into specific and spatially referenced development projects with supporting design and development guidelines as well as cost and options for financing projects.
- *Phase 2c: Implementation and Management Framework* – which translates the concept and plan in to a programme of projects and actions that will lead to the development of capital infrastructure and facilities.

The Precinct and Management Plan has been compiled and will be finalised in January 2017. The extent of the PP study area and concept plan is shown in Figure 2. Figure 3 shows the sub precincts within and adjacent to the precinct study area.

¹ Airport Precinct and Management Plan for the Pietermaritzburg Airport and Surrounds. December 2016. Prepared by Markewicz Redman Partnership, in collaboration with Royal HaskoningDHV and Glen Robbins Prepared for the Msunduzi Municipality.

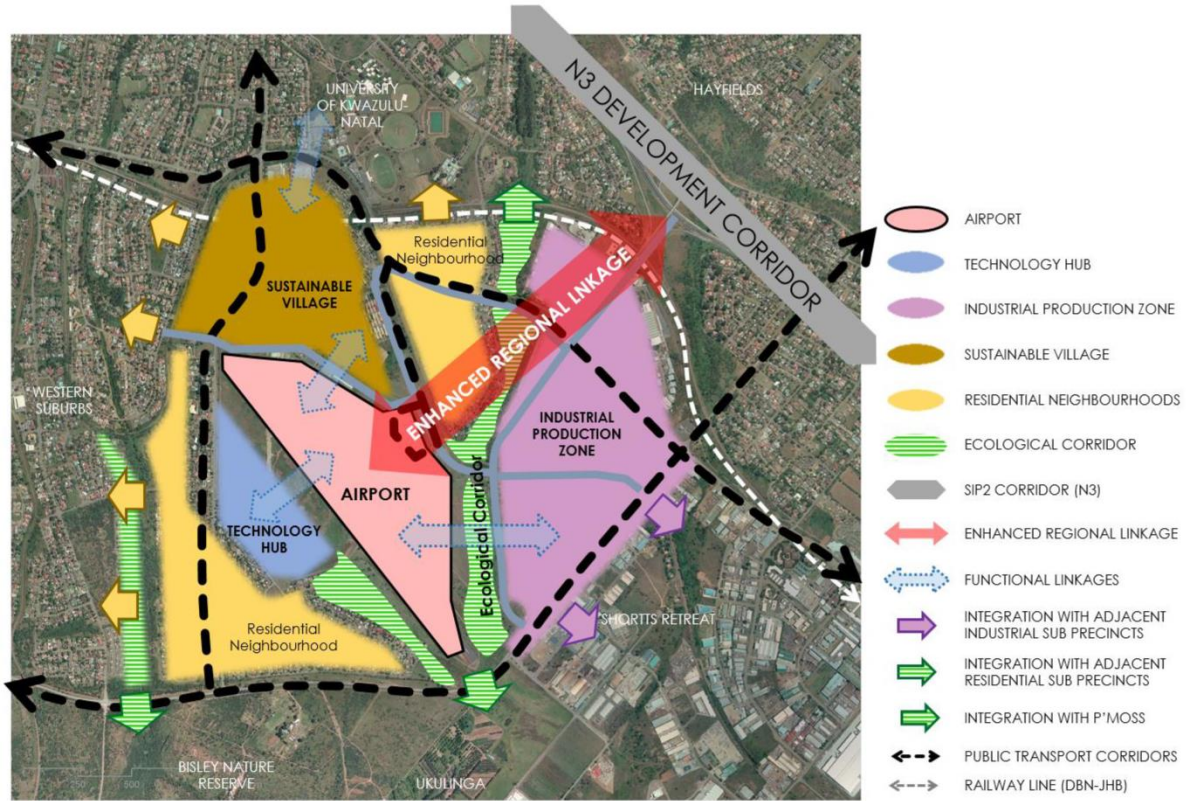


Figure 2 Precinct Plan spatial concept

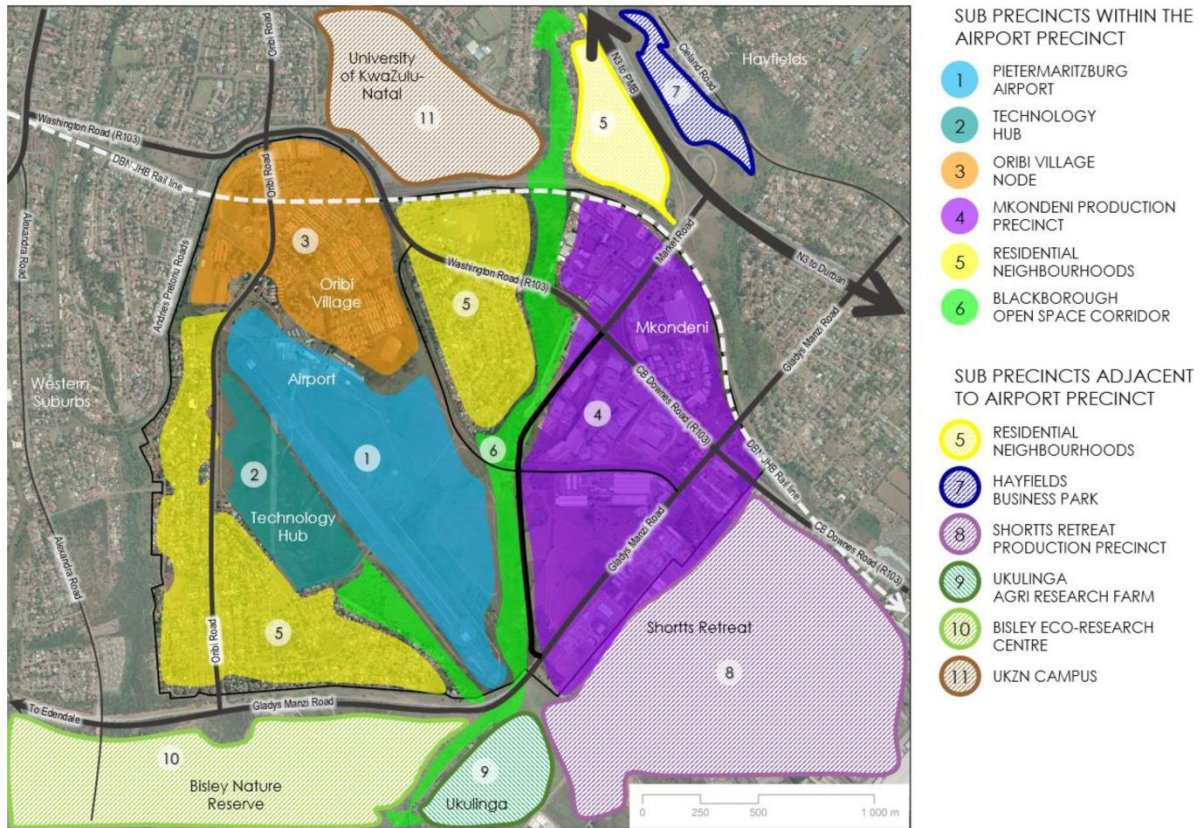


Figure 3 Sub precincts within and adjacent the Airport Precinct

Development frameworks have been developed for the following aspects within the Precinct, namely: Land-use; Access and Circulation; Public Space and Landscape; Built Form; Infrastructure; Environmental. This includes objectives, supporting principles, development guidelines and a spatial structure.

The role of each sub-precinct has also been established, with supporting guidelines for each of the framework elements. These have been broken down further into lists of projects across the precinct according to phasing and for which high level costings have been developed (Figure 4 – location of projects by phase).

Relationship between the Precinct Plan and the EIA

The relationship between the precinct plan and the EIA is an important one and involved the following integration and linkages:

- Issues, information and understanding of the area generated in the scoping process of the EIA were fed through to the PP team.
- The PP team was involved in key meetings during the EIA process, such as the authorities workshop and site visit.
- The PP and EIA teams engaged with key roleplayers on key issues that affected both processes, such as Transnet with regards the transfer/traversing of the defunct railway line.
- The PP team provided much input into the layout of various elements of phase 1 – notably the access links as part of the broader precinct access framework.
- The EIA team fed through outcomes of the specialist investigations into the PP, such as the outcomes of the noise impact assessment.
- The PP consolidates many of the mitigation measures and provides the mechanism for their implementation from infrastructure improvements that support the generation of the positive economy impacts of the development, to restoration and management plans for the open space.
- The EIA team fed through outputs (costs and final road alignments) from the DBSA Feasibility study and the Traffic Impact Assessment to the precinct planning team.

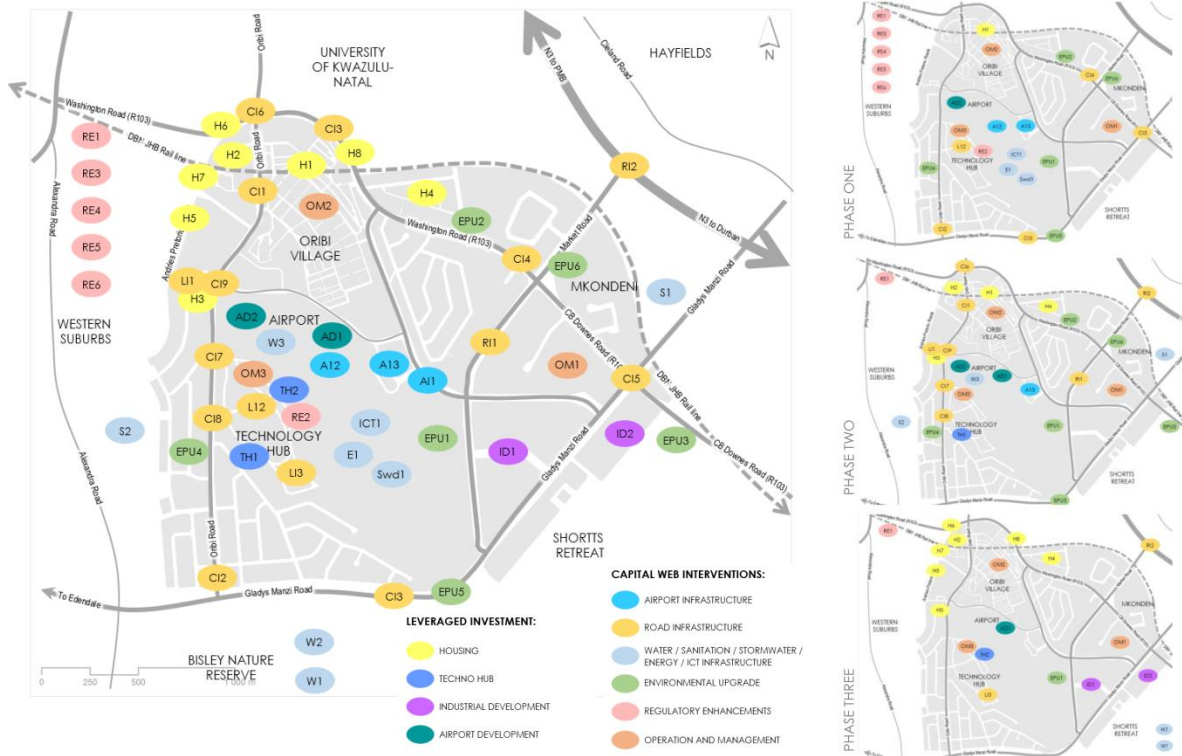


Figure 4 Location of projects by phase across the airport precinct

The Draft Precinct Plan further provides similar spatial outputs to Figure 3 for the Physical linkages and interventions, Sub-precincts and Environmental Upgrades and enhancements. It also provides guidelines for each of the sub-precincts. In summary, the scoping process for the EIA has informed the Precinct plan and vice versa. As a key example, the access routes to the airport were proposed by the precinct planning team as part of the broader access framework.

5.1.3 Technology Hub Feasibility Study

The definition of a Technology Hub is: *“An enterprise associated with research, design and related activities in the high-technology sector which is accommodated in park type work environment which is specifically created for the industrial needs of the enterprises concerned”*.

The Technology Hub concept primarily revolves around the Sustainable Model for a Knowledge Economy, an integration of institution, enterprise and business with the intention of promoting innovation. The four core functions of a technology hub include knowledge, innovation, enterprise and business.

A study¹ was commissioned in 2013 to investigate the feasibility of establishing a Technology hub in the MM. The provincial treasury subsequently secured international funding to initiate the development of Technology Hubs at four locations across the Province namely Richards Bay, Margate, Newcastle and Pietermaritzburg. GWI Project Management Group were appointed to

¹ KZN Technology Hub Feasibility Assessment – Msunduzi Value Proposition, 2013

allocate these funds across the four sites depending on the state of readiness for each and have been responsible for establishing the layout and design of the techno-hub provided in this report.

5.1.4 DBSA Feasibility Study

The Development Bank of South Africa (DBSA) provides financial, planning and other project support services to the local municipalities to improve service delivery. The MM secured funding for a feasibility study into two specific elements of the proposed expansion. The DBSA appointed VNA Consulting to undertake the feasibility assessment for:

- The proposed new access routes to the airport and the portion of industrial land to the south west, achieved through the extension of Market Road.
- The development of additional hangars and associated infrastructure to service the demand for additional general aviation.

The outcomes of these investigations were layouts and costs for these infrastructure components. The reports concluded that certain alternatives were not feasible and these have not been taken forward in the EIA assessment – notably the option 2 for the GA area (see section 5.9). In addition, the Traffic Impact Assessment (TIA) required inform both the EIA, the feasibility investigation and was undertaken under the DBSA contract. The outcomes of the TIA (road and intersection upgrade projects and costs) also fed into the precinct plan.

5.2. Nature of Development Planning and Roll-Out

With the feasibility and planning studies in 5.1 as context, the following points need to be understood regarding the nature and timing of the project roll out as well as the financing thereof.

- In the case of several of the land-uses such as the industrial zone, the Municipality will provide the bulk services but the cost of the top structure will be at the expense of the private investors.
- In the case of major supporting infrastructure like the Market Road access, this may be financed with support from other institutions or as part of existing government department budgets e.g. Department of Transport. For example, the DBSA may assist in financing the Market Road extension depending on the outcomes of the feasibility study.
- Consequently, the various land-uses and infrastructure will be developed in relation to market demand and the availability of finance over the duration of this phase 1 (to 2025), rather than as a consolidated project over an intense 2-3 year development period.
- The most likely developments to take place first are:
 - GA facilities where there has been a long standing waiting list.
 - Phase 1 of the techno-hub.
 - There has also been ongoing discussion with investors interested in the industrial land, so this area may also be developed sooner rather than later.

The new legal entity (see section 5.8) being established to operate the airport will be tasked with increasing the sustainability of the airport financial situation and raising revenue for the various projects.

Given that the various projects (industrial, commercial and hotel) will in most cases be developed by the private sector, the MM is only able to apply for environmental authorisation at the level of proposed land-use zoning e.g. (industrial, mixed use) which have restrictions in terms of what use may take place. The specifications of associated infrastructure are also provided in terms of location and extent (floor space, heights) which are fixed. The investors will be responsible for the detailed designs and getting the necessary building and any other permits.

5.3. Project Location and Extent

The MM is approximately 640 square kilometres in extent and located at the centre of the uMgungundlovu District Municipal, about 80 km North West of Durban along the N3. Figure 5 provides an indication of the extent and locality of MM. The Pietermaritzburg Airport, formerly known as Oribi Airport, is located within the MM boundary. Figure 6 provides an indication of the location and extent of the Pietermaritzburg Airport in relation to the MM. The Airport is located in the outskirts of Pietermaritzburg, owned and managed by the local MM and serves the city of Pietermaritzburg and surrounds as well as the outer west suburbs of Durban.

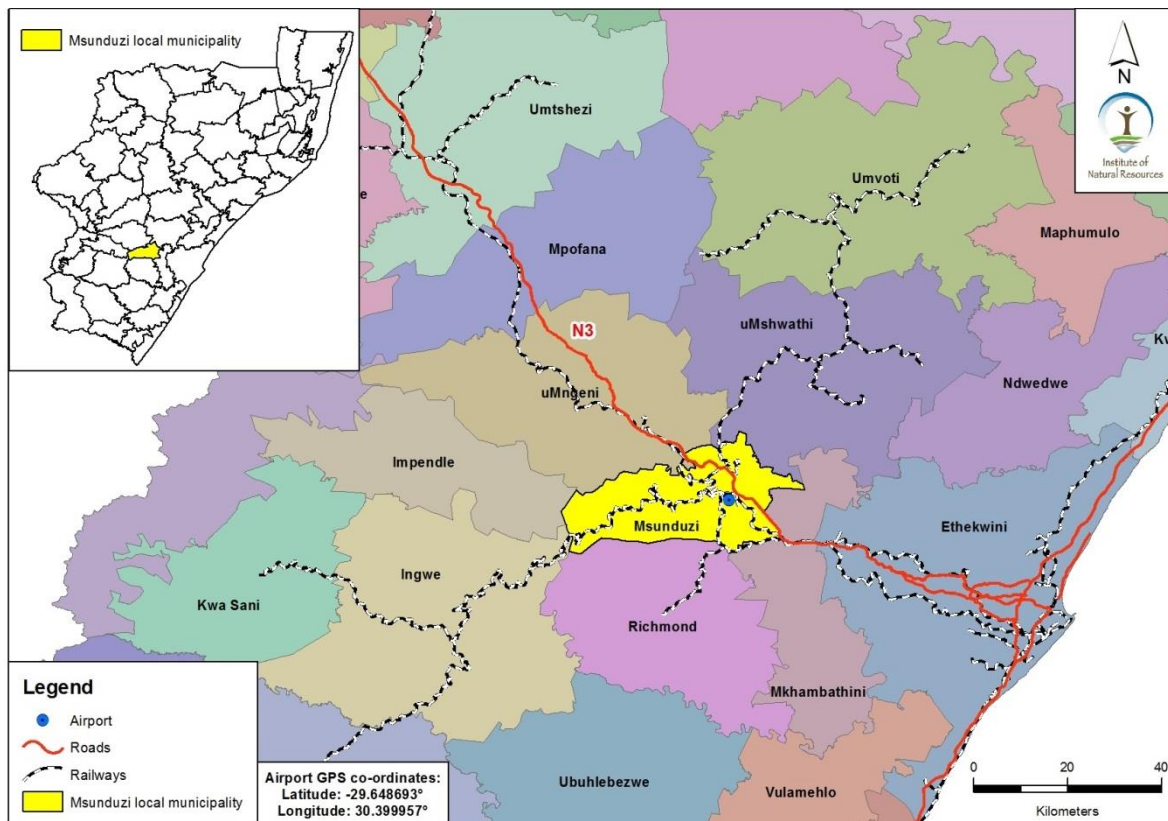


Figure 5 Location of Msunduzi Municipality in relation to Umgungundlovu District Municipality

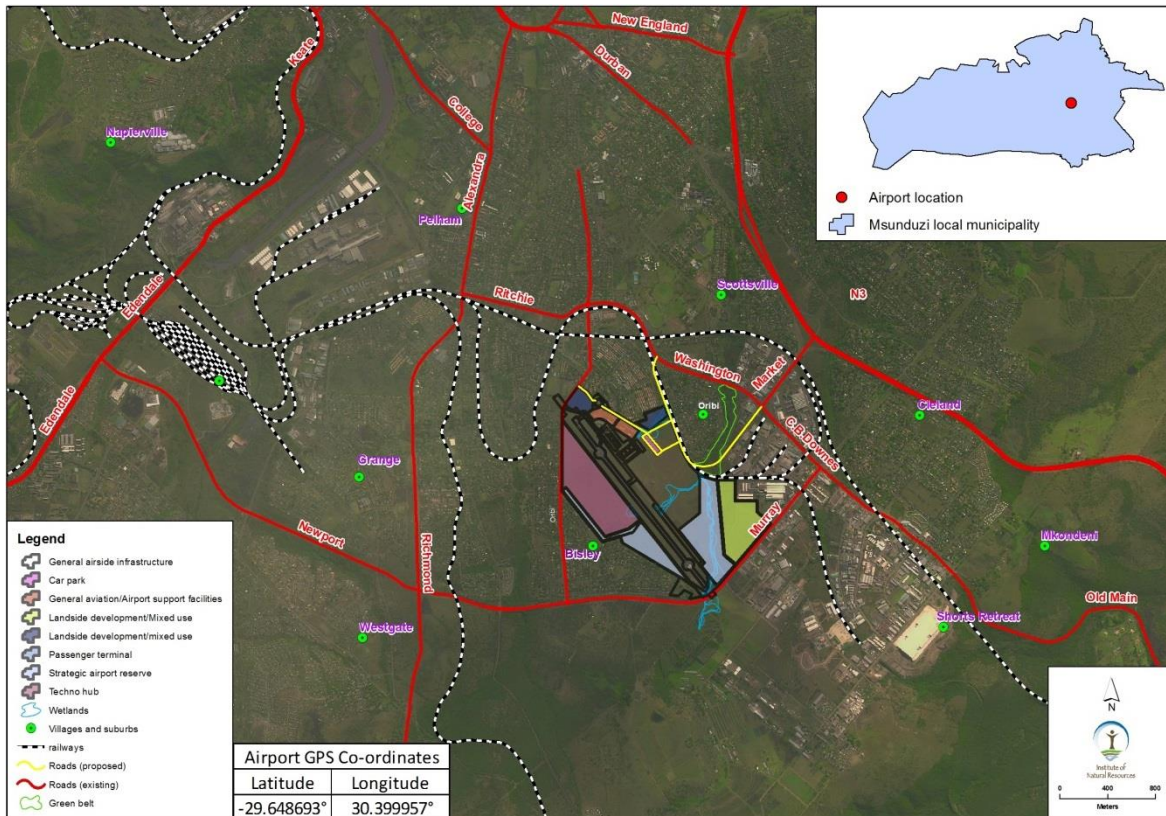


Figure 6 Location of Pietermaritzburg airport in relation to MM

5.4. Land Tenure, Use and Zonation

Expansion is proposed on the existing Airport Property (Remainder of Erf 10 000 and the adjoining properties: Rem of Erf 870, Erf 10159, Rem of Erf 1589, a portion of Erf 1910 all of Pietermaritzburg) as summarised in Table 5 below. Four of the land portions are owned by the MM except for a portion of Erf 1910 which is owned by Transnet.

Table 5 Summary of the land parcels

ERF No.	Surveyor General Code	Area (Ha)
R E / 8 7 0	N O F T 0 2 5 8 0 0 0 0 0 8 7 0 0 0 0 0 0 0	16.1
R E / 1 5 8 9	N O F T 0 2 5 8 0 0 0 0 0 1 5 8 9 0 0 0 0 0 0 0	18.1
R E / 1 9 1 0	N O F T 0 2 5 8 0 0 0 0 0 1 9 1 0 0 0 0 0 0 0 0	0.45
R E / 1 0 0 0 0	N O F T 0 2 5 8 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0	145.42
R E / 1 0 1 5 9	N O F T 0 2 5 8 0 0 0 0 1 0 1 5 9 0 0 0 0 0 0 0	12.69

According to the MM Planning Department, the properties listed above are zoned for “Airport Reservation”. The height restriction within this zoning for office use is 3 storeys and the maximum height restrictive is controlled by 90 degrees right angle. Apart from these specific restrictions, the current zoning does not provide for the various uses planned as part of phase 1. The MM is reviewing their town planning scheme and confirmed that the Airport properties (which form the subject of the EIA application), as well as the broader Airport precinct would need to be rezoned via the processes provided for under the SPLUMA. The Precinct Plan recognizes this need and has included rezoning as one of the regulatory enhancements required to facilitate the implementation

of the Precinct Plan. It further includes costs for running the rezoning process. The SPLUMA process includes consultation and may require additional environmental assessment to address issues across the Precinct, such as visual impact assessment.

The land-use map for the precinct (Figure 7) shows the amount of vacant land within and adjacent to the Airport. It is sections within these areas that are proposed for utilization in phase 1 as described below.

LAND USE: OVERALL

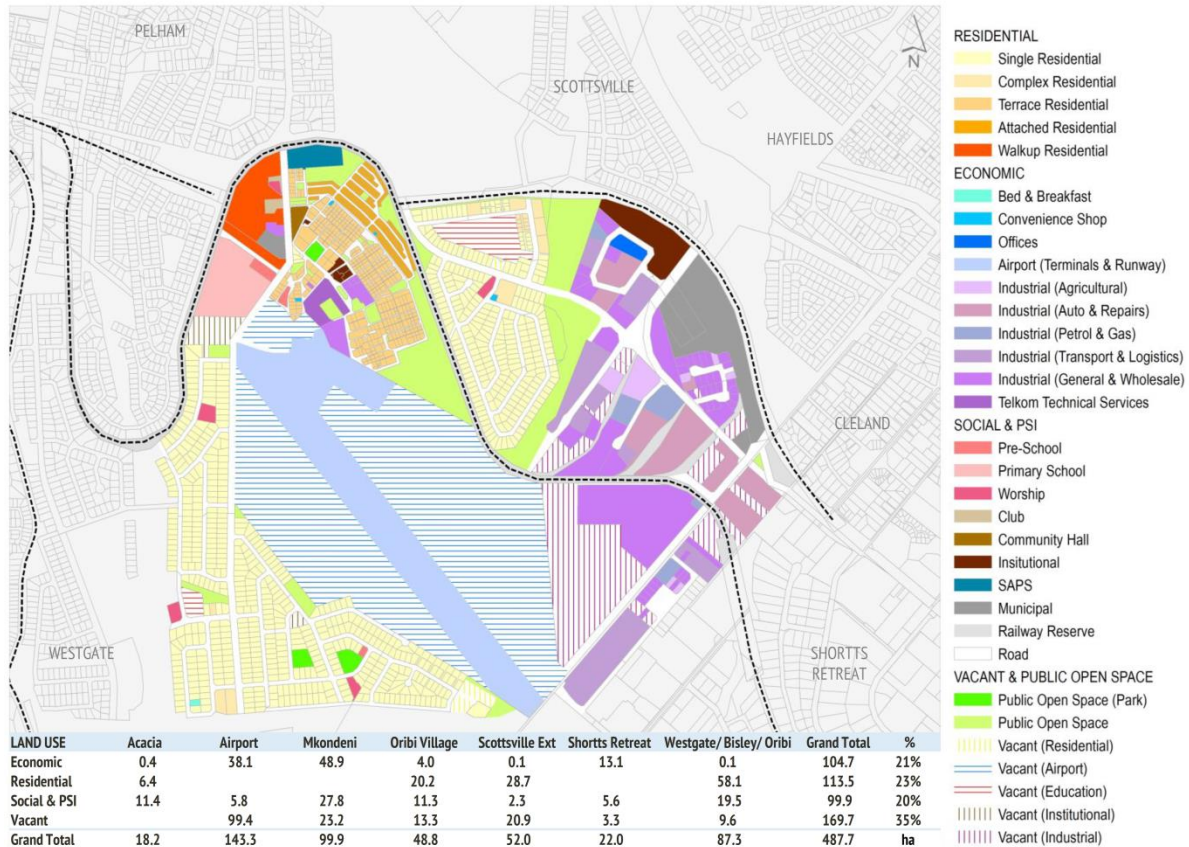


Figure 7 Land-use within the Airport Precinct (Source: Precinct Plan - Status Quo Report)

5.5. Existing Infrastructure

Figure 8 illustrates the existing infrastructure at the airport including the airside, landside infrastructure and the terminal building. The capacity and condition of the existing facilities, infrastructure, utilities and roads at the airport were some of the influential factors motivating for the expansion of the airport.

5.5.1 Airside infrastructure

- Runway:** The portion of the runway that represents the full structural pavement strength is 1 597m, with a stopway of 190m, giving a total length of 1 787m. This equates to an ICAO classification 2C airport. The stopway is, however, an area beyond the runway which can be used for deceleration in the event of an aborted take-off and should provide capable

support without causing structural damage to the aircraft. SA Airlink utilises the stopway when departing from Runway 34 to gain distance for take-off for their Jetstream 41.

- **Taxiway:** The gradient of the main taxiway, connecting the apron to runway is steep and undesirable, and a limited number of jets can be catered for on the runway and taxiway at a time.
- **Apron areas:** The insufficient parking/apron area is a safety concern for the commercial aircraft as it can only accommodate one plane at a time for departure, passengers cannot board while another plane is preparing for departure. Its current position of the apron area and taxiway in front of the terminal building is a development constraint for expansion.
- **Navigation Aids, Visual aids and Signage:** Recently added are the VOR/DME, NDB's, GNSS Let-down procedure and airfield ground lighting, PAPI's at thresholds, which has improved airport's efficiency.



Figure 8 Existing infrastructure layout

5.5.2 General Aviation

There is a long-standing waiting list of 34 users¹ wishing to locate their GA business at the Airport. Demand for hangar space at the Pietermaritzburg Airport is growing, partially due to the King Shaka Airport reducing its General Aviation obligation in favour of commercial flights, and the imminent closure of the Virginia Airport.

¹ List provided by Msunduzi Municipality

5.5.3 Landside Infrastructure

- **Access Roads:** The airport is located approximately 6km south of the CBD of Pietermaritzburg, and is 3.5km from the N3 freeway and 2km from the R56. Direct access into the airport is through Pharazyn Road off Oribi Road.
- **Parking Areas:** Servest Parking is responsible for the facility which houses the seven car rental firms and the private shuttle service. The location of the current designated drop-off and collection area is viewed as being unsuitable by some users; however, the preferred area is restricted and defined by the concession terms.

5.5.4 Terminal Building

The terminal building covers an area of about 1 200m² in public amenities including check-in counters, arrival and departure lounges, a VIP lounge, a cargo office, an airport management office, an ATM, a coffee shop and ablution facilities as shown in Figure 9 below. The layout and facilities within the terminal building were upgraded as part of the capacity of the terminal building had been deemed insufficient based on the growth in passenger numbers at the airport. Table 6 below summarises the extent of the different facilities in the terminal building.

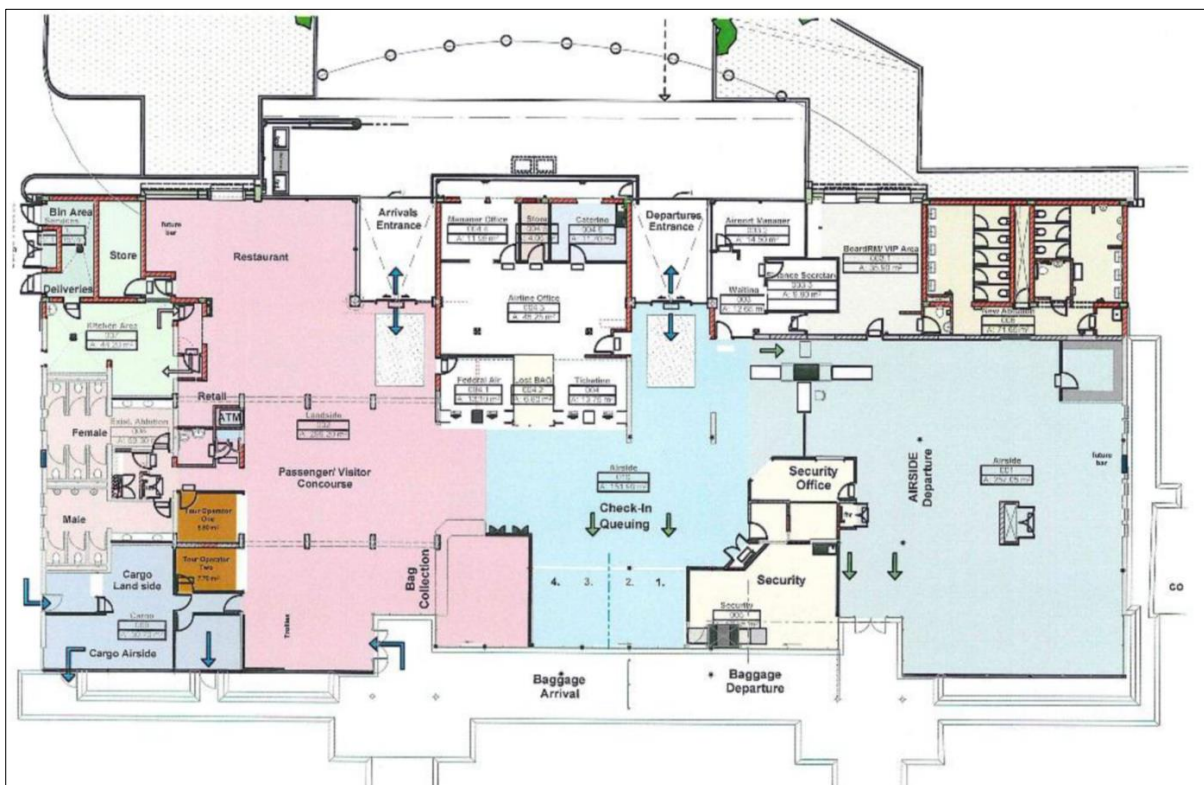


Figure 9 Layout of the existing terminal building

Table 6 Extent of the facilities in the terminal building

AREA	FACILITY	SUBDIVIDED AREAS (M ²)	TOTAL AREAS(M ²)
Offices	Airline Offices (Federal Air)	107.60	255.60
	Airport Management	36.95	
	Boardroom/VIP	35.90	
	Tour operators	16.30	
	Security	58.85	
Ablutions	Old	59.30	130.95
	New	71.65	
Kitchen	-	57.35	57.35
Arrivals	Restaurant/Future bar	173.20	296.20
	Arrival Concourse	*95.00	
	Baggage Claim	*28.00	
Departures	Check-in counters	*30.50	408.95
	Queuing	*60.00	
	Open Space	61.40	
	Airside Lounge	257.05	
Cargo	-	50.70	50.70
Total area			1 200

5.5.5 Other facilities and utilities

The other facilities and services at the airport site which were assessed include;

- Control tower
- Fire and rescue facility
- Fuel
- Car hire facility
- Hangars
- Utilities assessed included:
 - Electricity
 - Water
 - Sewerage
 - Communication

5.6. Proposed Infrastructure and Land-use

The project involves the expansion or addition of the following components which are detailed below:

- **Airside Infrastructure:** Extension of the taxiway to service an extension of the aircraft apron.
- **General Aviation:** Reconfiguration of existing hangars, and expanded facilities for aircraft maintenance and repair.
- **Terminal Building:** Site allocated for future expansion of the terminal building.
- **Landside Infrastructure:** Improved access via a link to Washington and/or Market Roads and associated link through the Industrial Zone to Gladys Manzi Road. Site for new parking area and drop off zone; an industrial zone, and mixed commercial zones.
- **Technology Hub:** Located between the runway and western boundary of the airport (Oribi Road) that provides for the following zones: special sports, mixed use/commercial, mixed use residential/hotel, aviation hub, education/techno-hub, and light industrial.
- **Open Space/Conservation:** Assigned to sensitive riparian systems and open space.

5.6.1 Airside Infrastructure

The airside infrastructure consists of the following elements shown in Figure 9.

5.6.2 Runway

No extensions to the existing runway are required. The total length of the existing runway is 1597m with a stop way of 190m; the classification of the runway will therefore remain an ICAO Code 2C runway; however the length does cater for certain code 3C aircraft to be able to operate at this airport. The runway is adequate to serve the aircraft mix within Phase 1.

5.6.3 Taxiways

For planning purposes the taxiway infrastructure including the relevant clearances have been laid out for full ICAO Code C aircraft (up to 36 m wingspan), this to cater for the possible long term future introduction of this aircraft category. An initial parallel Taxi Way will be developed to serve the extended apron.

5.6.4 Aprons

The new apron will be parallel to the runway on the eastern side. This phase incorporates a flexible extension of the existing apron where the indicated area allows for several parking configurations to be determined and implemented as per actual demand. However, for planning purposes six ICAO Code B aircraft stands and three ICAO Code C (e.g four AVRO RJ 85) stands have been provided. It will have an area of 14 000m² (200m wide and 70m deep). It is noted that currently the airport is used by smaller code C aircraft with a wingspan of around 26 m only. The indicated parking arrangement is therefore indicative. The proposed modular arrangement can be easily extended in future if demand dictates so. Between the several apron stands associated apron taxi lanes have been planned, further land reservation has been made for apron service roads.

5.6.5 Navigation Aids

Navigation aids will be upgraded and implemented concurrent with the terminal building, runway and taxiway system extensions to be compliant with ICAO's and CAA's standards.

5.6.6 Visual Aids and Signage

With the extension of the taxiway system and the new terminal building, the visual aids and signage need to be upgraded to be compliant with ICAO's and CAA's standards.

Table 7 lists the land use facilities including a brief description of the function served by Airside facilities.

Table 7 Description of the airside infrastructure

Main Category	Typical Facility Type	General Description
Airside Infrastructure	Runway Infrastructure	Asphalt runway pavements and associated pavement marking, Airfield Ground Lighting elements, ducting and manholes, special airport systems equipment, metrological equipment and storm water drainage elements. Intended use: Aircraft, controlled access.
	Taxiway Infrastructure	Asphalt taxiway pavements, associated pavement marking graded (grass) taxiway strips, airfield ground lighting elements, ducting and manholes, storm water drainage elements: Intended use: Aircrafts, controlled access.
	Apron Infrastructure	Concrete or asphalt pavements, associated markings, floodlighting masts, ducting and manholes, drainage elements. Intended use: Aircraft, Airport Service Vehicles, passengers, restricted access.

5.6.7 General Aviation

The expansion of the GA facilities will take place within two phases, within the overall phase 1 expansion.

- The first phase will involve the reconfiguration of the existing GA hangar facilities (indicated in pink in Figure 10) to optimize this area. In addition, new GA infrastructure will be developed adjacent the existing area (shown in blue in Figure 10).
- Once the terminal building and parking area moves to the new location indicated in Figure 9, the existing terminal facilities can be reconfigured for use by private and business aviation as well. Table 8 lists the land use facilities for including a brief description of the function served by the GA facilities.

Table 8 Description of the General Aviation infrastructure

Main Category	Typical Facility Type	General Description
General Aviation	Aircraft Hangars	Hangars to be used for parking of privately owned aircraft. Building heights for hangars are up to 8m for code B and 15m for Code C.
	Aircraft Maintenance and Repair facilities	Aircraft Maintenance and Repair activities are assumed to be mostly related to General Aviation although if scheduled flights intensify at some stage limited routine line maintenance services might be provided for by the airlines. MRO facilities are assumed to be located in the areas indicated for GA. These facilities will consist of hangars with workshops and warehousing for storage of equipment and parts.
	Aero Club facilities / Flight School	The current PZB Aero Club has facilities on the existing airport, During the development of the airport activities of the Aero club and Private Pilot Training Activities are assumed to continue and expand. Facilities like a club house, instruction rooms and hangars are assumed to be retained and located within the areas indicated for GA.



Figure 10 Layout and extent of the elements comprising of the Phase 1 of the project

5.6.8 Landside Infrastructure

- **Mixed-Commercial Use:** Mixed use area reservations are proposed on the northern end of the airport. A 75-125 room Hotel is proposed for the area between Oribi Road and the existing Airport entrance. The hotel buildings will be a maximum of two storeys supported by parking facilities for guests and staff. A second mixed use/commercial zone is proposed in the area adjacent immediately adjacent Oribi Village along the proposed new access road that links into Washington Road.
- **Industrial Zone:** The first phase will accommodate a new industrial zone of approximately 17 hectares which will accommodate land uses and activities similar to those in the existing and adjacent industrial estate (i.e. manufacturing, logistics, warehousing).

5.6.9 Airport Access

The current airport access road (Pharazyn Way) off Oribi Road will be retained as an access point to the General Aviation portion of the airport once the other access routes are established. The following additional airport access is proposed:

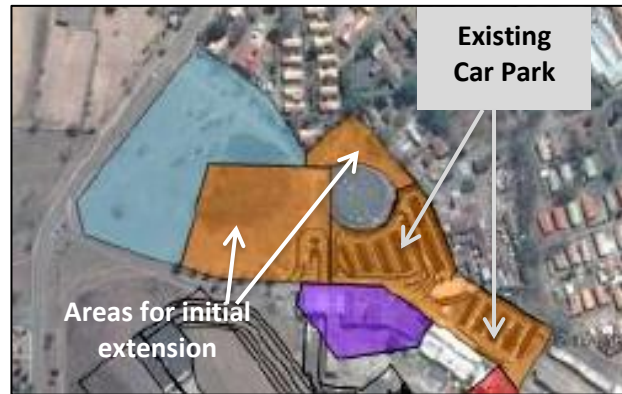
- i. A new access road off Oribi-Road. This will run along the boundary with Oribi Village and extend to the new parking area and terminal building once they are established.
- ii. A new road that links the new access off Oribi Road to Washington Road providing a 'loop' system'.
- iii. A new access road connecting the airport directly with the N3 via an extension of Market Road which currently culminates in a dead-end to the east of the service railway. This road (Market Road extension) will also provide access to the light industrial area and link through to Gladys Manzi (Murray) Road. This link will also tie into the Washington Road access.

Three new intersections are proposed off Oribi Road to access to the Techno-hub. These will be opposite existing access roads off Oribi road to the residential area.

5.6.10 Parking

A new parking area is proposed adjacent to the proposed position for the new passenger terminal building. This parking area will be used for staff, passenger and VIP parking. The car rental offices can also be relocated to this location. A section of the existing parking area will remain as such for this phase which could provide additional parking dedicated for the GA related facilities and airport staff. It should be noted that Servest, who manage the parking area have a contract until 2024 with an option to extend by 5 years. In terms of this contract they have an agreement with the Municipality to extend the parking area by approximately 12 800m² towards Pharazyn Way and adjacent the water reservoir in the area identified for the hotel. This area is shown in the following diagram and the extension is likely to commence in the short term.

The timing of a move for the parking area to the new site adjacent the new terminal building shown in adjacent figure is dependent on when alternative access is developed and the terminal building needs to move. These options are described further under the section dealing with alternatives.



- **Drop-off / public transport curbs**
Public Parking: At the main access road a loop is to be provided to maintain flow of traffic, while parking and drop-off zones remain connected. Terminal frontage roads with kerb for drop-off and pickup of passengers will be provided here with a bypass.
- **Car hire facilities:** Car rental parking and offices are located in the parking area. The timing and design would be undertaken in collaboration with the holders of this concession and in terms of their lease agreement.

Table 9 lists the land use facilities including a brief description of the function served by the land-side Infrastructure

Table 9 Description of the landside Infrastructure

Main Category	Typical Facility Type	General Description
Landside infrastructure	Access roads and circulation roads	Dual lane (bi-directional) airport access roads (asphalt) and single lane circulation roads (one direction). Street furniture and street lighting elements, storm water drainage elements. Intended use: Secondary arterial classification.
	Passenger and Staff Parking	Ground level, passenger car parking, asphalt or concrete block parking pavements, walkways, street furniture, gate house, drainage elements and street lighting.
	Drop-off/public transport curbs	Terminal frontage roads with kerb for drop-off and pickup of passengers.
	Car hire facilities	Car rental parking and offices

- Considered planning of the mixed uses should encourage movement of people as well as innovation through potential synergies.
- Buildings embody the aspirations of businesses as world leaders and innovators through their architectural expression and forms.
- The human mind is encouraged to test perceived boundaries through “creative space”.
- Traditional office typologies with confined or restrained spaces are to be avoided. Generous natural lighting, ventilation, form, colour, and open spaces are to be encouraged.
- In terms of energy efficiency and design, buildings should as a minimum comply with the requirements of SANS 204.
- Green Star and LEED certification of buildings are to be encouraged.
- Sources of renewable energy should be investigated and integrated in the planning of the hubs.

5.6.11 Passenger Terminal Building

The passenger terminal building currently provides an acceptable service level based on recent upgrades of the existing building. The Master Plan projected that current terminal building can be expanded to a maximum of approximately 2 360m² in phase 1. The Master Plan projected that a new passenger terminal would be required once the phase 1 threshold of 250 000 Pax is reached i.e. phase 2. It projected an increase in floor space to approximately 4 100m² and that the building be centrally located around the expanded airside facilities. So while the new terminal building is required in Phase 2, the site for this facility has been included in the phase 1 application. This is because, if the new access is developed via the Washington/market Road the terminal building would need to move to align with the new access and associated parking areas. Table 10 lists the passenger terminal building facilities for including a brief description of the function served by the passenger terminal building.

Table 10 Description of the passenger terminal facilities

Main Category	Typical Facility Type	General Description
Passenger Terminal Facilities	Passenger Terminal Building	Passenger Terminal Building where passengers board and alight flights. Consisting of: a central arrival/departure hall, commercial concessions (bars/restaurants shops) check in area, waiting lounges, airport and airline offices, and ablution facilities. A two storey passenger building is envisaged.

- **Electricity:** For Phase 1, the supply will remain to the terminal building, however, it may need to be augmented should the power required exceed the existing capacity. Further reticulation will be required for apron lighting and for the proposed GA area. Sufficient capacity should be provided to allow for future phases of the GA facilities.
- **Water Supply:** The nearest bulk reservoir is adjacent to the existing passenger terminal. It is understood that the bulk water system has sufficient capacity; however, pressure is a concern due to the relative elevations of the airport and reservoir. For Phase 1 the reticulation to the terminal should be upgraded to meet the additional requirements and address the current issues relating to the existing infrastructure. Additionally, a new supply will be required for the GA area, which is anticipated to be connected from the adjacent residential network.
- **Wastewater:** The Municipality has indicated that sufficient bulk supply is in place (or at least planned) in terms of wastewater trunk mains and treatment capacity. For Phase 1, the existing supply to the terminal will need to be upgraded to meet the additional demand. Reticulation will need to be provided for the GA areas.
- **Storm Water:** For Phase 1, improvements to the current storm water arrangements will need to be designed and form of part of a storm water management plan that takes into account the entire development area based on more detailed designs of the infrastructure.

5.6.12 Technology Hub

The definition of *Technology Hub* is “An enterprise associated with Research, development, design and related activities in the high-technology sector which is accommodated in a park-type environment which is specifically created for the industrial needs of the enterprises concerned”.

From an environmental perspective, to note is the institution design incorporating environmental principles into the design process, to reduce the overall human health and environmental impact that may arise across the techno hub's life cycle. These include:

- Large areas of green space are retained for the benefit and recreation of the employees and building occupants.
- Public spaces become informal outdoor boardrooms where networking and socialisation takes place.
- Provision of services, entertainment and recreation facilities, and proximity to accommodation can make hubs self-contained micro cities.
- Full integration with universities, tertiary institutions, and research institutes encourage growth in research and development.
- Research and development rich environments attract businesses investment in the hub through linkages with learning institutions.

The site set aside for the Technology hub is about 25 Ha. The table below depicts the conceptual zones envisaged for the technology hub of Msunduzi. This plan is based on a specific model formulated for this hub. The concept involves six specific zones, each with a sub zone. The six zones and sub zones are tabulated below with related functions.

Table 11 Summary of uses within the techno-hub zones

Zone	Sub-zone	Function
Mind Zone	Education - Research Zone	Laboratories (analytical, science and computer)
	Education - Student Zone	Studios (for Master and PHD students) and an interpretation centre which could be used by schools as a part of science education to instil an innovation culture in school children
Innovation Zone	Light Industrial - Testing Zone	Experimentation, materials and products testing for innovations designed
	Light Industrial	Laboratories for simulation, CAD, CFD, IT and product design
	Light Industrial	Consists of a learning factory for rapid prototyping, workshops and CNC Machining as well as product development
	Light Industrial	LAN lab with Computational Capacity and Product Testing and a server farm with unlimited connectivity and bandwidth.
Enterprise Zone	Enterprise Zone	Hub Management & Marketing/Branding is to be located in this zone and is the heart of the daily operations of the entire technology hub. Functions include: <ol style="list-style-type: none"> 1. Business Management & Marketing 2. Business Development & Planning 3. Consulting 4. Enterprise Finance <ol style="list-style-type: none"> a. Venture Capital b. Training and Mentoring 5. Skills Transfer 6. International and national business networking and linkages between research centres, industries, international technology parks, are created by the management body. 7. Property management function It also serves as the interface for the Mind/Innovation/Business zones.
	Enterprise Zone	The start-up zone consists of the following services: <ol style="list-style-type: none"> 1. Start-up Incubator

Zone	Sub-zone	Function
		<ol style="list-style-type: none"> 2. Innovator/Entrepreneur Development Program 3. Central Services <ol style="list-style-type: none"> a. Reception & Secretarial b. Boardrooms c. Video Conferencing d. Meeting Spaces e. Computer Lab f. IT Services g. Telecommunications 4. Studios <ol style="list-style-type: none"> a. Hot Desk (for ICT services) b. Small Tenants c. Medium Tenants
Public Zone	Mixed use Commercial	<p>The convention sub zone is equipped to involve a multi-functional space for:</p> <ol style="list-style-type: none"> 1. Skills transfer 2. Information & Knowledge Dissemination 3. Multifunctional Conference Spaces 4. Exhibition Space 5. 300+ Seat Auditoria / Cinema
	Mixed use Commercial – Life Zone	<p>The life sub zone consists of the following retail support services for tenants and employees:</p> <ol style="list-style-type: none"> 1. Cafes & Restaurants 2. Retail Services <ol style="list-style-type: none"> a. Convenience Store b. Banking & Post c. Hair & Beauty
	Sports – Body Zone	<p>The body sub zone includes the following in order to create a multifunctional and mixed use environment servicing the everyday needs of people.</p> <ol style="list-style-type: none"> 1. Gym 2. Sports & Recreation
	Mixed use/Residential/Hotel - Accommodation	<ul style="list-style-type: none"> • Short to Long Stay (hotels) • Spa
Business Zone	Mixed use commercial – Multi tenanted buildings	This sub zone allows for office or other space to be taken up by small to medium existing enterprise
	Mixed use commercial - Single-tenanted Buildings	This sub zone allows for office or other space to be taken up by medium to large existing enterprise.
Energy Zone	Solar Roof Zone	<ul style="list-style-type: none"> • Roof Mounted Solar Panel Farm
	Solar Terrestrial Zone	<ul style="list-style-type: none"> • Ground Based Solar Panel Farm • Energy Capacity • Power Security
Other	The spatial concept allows for parking, landscaping and interactive open spaces including a lake. A transport zone for shuttle services and taxi and bus drop offs is also compensated for within this plan.	

Phase 1A of the Techno-hub is proposed as shown below in Figure 11. It comprises:

- Bulk infrastructure (roads, storm-water, sewer and water reticulation) to service this initial phase but also the remainder of this section of the Techno-hub in order that these don't need to be expanded in future.
- A new fence between the site and the runway.
- Gatehouse and entrance security.
- An information centre and associated parking.

The cost of the bulk infrastructure for this phase is approximately R29 million. Detailed design, costing and tender documents have been developed for the infrastructure component of this phase i.e. not the top structures.

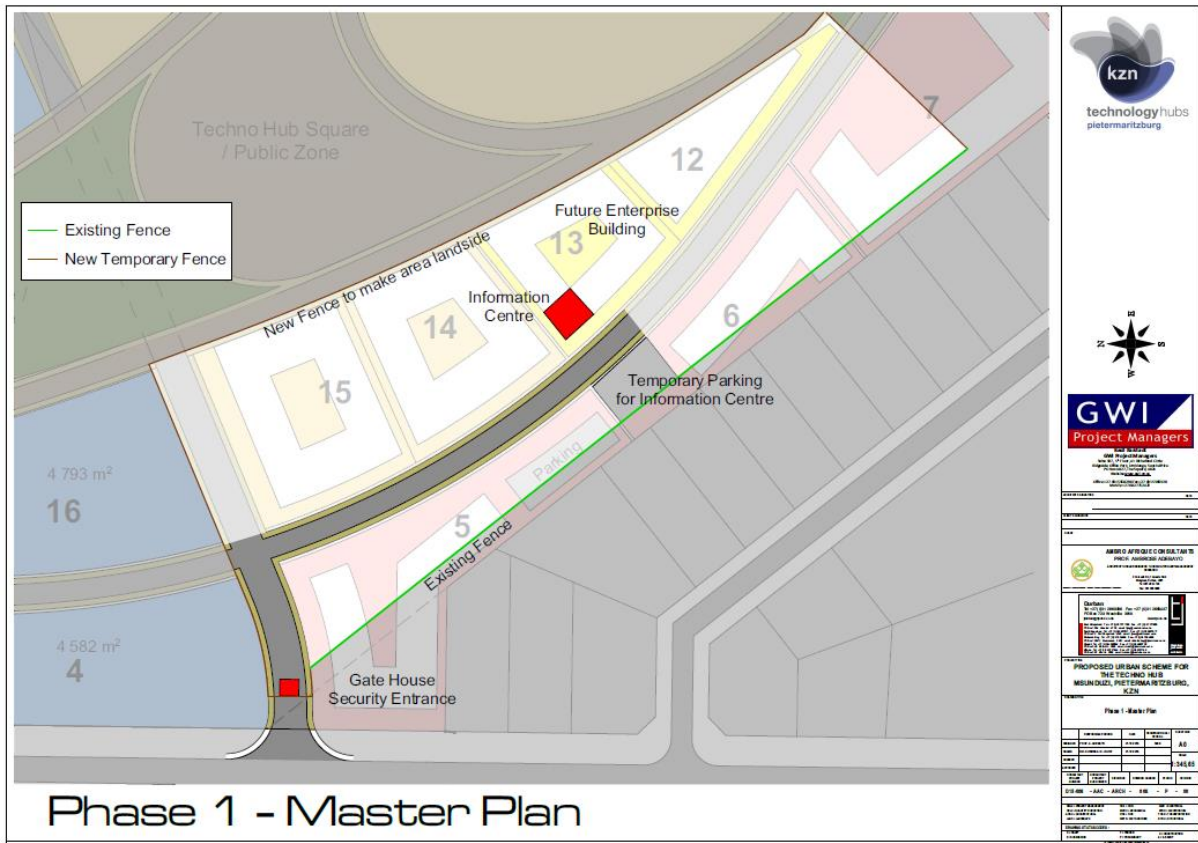


Figure 11 Layout for Phase 1A of the Techno-hub

IMPACT ASSESSMENT REPORT FOR THE PROPOSED EXPANSION OF THE PIETERMARITZBURG AIRPORT
 Draft Report for Comment

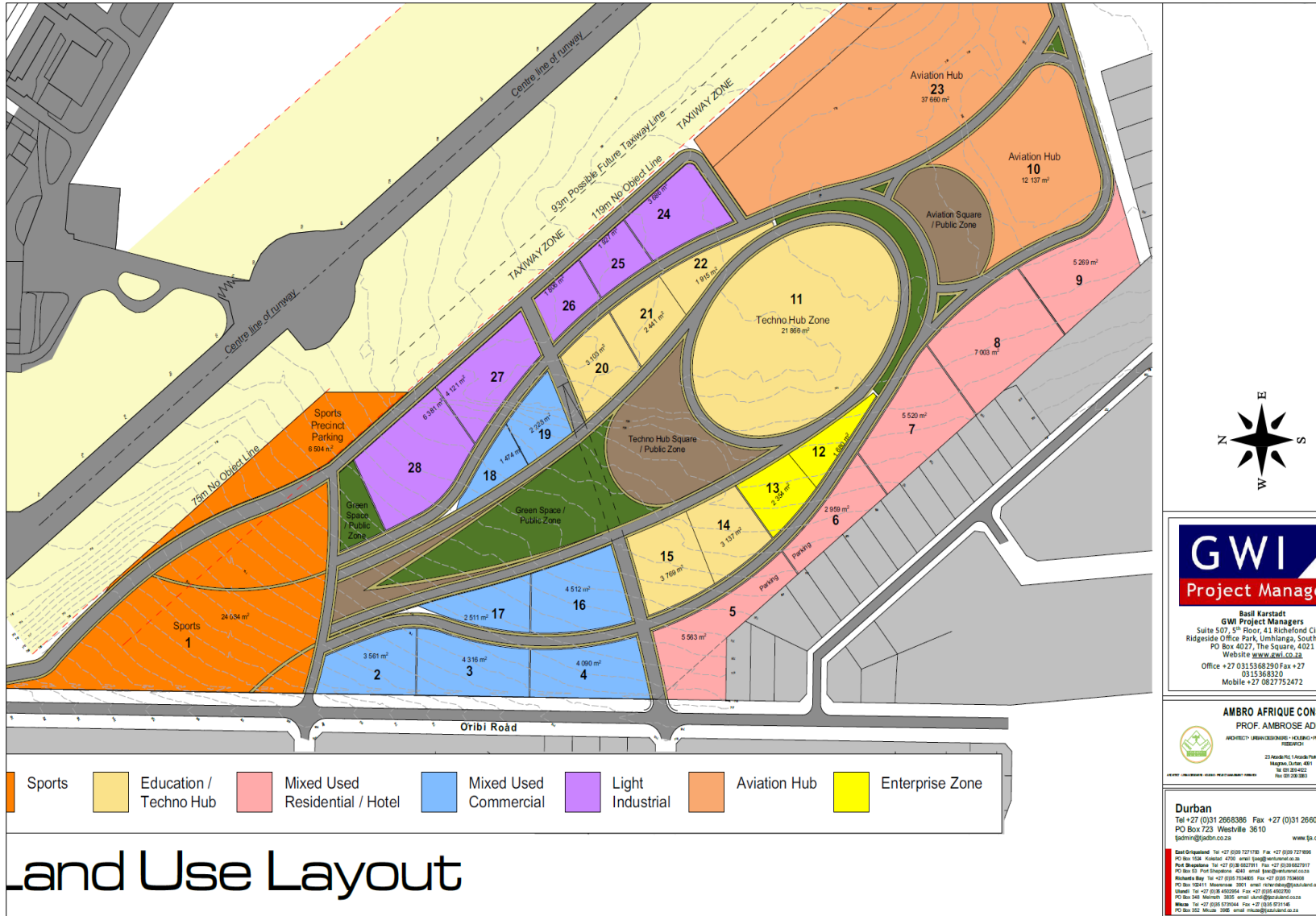


Figure 12 Layout of the proposed land-use within the Techno hub

5.7. Open Space

Like any development well-managed open space protects the natural green infrastructure, preserving important environmental and ecological functions such as storm-water runoff, amelioration of water quality issues, and erosion control. The MM EMF identifies conservation priorities throughout the municipality, and wetland and grassland systems areas are regarded as sensitive areas which have to be preserved protected and free from intensive development.

- **Conservation Zones and Buffer zones:** Conservation zones relating to sensitive areas and habitats have been included in the overall land-use plan for the airport proper. A significant portion of the land parcel comprising wetland and grassland has been set aside as strategic reservation in order to ensure the protection of a healthy system. The reserve is primarily an important riparian corridor along, and around the water bodies. It serves as a physical link to and between significant sources of biodiversity (from the Bisley nature reserve south of the airport extending all the way up to Msunduzi River past the Hayfields reserve) to prevent local species extinctions in the Msunduzi Municipal Area. Specific buffers have been delineated in the EIR to protect the system and inform future development. In addition the Precinct Plan has defined the corridor as a sub precinct and included costs for rehabilitation actions as a key project within the overall plan.

5.8. Institutional Structure

The municipality has 4 municipal entities, one of which is the Airport Entity. Municipal Entities are established on the same basis as State Owned Enterprises, where the companies established have a majority shareholding from government. In the case of the Airport Entity, it is envisaged that a “mini ACSA” will be established to operate and manage the airport. The entity will be managed by an independent Board comprising of Executive and Non-Executive Directors, with Non-Executive Directors in the majority, and the chairperson being a Non-Executive Director. One of the areas of management for the entity will be the development of vacant land in the airport, and in the precinct around the airport. The Technology Hub project will be one of the first development projects that will be managed by the Airport Entity. A Property Development division is proposed in the organizational structure of the new entity, and a process will be developed for the management of the Techno Hub, including a dedicated sub-unit that will manage the marketing of the site, and tenancing and other issues.

5.9. Alternatives

The EIA regulations define *alternatives* as: “different means of meeting the general purpose and requirements of the activity, which may include alternatives to the: Site (location of property), Type of Activity to be undertaken; Design or Layout; Technology to be used”.

It is a specific requirement of the EIA regulations that the SEIR process includes the identification and consideration of feasible alternatives in the scoping process for assessment in the EIR phase of the process. The value of this requirement is that alternatives are a form of mitigation, in that certain options may avoid or reduce the nature, extent or duration of one or more impacts, on one

or more aspects of the receiving environment. The following section presents an outline of the alternatives which were identified in the scoping process, the motivation therefore and why certain types of alternatives were not considered.

5.9.1 Alternative Site

No alternative site is proposed for assessment on the basis that the proposed site:

- Is owned by the Municipality,
- Is an operational and licensed airport and has been for over 75 years.
- Is zoned for Airport and associated activities,
- As discussed in section 4.2, the MM has identified opportunities to improve the financial sustainability of this enterprise and increase its contribution to the local and regional economy. The implementation of certain of these opportunities and improvements since 2010, has seen a marked improvement in the sustainability of the Airport. There is also interest from investors and funders to take up the various other opportunities provided through the proposed expansion. Considering any other site would undermine the progress made in this regard.
- The costs of establishing a new airport when there is growth in the performance of the current Airport motivates against considering this.

Lastly, it should be noted that there have at points in recent years been motivation from various parties that any further development of Pietermaritzburg Airport is flawed because of the topographical constraints and length of the runway which prevents larger planes from landing there. This reduces the potential for growth and competition which leads to high ticket prices. Based on these arguments, it has been proposed that an alternative site be considered in the Camperdown region. The proposed site falls within the neighboring Municipality to MM. Given that the Municipality is not able to invest beyond its geographical borders, this site is not an option. Furthermore, as discussed in section 4.2, the improvements to navigation aids and other developments have increased the size of planes that can land, with a concomitant increase in scheduled passengers (numbers have approximately doubled between 2010 and 2015).

5.9.2 Alternative Type of Activity

As the site is designed, zoned for and has a license to operate as an Airport, the consideration of alternative 'core' use is not an option. While the core function of the airport has not changed, the application of the "Airport City" concept has seen the addition of alternative land-uses within the adjacent land. The selection of these land-uses is in response to market demand and zoning of this land, and they are complimentary to other uses in the Airport Precinct or the Airport itself. They are therefore considered appropriate Land-use/types.

5.9.3 Alternative Layout

There are two elements of the proposed expansion for which alternative layouts/alignments were identified in the scoping process. The reason for and detail of each is described below.

Alternative Site for the Extension of General Aviation Infrastructure

There has been considerable demand for additional GA facilities, notably ‘hangar space’ for some time. A longstanding concern of the existing GA users at the Airport is that the GA and commercial aircraft and activities are not separated. As described at the Airport Users Focus Group meeting (See appendix 4) the users explained that ‘mixing’ commercial and light aircraft presents safety risks. Through the scoping process, the Airport User Group identified the site shown as ‘New GA Alternative II’. The site is located between the two wetlands in the open space corridor and would require new access off Gladys Manzi/Murray Road, proposed to be routed along an existing dirt track.



Figure 13 Project layout showing GA alternatives

This site was identified as beneficial by the users because it would separate the GA and Commercial aircraft, hereby reducing current issues. The location of the site would also mean that lighter aircraft would not have to taxi the full extent of the runway which is currently the case and unnecessary use of ‘runway time’.

The preferred alternative site for the expanded GA area is shown in Figure 13 as 'New GA alternative 1'. It is located adjacent to the existing GA facilities. It is preferred because it will be an extension of the existing developed area and so the cost will be lower.

The technical feasibility and associated costing for each option was investigated as part of the DBSA funded feasibility study. The outcomes of this study were that Alternative 2 is not feasible for the following reasons:

- It requires access to Murray road, at a location where there is no sight distance. Authorisation of this would be unlikely.
- An alternate access will be off the new Market Road Extension, which will sterilise a prime industrial property that is greatly in demand in the area, and a catalyst for the road extension.
- It will require a remote access to the airport, thus increasing the security risk at the airport, both on landside and airside.
- There is potential to interrupt line of site requirements from the control tower.

In addition to the technical aspects:

- Alternative 2 is considerably more expensive than option 1 because bulk services would need to be provided, including the new road and bridge. The earthworks would also be more expensive. The cost of Option 2 is estimated to be approximately R36 000 million more than the preferred alternative 1.
- The ecological impacts are higher.
 - The access road would require an additional wetland crossing, thereby adding to the cumulative impact on the already highly impacted system.
 - The site is located in the core grassland area identified in the ecological specialist study, thereby adding to the cumulative impact on grasslands.

The EIA regulations require that feasible alternatives are taken forward in the assessment. Given that alternative 2 is not considered technically feasible and has additional negative ecological and economic consequences, it was not taken forward into the assessment phase.

Alternative Access Routes

Access to the Airport is currently poor with only one entry point which is reached after navigating through the margins of the congested Mkondeni industrial area and several residential suburbs. It is a very indirect route from the main access route, the N3.

The Precinct Planning team proposed new access routes as part of the broader "Access Framework" in the Precinct Plan with the aim being to create more direct access to the Airport and adjacent industrial area, and also improve the general traffic flow within the broader Airport precinct.

The proposed routes are shown as 'proposed roads' in Figure 14. The improved access includes:

- An extension of the Market Road over the disused service railway via a bridge to a traffic circle.

- The road extends from the traffic circle to the south-east and links to Gladys Manzi Road, thereby providing access to the industrial land, and links through to this area to improve traffic flow.
- The road also extends in a northerly direction from the traffic circle to provide access to the airport and new parking area via internal roads. It also continues along the route of the railway and crosses over the railway to provide a loop system that links into Washington Road.

A new access road is also proposed adjacent to the boundary of the Oribi Village. This road ties into the Market-Washington Road loop system.



Figure 14 Layout of proposed new road infrastructure

These proposed additions to the road network will provide improved/direct access to the Airport and a total of 3 access points which will facilitate improved traffic flow through the broader precinct.

The alternatives within this system relate to the relationship between the proposed new roads and the disused service rail-line which is owned by Transnet. Transnet have confirmed that:

- The line has not been used in more than 10 years.
- There is the option to transfer the property to the Municipality and for the decommissioning of the line. Such transfers take place via a Transnet defined process. It also involves a cost which has yet to be defined.

Given the above situation the options for the Market-Washington Road extensions are:

- Option 1 – Market-Washington Road Extension on Rail Line Route - Under this option, it is assumed that the rail reserve **WILL** be transferred to the Msunduzi Municipality. The

proposed Market Road Extension will follow the route of the existing railway line, using the existing rail platform, and will link back into Washington Road.

- Option 2 -Market Road Extension adjacent to Rail Line

Under this option, it is assumed that the rail reserve **WILL NOT** be transferred to the Msunduzi Municipality in the foreseeable future. Under this option the proposed Market Road Extension will run parallel to existing railway line on the airport side, and will link back into Washington Road.

The new internal roads will be constructed within the Pietermaritzburg Airport to link the Market Road Extension with the airport internal roads.

Option 1 is preferred because:

- It enables the use of the existing rail platform which reduces the need for the earthworks required to develop the road, and negates the need for the bridge over the railroad berm at where it joins Market Road. There is a consequent cost saving of approximately R30 million.
- It frees up additional land/reduces the area of grassland impacted.

5.9.4 Alternative Design/Technology

As described in section 5.2 the level of information provided detailed designs will be the responsibility of developers who take up the opportunities created by the new Municipal entity. It will be their responsibility to investigate alternative technology and design to achieve a more sustainable outcome. The options they consider will be guided by the EMPR developed as part of the EIA, and other municipal policies.

5.9.5 No-go Option

This is a standard requirement of the EIA process and considers the situation where none of the proposed development elements takes place and the Airport continues in its current form and level of operation in terms of infrastructure and air traffic.

5.9.6 Alternative Sequencing of Developments

As discussed in section 5.2, the timing and rollout of the various elements in the proposed plan is dependent on demand and more importantly the finance to initiate the development. These unknowns affect when the various elements being established, effectively alternative sequencing.

The timing for the development of the new access roads is a key determinant in the sequencing of the other infrastructural elements. Moving the terminal building to the new site, and therefore the parking area because it needs to be located adjacent the terminal, is dependent on finance being obtained to develop the new access roads to Washington and/or Market roads. In the event that these roads are not constructed the terminal building may not need to move before the end of phase 1 – i.e. 2025. If the parking area did move before then, the Municipality is obliged in terms of the contract with the tenant to pay for the costs of such a move.

5.9.7 Alternative Flight Paths

Engagement with ATNS during the EIA investigation confirmed that there are no alternative flight paths due to the topographical constraints of the approaches to the airport, in combination with the weather patterns (notably the prevailing winds).

5.10 Project Costs

The total projected costs for the infrastructure associated with the Phase expansion are shown in Table 12. As explained in section 2.3 the majority of the project elements have been defined at a high level (low level of detail) via feasibility level investigations. Certain aspects, such as phase 1A of the Techno Hub, have involved detailed design to the level of tender documents being developed. The accuracy in the associated costs varies accordingly. It should also be noted that certain feasibility investigations developed costs excluding VAT, and certain included VAT. To standardize, VAT was added to arrive at a final cost. In reviewing the overall costs, the following should be noted:

- Given the high level nature of the values presented and the fact that the development will take place in a piece meal fashion over approximately 10-15 years, these costs will change.
- The preferred option for the proposed new road infrastructure results in a saving of approximately R30million.
- These costs only account for the development of the phase 1 infrastructure. The Impact assessment lists various mitigation and management measures and actions that will have cost implications. Certain of these have been taken forward in the Precinct Plan which includes a summary of projects that serve as mitigation e.g. rehabilitation of the Blackborough aquatic corridor and development of a storm water plan.
- The costs are substantial. As discussed extensively in the Economic Impact Assessment specialist report, the benefits of the project are dependent on the sourcing of this funding, and the successful establishment and operation of Municipal Entity set up to market and manage the Airport going forward.

Table 12 Summary of the infrastructure costs for phase 1 expansion

Infrastructure	Estimate Cost (incl. VAT)	Source of Costs
Taxiways and Aprons	R13,852,020	VNA
Control Tower	R790,818	Master Plan 2014
General Aviation (hanger cost)	R29,875,000	VNA
Mixed-Commercial Use	R7,377,686	Master Plan 2014
Industrial Zone	R23,730,876	Master Plan 2014
Road option 1 (on rail)	R51,795,510	VNA
Road option 2 (adjacent to rail)	R80,976,910	VNA
Parking	R13,262,760	Master Plan 2014
Passenger Terminal Building	R44,403,000	Economic Impact Assessment
Technology Hub – Top structures	R1,355,810,000	Economic Impact Assessment
Technology Hub (Basic Infrust and Bulk Services)	R262,590,933	GWl
Buffer Zone	R5,134,096	Master Plan Revised
Total: Full with Option 1 (Roads)	R1,808,622,699	
Total: Full with Option 2 (Roads)	R1,837,804,099	
Total: Option 1 (Roads), Phase 1A Techno-hub	R219,652,766	

NOTE: Technology Hub (Phase 1A only): R29,431,000 (Source – GWl)

6. OVERVIEW OF THE RECEIVING ENVIRONMENT

This section provides an overview of the key characteristics of the biophysical, socio-economic and cultural/historical heritage environment within the project and surrounding area. The description of the affected environment is drawn from:

- A range of available information sources which are referenced throughout.
- Two specialist investigations undertaken in 2011 when the EIA was originally commissioned these being wetland delineation and functional assessment, and a HIA.
- The various reports prepared as part of the Precinct Planning contract by the Markewicz - Redman Partnership (MPP).
- Unpublished information provided by I&APs during the PPP.

6.1. Topography

The airport has latitude and longitude coordinates of 29°38'48"S 30°23'54"E, at an elevation of 2423 feet (739m). A slope analysis conducted for the municipality in 2009¹ concluded that the land to the south of the runway is gently sloping with a gradient less steep than 1 in 3 metres (1:3). The 5m contours are also shown in Figure 15 and indicate the land sloping away from the higher flat on which the runway is located towards the wetland and Blackburnough Stream system. A detailed topographical survey² has been conducted as part of the planning for the Techno-hub site, which also includes small portions of the site to the East of the runway. This informed the engineering designs for the various infrastructural elements. It also informed the geotechnical survey.

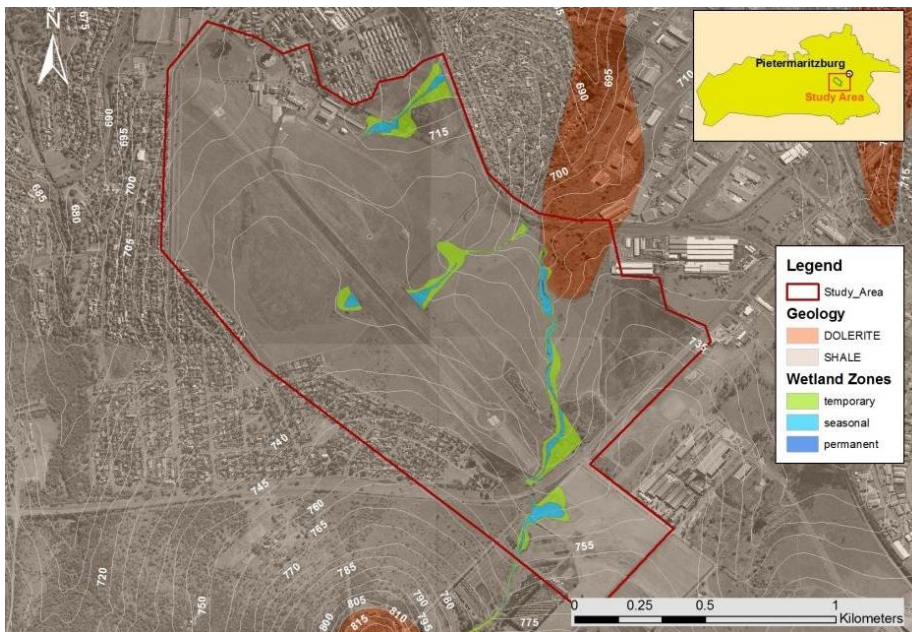


Figure 15 Geology and Topography of the study site

¹ Msunduzi Consolidated SDF Review July 2009

² Survey of the Pietermaritzburg Airport for Technology Hub Development. August 2015. Prepared by Global mapping South Africa for GWI.

6.2. Geology

According to the 1:50 000 Geological Series Map No. 2930CB, Pietermaritzburg, the site is underlain by the Pietermaritzburg Formation (Pp). The Pietermaritzburg Formation is intruded by Jurassic aged Dolerite (Jd), dolerite bedrock was not intersected during the investigation. On site the shale bedrock is overlain by unconsolidated, residual and transported horizons. Structural lineaments in the forms of faults or dykes were not identified during the desktop investigations nor were these observed during the field investigations undertaken as part of the specialist geotechnical survey. The geotechnical defined the following subsoil profile, the spatial extent of which is illustrated in Figure 16, summarized as follows:

- **Fill:** A fill horizon was generally described as a slightly moist, dark-reddish brown, soft to firm, intact sandy silty CLAY with dump rock and concrete. The fill varied in depth, extending between a depth range of 0m – 1m below the ground level.
- **Colluvial Horizon:** A colluvial horizon was identified and is described as a slightly moist, dark-greyish, loose but intact clayey silty SAND. This horizon generally extended from a depth of 0.00m to 0.30m below NGL.
- **Alluvial Horizon:** Is associated with the wetland areas and is described as moist, dark brown, soft, intact, sandy and silty CLAY. The alluvial horizon extended from 0.30m to 0.5.m.
- **Residual Shale Horizon:** A residual shale horizon was described as slightly moist, yellowish-orange-brown, loose to medium dense, intact, fine gravelly shale fragments in a slightly clayey SAND matrix. The residual horizon generally extended to a depth of 0.3m to 0.50m .
- **Shale Bedrock:** Shale forms the basal bedrock unit and was described as a light yellowish-brown stained orange, completely to highly weathered, fine grained, laminated with occasional infillings of clay gouge, soft to medium hard rock strength shale. Excavation refusal occurred on a medium hard rock strength shale variant. Shale rock was intersected at ground level in several areas with bedrock extending to beyond trial pit base depths.

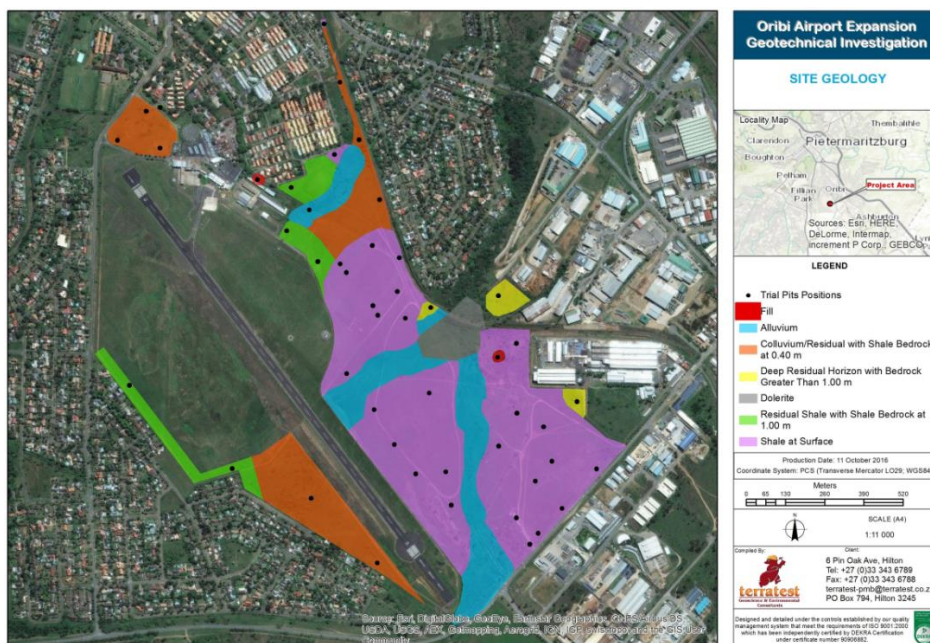


Figure 16 Site geology and soil profile

The geotechnical investigation (Terratest, 2016) drew the following conclusions relevant to development of the site:

- **Ground stability:** The shale bedrock generally extends to depth in excess of 0.4 m below NGL and is generally shallow dipping, dipping (08°/WSW). Occasional clay gouge is disseminated within laminations of the shale bedrock. This fabric and discontinuity is persuasive to the development of near horizontal shallow planar slip planes.
- **Excavation Conditions:** 'Soft' excavation conditions can be anticipated during stripping of the colluvial, alluvial and residual horizon and soft shale bedrock, which extend to various depths, generally between 0.0m to 0.4m below EGL. 'Intermediate' excavation conditions can be expected in the medium hard rock strength shale which generally extended from a depth of 0.4m to beyond the trial pit base depths.
- **Construction Material:** Where pavements are required the ferruginized shale horizon is only suitable for use in lower subgrade layer works. The completely weathered, shale bedrock is only suitable for use in the lower subgrade layerworks. Higher quality material required for the base and subbase layers will have to be sourced from a commercial quarry. Ashburton quarry is the nearest to the project site.
- **Cut and Fill:** The presence of shallow bedrock is favourable for founding, thus it is not envisaged that major engineering platforms will be required, this is however dependent on the design of the structure. Fill may be required and this must be imported from a commercial source.
- **Groundwater and Subgrade Drainage:** The groundwater table was not intersected during the investigation. The general, flat, impermeable nature of the site promotes surface run-off which is channeled via a network of natural drainage conduits and wetlands. The proposed roads should be designed with an appropriate storm water drainage management system.

The concluding summary is that: *The site is underlain by shale bedrock, which presents favourable founding conditions for structures. The site is considered suitable for the proposed development, provided that the design recommendations provided in the specialist geotechnical report are implemented to account for the certain geotechnical constraints.*

- The presence of clay gouge within the rock mass are inherent zones of weakness, foundation footing should be placed on competent bedrock devoid of clay.
- The transported horizons are considered unsuitable for founding structures due to the soil's variability in consistency and nature.
- Detailed geological investigation should be carried out once the layout plan and type of structures (lads) have been finalized, which may necessitate the need for geotechnical drilling and DPSH testing in order to provide a more detail evaluation of the shale rock mass.

6.3. Climate

The climate of the study site is seasonal, with hot and wet summers (December to February) and warm and dry winters (June to August). Rainfall in the study area is highly seasonal, typically highest in February and lowest in June. In the region, rainfall in the last couple of years has been very low

and erratic as shown in Figure 17. Temperature is less seasonal and is highest during January and February and lowest during June and July as shown for Pietermaritzburg Airport (Table 13).

Table 13 The monthly average minimum and maximum air temperature for the Pietermaritzburg Airport region for the period 2008-2016 (Source: SASRI weather web)

Temperature (°C)	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Max	27	28	27	24	24	21	21	23	25	24	24	26
Min	17	17	16	13	12	9	9	10	12	13	14	16

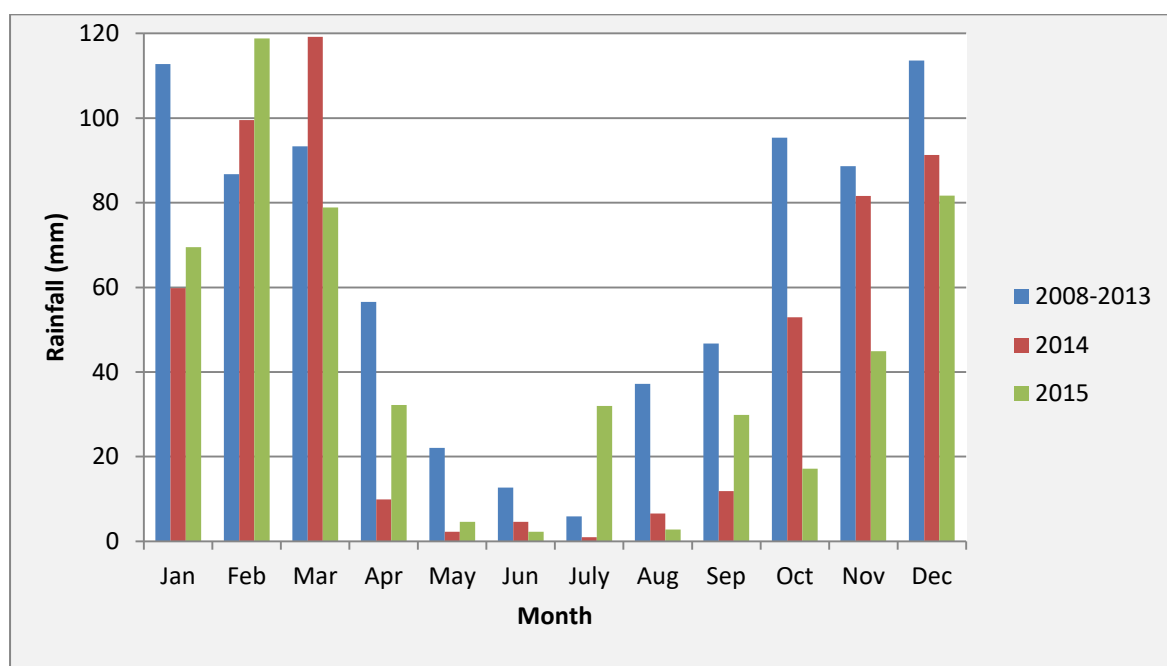


Figure 17 Average monthly total rainfall for the Pietermaritzburg Airport during 2008-2013 and 2014-2015. A noticeable decline in rainfall from 2014-2015 is discernible. (Source: SASRI weather web)

6.4. Air Quality

The climate and local weather in Msunduzi are strongly influenced by topography; the higher lying areas in the north and west of the municipality are colder and receive more rainfall than the lower lying areas in the south and east. The Pietermaritzburg city is located in a hollow formed by the valleys of the uMsunduzi River and its tributaries. On clear winter nights cold dense air flows down slope into the city bowl, much like water. This fills the valley floor with cold, dense air creating an inversion that prevents pollutants from escaping. This air movement also brings pollutants from the entire municipal area into the valley where it remains trapped by the inversion layer. The majority of industry within Msunduzi has developed within this inversion layer as this land is both flat and in close proximity to both road and rail transport routes. As a result the city suffers short-term peaks in pollution despite relatively few heavy industries.

There are a number of industries in Mkondeni industrial area, which lies within the airport precinct area. Mkondeni is an industrial hub with aluminum and steel production and factories among others,

with emissions contributing to the degraded air quality within the area. There are no heavy polluting industries proposed as part of this project. The primary cause of additional air pollution will be in the form of additional vehicular traffic.

6.5. Natural Systems and Biodiversity

The Msunduzi Environmental Management Framework (SRK, 2010) is the primary informant of areas of biodiversity value and environmental issues such as air and water pollution as well as environmental risk such as flooding. It also highlights natural areas and systems that supply levels of ecosystem services. These have all been combined in the establishment of an integrated development constraints map. As indicated in Figure 18, the airport site is identified as an area posing high development constraints.

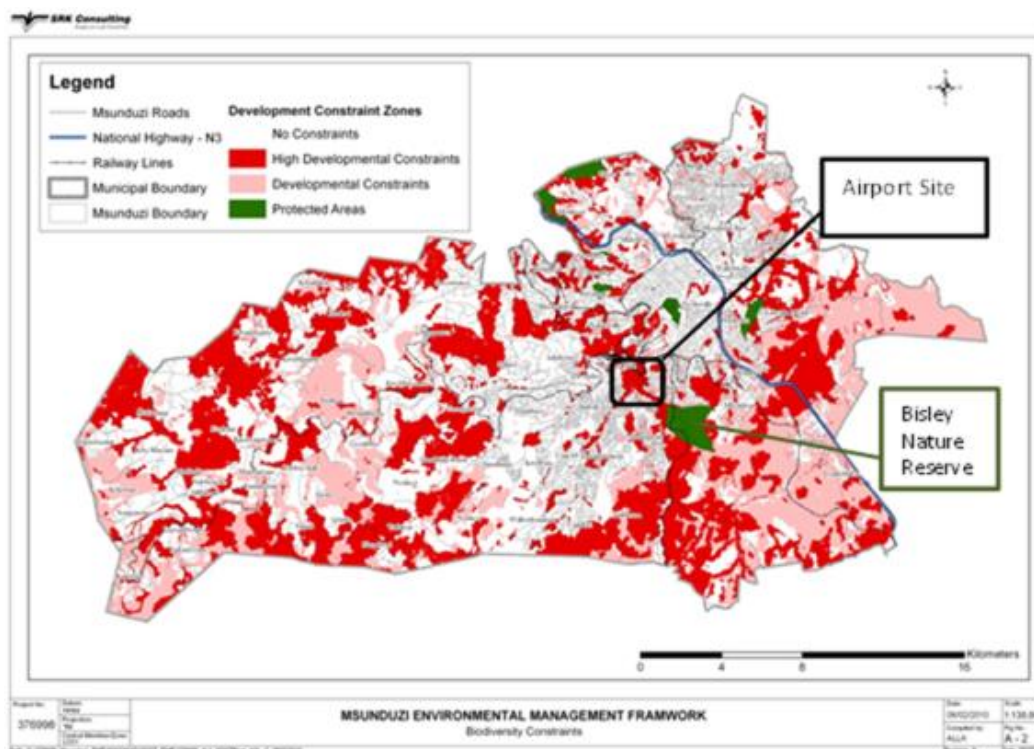


Figure 18 Development constraints within MM (Source: SRK, 2010)

Figure 18 also shows the close proximity of the development site to the Bisley Valley Nature Reserve. Bisley Valley Nature Reserve is situated on the western side of Pietermaritzburg airport on Murray Road going toward Mkondeni. This thorn veld reserve is 250 ha and managed by the Msunduzi Municipality and includes a variety of habitats including grassland, open and closed woodland, and thickets. There is a variety of bushveld birds, giraffe, impala and zebra. The proposed expansion will not impact directly on the Nature Reserve, the close proximity and forms a small part of the catchment for the stream system running through the Airport, there is a need to consider ecological linkages via the aquatic system between the Reserve and downstream systems.

Further analysis of the EMF report for the area indicates that the trigger for this category of constraint in terms of biodiversity is the occurrence of wetlands and grasslands on the site (Figure 19).

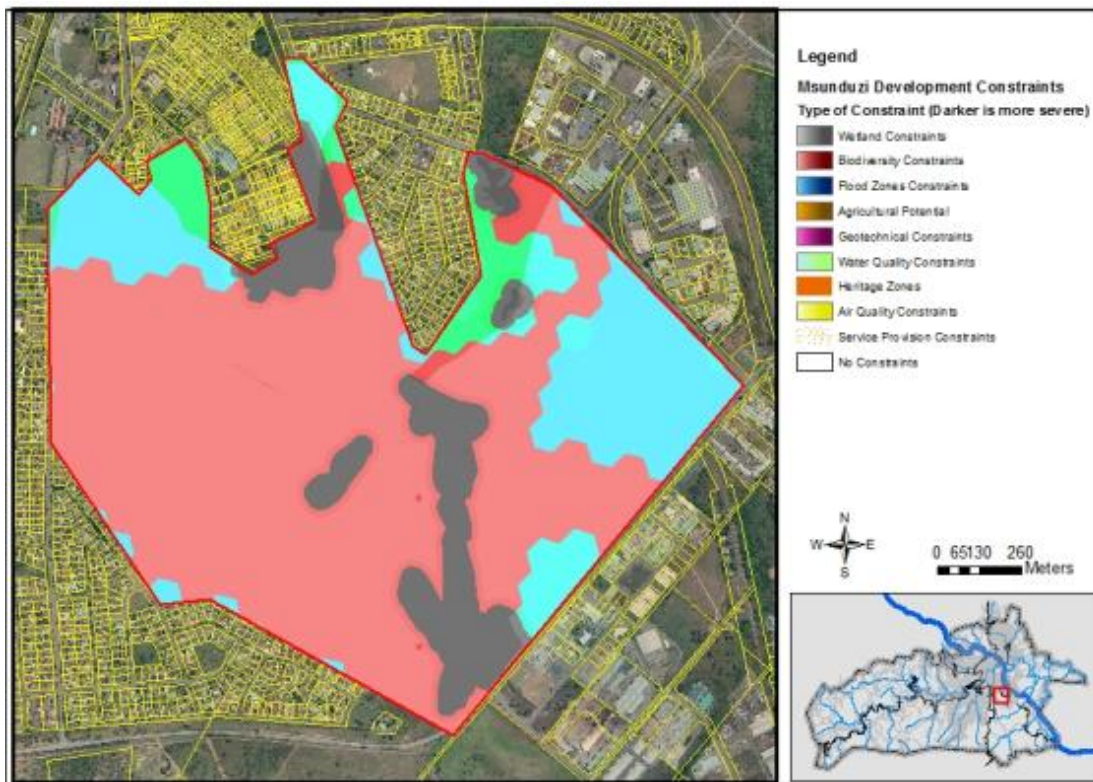


Figure 19 Environmental Constraints (Source: SRK, 2010)

Figure 19 shows the extent of wetland and grassland on the project site which is considerable, particularly in the case of grassland. It is these areas in which the various projects components and infrastructure will be developed.

6.5.1 Terrestrial Biodiversity

Vegetation

The regional vegetation type occurring on the study site is KwaZulu-Natal Hinterland Thornveld Mucina and Rutherford (2006). KwaZulu-Natal Hinterland Thornveld falls within the Savannah Biome and the vegetation is characterized by open thornveld dominated by *Acacia* spp. on undulating plains found on upper margins of river valleys. The vegetation unit is listed as vulnerable with a national conservation target of 25%.

A site assessment involving sampling at 3 sites within the airport fence and 4 in the adjacent area was undertaken. The aim of the investigation being: to map the vegetation units; establish the condition of the vegetation units; develop a species list (including both red data and invasive alien species). The assessment concluded that:

- **Grassland condition:** Apart from one section towards Murray Road which is degrading the grassland areas were considered to be in relatively good condition. The fenced-in areas are in better condition compared with the grassland areas outside of the perimeter fence. This finding is based on the relatively good plant diversity identified at the sample sites within

the fenced-in area. Other habitat types, apart from the various grasslands, included degraded bushveld and wetlands.

- **A combined species list:** for the whole area was compiled (120 species), with presence recorded for each of the seven sites. It was noted that this list is incomplete due to limitations in timing available to sample.
- **Red List plant species:** 5 red data species were identified on site, all of them either listed as declining or vulnerable; *Boophone disticha*, *Brachystelma franksiae*, *Crinum bulbispermum*, *Hypoxis hemerocallidea* and *Woodia verruculosa*.
- **Invasive Alien Plant Species:** The un-mowed, unburnt areas in the airport are being invaded by alien invasive woody plant species. *Lantana camara*, *Solanum mauritianum* (Bugweed), *Litsea sebifera*, *Melia azedarach* (Syringa), *Gleditsea triacanthos* (Honey locust) and *Tecoma stans* (Yellow bells) are species that require an active alien invasive control programme in this area. Other alien species are present throughout the study area with a full list of alien species being found in the specialist report.
- **Medicinal Plants:** of the species identified 3 are commonly used for various medicinal purposes.

Fauna

This desktop study identified seventeen potential faunal species of conservation concern that may be found within or adjacent to the study area (INR, 2008). These range from millipedes, earthworms and frog species to several bird species. All of the faunal species listed are largely cryptic species which made it difficult to confirm their absence or presence. An assessment of the 'likelihood of occurrence' was therefore made based primarily on the availability of suitable habitat.

In terms of birds, a study undertaken at Pietermaritzburg Airport by Byron and Downs (2002) looked at the bird presence of the area. The article noted that Pietermaritzburg Airport is one of the worst airports for birds striking aircrafts, with Hageda Ibis (*Bostrychia hagedash*) and the Crowned Plover (*Vanellus coronatus*) the most common birds hit by aircrafts at Pietermaritzburg Airport. Of all the bird species observed only the Lanner Falcon (*Falco biarmicus*) is on the Red Data Bird List (Near-Threatened in South Africa).

6.5.2 Aquatic Systems

Given the linear nature of aquatic systems, it is necessary to consider the systems within a project site in relation to the catchment up and downstream of the study site. The study site is located in the Msunduzi catchment. According to the EMF (2010), this catchment is highly modified with no absorption capacity which can be loosely translated to poor water quality. To ensure catchment rehabilitation to an acceptable level as per municipal requirements, there is need for catchment management interventions prior to any further development within the catchment. Figure 20 shows how the project area forms the headwaters of the stream which links the site to the Msunduzi River.



Figure 20 Overview of the drainage system

6.5.3 Wetlands

Wetlands are specialized systems valued for the range of ecosystem services they supply. A wetland delineation was undertaken to map these systems. The outcomes are shown in Figure 21.

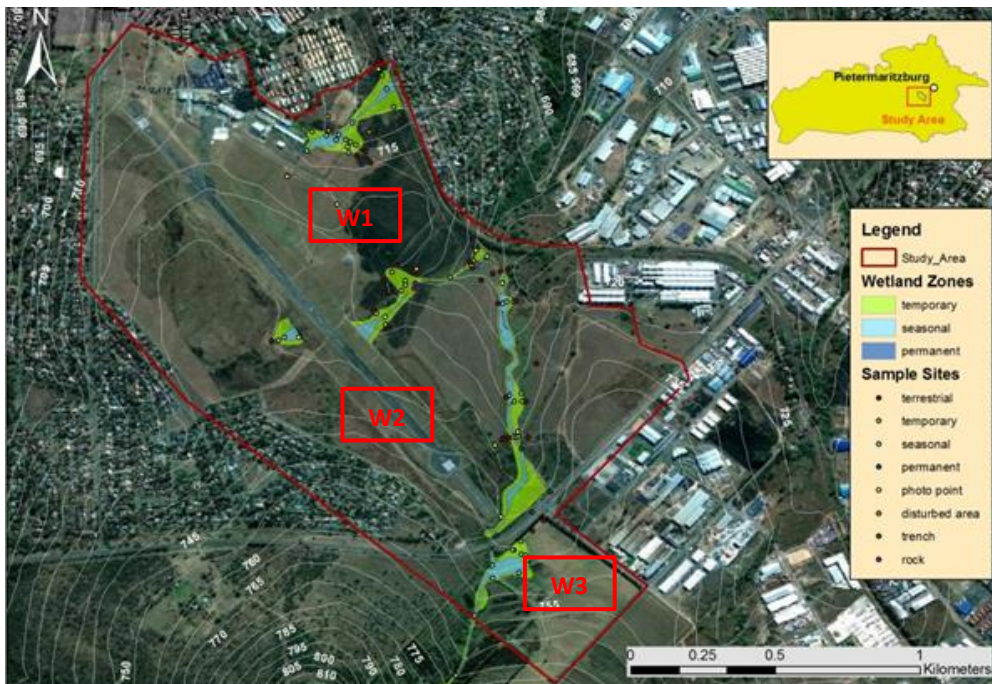


Figure 21 Wetlands within the study site

In addition a WET-Health and WET- Ecosystem services assessment were undertaken which concluded the following regarding the state and value of the three wetlands:

Wetland 1

This is a disturbed valley head seepage wetland, which has been extensively transformed through a range of anthropogenic activities not limited to the following which are shown in :

- The construction of the existing Pietermaritzburg Airport infrastructure and associated infrastructure (increased inputs into the wetland);
- Oribi village and sports fields at the village (portion of the wetland has been cleared for a soccer field);
- Photo 1 - Fencing;
- Photo 2 - Construction of channels / drains within the wetland to drain storm water runoff from the airport (this includes water from the apron and a car wash facility);
- Photo 4 - The on-going cutting and burning of vegetation in the vicinity of the airport for safety purposes;
- Photo 5 - The dumping of rubble and litter within the wetland;
- Photo – 6 Alien vegetation; and
- Photo 3 - The construction of a railway bridge, which has resulted in a ‘pinch’ in the wetland. It should be noted that downstream of this railway bridge is an urban area where the wetland has been largely destroyed and in some places replaced with a canal.



Figure 22 Map of Wetland 1 and impacting issues

Based on the level of transformation the health, importance and sensitivity of the wetland was assessed to be the following:

- **Health Category:** E (Seriously modified - The change in ecosystem processes and loss of natural habitat and biota is great but some remaining natural habitat features are still recognizable).
- **Ecological Importance & Sensitivity:** The EIS score for the wetland was determined to be less than 1. This means that the EIS is rated as **LOW** (Wetlands that are not ecologically important and sensitive at any scale. The biodiversity of these systems is ubiquitous and not sensitive to flow and habitat modifications. They play an insignificant role in moderating the quantity and quality of water of major rivers).
- **Ecosystem Services:** Due to extensive disturbances, wetland ecosystem services scored poorly. Hillslope / valley head seeps generally slow the movement of water through the catchment, which has a number of benefits, such as enhancing the quality of water. However, this wetland has been artificially canalized to accommodate storm water runoff from the airport precinct. In addition, the adjacent urban area has resulted in the loss of a significant portion of the wetland, i.e. through the clearing of soil / levelling of an area for a soccer field, etc. Flood attenuation scored the highest, which is indicative of the natural functioning of a seepage wetland (particularly early in the rainy season). Limited streamflow regulation, sediment trapping, enhancing of water quality and erosion control is still provided by the small portions of remaining seepage areas (i.e. portions not canalized). Water supply for human use only scored a 'relatively' high score due to its association with streamflow regulation.

Wetland 2

Wetland 2 is a disturbed valley head / hillslope seepage wetland, which has been transformed through anthropogenic activities, including but not limited to:

- Photo 5: The construction of the Pietermaritzburg Airport runway directly through the upper portion of the wetland;
- Photo 1 and 2: The canalization of the wetland downstream of the culverts under the runway;
- Photo 3: The removal of wetland soils within portions of the wetland (i.e. particularly upstream of the runway); and
- Photo 4: The reduction in vegetation cover through either burning and / or cutting

Based on the level of transformation the health, importance and sensitivity of the wetland was assessed to be the following:

- **Overall Health: D (Largely modified)** - A large change in ecosystem processes and loss of natural habitat and biota and has occurred).
- **Ecological Importance & Sensitivity:** The EIS score for the wetland was determined to be 1.6. This means that the EIS is rated as **MODERATE** (Wetlands that are considered to be ecologically important and sensitive on a provincial or local scale. The biodiversity of these

systems is not usually sensitive to flow and habitat modifications. They play a small role in moderating the quantity and quality of water in major rivers).

- **Ecosystem Services:** Due to the disturbances to this wetland ecosystem services in general scored poorly. Hillslope / valley head seeps generally slow the movement of water through the catchment, which has a number of benefits. However, water flows through a culvert under the runway and the wetland is largely canalized downstream of the culvert. Flood attenuation and streamflow regulation scored the highest, which is indicative of the natural functioning of a seepage wetland (particularly early in the rainy season). Limited erosion control and enhancing of water quality is still provided by the portions of remaining seepage areas. Note: Water supply for human use only scored a 'relatively' high score due to its association with streamflow regulation.



Figure 23 Map of Wetland 2 and impacting issues

Wetland 3

Wetland 3 is a disturbed channelled valley bottom wetland, which has been largely transformed through anthropogenic activities, including but not limited to:

- Photo 1: Farming activities in the catchment and the upper reaches of the channel. These include the converting of wetland areas to pastures and clearing for the cultivation of various crops;
- A tarred road (Gladys Manzi), which cuts through the top portion of the wetland;
- A light industrial area within the catchment. Storm water runs directly into the wetland;
- Photo 3: Deep trenches have been dug for water pipelines adjacent to the Gladys Manzi road. These trenches run directly through the top portion of the wetland and also along it;
- The dumping of rubble and litter within the wetland, primarily downstream of the Gladys Manzi road;

- Photo 4: Earth works, i.e. trenches, directly downstream of the Gladys Manzi road;
- Photo 5: Alien vegetation; and
- Photo 6: The construction of a railway bridge, which has resulted in a ‘pinch’ in the wetland, i.e. the toe of the wetland.

Based on the level of transformation the health, importance and sensitivity of the wetland was assessed to be the following:

- **Overall Health:** E (Seriously modified: The change in ecosystem processes and loss of natural habitat and biota is great but some remaining natural habitat features are still recognizable).
- **Ecological Importance & Sensitivity:** The EIS score for the wetland was determined to be **1.6**. This means that the EIS is rated as **MODERATE** (Wetlands that are considered to be ecologically important and sensitive on a provincial or local scale. The biodiversity of these systems is not usually sensitive to flow and habitat modifications. They play a small role in moderating the quantity and quality of water of major rivers).
- **Ecosystem Services:** Due to the existing disturbances to this wetland ecosystem services in general scored poorly. Water supply for human use scored the highest, which was due to the presence of all three wetland zones and limited use for agricultural purposes, i.e. water from the wetland is not used for irrigation purposes but crops and pastures within and adjacent to the wetland still benefit from the moist conditions. There is a level of erosion control in the upper portion of the wetland, where the vegetation cover is largely intact, however, directly above the toe of the wetland gullies have formed, which is likely due to the underlying geology and the ‘pinch’ in the system where the railway crossing was constructed. Carbon storage also scored relatively high, which is likely due to the presence of all three wetlands zones, although permanent zones are limited. As indicative of a channelled system there is some provision for flood attenuation and streamflow regulation



Figure 24 Map of wetland 3 and impacting issues

It should be noted that while all three wetlands within the study site are moderately to highly degraded, they still perform a level of various functions and their capacity to support associated biodiversity and perform other services can be improved through rehabilitation actions and improved management going forward. The proposed expansion will add to the existing impacts. The nature and significance of these issues is assessed in section 7, which involves recommendations for mitigating the existing a new impacts on these important systems.

6.6. Socio-Economic Environment¹

It is necessary to understand the socio-economic characteristics of the affected receiving environment for contextualizing issues identified and establish those of potentially high significance. The areas potentially affected by the proposed development is categorized spatially into:

¹ The contents of this section have been extracted from:

- Msunduzi Local Municipality. (No Date). Integrated Development Plan (IDP) Review for 2015/16. Msunduzi Local Municipality IDP Office. Pietermaritzburg.
- Urban-Econ. (2013). KZN Technology Hub Feasibility Assessment – Msunduzi Value Proposition. Prepared for the Department of Economic Development and Tourism and KZN Provincial Treasury. Durban.

- Regional context (Msunduzi Municipality) and
- Local context (airport and its precinct, and areas along the flight path) areas of influence

The MM is likely to experience impacts of a more indirect nature, predominately economic impacts. The local area of influence is the Pietermaritzburg airport and its surrounding suburbs, as well as the suburbs along the commercial/scheduled flight path which are directly impacted as a result of noise generated by aircraft on their approach and departure from the airport. The area surrounding the airport is inclusive of the area referred to as the Airport Precinct, for which a development plan has been developed that encompasses Phase 1 expansion of the Airport (The Precinct Plan is described in section 5.1.2).

6.6.1 Regional Socio-Economic Environment

The MM is located in the Umgungundlovu District Municipality, and is home to the Capital and second largest city on KwaZulu-Natal, Pietermaritzburg. Situated approximately 45 minutes' drive from Durban, the MM is astride the N3 corridor, one of the busiest development corridors in the country, which connects the Durban and Gauteng economic hubs. The MM is one of seven local municipalities in the District, and contributes 8% and 70% to the Gross Value Added (GVA) of the KZN province and District Municipality respectively. The MM consists of 37 wards, covering an area of approximately 590.6 km², and predominantly urban to peri-urban in nature, with some rural residential areas. The table below summarises the key statistics of the MM.

Despite the MM hosting a few major sporting events such as the Dusi Canoe Marathon, the Comrades Marathon and World Downhill Mountain Biking series, the MM is not a key tourism hub. Its capital status has however resulted in it being a political and administrative hub for the province.

Table 14 lists various key statistics about the MM.

Table 14 Municipal summary of key statistics

	2011 (Census) ¹	2016 ²	State
Total Population	618 536	679 039	Increase
Number of Households	163 993	180 469	Increase
Average Household Size	3.6	3.8	Increase
Population Growth Rate	1.12% p.a	2.00% p.a	Increase
Male: Female	45.45 : 54.55		
Female Headed Households	45.2%	45.9%	Increase
Unemployment	33%		
Flush Toilets Connected To Sewerage	51.6%	49.3%	Decrease
Weekly Refuse Removal	53.2%	47.4%	Decrease
Piped Water Inside Dwelling	47.9%	41.7%	Decrease
Electricity For Lighting	91.9%	96.1%	Increase

¹Msunduzi Local Municipality. (No Date). Integrated Development Plan (IDP) Review for 2015/16. Msunduzi Local Municipality IDP Office. Pietermaritzburg.

² <http://www.municipalities.co.za/locals/view/88/Msunduzi-Local-Municipality#demographic>

The MM is subject to several advantageous components, such as:

- Its strategic location along the N3 corridor and in close proximity to the Durban Port and the King Shaka International Airport (KSIA)
- Its good transport networks (road, air and rail)
- Is an administrative and service centre for the inland region
- Is home to leading tertiary institutions such as the UKZN and the Durban University of Technology (DUT)
- Is well equipped with services (commercial, community and infrastructure)
- Has an established business base with an integrated Chamber of Business (CoB)
- Its manufacturing basis which includes textiles, agriculture (timber, beef, dairy, agri-processing), aluminium, construction material, clothing and leather goods, motor components, and steel.
- It being a tourist destination which drives the increase of hotels and restaurants
- Its assortment of development projects and planned growth

Population and Demographics

As indicated in the recent census (2011), the average annual population growth rate in the MM of 1.21%, having risen from 552 837 people in 2001 to 618 536 people in 2011. Based on the 2016 municipal records, the population has further grown to 679 039. There has been an increase in the number of households (130 292 to 163 993 to 180 469 in 2001, 2011 and 2016 respectively), however the household size has decreased from 4.0 (2001) to 3.6 (2011) and 3.8 (2016) persons per households. As indicated in the table above, there are more females than males in the MM, which is a trend that has strengthened since 2001.

The majority of the MM's population (68.4% in 2011 and 64.7% in 2016) is within the economically active age bracket (15 to 64 years), while approximately a quarter of the population (26.6% in 2011 and 31.5% in 2016) is under the age of 15, and the remaining are over the age of 64. Although the dependency ration of people within in 15 to 64 age cohort has decreased, it still remains high at 46.2% (2011) and 54.7% (2016).

One of the main concerns in the MM is the prevalence of HIV/Aids. It has been recorded that the uMgungundlovu District Municipality, in which the MM falls, had the highest prevalence of the highest prevalence of HIV/Aids in the province and country in 2010¹. The HIV/Aids prevalence rate in the MM was 42.3% (2010).

In terms of education in the MM, there has been positive change between 2001 and 2011, with a decrease in the percentage of adults of the age of 20 with no schooling (record of 5.5% in 2001 and 4.3% in 2011). In line with this trend, there has also been an increase in the percentage of adults with a matric qualification, having risen from 24.5% in 2001 to 33.7% in 2011, and a further increase to 40.5% in 2016. In addition, those who have obtained higher qualifications have also increased from 9.2% to 13.1% and 14.5% in 2001, 2011 and 2016 respectively. Despite these positive trends, the number of children of school-going age that are attending school has decreased from 66 789 in

¹ According to the annual Department of Health anti-natal survey undertaken at state hospitals

2001 to 62 737 in 2011. isiZulu is the most predominately spoken language in the MM, followed by English. Other prominent languages include Afrikaans, isiXhosa and Sesotho.

Economy

In 2014, the MMs GDP showed signs of positive growth following the 2010 period of negative growth (3.85% for 2010). The census indicates that there has been a decline in the unemployment level, the percentage of unemployed economically active adults having decreased from 48.2% in 2001 to 33% in 2011. This trend is mirrored by the youth (15-34 years) unemployment rate, which has decreased from 58.2% to 43.1% in 2001 and 2011 respectively. The key economic sectors that drive the MM and contribute to the GDP include Community Services, Finance, Transport, Trade and Manufacturing.

In terms of the Gross Value Added (GVA), which is a measure of the value of goods and services produced in an area, the Municipality's GVA comprises of tertiary (69%), manufacturing (25%) and agricultural (6%) activities. The tertiary sector is driven by retail trade and business services, and a large portion of the manufacturing component is reliant on the commercial agricultural capacity of the surrounding municipalities. The main economic sectors contributing to the GVA are general government (19%), business services (14%), wholesale and retail trade (10%), and Transport and communication (9%). The Information Communication and Technology (ICT) is also a key sector with a growing at a rate of 7.5%, and is positively impacted by the 3.8% growth rate of the electrical machinery and apparatus sector. Alongside recent major developments (such as the Victoria Country Club Golf Estate, Liberty Midlands Mall, the Golden Horse Casino and Hotel, and 'Motor City'), property development is also on the rise in the MM, with developments ranging from residential estates to light industrial, hotel and conferring facilities, commercial enterprises, and logistics and warehousing.

As previously indicated, the MM is fortunate in that it has a number of economic advantages, namely: locational (its central location and its situation along the N3 corridor – a primary logical corridor linking two key economic hubs, Durban and Gauteng); natural/geographic (highly fertile land); human capital (array of good schools and tertiary education facilities); and institutional (capital city of the province).

Employment and Labour

Employment figures for the MM demonstrates that majority of employment is of a formal nature, accounting for approximately 167 000, while informal employment accounts for approximately 32 500 based on the 2015 figures. Formal employment rates grew by 1.5% between 2005 and 2015, however this rate is too slow to absorb the growing labour force, which is evident in the fact that unemployment rate in 2015 was 30%.

The majority of formal employment is generated by the community services sector, followed by the trade, finance and manufacturing sectors. The informal employment is dominated by the trade sector, with other main contributors being community services, construction and transport sectors.

Total remuneration derived from the formal sector in MM in 2015 was approximately R23.5 billion. The majority of this is generated through the community services sector (almost 40%), with other main contributors being the manufacturing, finance and trade sectors. This demonstrates that the manufacturing sector plays a relatively important role in generating relatively high paid jobs, although it only contributes to approximately 13.5% of the formal sector employment.

Expenditure

Household expenditure per sector is an important reflection of economic activity in the area. Accommodation, food, transport and taxes are the highest expenditure sectors.

Infrastructure

Trends in the access to basic services varies as access to piped water and electricity having increased between 2001 and 2011, while the percentage of households with flush toilets and refuse removal has decreased. Such decreases could be attributed to the population growth of the municipality. In terms of housing backlog, the Department of Human Settlement estimated there is a need for approximately 6 800 houses.

6.6.2 Local Socio-Economic Environment

The overview of the local socio-economic environment is categorized into three areas: the Airport, the suburbs surrounding the airport (inclusive of the Airport Precinct), and the 'extended flight path zone' (the suburbs in the Pietermaritzburg area that are potentially impacted by the commercial/scheduled flight path). The context of these three areas is provided in the sub-sections to follow.

Pietermaritzburg Airport¹

Pietermaritzburg Airport (previously known as Oribi Airport) is owned by the MM and serves the city of Pietermaritzburg and surrounds as well as the outer west suburbs of Durban. It is located at 29°38'44.47" S and 30°23'45.06" E off Oribi Road in the Suburb of Oribi. Construction of the Airport was completed in March 1931 when the municipality also received a license to operate from the Civil Air Board². A flying school was opened in 1938, and the Aerodrome was then leased to the Defence Authorities for the duration of the war and for a year afterwards. The City Engineer took over the Aerodrome in 1945 from the Defence Authorities. Over time, concern about the state of the runway led to extensive investment by the Defence Department and the city council, culminating in an official ceremony marking the opening of the Oribi Aerodrome in July 1967. While the Airport provides a service to General Aviation (GA) and there has been significant demand for increase in the GA facilities so this revenue stream will increase, the sustainability of the airport and its contribution

¹ Source: Delta Built Environment Consultants, 2014

² The history presented in this section is a summary drawn from the historical overview of the airport presented in the 2007 Economic Impact study by Coetzee and Oldham.

to the regional economy depends on the scheduled passenger services and associated “belly” freight (Coetzee and Oldham, 2007). The Municipality has continued to run the airport but not without subsidizing the provision of this service, which was estimated to be approximately R 5.5 million in 2007.

Since the initial construction of the airport, the surrounding land has naturally developed. The airfield site, contained within the airfield boundary fence, covers an area of approximately 89ha, however, there is significant area of undeveloped municipal owned land available which falls directly alongside the airfield, totaling to an area of approximately 157.45ha.

Existing infrastructure at the airport includes the airside, landside infrastructure, the terminal building, and other facilities and utilities. The capacity and condition of the existing facilities, infrastructure, utilities and roads at the airport were some of the key influential factors for the expansion of the airport. The various infrastructure types contain the following components:

- **Airside infrastructure:** runway, taxiway, apron areas, navigation aids, visual aids and signage
- **General Aviation:** facilities for non-scheduled aircraft and associated activities
- **Landside Infrastructure:** access roads and parking areas
- **Terminal Building:** public amenities including check-in counters, arrival and departure lounges, a VIP lounge, a cargo office, an airport management office, an ATM, a coffee shop and ablution facilities
- **Other facilities and utilities:** control tower, fire and rescue facility, fuel, car hire facility; hangars and general utilities (electricity, water, sewerage, communication).

Airport Surrounds

The Pietermaritzburg Airport and its surrounding areas (inclusive of the Airport Precinct which is defined below) falls with the *Central Business District (CBD), Ashburton and Eastern Areas Area Based Management (ABM)* region of the MM. CBD functions as the primary market area for the MM and a place of power concentration (economic, political and financial), investment, and rates revenue generation. The region also provides social interaction and integration opportunities, is a tourism destination and acts as a gateway to the surrounding tourist destinations. The Capital City status has contributed to the economic and development growth and stability of the region.

The CBD, Ashburton and Eastern Areas ABM is the main employer with the Municipality’s working population, with a large portion being employed in governments departments, while other in the industrial sector, particular in areas such as Willowton, Pelham, Mkhondeni and Northdale. The ABM is also home to the major education institutions in the Municipality, namely the University of KwaZulu-Natal (UKZN) and Durban University of Technology, which are in the Scottsville area, and the UNISA and FET College/s which are in the central (CBD) areas. Although the ABM’s land use is dominated by thornveld and grasslands, the region is predominantly used for residential purposes. The area is also home to important transport corridors as it accommodates a large proportion of the N3, which also connects provincial corridors, and hosts the city’s airport and railway station.

The area surrounding the airport is characterised by different types of land-use, namely low and middle income residential areas, industrial areas, and open space/reserve and agricultural areas.

There are several schools in the surrounding area, such as crèches and day cares and a primary school (Bisley Park Primary) as well as several churches and two sporting clubs.

In terms of commercial entities within the residential areas (therefore excluding the car hire services etc. that operate within the airport boundary, and the industrial sector), there are several shops and service providers. From a tourism perspective, there are various small scale businesses such as lodges and BnBs, and transport/tour agencies. There are also several informal, small scale business entities within the residential areas.

Airport Precinct

The Airport Precinct includes the airport and portions of the surrounding residential neighbourhoods (Scottsville Extension, Oribi Village, Bisley and Oribi Heights) and industrial areas (Shortts Retreat and Mkondeni). The Precinct is 495ha in size and is located 2km from the main national transport route (N3) and 5km south-west of the Pietermaritzburg (CBD) (TMRP, 2016).

The Airport Precinct Plan (APP) of 2016¹ was commissioned by the Municipality in line with the Aerotropolis of Airport City concept, which seeks to optimize their role of the airport through links to the immediate/local context and the broader regional economy.

Land Use

Land-use within the Precinct is characterised below (TMRP, 2016).

- ***Residential:*** Accounts for approximately 23% of the Precinct and is cluster into four distinct areas:
 - ***Oribi Village:*** A former military barracks and low income housing area is now predominately an urban residential area managed by the Provincial Human Settlement Department.
 - ***Oribi/Bisley/Westgate:*** Mainly sub-urban single detached residential land-use types, with three duplex/cluster complexes.
 - ***Scottsville Extension:*** Mainly sub-urban single detached residential units, with seven cluster/duplex complexes.
 - ***Westgate:*** The main land-use type is a residential complex, Acacia Park, which is a social housing cluster managed by the Msunduzi Housing Association.
- ***Economic:*** Accounts for approximately 21% of the Precinct and comprises of three distinct economic clusters.
 - ***Mkondeni:*** A mixed use industrial areas, dominated by agri-industry, general industrial and wholesale, and auto and repairs businesses, with evidence of informal trading operations.
 - ***Oribi Village:*** Various small businesses making use of existing building stock and some formal operations.

¹ Airport Precinct and Management Plan for the Pietermaritzburg Airport and Surrounds, 2016

- *Shortts Retreat*: An industrial area characterised by auto repair and transport, and logistics businesses.
- *Social facilities*: Accounts for approximately 8% of the Precinct and includes a mobile clinic, clubs, a community hall (not in use), a fire station, institutional facilities, a municipal market, places of workshop (Christian denomination), public spaces and schools.
- *Vacant/public open space*: Accounts for 35% of the Precinct and has either been set aside for future use as part of the Town Planning Scheme or classified as public open space or road verges

Infrastructure

There are various infrastructure types within and adjacent to the Precinct, which are described below.

- *Road network*: The Precinct area is in close proximity to the national road network (N3), as well as connected to with main roads that link the area to the city and national routes. Traffic activity is most intense during the typically commuter peaks periods.
- *Rail network*: The Precinct vicinity contain three rail lines
- *Public transport network*: The main form of public transport is taxis (combi taxis)
- *Non-motorised transport facilities*: In general, to condition of formal non-mortised transport facilities (for pedestrians, cyclist and horses) are poor and minimal.
- *Parking*: Parking facilities are generally adequate, with sufficient parking in residential and industrial areas cater for demand.
- *Access*: Access to the airport is by means or Oribi Road, which is classified as Class 4 urban collector street. The access is somewhat remote from the main national and provincial road network, limiting the airport access ease.
- *Bulk water supply*: The Precinct and adjacent areas are supplied water from the Bisley Reservoir by means of Bisley Break pressure Tank (BPT), and the Balancing Reservoir supplies the Bisley Reservoir, which supplies the Oribi Reservoir. There is one operational fire hydrant in the area; however its use is hindered by its inadequate pressure.
- *Bulk sanitation*: The Precinct falls into three sewer catchments, namely the Scottsville Mall, Foxhill South 1 and Blackburrow catchments. All sewage drains to the Darvill Waste Water Treatment Works.
- *Stormwater drainage*: The current drainage system is governed by the Msunduzi Stormwater Management Plan, which provides stipulations for runoff management.

Property Ownership and Values

The largest land owner in the Precinct is the MM, owing approximately 39% of the land, the most of which is within the airport boundary. Of the remaining area, 31% is privately owned (either residential, commercial, mixed use or industrial), 11% belongs to the National Government (mainly Oribi Village), and 8% is unknown. In terms of property values, the total municipal value of properties in the Precinct is R 1 462 billion, over which 77% is held by the private sector.

The airport precinct currently contributes 3% in property rates to the MM, which amount to approximately R21 million per annum. Of this, the industrial properties in Mkondeni and Shortts Retreat contribute 37%, the residential areas (Scottsville Extension and Westgate/Bisley/Oribi) contribute 35%, and the airport contributes less than 1%.

Heritage Resources

The MM is rich in historical, archaeological, cultural and architectural history, totalling 646 recorded heritage sites and 32 heritage zones (Msunduzi EMF, 2010), some of which are within the airport boundary and the Precinct.

The Pietermaritzburg Aero Club is a well-known facility located adjacent to the existing airport terminal building, and is classified as medium to high heritage significance. The club house is over 60 years and has been continually used for its purpose, holding much social, historic and cultural value. Currently, the heritage resource has not been graded but protected as a grade IIB heritage resource, and therefore required permission from Amafa Kwazulu-Natal (The Provincial Heritage Resources Authority) before alteration or demolition (van Schalkwyk, 2016).

Extended Flight Path

Several suburbs within the MM are potential impacted due to their location along the commercial/scheduled aircraft flight path. These suburbs along the 'extended flight path' are potentially impacted due to the topography of the area, resulting in their elevation being higher than other parts of Pietermaritzburg, and therefore being exposed to aircraft noise.

These areas, classified as the 'extended flight path zone' for the purposes of this assessment, are located in the more upmarket suburbs of Pietermaritzburg, extending to the southern part of Hilton (De Klerk, 2016). These suburbs include Worlds View, Wembley, Athlone and Clarendon which are the established and more affluent "leafy suburbs" of Pietermaritzburg (De Klerk, 2016).

7. IMPACT ASSESSMENT

The assessment of impacts forms the focus of this document as it provides the basis for establishing whether the project is sustainable or not i.e. whether it results in any impacts that extended beyond ecological or legal limits (after mitigation) and are consequently unacceptable. The assessment is presented as follows:

- i. A **summary of the key issues** assessed, and the specialist team responsible for the relevant assessment. The specialist studies are included as separate reports. The relevant information from the specialist studies have been integrated into the assessment. These may include one or more of the following aspects:
 - a. Summary of the findings of the investigation.
 - b. Assessment of the impact – based on the application of the assessment methodology.
 - c. Recommendations regarding mitigation and management measures taken into account by the specialist team and EAP in making an assessment.

- d. Assumptions and limitations that affected the confidence in the conclusions of the findings, and/or the assessment of significance.
- ii. An overview of the **relationship between** the various **specialist studies** is provided, and between the specialist work **and** the various **development planning and feasibility studies**.
- iii. The **assessment methodology** applied in the assessment is provided. The reader is able to refer back to method in reflecting on how it has been applied to a particular issue and the conclusions reached.
- iv. **Findings of the assessment** of key issues under the Natural and Socio-Economic components of the receiving environment.

7.1. Summary of Issues and Specialist Investigations

The key issues assessed are summarized in Table 15 along with the primary specialist responsible for the relevant study. The specialist reports indicate the approach and methods applied to the investigations, along with any assumptions and limitations that affected the methods applied and/or the confidence in outcomes of the assessment i.e. assessment of significance. They also list the supporting specialist teams.

Table 15 Summary of Issues Assessed and Specialists

Key Issues	Specialist Assessment	Specialist
<p>Impact on wetlands: Loss of wetland biodiversity and ecosystem function.</p> <p>Impact on Terrestrial Biodiversity: Loss/degradation of grassland and thornveld habitat and associated plant and animal species.</p>	Ecological Report	<p><i>Organization:</i> Institute of Natural Resources <i>Principal Specialist:</i> Ian Bredin <i>Qualifications:</i> MSc, Pr.Sci.Nat</p> <p><i>Organization:</i> University of KwaZulu-Natal <i>Principal Specialist :</i> Christina Curry <i>Qualifications:</i></p>
Risk to infrastructure : From unstable geology and soils	Geotechnical Assessment	<p><i>Organization :</i> Terratest Geotechnical and Environmental Consultants <i>Principal Specialist</i> Keval Singh Engineering Ecologist <i>Qualifications:</i> BSc, Bsc Honours, Pr.Sci.Nat.</p>
Economic Impact: On the Regional and local economic benefits, and the financial sustainability of the Airport.	Economic Impact Assessment	<p><i>Organization :</i> Private Consultant <i>Principal Specialist:</i> George Oldham George <i>Qualifications:</i> M. Sc. Economics</p>
Impact of noise on property values	Property Valuation Study	<p><i>Organization :</i> Mills Fitchet (Natal) Pty Ltd <i>Principal Specialist:</i> Stephen de Klerk Professional Valuer <i>Qualification:</i> MSc, BSc Bldg, Pr. CPM, MCIQB, NDPV, MSAIV</p>
Aircraft noise - change in noise levels and associated nuisance impact arising from increased commercial air traffic.	Environmental Noise Impact Baseline and Impact Assessment	<p><i>Organization :</i> IMA Trader 20 cc <i>Principal Specialist:</i> Andrew Simpson Environmental Noise Specialist <i>Qualification:</i> Msc, Pr.Sci.Nat.</p>
Traffic Impact - Cumulative impact of the project traffic on traffic operations, access and safety.	Traffic Impact Assessment	<p><i>Organization:</i> Royal Haskoning DHV <i>Principal Specialist:</i> Derek McGuigan Civil Engineer <i>Qualification:</i> BSc, PrEng</p>

Key Issues	Specialist Assessment	Specialist
Heritage Resources - Impact on archaeological and heritage assets including historical assets.	Heritage Impact Assessment	<i>Organization:</i> eThembeni Cultural Heritage <i>Principal Specialist:</i> Len van Schalkwyk Archaeologist; Heritage Practitioner <i>Qualification:</i> Archaeology, MA Archaeology

The relationship between the specialist investigations and between these and the various development and technical feasibility studies is summarized in Figure 25, noting the following:

- Several specialist investigations informed the feasibility assessments i.e. the outcomes of the geotech study and wetland delineation informed the DBSA feasibility study for the new GA and Market Road extension in terms of final alignments.

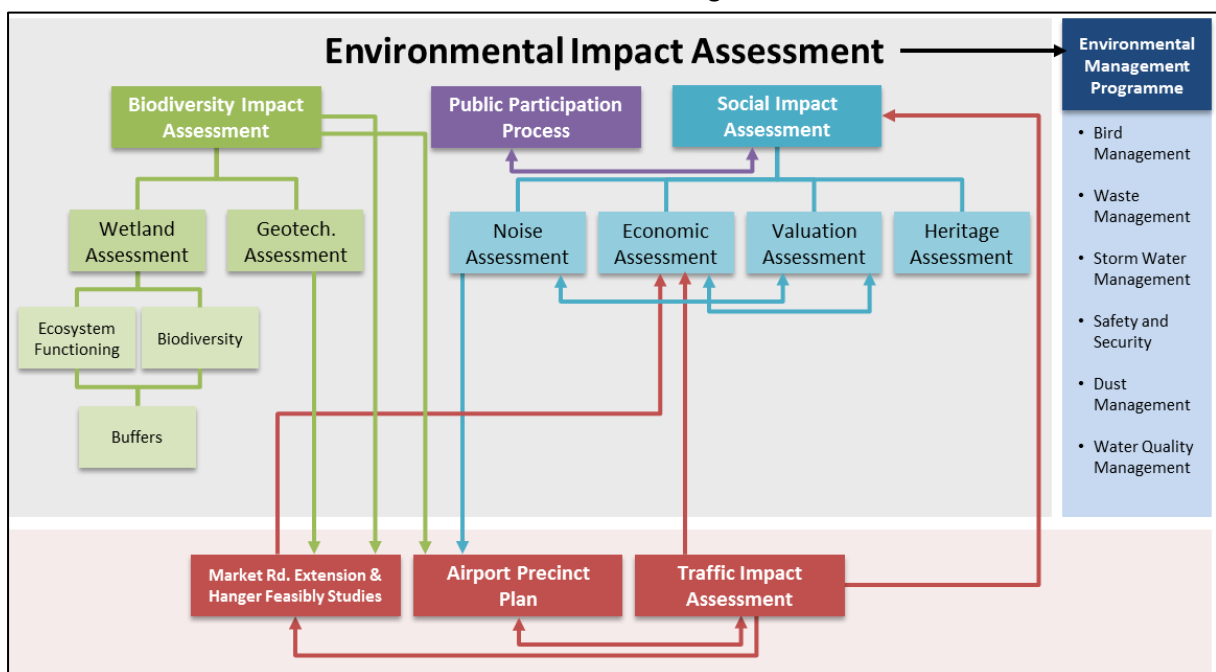


Figure 25 Relationship between EIA specialist studies and the project feasibility and planning investigations

- The Traffic Impact Assessment (TIA) fed into the DBSA feasibility study as well as the Precinct Plan in terms of upgrades in the road and intersection infrastructure required to address both existing and future congestion issues.
- The DBSA feasibility assessment fed into the Precinct Plan with the provision of final alignments of the market road and internal Airport expansion road network.
- The Precinct Plan provided a home for the inclusion of various mitigation and management measures in the form of specific projects that require funding to support the sustainable development of the Airport Phase and broader Airport precinct plans. For example, the inclusion of sound proofing for the Bisley Park Primary School as a key project to address existing and additional noise issues.
- Within the EIA process, the majority of the issues are socio-economic in nature and the relationship. The TIA, Noise, Economic, Heritage and Property Valuation therefore all fed

through into the integrated Socio-economic Impact Assessment. There were also the following interdependencies between these specialist studies:

- The outcomes of the noise assessment influenced the assessment of the impact on property values.
- The outputs of the property valuation assessment in turn influenced the economic impact assessment.

In addition to the key issues and associated impacts listed in Table 15, on which the assessment has focussed, there are other issues and impacts which require consideration but did not warrant application of the assessment methodology as they either of limited significance and/or, their significance is easily addressed through standard mitigation and/or management measures. These issues and impacts are summarised in Table 16 and dealt with in one or both of the following ways:

- A description of the issues and why it is not significant is provided in the assessment.
- It is described in the EMPR, along with recommendations regarding appropriate mitigation and management.

Table 16 Summary of issues and impacts of limited significance

IMPACT	DESCRIPTION
<i>Stormwater infrastructure and management</i>	<ul style="list-style-type: none"> ● Flooding of the existing passenger terminal and fire station due to the slopes of the adjacent taxiway and aprons. ● Possible surface water contamination from sediments, oil, fuel, heavy metals from parked, moving vehicles and or during aircraft servicing. ● Contamination from the incorrect storage and/or disposal of waste materials generated during construction. ● Increase area of hard surface (e.g. more paved and sealed surfaces due to more roads, parking, aprons, taxiways and buildings)
<i>Erosion and Sediment</i>	<ul style="list-style-type: none"> ● Run-off of soil from cleared areas and soil stockpiles ● The movement of heavy construction vehicles
<i>Resource Conservation</i>	<ul style="list-style-type: none"> ● Shortages of finite resources (water, fuel, energy and materials) that have a negative impact on airport operations ● Increased electricity capacity will be required ● Increased demand yet low pressure of water supply due to the relative elevations of the airport and reservoir
<i>Waste Management</i>	<ul style="list-style-type: none"> ● Pollution of habitat from general and hazardous waste ● Secondary contamination from improper waste management e.g. possible contamination of groundwater or surface water from leachate ● Contamination of waste streams ● Increasing waste to landfill ● Reduced aesthetic value of the construction site and airport
<i>Handling and Storage of Hazardous substances</i>	<ul style="list-style-type: none"> ● Contamination of soil and water through spills, accidental leaking of equipment, rupture of containers or incorrect disposal of waste containers ● Potential spills from fuel pipe rupture and poor pipeline connections or overflow leading to contaminated stormwater, soil and/or groundwater ● Associated costs to clean-up contamination
<i>Pollution Control</i>	<ul style="list-style-type: none"> ● Stormwater and soil contamination. ● Associated economic impact cost to clean up
<i>Emergency Preparedness and Response</i>	<ul style="list-style-type: none"> ● Environmental pollution, fire, contamination of water bodies, cost implications in repairs of damages
<i>Air Quality</i>	<ul style="list-style-type: none"> ● Nuisance dust and air pollutant emissions from vehicle to surrounding

IMPACT	DESCRIPTION
Management	receptors affecting visibility <ul style="list-style-type: none"> • Pollution from emissions associated with construction machinery and vehicles and aviation activities • Increases of pollutant levels and greenhouse gases
Visual Impact	<ul style="list-style-type: none"> • Alteration of the overall landscape from encroachment of the natural systems (grassland, wetlands etc.) • Reduced aesthetic value of the airport • Loss of open space that will occur as a result of the proposed development
Impact on infrastructure and services	<ul style="list-style-type: none"> • Pressure on the existing infrastructure and services (water, sanitation, storm water, energy and information and communications technology (ICT)) as a result of an intense influx of people and activities occurring in the local area • Safety and health risks are likely to be imposed on the local community
Open spaces	<ul style="list-style-type: none"> • Loss of open space available for recreational use as a result of the proposed development • Reduced character definition of the precinct
Local employment of labour and contractors	<ul style="list-style-type: none"> • Social conflict from the influx of construction workers
Health and Safety	<ul style="list-style-type: none"> • Accidents/incidents • Major environmental incidents • Damage to property and • Fatalities
Bird Strike	<ul style="list-style-type: none"> • Damage to aircraft and the potential for accident which present a risk to passengers and aircraft/port staff. • Cost implications as a result of flight delays and aircraft repairs.

7.2. Assessment Methodology

To determine and evaluate the significance of potential impacts on identified resources and receptors, impact assessment and mitigation is applied in accordance with define assessment criteria. The purpose of this method is to develop and describe measures to be applied in order enhance the potential benefits, and to minimize or avoid any potential harmful effects.

7.2.1 Definition of Key Terminology

- **Project:** The collection of activities and components for which authorization is being applied for, which includes all associated facilities that are required for the Project to proceed.
- **Project Site:** The operational area/s of the project activities, including private transport corridors (those exclusively dedicated for the project activities during its operation).
- **Project Footprint:** The area within and surround the project site that is anticipated to be physically influenced/affected by the activities of the project in all phases. This includes areas used temporarily (i.e. land and roads used during the construction phase, as well as private and public areas along transport corridors that are disturbed)

7.2.2 Impact Types and Definitions

Any change to a receptor or resource as a result of a component of the project (or a related project activity) is considered impact. By evaluating baseline data as a platform for assessment, it provides the information required to evaluate and describe the affects that project is likely to have on the socio-economic and biophysical environment. They type/nature of each impact can be categorized as positive, negative, indirect, direct or cumulative, as defined in the Table 17 to follow.

Table 17 Impact Nature and Type

Nature or Type	Definition
Positive	A positive change or improvement on the baseline.
Negative	A negative or adverse change from the baseline, or the introduction of an undesirable new aspect.
Direct impact	Resulting from the direct interaction between the project's activities and the receiving environment.
Indirect impact	Resulting from other activities that are expected to occur as an effect of the project.
Cumulative impact	Impacts which act jointly with others to affect the same components (receptors and/or resources) of the project. This includes impacts from simultaneous and/or planned future impending third party activities).

7.2.3 Assessing Significance

Impacts need to be determined in terms of their 'significance', which is defined by the impacts' **magnitude** and its' **likelihood** of occurring. 'Magnitude' is defined by the **extent**, **duration** and **intensity** of the impact, and sometime referred to as the 'severity' of the impact. To determine the magnitude of an impact, a set of criteria is used as per Table 18 below. Also defined in the table is a scale of 'likelihood' to be used in determining its significance.

Table 18 Significance Criteria

Impact Magnitude	
Extent	<ul style="list-style-type: none"> – On-site: Within (limited to) the boundary of the projects' development site – Local: Affect an area that is within a 20km radius of the projects' development site – Regional: Experience at a regional scale (as determined bit administrative boundaries, habitat type/ecosystem) or affect regionally important resources/receptors – National: Affect an area and/or resources/receptors that are of national importance or have macro-economic implications.
Duration	<ul style="list-style-type: none"> – Temporary: Intermittent/occasional or brief duration – Short-term: Only occurring within the construction phase of the project – Long-term: Occurring throughout the life of the project, but ceases upon the projects termination (when it stops operating) – Permanent: Result in permanent change to the receiving environment that continues beyond the life span of the project (after it stops operating)
Intensity	<p>Biophysical Receiving Environment <i>The sensitivity of the biophysical resource/receptor determines the intensity of the impact</i></p> <ul style="list-style-type: none"> – Negligible: Non-measureable impact – Low: Does not affect the natural processes and functions – Medium: Alters the environment but natural processes and functions endure (although in a modified manor) – High: Alters natural processes and functions to the extent that they will cease (either temporarily or permanently)

	<p>National and/or international standards and limits should be applied, where appropriate, to determine/measure the impact. Quantification of the magnitude of impact and the accompanying rational should be attempted in the specialist studies.</p> <p>Socio-Economic Receiving Environment The ability of the communities/people affected to adapt their livelihoods to the changes brought about by the project, determines the intensity of the impact.</p> <ul style="list-style-type: none"> – Negligible: No noticeable change to livelihoods – Low: Ability to adapt livelihoods with relative ease and maintain baseline conditions – Medium: Ability to adapt livelihoods with some difficulty and maintain baseline conditions with a degree of support – High: Affect does not enable livelihoods to adapt to changes or maintain baseline conditions
Likelihood - the likelihood that an impact will occur	
Unlikely	The impact is unlikely to occur.
Likely	The impact is likely to occur under most conditions.
Definite	The impact will occur.

The significance rating matrix (Table 19) is adopted after defining the magnitude and likelihood of the impact, as a means of determining the significance of the impact. The significance colour scale is adopted to provide a visual representation of the magnitude of negative and positive ratings (Table 20).

Table 19 Significance Rating Matrix

Significance				
Magnitude	Likelihood			
	Unlikely	Likely	Definite	
Negligible	Negligible	Negligible	Minor	
Low	Negligible	Minor	Minor	
Medium	Minor	Moderate	Moderate	
High	Moderate	Major	Major	

Table 20 Significance Colour Scale

Negative Ratings	Positive Ratings
Negligible	Negligible
Minor	Minor
Moderate	Moderate
Major	Major

Table 21 Significance Definitions

Significance Definitions	
Negligible significance	No effect on the receiving environment (resource/receptor/people) imposed by an activity of the project, or where the anticipated effect indistinguishable from the baseline or is considered to be insignificant (negligible or unnoticeable).
Minor significance	Evidence of an effect with a sufficiently small magnitude (with or without mitigation) that is within the accepted standards and/or the receiving environment is of low value/sensitivity.
Moderate	An effect that is within the accepted standards and limits. Emphasis must be placed on

significance	demonstrating that the significance of the impact has been reduced, as far as reasonably possible. ‘Moderate’ impacts do not necessarily need to be reduced to ‘minor’ impacts, but rather be managed efficiently and effectively as ‘moderate’ impacts.
Major significance	An impact that exceeds accepted limits or standards, or where large magnitude impacts affect components of the receiving environment that are highly valuable/sensitive. The intention of the EIA process is avoid major residual impacts, particularly such impacts which are long-term or cover an extensive area. However, such impacts may not be able to be mitigated even after all reasonable options have been exhausted, in which case such negative factors need to be weighed against positive factors in order to make a decision.

A statement of the **degree of confidence** in the assessment must be qualified once the significant of the impact has been determined. The degree of confidence is expressed as ‘low’, ‘medium’, or ‘high’ as determined based on the associated uncertainties (whether or not there is sufficient information to adequately assess the impact).

The assessments have also taken into consideration:

- **Mitigation and Management measures:** A pre and post mitigation assessment is provided for each impact.
- **Alternatives:** each impact has been assessed for the proposed development scenario and for the No-Go option.

7.3. Impact on the Natural Environment

7.3.1 Overview of Impacts

The proposed expansion of Pietermaritzburg Airport and associated developments will result in the following impacts to the terrestrial and wetland habitats within and downstream of the project area:

- i. **Loss of wetland/stream habitat** (habitat and buffer) – from the direct transformation of these systems during the construction phase.
- ii. **Loss of Grassland habitat & Associated Red Data Species** – from the direct transformation of these systems during construction.
- iii. **Increased infestation by Alien invasive plant species** - in wetland and grassland - construction/operational phase.
- iv. **Pollution and erosion** of wetland and stream habitat– (operational phase) from uncontrolled storm water flow.

Issues of lesser concern which are addressed through effective management measures is the **Pollution and Sedimentation of the Wetlands and the Blackborough Spruit** – during construction from activities and substances (cement, steel, rubble, etc.) and sediment from disturbed areas. The other risk of pollution is from spills of fuel and other harmful substances both during construction and the operational phase. This demands effective management measures to limit the risk of contamination/sedimentation and emergency response procedures for accidents involving harmful substances.

The extent of the various systems and their location across the study area is shown in **Figure 26**. The extent of the direct loss in terms of area (hectares) and percentage of the current area is summarized in Table 22. This map and these figures are referred to in the assessment that follows.

Table 22 Extent loss of different habitat types across the study area

HABITAT	AREA (ha)	PERCENTAGE AREA LOSS (%)	CAUSE FOR AREA LOSS
Wetland 1	3,01	4	Proposed road, Commercial mixed use, GA Phase 1
Wetland 2	2,33	26	Techno hub, small stretch of proposed road, car park, passenger terminal
Wetland 3	5,70	1	Small patches of road, GA Phase 1, Industrial area
Grassland Inside fence line	69,53	50	Techno hub, Taxiway apron, passenger terminal, GA Phase 1, Car park, proposed roads
Grassland Outside fence line	45,38	11	Techno hub, Industrial area, Commercial mixed/use, GA Phase 1, proposed roads
Secondary Grassland	3,07	100	Techno hub
Maintained Areas	21,36	16	Commercial Mixed Use, Taxiway apron
Sports field	0,68	100	Commercial Mixed Use
Degraded grassland	10,47	87	Proposed Industrial and proposed road
Degraded Bushveld	6,48	3	Proposed Road
Wooded Grassland	4,68	46	Proposed Industrial and proposed road

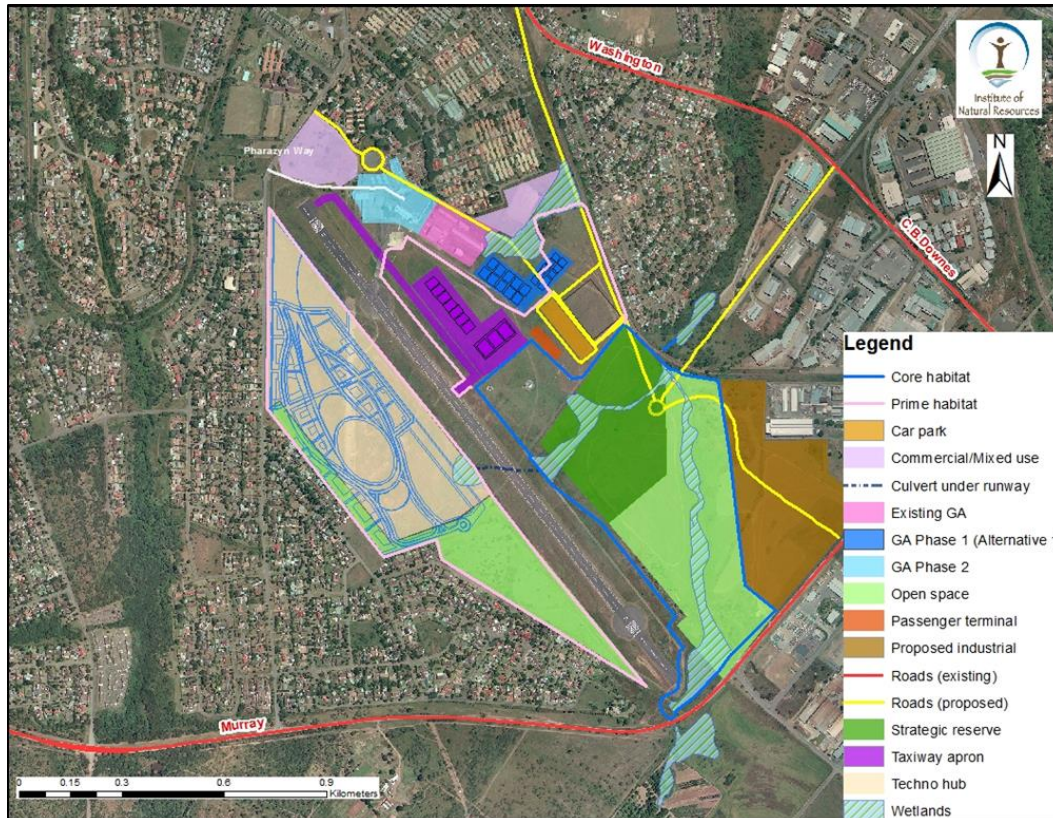


Figure 26 Map showing the core and prime habitats

The development will result in the direct loss of wetland and grassland habitat and a small portion of degraded bushveld, even if the final buffer zone is implemented and effectively managed (Table 22).

7.3.2 Loss of Wetland/Stream Habitat

As summarised in Table 22, approximately 0.7ha across the 3 wetlands is likely to be lost as a result of direct transformation to infrastructure. This represents a small percentage of what are degraded systems. The impact is consequently of moderate significance at a local scale.

Component	Type	Status	Extent	Duration	Intensity	Magnitude	Likelihood	Significance	Confidence
Wetland and Stream Habitat	Direct	-ve	Local	Permanent	High	Medium	Likely	Moderate	Medium
<i>With enhancement</i>	<i>Direct</i>	<i>+ve</i>	<i>Local</i>	<i>Short Term</i>	<i>High</i>	<i>Medium</i>	<i>Likely</i>	<i>Moderate</i>	<i>High</i>
<i>NO-GO Option</i>	<i>Direct</i>	<i>-ve</i>	<i>Local</i>	<i>Permanent</i>	<i>Medium</i>	<i>Moderate</i>	<i>Likely</i>	<i>Minor</i>	<i>Medium</i>

The proposed mitigation measures are:

- Develop and implementation of a wetland and stream rehabilitation and management plan - Rehabilitation of entire remaining wetland systems, which will need to include rehabilitation activities such as clearing aliens, replanting of veg, clearing rubble, erosion control, etc.
- Amend final design of infrastructure to limit wetland and buffer area lost.
- Adherence to and management of buffers developed according to the National Guideline for the development of Wetland Buffers. The guideline accounts for the type and sensitivity of the wetland, the catchment context and the type of development proposed. Consequently the buffers differ in size as shown in Figure 27. An impact buffer width of 43 meters was determined for Wetland 1, 25 meters for Wetland 2 and 26 metres for Wetland 3. These buffer sizes are sufficient to mitigate lateral impacts through diffuse surface runoff into the wetland (i.e. such as sediment deposition, diffuse storm water runoff, etc.).

The implementation of these mitigation measures would improve the condition and thereby the capacity of the wetland and stream habitat to generate various ecosystem services, including biodiversity. The implementation of the mitigation measures would translate into a net positive impact given the current poor state of the wetlands, and the limited loss that will occur from phase 1. This benefit would not be realized if the No-Go option prevailed. The assessment if for this option is negative.

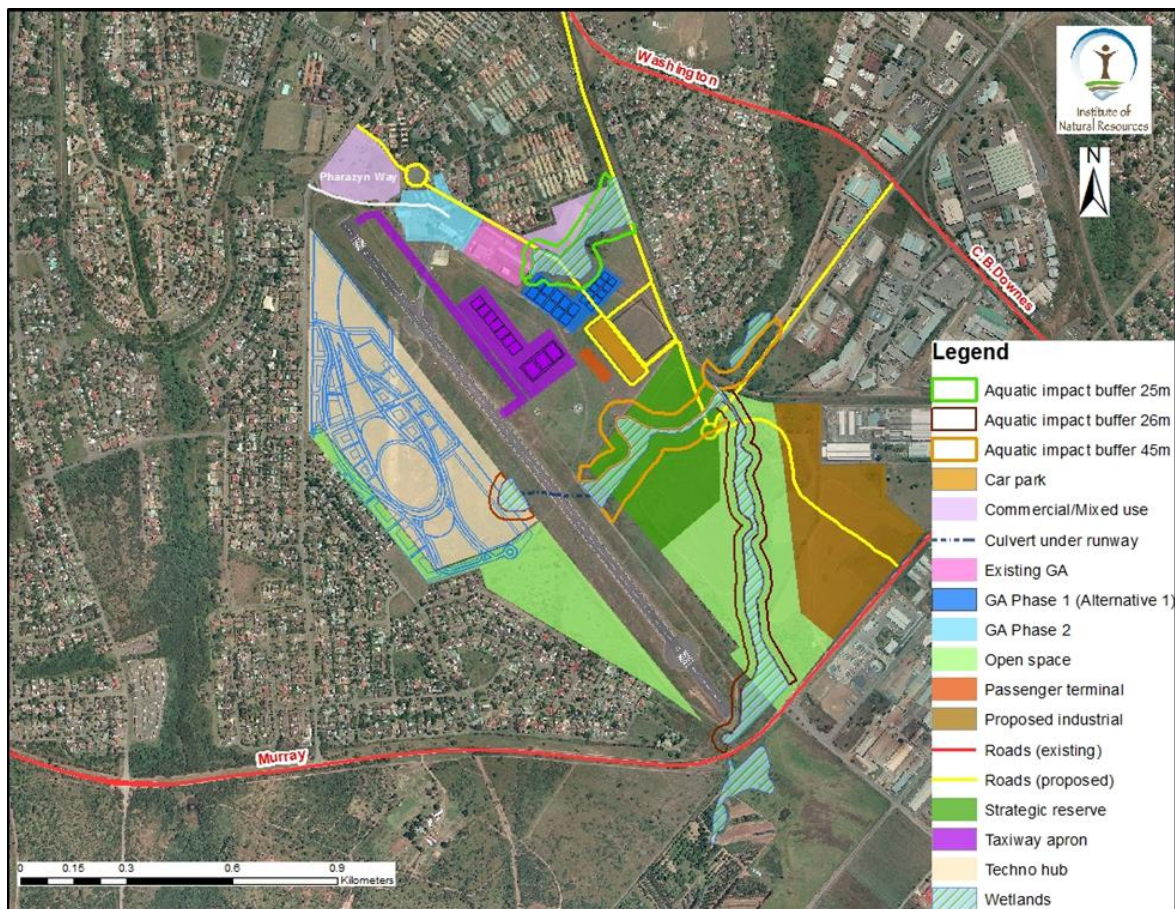


Figure 27 Wetland buffers

7.3.3 Loss of Terrestrial Habitat – (Grassland, Bushveld and Red Listed Species)

The development of proposed infrastructure for the airport, will lead to the permanent loss of about 41.3% of grassland habitat within a vegetation type classified as vulnerable. The grassland provides habitat for:

- 5 verified red list species plant, all of which are listed as “declining’ or “vulnerable”.
- 3 species of plants used for medicinal purposes. There are likely to more species.
- Potentially 17 species of fauna, ranging from earthworms and millipedes to frogs and birds. This is a desktop unverified list due to the cryptic nature of the species which make it difficult to verify their occurrence. The specialists speculated that many would not occur there due to the unsuitability of the habitat – with possibly 5 likely to occur.

Component	Type	Status	Extent	Duration	Intensity	Magnitude	Likelihood	Significance	Confidence
Grassland habitat and associated red data species	Direct	-ve	Local	Permanent	Medium	Moderate	Definite	Moderate	Medium
With enhancement	Direct	-ve	Local	Permanent	Medium	Moderate	Definite	Moderate	Medium
No-Go Option	Direct	+ve	Local	Long Term	Medium	Moderate	Likely	Moderate	Medium

The proposed mitigation measures are:

- Realignment of final designs to limit area of impact to grassland habitat (particularly prime and core habitat areas). Figure shows the “final buffer” which integrates the wetland and ‘core grassland habitat¹”.
- Develop and implement a grassland management plan.
- Search and rescue of red data species prior to construction.

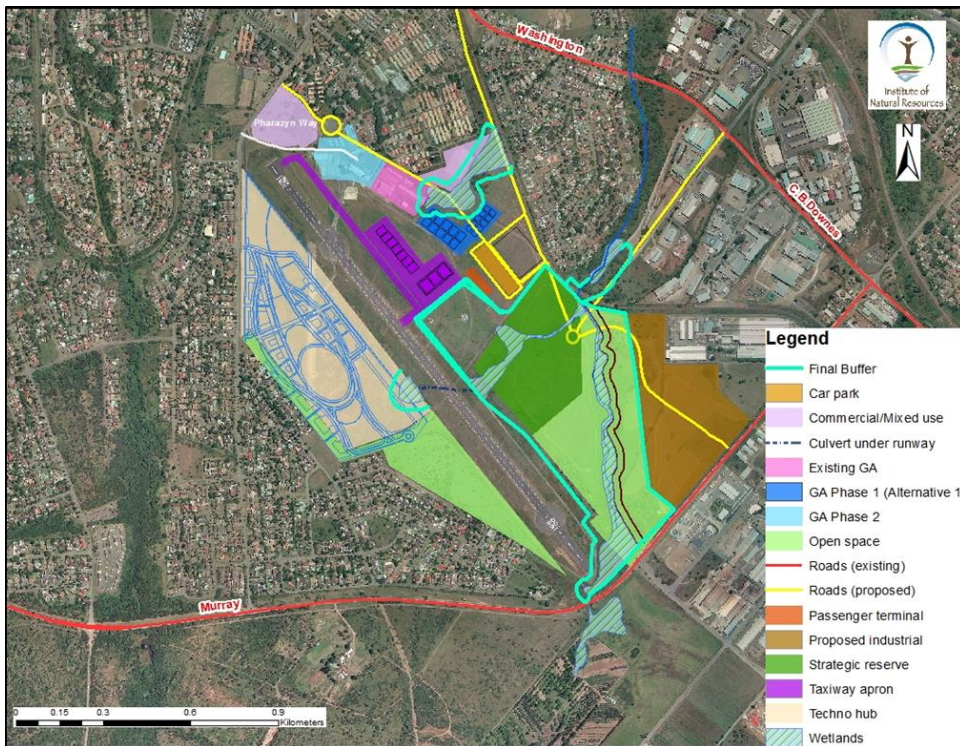


Figure 28 Integrated aquatic/terrestrial buffer areas to be excluded from development and rehabilitated to improve condition and functionality.

The no-go option would result in there being no loss of grasslands and associated species within the fenced precinct. The grasslands within the fenced area are also likely to be managed in a similar manner to how they are currently being managed, thus maintained in their current state. The grasslands outside of the fenced area would also remain. The condition of these systems is unlikely to change significantly under a No-Go Scenario.

7.3.4 Increased infestation by Alien invasive plant species

The disturbance of the natural systems during construction and development will increase conditions that support the increased infestation by alien invasive species which are an existing problem in all the habitats (a species list is provided in the specialist report). As the study area is at the head of the Blackborough Spruit catchment, the risk of the spread downstream is also increased. Invasive alien plants are one of the issues resulting in the degraded state of the natural systems, and they do not completely alter the value and functioning of these systems. The issue requires the

¹ Core Habitat = The area of natural habitat essential for long term persistence of a species in its current distribution range.

mitigation via the development of an IAS management plan which is implemented pre and during the construction phase, and then maintained during operational phase.

Component	Type	Status	Extent	Duration	Intensity	Magnitude	Likelihood	Significance	Confidence
Increased infestation of alien invasive plant species	Direct	-ve	Local	Long Term	Low	Moderate	Definite	Moderate	Medium
<i>With mitigation</i>	<i>Direct</i>	<i>-ve</i>	<i>Local</i>	<i>Long term</i>	<i>Medium</i>	<i>Moderate</i>	<i>Definite</i>	<i>Minor</i>	<i>Medium</i>
<i>No-Go Option</i>	<i>Direct</i>	<i>-ve</i>	<i>Local</i>	<i>Long Term</i>	<i>Medium</i>	<i>Moderate</i>	<i>Likely</i>	<i>Negligible</i>	<i>Medium</i>

If the development does not go ahead there is less disturbance and less chance of increased infestation into the wetland, bushveld and grassland habitats. However, the opportunity to develop and implement the IAS management plan, and thereby deal with the existing issues will be lost. The impact is therefore of negligible significance.

7.3.5 Pollution and Erosion of Wetland and Stream Habitat from uncontrolled Storm/Waste water

Erosion and pollution of the wetlands and Blackborough Spruit from uncontrolled stormwater runoff and discharge of sewage are existing issues impacting the physical structure and water quality within these systems. The development will result in:

- The transformation of natural and open space to hardened surfaces which will increase the intensity and volume of storm-water peaks and thereby the risk of erosion in the wetlands and stream.
- The Storm water from the developments may contain a variety of nutrients that can alter the health of the wetland and stream.

The available mitigation measures include:

- Realignment of the proposed infrastructure to accommodate the recommended buffer zones.
- Development of a storm water management plan which applies sustainable urban storm water design principles, and integrates soft options for discharging water.
- Identification of sources of sewage and other discharge and application of relevant measures to address these impacts.

Component	Type	Status	Extent	Duration	Intensity	Magnitude	Likelihood	Significance	Confidence
Increased risk of erosion and pollution of wetland and stream habitat.	Direct	-ve	Local	Long Term	Medium	Moderate	Likely	Moderate	Medium
<i>With mitigation</i>	<i>Direct</i>	<i>-ve</i>	<i>Local</i>	<i>Long term</i>	<i>Medium</i>	<i>Low</i>	<i>Likely</i>	<i>Minor</i>	<i>Medium</i>
<i>No-Go Option</i>	<i>Direct</i>	<i>+ve</i>	<i>Local</i>	<i>Long Term</i>	<i>Medium</i>	<i>Moderate</i>	<i>Likely</i>	<i>Moderate</i>	<i>Medium</i>

7.4. Impact on the Socio-Economic Environment

7.4.1 Overview of Impacts

The potential socio-economic impacts of the proposed developed are linked to the sensitivity of the receiving environment, and the footprint and outputs of the proposed development. Such impacts

may occur during the construction and/or operation phases. These impacts were identified through engagement with I&APs and specialist assessment. The list below provides an overview of the anticipated socio-economic impacts identified as requiring an in-depth assessment of the impacts and their significance, and well as mitigation, enhancement and management measures.

- Impact on the local and regional economy
- Impact on the financial sustainability of the airport
- Impact on traffic operations, access, and safety
- Impact of aircraft induced noise
- Impact of noise on property values
- Impact on archaeological and heritage resources

This assessment also includes an evaluation of cumulative impacts as well as the no-go option, demonstrating the positive and negative implications of the option.

7.4.2 Low Significance/Manageable Issues

In addition to the list of 'key' issues above, there are a range of additional impacts identified which are either:

- i. Of low significance and easily dealt with through standard management measures. An example is dust which is generated during construction.
- ii. Significant but are either addressed or optimized through management requirements/actions. An example is the benefit to local labour from job opportunities during construction and operational phase. This is a significant benefit. It does however not required detailed assessment. Rather, the optimization of the positive impact is achieved through inclusion of tender requirements imposed on the contractor to employ a certain percentage of labour from the local labour pool.
- iii. A third category of issues are those that were identified in the scoping process and upon investigation were shown to be of negligible impact. A level of explanation is however warranted and is provided below. An example of such an issue is the impact of vibration caused by aircraft and large construction machinery on the integrity of buildings from aircraft.

All relevant management and mitigation measures related to these issues have been taken through to these EMPR.

Air quality

With any construction activities, air quality impacts are typically experienced in the form of nuisance effects as a result of dust generation. Such impacts must be managed and monitored during the construction phase of the proposed development to limit impacting the local receiving environment. It is also important that disturbed/exposed areas are rehabilitated after use to prevent future dust generation. It is unlikely that the facilities of the proposed development will result in negative air quality implications during the operational phase as the nature of the facilities do not differ from the current context.

Economic and Safety impacts of Bird strikes

Bird strikes result in an economic impact in terms of the cost implications as a result of flight delays and aircraft repairs. There is also the safety risk related to accidents. Airport Management and Airlink (the only current commercial airline operating at the Pietermaritzburg Airport), bird strikes do currently have a negative economic impact (the bird strike rates at Pietermaritzburg are some of the worst of any Airport in South Africa). There are informal bird management measures in place; however the formalization by means of the management plan would aid the mitigation of negative impacts. There is also the potential to adopt more effective management options to further mitigate future impacts.

Health and safety

As with any development, safety and health risks are likely to be imposed on the local community as a result of temporary or permanent influx of persons (contractors, labour, etc.). Efforts should be made by local authorities and developers to prevent such impacts from occurring.

Infrastructure and services

The proposed development is anticipated to occur in phases, over an approximate 10-15 year period. As a result, there is unlikely to be an intense influx of people and activities occurring in the local area. Importantly, the Airport Precinct Plan includes an *Infrastructure Framework* which details that current infrastructure and services (water, sanitation, storm water, energy and ICT) and provides guidance on upgrades based on future demands. The Infrastructure Framework indicates that – *“Upgrading of existing bulk infrastructure supplying services to the Precinct and/or the reticulation within each of the sub precincts should keep pace with the demands of existing and new development in order for the precinct to be a competitive investment location and in order to protect existing economic development and provide an appropriate infrastructure platform for the “work live play” vision. In addition consideration should be given in all instances of new infrastructure and upgrading of existing infrastructure to the construction of green infrastructure”* (TMRP, 2016, Pp 26).

Local employment of labour and contractors

During the construction and operational phases of the proposed development, it is important that, where feasible, employment, skills development and business opportunities are offered to the local community. It is a municipal guideline that with all developments in the Municipality, 70% of contractors and labour during the construction phase must be sourced from the developments’ local area. This acts as a means of positively impacting the local receiving socio-economic environment.

Open spaces

Open/public spaces are important social assets and should therefore be considered in planning going forward, particularly considering the loss of open space that will occur as a result of the proposed development. Their value lies in use for recreational and spiritual purposes. Like any development well-managed open space protects the natural green infrastructure, preserving important environmental and ecological functions. The Msunduzi Municipality Environmental Management Framework (EMF) identifies conservation priorities throughout the municipality, and wetland areas are regarded as sensitive areas which have to be preserved protected and free from intensive development.

Conservation zones relating to sensitive areas and habitats have been identified for protection. In addition, buffer zones between residential and airport related land uses have been provided. The ecological specialist reports has delineated specific buffers for each of the three wetlands and proposed core grassland habitat associated with these wetlands as being conserved and managed. The reserve is an important riparian corridor along, and around the water bodies. It serves as a physical link to and between significant sources of biodiversity (from the Bisley nature reserve south of the airport extending all the way up to Msunduzi River past the Hayfields reserve) to prevent local species extinctions in the MM Area.

To provide further guidance on public spaces and corridors in the airport precinct, the Airport Precinct Plan (TMRP, 2016) detailed a *Public Space and Landscape Framework*. The Precinct Plan indicates that *“A discernible public space network and high quality landscaping throughout the precinct is critical to the creation of a brand identity for the area, as well as, for the comfort and convenience of its residents, users and visitors. Public space is the “glue” that integrates various sub precincts, neighbourhoods and blocks and its quality and useability as an attribute for the competitiveness of the area as a “live, work, play” precinct cannot be underestimated.”* (TMRP, 2016, Pp 20). The Precinct Plan consequently includes as one of the projects for the Blacbourh Spruit “Sub-precinct” the rehabilitation of this area and provision of access and trails for local people to walk and enjoy the area.

Pollution

Generation of pollution (solid, natural, effluent, noise and air) is a typical implication any new development, and has the potential to negatively impact the local social environment during the construction and operational phases. Guidelines must therefore be used to manage, monitor and mitigate pollution.

Traffic noise

Currently, the areas surrounding the airport are exposed to traffic noise either due to general traffic along main the urban roads (i.e. Oribi and Washington Roads) and/or heavier vehicle traffic in the industrial areas (i.e. Gladys Manzi and C B Downes Roads). The proposed development includes improvement and expansion to the local road network, with the intention of improving traffic flows

and therefore resulting in less congestion. The traffic impact assessment undertaken (McGuigan, 2016) suggests that additional traffic volumes as a result of the proposed development are likely to occur on main roads and intersections in the precinct area, which already experience high volumes particularly during peak hours. Therefore, the traffic induced noise impact is likely to remain isolated to main routes, with little to no impact on quieter residential areas, as is the current situation. It should also be noted that traffic noise was not raised as a significant concern by I&APs during the public consultation process, but focus was rather on congestion, access and safety, which were assessed in the traffic impact assessment (refer to sub-section: Impact on traffic operations, access and safety).

Vibration

During the construction phase, it is anticipated that little high vibration activities (such as piling or blasting) will be required for the construction of the proposed development elements. The movement of heavy construction vehicles will be isolated to main roads, and will not generate additional noticeable vibration on the receiving environment. In addition, the construction of facilities will occur in phases, meaning that activities will be isolated and limited in their intensity.

Ground-Borne vibration impacts during the operational phase are also deemed insignificant. Movement of aircraft and support equipment occurs along smooth surfaces and does not generate vibrations that will affect sensitive receptors, as is currently the case.

A potential concern is typically regarding vibrations caused as a result of aircraft take-off and landing, which is generated through low-frequency noise energy. Some local I&APs highlighted this as a potential concern due to the expectation that aircraft induced vibration could affect the structural integrity of buildings. However, numerous studies have been conducted in similar cases to investigate the validity of such concerns and perceptions (Desia, 2016). These studies have revealed that aircraft sounds levels, even those in close proximity to an airport, are of insignificant magnitude to result structural damage to buildings. Even in cases where audible and visual (i.e. vibration of windows) evidence is noted, the magnitude of the vibration generated by aircraft is insufficient to cause damage. Such studies were even conducted based on older aircraft, which have much higher noise and low-frequency energy level output than modern aircraft. Furthermore, noise induced vibration may only begin to occur on light building structures when the noise level reaches approximately 85dB(A). Based on the findings of the baseline noise impact assessment, even the areas that are subject to greatest exposure to take-off and landing aircraft noise do not experience noise levels of that magnitude (Shrives and Simpson, 2016).

Visual impact

Due to the type, style and/or the location of the elements of the proposed development, visual impacts are deemed of little concern. This was reiterated by the fact that during the public consultation process, visual impacts on the areas surrounding the proposed development were of little concern to I&APs. Based on the sub-precinct guidelines provided in the Airport Precinct Plan (TMRP, 2016), non-of the proposed facilities will be designed above 3 stories (the mixed used/commercial sites cannot exceed 3 stories, all other facilities are 2 or less stories). As indicated

in this report rezoning will be required via the SPLUMA process which involves consultation. It may be required through this process that a visual assessment is necessary.

7.4.3 Impact on the local and regional economy

Through the economic impact assessment, the specialist assessed the potential impact that the proposed development is likely to have on the local and regional economy (Oldham, 2016). This assessment is broken down into two categories, as follows, and considered all elements of the proposed development (road network expansion, airport landside and airside infrastructure, and the mixed use/commercial and industrial zone, and the Techno Hub):

- i. **The direct and indirect effects on employment and income** that is likely to be generated as a result of the implementation of the proposed development during the construction phase.
- ii. **Investment in and stimulation of the economy** as a potential result of the proposed development.

These two impact categories are elaborated on and a summary of the impacts generated per element of the proposed development (Table 23 and Table 24), followed by impact mitigation and enhancement measures that should be adopted.

The Pietermaritzburg Airport Sub-precinct project (includes the airport landside and airside infrastructure, and the mixed use/commercial and industrial zone) has great potential to stimulate economic growth and create jobs in the uMgungundlovu region but there is much that can go amiss with this project.

The initial impact from Phase 1 of the Airport Expansion Project will be derived from a new road system, connecting the Airport to the N3 highway, investment in airside and landside infrastructure, including a new General Aviation zone, at the Airport and basic infrastructure, and bulk services, for the Techno Hub.

Over a period of 10 years it is estimated that this will increase regional gross domestic product by R763 million, income from remuneration by R426 million and create 5092 jobs. These benefits will be spread over 10 years but not continuously. In other words, implementation is likely to be ‘lumpy’. The total impact for the 10 year period would be a growth rate of approximately 1.5 percent.

The major economic impact should arise from investment in buildings and facilities in the Techno and new development zones at the Airport. For the Techno Hub a Concept Plan implies CAPEX of R1.35 billion. At this stage there very little information as to where these business and institutional investors will come or the nature, scale or timing of projects. Thus, it is impossible to make any reliable prediction or estimate of the impact on GDP or employment in the next 10 years.

In the long term sustainable economic growth derives from the operation phase when investment projects become viable. The vision is of a fully operational Techno Hub and a range of economic activities in the Business zones. It is doubtful that much of this vision will be achieved in Phase 1 of the Airport Expansion Project and, therefore, no attempt is made to quantify these benefits, Capital funding may be the Achilles heel of the Airport project. Not only are hundreds of R millions needed for public investment but even greater amounts from private funding for the Techno Hub and

Airport projects. None of the Airport or Techno Hub studies and plans give much attention to this issue.

Successful implementation of this complex project requires a management structure able drive the process forward. Once basic infrastructure and services are installed a major marketing initiative will be required to attract private sector investment. Failure to involve private business raises the spectre of a white elephant.

Thus, in the light of the above qualification, it may be concluded that benefits to the local and regional economy, in terms of job creation and economic growth, could be significant but will be derived from a range of diverse investments and take time to materialize. There are major possible impediments to successful implementation of the project stemming from failure to raise capital funding, a lack of effective co-ordination and management and ineffective marketing of investment opportunities to the public and private sectors.

Mitigation and Enhancement Measures

The reason why the evaluation of the Project, in terms of its economic impact on the region, is given as of moderate significance with a medium level of confidence in the forecast, is that because planning is at an initial stage, a number of key issues and proposals have not been decided. The following measures relate to actions and decisions necessary from Msunduzi Municipality to enhance the impact of the Project or mitigate some of the adverse factors.

- Finalise a land disposal policy with regard to leasing or selling land within the Airport Precinct.
- Approve an incentive package for potential investors in the Techno Hub and Airport Precinct.
- Establish responsibility and provide funding for a campaign to market and create awareness of investment opportunities in the Airport Precinct and Techno Hub.
- Remove some of the uncertainty surrounding the capital funding of the Project by including it in the Integrated Development Plan (IDP) and Capital Budget as well as actively seeking alternative sources of funding.
- Planning should, as soon as possible, move on from high level planning to the identification of specific projects suitable for the designated new development zones. This has been undertaken within the Precinct Plan.
- Accelerate planning approval and funding for the Market Road Extension
- Finalise planning for an extended General Aviation zone creating opportunities for private investors requiring additional hangar space.
- Promote aeronautical and aviation related activity at the Airport in order to raise revenue and reduce, or eventually eliminate, the Municipal financial subsidy of the airport.

Table 23 Significance of direct and indirect effects on employment and income (construction phase)

Component	Type	Status	Extent	Duration	Intensity	Magnitude	Likelihood	Significance	Confidence
Road network extension	Direct	+ve	Local	Short Term	High	Medium	Likely	Moderate	Medium
<i>With enhancement</i>	<i>Direct</i>	<i>+ve</i>	<i>Local</i>	<i>Short Term</i>	<i>High</i>	<i>Medium</i>	<i>Likely</i>	<i>Moderate</i>	<i>High</i>

Component	Type	Status	Extent	Duration	Intensity	Magnitude	Likelihood	Significance	Confidence
Airport landside and airside infrastructure (including mixed use commercial and industrial zone)	Direct	+ve	Regional	Medium Term	Medium	Medium	Likely	Moderate	Medium
<i>With enhancement</i>	<i>Direct</i>	<i>+ve</i>	<i>Regional</i>	<i>Medium Term</i>	<i>Medium</i>	<i>Medium</i>	<i>Likely</i>	<i>Moderate</i>	<i>High</i>
Techno Hub	Direct	+ve	Regional	Long Term	Low	Medium	Likely	Moderate	Medium
<i>With enhancement</i>	<i>Direct</i>	<i>+ve</i>	<i>Regional</i>	<i>Long Term</i>	<i>Low</i>	<i>Medium</i>	<i>Likely</i>	<i>Moderate</i>	<i>High</i>

Table 24 Significance of investment in and stimulation of the economy

Component	Type	Status	Extent	Duration	Intensity	Magnitude	Likelihood	Significance	Confidence	Comment
Road network extension	Direct	+ve	Regional	Long Term	Medium	Medium	Likely	Moderate	Medium	Connectivity, Access to Airport, Travel costs
<i>With enhancement</i>	<i>Direct</i>	<i>+ve</i>	<i>Regional</i>	<i>Long Term</i>	<i>Medium</i>	<i>Medium</i>	<i>Likely</i>	<i>Moderate</i>	<i>High</i>	
Airport landside and airside infrastructure	Direct	+ve	Regional	Long Term	Medium	Medium	Likely	Moderate	High	Stimulate Aeronautical Activity: Commercial and General Aviation
<i>With enhancement</i>	<i>Direct</i>	<i>+ve</i>	<i>Regional</i>	<i>Long Term</i>	<i>Medium</i>	<i>Medium</i>	<i>Likely</i>	<i>Moderate</i>	<i>High</i>	
Airport landside and airside infrastructure	Direct	+ve	Local	Short Term	High	High	Definite	Major	High	Stimulate Private Investment in General Aviation Zone
<i>With enhancement</i>	<i>Direct</i>	<i>+ve</i>	<i>Local</i>	<i>Short Term</i>	<i>High</i>	<i>High</i>	<i>Definite</i>	<i>Major</i>	<i>High</i>	
Airport landside and airside infrastructure	Direct	+ve	Regional	Long Term	Low	Low	Likely	Minor	Medium	Stimulate Private Investment and Economic Activity in new Business Zones
<i>With enhancement</i>	<i>Direct</i>	<i>+ve</i>	<i>Regional</i>	<i>Long Term</i>	<i>Low</i>	<i>Low</i>	<i>Likely</i>	<i>Minor</i>	<i>High</i>	
Techno Hub	Direct	+ve	Regional	Long Term	Low	Medium	Likely	Moderate	Low	Investment in Techno Hub and stimulation of economy
<i>With enhancement</i>	<i>Direct</i>	<i>+ve</i>	<i>Regional</i>	<i>Long Term</i>	<i>Low</i>	<i>Medium</i>	<i>Likely</i>	<i>Moderate</i>	<i>Medium</i>	

7.4.4 Impact of the sustainability of the airport

Through the economic impact assessment (Oldham, 2016), the specialist assessed the potential impact that the proposed development is likely to have on sustainability of the airport. Currently the operating budget for Pietermaritzburg Airport is subsidised by the Msunduzi Municipality. Operating expenditure exceeds revenue by about R2 million be annum. The economic impact assessment undertook to determine the impact of that the proposed development is likely to having on addressing the sustainability of the airport.

This assessment is Msunduzi Municipal accounts for financial year 2014/15 show an Airport deficit of R5 million. This is subsidized from rates and general revenue. The Airport accounts are an integral part of the municipal accounting system and include an arbitrary allowance for depreciation and other extraneous items.

A true picture of the Airport financial situation will not be obtained until income and expenditure are “ring fenced” and accounted for using sound business principles. This will occur if a municipal entity, or some other form of independent management, is established. A financial model, projecting future trends in income and expenditure, predicts that the upward trend in aeronautical revenue will eliminate an operational deficit, and the need for a subsidy, within 5 years. This prediction is based on continuous growth in commercial aviation passenger numbers, as estimated for Phase 1 of the Airport Master Plan.

There is a qualification to this conclusion. Additional operational expenses will be incurred as the Airport Project progresses. Management of the operational budget will be challenged by the incorporation of new Business zones and the Techno Hub. This may prolong the need for a subsidy. The Techno Hub economic incentives to investors will be beneficial in the long run but in the short run intensify the necessity for a subsidy. Over a period of ten years, however, as new income streams from leases materialize the need for a subsidy should steadily diminish.

Long term financial sustainability will depend on policies and decisions made by Msunduzi Municipality. The future economic success of the airport project depends on attracting new inward investment from research and educational institutions, as well as national and international companies. The right management structure needs to be set in place to attract investment funding.

Both the aeronautical and business aspects of the airport precinct should, in the long term, be financially viable and not a drain on municipal resources in the form of subsidies.

Enhancement Measures

In order to enhance the sustainability of the airport, it is recommended that there be an approval of a proposal to establish a separate Management Entity to take ownership and control of the Airport Precinct, including the Techno Hub.

Table 25 Significance of the impact of the sustainability of the airport on the Municipality

	Type	Status	Extent	Duration	Intensity	Magnitude	Likelihood	Significance	Confidence	Comment
Airport Sustainability		+ve	Local	Long Term	Medium	Medium	Likely	Moderate	Medium	Elimination of the Municipal Subsidy of Airport
<i>With enhancement</i>		+ve	<i>Local</i>	<i>Long Term</i>	<i>Medium</i>	<i>Medium</i>	<i>Definite</i>	<i>Major</i>	<i>High</i>	<i>Management Entity</i>

7.4.5 Impact on traffic operations, access and safety

A traffic impact assessment (TIA) for the airport precinct was undertaken by Royal HaskoningDHV (McGuigan, 2016) under contract to VNA who were responsible for the feasibility investigation into the Market Road extension. The outcomes of the TIA also fed into the Precinct Plan. As the impact of Phase 1 traffic is linked to the traffic flow and associated infrastructure within the broader precinct, the recommendations of the TIA have been costed and included within the Precinct Plan. The Airport Precinct Plan (section 7.4) lists and prioritizes infrastructure upgrades in terms of:

- Regional road infrastructure
- City transport infrastructure
- Local infrastructure

The assessment was based on the quantification of the change in the traffic operational quality as a result of the additional traffic generated by the proposed Phase 1 development. The TIA:

- Assessed this change based on the quantification of the current situation (established through traffic counts) against modelled scenarios using increased volumes based on the addition of the Phase 1 increase in combination with anticipated average/accepted traffic growth rates.
- Scenarios were modelled for different future scenarios (timeframes) as per the terms of reference established by the Msunduzi Municipality Roads Transport Planning Department. The 2021 scenario relates to the Phase 1 development.

A spatial overview of the key roads and intersections considered within the TIA is depicted in Figure 29.

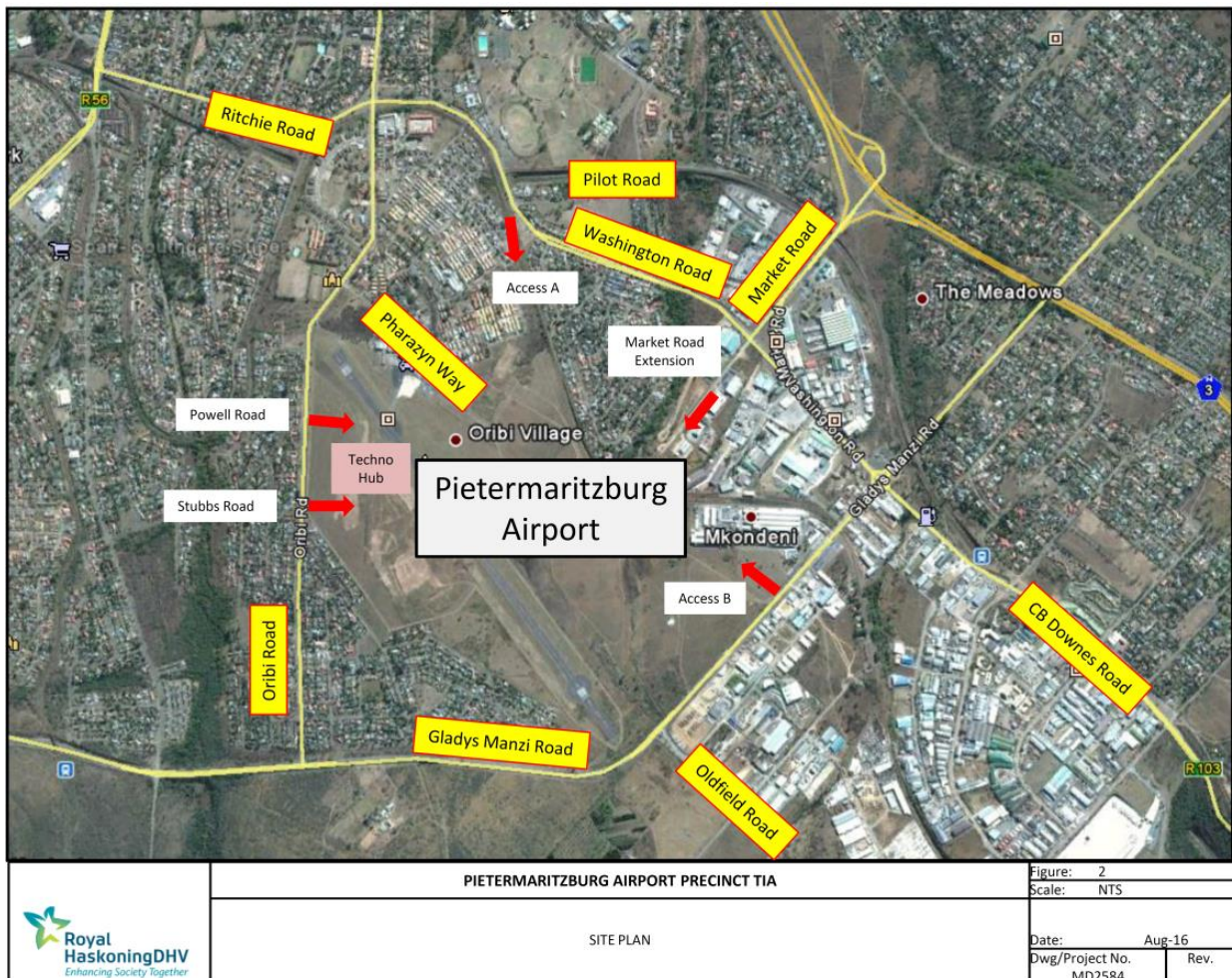


Figure 29 Road and intersections assessed as part of the traffic impact assessment (Source: McGuigan, 2016)

The baseline assessment of the TIA concluded that:

- There is congestion on several roads in the precinct area, but that only the section of Washington between Gladys Manzi Road and Market Road would require an upgrade to accommodate the cumulative impact of general and Phase 1 expansion. This upgrade was established as a need under the current situation.
- The configurations of several intersections are currently inadequate and contributing to queues/congestion in peak hours. The increased traffic will exacerbate the situation and reconfiguration of several intersections are required to address this issue, namely:
 - Washington/Oribi/Ritchie Road intersection
 - Washington/Market/Market Extension intersection
 - Washington/CB Downes/ Gladys Manzi intersection
- The configurations of the following intersections are currently acceptable but will become inadequate with the additional demand associated with proposed expansion. They will require configuration and in most cases to be signal controlled:
 - Gladys Manzi/Oldfield Road Intersection
 - Gladys Manzi/Oribi extension Intersection
- New intersections
 - Washington Road/Access A intersection will require signal control and configured appropriately
 - Gladys Manzi/Access B intersection will require signal control and configured appropriately
 - Oribi Road/Techno-Hub intersections will operate effectively beyond Phase 1, but will require monitoring

Impact Assessment

The understanding generated through the TIA has been used to assess the following issues:

Accessibility: This entails ensuring that convenient and efficient access to the proposed development is secured in the interests of entrenching the viability of the project.

Table 26 Significance of the impact of traffic accessibility

Issue	Type	Status	Extent	Duration	Intensity	Magnitude	Likelihood	Significance	Confidence
Accessibility to the Airport	Direct	+ ve	Regional	Permanent	Medium	High	Definite	Major	High
<i>With mitigation: the proposed development is the mitigation so the impact assessment is the same</i>	<i>Direct</i>	<i>+ ve</i>	<i>Regional</i>	<i>Permanent</i>	<i>Medium</i>	<i>High</i>	<i>Definite</i>	<i>Major</i>	<i>High</i>
No-Go Option	Direct	- ve	Regional	Long Term	Medium	High	Definite	Major	High

Currently there is one access to the Airport and adjacent land via Pharazyn Way – off Oribi Road. This requires that users need to travel through residential and industrial areas to access the Airport. Poor access is therefore currently a negative issue. The expansion will increase the access to four options, namely:

- Direct access from the N3 via the proposed Market Road extension.

- Via the new access road off Washington Road
- The new access road off Gladys Manzi
- Existing access of Oribi Road

This is a positive significant positive impact in terms of accessibility and the marketing of the airport and other proposed commercial uses (shops, hotel, industrial etc.).

Given that poor access is currently a problem for the airport, in the event the Phase -1 development does not take place i.e. No-go option, the impact under this scenario will be negative.

Traffic Operations: All affected elements of the existing road network (road, intersections, signage, calming/management) are tested to determine how the additional traffic affect use of the infrastructure in terms of traffic flow.

Table 27 Significance of the impact of traffic operations

Issue	Type	Status	Extent	Duration	Intensity	Magnitude	Probability	Significance	Confidence
Traffic operations (flow)	Direct	- ve	Local	Permanent	Medium	High	Definite	Moderate	High
<i>With mitigation – proposed improvements to roads (Section of Washington Road between Gladys-Manzi and Market Road – and upgrades to the various intersections)</i>	Direct	+ ve	Local	Permanent	High	High	Definite	Major	High
No-Go Option	Direct	- ve	Local	Permanent	Medium	Moderate	Definite	Moderate	Moderate

The assessment shows that the additional traffic volumes will extend the capacity of a considerable portion of the core infrastructure (one section of road and several intersections) beyond their limits. The impact is therefore of moderate negative significance at the local scale (Airport precinct). The available mitigation is the proposed new access routes and the upgrades to certain road sections and intersections. Given that congestion and poor flow are currently issues, implementation of these upgrades will improve the current level of traffic flow – i.e. a positive impact. The significance will be higher because it will improve a current negative situation. The situation will be further improved through the combined implementation of other transport projects such as the RBT programme and SANRAL upgrades to the N3-Market road extension. In the event that the proposed improvements are not undertaken, the current congestion would remain - the negative impact would prevail.

Safety: Public, pedestrian and motorist safety underscore any recommendations which emerge from the traffic impact study. This was raised as a specific concern in certain areas, of the Airport precinct where there are large numbers of pedestrians, including school children.

Table 28 Significance of the impact of traffic safety

Issue	Type	Status	Extent	Duration	Intensity	Magnitude	Probability	Significance	Confidence
Traffic and Pedestrian Safety	Direct	- ve	Local	Permanent	Medium	Moderate	Likely	Moderate	Likely

Issue	Type	Status	Extent	Duration	Intensity	Magnitude	Probability	Significance	Confidence
With mitigation – proposed improvements to roads/intersections, implementation of Public Transport and Non-motorised transport options, inclusion of safety measures/systems	Direct	+ ve	Local	Permanent	Medium	High	Likely	Moderate	High
No-Go Option	Direct	- ve	Local	Permanent	Medium	Moderate	Likely	Moderate	Moderate

Existing congestion and lack of adequate pedestrian and safety infrastructure coupled with high levels of pedestrian use – particularly in the vicinity of Oribi Village represent a current negative impact. Increased traffic from the proposed expansion would exacerbate this issue. Given that this is currently a negative issue, implementation of the proposed mitigation would not only address the impact from additional traffic, but also address the current negative situation. The mitigation would therefore turn a negative into a positive.

In the case of the No-go option, the likelihood of the mitigation being implemented is reduced and the negative impact would not be addressed i.e. remain negative.

7.4.6 Aircraft induced noise

Noise has been identified as one of the most significant environmental aspects of operating airports. In order to establish the current baseline and measure the efficacy of future noise emission reduction strategies, a specialist study (Environmental Noise Impact Assessment) was conducted. The study evaluated aircraft noise impacts in the vicinity of the Pietermaritzburg Airport and in impacted suburbs along the commercial/scheduled flight path. The assessment was undertaken by IMA Trader 20 cc (IMA) and documented in the Environmental Noise Impact: Baseline Assessment and Impact Prediction Report (Shrives and Simpson, 2016). The aim of this assessment was to:

- Determine current environmental sound levels in areas surrounding the airport and along the typical commercial aircraft flight paths while the aircraft flies over and in-between flight times.
- Evaluate and compare background ambient sound levels versus aircraft peak noise impacts, using SANS 10103:2008 as a guideline with respect to impacts on various districts (at sensitive receptors).
- Determine whether the aircraft impact on the existing baseline noise environment and at sensitive receptors along the flight path exceed any relevant environmental guidelines.
- Consider the impact of projected passenger demand growth scenario up for Phase 1 Airport Master Plan, based on the context of the baseline measurements.

The projected impact assessment is guided by relative aircraft sound power levels (Effective Perceived Noise Level in Decibels – EPNdB) from the US Federal Aviation Authority (FAA) and does not constitute a formal modelling exercise, which was deemed unnecessary *at this stage*.

The key findings from the assessment are as follows:

- The overall noise environment (L_{Aeq}) is quieter at noon than in the morning or the evening, even including aircraft noise. This shows the influence of road traffic during commuting hours.
- Spatially, the suburbs of Hilton and Worlds View are quietest, Bisley is the noisiest and Clarendon and Wembley are moderately affected by noise compared with the other suburbs.
- The monitoring points at the north end of the runway are the most impacted. This is typically when the aircraft is at its lowest height above the ground and initiating maximum forward thrust (take-off) or reverse thrust (approach and landing).
- During the survey, it was noted that the 'peak aircraft' noise only persists for an average of 20 - 30 seconds (out of 15-min measurement runs) but varies slightly at each location dependent upon extraneous factors such as wind direction, cloud cover and blanket noise from other sources.
- This study remains valid providing the commercial aircraft operator does not deviate significantly from the two most frequently used aircraft type (ERJ 135 LR and AVRO RJ 85) on the Pietermaritzburg to Johannesburg route. The AVRO ('Quad-jet') is the larger and noisier of the two aircraft, but both aircraft are required for economic reasons. Passenger demand requires that the AVRO is typically used for the first flight out (morning) and the last flight in (evening), with the ERJ being more common in-between.
- In respect of 'compliance' with the SANS land-use district guidelines, the L_{Aeq} result is not closely related to aircraft noise at most sites (as it peaks for only a fraction of the time-weighted average); thus, such terminology should be avoided. Hence, a combination of factors was used to assess the 'aircraft impact' on each receptor location, which showed clearly that Bisley is the most significantly impacted suburb related to aircraft noise. This is directly related to proximity to the north end of the runway, which is most frequently used for take-off and approach owing to the common southeasterly wind field over Pietermaritzburg.
- Whilst aircraft are certainly audible for short periods in other suburbs, elevated L_{Aeq} (above guideline values) are related to a range of sources, from road traffic to barking dogs. The contribution of aircraft flyover is not regarded as the primary factor causing elevated L_{Aeq} , unless it was specifically observed as such by the noise specialist. Thirty seconds constitutes only 3% of the 15-minute L_{Aeq} monitoring period, which was centered on the flyover time, so the overall influence on longer-term L_{Aeq} parameters remains negligible.
- Given the mixed urban¹ land-use that is impacted by the flights, there are no perfect flight times for the commercial aircraft. All commercial flights will impact one or more of the receptors. Domestic households are more sensitive during morning and evening, whilst schools and crèches are more sensitive during working hours.
- These jet aircraft noise events have already been occurring for five years and no formal complaints have been received to date (ATNS, 2016). The general lack of response until the Scoping Phase of this EIA suggests that the noise events are acceptable to most, who have

¹ 'Mixed urban' in this context refers to all types of developed land use that comprise the cityscape, including commercial, industrial and residential, etc.

become acclimatized to typical urban sounds. They are not harmful to health at the levels recorded and should not disturb sleep given that the standard operating hours all fall with SANS daytime classification (6.00am to 10.00pm).

- The passenger demand growth estimates described in the Airport Master Plan: Phase 1 suggest that one or two extra flights will be required per day (refer to Appendix A: INR Summary of 'Passenger Demand and Flight Projections').
- One of these flights has recently been confirmed to be that which will depart to Cape Town at 7.00am and arrive from Cape Town at 7.30pm weekdays, with only one outbound and one inbound flight across each weekend (7.00am Sat and 7.30pm Sun). This Cape Town flight will use the smaller and quieter of the two commercial aircraft currently operating from Pietermaritzburg Airport (ERJ 135 LR). Given the low observed noise impact of this aircraft, combined with the take-off and approach times being within the existing peak periods (morning and evening), it is suggested that this impact will be largely indiscernible and should not cause further nuisance.
- The other proposed change would involve accommodation of a 20% growth in the current capacity (across all flights, including the Cape Town flight by 2025). Intensive discussion with Airlink suggested that the best prediction that can be made at this stage is replacement of the current AVRO RJ 85 with the ERJ 170/190 Series. The latter will facilitate greater passenger carrying capacity, but are also more economical having only two engines versus four.
- After examination of the sound power emissions from the larger of two replacement aircraft (ERJ 190), it is anticipated that noise emissions from this fleet modernization could increase take-off noise (model and load dependent), but will reduce approach and landing noise (all models and loads) close to source and relative to the older, existing aircraft. The differences are small (≤ 5 dB at source), so whether this constitutes any perceived difference at receptors will be largely dependent on extraneous factors (road traffic noise, weather, aircraft operational procedures, etc.). These impacts will continue to occur in the existing peak flight times as dictated by passenger demand.
- Given that future passenger predictions are uncertain, higher confidence can be ascribed to replacement of existing aircraft to absorb passenger demand, since this is motivated by fleet modernization - economic advantages, which bring associated environmental benefits of more modern aircraft.

The overall predicted sound level impact (net evaluation) has been presented spatially in Figure 30 using coloured symbols to indicate the comparative noise nuisance at each site. The method of evaluation of the data to produce the overall impact output map took into account all of the following criteria:

- L_{Aeq} , L_{Amin} , L_{A90} , L_{A10} , L_{Amax}
- Personally observed 'instant peak aircraft noise'
- Field observations and log sheet information
- Interviews with local residents/school staff where relevant

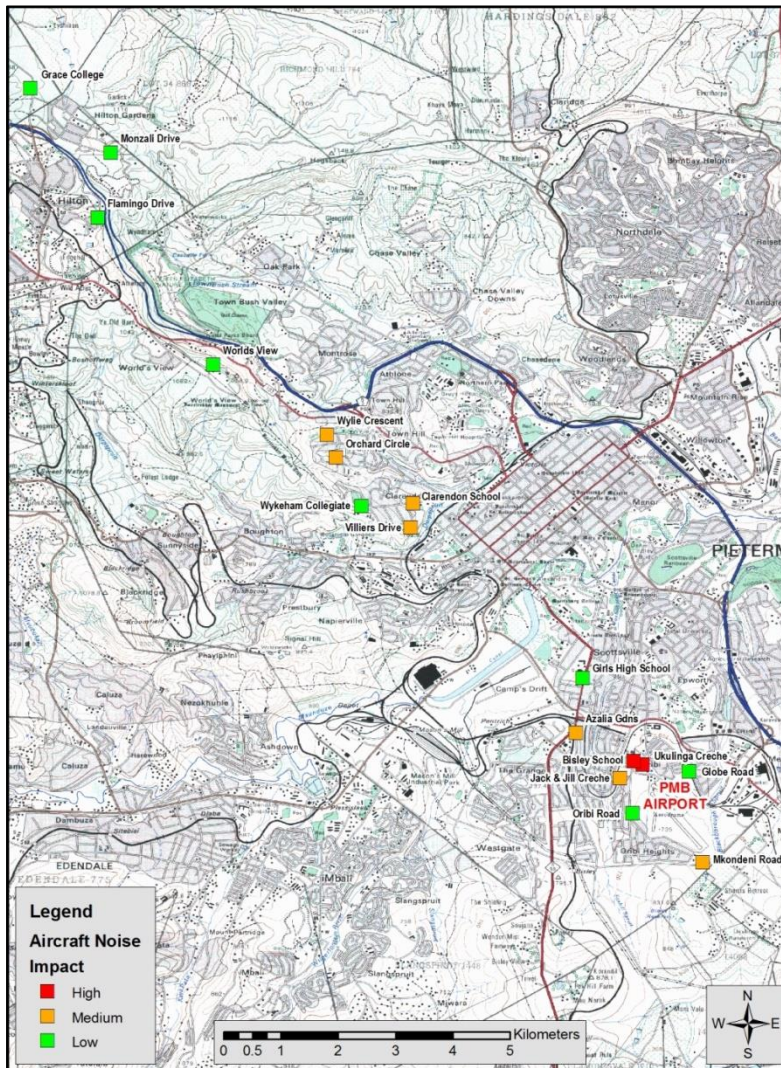


Figure 30 Spatial representation of integrated aircraft noise impact assessment at monitoring locations

Impact Assessment and Recommendations

The following is recommended from impact assessment in the context of baseline results, as opposed to aircraft-specific modelling:

- Environmental noise in the Bisley area, close to the north end of the runway is of concern to schools and crèches. This should be tackled through sound attenuation measures on public buildings. These measures could include double-glazing of windows and sound insulation in the ceiling. Such measures have proven effective in the abatement of aircraft noise from best international practice.
- Should the commercial fleet be changed to types of aircraft with significantly higher overall sound level output, the frequency of flights increased, flight times extend beyond the current time bracket or the flight paths change significantly in the future, then the noise impacts must be re-evaluated around the airport precinct through further measurement against this baseline.

- On review of findings from the baseline survey, a decision was taken by the Environmental Assessment Practitioner as to whether further investigation through aircraft-specific modelling is required. From the Technical Workshop (INR, 2016), it appears that none of the original triggers for modelling were found. A majority of participants, including representatives from the CAA, ATNS, INR, Airlink and Municipality decided that aircraft specific noise modelling may cause more confusion than it resolves. This decision was taken considering the small size of the airport, that no extension of the runway is being considered at this stage (which limits its use to relatively similar aircraft) and considering the limited ability of noise modelling to simulate a complex receptor environment (experience gained at King Shaka International Airport). A large portion of the mixed urban noise sources would need to be incorporated for the model to predict realistically, based on the baseline measurements and observations.
- Alternately, a post-expansion comparative survey at significant impact sites may be considered more useful. Since noise created by aircraft is an event (to the ground-based observer) that has already been established spatially, this survey could be limited to sites in close proximity where current impacts from the runway are significant. The basis for this recommendation is that aircraft type and flight plans are not affected significantly by the initial phase of the Airport Expansion Master Plan, whilst flight events are not currently of a harmful magnitude or duration, being very brief compared with other noise sources observed.
- It is planned and gradually being confirmed that all commercial aircraft type will be changed to more modern and quieter¹ aircraft than the current AVRO RJ 85 'Quad-jet'. Reduction of sound energy at source can reduce event-based impacts at all receptors (ICAO, 2007). The contribution of the aircraft flyover at the majority of sites is very small compared with other constant noise sources; road traffic being the most significant contribution to high L_{Aeq} values during this survey, both in the foreground and background. It is only where the flyover actually interferes with speech communication that sound attenuation is required on buildings; i.e. in close proximity at Bisley School and the crèche(s).
- Apart from the (now definite, as at January 2017) introduction of a Cape Town flight using the ERJ 135 LR (described earlier), further flight scheduling cannot be determined accurately at this stage (INR, 2017). However, in order to minimize noise impacts through disturbance, aircraft being introduced should be equivalent to or quieter than the AVRO RJ 85 in all possible flight modes and should be limited to before and after school hours (8.00am to 3.00pm). Noise nuisance should be minimized over Bisley as the primary impact zone, where sensitive receptors such as the school and crèche(s) are situated. Various aviation operational procedures can also facilitate this to some extent (e.g. approach angles), although passenger safety is always the primary concern (ATNS, 2016).

The following are considered in determining the impact significance:

¹ Worst-case (ERJ 190): 4 dB lower on approach (all models); ≤ 5 dB higher on take-off (model and load dependent) - at source; e.g. edge of runway. ERJ 170 is lower in all respects, being a smaller aircraft. Fleet mix yet to be confirmed and subject to variation in operational requirements.

1. **Proposed Expansion:** describes the Airport Expansion Master Plan Phase 1 project / growth, which focuses largely on the modernization of the aircraft fleet from a noise perspective, with introduction of two possible new aircraft models to replace older existing models and increase passenger capacity. It also covers the introduction of the Cape Town Flight using the ERJ 135 (confirmed as at January 2017) and the possible introduction of another Jhb-bound flight (not confirmed iro aircraft model, although scheduling is likely to remain during peak demand – morning and evening).
2. **With Mitigation:** describes the above, using all possible and practical mitigation options appropriate for the Pietermaritzburg Airport as guided by the ICAO ‘Balanced Approach to Aircraft Noise Management’ (refer to Annexure 1 for the full suite of viable mitigation options). The approach is centred on a balance of four key elements as listed below, with accompanying mitigation options that are viable for this case, some of which are already partially and/or informally in place, or have been included in the Airport Precinct planning process:
 - Reduction at source
 - Change in the type of aircraft
 - Noise performance trends of the fleet mix operating at the airport
 - Regular assessment of the Noise performance of aircraft
 - Land-use planning and management
 - Change in land use zoning
 - Planning over time
 - Prevent encroachment of incompatible land use
 - Mitigate noise impact on receiving environment (building codes, noise insulation programmes, land acquisition and relocation, transaction assistance, real estate disclosure, noise barriers)
 - Financial mitigation (capital improvements planning)
 - Noise abatement operational procedures
 - Noise preferential runways
 - Noise abatement departure and approach procedures
 - Ground-based operational procedures
 - Operating restrictions
 - Partial restrictions
3. **No-Go Option:** effectively describes continuance of the *status quo* iro aircraft type and scheduling. However, it is important to note that whilst this option must be considered for EIA purposes, is practically impossible to maintain the airport precinct and aircraft fleet unchanged in perpetuity. As mentioned earlier, the AVRO is already out of production and safety regulations will ultimately dictate that these units must be superseded by a more modern aircraft (one which is currently in production), regardless of actual growth in passenger demand. The latter will influence which models supersede the AVRO, although this is also constrained by the physical characteristics of the airfield (runway, infrastructure, etc.) and its geographical location (topographical setting and socio-economic pressures).

Whilst 17 sites were measured across most parts of the flight schedule in the baseline survey, a spatial zoning and temporal pattern becomes apparent, which should be considered alongside the impact tables presented below. To avoid duplicity, suburbs (sites) are grouped as follows for impact assessment:

1. **Zone 1:** Hilton and Worlds View (four sites – distant: 10 km and more NW of runway);
2. **Zone 2:** Clarendon and Wembley (five sites – intermediate: between 6 and 9 km NW of runway);
3. **Zone 3:** Pelham and Scottsville Extension (two sites – nearby: between 2 and 3 km NW of runway);
4. **Zone 4:** Bisley (three sites – close proximity: within 1 km NW of runway);
5. **Zone 5:** Mkondeni and Oribi (three sites – close proximity: within 1 km NE, SE and SW of runway).

Table 29 Summary of impact significance of aircraft noise on suburbs

Suburb	Type	Status	Extent	Duration	Intensity	Magnitude	Likelihood	Significance	Confidence	Comment	
ZONE 1 (Hilton and Worlds View)	Proposed Expansion	Direct	-ve	Local	Long-term	Low	Low	Likely	Minor	Medium	Aircraft at high altitude; noise impacts discernible but low. More flight events = higher probability
	With mitigation	Direct	-ve	Local	Long-term	Low	Low	Likely	Minor	Low	As above and flight paths or approach unlikely to change w/ mitigation
	No-Go Option	Direct	-ve	Local	Long-term	Low	Low	Definite	Minor	High	Environmental noise impact remains as per baseline – low impact in these areas
ZONE 2 (Clarendon and Wembley)	Proposed Expansion	Direct	-ve	Local	Long-term	Medium	Medium	Likely	Moderate	Medium	Aircraft discernable during approach in these suburbs; impact dependent upon road traffic and flight path. More flight events = higher probability
	With mitigation	Direct	-ve	Local	Long-term	Medium	Low	Likely	Minor	Low	ERJ quieter approach than AVRO; take-off already completed; reduction at source & operational procedures
	No-Go Option	Direct	-ve	Local	Long-term	Medium	Medium	Definite	Moderate	High	AVRO has moderate noise impact over these suburbs, exacerbated by landing gear in this zone

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Suburb	Type	Status	Extent	Duration	Intensity	Magnitude	Likelihood	Significance	Confidence	Comment	
ZONE 3 (Pelham and Scottsville Extension)	Proposed Expansion	Direct	-ve	Local	Long-term	Low	Low	Likely	Minor	Medium	Background noise is dominant in these suburbs; one or two new events / minor changes in aircraft unlikely to be detected
	With mitigation	Direct	-ve	Local	Long-term	Low	Low	Likely	Minor	Low	New aircraft fleet and scheduling not yet confirmed in detail; noise impacts remain minor
	No-Go Option	Direct	-ve	Local	Long-term	Low	Low	Definite	Minor	High	Background noise is dominant in these suburbs; aircraft present but often obscured by road traffic
ZONE 4 (Bisley)	Proposed Expansion	Direct	-ve	Local	Long-term	High	High	Likely	Major	Medium	Measured aircraft noise impact interferes with speech communication; more events = more impact
	With mitigation	Direct	-ve	Local	Long-term	Moderate	Medium	Likely	Moderate	Low	ERJ quieter approach than AVRO; largest models have noisier take-off; minimization through: fleet mix, sound attenuation (insulation) & op. proc.
	No-Go Option	Direct	-ve	Local	Long-term	High	High	Definite	Major	High	Measured aircraft noise impact interferes with speech communication
ZONE 5 (Mkondeni and Oribi)	Proposed Expansion	Direct	-ve	Local	Long-term	Moderate	Medium	Likely	Moderate	Medium	Background noise often dominant in Mkondeni; aircraft noise does not propagate towards Oribi (E & W); new events / minor changes in aircraft can impact S end of runway
	With mitigation	Direct	-ve	Local	Long-term	Low	Low	Likely	Minor	Low	ERJ quieter approach than AVRO; largest models have noisier take-off; minimization through: fleet mix, noise abatement (barriers) & op. proc.

Suburb	Type	Status	Extent	Duration	Intensity	Magnitude	Likelihood	Significance	Confidence	Comment	
	No-Go Option	Direct	-ve	Local	Long-term	Moderate	Medium	Definite	Moderate	High	Background noise is dominant in Mkondeni; aircraft noise does not propagate towards Oribi; aircraft movements can impact S end of runway

In summary of this investigation, with given limitations and assumptions, there are no fatal flaws identified from either the baseline or the minor changes in aircraft required by obsolescence and passenger demand. Whilst existing and new flight events are undesirable to sensitive receptors, significant impacts were measured almost exclusively in the Bisley area, immediately adjacent to the north end of the runway. No impacts pose a threat to public health outside of the airport boundary and flyover impacts (nuisance) can be mitigated to some extent in future through adoption of various measures described above using the ‘Balanced Approach to Aircraft Noise Management’ (ICAO, 2007).

7.4.7 Impact on property values

Mills Fitchet Africa Pty Ltd undertook a property valuation assessment to determine the current and potential impact of the increase of aircraft induced noise impacts on property values along the commercial/schedule flight path (De Klerk, 2016). As indicated in the noise impact section above, the areas that are exposed to the significant noise disturbance induced by commercial aircraft are categorized into two zones, namely; the airport surrounds (including the suburbs directly surrounding the airport) and the extended flight path (suburbs in the northern western portion of Pietermaritzburg that are at higher elevations).

The methodology applied to quantify the impact on property values in the surrounding areas and those affected by noise levels along the flight paths, included the following processes:

- Background research and literature review
- Interviews with estate agents and property professionals
- Property value analysis

Based on the flight paths and affected areas around the airport as demarcated, it is understood that *the extent of the affected areas before and after the proposed airport expansion* are essentially the same, however, the proposed airport expansion could increase the impacts on these areas due to the potential increase in the frequency of commercial flights, rather than broaden the affected areas, and on the assumption that no alternative flight paths have been identified.

The outcomes of the Baseline Noise Impact Assessment was also used to determine which suburbs are exposed to significant noise impacts, and used to imply the impact on property prices in the case of an increase in the frequency of commercial flights.

The following property value impacts are currently induced by aircraft noise (nuisance factor).

- **Current impact on property values in the airport surrounds zone**
 - According to the some of the estate agents that were interviewed, the market has effectively “priced in” the effects of being near the airport, and this also appears to be evident from the sales data, which indicates a fairly consistent price range of between R859,250 and R1,062,167 for properties in this area, with the properties further from the airport tending toward the upper end of this scale and with average values between 6.72% and up to 12.08% higher. It was noted that this could also be attributed to larger stands and house sizes in the more outlying suburbs.
 - The feedback from the estate agents and property brokers was mostly positive, with more anticipated benefits for the local economy and commuters than negative impacts.
 - This view also relates to the findings of the media review where “the available literature suggests that the estimated NDI (Noise Deprecation Index) would be higher in more affluent areas than in less affluent ones.”
 - In terms of the results of the investigation and based on the current frequency of flights and aircraft noise levels, there is little or no negative impact on the property prices in the Airport Surrounds zone, and most people are positive about the perceived benefits and spin-offs from the proposed airport expansion project.
 - *Conclusion:* Receiving environment less sensitive to noise from airport activities, currently nominal negative impacts, market has allowed for impacts of proximity to airport in house prices.
- **Current impact on property values in the extended flight path zone**
 - The Extended Flight Zone area covers the more upmarket northern suburbs of Pietermaritzburg and extends to the southern parts of Hilton. This area is impacted by noise from aircraft approaching Pietermaritzburg Airport as they make their final approach to land and less frequently when they take-off in a northerly direction.
 - The exposure to aircraft noise varies according to the altitude as well as other factors such the ambient noise from the N3 national road and local traffic, etc.
 - According to the noise impact assessment by IMA Trader 20 cc, Clarendon which is “directly under the take-off flight path on *suburban elevated terrain before aircraft have climbed to a significant attitude*” was therefore identified as an area that is more exposed to aircraft noise. This area overlaps with Wembley (it would appear that the southern part of Wembley and Clarendon are essentially the same geographic area).
 - Four active estate agents were canvassed in this area. Two estate agents ranked the noise rating as *Mild* and *Average* respectively, one estate agent was of the opinion that property prices have depreciated by as much as 20% in the Wembley area, while another estate agent was concerned that property values could be negatively affected along the flight path over Hilton College Road to World’s View if the noise levels and frequency of flights increased substantially. However, these impacts were not substantiated by the agents.

- A property transfer search indicated lower values for Clarendon, which seems to relate to the findings of IMA Trader 20 cc. The average property price for the Clarendon sample is R1,587,308 compared to that of the Wembley Out Zone of R2,189,067, a difference of around 38%. This could also be attributed in some measure to the fact that the properties in the Wembley sample are larger on average, 2,694m² compared to 2,129m², and is also dependant on the size and quality of improvements, and other value forming attributes.
- In general therefore, **there are a few areas in the higher lying parts of Clarendon and Wembley where aircraft noise is having a negative impact on property values.**
- *Conclusions:* Receiving environment more sensitive to noise from aircraft flying overhead, currently fairly significant impacts to property values in higher lying areas, where discounts of around 20% are estimated.
- **Current impact on property values of industrial and commercial properties**
 - In terms of the feedback and the results of our research, the general consensus is that there are currently no negative impacts from aircraft noise on the industrial area of Mkondeni in the Airport Surrounds zone, nor on the commercial office node in VCCE in the Extended Flight Path zone.
 - The estate agents and property brokers that were canvassed are on the whole very positive about the benefits of the proposed airport expansion project on commercial and industrial properties.
 - *Conclusions:* Receiving environment not sensitive to aircraft noise. No negative impacts due to current aircraft noise.

The following property value impacts are likely to be induced by aircraft noise (nuisance factor), based on the anticipated introduction of additional commercial scheduled flights (therefore during the operational phase), which may also be further mitigated by the introducing quieter aircraft.

- **Potential impact on property values in the airport surrounds zone**
 - Overall, the opinion of those estate agents canvassed in this area is positive, and it would appear that one could expect property values to stay much the same (normal price escalation aside), or increase if the airport expansion plan provides more amenities, and generates more business and work opportunities and in the immediate local area.
 - However, if aircraft noise levels and the frequency thereof increase to nuisance levels [i.e. above around 65dB(A)], then one could expect to see a negative impact on property values.
 - There may also be some nodes that are negatively impacted by other factors such as increased traffic, higher ambient noise levels, and other un-desirable effects of urbanisation and densification of the area that may result in reduced property values.
 - *Conclusions:* If noise levels increase substantially, there will most likely be a negative impact on property values in specific nodes in this zone.
- **Potential impact on property values in the extended flight path zone**
 - In terms of the effects of the airport expansion on the extended flight path area and the greater Midlands region, there is generally optimism about having more flight

options, better access to and from the airport, more business opportunities, and generally being more connected with the rest of the world. This in turn could attract more people to reside and work in the area, and would most likely have a positive impact on property values in general for the area.

- However, should the frequency of flights increase and with similar or higher aircraft noise outputs, the situation in the Extended Flight Path zone could worsen, and in particularly in the higher lying areas of Wembley and Clarendon, with fairly substantial negative impacts on property values.
- The increased flights are unlikely to negatively affect property values in the outlying areas as aircraft are normally at a high altitude and as a result the noise levels are marginal.
- *Conclusions:* The receiving environment is sensitive to aircraft noise and will most likely respond negatively to increased noise and frequency, with a resultant decrease in property values in those parts directly under the flight paths that are most affected. However, given the nominal increase in the number of flights and expected noise levels, the overall impact is likely to be low.

The significance of aircraft noise induced potential impacts on the property values of affected suburbs is provided in Table 30 to follow, indicating significance with and without mitigation, as well as for the ‘no-go’ option. The suburbs have been clustered into zones, in line with those defined in the noise impact assessment above. The following conclusions are made:

- *Proposed expansion impact on airport surrounds zone (Zones 3, 4 and 5):* In Bisley, Orbi, Scottsville Extension and Pelham, the market is less sensitive to noise as properties priced accordingly.
- *Proposed expansion impact along extended flight path zone (Zones 1 and 2):* Impact on elevated areas of Wembley and Clarendon suburbs due to the sensitivity of the market in those areas; Worlds View and Athlone are not directly under flight path and on opposite slope
- *Mitigation:* Appropriate mitigation measures as per the ICAO Balanced Approach to Noise Management guideline (refer to Section 0: Impact on property values and Annexure 1)
- *No-go option:* If project does not go ahead, then no change to current property values are anticipated due to increased aircraft noise

Table 30 Summary of impact significance of aircraft noise on property values per suburb

Suburb	Type	Status	Extent	Duration	Intensity	Magnitude	Likelihood	Significance	Confidence	
ZONE 1 (Athlone and Worlds View)	Proposed Expansion	Direct	-ve	Local	Long Term	Low	Low	Likely	Negligible	Medium
	With mitigation	Direct	-ve	Local	Long Term	Low	Low	Likely	Negligible	Medium
	No-Go Option	Direct	-ve	Local	Long Term	Negligible	Negligible	Unlikely	Negligible	High
ZONE 2 (Clarendon and Wembley)	Proposed Expansion	Direct	-ve	Local	Long Term	High	High	Likely	Moderate	High
	With mitigation	Direct	-ve	Local	Long Term	High	High	Likely	Moderate	High
	No-Go Option	Direct	-ve	Local	Long Term	Negligible	Negligible	Unlikely	Negligible	High
ZONE 3 (Pelham)	Proposed Expansion	Direct	-ve	Local	Long Term	Low	Low	Likely	Minor	High

Suburb	Type	Status	Extent	Duration	Intensity	Magnitude	Likelihood	Significance	Confidence	
and Scotts. Ext.)	With mitigation	Direct	-ve	Local	Long Term	Low	Low	Likely	Minor	High
	No-Go Option	Direct	-ve	Local	Long Term	Negligible	Negligible	Unlikely	Negligible	High
ZONE 4 (Bisley)	Proposed Expansion	Direct	-ve	Local	Long Term	Low	Low	Likely	Minor	High
	With mitigation	Direct	-ve	Local	Long Term	Low	Low	Likely	Minor	High
	No-Go Option	Direct	-ve	Local	Long Term	Negligible	Negligible	Unlikely	Negligible	High
ZONE 5 (Oribi)	Proposed Expansion	Direct	-ve	Local	Long Term	Low	Low	Likely	Minor	High
	With mitigation	Direct	-ve	Local	Long Term	Low	Low	Likely	Minor	High
	No-Go Option	Direct	-ve	Local	Long Term	Negligible	Negligible	Unlikely	Negligible	High

7.4.8 Impact on archaeological and heritage resources

eThembeni Cultural Heritage (ECH) undertook a heritage impact assessment (van Schalkwyk, 2016) to consider all cultural resources as defined under the South African Heritage Resources Act No 25 of 1999. The Act defines a heritage resource as any place or object of cultural significance i.e. of aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance.

South Africa's heritage resources are both rich and widely diverse, encompassing sites from all periods of human history. Resources may be tangible, such as buildings and archaeological artefacts, or intangible, such as landscapes and living heritage. Their significance is based upon their aesthetic, architectural, historical, scientific, social, spiritual, linguistic, economic or technological values; their representivity of a particular time period; their rarity; and their sphere of influence.

The integrity and significance of heritage resources can be jeopardized by natural (e.g. erosion) and human (e.g. development) activities. In the case of human activities, a range of legislation exists to ensure the timeous identification and effective management of heritage resources for present and future generations.

Upon assessment of potential impacts imposed by the proposed development, the following conclusions were made:

- In the area of the proposed project, there was no evidence of the following heritage resources types:
 - Ecofacts
 - Places to which oral traditions are attached or which are associated with living heritage
 - Historical settlements and townscapes
 - Landscapes and natural features
 - Graves and burial grounds
 - Public monuments and memorials
 - Movable objects excluding any object made by a living person
 - Battlefields

- **Archaeology Sites:** Vegetation density is moderate to high on the undeveloped portions of the proposed development area, limiting soil surface visibility. However, it is highly unlikely that significant archaeological remains, or other heritage resources such as structures or ancestral graves, are present.

The KwaZulu-Natal Museum (KZN Museum) archaeology data base records the occurrence of three sets of Early and Middle Stone Age artefacts at the southern end of the “aerodrome”:

- **2930CB 008:** Drain on the left of the road to Mkondeni near aerodrome, thus on the road parallel to the runway. No description of site.
- **2930CB 050:** An assiduous surface-collection found scattered over an area of about 25 acres at the southeast corner of Oribi aerodrome.
- **2930CB 131:** See sketch map in site record file in Natal Museum.

Archaeologists currently explain artefacts in these contexts to be part of down-slope colluvial wash along pre-existing drainage lines and consequently out of primary context. The ubiquitous occurrence of these classes of artefacts identified in the greater Pietermaritzburg area, largely out primary context, render them of low to negligible scientific value.

- **Palaeontology:** The project area is underlain primarily by Pietermaritzburg and Vryheid Formation shales of the Permian Ecca Group and Dwyka tillites. The upper contact between these two formations is difficult to map as shales within these are almost indistinguishable. Whilst King (1948) reported *Glossopteris* flora within these deposits at isolated localities the presence of intrusive dolerite sills within the development footprint precludes the presence of any significant fossil remains (G. Botha *et. al.* 2002). Consequently no further palaeontological assessment is considered necessary.
- **Buildings and structures:** None will be affected by the proposed development.

It is unlikely that any of the modern terminal buildings, hangars and associated structures within the proposed development area has any heritage significance; however, if any of these buildings is older than sixty years, including those within the Oribi Village precinct, the developer will require a permit from Amafa aKwaZulu-Natali (the Provincial Heritage Resources Authority) for their alteration or destruction. Neither the Pietermaritzburg Aeroclub clubhouse nor the Oribi Village Precinct will be affected by this phase of the proposed developments.

The following mitigation measures are recommended:

- Msunduzi Municipality, as the authority responsible for the management of local heritage resources in terms of NHRA Section 8, should apply to Amafa for the declaration of the Pietermaritzburg Aeroclub as a Grade IIB heritage resource. In terms of such grading, internal changes to a building are allowed, but external alterations require a permit from Amafa. The Pietermaritzburg Aeroclub will automatically be subject to zoning scheme controls as soon as its grading is confirmed by Amafa.
- Protocol for the identification, protection and recovery of heritage resources during construction and operation, as detailed in the heritage impact assessment report (van Schalkwyk, 2016).

Table 31 Significance of impact on archaeological and heritage resources

	Type	Status	Extent	Duration	Intensity	Magnitude	Likelihood	Significance	Confidence
Proposed expansion	Direct	-ve	Local	None	Negligible	Negligible	Unlikely	Negligible	High
With mitigation	Direct	-ve	Local	None	Negligible	Negligible	Unlikely	Negligible	High
No-go option	Direct	-ve	None	None	None	None	Unlikely	None	High

7.4.9 No-Go Alternative

The no-go alternative would have varying implications on the positive and negative impacts identified in the sub-sections above. However, such impacts cannot be viewed in isolation and the potential positive implication of the no-go alternative on one impact may result or be at the expense of a negative implication on another.

The greatest cost of the no-go alternative would be loss of opportunity for the economy, both in terms of stimulating the regional and local economy, as well as the loss of employment opportunities. In addition, if the proposal were to not go ahead, it would be unlikely that the airport would be able to be a sustainable entity, and therefore continue to negatively implicate the Municipality. Currently, the MM subsidizes the airport but evidence shows that the proposed development has the potential to enable the airport sustainability within the next 10 years. The benefit of both the investment and employment opportunities, as well as the decrease need for Municipal subsidization, would stimulate the socio-economic development of the region. This opportunity would be lost if the no-go option is selected. *It is reiterated that the stimulation of the economy and the sustainability of the airport is strongly dependent in investment in the proposed development, which is currently larger unknown.*

A potential positive implication of the no-go alternative would be on the aircraft noise impact and consequential impacts on property values and nuisance disturbance along the flight path and areas surrounding the airport. If the proposed development does not go ahead, the capacity of the current airport facilities would limit the number of additional scheduled flights operating at the airport, and therefore limit the noise and property implications of affected areas. However, even with the no-go alternative, the current airport facilities do have capacity to add additional flights and therefore it would be inaccurate to presume that the no-go alternative would result in no future aircraft noise induced impacts. The proposed development would offer the opportunity for implementation of appropriate noise management mitigation procedures, which potentially would not occur if the development does not go ahead. Similarly, the expansion of the road network proposed would also benefit the local and regional traffic operations, access and safety. Without the expansion, the traffic conditions would likely be exacerbated from the current negative situation, whereas the proposed development has the potential to increase capacity, safety and operations, particularly if recommended mitigation options are implemented.

8. IMPACT STATEMENT

The following table provides a summary of the impacts assessed and provides a consolidated overview of the nature of the impacts (positive/negative) and the level of significance (negligible-Major).

BIOPHYSICAL ENVIRONMENT						
Impact	Status	Magnitude	Likelihood	Significance	Confidence	
Impact 1: Transformation and disturbance of natural habitat						
- Loss of wetland and stream habitat	-ve	Medium	Likely	Moderate	Medium	
with enhancement	+ve	Medium	Likely	Moderate	High	
- Loss of grassland and associated red data plant and faunal species	-ve	Medium	Definite	Moderate	Medium	
with enhancement	+ve	Medium	Definite	Moderate	High	
- Increased infestation of alien invasive plant species	+ve	Medium	Likely	Moderate	Medium	
with enhancement	-ve	Low	Definite	Minor	High	
Impact 2: Risk of erosion from uncontrolled storm-water						
- Altered volume and intensity of storm-water flow off increased hardened surfaces	-ve	Medium	Likely	Moderate	Medium	
With enhancement	-ve	Low	Likely	Minor	High	
Impact 3: Risk of Pollution						
- Water quality impacts from construction activities and risk of spills of harmful substances such as fuels caused by accidents.	+ve	Medium	Likely	Minor	High	
With enhancement	+ve	Low	Likely	Negligible	Medium	
SOCIO-ECONOMIC ENVIRONMENT						
Impact	Status	Magnitude	Likelihood	Significance	Confidence	
Impact 1: Direct and indirect effects on employment and income (construction phase)						
- Road network extension	+ve	Medium	Likely	Moderate	Medium	
with enhancement	+ve	Medium	Likely	Moderate	High	
- Airport landside and airside infrastructure	+ve	Medium	Likely	Moderate	Medium	
with enhancement	+ve	Medium	Likely	Moderate	High	
- Techno Hub	+ve	Medium	Likely	Moderate	Medium	
with enhancement	+ve	Medium	Likely	Moderate	High	
Impact 2: Significance of investment in and stimulation of the economy						
- Road network extension	+ve	Medium	Likely	Moderate	Medium	
with enhancement	+ve	Medium	Likely	Moderate	High	
- Airport landside and airside infrastructure: Aeronautical Activity	+ve	Medium	Likely	Moderate	High	
with enhancement	+ve	Medium	Likely	Moderate	High	
- Airport landside and airside infrastructure: GA Zone	+ve	High	Definite	Major	High	
with enhancement	+ve	High	Definite	Major	High	
- Airport landside and airside infrastructure: New Business Zones	+ve	Low	Likely	Minor	Medium	
with enhancement	+ve	Low	Likely	Minor	High	
- Techno Hub	+ve	Medium	Likely	Moderate	Low	
with enhancement	+ve	Medium	Likely	Moderate	Medium	
Impact 3: Sustainability of the airport						
- All proposed developments	+ve	Medium	Likely	Moderate	Medium	
with mitigation/enhancement	-ve	Medium	Definite	Major	High	
Impact 4: Traffic operations, access and safety						
- Access	+ve	High	Definite	Major	High	
with mitigation	+ve	High	Definite	Major	High	
- Traffic Operations (flow)	-ve	Medium	Definite	Moderate	High	
with mitigation	+ve	High	Definite	Major	High	
- Safety	-ve	Medium	Likely	Moderate	Likely	
with mitigation	+ve	Medium	Likely	Moderate	High	
Impact 5: Aircraft induced noise						
- Zone 1 (Hilton and Worlds View)	-ve	Low	Likely	Minor	Medium	
with mitigation	-ve	Low	Likely	Minor	Low	
- Zone 2 (Clarendon and Wembley)	-ve	Medium	Likely	Moderate	Medium	
with mitigation	-ve	Low	Likely	Minor	Low	
- Zone 3 (Pelham and Scottsville Extension)	-ve	Low	Likely	Minor	Medium	
with mitigation	-ve	Low	Likely	Minor	Low	
- Zone 4 (Bisley)	-ve	High	Likely	Major	Medium	
with mitigation	-ve	Medium	Likely	Moderate	Low	
- Zone 5 (Mkondeni and Oribi)	-ve	Medium	Likely	Moderate	Medium	

Impact	Status	Magnitude	Likelihood	Significance	Confidence
<i>with mitigation</i>	-ve	Low	Likely	Minor	Low
Impact 6: Impact on property values					
- Zone 1 (Athlone and Worlds View)	-ve	Low	Likely	Negligible	Medium
<i>with mitigation</i>	-ve	Low	Likely	Negligible	Medium
- Zone 2 (Clarendon and Wembley)	-ve	High	Likely	Moderate	High
<i>with mitigation</i>	-ve	High	Likely	Moderate	High
- Zone 3 (Pelham and Scottsville Extension)	-ve	Low	Likely	Minor	High
<i>with mitigation</i>	-ve	Low	Likely	Minor	High
- Zone 4 (Bisley)	-ve	Low	Likely	Minor	High
<i>with mitigation</i>	-ve	Low	Likely	Minor	High
- Zone 5 (Oribi)	-ve	Low	Likely	Minor	High
<i>with mitigation</i>	-ve	Low	Likely	Minor	High
Impact 7: Impact on archaeological and heritage resources					
- All proposed developments	-ve	Negligible	Unlikely	Negligible	High
<i>with mitigation</i>	-ve	Negligible	Unlikely	Negligible	High

The concluding recommendation from the EAP is that the project should be implemented in the preferred layout.

This recommendation is based on the following analysis of the full suite of impacts assessed:

- i. None of the impacts on the **biophysical environment** are rated to be of major significance post mitigation. In addition, the project provides for investment (rehabilitation plan) in the ecological infrastructure, notably the aquatic (wetland and stream) systems which are currently degraded and not functioning to optimal levels. This is an important potential positive given that:
 - a. As established in the Msunduzi EMF, water quality is an issue in this catchment and the improved condition of wetlands will assist in managing pollution/run/off from the airport site.
 - b. From a biodiversity perspective the river is an important corridor linking Bisley Nature Reserve, ultimately with the Duzi River. It should be noted that this benefit and conclusion is dependent on the development and implementation of the restoration plan (which is provided for the Precinct Plan).
- ii. The **economic benefits** at a local scale in terms (in terms of employment during construction) and regional economy from the construction of the various elements is also positive, at a significant level in certain instances.
- iii. Importantly, the phase 1 developments will result in the **airport becoming financially sustainable**, thereby alleviating the need for ratepayers to subsidize it.
- iv. There are existing traffic congestion and safety issues. While the expansion will exacerbate these, the **recommended interventions** will address the current issues - **resulting in a net positive outcome**.
- v. In the case of noise impacts only Bisley (and then only a few sensitive receptors in close proximity to the end of the runway on the northerly departure direction) are affected at a significant level. This is again an existing issue. The increased air traffic arising from the expansion won't worsen the situation, but it does/along with the Precinct Plan provide a mechanism for addressing the issue through the proposed mitigation.

- vi. In terms of the **impact on property values**, it is only in the **Clarendon/Wembley area** where the impact is considered **moderate**. Importantly, while the proposed mitigation does not reduce the conclusion for this area, it **does not worsen** either.
- vii. In terms of alternatives considered:
 - a. The **No-go alternative is not a sustainable option in terms of the socio-economic context**, because it does not generate the significant benefits for the local and regional economy that the proposed expansion does. A continuation of the status quo will also not address the financial sustainability of the Airport. Furthermore, apart from a reduced impact on the grassland (and associated biodiversity) which is regionally significant in terms of conservation value, the No-Go alternative does not mitigate any significant issues to any level of consequence. In fact, in several cases, the No-Go option results in the perpetuation of existing negative issues – such as the traffic congestion and safety issues.
 - b. The **preferred road alignment** (Option 1) for the proposed market Road extension is **should be implemented** because it is approximately R30 million cheaper than the alternative (Option 2) which runs in parallel with the service rail line. This also reduces the land required for infrastructural development.

As a summary, the positive economic impacts far outweigh any of the less significant impacts on the receiving social, economic or biophysical components of the environment. In addition, the assessment has highlighted several existing issues and provided improved understanding of these and measures for addressing them.

This statement and conclusions only hold if the recommendations in the following table and the EMPR are implemented.

Table 32 Summary of recommended mitigation and management required to support the impact statement

IMPACT	MITIGATION/ENHANCEMENT
Impact on wetland and aquatic resources	<ul style="list-style-type: none"> - The implementation of the recommended final buffer zones <ul style="list-style-type: none"> • The implementation of the recommended final buffer zones during the construction and operational phases will significantly reduce the likelihood of the development impacting the adjacent aquatic ecosystems through diffuse surface runoff. In order for the buffer zones to function effectively sediment curtains must be used throughout the construction phase. The sediment curtains will need to be placed outside of the buffer zone and constructed parallel to the edge of the buffer. • The sediment curtains in conjunction with the recommended final buffers zones are anticipated to effectively mitigate the increase in sedimentation during the construction phase. The buffer zones are also expected to mitigate other possible inputs, such as nutrients and toxic contaminants, during the operational phase. However, this will be dependent on effective management of the buffer areas. Appropriate management measures include: <ul style="list-style-type: none"> ○ The implementation of an alien invasive vegetation clearing programme; ○ Clearing of all debris and / or litter from the buffer areas and aquatic ecosystems on a regular basis; and ○ The focus of maintaining the buffer area as a strip of natural vegetation (i.e. focus should be on achieving the best possible basal cover for the

IMPACT	MITIGATION/ENHANCEMENT
	<p>buffer areas).</p> <ul style="list-style-type: none"> ○ In the grassland areas, no gardens should be created, mowing needs to be kept to a minimum. • It is important to highlight that the buffers will only be effective at mitigating diffuse surface runoff from adjacent activities and not adjacent point sources discharges or direct impacts in the buffer and/or aquatic ecosystem. Should there be anticipated impacts of this nature, then alternative mitigation measures will need to be investigated. <p>- Develop and implement a wetland and grassland rehabilitation and management plan</p> <ul style="list-style-type: none"> • Rehabilitation of entire remaining wetland systems, which will need to include rehabilitation activities such as clearing aliens, replanting of veg, clearing rubble, erosion control, etc. Given the extent of the loss of wetland habitat it is anticipated that rehabilitation, and not offsets, will sufficiently mitigate the impacts of the proposed development. Therefore, a detailed rehabilitation and management plan is required to be developed, prior to construction, to determine the hectare equivalents of the wetland habitat lost and the appropriate rehabilitation and management measures required to mitigate the impacts. A grassland management plan will also need to be developed prior to construction, as a considerable area of grassland in relative good condition will be lost as a result of the development. Thus the plan is important to ensure that the core grassland habitat within the recommended final buffer zone, and remaining portions of prime grassland habitat, are managed as conservation areas. It is important to note that a portion of the core habitat identified incorporates Irreplaceable CBA areas, which are considered critical for meeting biodiversity targets and thresholds, and which are required to ensure the persistence of viable populations of species and the functionality of ecosystems. <p>- Amendment of the final design of infrastructure to limit the loss of wetland and grassland habitat</p> <ul style="list-style-type: none"> • The final designs for the development need to be amended, where practically possible, to limit the impact to wetlands and grassland. An ecologist needs to be contracted prior to construction, and during the appropriate season (e.g. spring/summer), to undertake a search and rescue operation for floral species that are able to be relocated (this will also provide an opportunity to document additional populations of red list species). • For example: the layout of the hangers and commercial / mixed use development currently within a portion of Wetland 1 should be realigned, if practically possible, to exclude the wetland and buffer zone. In addition, crossing points should be kept to a minimum and be ideally be located at existing crossing points / disturbance points. No excavation of the wetland should be permitted (Roads should ideally not be allowed to traverse a wetland). <p>- Standard pollution control measures and sediment control measures/systems</p> <ul style="list-style-type: none"> • Sediment curtains should be used during construction. These should be placed outside of the recommended buffer zones. Activities within wetlands should be limited. The footprint of activities should be reduced. <p>- Develop and implement an invasive plant management plan</p> <ul style="list-style-type: none"> • The plan should cover all habitats throughout the study area and should be developed for the different phases of the development (i.e. construction and operation). <p>- Develop and implement a storm water management plan</p> <ul style="list-style-type: none"> • Develop and implement a storm water management plan that applies

IMPACT	MITIGATION/ENHANCEMENT
	<p>sustainable urban storm water design principles.</p> <ul style="list-style-type: none"> - Buffer zone management <ul style="list-style-type: none"> • The following management measures must be implemented to reduce the impact of the development and enhance the functionality of the buffer zones. <ul style="list-style-type: none"> ○ Demarcate the recommended buffer zones (e.g. with the use of clearly visible pegs / markers, placed along the edge of the final buffer zones). The buffer areas, other than dedicated crossing points, should be considered ‘no go’ areas during the construction phase. ○ The buffer zones should be managed throughout the construction and operational phases as strips of natural vegetation. Maintaining good basal cover must be the primary focus. Therefore, it is recommended that an alien invasive vegetation clearing programme be implemented to ensure the buffer areas do not become overrun by invasive species, which would likely reduce the basal cover. ○ The municipality should assign responsibility for the maintenance of the buffer areas to ensure they can function effectively throughout the construction and operational phase.
<p>Direct and indirect effects on employment and income (construction phase)</p> <p>Significance of investment in and stimulation of the economy</p>	<ul style="list-style-type: none"> - Finalise a land disposal policy with regard to leasing or selling land within the Airport Precinct. - Approve an incentive package for potential investors in the Techno Hub and Airport Precinct. - Establish responsibility and provide funding for a campaign to market and create awareness of investment opportunities in the Airport Precinct and Techno Hub. - Remove some of the uncertainty surrounding the capital funding of the Project by including it in the Integrated Development Plan (IDP) and Capital Budget as well as actively seeking alternative sources of funding. - Planning should, as soon as possible, move on from high level planning to the identification of specific projects suitable for the designated new development zones. - Accelerate planning approval and funding for the Market Road Extension - Finalise planning for an extended General Aviation zone creating opportunities for private investors requiring additional hangar space. - Promote aeronautical and aviation related activity at the Airport in order to raise revenue and reduce, or eventually eliminate, the Municipal financial subsidy of the airport.
<p>Sustainability of the airport</p>	<ul style="list-style-type: none"> - Approval of a proposal to establish a separate Management Entity to take ownership and control of the Airport Precinct, including the Techno Hub.
<p>Traffic, access, safety and facilities</p>	<ul style="list-style-type: none"> - 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.

IMPACT	MITIGATION/ENHANCEMENT
<p>Aircraft induced noise</p> <p>Impact on property values</p>	<ul style="list-style-type: none"> - Pedestrian and non-motorised transport facilities will have to be provided. - All possible and practical mitigation strategies as guided by the ICAO ‘Balanced Approach to Aircraft Noise Management’. The approach is centred on a balance of four key elements as listed below, with accompanying mitigation options that are viable for this case, some of which are already partially and/or informally in place, or have been included in the Airport Precinct planning process: <ul style="list-style-type: none"> • Reduction at source <ul style="list-style-type: none"> ○ Change in the type of aircraft ○ Noise performance trends of the fleet mix operating at the airport ○ Regular assessment of the Noise performance of aircraft • Land-use planning and management <ul style="list-style-type: none"> ○ Change in land use zoning ○ Planning over time ○ Prevent encroachment of incompatible land use ○ Mitigate noise impact on receiving environment (building codes, noise insulation programmes, land acquisition and relocation, transaction assistance, real estate disclosure, noise barriers) ○ Financial mitigation (capital improvements planning) • Noise abatement operational procedures <ul style="list-style-type: none"> ○ Noise preferential runways ○ Noise abatement departure and approach procedures ○ Ground-based operational procedures • Operating restrictions <ul style="list-style-type: none"> ○ Partial restrictions
<p>Impact on archaeological and heritage resources</p>	<ul style="list-style-type: none"> - Msunduzi Municipality, as the authority responsible for the management of local heritage resources in terms of NHRA Section 8, should apply to Amafa for the declaration of the Pietermaritzburg Aeroclub as a Grade IIB heritage resource. In terms of such grading, internal changes to a building are allowed, but external alterations require a permit from Amafa. The Pietermaritzburg Aeroclub will automatically be subject to zoning scheme controls as soon as its grading is confirmed by Amafa. - Protocol for the identification, protection and recovery of heritage resources during construction and operation, as detailed in the heritage impact assessment report (van Schalkwyk, 2016).

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10. APPENDICES

10.1. APPENDIX 1: EAP Curriculum Vitae

David Cox

Personal Data

Nationality:	South African
ID Number:	7206085158083
Date of Birth:	8 June 1972
Place of Birth:	Port Shepstone, South Africa
Place of Residence:	Nottingham Road, KwaZulu-Natal, South Africa
Marital Status:	Married (3 children)

Education and Professional Training

Institution	Qualifications	Year
University of Natal, Pietermaritzburg S.A.	Masters in Environment & Development <i>(Thesis Title: The Mooi-Mgeni Transfer Scheme: Developing a model for off-site mitigation of wetlands)</i>	1999
University of Natal, Pietermaritzburg S.A.	B Soc Sci (Geography, Law Majors)	1995

Other Training

- GRI Certified Sustainability Reporting 2011
- GRI Indicators Reporting 2011

Key Experience and Expertise

Environmental Planning, Assessment and Reporting

A primary focus area of David's experience is environmental planning, assessment and reporting. He has worked with the full range of Environmental assessment and management tools across the development life cycle. At a strategic level David has been involved in State of Environment Reporting (SoER), Strategic Environmental Assessment (SEA) and he has a keen interest in the interface between development and environmental planning. At a project level David has been involved in feasibility, due diligence and risk assessments for specific projects. He has led numerous Environmental Impact Assessments (EIA) and been responsible for the development and implementation of Environmental Management Plans and Programmes (EMPs). David's experience in such work has been as the project leader. He also has a comprehensive understanding of the relevant regulatory processes, key environmental issues and has managed the stakeholder participation process in the projects he has undertaken. He is experienced in managing large multidisciplinary teams and integrator of specialist inputs.

Institutional Development and Governance

David's training included a legal component which he has applied in work with all spheres of government in improving institutional co-ordination, environmental governance and legal compliance. This experience has involved analysis of the existing institutional structures, roles and responsibilities and co-ordination role-players. He recent projects include the development of National EIA guidelines for social infrastructure projects, a guideline model for improved application of the EIA regulations in relation to local economic development activities by Municipalities, a framework for mitigation banking as a mechanism for wetland conservation in South Africa, and recommendations for the institutional component of the National Biodiversity Strategy and Action Plan. David was also involved in a review of the institutional structure and operation of Resource Use Management Programmes within the provincial conservation organisation. David also provided input to the development of the Province's Environmental Implementation Plan in 2008.

Natural Resources Management

David's master's thesis focussed on wetland assessment and developing a model for off-site mitigation of wetlands. He has built on his experience and skills in the area of natural resources management across terrestrial and water resources with a specific focus on wetlands. His consulting and research projects have involved wetland assessments, the planning of wetland offsets and the investigation of alternative mechanisms for addressing the impact to wetlands, such as mitigation banking. This experience spans consulting and research projects concerned with the development of policy, and tools focussed on improved NRM, with several projects focussed on Integrated Water Resources Management. His general water resource management experience includes several projects focussing on the improved participation of local government in IWRM, and he has undertaken capacity building work with municipalities on IWRM. David's has also worked on several projects which have focussed on the development of decision support tools and mechanisms to facilitate effective integrated water and wetland resources management (IWRM). Examples include incorporation of economic considerations into the determination of the ecological reserve for rivers and the stakeholder consultation component of a protocol for the determination of resource quality objectives for water resources.

Consultation and Participatory Processes

Public participation is a specific requirement of the IEM field. Apart from experience in managing this process in related projects, the majority of David's other work has involved varying degrees of interaction with a wide range of stakeholders including government officials and authorities, rural communities, the private sector and NGOs. Much of this experience is related to work in the Water Sector, notably recent development of the stakeholder consultation component of the national protocol for establishing resource quality objectives for water resources. He has also worked at grass roots levels with affected communities in impact assessments and landowners regarding the implementation of wetland offsets.

Project Management

In his role at the INR, David has been responsible for all aspects of project management, from financial management and final reporting, to co-ordinating large interdisciplinary teams, and being responsible for client liaison and final reporting.

Language Skills

* *underline mother tongue*

** : 1=very good, excellent; 2=good; 3=fair; 4=basic, 5=no knowledge

Language	Speak	Write	Read/Understand
<u>English</u>	1	1	1
Afrikaans	3	3	3

Memberships

IAIAsa (International Association for Impact Assessment, SA affiliation - KwaZulu-Natal Branch: Current Chairman)

Work Experience

Organisation	Institute of Natural Resources
Position June 2008 - present South Africa, KwaZulu-Natal	Principal Scientist Programme Leader: Integrated Environmental Management (IEM) Programme Responsibilities: <ul style="list-style-type: none"> ▪ Generating work through relationship building, writing research proposal, responding to tenders, profiling the organisation and contributing to strategic direction of the organisation. ▪ Guiding the development of the IEM programme. ▪ Research – leader. ▪ Project Management <ul style="list-style-type: none"> - Client Liaison – technical and financial progress reporting. - Management of sub-consultants – preparing terms of reference, managing quality of final products. - Final reporting – preparation of final reporting for projects. ▪ Mentoring of junior staff.
Position	Principal Scientist

Organisation	Institute of Natural Resources
June 1999 – June 2008 Senior Scientist	<ul style="list-style-type: none"> ▪ Generating work through proposal writing and responding to tenders. ▪ Research - leader and analyst. ▪ Project Management <ul style="list-style-type: none"> - Client Liaison – monthly reporting (progress and financial) - Management of sub-consultants – preparing terms of reference, managing quality of final products - Final reporting – preparation of final reporting for projects.

Project Experience

CLIENT	PROJECTS EXPERIENCE
Environmental Planning, Assessment and Reporting	
Industrial Development Corporation	Proposed Forestry Expansion in the Eastern Cape Managed the environmental component of a scoping process for proposed development of 24 projects covering approx. 1500ha. Reviewed existing studies to identify key environmental issues, legal requirements and make recommendations regarding further investigation.
De Beers Consolidated Mines	Compliance Review of Alluvial Diamond Mining, Operations Undertook a review of compliance with conditions of environmental authorisation and environmental management programme for diamond mining operations on the Vaal River in the Northern Cape.
The Planning Initiative/ Ethekwini Municipality	Development of a Functional Area Plan and Draft Scheme for the Tongaat and Inyaninga Areas Responsible for the Environmental Sector report which provided spatial definition of the open space system (OSS), with associated principles and guidelines for defining the open space in the functional area plan. The report also included guidelines for detailed planning and conditions of approvals that give effect to the aim and objectives of the OSS.
Eskom	Development of an Environmental Constraints Framework to inform ESKOM Master Planning Project leader responsible for developing and ECF to inform Eskom master planning for Transmission infrastructure in the North Eastern Region of KwaZulu-Natal. An SEA approach was followed in establishing the environmental opportunities and constraints. The approach considered the major components of the Environment (Social, Cultural, biophysical) in terms of both the impact of the environment on Eskom and the impact of Eskom on the environment.
Virtual Consulting Engineers	Basic Environmental Assessment for the Extension of the Tongaat Trunk Sewer Line Project leader for managing the environmental application and assessment of the extension of the Tongaat Trunk sewer Line to link the King Shaka International Airport and DubeTradePort with the regional Tongaat Waste Water Treatment Works.
uMswathi Municipality	Environmental Management Framework for Mshwathi Municipality. Project leader for development of an environmental management framework for a 20 000ha proposed development node and consolidating the outputs of the Strategic Environmental Assessment into a range of products including Environmental Sensitivity zone and guidelines, Development Planning Guidelines and a strategic environmental management plan designed to address key sustainability issues identified in the SEA.
The Planning Initiative	Environmental component of Rezoning Application for Mount Moreland. Provided environmental input to planning of rezoning application. This input was based on a baseline ecological assessment. Also provided an assessment of the impact of the proposed rezoning application.
Ezemvelo KZN Wildlife	Due diligence Assessment for Proposed Re-development of Royal Natal and Spioenkop Nature Reserves. Responsible for environmental component of a due diligence assessment for the proposed re-development of infrastructure at two nature reserves by the provincial conservation authority.
ACSA	King Shaka International Airport Fuel Storage Facilities: Ground & Surface Water Risk Assessment Responsible for co-ordinating and compiling the risk assessment which was a condition of the authorisation for new KSIA.
Dube-Tradeport	Basic Environmental Assessment for the Proposed Extension of the Tongaat Trunk Sewer Line Responsible for managing the Basic Environmental Assessment process for the extension of bulk sewer line to link the new King Shaka Airport and Dube TradePort to the Tongaat Waste Water Treatment Works.
De Beers Consolidated Mines	Environmental Impact Assessment for proposed Alluvial Diamond Mining Project manager for EIA for proposed mining by De Beers on the Vaal River within Rooipoort Nature Reserve in the Northern Cape Province. Responsible for managing the EIA process, commissioning and co-ordinating specialist input, the public participation process, budget, client liaison and the final reporting.
National Ports Authority	Environmental Impact Assessment - Berth 306 Port of Richards Bay Project manager and lead consultant responsible for providing the following Environmental Services for the Construction of Berth 306 in the Port of Richards Bay:

CLIENT	PROJECTS EXPERIENCE
	<ul style="list-style-type: none"> - Management of the EIA process. - Development of an Environmental Management Plan (EMP) - Development of an Biomonitoring Programme (BMP) - Monitoring and auditing of the implementation of the EMP and BMP - Identification and management of the licensing process for an offshore borrow site.
TPA Consulting/ Department of Transport	<p>Basic Environmental Assessment and Environmental Management of new local access roads in KwaZulu-Natal Midlands.</p> <p>Management of the EIA application and scoping process (including public consultation), development of an EMP and monitoring of compliance during construction. Responsibilities also included management of specialist sub-consultants (heritage impact assessment and ecology), budgets, engaging relevant departments, client liaison and final reporting.</p>
KwaZulu-Natal Agricultural Development Trust	<p>Environmental Impact Assessment – Makhathini Cotton Farming</p> <p>Management of the Environmental Scoping Investigation for the proposed development of 2500ha irrigated agricultural estate on the Makhathini Flats. Preparation of application, commissioning specialist studies, management of budget and public participation process, and production of environmental scoping report.</p>
Sappi-Saiccor	<p>Environmental Impact Assessment - Temporary water Storage scheme on the Mkomazi River</p> <p>Management of scoping investigation into impacts associated with two temporary barrages on the Mkomazi River, aimed to ensure the supply of water to Sappi-Saiccor during drought periods. Responsible for management of specialist investigations and compilation of biophysical component of the environmental scoping report.</p>
Impala Irrigation Board	<p>Environmental Management of Paris Dam</p> <p>Member of team managing the environmental component for the development of Paris Dam by Impala Irrigation Board and DWAF. Duties include the preparation of an environmental management plan, developing rehabilitation plans and monitoring their undertaking. Also managed the team of specialist responsible for compiling the environmental operating rules and monitoring programme.</p>
Traffic and Transportation Department, eThekweni Municipality	<p>KwaMashu-Effingham Link Road: A Comparative economic, social and environmental assessment of alternative alignments through the Kenville area</p> <p>Managed a team who investigated the environmental, social and economic costs of two alignments through a residential area so as to advise a decision regarding the most suitable alignment. Responsibilities included commissioning specialist input, identifying impacts and issues and establishing costs and mitigation options for each. Collating information into a report, which compared the total environmental and social costs of the two alignments.</p>
Cathedral Peak Hotel	<p>Environmental Management Plan for Cathedral Peak Hotel</p> <p>Development of an EMP for the CPH which is a 400 hectare property located within the UkhuhambaDrakensberg World Heritage site. The EMP was required for the hotel to meet legal requirements pertaining to overall operation.</p>
Imani-Capricorn	<p>Assessment of environmental impacts of proposed infrastructural and tourism ventures along the Transkalagadi highway in Botswana</p> <p>Assessment of the environmental impacts associated with proposed infra-structural and tourism ventures along the Transkalagadi highway in Botswana.</p>
Environmental Impact Manage- ment Services	<p>Peaking Power Plant EIA: Ecological Assessment</p> <p>Provide consolidated ecological assessment (terrestrial and aquatic) for a proposed peaking power plant for two proposed sites near Durban, South Africa. Responsible for managing and integrating specialist studies (Aquatic and terrestrial), compiling consolidated report and managing the budget and client interactions.</p>
Development Bank of South Africa /Imani-TMT Consortium	<p>The C2C Corridor Development and Transport Study of Trans-Kalahari Highway</p> <p>Provided an assessment of environmental impacts as part of the feasibility study for the proposed tarring of the Trans-Kalahari Highway.</p>
ENVIRONMENTAL GOVERNANCE	
National Department of Environmental Affairs	<p>Development of EIA Guidelines for Social Infrastructure Projects</p> <p>Key team member responsible for developing a guideline to improve the efficiency and effectiveness of the EIA process as it relates to social infrastructure development. The guideline highlighted the importance of considering environmental issues in the planning phases, the EIA process, and the post environmental authorisation phase which is often overlooked. The guideline also focussed on better alignment of the EIA and other relevant regulatory processes, which is one of the key challenges in achieving compliance with the legal framework.</p>
Uthungulu District Municipality, KwaZulu-Natal	<p>Development of a Model to Streamline the EIA Process for Local Economic Development Projects in the Uthungulu District Municipality</p> <p>Project Leader responsible for development of a model that addresses the barriers and limitations of the EIA and other regulatory processes on the implementation of Local Economic Development Projects by municipalities. The Uthungulu District Municipality served as the pilot area.</p>
Department of	<p>Alignment of the application processes for Agricultural Activities under the Agricultural (CARA) and Environmental</p>

CLIENT	PROJECTS EXPERIENCE
Agriculture and Environmental Affairs	<p>(EIA Regulations) Legislation</p> <p>The project aimed to improve the alignment between the legal processes governing the authorisation of agricultural activities. This involved stakeholder consultation and a legal review to determine the legal, institutional, logistical and broader issues resulting in illegal development and tension between role players (government, agric sector and environmental organisations). The outcomes included a model to ensure legal compliance, improved institutional and logistical efficiency and alignment of decision making between relevant authorities.</p>
South African Department of Environmental Affairs and Tourism	<p>National Biodiversity Strategy and Action Plan – Institutional Component</p> <p>The NBSAP set out a framework and plan of action for the conservation and sustainable use of the country's biodiversity. Responsible for stocktaking and assessment phase of the institutional component. This included a review of documentation and consultation with key role players in government and other relevant institutions. The information and feedback was analysed to identify key institutional issues and challenges against which recommendations were provided that informed the final outcome - action plan.</p>
DAEA	<p>KwaZulu-Natal State of the Environment Report</p> <p>Part of a team responsible for developing indicators for reporting on the status of the terrestrial environment (land and biodiversity) in the province. Responsibilities included collection, analysis and presentation of data for indicators associated with different terrestrial environments, as well as final main and relevant chapters of summary report.</p>
Department of Agriculture and Environmental Affairs	<p>Initial review of Section 24G Review applications</p> <p>Co-ordinated a review and analysis of over 800 applications for illegal development activities. Established and analysed a database of applications. Responsible for final report with recommendations to client for dealing with administrative inaccuracies and finalising the applications in terms of legal framework.</p>
NATURAL RESOURCE MANAGEMENT	
European Union	<p>Afromaison - Africa at meso-scale: adaptive and integrated tools and strategies for natural resources management</p> <p>Key team member responsible for developing INRM strategies for the South African Case Study area - the Uthukela District. A major focus was on integrating the research outcomes into practical application through appropriate planning instruments in the District, notably the Environmental Management Framework. An important focus of this work was the institutional alignment required to achieve integration.</p>
Trans-Caledon Tunnel Authority	<p>Mooi Mgeni Transfer Scheme Phase 2: Spring Grove Dam Wetland and Biodiversity Offsets</p> <p>Responsible for the planning of offsets to account for the loss of wetland, river and terrestrial habitats inundated by Spring Grove Dam. This involved a review of the loss within the basin and setting of offset targets in terms of offset policy.</p>
Isimangaliso Wetland Park Authority	<p>Development, Empowerment and Conservation in the Isimangaliso Wetland Park and Surrounding Region</p> <p>Part of a team responsible for a scoping investigation to identify the current state of the catchments and associated issues responsible for decreased freshwater supply to the Estuarine system. Responsible for catchment management specialist investigation and integrated report combining hydrology, geomorphology and literature review.</p>
European Union	<p>LoGo Water: Towards the effective involvement of Local Government in Integrated Water resources Management within the River Basins of the SADC Region</p> <p>The project involved collaboration between SADC based and European researchers and involvement of associated local governments within the 4 riparian states of the Limpopo River Basin. The research component was concerned with identifying and documenting the state of LG involvement in the SADC region, the limitations and barriers to improved involvement of LG and the development of a range of outputs (including tools and guidelines) aimed at overcoming the challenges and issues identified. The project also involved various awareness raising events including a regional workshop and international seminar.</p>
DWA	<p>Development of a Protocol for the Determination of Resources Quality Objectives for Water Resources</p> <p>Part of a team responsible for developing the protocol for setting RQO's for all water resources in line with the national water act and water resource classification and reserve determination processes. David was responsible for the stakeholder consultation component of the project.</p>
Water Information Network Southern Africa	<p>Promoting the understanding of Integrated Water Resources Management (IWRM) Among Local Governments in the context of Water for Growth and Development</p> <p>The aims of the project as per the title was achieved through a process involving a workshop and learning journey. Responsibilities included the development of the workshop structure and content, development of background and supporting materials, facilitating the workshop proceedings, and drafting of a record of proceedings, project report and article summarising the event and key issues relating to the topic of IWRM and municipalities.</p>
Water Research Commission	<p>Assessing the Appropriateness of Wetland Mitigation Banking as a Mechanism for Securing Aquatic Biodiversity in the Grassland biome of South Africa</p> <p>The project involved a review of the mitigation banking concept as implemented in other countries (notably the USA) and an analysis of the strengths and weaknesses of the concept from the legal, institutional and ecological perspective. An analysis of the appropriateness of the concept to South Africa resulted in a proposed model considered appropriate for the local institutional and legal framework, with recommendations for avoiding the risks</p>

CLIENT	PROJECTS EXPERIENCE
	and harnessing the benefits associated with the mechanism. The final output was the identification of a pilot catchments and projects to pilot the proposed model and a broad framework for implementing the pilot.
Water Research Commission	Incorporating Economic Considerations in the Determination of the Environmental Reserve for Rivers Member of a team concerned with evaluating the use of a resource economics approach in contributing to the determination of the ecological reserve as described in the National Water Act, No 36 of 1998. The team developed a framework for incorporating economic considerations, developed and tested methods for valuing the ecosystem goods and services provided by Crocodile River in Mpumalanga South Africa.
DWAF/ Umgeni Water	Spring Grove Dam EIA - Specialist Investigation into the Impact on Wetlands and Associated Crane Populations Responsible for the investigation into the impact of the dam on wetlands and affected crane populations. Also required to make recommendations regarding for recommendations implementing off-site mitigation of wetlands within the catchment.
Water Research Commission	Off site mitigation for Wetlands Inundated by Spring Grove Dam Specialist investigation: responsible for identifying wetlands and securing agreement from landowners to rehabilitate degraded wetlands. This required mapping and assessing wetlands, landowner consultation, development of rehabilitation, monitoring and maintenance plans.
Department of Water Affairs and Forestry	Thukela Water Project Managing the environmental component of the Thukela Water Project for the feasibility level investigation. This role involved integration of specialist studies on the biophysical impacts, including the geomorphology, hydrology and aquatic studies into the main environmental feasibility report.
DAEA	Assessment of the impact of dumped boiler ash and rubble on a wetland in Willowton, Pietermaritzburg Quantified the loss of wetland area and the impact on ecological functioning and water quality in the surrounding environment from illegally dumped boiler ash and rubble. Assessed the significance of the impact and provided recommendations regarding potential mitigation and future management.
Department of Environmental Affairs and Tourism	National Wetland Inventory – Pilot Study Member of team tasked with investigating the most economical method of mapping the country's wetlands to a set level of detail.
DWAF	Identification of Candidate Wetlands for Rehabilitation in the Mearns Dam Basin Identification of wetlands suitable for rehabilitation and to recommend measures for implementing rehabilitation. Also required to make recommendations regarding management measures for protecting those wetlands identified as being in good condition.

Publications

Cox, D. Burger, B and Quayle, L. 2011. *The Contribution of SEA to Improved Corporate Environmental Governance: The example of an Environmental Constraints Framework for Project Planning in Eskom Distribution's Eastern Region*. IAIAA Conference 2011.

Cox, D and Pringle K. 2010. *Development of a Model to Support Local Government in the Efficient and Effective Application of the Environmental Impact Assessment Process*. IAIAA Conference 2010.

Cox, D and Kotze, D. 2008. *Mitigation banking as a mechanism to inform project level decision making and facilitate effective biodiversity offsets for wetlands: Analysis of a proposed model for South Africa*. IAIAA Conference 2008.

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Philip, R, Anton, B. Cox, D. Smits, S, Sullivan, C. A, Chonguica, E, Monggae, F. Nyagwambo, L. Pule, R, Berraondo López, M. 2008. *Local Government and Integrated Water Resources Management (IWRM) Part II: Understanding the Context – The Role of Local Government in IWRM*.

David has authored in excess of 50 consultancy reports and associated documents during his 15 years in the field.

References

Mr Ian Felton

Assistant Manager: Environmental Planning
uMgungundlovu District
Environmental Services
Department of Agriculture, Environmental Affairs &
Rural Development
P/Bag X07; CASCADES; 3202
Phone: 033 - 347 1820
Fax: 033 - 347 1826
E-mail: ian.felton@kzndae.gov.za

Mr Bruce Burger

Bruce Burger
Environmental Management Advisor
Phone: 031-710 5386
Mobile: 084 22 333 57
Pax. 8321-5386
Fax. 031-710 5146
E-mail: BurgerBJ@eskom.co.za

10.2.APPENDIX 2: EIA Phase Comments and Response Register

The table to follow documents the comments and responses received during the EIA Phase (thus far) of the assessment. Comments on the Draft EIR accompanying reports will be added to this register during the 30 day comment period. The full Scoping and EIA phases C&RR is available as Appendix 20 to the PPP Report. This includes the records of the comments received (either via email or comment slips).

COMMENT/QUERY	RESPONSE
SOCIO-ECONOMIC ENVIRONMENT	
<p>1. Noise and property impacts, flight prices, Techno-Hub and Airport expansion <i>[Nigel Berjak, Clarendon]</i></p> <ol style="list-style-type: none"> 1. Noise pollution with increase frequency of flights is a big problem for those of us who reside in these areas. It is already noisy when a flight comes in. Perhaps alternatives should be looked at i.t.o. flight path angles. 2. The comment regarding the cost of flights: the cost of flights is primarily high, from the invoices I have had when flying from PMB, due to the airport taxes, not the airline. 3. Property values within the flight path need to be addressed by the municipality and reduced rates applied. 4. I would like to see the study that indicates that PMB is ' for the already exponentially increasing passengers'. Exponential needs to be clarified as the use of the term is either incorrect or very concerning! The projection of numbers flying in must be shown and the accompanying study available to be scrutinised by the IAP. 5. The IAP meeting notes indicate that Cape Town would not be a provided route due to the length of trip possible of the planes that will be able to be operated from the same length runway. Did I read this incorrectly? 6. Please advise what the Techno Hub is going to consist of as I cannot see this within the meeting minutes nor discussion. Please also advise which companies have indicated their desire to operate the 'Technology' businesses from the airport, from the feasibility study. 7. The meeting notes indicate that the municipality is going to relinquish ownership of the airport to a new company, of which is will be a shareholder. Who are the other shareholders going to be? Are these local companies who could benefit or simply foreigners who have no value in our city, other than making their own money. Also, please advise to what extent foreign investors are going to be reinvesting money to the overall city, rather than simply within the airport and taking the money out of the country. 	<ol style="list-style-type: none"> 1. A Noise Impact Assessment has been conducted for the areas along the flight paths (which includes Clarendon). Please refer to section 7.6. <i>Social Environment</i> of the Environmental Impact Report (EIR), as well as the <i>Environmental Noise Impact Baseline Assessment and Impact Prediction</i> specialist report. Alternative flights path/s were assessed by Air Traffic Navigation Services (ATNS). Please refer to section 5.9.7 <i>Alternative Flights Paths</i> of the EIR. 2. Airlink have the monopoly (they are the only airline) and therefore the prices do not need to be competitive. According to Airport Management - the municipality charges R92.10 passenger levy on departing Airlink flights. Arrivals have no passenger levy charge. Airport taxes imposed on the passengers are determined by Airlink and the municipality has no control over the fee. 3. A Property Valuation Assessment has been conducted for the areas along the flight paths (which includes Clarendon). Please refer to section 7.6. <i>Social Environment</i> of the Environmental Impact Report (EIR), as well as the <i>Property Valuation Assessment</i> specialist report. Please refer to comment 28 (bullet 2) above. 4. Please refer to section 4. <i>Project Context, Need and Desirability</i> of the EIR. 5. At the time of focus group meeting, that was a correct understanding. However, the practitioner has since consulted with Airlink who have indicated that is it likely they will add a daily Cape Town flight to their schedule in the future. Please refer to Appendix 3: <i>Public Participation Process (PPP) Report</i> of the EIR - Appendix 17 of the PPP Report provides the minutes of the communication with Airlink. 6. Please refer to Section 5.6.7: <i>Technology-Hub</i> of the EIR for detail on the Techno-Hub. Letters of Intension to enter into lease negotiations for sites within the Techno-Hub site have been received from the Durban University of Technology (DUT) (Aviation Academy), Adept Airmotive (design and installation of light aircraft engines), Raptor Aero Logistics (design and manufacture of remotely piloted aircraft systems), and Royal Haskoning (Multi-sports complex with velodrome). These are not

COMMENT/QUERY	RESPONSE
	<p>formal contracts/agreements, but rather demonstrate indicative interest.</p> <p>7. Please refer to section 5.8 <i>Institutional Structure of the EIR.</i></p>
<p>2. Rezoning of Area Surrounding the PMB Airport <i>[Terence Talbot, Business Sector]</i> Will Oriibi Road be re-zoned to commercial?</p>	<p><i>[Tony Markewicz, The Markewicz Redman Partnership]</i></p> <ul style="list-style-type: none"> - The Draft Precinct Plan indicates that a change of use to limited business along major access routes running through the area could be entertained but the change should not impact negatively on surrounding areas or on the functionality of the major access routes it is located on (“Limited business uses could be entertained along major access routes but should not impact detrimentally on neighbourhood functionality or quality and public transport routes”). Please note that the Precinct Plan is still in Draft form and has not been approved by Council.
<p>32. Flight Corridor, and Noise Assessment <i>[Liz Dralle, Upper Wembley resident and Upper Wembley Residents Association representative]</i></p> <ol style="list-style-type: none"> 1. I would like to put it on record, for the Oriibi Airport Expansion EIA, that a plane just flew over our home at 11:15pm tonight. Please confirm this with the airport and include in your associated EIA Reports for assessment in light of previous comments noting that flights do not occur at this time of night. Further, please ensure that the Noise Specialist takes cognizance of this information in her assessment of noise impacts. 2. Lastly, Martin Flavell, the Chairman of the Upper Wembley Residents Association, has requested that I represent our association in terms of the EIA. Therefore, please consider all comments made previously, and all future comments to be made on the EIA, to be on behalf of the Upper Wembley Residents Association, as well as in my personal capacity. 	<ol style="list-style-type: none"> 1. In response to your query regarding the flight on Friday night, the Airport Manager and Air Traffic Navigation Services (ATNS) have provided the following response. “On Friday we had adverse weather conditions in KZN. Hence there were excessive delays with our flights on that particular day. That flight was a delayed Airlink flight which usually lands at 19:30. They [Airlink] are allowed to land at that time, with prior arrangement.” (Airport Manager) It is reiterated that even though the airport tower closes at 20H00, there are anomalies where commercial flights are delayed due to weather conditions, or when mercy flights need to use the airport. These are rare cases but they do occur, as has been previously mentioned. The airport is open for anyone 24hours, although is an unmanned airfield after the tower closes. 2. <i>Noted.</i>
<p>33. Flight Corridor, and Noise and Property Assessments <i>[Craig Mitchell, Wembley resident]</i></p> <p>With reference to the proposed expansion of the Oriibi Airport please can you add me to your list of interested and affected parties as I am a resident in Wembley and share the concern of many of the other residents In the area that the expansion of the airport will increase the number of flights over our area which will decrease the value of our property and increase the potential pollution (noise & other).</p> <p>Many thanks and I trust this matter will be fully investigated as part of the EIA process and an alternate flight path which does not impact negatively on the residents of the greater Wembley area identified.</p>	<ul style="list-style-type: none"> - You have been added you to our Interested and Affected Parties (I&APs) database. - In response to your comments, please note the following: <ul style="list-style-type: none"> o A Noise Impact Assessment and Property Valuation Assessment have conducted as part of the EIA, which include the suburb of Wembley. Please refer to section 7.6. <i>Social Environment</i> of the EIR, as well as the relevant specialist reports. o Flight paths alternatives were assessed as part of the process, please refer to section 5/9/7/ <i>Alternative Flight Paths</i> of the EIR. o Please visit our webpost for further information of the process - http://inr.org.za/scoping-and-eia-for-the-proposed-expansion-of-the-pietermaritzburg-airport-2/

10.3.APPENDIX 3: Letter from EDTEA Confirming Acceptance of Environmental Scoping Report



edtea

Department :
Economic Development, Tourism and
Environmental Affairs

PROVINCE OF KWAZULU-NATAL

Enquiries: Reka B-Kalicharan
Reference: DC22/0036/2016
Date: 18 October 2016
Physical Address: 8 Warwick Road, Cascades
Tel: (033) 347 1820, Fax: (033)347 1826
Postal Address: Private Bag X07, Pietermaritzburg, 3202
www.kznded.gov.za

Directorate: Environmental Services: uMgungundlovu District

Institute of Natural Resources NPC
P. O. Box 100396
Scottsville
3209

Attention : Mr. David Cox / Ms. Sian Oosthuizen
Telephone Number : (033) 346 0796
Fax Number : (033) 346 0895
Cell Number : (082) 333 8341 / (076) 656 8880
Email Address : dcox@inr.org.za / soosthuizen@inr.org.za

cc: Mr. David Gengan - Msunduzi Municipality, Tel: (033) 392 2600, Fax: none provided; E-mail: david.gengan@msunduzi.gov.za

Dear Sir/s/Madam

RE: DC22/0036/2016: ACCEPTANCE OF THE SCOPING REPORT FOR PROPOSED PIETERMARITZBURG AIRPORT EXPANSION ON REMAINDER OF ERF 10 000 AND ADJOINING PROPERTIES VIZ. REM OF ERF 870, ERF 10 159, REM OF ERF 1589 AND PORTION OF ERF 1910 LOCATED WITHIN MSUNDUZI LOCAL MUNICIPALITY, UMGUNGUNDLOVU DISTRICT.

1. The Final Scoping Report (FSR) for the abovementioned activity, submitted in terms of the requirement of Regulation 21(1) of the Environmental Impact Assessment (EIA) Regulations, 2014, was received by the Department of Economic Development, Tourism and Environmental Affairs (herein referred to as "this Department") on 26 September 2016.
2. Following a review of the FSR and a site inspection conducted on 05 October 2016, this Department advises in terms of Regulation 22 of the EIA Regulations, 2014 that the FSR is accepted subject to the following conditions:
 - 2.1 All aspects raised at this Department's site inspection must be adhered to viz. all activities being applied for must be assessed and mitigated for especially with regard to watercourse crossings. In this regard the Watercourse crossings must be reflected on a layout plan and referenced accordingly for e.g. WC1, WC2. The GPS Co-ordinate/s of the watercourse crossing/s must be provided (in degrees, minutes and seconds format) and the type of structure to be implemented at the crossings must be specified e.g. 2 x 900mm diameter pipes or bridge type and specifications.

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- 2.2 In respect of the various new access points proposed – these must also be reflected on a layout plan and referenced accordingly for e.g. Access 1, Access 2. Details and location of each new proposed access road viz. start and end point co-ordinates, length, (proposed width or type of access point etc.) must be specified.
 - 2.3 Whilst the project description indicates the various components of the proposed development, the proposal must be elaborated to include details in respect of the estimated extent/size of the components; the length/width of access routes. Additionally, the proposed development must be linked to a concept layout plan that illustrates the various aspects outlined above.
 - 2.4 The Wetland Assessment Report (undertaken by Institute of Natural Resources, dated August 2011) conducted is to be used as an interim assessment and it is noted that a wetland assessment has been identified in the Plan of Study for EIA (PoSEIA) and will be expanded on to include assessment of areas due to road expansions and to inform feasible buffer widths etc.
 - 2.5 Due to the significant concerns raised by interested and affected parties (I&AP) and the proximity to sensitive receptors viz. residential areas, educational facilities and place of worship; the Department requires that a Phase 2 Noise assessment be undertaken which must include modeling of various scenarios of increased aircraft traffic and noise impacts associated with the airport development and its operations.
 - 2.6 Where the development concept includes high density multi-storey development a Visual Assessment must be included in the PoSEIA. In this regard the current height restrictions enforceable by the Msunduzi Municipality land use schemes must be used as a guide.
 - 2.7 All specialist studies undertaken must meet the requirements of Appendix 6 of the EIA Regulations, 2014 and the final Environmental Impact Assessment report (EIAR) must meet the requirements of Appendix 3 of the EIA Regulations, 2014.
- 3 The applicant must amend the Plan of Study for Environmental Impact Assessment (PoSEIA) to include the above requirements of this Department where applicable and proceed with the tasks contemplated in the amended PoSEIA.
 - 4 A final EIAR is required to be submitted within 106 days from this acceptance letter. Should the applicant fail to meet this prescribed timeframe and the Department does not receive a final EIAR by 22 February 2017 then in terms of regulation 45 of the EIA Regulations, 2014 the application is likely to lapse and be withdrawn.
 - 5 Please note that the activities applied for may not commence (including site preparation and other action on the site) prior to an Environmental Authorisation being granted by this Department.
 - 6 All enquiries regarding this application may be directed to **Reka, B-Kalicharan**.

Yours sincerely



For: Head of Department
Department of Economic Development, Tourism and Environmental Affairs