

AERODROME FUNCTIONS, CHALLENGES AND OPPORTUNITIES WITHIN THE NORTH WEST AVIATION SYSTEM

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ABSTRACT

Individual aerodromes support different types of aviation functions and activities, and thereby contribute to the overall operational capacity and efficiency of the bigger aviation system.

The functions of an aerodrome can include commercial air transport services (both scheduled and / or unscheduled services) and general aviation. General aviation is all civil aviation operations other than scheduled air services and non-scheduled air transport operations for remuneration or hire and include non-commercial business aviation, instructional flying, pleasure flying and aerial work.

Aerodromes providing general aviation operations are faced with various challenges ranging from lack of funding for infrastructure maintenance, compliance to licensing conditions, contractual arrangements with the owner of the aerodrome (typically a municipality) and property issues.

The North West Province is home to 13 licensed aerodromes and six registered aerodromes. Of these, four airports receive scheduled commercial services, with the remainder providing a general aviation function.

The North West Department of Community Safety and Transport Management developed an Aviation Master Plan for the province during 2018. This plan considered the role played by each aerodrome within the provincial and regional aviation system. The plan also identified the typical challenges faced by aerodromes and opportunities for maintaining and growing the general aviation market.

This paper presents a view on the functions of licensed and registered aerodromes in North West Province as part of a bigger aviation system and considers the main challenges and key opportunities for specifically the general aviation focused aerodromes in the province.

1. INTRODUCTION

The North West Province has an extensive network of licensed, registered and unregistered aerodromes¹. These aerodromes serve a variety of functions such as commercial air transport services (scheduled and unscheduled, domestic and international

¹ A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft (ICAO, 2013).

passenger services) to the general public, non-commercial business services and aerial work related to specific economic activities (e.g. agriculture, mining, manufacturing, tourism), aviation training and recreational aviation activities.

Air transport is one of various modes facilitating the movement of passengers and freight from one point to another (the others are road, rail, maritime and pipeline). The planning of air transport infrastructure and services therefore needs to consider its role within the bigger transport environment, to address specific needs and markets (most suitable to air transport) and ensure sustainable investment in air transport. Typically, air transport will focus on commodities that have low volume (passengers, smaller freight), higher value and where the travel distance is long.

Considering the above, the North West Department of Community Safety and Transport Management developed an Aviation Master Plan for the province during 2018. This plan considered the role played by each aerodrome within the provincial and regional aviation system. The plan also identified the typical challenges faced by aerodromes and opportunities for maintaining and growing the general aviation market.

2. METHODOLOGY

The objective of the Aviation Master Plan is to provide a framework defining the function (role) of each airfield within the context of the provincial and regional air transport market and guiding future infrastructure development and service delivery that is in line with its function and that will cost-effectively satisfy aviation demand while considering potential environmental and socioeconomic impacts.

The study was structured into five phases:

- Understanding the context of the aviation sector in the province.
- Status quo assessment of aerodromes.
- Demand forecast and future role.
- Needs assessment and option development:
 - Maintenance plan.
 - Financial needs.
 - Management model.
- Developing the Master plan.

3. CONTEXT

3.1 Demography and Economy

The North West Province consists of four district municipalities (Bojanala Platinum, Ngaka Modiri Molema, Dr Ruth Segomotsi Mompati and Dr Kenneth Kaunda) and 18 local municipalities. The capital of the province is Mahikeng, located in the Ngaka Modiri Molema district municipality.

The population of the North West Province is approximately 3.6 million people (2013 estimate) (Statistics South Africa, 2013) with large settlements in Rustenburg, Brits, Klerskorp, Potchefstroom and Mahikeng. The economy in North West Province is typical of a province which is predominantly rural and includes agricultural, industrial/manufacturing, mining and tourism.

Key economic activities of the province (primary and secondary sectors) include the following:

- Agriculture: Maize, sunflowers, vegetables, wheat, poultry and livestock.
- Mining: PGM (platinum group metals), gold, stone, limestone and chrome.
- Manufacturing: Cement, animal feed, ferrochrome and processed foods.

3.2 Aviation Legislative and Regulatory Context

The legislative and regulatory context of aviation (and particularly aerodrome management and operation) is of particular salience, as it determines the rights, responsibilities, and procedural implications surrounding the licensing and operation of airports in South Africa.

The following policy instruments are of particular relevance and were reviewed as part of this study:

- White Paper on National Transport Policy, 1996 (Department of Transport, 1996).²
- Moving South Africa – the Action Agenda, 1999 (Department of Transport, 1999).
- White Paper on National Civil Aviation Policy, 2015 (Department of Transport, 2015).
- The Constitution of the Republic of South Africa, 1996 (Act No.108 of 1996).
- The Civil Aviation Act, 2009 (Act No. 13 of 2009).
- The Civil Aviation Regulations (SA-CARs or CARs).
- Annexes to the Convention on International Civil Aviation, 1944 (Chicago Convention), specifically Annex 14, Volume 1 (Aerodrome Design and Operations).

3.3 Functions of Aerodromes

ICAO provided a classification system in 2009 to give clear definition of civil aviation activities, for statistical and planning purposes. The system broadly classifies civil aviation activities into commercial air transport services, general aviation, airport services, air navigation services, civil aviation manufacturing, aviation training, maintenance and overhaul, as well as regulatory functions and other activities (see Figure 1).

The Master Plan adapted the classification system presented above, and in specific the first two classes (commercial air transport services and general aviation) with all of its sub-classes, for the functional classification of aerodromes in the North West Province.

3.4 Targeted Airport Development Trends

A number of development trends at airports are of relevance to the master plan, such as the development of aerospace supplier parks, training focussed facilities, aerotropolis and special economic development zones.

4. STATUS QUO OF AERODROMES IN NORTH WEST PROVINCE

4.1 Aerodromes in North West Province

The Master Plan focussed on the aerodromes in the North West Province listed as licenced aerodromes in the Airports Information Publication (AIP) (Civil Aviation Authority, 2005), as well as the Madikwe Game Reserve aerodromes (due to them accommodating scheduled flights).

² The updated White Paper on National Transport Policy was not yet available at the time of conducting this study.

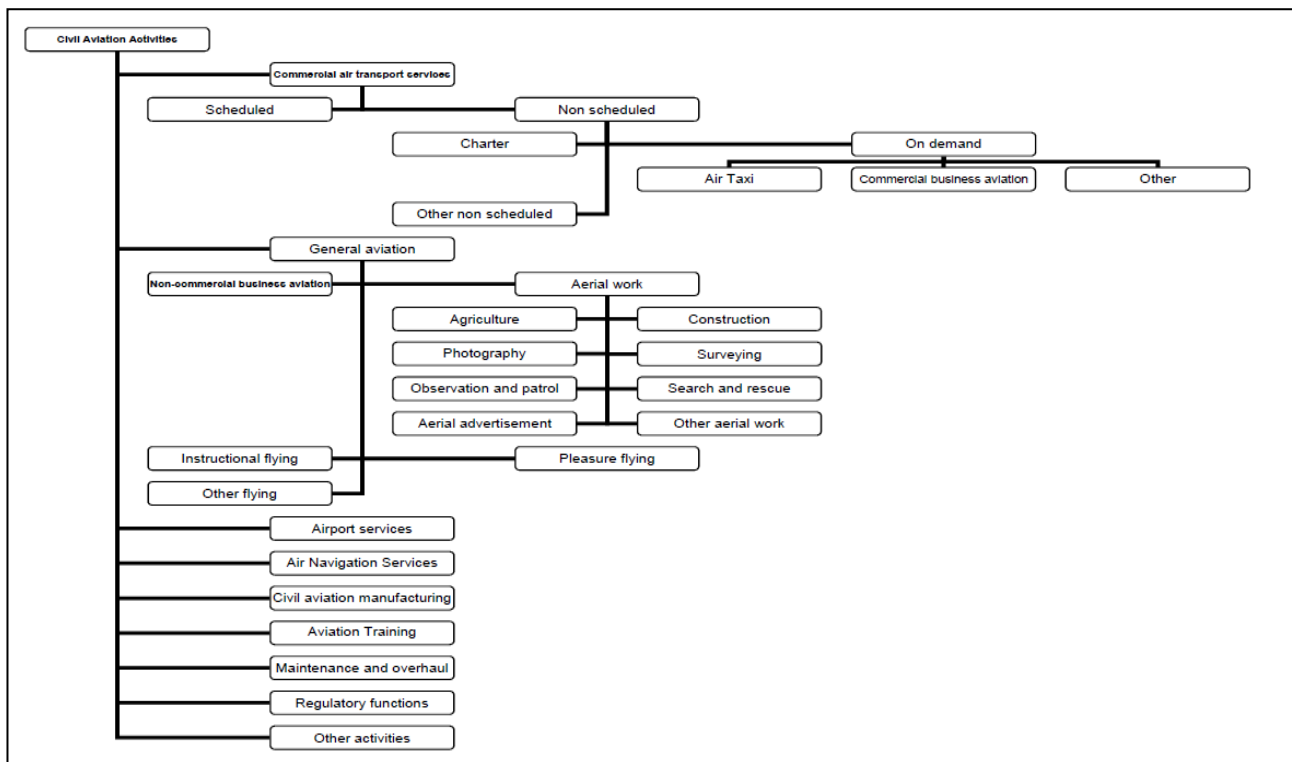


Figure 1: ICAO classification of civil aviation activities, (ICAO, 2009)

The licenced (13) and registered (6) aerodromes in the province are shown in the map in Figure 2³.

4.2 North West Province Aerodrome Functions

The ICAO classification system was used to classify the aerodromes in North West Province according to their functions, as summarised in Table 1 below. This table also indicates for which functions and at which airports future opportunities were identified.

4.3 Summary of Main Issues

The main issues that were identified during the status quo analysis were the following:

- Maintenance backlog. This ranged from maintenance needs related to pavements (runways, taxiways, aprons), fencing, lighting and buildings.
- Ownership and property issues. Potchefstroom Airport experienced uncertainty on the role and rights of the SANDF at the airport, due to the stipulations of the Defence Endowment Property and Account Act. Pilanesberg International Airport had land claims on portions of the airport property.
- Lease agreements. A number of airports did not have valid lease agreements with the operators of the airports.
- Airport licensing. Some airports had their licenses revoked in recent years.

A number of opportunities were also identified from the status quo analysis with regards to commercial air transport services (scheduled, unscheduled, freight), aerial work (agricultural), recreation, training, aircraft maintenance, and land development (training focussed facilities and aerospace supplier parks).

³ Vryburg Aerodrome and Schweizer Reneke Airfield were, during the course of the study, found to be not licensed anymore.

Table 1: Main functions of aerodromes in North West Province

Function	Main airports (current)	Future opportunities⁴
Commercial air transport services	George Dick Montshioa Airport ⁵ , Pilaesberg International Airport, Madikwe East Airfield, Madikwe West Airfield	George Dick Montshioa Airport (expansion of current services), PC Pelsler Airport
Non-commercial business travel	Lichtenburg, Pilaesberg International, Rustenburg, Brits, Potchefstroom and PC Pelsler airports	
Aerial work, agricultural activities	Lichtenburg, Delareyville, Schweizer-Reneke, Brits, Aviator's Paradise and Potchefstroom airports	Vryburg aerodrome
Aerial work, community services	Potchefstroom Airport, PC Pelsler Airport	
Instructional flying	George Dick Montshioa Airport, Brits, Rustenburg, Potchefstroom (specifically gliding) and PC Pelsler airports	Lichtenburg Airport, Vryburg aerodrome
Pleasure flying (recreational)	Rustenburg, Brits, Aviator's Paradise, Potchefstroom and PC Pelsler airports	Vryburg aerodrome
Pleasure flying (air shows)	Brits Airport, PC Pelsler Airport	
Aircraft maintenance services	George Dick Montshioa Airport	Lichtenburg Airport, and PC Pelsler Airport or Potchefstroom Airport
Refuelling facilities	Pilaesberg International, Rustenburg, Brits, Potchefstroom and PC Pelsler Airport	George Dick Montshioa Airport, Lichtenburg Airport
Military function	Potchefstroom Airport	
Targeted airport developments (training focused facilities)		George Dick Montshioa Airport, Brits Airport, Rustenburg Airport, Potchefstroom Airport, PC Pelsler Airport
Targeted airport developments (aerospace supplier parks, aerotropolis)	Potchefstroom Airport	George Dick Montshioa Airport, Potchefstroom Airport (expansion of current services)

5. DEMAND FORECAST

An assessment was done of the expected future demand at aerodromes, taking into account expected growth as well as their function. The expected demand, as in 2030, is indicated in Figure 3.

⁴ As identified through discussions with stakeholders

⁵ Previously Mafikeng Airport

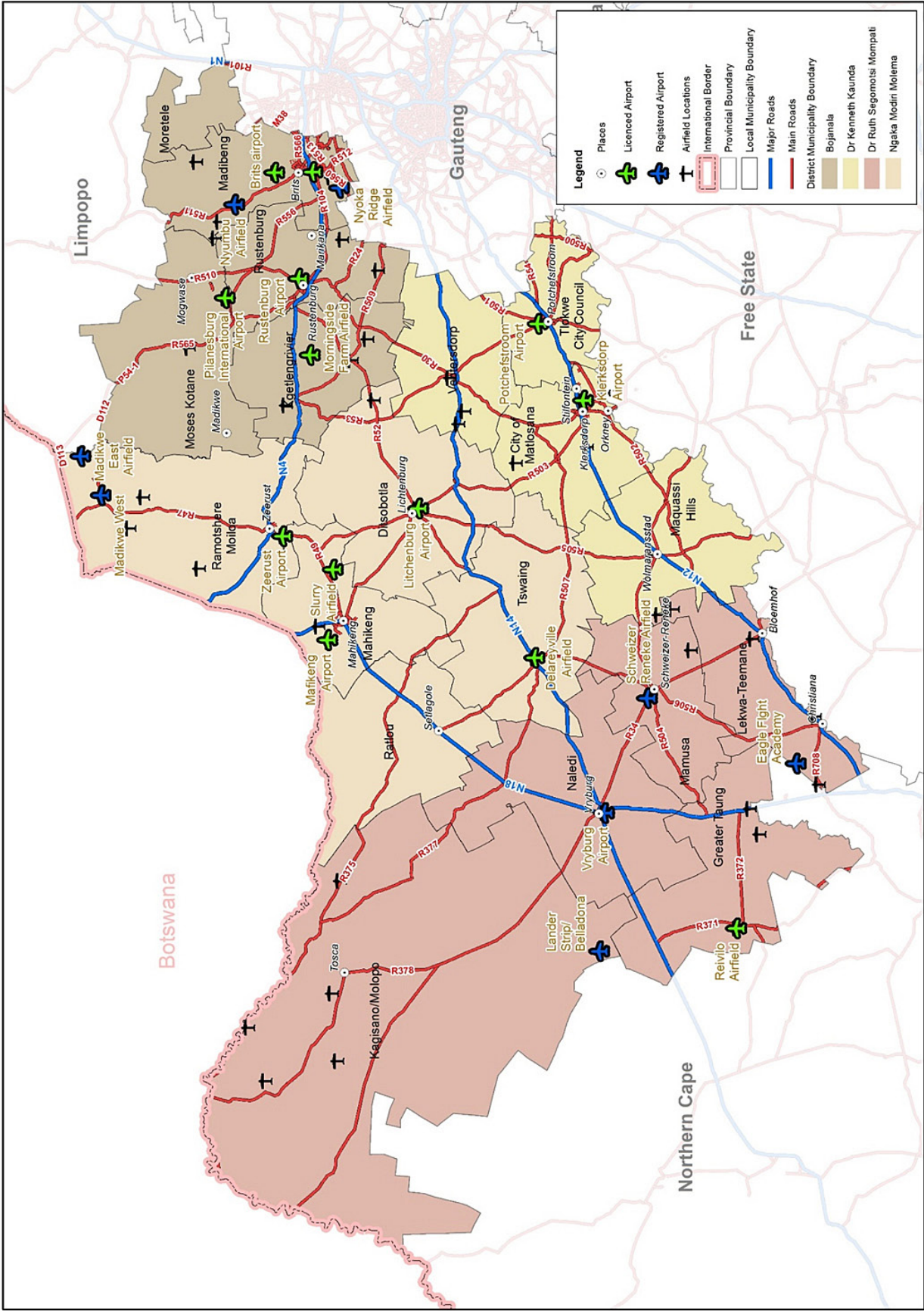


Figure 2: North West licensed and registered aerodromes

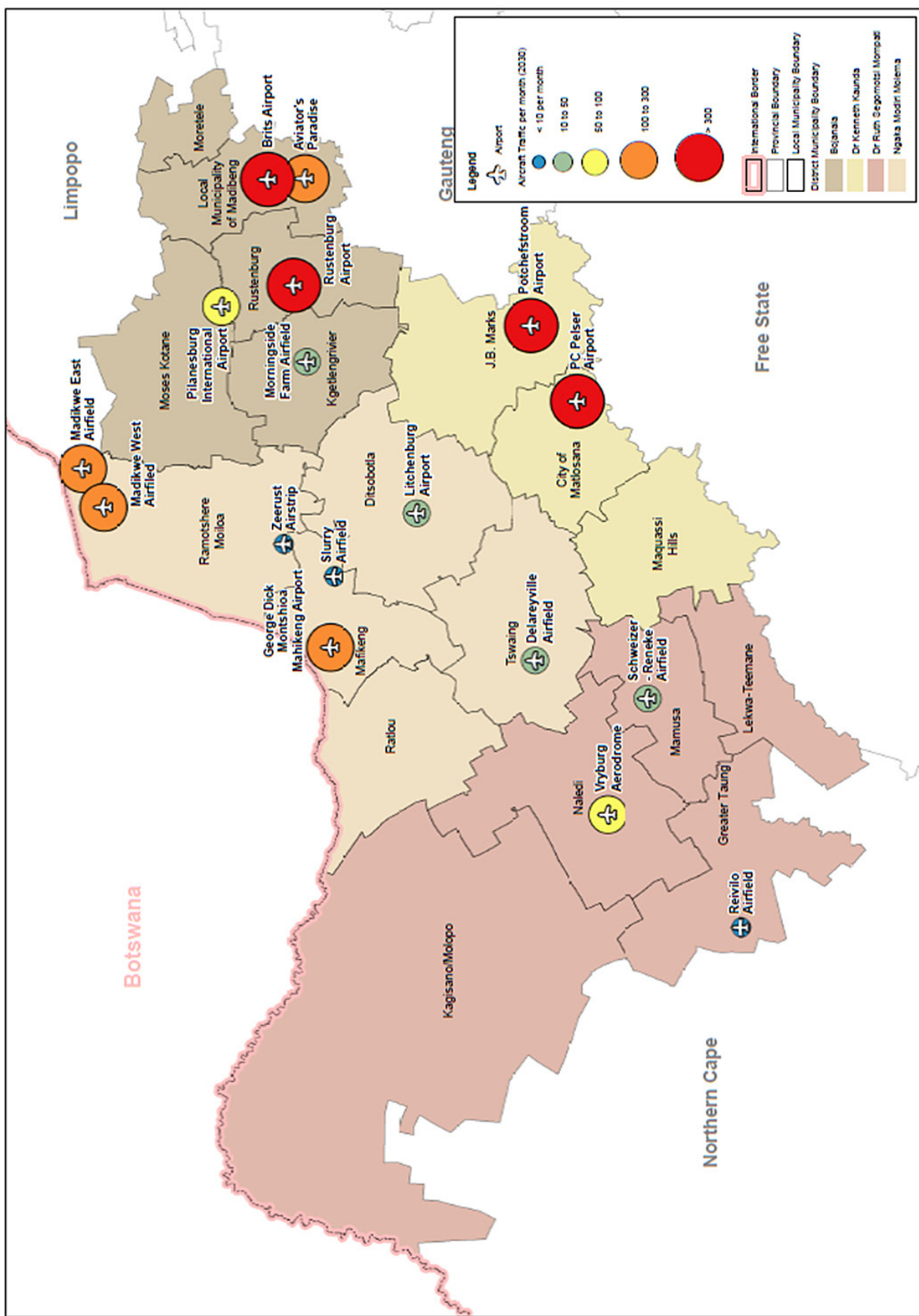


Figure 3: Air traffic movement per month (2020)

6. NEEDS ASSESSMENT AND OPTION DEVELOPMENT

6.1 Maintenance Plan

Specific attention was given to the airside infrastructure pavements, as well as non-conformances with ICAO Annex 14 SARPs. Information from the visual assessments were used to determine the maintenance needs for each of the airports, and to draw up a Maintenance Plan. The following three types of maintenance were addressed:

- Routine maintenance actions.
- Periodic maintenance actions.
- Strengthening and upgrade.

6.2 Financial Needs

For the purpose of the Master Plan, the aerodromes in the province were divided into four categories (listed below) based on similar levels of activity and their potential for revenue generation and cost recovery. The evaluation then focussed on each of the categories (instead of individual aerodromes).

- Large aerodromes (government owned): Aerodromes accommodating commercial services, with relatively large volumes of passenger and aircraft movement. George Dick Montshioa Airport, Pilanesberg International Airport, Madikwe East and Madikwe West Airfields are the only aerodromes that fall within this category.
- Medium aerodromes (government owned): Aerodromes with relatively high level of recreational activity, and often a training facility and/or flying club. Brits, Rustenburg, Lichtenburg, Potchefstroom and PC Pelsers Airports were grouped in this category.
- Small aerodromes (government owned): Aerodromes with no commercial activity and little to none income generation potential. Vryburg, Zeerust, Delareyville, Reivilo, Schweizer-Reneke were categorised into this category.
- Privately owned aerodromes: Aerodromes that have a private owner (i.e. not government owned). This includes Aviator's Paradise, Morningside Farm and Slurry.

Operating revenue comprise of aeronautical and non-aeronautical income streams. The revenue sources that are typically applied by aerodromes in the province are summarised in Table 5 below.

6.3 Management Model

There are 14 (out of 17) aerodromes that is owned by government (four by provincial government and the remainder by local government). On the operations side, there are however much more private sector involvement. Eight of the aerodromes are currently operated by a private party (typically a company, or a flying club, or a person) with only nine operated by the government itself.

Different management models were considered for the Large, Medium and Small aerodromes, with the main options being service contract, management contract, lease or concession.

In choosing between the management options, one needs to give consideration to the level of expertise and business turn-around required, status of existing facilities and need for upgrades, interest from private sector, and apportionment of risks between players.

Table 2: Typical revenue sources by aerodrome size

Revenue type	Large	Medium	Small	Privately owned
Aeronautical revenue	<ul style="list-style-type: none"> • Landing fees • Parking fees • Passenger fees • Passenger fee (Madikwe Airports) 	<ul style="list-style-type: none"> • Landing fees⁶ 	<ul style="list-style-type: none"> • No aeronautical revenue is collected at any of the aerodromes in this category 	<ul style="list-style-type: none"> • None
Non-aeronautical revenue	<ul style="list-style-type: none"> • Rental of hangars • Rental of terminal space (car rental agencies) • Government subsidies 	<ul style="list-style-type: none"> • Rental income from hangars • Mark-up included on fuel sales • Membership fees (from flying clubs) • Revenue from restaurants, bars etc. 	<ul style="list-style-type: none"> • No non-aeronautical revenue is collected at any of the aerodromes in this category 	<ul style="list-style-type: none"> • Owner funding (private funding) • Hangar rentals (Aviator's Paradise)

7. CONCLUSIONS AND RECOMMENDATIONS

The study made specific conclusions and recommendations on key issues, and then on each aerodrome in specific, that were included in the Master Plan. The main conclusions and recommendations of the Master Plan are listed below.

7.1 Outsourcing of Airport Operations

The White Paper on National Civil Aviation Policy, 2015 (DOT, 2015), in clause PS 17 states the following: “Local and international private sector participation in the provision and operation of airport infrastructure should be encouraged in all spheres of government. Airports should also be permitted to operate under a range of types of management and control, allowing airports some flexibility in their business model, but without risking the core aeronautical activities of such airport.”

The argument is that private sector is often better equipped to operate an airport, due to the technical expertise and business skills required. Consultations indicated that there is interest of private sector to take over operations at some of the aerodromes currently operated by government.

It should be noted that, if operations are outsourced, the government entity will typically remain the owner of the aerodrome and will still determine the strategy and development of the airport (depending on the contractual arrangements with the operator).

7.2 Contracts with Private Operator

During the status quo investigation, it was noted that contracts between government and operators of airports were often outdated (expired), not available (both parties did not have

⁶ A few aerodromes have either charged landing fees in the past or have investigated the feasibility of charging landing fees at the aerodrome. However, the administrative costs associated with the collecting of this revenue was found to be too high (compared to the revenue), and none of the aerodromes in this category currently charge a landing fee.

copies), or contracts were never entered into by the parties. Where contracts have been entered into, the main issue highlighted by operators was the duration of the contract (too short).

The assessments made during this study argue for a contracting model that transfers more risk for a longer period than a management contract; therefore a lease contract (an external party operates the airport for his own account, pays the municipality a fee for that right, and carry the risk of the airport not achieving the expected financial performance).

Depending on the extent of responsibility related to maintenance and development that is transferred to the operator, a contract duration typical of that of a lease agreement (five to 10 years) will be required.

For aerodromes in the Small category, it is envisaged that there will not be much interest from private sector to take over operations of the aerodrome, as there are very little traffic and not much opportunity to collect revenue. The municipality can consider service contracts for specific services such as security, and basic maintenance.

7.3 Licensing of Airports

Airport licensing is the primary regulatory instrument for ensuring safety and security at an aerodrome.

The Civil Aviation Regulations (Civil Aviation Authority, 1997), Part 139, states that an airport that is not licensed, may not be used in commercial air transport operations. Where such services are currently provided at unlicensed airports, it is recommended that either this service be stopped, or that the airports obtain a license. Government can take this matter up with SACAA as the safety regulator and the organisation that issues licenses.

7.4 Financing of Airports

The White Paper on National Civil Aviation Policy, 2015, states the following:

Clause PS.15, “Existing and new airports should as far as possible be developed and operated on the basis of financial sustainability and viability guided by the National Airports Development Plan. Existing publicly owned airports, excluding military airports, are encouraged to make every effort to become viable and sustainable, including through optimising non-aeronautical revenue and airport precinct development. Failing that, other justifications relating to social or economic benefits could be supported, should there be sufficient willingness for local or provincial government to cover associated costs. Where neither financial viability nor socioeconomic justification can be achieved, alternative uses for such assets should be investigated, with due regard to the high cost of developing a new airport to cater for future demand.”

Based on the study analysis, the following conclusions and recommendations are made:

- An aerodrome should aim to at least cover its operational costs through revenue generated at the airport. This is currently the case at most of the “Medium aerodromes”.

- Large capital expenditure is required at aerodromes, every few years, for maintenance of pavements (runways, taxiways, aprons). These costs cannot be covered by the normal revenues of the aerodrome. It is recommended that government consider funding of these costs in line with PS. 18 of the White Paper on National Civil Aviation Policy, 2015.
- Introduce non-aeronautical charges at aerodromes where relevant, such as the introduction of membership fees at some airports, and the introduction of concession/renting fees, advertising fees and vehicle parking fees. There are also possibilities for generating revenue from precinct development, such as training focussed facility developments and industrial parks.

7.5 Maintenance of Airports

A maintenance plan for especially airside infrastructure (runways, taxiways, apron) should be followed. Maintenance of pavement structures (runways, taxiways, aprons) of the aerodromes can be included in the Road Asset Management Systems (RAMS) of government, to ensure continued monitoring and proper provision for future maintenance.

7.6 Ultimate Airport Development and Surrounding Land Use

The White Paper on National Civil Aviation Policy, 2015, states in Clause PS. 27, that “Provincial and municipal government should jointly incorporate airports as part of a holistic planning approach to the total transport system and the environment in which the airports are located, and ensure that airports would be included in the formulation of spatial development frameworks in terms of the Spatial Planning and Land Use Management Act, the Integrated Development Plans (IDPs) and Local Economic Development Plans. In addition, airports should be included in all transport plans prepared in terms of the National Land Transport Act (and the proposed Multi-modal Transport Planning and Co-ordination Act)”.

In this regard, it is important to understand the future function and usage of the aerodrome to determine the “ultimate” extent of the aerodrome. This area should be safeguarded, by erecting a proper perimeter fence around the airport along this boundary. This will also protect the airport against any encroachment of residential settlement around the airport, that may pose safety risks for aviation activities.

8. REFERENCES

Civil Aviation Authority, South Africa (CAA) (1997), Civil Aviation Regulations (CARs) Part 139 on Aerodromes and Heliports, published by Butterworths Publishers, Durban.

Civil Aviation Authority, South Africa (CAA) (2005), Aeronautical Information Publication.

DOT (2015), White Paper on National Civil Aviation Policy.

ICAO. (2009). Review of the classification and definitions used for civil aviation activities, STA/10-WP/7. Tenth session of the Statistics Division. Montreal.

ICAO. (2013). Aerodrome Design and Operations. ICAO.