APPENDIX 20

AIRSPACE AND CAPACITY STUDY

Airspace and Capacity Study

Cape Town and Cape Winelands Airports

Report

Client:	Cape Winelands Airport Ltd	Document Reference:	110CWA001
Date:	22 March 2024	Version	1.0

Executive Summary

Cape Winelands Airport Ltd (CWA) wish to further develop the Cape Winelands Airport as a commercial entity accepting national and international flights.

Formal responses were received from Airports Company South Africa (ACSA) and the General Aviation (GA) communities.

An independent review was requested, this report details the study undertaken to review the concerns raised by all parties. That process includes an extensive review of the airspace environment.

The summary of findings is that:

1. The Cape Winelands Airport (FAWN) will be able to operate independently of Cape Town International Airport (FACT). Therefore, any concerns of impact to operations from/to FACT are mitigated.

2. The future development plans for FACT are also not expected to be an issue. The runway re-alignment will enhance airspace use and further cement the independent operations between the two airports.

3. The GA community raised valid concerns as will always be the case where more Controlled Airspace is required. However, there are opportunities for improving airspace access, including the rationalising of existing airspace to reduce airspace infringements and allow for better use of VFR corridors.

4. There is no immediate solution available to the GA community as this will require further consultation. Further explanation is contained within this report that provides some guidance of what future outcomes may be.

5. CWA has commenced with an Airport Task Force that includes a large contingent of stakeholders. It is recommended (if not already done) that smaller work groups are formed to deal with specific concerns that will help determine the airspace design requirements.

Further information and technical explanations from the above summary are contained within this report.

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Abbreviations

ACSA	Airports Company South Africa
ADS-B	
AIM	Aeronautical Information Management
AIP	Aeronautical Information Publication
AIRAC	Aeronautical Information Regulations and Control
ANS	Air Navigation Services
ANSP	Air Navigation Service Provider/s
ARCC	Aeronautical Rescue Co-Ordination Centre
ASBU	Aviation System Block Upgrades
ATC	Air Traffic Control
ATCO	Air Traffic Control Officer
ATFM	Air Traffic Flow Management
ATM	Air Traffic Management
ATNS	Air Traffic and Navigation Services
ATS	Air Traffic Services
ATZ	Air Traffic Zone
CANSO	Civil Air Navigation Services Organisation
CAST	Combined Airports Safeguarding Team
CCO/CDO	Continuous Climb and Continuous Descent Operations
CTA	Control Area
CTIA	Cape Town International Airport
CTR	Control Zone
CWA	Cape Winelands Airport
CONOPS	Concept of Operations
EGGW	London Gatwick Airport
EGLC	London City Airport
EGLL	Heathrow Airport
EGWU	Royal Air Force, Northolt

EIA	Environment Impact Assessment
ENR	En-Route section within an AIP
eVTOL	Electric Vertical Take-off and Landing/s
FABL	Bloemfontein Airport
FACA	Cape Town Flight Information Region
FACT	Cape Town International Airport
FAD	Danger Area
FAGC	Grand Central Airport
FAGM	Rand Airport
FALA	Lanseria
FAOR	O.R Tambo International Airport
FASH	Stellenbosch Airport
FAWB	Wonderboom Airport
FAWK	Waterkloof Airforce Base
FAWN	Cape Winelands Airport
FIR	Flight Information Region
FL	Flight Level
FRA	Free Route Airspace
GA	General Aviation
GANP	Global Air Navigation Plan
IAP	Instrument Approach Procedure
ICAO	International Civil Aviation Organisation
IFP	Instrument Flight Procedure
IFR	Instrument Flight Rules
ILS	Instrument Landing System
KEWR	Newark Liberty International Airport
KJFK	JF Kennedy International Airport
KLGA	LaGuardia Airport
MSC	Morningstar Flying Club
NACO	Netherlands Airport Consultants

NAMP	National Airspace Master Plan
NM	Nautical Miles
NASCOM	National Airspace Committee
OMDB	Dubai International Airport
OMSJ	Sharjah International Airport
PANS-OPS	Procedures for Air Navigation Services - Operations
PBN	Performance-Based Navigation
PSR	Primary Surveillance Radar
RNP	Required Navigational Performance
SACAA	South African Civil Aviation Authority
SARPS	Standards and Recommended Procedures
SAHPA	South African Hand Gliding and Paragliding Association
SFC	Stellenbosch Flying Club
SID	Standard Instrument Departure
SSR	Secondary Surveillance Radar
STARS	Standard Terminal Arrival Route
TMA	Terminal Control Areas
UAV	Unmanned Aerial Vehicle
UTC	Universal Time Coordinated
VFR	Visual Flight Rules

Introduction

Overview

1. Cape Winelands Airport Ltd (CWA) wish to further develop the Cape Winelands Airport, ICAO Code FAWN, as a commercial airport accepting national and international flights.
2. The development of the airport into a fully commercial enterprise has required extensive planning applications and consultation. A comprehensive set of documentation have been submitted including an Environment Impact Assessment (EIA) and supporting Concept of Operations (CONOPS).
3. Formal responses have been received, with Airports Company South Africa (ACSA) providing an extensive report related to the impact FAWN may have on Cape Town International Airport (CTIA – ICAO Code FACT).
4. Straten Consulting Services Limited (Straten CSL) has been engaged to review the response made by ACSA. FACT has submitted plans for expansion with a second parallel runway.
5. This report focuses on the responses to airspace and the perceived negative impact FAWN may have on operations at FACT both now and in the future.

Straten CSL

6. Straten CSL is an award-winning international aviation consultancy based in the United Kingdom. Our expertise is in the field of Air Traffic Management, Airport Master Planning and Airspace. We are currently supporting airspace and airport projects in a number of regions and include:
   - Qantas Group – Qantas has a requirement to train 250 cadet pilots per year. The current training environment is constrained through airspace issues. Straten CSL is conducting an airspace assessment, on a training facility, to determine training capability to meet the desired training output. We previously completed a three-phase capacity study at Perth Airport in support of Qantas with a future planned study for Melbourne Airport.
   - Barbuda Airport – based in Antigua and Barbuda, a new airport has been built to support the island of Barbuda and the Barbuda Ocean Club. The project involves supporting the client navigate the regulatory requirements for obtaining an aerodrome licence and assist with airspace design and associated procedures.
   - Arlanda Airport, Oslo – Straten CSL is supporting IBG with a capacity study of the airport under its current runway environment together with a study on future runway requirements. This includes runway layout options and consideration on noise and emissions.
   - Airport Master Planning – Assisting AtkinsReális with airport master planning projects in Jeddah, Riyhad and AlUla within the Kingdom of Saudi Arabia. These studies include future requirements for the airspace to meet the growth aspirations of these airports. Jeddah Airport has a future planned capacity of 114 million passengers by 2030.

- Qatar – assisted IBG with the airspace and capacity project in Qatar for both Hamad and Doha airports including airspace design for civil and military activities. The project was required to meet the capacity requirements for the FIFA World Cup event held in Qatar in 2022 together with re-design to meet the implementation of Qatar's successful application for its own Flight Information region (FIR).

7. Clients include London Southend Airport, Airbus UK, Blackpool Airport, Newcastle Airport, Serco UK and Europe, Scottish Power Renewables, Qantas Group, RSK, WSP, AtkinsReális amongst a host of property and renewable energy developers. Straten CSL assists developers with aeronautical studies where a potential impact to an airport or aviation exists.
8. Straten CSL is a member of the British Aviation Group and is a representative on the Combined Airports Safeguarding Team (CAST) a UK CAA led industry initiative consisting of airports, Air Navigation Service Providers (ANSPs) and industry partners.

About the Author

9. John van Hoogstraten is an Air Traffic Controller by profession with over 35 years' experience in the industry. He worked for several ANSPs in various roles and submitted written papers to ICAO Regional Offices in Nairobi and Cairo. Work experience includes extensive project work in airport master planning and airspace design in the United Arab Emirates (UAE), United Kingdom (UK), Kingdome of Saudi Arabia (KSA), Greece, Romania, Rwanda and Brunei. Further work experience includes:

- ATNS, South Africa
  - Air Traffic Controller at FALA and FAOR (Tower and En-Route)
  - Chief ATC Officer managing the Outstations portfolio.
  - Deputy Chief, Johannesburg and Bloemfontein Area.
- General Civil Aviation Authority, UAE
  - Air Traffic Control Officer (Approach and En-Route).
  - Senior Air Traffic Control Officer (ATCO) for the UAE Airspace.
- Abu Dhabi Airports Company, UAE.
  - Head of Quality, Safety, and Risk.
  - ANS Compliance Manager.
- Serco Middle East, UAE
  - Divisional Head of Safety and Assurance.
  - Head of Safety, Regulations and Licensing Group - UAE, Bahrain and Iraq.
  - CANSO – Deputy Chair Middle East Safety Working Group
- Cyrrus Ltd, United Kingdom, Aviation Consultancy
  - Operations Director
- Straten CSL, United Kingdom, Aviation Consultancy

- Managing Director
- Independent Business Group, Sweden, Aviation Consultancy
  - Director of Air Navigation Services

Document Layout

10. The Study has focused on the response from ACSA regarding the airspace impacts future FAWN operations will have on operations at FACT. In addressing the concerns raised, this report will be set out as follows:

- ACSA and general Aviation Concerns – The airspace and operational impact identified by ACSA will be extracted and reviewed.
- Airspace Assessment – An assessment of current airspace usage and design. This will include current and future considerations.
- Review of the NACO Airspace CONOPs Report.
- Summary and Conclusion

Airspace Analysis

ACSA Concerns

11. The ACSA comments are described in a letter[1] of comment on the proposed expansion of Cape Winelands Airport.

12. Table 1 sets out a summary list from the ACSA letter with comment on whether it falls within the criteria for this analysis and therefore subject to further review.

13. A more detailed analysis of the airspace will be conducted at which a response to each identified airspace concern will be addressed providing evidence to either support or oppose the concern.

ACSA Response to:	ACSA Concern	Analysis Criteria
2.1. Page 34: Proposed development and expansion of CWA.	Border control issues and NAPD criteria.	Non-airspace issue, not reviewed further.
2.2. Page 37	Comment related to traversing international and national boundaries.	Non-airspace issue, not reviewed further.
2.3. Page 93 & 94	Comment on classification and relocation of GA aircraft.	Non-airspace issue, not reviewed further.
2.4. Page 99	Comment on unmet market demands.	Non-airspace issue, not reviewed further.
2.5 Page 101: Alternate airport for fuel planning and environmental savings.	ACSA analysis shows that the complexity in the airspace will negate the benefits derived from fuel savings	Airspace issue, reviewed within this report.
2.5. Page 293: Coexistence of Cape Winelands Airport and Cape Town International Airport.	7th Bullet: The airspace conflict and restrictions will in our initial analysis (as explained later in this response) create inefficiencies in the airspace and in the movements into Cape Town International Airport. CWA will impact the airspace and procedures into CTIA. This could also potentially result in higher noise footprint at CTIA, inefficient flight paths and increased fuel burn for airlines flying into CTIA.	Airspace issue, reviewed within this report.
	8th Bullet: Recognition of CTIA future plans and a 2nd runway and the potential impact to the proposed flight paths.	Airspace issue, reviewed within this report.

[1] Comment on Proposed Expansion of Cape Winelands Airport, DEA&DP Reference No. (Pre-Application): 16/3/3/6/7/A5/20/2209/23 & DWS Ref No: WU33620, dated 08 December 2023 and addressed to PHS Consulting acting on behalf of Cape Winelands Airport Ltd.

ACSA Response to:	ACSA Concern	Analysis Criteria
2.6 Page 340: Proposed increase of flight activity at CWA…	ACSA state their analysis indicates that there will be an airspace conflict now and, in the future, which will risk the future development of CTIA and also other surrounding airfields.	Airspace issue, reviewed within this report.
3.1. Appendix 12 Page 10 & 11: Bulk of GA could relocate to CWA.	Comment on the requirement to clarify a definition of GA highlighting light and high-performance GA.	Non-airspace issue, not reviewed further.
3.2. Page 11: CWA positioning itself as a secondary airport in Cape Town.	Comment on clarification of "specific market segments".	Non-airspace issue, not reviewed further.
3.3. Page 11: CWA is a privately funded airport.	Clarification that ACSA is not government funded nor funded by the South African taxpayer.	Non-airspace issue, not reviewed further.
3.4. Page 11: CWA is considered an "alternate" airport.	Comment on diversions and alternate airports.	Non-airspace issue, not reviewed further.
3.5. Page 11: Boosting tourism by enabling new route development.	General comment on the position of CTIA and work committed to on route development.	Non-airspace issue, not reviewed further.
3.6 Page 12: Integration into existing airspace.	Concerns that the proposed CWA development will result in dependencies on CTIA. Mention is made of the CWA CONOPs document referencing only the current, single runway at CTIA.	Airspace issue, reviewed within this report.
	A further concern is raised that it is 'logical' that aircraft will need to follow the same routes and will be compounded by the newly, planned runway orientation.	Airspace issue, reviewed within this report.
4. Comments related to Appendix 17, Civil Aviation Baseline and Scoping.	It is ACSA's position that the current flight paths of the airports will have dependencies and interfere.	Airspace issue, reviewed within this report.
	Consideration to two international airports operating within close proximity of each other and resultant resource allocation (navigational aids and ATS).	Airspace issue, reviewed within this report.
	The development (CWA) may add additional strain on ATC at CTIA with additional complexities.	Airspace issue, reviewed within this report.
5. Comments related to Appendix 19: Development of an Airspace CONOPs for CWA. Numerous bullets points relating to (but not limited) to:	Future runway alignment and additional parallel runway.	Airspace issue, reviewed within this report.
	Airspace design must not limit CTIA expansion plans to 45 million passengers/72 movements per hour.	Airspace issue, reviewed within this report.

ACSA Response to:	ACSA Concern	Analysis Criteria
	CWA airspace design must not negatively impact the safety and efficiency for flights into CTIA and furthermore be totally independent.	Airspace issue, reviewed within this report.
	Concerns that inefficiencies, created by airspace dependencies, will impact operators and ATC.	Airspace issue, reviewed within this report.
	Maintaining CTIA glide slope criteria.	Airspace issue, reviewed within this report.
	CTIA must receive priority in terms of flight paths (routes).	Airspace issue, reviewed within this report.
5.2 Page 14: Airspace restrictions of VFR traffic around Cape Town CTR	Any change to airspace arrangements, as a result of CWA impacting traffic flows outside the CTIA CTR, will negatively impact the aviation industry.	Airspace issue, reviewed within this report.
5.4 Page 20: Airspace capacity	ACSA are concerned that there will be dependencies between FACT and FAWN.	Airspace issue, reviewed within this report.
5.5 Page 20: Environment	ACSA recommend a cumulative airspace and noise impact study	Airspace issue, reviewed within this report.
	Concern raised over the current, reported FACT TMA capacity is 35 aircraft per hour and that FAWN will impact capacity during peak periods at both FACT and FAWN and will require consideration towards re-sectorisation to accommodate forecasted traffic volumes and ATC workload. There is additional comment to extended arrival management systems and separation criteria.	Airspace issue, reviewed within this report.
	Concern is raised over Approach Control resource based at FACT.	Airspace issue, reviewed within this report.
	Concern is raised over keeping IFR traffic outside/below FACT airspace – relates to question over dependency of the two airports.	Airspace issue, reviewed within this report.
	Query over the re-design of FACT's TMA and CTR design under current and future runway environment.	Airspace issue, reviewed within this report.
	Query related to use of Surveillance radar (Primary and Secondary) at FACT.	Airspace issue, reviewed within this report.

TABLE 1: SUMMARY OF ACSA CONCERNS AND ANALYSIS CRITERIA

General Aviation Concerns

14. CWA has engaged with GA at the initial stages of the airport proposal. Feedback has been received both formally and informally via social media[2] following the pre-application draft environmental scoping report for the proposed expansion of CWA. Both are considered and recorded in Table 2 below.

Representative	Concern	Analysis Criteria
South African Hang Gliding and Paragliding Association (SAHPA)	General concern that gliding activities were not included in the EIA for CWA. Specific mention is made to potential impact to Rondebossie, a launch site with 6km of CWA.	Airspace issue, reviewed within this report.
Stellenbosch Flying Club (SFC)	Request for inclusion as an affected stakeholder.	Non-airspace issue, not reviewed further.
	Concern on the proposed change to FAD69.	Airspace issue, reviewed within this report.
	Request clarity on the VFR corridors.	Airspace issue, reviewed within this report.
Morningstar Flying Club (MSC)	Concern over 'free and safe' use of airspace related to usable VFR corridors.	Airspace issue, reviewed within this report.
Social Media response (Facebook)	Concern on the impact of recreational flying.	Airspace issue, reviewed within this report.
	Questions how the FAWN airspace will 'overlap; with FACT.	Airspace issue, reviewed within this report.
	Concern on impact to local airfields Diemerskraal and Wintervogel.	Airspace issue, reviewed within this report.
	Concern on noise pollution.	Airspace issue, reviewed within this report.
	Concern over the socio-economic impact to local areas.	Non-airspace issue, not reviewed further.

TABLE 2: SUMMARY OF GENERAL AVIATION CONCERNS

[2] The Facebook response noted is as received on the CWA Facebook page, on 09 March 2024, at https://www.facebook.com/story.php?story_fbid=pfbid026kJGYHHkNuUGEjQi3fHkMLwk6qFgCtPmeJfhUMfmYSdz2XvrehhnMs7YQZtSLDMol&id=100064689009023&sfnsn=scwspwa&mibextid=6aamW6&paipv=0&eav=AfZtRamAJCnAjS-KzVeNOcDjaj4ttiJbdtaMaJ4g9uwli9Gog74n_cxv4n4DYpC9yuw&_rdr . Responses after this date are not included.

Airspace Assessment

Introduction

15. To address the concerns raised in Table 1 and Table 2, the airspace environment will be analysed and assessed for potential impact to both FACT and GA activities.
16. The purpose of analysing the airspace is to understand how it is currently being managed within the existing environment. From this analysis we can then determine what impact (if any) a FAWN airspace structure could have. This analysis, while looking for impact, will also consider any opportunities that may be possible to support expansion of FACT, FAWN and the local GA community.
17. The assessment of the airspace considers a review of the existing environment. Real-time tracks, extracted from FlightRadar24® that provide a 3-dimensional view of aircraft tracks arriving and departing FACT. Note that there will be slight discrepancies between this data and radar track data from ATNS surveillance sources. FlightRadar25® uses ADS-B as its surveillance source which has a different refresh rate to conventional Primary and Secondary Surveillance Radars (PSR and SSR).
18. The purpose of the 3-dimensional review will provide a reader with a visualisation of actual traffic flows. Traffic data consists of 95 departure tracks and 92 arrival tracks. The purpose of demonstrating in this manner is to present a high concentration of tracks as a single presentation. This exceeds the FACT hourly peak expectation for the new runway environment and presents a dense traffic environment.
19. These tracks will also provide an indication of where the FAWN departures and arrivals might impact the FACT traffic. Vertical data for each track is available and presented where appropriate.
20. Use of the actual data, together with indicative routes for FAWN, will provide guidance on a future airspace solution and how GA traffic may be accommodated.

Analysis

21. The airspace supporting the Cape Town area is contained within the Cape Town Flight Information Region (FIR) denoted as FACA and consists of the following portions of controlled airspace[3] [4]:

    - Control Zone (CTR) with a defined lateral zone and vertical limits from surface to 2,500ft.

[3] The airspace data is extracted from 3dairspace.org.uk and represents the South African airspace and updated 15 January 2024. This aligns with the South African AIP AIRAC publication date and cross validated against ATNS AIM 3D airspace model.
[4] The airspace lateral boundaries can be found in the SA AIP relevant Aerodromes and Enroute sections. All data is as per AIRAC data extracted by 08 March 2024 and does not include any further updates.

- Terminal Control Areas (TMA), located above the FACT CTR commencing at a specified lower and upper altitude with a defined lateral limit. The lowest altitude is 2,500ft, which coincides with the FACT CTR upper limit.
- Control Areas (CTA), these are located above and coincident with the TMA airspace limits.

22. This study will focus primarily on the FACT CTR, serving CTIA and the FACA TMA serving the greater Cape Town area. The upper airspace, within the FACA FIR and CTAs will be used to demonstrate the enroute environment.

23. Other regulated and published airspace will be considered further in the report where relevant.

24. Figure 1 provides a visual indication of the FACT CTR and location of FAWN. A circle is defined from the centre point of FAWN to the edge of the FACT CTR. The radius is approximately 2.7nm (5km) and extends vertically to 2,500ft to match the FACT CTR. The purpose of defining the area in this manner will become clear as traffic data is added and vertical data of flights demonstrating the impact to the airspace environment.

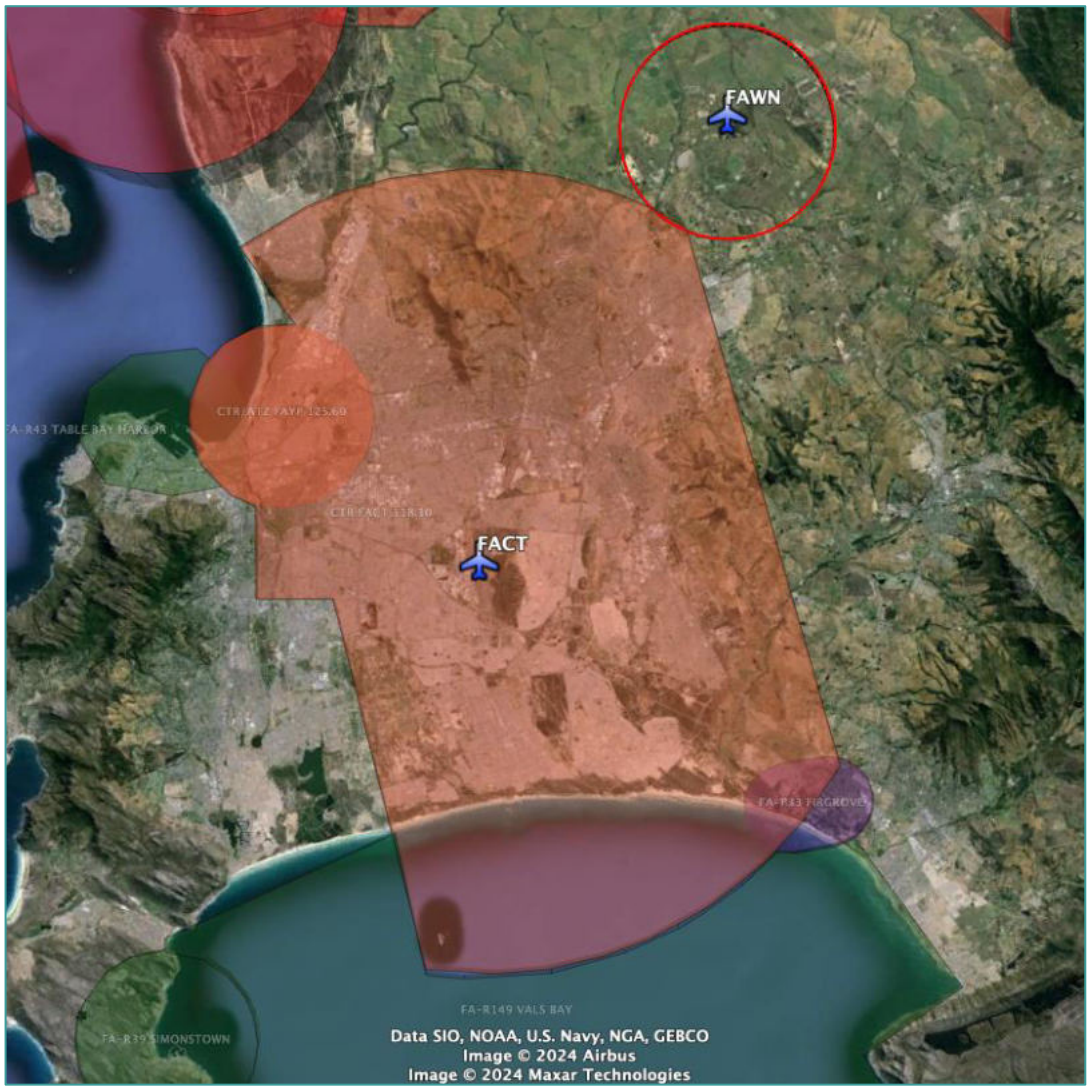

FIGURE 1: FACT CTR WITH FAWN INDICATED

25. Departure and Arrival data has been extracted from Flightradar24® and imported into Google Earth Pro. The airspace structure is defined in 3-dimensions with actual flight data included.

26. Data for each flight track is available and provides an altitude and speed within a 10 second time and date stamp. Two altitudes and speeds are recorded, at the commencement and the end of the 10-second period. The exact flight details, for each flight, providing aircraft type, registration and callsigns (where relevant) and is available upon request.

27. Flight data was extracted over a period of a week to represent flights from Monday through to Sunday. While variances may occur on weekly schedules throughout the year, the flights represent most, if not all, departure and arrival directions for FACT including a flight flying to the Antarctica by a Smartwings flight (QS4001) to the Troll Research Station on 19 February 2024.

FACT Arrival Analysis

28. Figure 2 provides an overview of 92 arrival flights to FACT extending as far as Johannesburg and Durban and flight tracks to the north.

29. The colour variation of tracks relates to altitude, green indicates lower levels changing to yellow, then red followed by pink and black as they gain altitude.

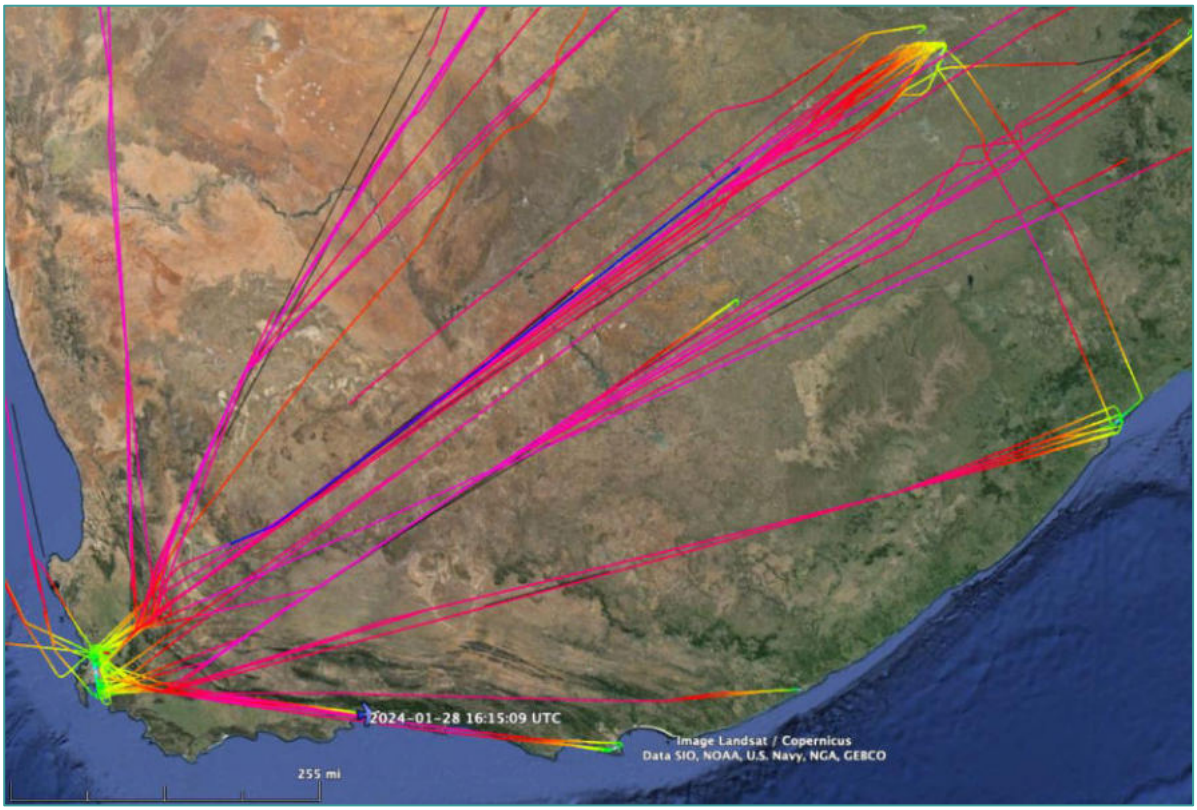

FIGURE 2: OVERVIEW OF FACT ARRIVAL FLIGHTS

30. Figure 3 provides a zoomed in view of Figure 2 providing detail of flights in the region of FAWN (indicated by means of a red circle). The green and yellow lines represent individual aircraft tracks.

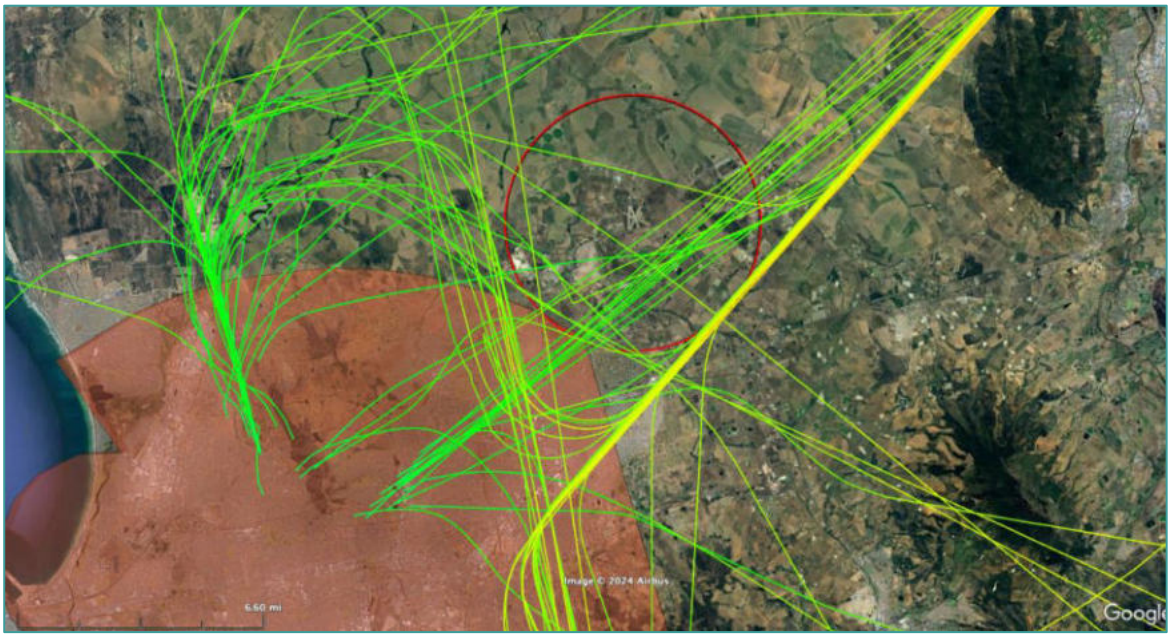

FIGURE 3: ZOOMED IN TRACKS REPRESENTING FACT ARRIVALS

31. Figure 4 provides an elevation view taken from the east of the point where the FACT CTR joins the FAWN airspace. The transparent red area represents the FACT CTR, and the FAWN circle area indicated with a grey wall with red vertical lines.

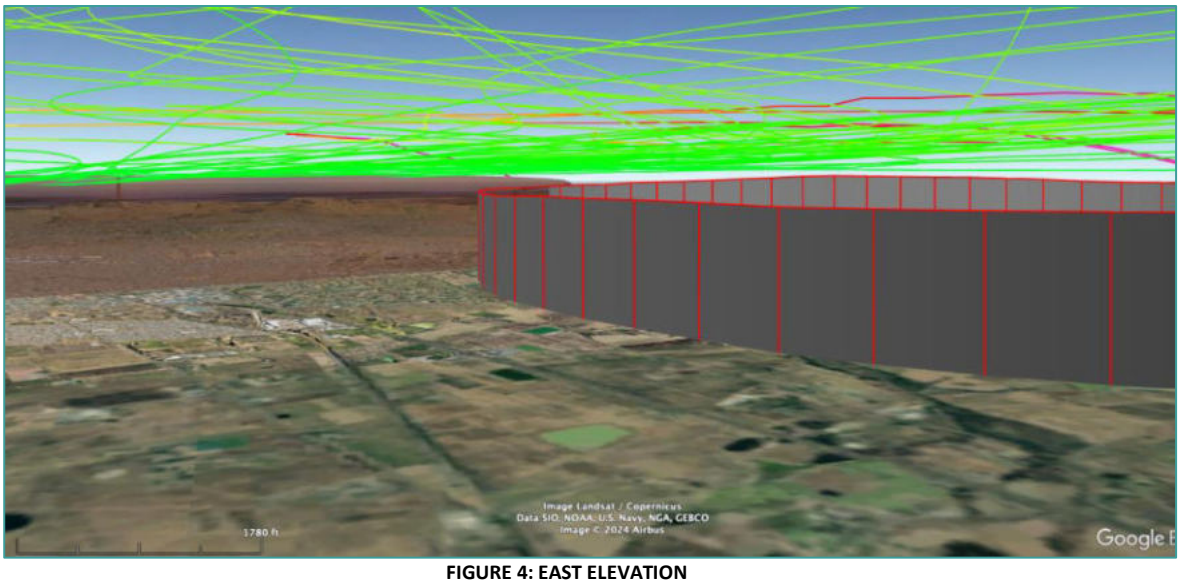

FIGURE 4: EAST ELEVATION

32. The green lines represent the individual aircraft tracks with Figure 5 indicating the lowest aircraft observed from that viewpoint.

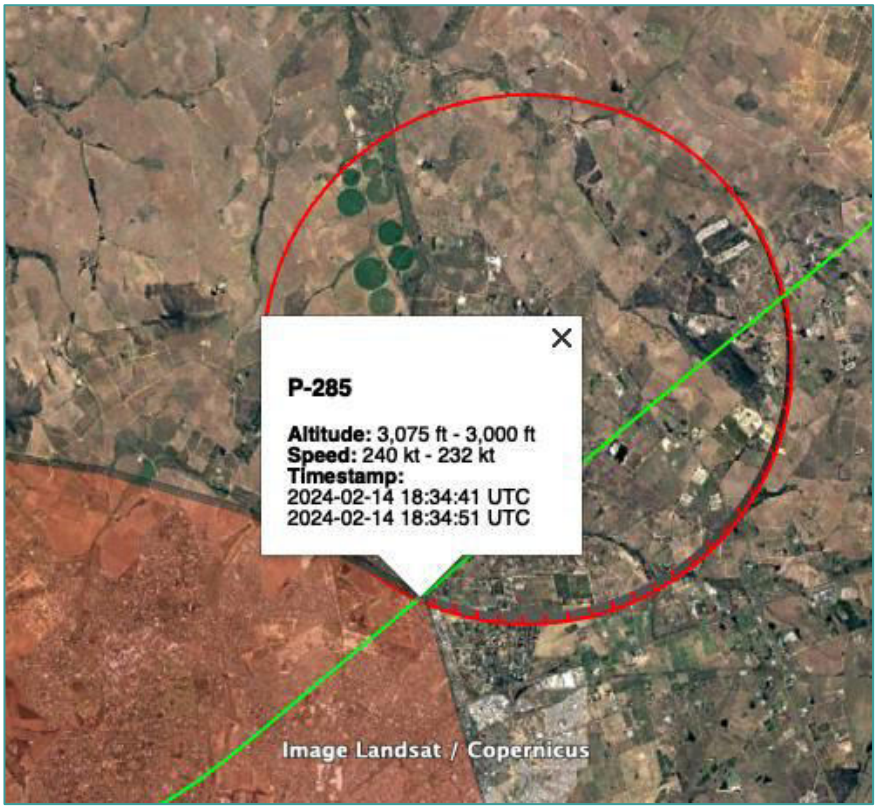

FIGURE 5: LOWEST AIRCRAFT FROM THE EAST ELEVATION

33. The lowest flight elevation indicated in Figure 5 is between 3,000ft and 3,075ft.

34. Further analysis of this flight determines that the aircraft, LNK925, operated by SA Airlink from Johannesburg, flew a visual approach as indicated in Figure 6.

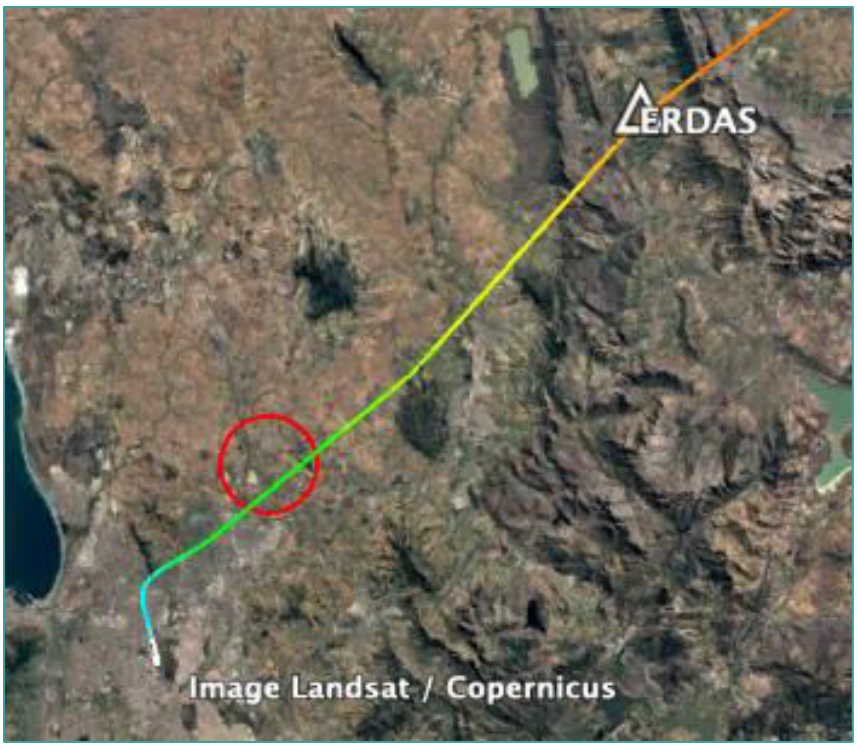

FIGURE 6: FLIGHT PATH FOR LNK925

35. It is assumed a visual approach was flown due to the close-in distance from the runway threshold to establishing on Final Approach to Runway 19. In addition, an aircraft inbound from Johannesburg would normally expect to fly the ERDAS 1B Arrival (STAR), this track turns the aircraft in a northerly direction before being provided a radar route (vectoring) for the Instrument Landing System (ILS) Approach.
36. The visual approach provides a worst-case vertical profile for aircraft approaching FACT in relation to being in the vicinity of FAWN. A number of visual approaches have been identified and in general are typically in the airspace band of 3,500 to 4,200ft in that vicinity for a visual approach.
37. The distance to touchdown, for the GE125 flight, is approximately 12.5nm from the point it crosses the FACT CTR.
38. As IFR aircraft are required to be contained in Controlled Airspace (CTR and TMA) it is very unlikely for an aircraft to descend below 3,000ft until within the lateral boundary of the FACT CTR.
39. Aircraft arriving to Runway 01 tend to be higher than for Runway 19. An analysis of Runway 01 arrivals indicates aircraft in a vertical profile of between 6,300 to 10,000ft when passing abeam FAWN and turning onto a downwind position. Generally, an aircraft flying the arrival (STAR), passing abeam FAWN will have approximately 25nm track miles to touchdown and therefore significantly higher than for Runway 19.
40. The general rule of thumb for arriving aircraft is application of the 3-degree rule. This allows for an acceptable descent gradient of 3-degrees and is applied by calculating the distance to touchdown by 3. By example, an aircraft at FL300 should commence descent no later than 90nm calculated as 300 x 3 and drop the last 0. Applying the same calculation for aircraft at 12nm from the airfield would need to be around 4,000ft altitude. This is a general rule of thumb and naturally has variances applied for wind, speed, temperature and aircraft weight.
41. In summary, FACT arrivals are not impacted a volume of airspace serving FAWN.

FACT Departure Analysis

42. Figure 7 provides an overview of 95 arrival flights to FACT extending as far as Johannesburg and Durban and flight tracks to the north.
43. Figure 8 provides a zoomed in view of Figure 7 over the Cape Town area.
44. As expected, the distribution of aircraft tracks is very similar to the arrival tracks.
45. The colour variation of tracks relates to altitude, green indicates lower levels changing to yellow, then red followed by pink and black as they gain altitude.

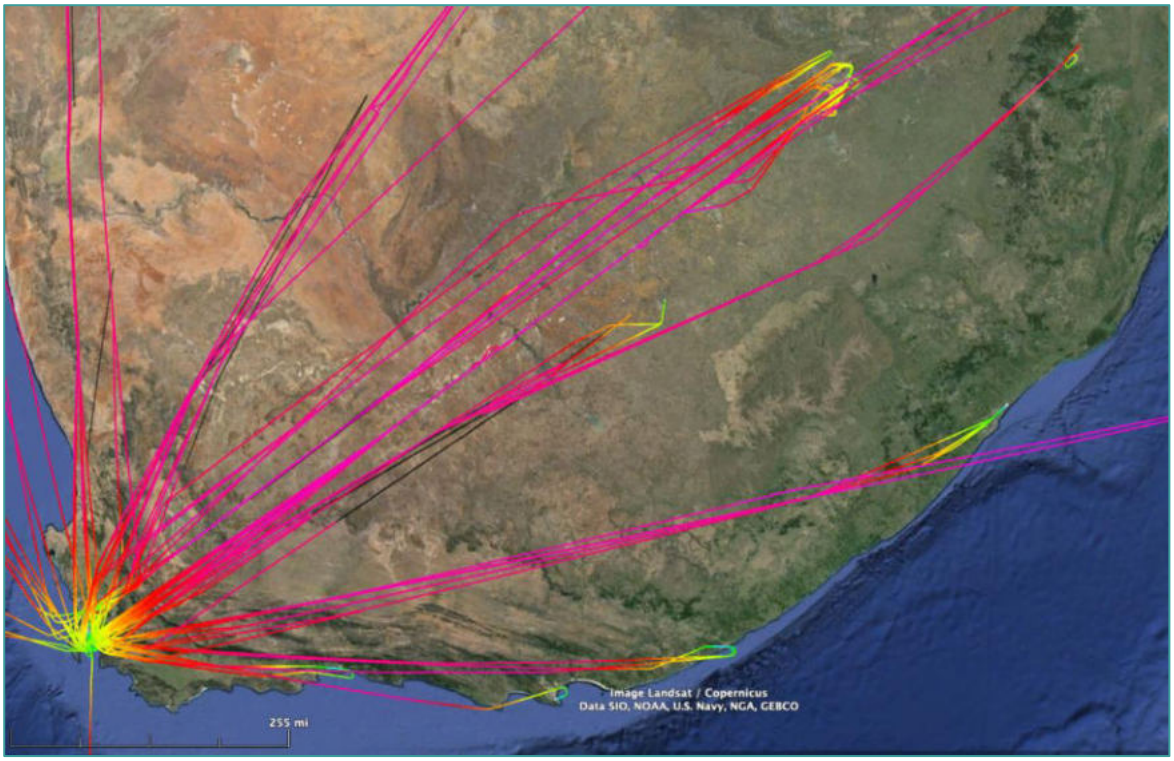

FIGURE 7: OVERVIEW OF FACT DEPARTURE TRACKS

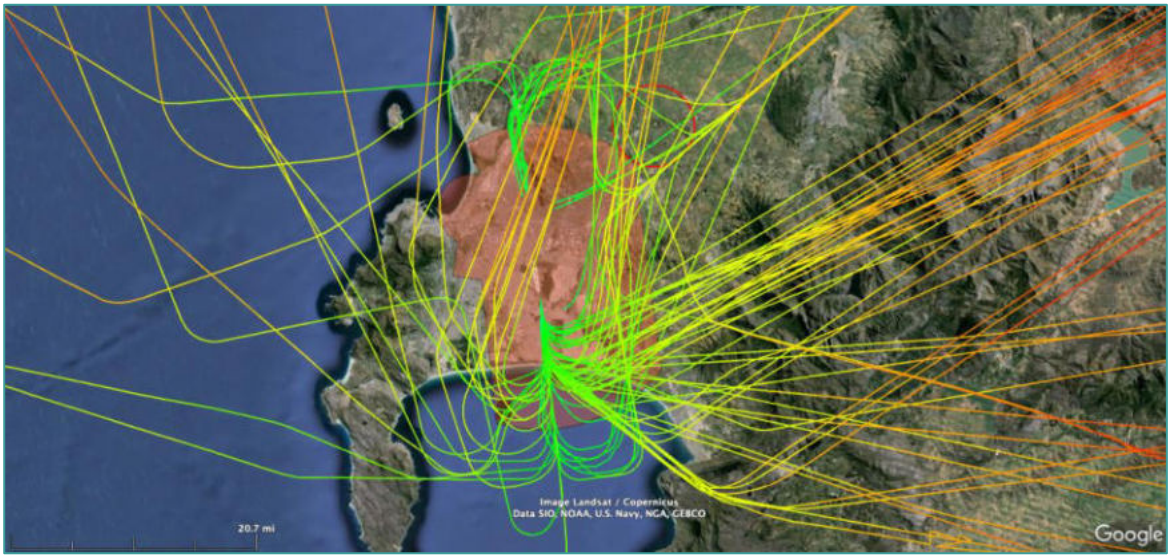

FIGURE 8: ZOOMED IN TRACKS REPRESENTING FACT DEPARTURES

46. The same principle, as applied to the arrivals, has been done with the departures. Figure 9 and Figure 10 provide the elevation views from an easterly and westerly perspective together with the lowest identified departure aircraft in the vicinity of the FAWN circle (grey area with red vertical lines).

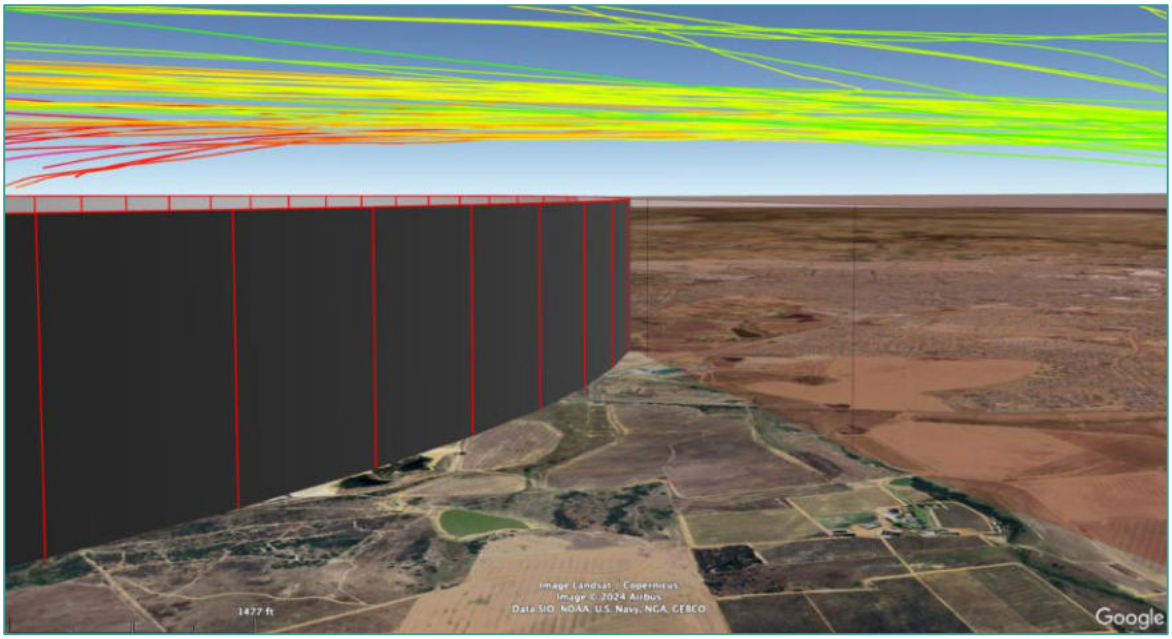

FIGURE 9: ELEVATION VIEW FROM THE EAST

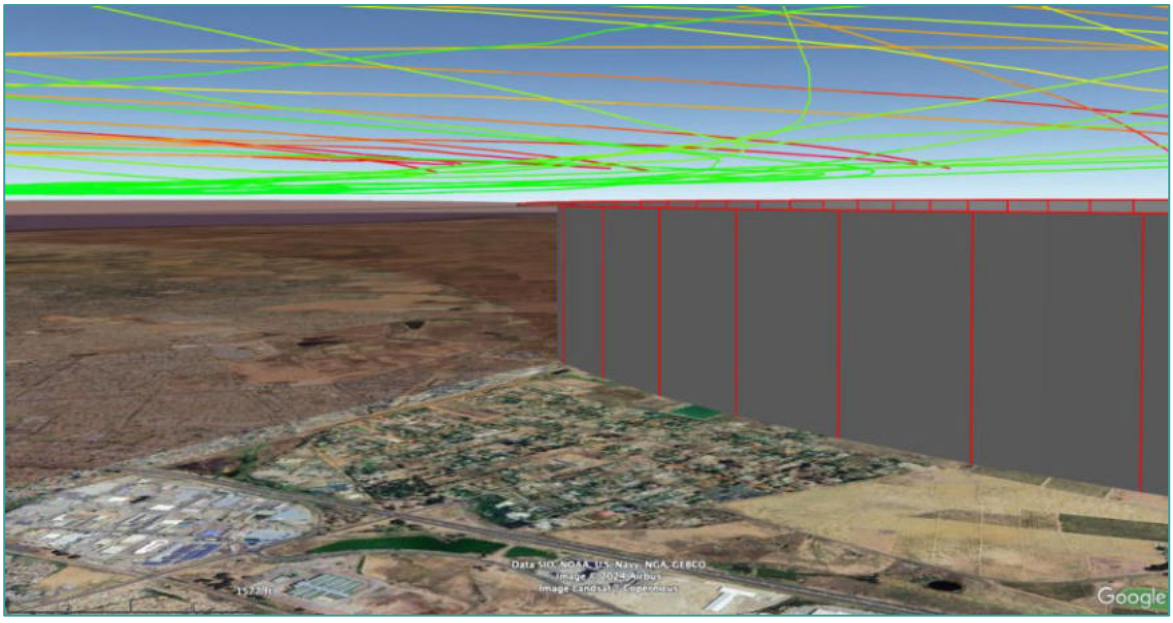

FIGURE 10: ELEVATION VIEW FROM THE WEST

47. The lowest identified departure track is evident in Figure 11 with the nearest and lowest track to FAWN at between 3,825 to 3,850ft at a speed of 226 knots.
48. The aircraft is an SA Airlink E135 departing from FACT to FABL, aircraft type E135.
49. A further review of remaining aircraft tracks, for flights departing from Runway 19, indicates most flights to be in the level band of 5,000 to 8,000ft.

FIGURE 11: LOWEST FACT DEPARTING AIRCRAFT IN THE VICINITY OF FAWN

50. In summary, FACT departures are not impacted by a volume of airspace serving FAWN.

FACT Airspace Analysis

51. It is evident that most arriving and departing aircraft for FACT follow the published departures (SIDS) and arrival routes (STARS). In complying with these published route structures, aircraft are well above 3,000ft when in the vicinity of FAWN.
52. Where aircraft have been provided shorter, direct routings, they are consistently above 3,000ft. This is consistent with the requirement for ATC procedures for containing IFR flights in controlled airspace.
53. As a result of the above, further development of an airspace structure for FAWN should be easily achieved.
54. The displacement of the two airports allows for a natural vertical displacement based on tracks miles to a common point. This will result in the airports being totally independent of each other.

55. As demonstrated in slides 69 and 70 of the Concept of Operations for FAWN[5], concept Instrument Flight Procedure (IFP) designs are considered. These designs demonstrate how flights departing FAWN could be integrated into the existing departure array serving the Cape Town area.

56. An aircraft departing to FAOR from Runway 01 at both airports, will result in FACT traffic being above FAWN departures allowing for the simple application of vertical separation by ATC.

57. Aircraft departing Runway 19 would probably have similar track miles to the first joining point. However, the distance to that point is 25nm for a FAWN departure permitting more than sufficient time for vertical separation to be applied for a simultaneous FACT departure.

58. The current SID procedures do not have any attitude restrictions climbing to Flight Level 090 (FL90). With the introduction of flights accessing the same route structure, a simple mitigation is to have built in altitude criteria for each airport. This will result in flight paths being separated by design thereby ensuring safety and efficiency in the event of a radio failure.

59. The same design criteria can be applied to ensure separation by design in the unlikely event of the airports using opposite direction runways. IFP design in this manner allows for manageable workload for ATC and pilots and sets out predictable flight requirements.

Analysis of Other Airspace Environments

60. A further analysis of high-capacity airport environments was reviewed to see where, and if, airports were dependant on each other. Table 3 provides a summary of airports and distances together with air traffic movements. It is evident, from this summary that close proximity of FAWN to FACT is not a factor to one being dependant on the other and restricting current or future capacity.

61. For comparison, the distance between FACT and FAWN is 13.16NM. Traffic and passenger (pax) data is the latest available for the relevant consolidated 12-month period either as 2022/3 or full calendar period of 2023.

Airport	Closest Airport	Distance (NM)	Total Air Traffic Movements (combined)	Total Pax (combined)	Comment
FAOR	FAWK	16	181,527	15 622 216	FAWK data not available. The position of FAWK airspace is relevant to demonstrate how each airport operates independently.
OMDB	OMSJ	9.15	514,405	102,294,365	Runways parallel direction in a confined airspace.
EGLL	EGLC	19.5	508,701	82,610,118	Same direction and aligned. Similar arrangement to FACT-FAWN.

[5] Final Report – Development of an Airspace CONOPS for the Cape Winelands Airport, version Final, dated 11 November 2022

Airport	Closest Airport	Distance (NM)	Total Air Traffic Movements (combined)	Total Pax (combined)	Comment
KJFK	KLGA	8.9	840,186	89,714,823	High-capacity airspace environment that includes Newark Liberty Airport in close proximity.

TABLE 3: AIRPORT COMPARISONS

62. Within the Johannesburg TMA there are a number of airports that add to the complexity of the FAWK airspace (Figure 12).

63. This includes FALA, with scheduled traffic and a number of busy GA airports including FAWB, FAGC and FAGM. Of note is FAGC which sits below a busy departure and arrival track for FAOR.

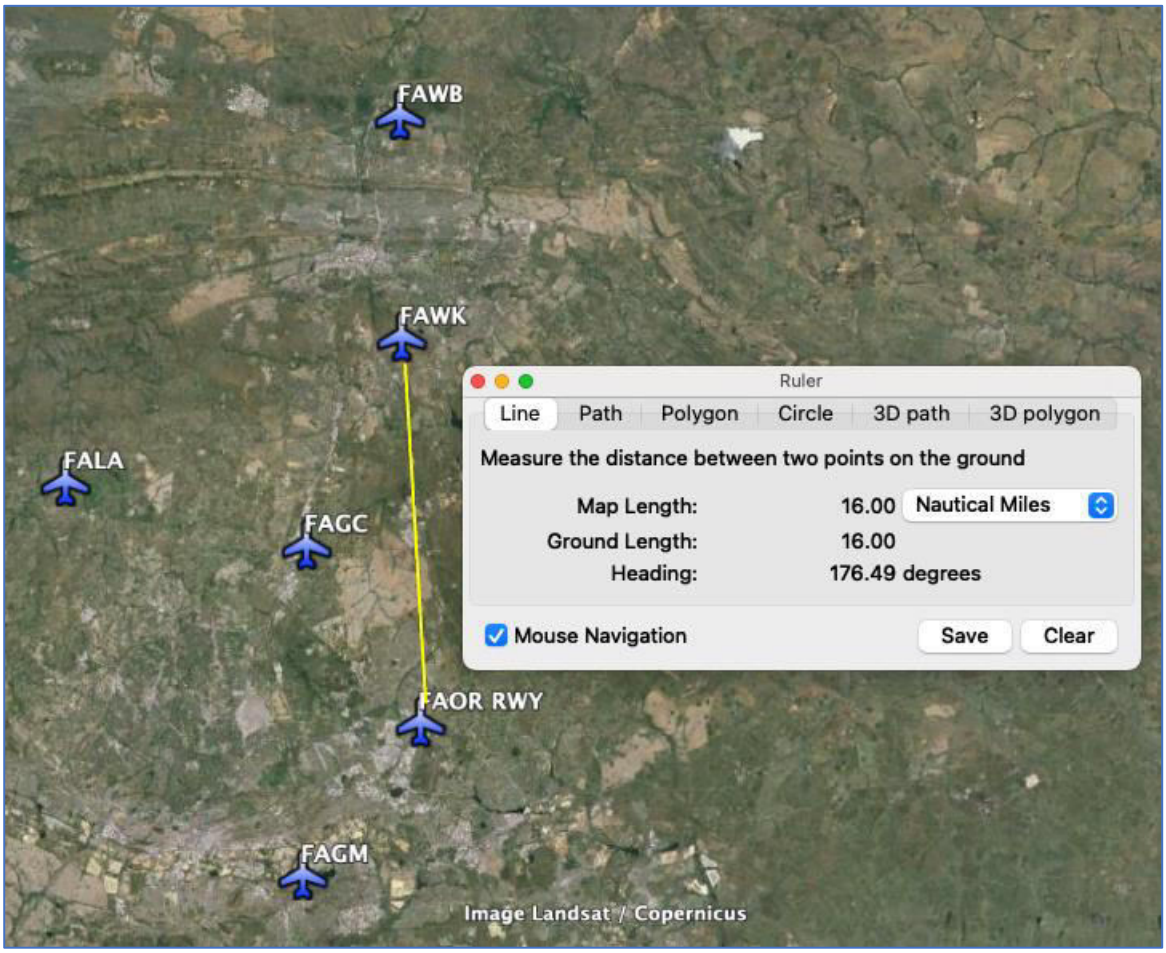

FIGURE 12: JOHANNESBURG TMA

64. The United Arab Emirates is a very good example where Sharjah (OMSJ), base to Air Arabia, is in close proximity to Dubai International Airport (OMDB), home to Emirates. Although the airports have parallel runways the supporting airspace is very confined with an air traffic route structure aligned to the runway direction. This results in narrow arrival airspace corridors to the east and west.

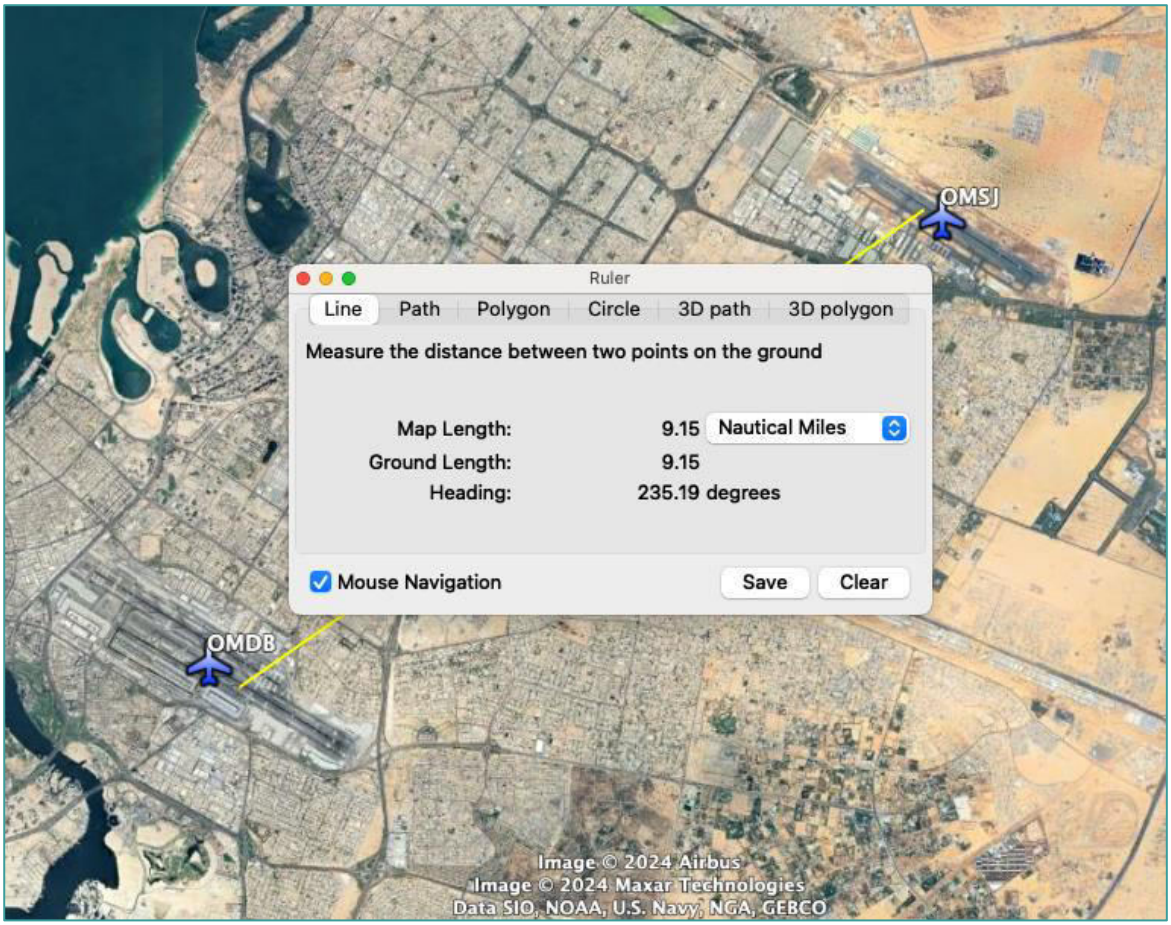

FIGURE 13: DUBAI CTA - OMDB AND OMSJ

65. Within the London TMA, there are a number of high-capacity airports. Heathrow (EGLL) is the busiest international airport. London City (EGLC) is nearby with same direction runway (Figure 14). To the south is Gatwick (EGGW) that operates on the of the busiest single runway operations with a declared capacity of 55 movements per hour with peak capacity of 60 movements regularly achieved.

66. To the north of EGLL is RAF Northolt (EGWU), which is base to 32 Squadron, the Royal Flying Corps, who are responsible for transporting the Royal Family and senior government officials. The nature of operation requires fully independent operations from EGLL.

67. Apart from these airports, Stanstead and Luton share the London TMA for scheduled operations. There are also a number of busy commercial operations within the TMA including Biggin Hill that accommodate a high number of business jet operations.

68. The combined air traffic movements and passengers for the London TMA (excluding RAF Northolt) is just under 168 million passengers and just more than 1,160,676 air traffic movements per annum.

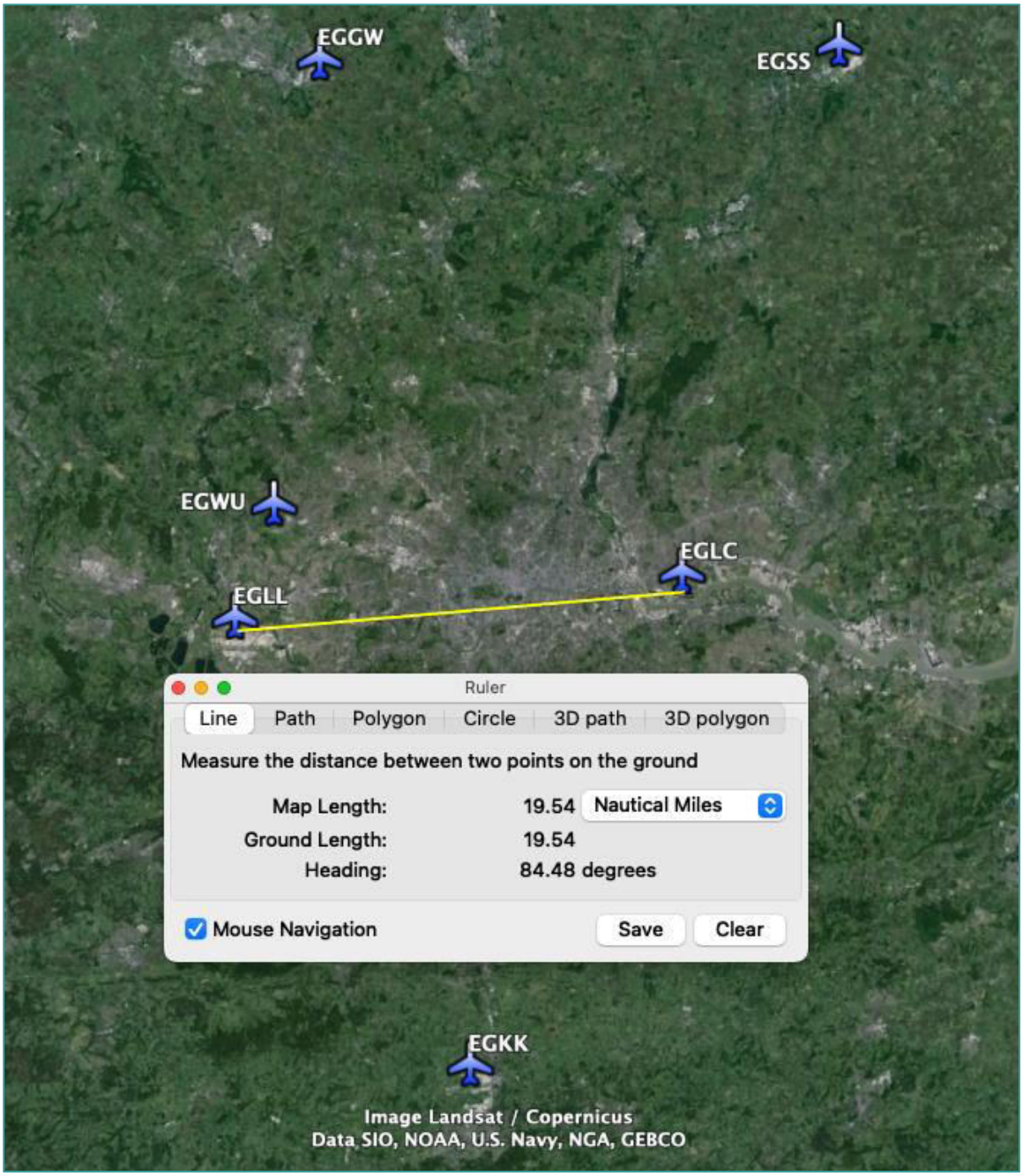

FIGURE 14: LONDON TMA

69. The New York airspace is also considered one of the busiest portions of airspaces in the world. Three airports operate in close proximity consisting of JFK International (KJFK), LaGuardia (KLGA) and Newark Liberty (KEWR). Combined, these airports move 1,265,944 air traffic movements and more than 120 million passengers per annum.

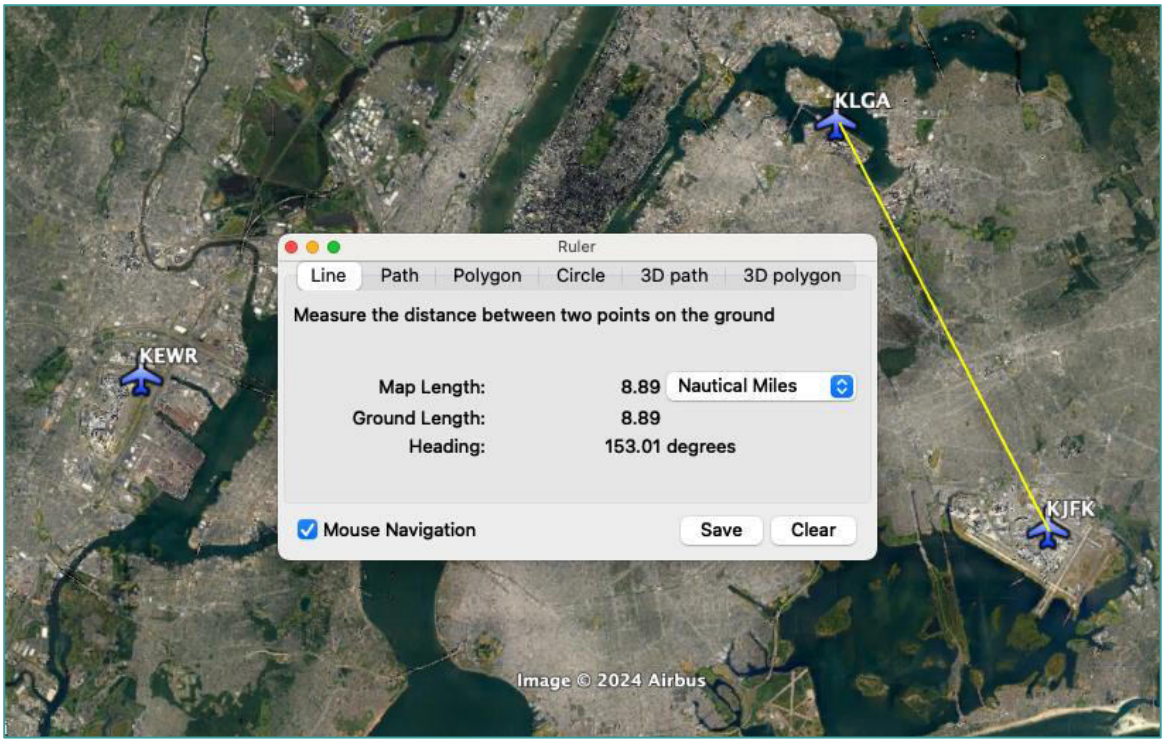

FIGURE 15: NEW YORK AIRSPACE

South African Airspace

70. In general terms, airspace is considered a State Asset. The State has the responsibility of assigning airspace designation to its use as per ICAO standards and recommended practices. The State will also provide a licensing regime for Air Navigation Service Providers (ANSPs) to provide a service based on a system of user requirements, e.g., airports and operators.

71. South Africa has an ICAO compliant aviation infrastructure with the South Africa Civil Aviation Authority dispensing its duties in line with the Civil Aviation Act 13 of 2009.

72. In line with the Act, South Africa has set out a National Airspace Master Plan (NAMP)[6]. The primary purpose of which is, "*…to achieve an interoperable, globally harmonised ATM system for all users during all phases of flight…*". There are significant comments within this document that are relevant to the airspace management and overall requirements to meet user needs.

73. The objectives of the NAMP are clearly laid out in Chapter 5 and copied below for ease of reference:

The objectives of the NAMP are as follows:

- *To service the airspace in accordance with ICAO Standards and Recommended Practices (SARPS) in such a way that it meets the requirements of all users and particularly, the international community.*

[6] Version 1.1, revision date 11 November 2010.

- *To rationalize all managed airspace in accordance with ICAO SARPS in such a way that it meets the requirements of all users by a consultative process, strategically and tactically.*
- *To minimize all permanent Prohibited, Restricted and Danger areas in accordance with ICAO SARPS and to facilitate the flexible use of airspace to the benefit of all users.*
- *To continually maintain information (uncontrolled) airspace in accordance with ICAO SARPS in such a way that it meets the requirements of all users.*

74. Besides the normal expectation to meet ICAO SARPs, the second bullet is of significance to the FACT CTR. It is within this context that the FACT CTR could be made more efficient – this will be further explained within this report.

75. Of concern is that the NAMP has not been revised since 2010. It is understood the National Airspace Committee (NASCOM), consisting of concerned stakeholders, meets regularly. However, there have been significant developments in ICAO publications, that influence a States national airspace plan, that do not appear to be addressed. Examples of ICAO publications since 2010 are:

- Global Air Navigation Plan 2016-2030, published in 2016.
- Doc 9992 Manual on the Use of Performance-Based Navigation (PBN) in Airspace Design, First Edition, 2013.
- Doc 9997 Performance-Based Navigation (PBN) Operational Approval Manual, First Edition – 2013, Second Edition, 2015.

76. It is not the intent of this report to compare the NAMP to the above changes as it is assumed that many of these activities are managed through NASCOM. The purpose is to align the processes with the GANP specifically to the consideration to other airspace users including new users. Therefore, consideration to airspace design and allocation must bear this in mind.

77. ICAO has established a number of Aviation System Block Upgrades (ASBU) defined as the ICAO methodology as a programmatic and flexible global approach that allows all Member States to advance their Air Navigation capacities based on their specific operational requirements.

78. With the above backdrop, airports are provided airspace designated for the intended use based on the type of Air Traffic Services (ATS) provided. There is no ownership of airspace, with ANSPs delegated the management of airspace according to their licence.

79. Within the Cape Town environment, the FACT CTR is assigned to the ANSP (Air Traffic and Navigation Services - ATNS) to manage on behalf of the Airport. The airspace infrastructure above the CTR, consisting of TMAs and CTAs, serves the greater Cape Town and Western Cape region. On the basis that FACT has traditionally been the only major airport in Cape Town, the airspace has been designed to primarily meet that need.

80. Further analysis of the FACT CTR identifies a number of factors that should be considered in future airspace design. The purpose is not to remove airspace from an airport but to define the user requirements and assign airspace to what is needed, not wanted. This aligns to the NAMP objective of rationalising airspace in conjunction with the ICAO GANP.

81. Normal CTR design has the runway centred permitting sufficient airspace to either side and for the approach and departure ends to contain IFP design protection areas.

82. The FACT CTR has the runway displaced to the left of the CTR airspace volume. Figure 16 provides a visual indication with distances from the runway to the CTR boundaries. The arrival and departure distances are as normally expected and approximately 10nm from the runway ends. This will ensure containment for a 3-degree glide slope. To the sides, we have 4nm to the west and 8nm to the east.

FIGURE 16: FACT CTR DIMENSIONS

83. A review of the FAOR CTR indicates similar dimensions to either end but with a 6nm lateral limit to either side of the runways. The CTR for Gatwick Airport, in the UK, reveals a CTR that extends to a distance of less than 4nm either side of the runway.

84. Further review of the AIP reveals that the FACT CTR has an extensive VFR hotspot area to the eastern edge of the CTR, see Figure 17.

FIGURE 17: FACT CTR HOTSPOT

85. There is a significant opportunity here to address the concern of the FAWN airspace requirement coupled with reducing the potential for airspace infringements.

86. Figure 17 indicates a significant infringement area along the eastern border with the area hatched in red. Moving this CTR boundary further west could have a significant impact in reducing airspace infringements.

87. The argument here is that infringements are occurring where there is no need for airspace. As demonstrated with FAOR and Gatwick airports, it is possible to reduce the boundary to between 4nm and 6nm while safely maintaining a high-capacity airport. Whilst not the focus of this report, it is recommended that CTR boundary lines are designed with terrain features in mind that aids GA pilots to visually identify airspace limits.

88. In summary, the ICAO GANP requires the consideration to new users, implementation of PBN and define requirements to operational need as a result. It is a considered position that the FACT CTR will need to be adapted to meet the future need of all airspace users (including Unmanned Aerial Vehicles (UAVs)) and to meet performance requirements.

89. In meeting future requirements, the SACAA in conjunction with ACSA and ATNS, will need to consider new airspace users in the Cape Town area, in particular UAVs. Therefore there is a real opportunity to rationalise the FACT CTR. FACT is significantly closer to the Cape Town city centre and will, in all probability, be subject to a higher volume of UAVs, including eVTOL (Electric Vertical Take-off and Landing) aircraft.

FAWN Airspace Concept of Operations Review

90. NACO, in association with ATNS and NLR developed an airspace concept of operations (CONOPS) for FAWN. A final report was issued on 11 November 2022, this section covers the review of that document with reference to Slide numbers of that document.

91. This study reviewed the CONOPS with two objectives in mind, first to validate the concept presented, and secondly to determine if the concerns raised by ACSA have any merit. The scope of the CONOPS review is therefore limited to the determination of independent operations (of FAWN) and the airspace design concept presented.

92. The Strategic Requirements on slide 64 were reviewed in context of the analysis completed in this study. All three objectives are aligned to the outcomes of this study, of particular note is the requirement for independent operations between FAWN and FACT. The second requirement accords with the opinion of this Study insofar that the opening of FAWN can be achieved without any major airspace change required.

93. The proposed IFPs are the correct types for introduction considering the requirements of the ICAO GANP.

94. The concept designs from slides 69 to 72 are consistent with expectations. The challenges to applying the design criteria appear to be fully acknowledged and comment to mitigation is consistent.

95. The reported FACT TMA capacity statement on slide 79 is inconclusive. Airspace capacity is determined by runway capacity, in the instance of the FACA TMA, it primarily serves FACT. Given that FACT has a runway capacity of 30 aircraft per hour, a TMA capacity of 35 is feasible.

96. If an airport maintains a peak capacity throughput, the adjoining TMA will be able to manage that excluding any constraints, i.e. en-route holding or severe weather. If a second airport or runway uses the same portion of TMA airspace, then the declared capacity will need to be reviewed in conjunction with the associated IFP designs to support the airport.

97. As a guide, in an arrival peak, aircraft landing at 5nm intervals will require spacing of approximately 10nm at 40nm from landing. The reason is that the leading aircraft will always slow down first resulting in marginal gains from the following aircraft until they reach final approach.

98. The situation is in reverse with departing aircraft due to the first aircraft being in a position of accelerating earlier. Aircraft below 10,000ft are not permitted to exceed 250 knots (indicated). Allowing for standard wake turbulence criteria, the second aircraft will get airborne between 2 to 3 minutes afterwards. It is therefore logical to assume that a continuous stream of departures can be maintained.

99. The section covering the merging of traffic flows is consistent with airspace design and sets out the methodology for managing traffic flows. Capacity on each route must not be observed purely in the lateral sense, i.e, one aircraft following another. There is a vertical competent to be considered whereby aircraft are vertically separated. Of note, this section provides the short to medium term aspirations of growth in the region. As mentioned within the Strategic requirements, future capacity demands will require further design of the IFPs.

100. Mention is made in this CONOPS document of meeting PBN requirements. The FACT SIDS and STARS are designed using ground-based navigational aids, this is not aligned to the requirements of the ICAO GANP or regional initiatives.

101. Regardless of future capacity demands, the SIDS and STARS will have to be re-designed to RNP criteria and to further support Continuous Climb and Continuous Descent Operations (CCO/CDO) initiatives, in so doing, IFP procedures can be defined as ‘safe by design’ meaning aircraft require less ATC intervention. By example, a STAR can be designed with the required level and speed

constraints up until the runway threshold. ATC would issue a clearance for an aircraft to comply with a designated STAR to the designated Instrument Approach Procedure (IAP). This design methodology eliminates the need for frequent level and heading adjustments and ensures the SIDS are either vertically or laterally separated. The ICAO GANP has set the target of full RNP integration in 2030.

102. This Study determines that the proposed CONOPS to be consistent in the approach taken to the introduction of airspace requirements and IFP design. All aspects have been covered and include future requirements under the ICAO GANP.

Airspace Review Summary

103. The high-level review of the FACT arrival and departure tracks over FAWN indicates there is sufficient distance to permit independent operations between the two airports. Aircraft arriving and departing FACT permit sufficient vertical separation for aircraft to depart and arrive FAWN.

104. The NACO CONOPS report demonstrates how the FAWN procedures could be adapted to merge with FACT traffic routes in the short term. The concept IFP designs are feasible and demonstrate the capability of PANS-OPS design criteria to achieve solutions to complex airspace designs.

105. As capacity demands on airspace grow, the route structure can be adapted to separate the routes laterally. The adoption of vertical and lateral separation can easily be developed within the capability of the PBN requirements post 2030 and as described with respect to the ICAO Global Air Navigation Plan (GANP) and the South African National Airspace Master Plan.

106. It should be noted that ATNS contributed to the development of the CONOPS, as the designated ANSP, they have not identified any airspace constraints to capacity with both airports in operations.

107. Examples of near-airport environments in high-capacity airspace provides sufficient evidence that the close proximity of FAWN to FACT should not impact the current and future aspirations of both airports. The examples provided differing runway alignments and environments.

108. The conclusion of the aforementioned analysis has determined that the current and future airspace demands for FACT will not be affected by the future aspirations of FAWN. The airspace environment will permit the airports to operate independently of each other. Table 4 is a copy of Table 1 with non-airspace issues extracted and each airspace concern raised by ACSA addressed.

ACSA Response to:	ACSA Concern	Analysis Comment
2.5 Page 101: Alternate airport for fuel planning and environmental savings.	ACSA analysis shows that the complexity in the airspace will negate the benefits derived from fuel savings	ACSA did not provide evidence of their analysis on airspace impact. However, this report and the CONOPS demonstrates the ability of each airport to operate independently.
2.5. Page 293: Coexistence of Cape Winelands Airport and Cape Town International Airport.	7th Bullet: The airspace conflict and restrictions will in our initial analysis (as explained later in this response) create inefficiencies in the airspace and in the movements into Cape Town International Airport. CWA will impact the airspace and procedures into CTIA. This could also potentially result in higher noise footprint at CTIA, inefficient flight paths and increased fuel burn for airlines flying into CTIA.	No evidence is provided by ACSA to support this statement. This report indicates that the existing procedures for FACT would not be amended to result in additional track miles. It is the opinion of this report that the existing procedures can be enhanced to further reduce noise and fuel burn by applying the latest PBN principles of Continuous Climb and Continuous Descent Operations (CCO/CDO).
	8th Bullet: Recognition of CTIA future plans and a 2nd runway and the potential impact to the proposed flight paths.	No evidence is provided by ACSA to support this statement. On the basis that both airports can operate independently demonstrates that expansion plans for FACT will not be impacted.
2.6 Page 340: Proposed increase of flight activity at CWA…	ACSA state their analysis indicates that there will be an airspace conflict now and, in the future, which will risk the future development of CTIA and also other surrounding airfields.	No evidence is provided by ACSA to support this statement. The review undertaken in this study finds no evidence to support this statement.
3.6 Page 12: Integration into existing airspace.	Concerns that the proposed CWA development will result in dependencies on CTIA. Mention is made of the CWA CONOPs document referencing only the current, single runway at CTIA.	No evidence is provided by ACSA to support this statement. The review undertaken in this study finds no evidence to support this statement.
	A further concern is raised that it is 'logical' that aircraft will need to follow the same routes and will be compounded by the newly, planned runway orientation.	This is an incorrect statement. While some segments of flight might be required, they can be vertically managed so as not to impeded efficiency for either airport. Latest PBN developments has resulted in the implementation of Free Route Airspace (FRA) in multiple countries, these include the UK, UAE together with a number of European countries. The Borealis Alliance has been created with 9 ANSPs managing 39% of European traffic with greater than 11,000 flights per day. FRA will enable annual savings of around 145,000 tons of CO2, which is directly related to fuel burn.
4. Comments related to Appendix 17, Civil Aviation Baseline and Scoping.	It is ACSA's position that the current flight paths of the airports will have dependencies and interfere.	No evidence is provided by ACSA to support this statement. The review undertaken in this study has determined that both airports can operate independently.

ACSA Response to:	ACSA Concern	Analysis Comment
	Consideration to two international airports operating within close proximity of each other and resultant resource allocation (navigational aids and ATS).	No evidence is provided by ACSA to support this statement. Evidence provided in this report demonstrates multiple examples of high-capacity airports operating in far more demanding environments.
	The development (CWA) may add additional strain on ATC at CTIA with additional complexities.	No evidence is provided by ACSA to support this statement. Provision of ATC is a service provided by ATNS, they are also co-authors of the FAWN CONOPS. There are no concerns raised in the CONOPS to support the concern raised by ACSA.
5. Comments related to Appendix 19: Development of an Airspace CONOPs for CWA. Numerous bullets points relating to (but not limited) to:	Future runway alignment and additional parallel runway.	No evidence is provided by ACSA to support this statement. The new runway alignment will enhance the independent operations between the two airports. Departures from Runway 36 will be further displaced from FAWN. Since the two airspace structures can operate independently, the likelihood of one airport impacting the other is mitigated. Further development of the FACA airspace structure, to meet future PBN requirements will continue to ensure independent operations and enhance flight efficiency and airspace capacity.
	Airspace design must not limit CTIA expansion plans to 45 million passengers/72 movements per hour.	The proposed development of FAWN will not impact the future planned aspirations of CTIA.
	CWA airspace design must not negatively impact the safety and efficiency for flights into CTIA and furthermore be totally independent.	The proposed airspace will be independent of the FACT CTR. It is the role of the procedure designers, applying PBN concepts, that will ensure safety and efficiency.
	Concerns that inefficiencies, created by airspace dependencies, will impact operators and ATC.	Considering the independent operations of the airspace, this matter is considered mitigated.
	Maintaining CTIA glide slope criteria.	As demonstrated in this report, the IFPs for FACT will not be impacted. These are designed to meet the current glide slope requirements for FACT.

ACSA Response to:	ACSA Concern	Analysis Comment
	CTIA must receive priority in terms of flight paths (routes).	Given the independent operations of both airports, this statement is of little consequence. Notwithstanding this statement, it is not in compliance with ICAO nor is it safe to create this expectation. If safety is a priority, then all flights into the Cape Town area will receive equal priority unless the flight is designated a State flight as per normal protocol. Other priorities include emergency or medical flights.
5.2 Page 14: Airspace restrictions of VFR traffic around Cape Town CTR	Any change to airspace arrangements, as a result of CWA impacting traffic flows outside the CTIA CTR, will negatively impact the aviation industry.	No evidence is provided by ACSA to support this statement. The examples of high-capacity airports elsewhere in the world indicate this statement has no basis.
5.4 Page 20: Airspace capacity	ACSA are concerned that there will be dependencies between FACT and FAWN.	No evidence is provided by ACSA to support this statement. The review undertaken in this study finds no evidence to support this statement.

ACSA Response to:	ACSA Concern	Analysis Comment
5.5 Page 20: Environment	Concern raised over the current, reported FACT TMA capacity is 35 aircraft per hour and that FAWN will impact capacity during peak periods at both FACT and FAWN and will require consideration towards re-sectorisation to accommodate forecasted traffic volumes and ATC workload. There is additional comment to extended arrival management systems and separation criteria.	No evidence is provided by ACSA to support this statement. The airspace may currently have a declared capacity of 35 aircraft per hour but that does not equate to a peak capacity capability. Airspace capacity is determined by runway capacity, as such the current capacity at FACT is 30 per hour with the airspace capable of managing an additional 5 aircraft. This is a standard modelling scenario whereby continuous flow from an airport determines that the airspace capacity is equal to the runway capacity plus an overflow value – this is in order to maintain runway throughput. If ACSA are concerned on the current TMA capacity, this invalidates their own expansion plans where 72 aircraft per hour are envisaged. It is the opinion of this report that the FACA TMA can safely manage the runway capacities of both FACT and FAWN including future expansion plans for FACT. It is accepted that as both airports increase capacity that the airspace will have to undergo some change, but this is more to do with IFP design than airspace volume creation. The additional comment is not understood, the ATNS Metron ATFM system is capable of manging multiple airport environments, this is normally a parameter setting adjustment is the system. Separation criteria consists of vertical and lateral separation and therefore multiple aircraft can be accommodated simultaneously through a single arrival point. An ATFM system uses a time-based approach to achieve lateral separation for a runway. That said, the time separation at 30nm from an airport applies sufficient room to allow the following aircraft to gain for the appropriate distance on final approach. Where there are multiple aircraft for alternate airports then vertical separation is applied.
	Concern is raised over Approach Control resource based at FACT.	This statement is not clear. It is understood that ATNS are required to provide an Approach and Area Control service for the Cape town region. Therefore, the Approach Control service provision is not a dedicated FACT service. If additional Approach Control service is required due to increase in traffic demand, then this is an issue for ATNS to address.

ACSA Response to:	ACSA Concern	Analysis Comment
	Concern is raised over keeping IFR traffic outside/below FACT airspace – relates to question over dependency of the two airports.	This statement is not clear nor is there any evidence to support it. There is no evidence to support the concern that FAWN will be dependant of FACT (and vice-versa) therefore the concern is without basis.
	Query over the re-design of FACT's TMA and CTR design under current and future runway environment.	There are many examples of airports, in close proximity, where airspace design mitigates any concern over congestion or capacity issues. The main constraint to airspace capacity is runway capacity – simply put, if the runway fails to meet demand, then the airspace will be impacted but that does not imply that runway capacity issues at one airport will directly influence another.
	Query related to use of Surveillance radar (Primary and Secondary) at FACT.	It is understood that these assets are the property of ATNS who are also responsible for maintenance. These same assets are used in the FACA FIR, well beyond the FACT CTR.

TABLE 4: ANALYSIS COMMENTS TO ACSA CONCERNS

110. In conclusion, this Study addresses the concerns raised by ACSA. Without the benefit of evidence provided by ACSA to substantiate their concerns, this Study is unable to address them in more detail.

General Aviation Review

111. Concerns raised by nearby GA operations requires a further analysis into airspace arrangements. This is an understandable position given the change in airspace classification and associated rules. GA operate predominantly in Class G airspace (uncontrolled) and the expansion of FAWN airspace (Controlled) will effectively limit accessible airspace.

112. Following pre-application engagement and comment to the CONOPS for FAWN, this report will focus on GA operations of Stellenbosch Airport (FASH), Rondebossie (unlicensed gliding facility) and Morningstar, also an unlicensed airfield to the west of FAWN.

113. Given the extensive review within this report and the statements made within the CONOPS, this section will focus on the concerns raised in Table 2. Table 5 is set out in much the same as the ACSA Table with only airspace issues commented on. Figure 18 provides and overview of GA airfields in the vicinity including the Rondebossie launch site.

Representative	Concern	Analysis Comment
South African Hang Gliding and Paragliding Association (SAHPA)	General concern that gliding activities were not included in the EIA for CWA. Specific mention is made to potential impact to Rondebossie, a launch site with 6km of CWA.	SAHPA set out a very detailed explanation regarding their concerns, which this Study fully agrees with. With regards to specific concerns, this Study is assessed that the activities are highly unlikely to be impacted by the expansion of FAWN as detailed in the CONOPS for the following reasons: 1. Paragraph 7.4, of the noted concern, details the activity as typically being between 300-600ft and very rarely exceed 1,500ft and operate within 500m of the launch site. 2. Rondebossie is not a registered site with the SACAA. No reference is found regarding the site in the latest version of the AIP in ENR5.5. 3. The activity of Rondebossie is not disputed but SAHPA mention they have approximately 780 members and approximately 310 launch sites. That implies that either the sites have very little activity (2-3 launches per week) or each site is not consistently used. It is assumed that the international visitors are also spread throughout the year across the various sites. Notwithstanding the above, it is entirely feasible for Rondebossie to continue operating within the environment they currently enjoy. The recommendation is that future operations include a Letter of Agreement covering notification of gliding activity and the area to be contained. This is a fairly common occurrence for ATC Units to have local agreements with recreational flying clubs. The agreement can include airspace constraints for normal activities as well as a procedure for activities that require more airspace.
Stellenbosch Flying Club (SFC)	Concern on the proposed change to FAD69.	The CONOPS details some impact to FAD69 and the reality is that along with the airspace change to FAWN, the same will be required for FAD69. That said, FAD69 is a large area with FAWN only impacting part of the area. There may be opportunity to retain lower airspace portions of FAD69 or expand them. Through the applicable airspace bodies, CWA has initiated a Task group to ensure engagement by all stakeholders. Given this forum, it is not unreasonable to expect a reasonable outcome to support General Flying Areas.

Representative	Concern	Analysis Comment
	Request clarity on the VFR corridors.	It would be premature to determine where VFR corridors can be defined. This Study has identified a strong case to reduce the current size of the FACT CTR. In the same way, the FAWN airspace structure should be designed for what is needed to contain IFP designs (including associated protections surfaces – these consist of Primary and Secondary protection surfaces). By ensuring that the FACT and FAWN CTR/ATZ airspace volumes are reduced to what is needed rather than wanted, the remaining airspace will provide the possibility of VFR corridors between the FACT and FAWN airspace volumes. Notwithstanding the creation of VFR corridors, the FAWN CONOPS document recognises and accepts that VFR transiting the airspace will be accommodated when possible.
Morningstar Flying Club (MSC)	Concern over 'free and safe' use of airspace related to usable VFR corridors.	As discussed in the response to SFC, there are opportunities to improve some airspace volumes.
Social Media response (Facebook)	Concern on the impact of recreational flying.	As discussed in the response to SFC, there are some opportunities to rationalise current airspace volumes.
	Questions how the FAWN airspace will 'overlap with FACT.	No overlap of airspace is envisaged, however the process of conducting a formal airspace change process may result in differences from the CONOPS. An airspace change process must be driven through airspace requirements and needs of users. Rationalisation of the FACT CTR will result in some gains, including improved accessibility between Morningstar and FASH. The comment in relation to transponders is an interesting observation. The growth of the UAV market is driving the future requirement for all aircraft to be fitted with an acceptable form of electronic conspicuity, e.g., ADS-B. The use of ADS-B has proven to enhance safety in the GA environment due to the capability of ADS-B interrogation, this aids pilots to identify other aircraft in flight either due to limited visibility (looking into the sun) or blind spots from the cockpit view. Extensive trials were undertaken in the UK through the organisation Airspace4All. Results of the trials and further details can be found at: https://www.easa.europa.eu/community/topics/airspace4all-ga-airfield-ats-ads-b-traffic-display-trial. https://www.arpas.uk/tag/airspace4all/ https://www.caa.co.uk/newsroom/blogs/bringing-ads-b-surveillance-trials-to-airfields/

Representative	Concern	Analysis Comment
	Concern on impact to local airfields Diemerskraal and Wintervogel.	Diemerskloof airfield circa 14nm from FAWN. It has direct access into FAD69 and unlikely to be impeded on routes to FASH. Where routing through the FAWN airspace cannot be permitted, a detour will be required but not seen as significantly long. Wintervogel is circa 9nm from the extended centreline of Runway 01. From experience, access could be agreed from the north permitting access without contacting ATC. Any routing in other directions will probably require ATC contact for routing. Given the distance and expected aircraft types operating, it is feasible to keep the initial flight legs low-level (not above 1,000ft). The exact mechanism to permit operations should not be overly complex and will require discussions to understand normal routings and expectations from/to Wintervogel.

TABLE 5: ANALYSIS COMMENT TO GENERAL AVIATION

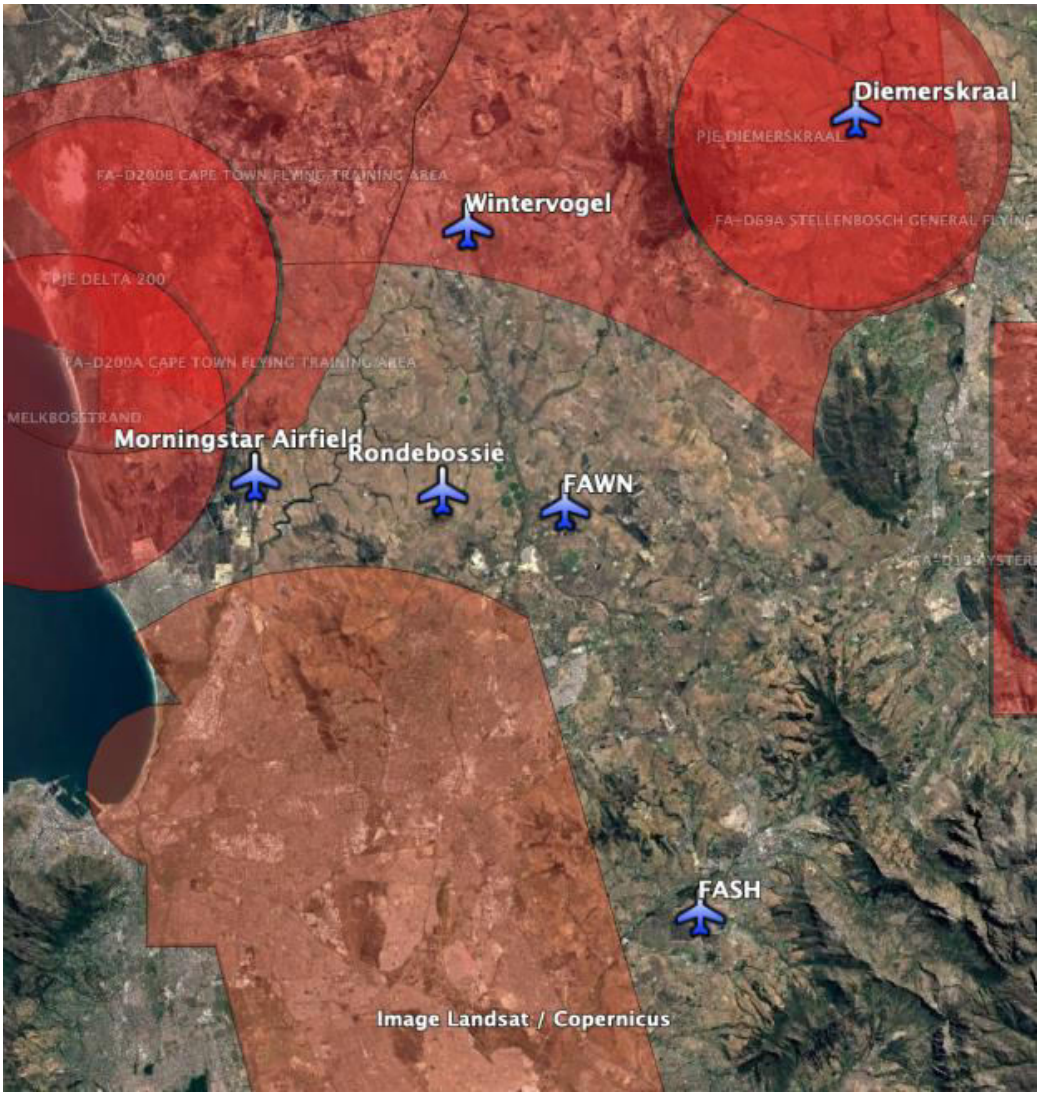

FIGURE 18: LOCAL GA AIRFIELDS

116. The conclusion of the review on GA determines that exact details cannot, at this stage, be provided. Addressing GA concerns differs from that of ACSA due to the differing airspace requirements.

117. There is a clear opportunity to address the dimensions of the FACT CTR which is seemingly larger than it needs to be. The CTR airspace portion to the east is largely unused and is subject to a high number of airspace infringements.

118. It is considered that the FACT CTR can be significantly reduced without impacting their operations. This will have a positive impact of reducing airspace infringements.

119. ICAO urges Member States to minimise airspace to what is needed, the NAMP supports the concept of efficient use of airspace. Therefore, the future development of FAWN, and its associated airspace requirements, should include consultation with all interested parties.