



Project Prefeasibility Report

1. Project Details

Project Name	Creation of a regulatory sandbox to position the Western Cape as a Global Hub for Drone Innovation.
Location	Saldanha Bay Local Municipality
Sector	Technology
Department	Department of Economic Development and Tourism
Project Owner	Fernel Abrahams Hendrickse
Project Manager	Fernel Abrahams Hendrickse

1.1 Background & Justification

The Western Cape Government (WCG) is establishing a Regulatory Sandbox for Drones and UAVs to position the Province as a global hub for drone innovation. This initiative, aligned with the Growth for Jobs (G4J) strategy and WCIF 2050 Principles, aims to provide a controlled environment for testing, regulatory adaptation, and commercialisation of unmanned aviation technologies.

Spanning 2024 to 2025, the project follows a six-phase development model that includes stakeholder engagement, technical requirements, site selection, operational design, and governance finalisation. Viable locations such as Saldanha, Atlantis, and George have been shortlisted based on airspace, infrastructure, and community impact criteria.

The sandbox supports a phased implementation model, progressing from VLOS and EVLOS to BVLOS and UTM-integrated operations, with a long-term goal of enabling fully functional drone corridors. It offers direct engagement with SACAA, ATNS, DoT, and includes frameworks for trial authorisations, exemptions, and real-time compliance monitoring.

The project is designed to de-risk investment and attract participation from drone operators, manufacturers, technology firms, and research institutions. It also supports job creation, STEM education, and inclusive economic growth through gender responsive procurement and local enterprise development.

As the sandbox transitions into a public-private partnership (PPP), investors are offered clear pathways to co-develop infrastructure, manage operations, and commercialise drone services. With regulatory alignment, scalable infrastructure, and structured governance in place, the sandbox presents a compelling investment opportunity to lead Africa's drone innovation landscape.

1.2 Project Scope

The scope of work for the WC Drone and UAV Regulatory Sandbox covers the full lifecycle of designing, establishing, operating, and scaling a mission-oriented regulatory innovation platform. The project includes structured stakeholder engagement with regulators, industry, municipalities, research institutions, and communities, supported by a documented engagement plan and research methodology. It entails close collaboration with national aviation authorities to define sandbox-specific regulatory frameworks, trial authorisations, and alternative compliance mechanisms aligned with risk-based aviation principles. The scope further includes technical planning for ground and airspace requirements, enabling phased operations from VLOS and EVLOS to BVLOS and future Unmanned Traffic Management integration. A comprehensive site identification and feasibility process underpins the selection of viable locations, alongside infrastructure planning for a minimum viable sandbox with scalable expansion capability. Governance and institutional arrangements are established through multi-stakeholder oversight bodies and an operational management team. The project also includes operationalisation of sandbox activities, digital compliance and monitoring systems, financial and

comercial structuring, performance tracking, and a phased transition towards public-private partnership models and long-term operational sustainability.

2. Objectives & Key Focus Areas

Objective	Key Focus Area
Position the WC as a Global Hub for Drone Innovation	Enhancing Private Sector Partnerships
Establish a Regulatory Sandbox for Drones and UAVs	- Prioritising Infrastructure for Maximum Impact - Innovation & Futures Planning
Support Economic Growth and Job Creation	Prioritising Infrastructure for Maximum Impact
De-Risk Private Sector Investment in the Drone Sector	Enhancing Private Sector Partnerships
Build an Integrated Drone Innovation Ecosystem	- Prioritising Infrastructure for Maximum Impact - Strengthening Municipal Infrastructure

3. Project Timeline & Cost

Estimated Duration	2 Year(s) & 0 Month(s)
Estimated Start Date	01 Nov 2024
Estimated Cost	R 2.1M

4. Project Stage-0 Submission & Approval

Submitted By	
Submitted On	
Signed By	
Approved On	

5. Environmental & Social Considerations

5.1 Environmental Considerations

- Greenhouse gas emissions and deforestation contributing to climate change
- Loss of biodiversity due to habitat destruction and fragmentation

5.2 Social Considerations

- Assessment of community impacts such as displacement and livelihood loss
- Protection of health and safety from environmental hazards
- Promotion of social equity and fair distribution of development benefits
- Engagement with stakeholders throughout the project lifecycle

6. Regulatory & Environmental Approvals

6.1 National Level

6.2 Provincial and Local Levels

- Provincial Environmental Departments: Implement and enforce environmental regulations within provinces
- Municipalities: Play a role in environmental management, especially in land-use planning and development applications

6.3 Other Relevant Entities

- Council for Scientific and Industrial Research (CSIR)
- UAS Sandbox Task Force (UAS-SB-TF)

7. Identify Key Stakeholders

7.1 Government

- Department Of Infrastructure
- Department of Environmental Affairs and Development Planning
- Western Cape Government
- Department of Economic Development and Tourism

7.2 State-Owned Entities

- Western Cape Archives and Records Service (WCARS)

7.3 Private Sector

- Financial Institutions

7.4 Civil Society

- Civil society organizations advocating for community needs

7.5 Other Stakeholders

8. WCG Sector Priorities

Outcomes	Social	Energy & Water	Economic	Technology	Ecological
Households have increased access to basic services and improved shelter				Short Term 1-5 YRS	

9. Infrastructure Type

9.1 Hard

As a secondary component, it enables Hard infrastructure. Although not dominant, the project includes limited and enabling hard infrastructure, such as:

- Ground facilities and test sites (minimum viable sandbox)
- Communications and digital equipment
- Physical safety and operational infrastructure
- Future scalable infrastructure for BVLOS and corridors

9.2 Soft

Primarily classified as Soft Infrastructure. The Western Cape Drone and UAV Regulatory Sandbox is fundamentally a soft infrastructure project, because its core function is to create institutional, regulatory, and governance capability, not a large physical asset.

It is a Soft infrastructure because:

- It establishes regulatory frameworks, trial authorisations, exemptions, and alternative compliance mechanisms.
- It builds institutional capacity within government and regulators.
- It creates rules, processes, digital systems, and coordination mechanisms.
- Its main "asset" is regulatory certainty and learning, not concrete or steel.

10. Project Stage-1 Submission & Approval

Submitted By	
Submitted On	
Signed By	
Approved On	

11. Geo Location

Geo Location	
Latitude	
Longitude	

12. Procurement Planning

- **Designated Groups** - Historically disadvantaged individuals
- **Local Content and Production**
- **Broad-Based Black Economic Empowerment (B-BBEE)**

13. Procurement Action

- **Procurement Planning**
- **Preferential Procurement Regulations (2022)** - Aligned : Yes
- **Sustainable Public Procurement (SPP)** - Aligned : Yes

14. Social Impact

- **Inclusive Economic Participation**
- **Social Equity & Spatial Justice**
- **Strengthened Community Trust in Public Transport**
- **Environmental Sustainability**
- **Skills Development and Job Creation**
- **Community Empowerment**
- **Ethical and Transparent Governance**
- **Safety & Security**

15. Property Availability

Has the land for the site been identified?: Yes

Remarks: A site identification and feasibility process has been completed. The location is identified at an area / node level, not at a specific plot of land. This means the project has identified where the sandbox could be located geographically, but not which exact piece of land will be used

16. Project Stage-2 Submission & Approval

Submitted By	
Submitted On	
Signed By	
Approved On	

17. Background & Justification

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18. Economic and Social Justification

- Poverty reduction
- Job creation
- Inclusive growth
- Reducing inequality
- Stimulating Local Economic Activity
- Financial Sustainability Through Diversification and Efficiency
- Alignment with Provincial Economic Strategies
- Supporting Community Trust and Transparency
- Job Creation, Skills Development and Local Participation

19. Geographic Coverage

19.1 Regions

- West Coast

19.2 Municipalities

District	Municipalities
West Coast District Municipality	Saldanha Bay

19.3 Communities

District	Communities
West Coast District Municipality	Saldanha

20. Sector-specific analysis

- **Technology & Regulatory features**

Interaction between technology, regulation, and public safety

21. Approval Bodies

21.1 Provincial Government Departments

- Department of Economic Development and Tourism
- Western Cape Government
- Department Of Infrastructure
- Provincial Treasury
- Department of Premier
- Department of Environmental Affairs and Development Planning
- Local Government
- City of Cape Town – Local planning, building plan approval
- Department of Mobility
- Provincial Regulatory Authority (Transport)

21.2 Public Entities and Regulatory Bodies

- Western Cape Provincial Treasury
- Municipal Building Control & Planning Authorities
- Western Cape Provincial Parliament
- Provincial Regulatory Authority (Transport)
- Municipal Traffic & Transport Authorities
- South African Civil Aviation Authority
- Air Traffic and Navigation Services
- Department of Transport

22. Environmental Considerations

22.1 Projections of usage over time

- **Phased Operational Capability**

Usage growth is directly linked to the phased expansion of permitted operations: Initial phase: VLOS / EVLOS
Subsequent phases: BVLOS Longer term: corridors and UTM-enabled operations Each phase unlocks new user segments and use cases, driving step-changes in demand rather than linear growth.

- **Regulatory Readiness and Approval Throughput**

Number of trial authorisations that can be processed and overseen safely. Maturity of sandbox regulatory processes and digital systems. Increasing confidence of regulators in approving more complex operations. Demand increases as regulatory throughput and certainty improve.

- **Capacity Constraints**

Available airspace slots and time windows. Operational management and monitoring capacity. Safety oversight limits. Demand forecasts must reflect managed capacity ceilings, especially in early years.

22.2 Informed by

- **Stakeholder Engagement Data**

Results from the initial stakeholder engagement survey and consultations with: Drone operators Technology developers Industry bodies Regulators and research institutions This data provides: Indications of latent demand Types of operations sought (VLOS, EVLOS, BVLOS) Expected frequency and intensity of sandbox usage

- **Operational Phasing Assumptions**

Defined project phases (Minimum Viable Sandbox ? expanded operations ? PPP model). Each phase introduces:
New service levels Increased operational capacity Broader user eligibility These phasing milestones serve as anchors for step-change increases in usage.

23. Social Considerations

23.1 Inclusive Economic Development

- Supports SMMEs, women- and youth-owned enterprises

23.2 Public Participation and Equity

- Ensures community involvement in planning and decision-making

23.3 Expanded Public Works Programme (EPWP)

- Targets vulnerable groups including youth, women, and persons with disabilities

24. Investment Needs

24.1 Infrastructure Development

- Digital and Operational Infrastructure
- Logistics & Commercial Precinct Infrastructure

24.2 Education

- STEM education support
- Research and innovation capacity
- Industry–academia collaboration

24.3 Green Economy

- Low-Carbon and Resource-Efficient Mobility
- Green Innovation and Technology Development
- Digitisation-Enabled Environmental Efficiency
- Climate Resilience and Adaptation Support
- Green Finance & ESG Alignment

24.4 SMME and Entrepreneurship Support

- Lowering Barriers to Market Entry
- De-Risking Early-Stage Innovation
- Access to Shared Infrastructure
- Market Validation and Credibility
- Pathways to Commercialisation
- Regional and Spatial Inclusion of Enterprises

25. Policy Incentives

25.1 Sector-Focused Incentives

- Technology and Innovation: Support for ICT hubs, fintech, and digital startups.
- Inclusive Infrastructure Development
- Public-Private Partnerships (PPP)
- Economic Inclusion
- Advanced Manufacturing & Aerospace
- Freight logistics and export competitiveness incentives

25.2 Investment Ecosystem Support

- Western Cape Infrastructure Pipeline / DOI support
- Provincial Treasury PPP and project preparation support
- WCIF 2050 Panoptic Evaluation framework
- Development finance institution (DFI) technical assistance
- National PSP and rail reform support mechanisms

25.3 Business Support and Facilitation

- Site selection assistance
- Regulatory guidance
- PPP and concession advisory support
- Stakeholder coordination
- Internal project preparation and pipeline support
- Regulatory sandbox facilitation
- Development Finance Institution (DFI) Engagement

25.4 National Incentives Accessible in the Western Cape Via the Department of Trade, Industry and Competition (DTIC)

- Indirect DTIC Alignment (Not Incentive-Based) [around inclusive economic participation, formalisation of informal sectors, SMME participation through procurement and concessions]
- Technology and Innovation Support
- ational rail reform and open-access policy enablement

25.5 Investment Summits: Hosted by the Premier to connect investors with opportunities and funding partners

26. Scale And Complexity

26.1 Total Addressable Market (TAM)

• Population served by a transport corridor

Primary Population Served

1. Drone and UAV Operators

Commercial drone operators (VLOS, EVLOS, BVLOS)

Start-ups and SMMEs entering the unmanned aviation market

Established firms testing advanced operations

Firms requiring regulatory validation before commercial deployment

This group represents the core demand base for the regulatory sandbox.

2. Technology Developers and Service Providers

Drone manufacturers and hardware developers

Software, data analytics, and sensing companies

Unmanned Traffic Management (UTM) solution providers

Safety, detect-and-avoid, and compliance technology firms

These users require real-world testing, validation, and regulatory learning environments.

3. Investors and Private Sector Partners

Venture capital and strategic investors

Infrastructure and technology investors

Firms interested in PPP participation or concessions

The sandbox serves them by reducing regulatory and operational risk, improving investment readiness.

• Data sources

◦ Geographic

Site Selection and Geographic Analysis

- Assessment of six candidate sites and shortlisting of three viable locations.
- Consideration of:
 - Proximity to industrial zones
 - Innovation ecosystems
 - Research institutions
 - Logistics and infrastructure nodes
- This informed the **geographic scope of the TAM** (provincial, scalable nationally).

- **Other Data sources Methods**

The Total Addressable Market was determined through a combination of stakeholder engagement, sector and value-chain analysis, regulatory assessment, site feasibility analysis, and policy alignment, rather than through a standalone quantitative market sizing exercise. Demand is defined by ecosystem participation and regulatory need rather than consumer volumes.

26.2 Served Available Market (SAM)

- **Location**

Location

- The project's SAM is geographically constrained by the availability of suitable airspace and compatible land use.
- Six sites were assessed; three locations shortlisted (Saldanha, Atlantis, George).
- Location determines:
 - Type of operations permitted (VLOS, EVLOS, BVLOS)
 - Proximity to controlled airspace
 - Environmental and community constraints
- As a result, only operators and use cases compatible with these locations are immediately serviceable.

Conclusion: Location is a primary determinant of the Served Available Market.

- **Capacity**

Capacity

- The sandbox is designed as a Minimum Viable Sandbox (MVS) initially.
- Capacity is constrained by:
 - Available airspace slots and time windows
 - Operational management capacity
 - Safety and regulatory oversight limits
- The number of concurrent tests, operators, and trials is therefore finite and managed.
- Capacity expands over time through phased scaling and potential PPP transition.

Conclusion: Capacity constrains the SAM in early phases, with planned scalability.

- **Are there any envisaged Operational constraints?**

Operational Constraints

- Operations are constrained by:
 - Aviation safety rules and approval conditions
 - Phased progression (VLOS ? EVLOS ? BVLOS)
 - Environmental and community impact limits
 - Availability of regulatory oversight and monitoring systems
- Not all technologies or use cases can be accommodated simultaneously or immediately.

Conclusion: Operational constraints are central to defining which market segments are serviceable at each phase.

- **Which of the following criteria is being used to support this analysis in terms of Segmentation?**

- **Region**

Region

Region is explicitly used to support the scale and complexity analysis.

- The project is segmented by geographic location, with:
 - Six candidate sites assessed
 - Three shortlisted regions (Saldanha, Atlantis, George)
- Regional characteristics affect:
 - Airspace availability
 - Environmental constraints
 - Municipal readiness
 - Community impact
- The sandbox is designed as multi-site and scalable, making regional segmentation central to understanding complexity.

Conclusion: Region is a core segmentation lens.

- **Service level**

Service Level

Service level is explicitly used, through phased operational capability.

- The project segments users and operations by:
 - VLOS
 - EVLOS
 - BVLOS
 - Future corridor and UTM-enabled operations
- Each service level has different:
 - Regulatory requirements
 - Safety constraints
 - Infrastructure needs
 - Market accessibility

This segmentation explains:

- Why the project must be phased
- Why complexity increases over time
- Why not all users can be served simultaneously

Conclusion: Service level is a key segmentation driver.

- **Regulatory risk, user type, maturity**

Regulatory Complexity / Risk Profile Segmentation by: Risk level of operations Safety-critical vs low-risk use cases This directly informs: Approval processes Operational sequencing Governance intensity b) User Type / Market Role Operators Technology developers Regulators Researchers Public-sector users c) Operational Readiness / Maturity Early-stage innovators vs advanced operators Trial-stage vs near-commercial deployments

26.3 Demand Forecasting

• Projections of usage over time

- **Phased Operational Capability**

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26.4 Size

Project Type	New Project
Project Size	Small to Medium - Below 30 Mill

27. Challenges

27.1 Financial Complexity

The project presents **financial complexity** arising from its role as a regulatory and ecosystem-enabling intervention rather than a conventional infrastructure asset. A key challenge is the absence of a defined capital and operating cost baseline at this stage, as financial requirements depend on final site selection, the scope of the Minimum Viable Sandbox, and the pace at which advanced operations are enabled. The project must balance upfront public investment to establish core regulatory, digital, and operational capabilities with the need to avoid overcapitalisation before demand and regulatory pathways are proven. Revenue models are expected to focus on cost recovery rather than full commercial returns, which limits short-term revenue certainty and requires careful structuring to ensure long-term financial sustainability. Additional complexity arises from the planned transition to a public–private partnership model, which necessitates clear risk allocation, affordability assessment, and value-for-money justification despite evolving operational and regulatory conditions. Aligning public funding cycles, potential private investment, and phased scaling of costs and revenues over time is therefore a central financial challenge for the project.

27.2 Operational Complexity

The project entails significant **operational complexity** due to the need to manage a multi-actor, multi-site regulatory sandbox within a live and safety-critical aviation environment. Operations must accommodate diverse users—including start-ups, established operators, researchers, and public-sector entities—each with different technical capabilities, risk profiles, and regulatory requirements. Coordinating flight scheduling, airspace access, compliance monitoring, and incident management across phased operational modes (VLOS, EVLOS, and eventually BVLOS) requires robust operational protocols and real-time oversight. The sandbox must also operate within environmental, municipal, and community constraints, ensuring that activities remain compliant with land-use conditions and socially acceptable. Additional complexity arises from the need to align daily operations with evolving regulatory guidance, stakeholder expectations, and governance structures, while maintaining transparency and trust. As the project scales and transitions toward a PPP model, operational responsibility will increasingly be shared between public and private actors, requiring clear role delineation, service-level agreements, and performance monitoring to ensure safety, efficiency, and continuity of operations over time.

27.3 Technical challenges

The project faces a range of **technical challenges** inherent to establishing and operating a regulatory sandbox for drones and UAVs within a live aviation and spatial environment. Key challenges include safely enabling progressively complex operations, particularly the transition from Visual Line of Sight (VLOS) to Extended and Beyond Visual Line of Sight (EVLOS and BVLOS), which requires robust detect-and-avoid capabilities, reliable command-and-control links, and enhanced situational awareness systems. Integrating sandbox operations with existing airspace management and air traffic control systems presents further technical complexity, especially in relation to dynamic airspace allocation and future Unmanned Traffic Management (UTM) concepts. The project must also accommodate a wide range of drone platforms, payloads, and software systems, requiring interoperable digital infrastructure and flexible operational standards. Ensuring data integrity, cybersecurity, and real-time monitoring across multiple operators and sites is another critical technical challenge. These issues are compounded by the need to balance innovation with safety, maintain regulatory confidence, and scale technical capability incrementally without over-investing in infrastructure ahead of proven demand.

28. Phases

29. Project Stage-3 Submission & Approval

Submitted By	
Submitted On	
Signed By	
Approved On	