

Launching South Africa's Space Sector

Economic Impact of Spaceport Overberg

CLASSIFIED

PyraLink Aerospace



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About The Mission Emblem

The PyraLink mission patch was designed to pay tribute to those brave individuals who sacrificed and laid it all on the line in the fight to preserve our freedom.



The Springbok

Represents South Africa's national animal built for speed, agility, and stamina. These qualities are reflected in the payload to be launched.

The Rocket Launch

This launch will provide the capability to serve our current and future customers, and for South Africa's Department of Defence.

Background

In the background you will find Africa, SumbandilaSat, and the three stars on the patch represent guidance, protection, and allegiance.

The words "Spaceport South Africa" are emblazoned around the seal. ties the Patch together in its translation: "Through hardships to the Stars".

To read more about the logo inspiration, visit our social media

Key findings

- PyraLink Aerospace is building South Africa’s first private spaceport in Overberg. We expect project spinoff benefits to sectors such as construction, transportation, and professional, scientific, and technical services from Spaceport Overberg to spread to other regions throughout South Africa.
- In total, we expect the construction of the Launch Site to contribute R171 million to South Africa’s GDP and boost employment by an average of 1,108 annual full-year jobs across South Africa, with 748 of those jobs within the province of Western Cape.
- Once Spaceport Overberg fully ramps up its operations, we project it will add around R200 million to South Africa’s GDP annually, boost revenue to government by more than R71 million, and create close to 500 annual full-year jobs across South Africa.

- The possibility also exists that Spaceport Overberg will be seen as a hub for Planetary research and Rocket activity in the space industry, leading the expansion of South Africa’s expertise in this growing area.

Table 1

Operations at Launch Site 01 to contribute significantly to provincial and national economy

	South Africa		Overberg	
	High-estimate tourism	High-estimate tourism	High-estimate tourism	High-estimate tourism
GDP	R12,1 million	R255,2 million	R85,7 million	R1,1 million
Government Revenue	R249,3 million	R23,2 million	R90,1 million	R16,7 million
Employment	1,150	924	966	684

Note: Table reflects anticipated figures upon full project ramp-up, expected 2027/8.
Sources: PyraLink Aerospace, Overberg District Municipality

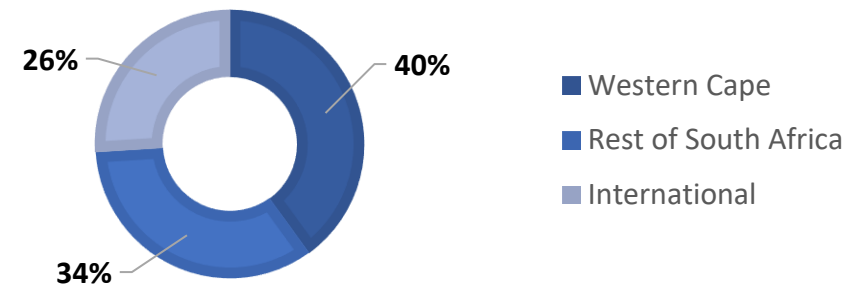
Spaceport Overberg

South Africa’s first private spaceport—Spaceport Overberg, a world-class facility to place satellites into polar and sun-synchronous orbits—is on track to be sited on the south coast of South Africa, near Arniston, Western Cape. It will be the first dedicated Rocket launch complex in South Africa. The satellites placed from here will lead Africa in National Security Intelligence, earth observation, imaging, broadband, and telecommunications.

Economic benefits of the PyraLink Overberg facility will derive from the following activities:

- Launch Pad Construction
- Operations
- Non-business tourism arising from school trips, launch viewing, and visits to the Space Experience centre
- Business tourism
- The potential for additional development in the region (tied to both Spaceport Overberg and growing economic activity in the region)

Bulk of construction spending destined for South African businesses (per cent)



Note: Figures are based on anticipated spending during the three-year construction phase. Sources: PyraLink Aerospace

Construction

We expect construction to span three years and to cost R225 million. Of that, an estimated R76 million (34 per cent) will go to Space Hardware in the form of contracted work and/ or direct purchases. A further R58 million (26 per cent) will go to Western Cape, SA businesses & International space equipment suppliers. (See Chart 1.)

Tourism (business and pleasure)

We have estimated Six potential sources of visitors after Spaceport Overberg becomes operational:

- School trips
- De Hoop nature Reserve
- The Department of Tourism
- Launch viewing
- Visits to an (optional) “Space Experience Centre” (this source is based on PyraLink establishing an Experience Centre)
- Business travellers who are directly involved in Space launch activity

Operations

Once Spaceport Overberg is fully ramped up (in this case in 2027/8), we expect business operations to generate R122 million in expenditures. Of that, we project that R12 million, or 10 per cent, will stay in Overberg (including salaries for PyraLink Launch Site employees), with a further R2 million (2 per cent) going toward other South African businesses located outside Western Cape. We expect the remainder, R107 million (88 per cent), to go to businesses located outside South Africa.



- Discover Our Launch Site

LAUNCH COMPLEX 1

OVERBERG, SOUTH AFRICA -
PRIVATE ORBITAL LAUNCH SITE

PYRALINK
SPACE

Facilities

PyraLink facilities at LC-01, OTR will include a Launch vehicle integration hangar, propellant and pressurant storage and supply areas, a concrete launch pad, and a lightning protection system. A PyraLink Aerospace administrative facility is located adjacent to the launch complex. This facility will include the following components, at a minimum:

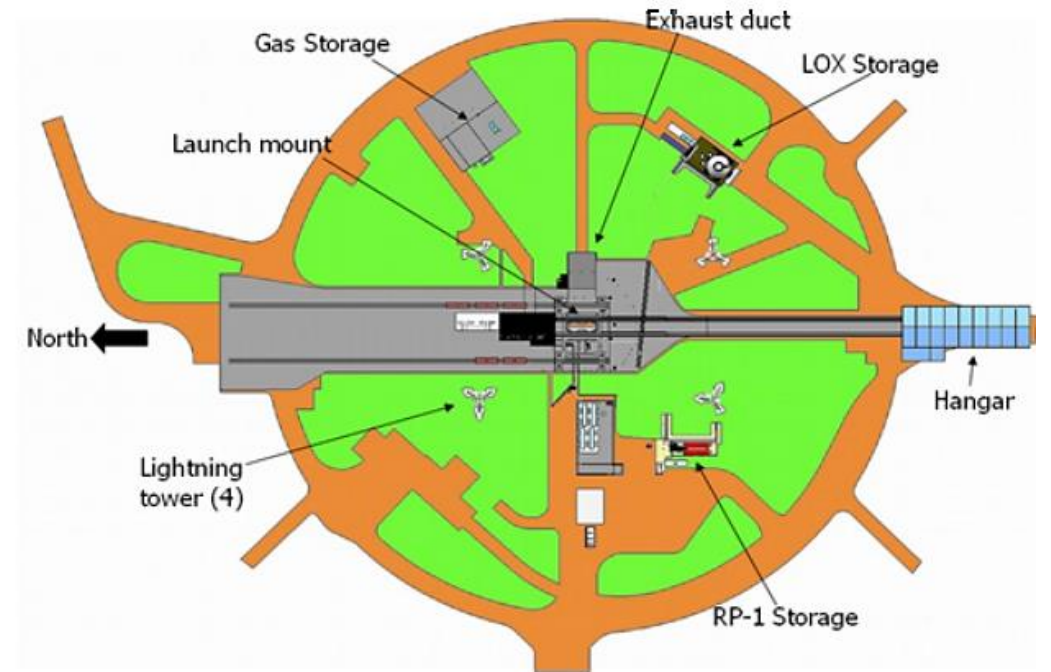
- Commercial/Private hangar space for housing, outfitting, and light maintenance of the PyraLink Rocket and Customer Satellite.
- Operational and mission control spaces for PyraLink Launch Team, including, pre-launch preparation, post-launch recovery, family and friends lounge, fully furnished open office areas, conference space, restroom and launch viewing indoor/outdoor areas.

Pad Security: South African Air Force | South African Police Service

Ground area: 70 km (max) x 14 km (max) (total 43 000 ha).

Flight area: More than 240 km x 55 km, with no height limitation.

Sea area: Unlimited. 70 km x 30 km covered by electro-optical sensors.



A general layout of the launch facilities is presented above

Cape Regional Space Cluster

Located immediately east of the southernmost tip of Africa (34 South) on the south-eastern coast of the Western Cape, between Arniston and Cape Infanta. The ideal environment for PyraLink Space Activities located in the flight area FAR147 is controlled by the South African Air Force (SAAF). There is thus no altitude limitation at any time, although supersonic flights & Rocket engine tests are subject to strict guidelines to minimize the negative effects of sonic shock waves.

DERMOGRAPHICS

304,963

Population

67,2%

Aged 15 - 64 years

120,690

Employed (2020)

3,895

Estimated Jobs Lost

Potential for additional development in the region

While it is beyond the scope of this report to objectively quantify the level of additional development that could occur due to the existence of Spaceport Overberg, it is possible to identify a few areas from which such development could stem.

We expect domestic launch capacity to lessen the regulatory and logistical challenges faced by South African companies looking to launch satellites. For years, South Africa has relied upon foreign launching states such as the United States and Russia. As a result, South African companies have had to pay hundreds of thousands of dollars for commercial space flight operations, including licences for launch operators and satellites. Having domestic launch capacity could reduce the costs associated with obtaining such licences, as well as other logistical costs.

In addition to spawning potential greater demand for domestic launches, the existence of Spaceport Overberg could encourage new firms to set up production of various components associated with either the satellites or the launch of satellites that currently need to be sourced internationally. There is also a potential benefit in attracting companies that develop aircraft for launch, as they require launch sites to test their products, in turn benefiting the Overberg Test Range with rents. Reductions in cost and logistical challenges could provide a competitive advantage, particularly for South African companies looking to launch satellites.

A further downstream benefit of Spaceport Overberg might be related to inspiring South African students to pursue STEM careers as they visit the Launch site and become interested in Space exploration.

See a Live Rocket Launch

Witnessing a live rocket launch is a jaw-dropping, bucket-list experience. PyraLink OTR Visitor Complex provides the closest public viewing of rocket launches with live launch commentary from space experts. Viewing locations are within a few kilometers from the launch pads, so you can see and feel the lift-off of spacecraft leaving Earth under the full power of mighty SA rocket engines.

Distances to launch pads:

- To ASRI UKZN LC-02 ~4,55 km
- To PyraLink LC-01 ~4,24 km
- To Air Force Base Overberg ~3,11 km
- To Test Flight and Development Centre ~ 1,24 km

PyraLink also offers a Customer Launch Experience Room (CLER) located at the Range Control Center approx. 2.5 km from the launch pad. The CLER is a comfortable private facility that provides our customers with panoramic views of the launch pad, enabling them to experience an unrivalled lift-of



Your Ride to Space

The P1 launch vehicle has been conceptualised by PyraLink as a Medium launch vehicle designed for the injection of medium-heavy satellites into SSO from South African soil, and in particular, from the Denel Overberg Test Range in the country's Western Cape province. The vehicle is to be propelled by PyraLink Tap-Off cycle rocket engines, which are currently under development. This concept intends to utilize resources, technologies and manufacturing processes available in South Africa.

LOX/RP-1

Propellants

9 Engines

First Stage

Overberg

Launch Complex

\$7M

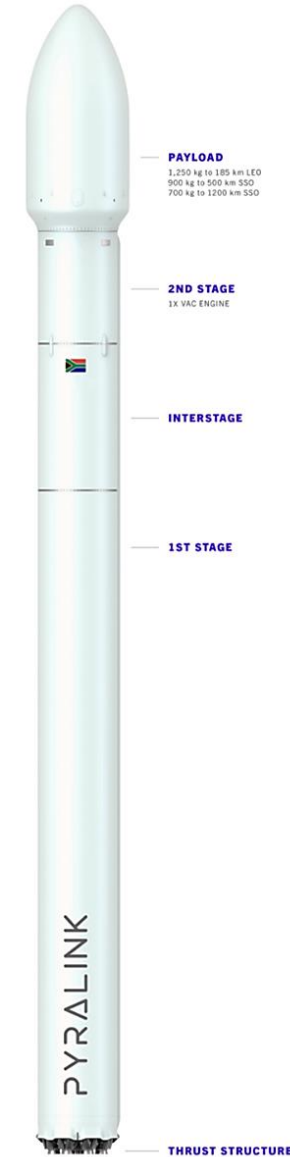
Launch Price

\$5.2k/kg

Payload to SSO/LEO

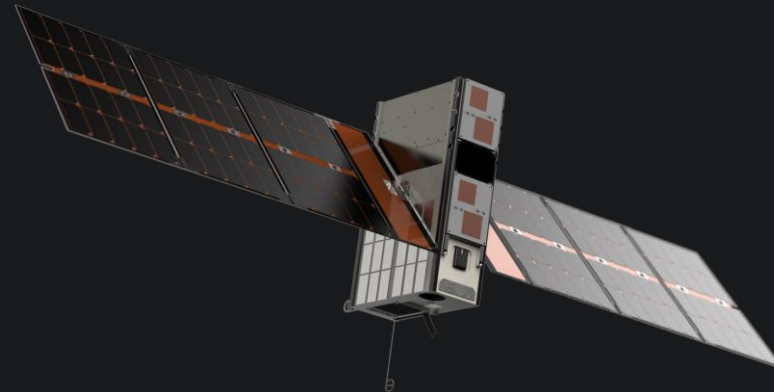
100%

Made in SA



Glossary of Key Terms

- A **dedicated launch**, also known as a “single-manifest” launch, is a launch in which the vehicle’s payload capacity is dedicated to one particular customer, as opposed to several customers sharing the available payload mass.
- **Sun-Synchronous Orbit:** A Sun-synchronous orbit, also called a helio-synchronous orbit, is a nearly polar orbit around a planet, in which the satellite passes over any given point of the planet’s surface at the same local mean solar time.
- **Payload:** Payload is the carrying capacity of an aircraft or launch vehicle, usually measured in terms of weight
- **SASCS:** intended to assure access to space for the South African Department of Defence and other South African government payloads.
- **Orbit:** The curved path of a celestial object or spacecraft around a star, planet, or moon, especially a periodic elliptical revolution.
- **Payload:** Payload is the carrying capacity of an aircraft or launch vehicle, usually measured in terms of weight



Appendix A

Economic impact methodology

The direct impact measures reported reflect the level of economic benefits associated with only front-line businesses and their employees. The specific scope of analysis is based on the perspective under analysis. From the perspective of Spaceport Overberg operations, the front-line business is the spaceport itself together with Denel OTR and its employees. From the perspective of tourism (pleasure and business) activity, the front-line businesses are those that directly interact with the travellers, including transportation, accommodation, food and beverage services, recreation and entertainment, and travel services. From the perspective of the construction of Spaceport Overberg, the front-line businesses include those businesses directly involved in the design and construction of the facility. For example, the operations of PyraLink require Rockets to be designed, built, and transported to Overberg Test Range, LC-01.

Appendix B

Activity and spending assumptions

We assumed 70 per cent of the Launch Viewing and Experience Centre tourists will be from South Africa and 30 per cent from international locations. Moreover, we assumed that 75 per cent of the Launch Viewing and Experience Centre tourists will stay overnight and that 25 per cent will be same-day travellers.

With PyraLink & Denel OTR expected to drive new tourism activity to the region (both business and pleasure travellers), it may not be far-fetched to expect that new tourism infrastructure will eventually be added to meet the growing demand.

We expect that Spaceport Overberg will directly employ 203 workers annually within the province, with a further 106 being employed through the supply chain, as well as re-spending benefits. Within the Western Cape, the Launch Site is expected to generate 420 jobs annually.

Appendix C

Satellite Launch Services

Launching is the first step to Space. By enabling access to Space, we contribute to South Africa's progress in this exciting area. Our mission is to make the launch of your satellite as simple and 'Smooth' as possible for you. We can offer you a complete package deal, taking care of all aspects of the launch, or we can offer you a solution tailored to your specific payload needs.

PyraLink Aerospace offers flexi and executive launch opportunities for medium-large spacecraft, to low earth orbit or beyond on a variety of different launch azimuths. Special orbit types and specific launch periods may be available on request. Let us know what you need launch@pyralink.co.za

Appendix D

National Security Launch

Access to Space through PyraLink space transportation capabilities is essential to:

- Place critical South African Government assets and capabilities into space;
- Augment space-based capabilities in a timely manner in the event of increased operational needs or minimize disruptions due to on-orbit satellite failures, launch failures, or deliberate actions against South African space assets;
- Support the South African Space Command Section (SASCS).
- PyraLink Aerospace, therefore, must maintain robust, responsive, and resilient South African Space transportation capabilities to assure access to space.

Appendix E

Goals and Objectives

The PyraLink Launch Complex (LC-01) Master Plan, goals and objectives were developed to flow from and support the goals stated in the **South African National Space Agency's Revised Strategic Plan for 2020-2030**.

- Create a stronger society where South Africans can make Space part of their daily conversations.
- Support South African National Security satellite missions & Support SANSA's vision 2040.
- Assuring South Africa's Access to Space for civilian and military users in a safe and sustainable space environment.
- Space at the core of how we will fight and win in the future across multi-domain operations.
- Create a Spaceport that provides a positive economic & social benefit to the People of South Africa and Africa.

Appendix F

Political

The usefulness of surveillance relies on close coordination with SANSA partnership management, which lies within two key center organizations. PyraLink maintains relationships with OTR managers and stakeholders of partnerships for awareness of any concerns with regards to safety requirements and policies.

If there are no benefits to PyraLink Aerospace, OTR or the SA Air Force from accepting the burden of a private spaceport on their property, then this option will likely be rejected for reasons of range safety, security, and prioritization for assured national access to space. It is important that whatever form a private spaceport takes, it is seen as complementary to, and not competitive with, the Overberg Test Range. In this fashion, there will be a greater likelihood of cooperative support of the market niche targeted by the PyraLink Leadership.

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