science & innovation

Department:
Science and Innovation
REPUBLIC OF SOUTH AFRICA

sansa
SOUTH AFRICAN NATIONAL
SPACE AGENCY

SANSA Strategic Plan 2020-2025 and 2019/20 APP

19 May 2020

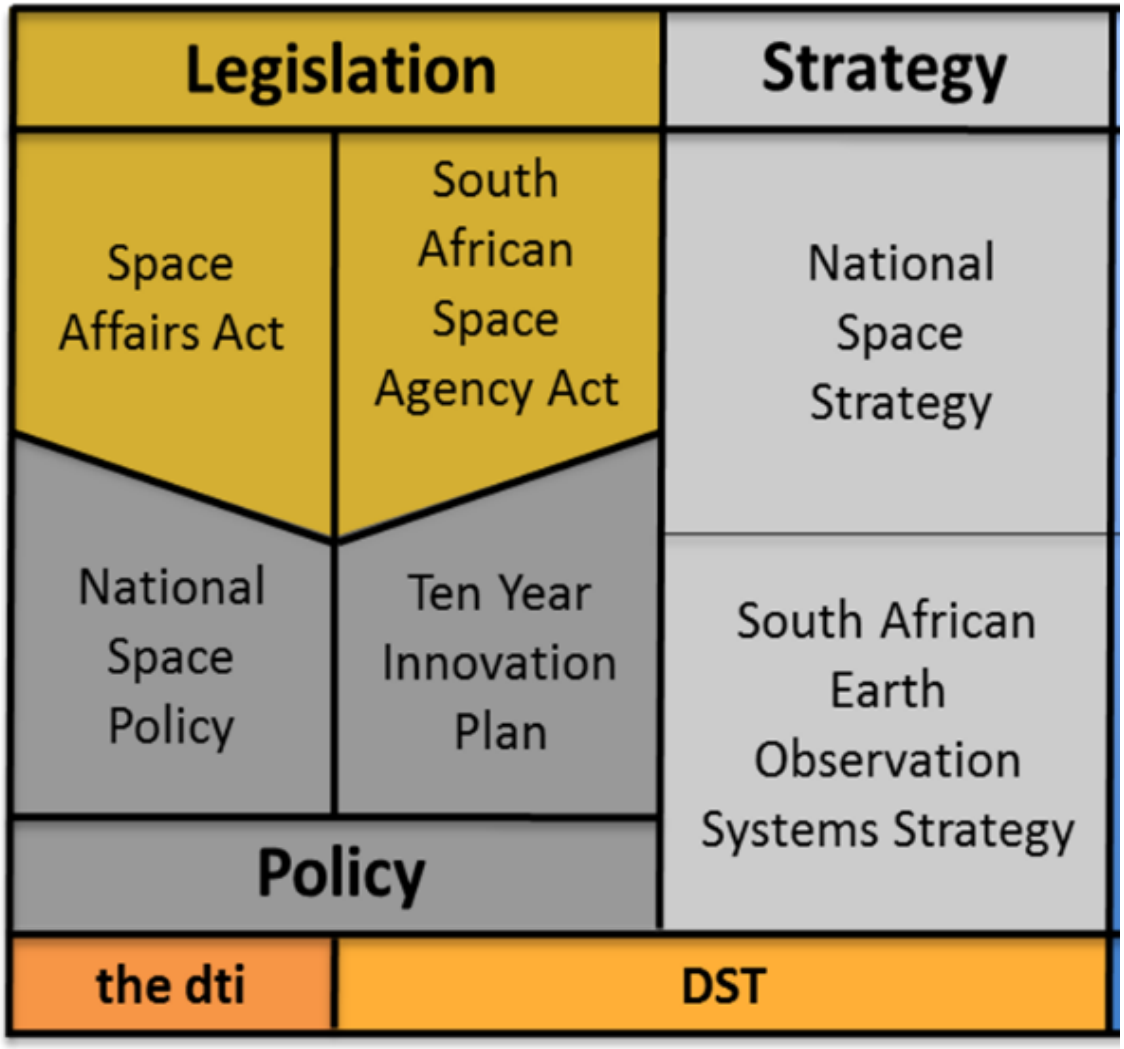
SANSA Board and Management

Overview

- Our Mandate and Situational Analysis
- Our Strategic Focus
- Measuring our Performance
- On the Horizon

Our Mandate and Situational Analysis

Legislative and Policy Mandate



Linking to Government Priorities

Environmental Resource Management	Health, Safety and Security	Innovation and Economic Growth
• Environmental and geospatial monitoring • Ocean, coastal and marine management • Land management • Rural development and urban planning • Topographic mapping • Hydrological monitoring • Climate change adaptation and mitigation • Meteorological monitoring	• Disaster monitoring and relief • Hazards forecasting and early warning • Cross border risk • Disease surveillance and health risk • Asset monitoring • Regulatory enforcement • Defence, peacekeeping and treaty monitoring	• Tourism and recreation • Communications • Space science and exploration • Space technology transfer and spinoffs • Development of the space industry

Linking to Government Priorities

Priority Areas	Nine Point Plan	NPD (13)	Triple Challenge	MTSF (7)	SDGs (17)
Environmental and geospatial monitoring	5	7	3	`5	2
Ocean, coastal and marine management	4	8	3	5	3
Land management	4	10	3	7	3
Rural development and urban planning	4	13	3	7	2
Topographic mapping	3	5	2	7	15
Hydrological monitoring	3	12	3	7	2
Climate change adaptation and mitigation	5	13	2	7	1
Meteorological monitoring	3	8	2	5	5
Disaster monitoring and relief	5	11	2	5	3
Hazards forecasting and early warning	5	11	2	5	5
Cross border risk	4	8	3	4	2
Disease surveillance and health risk	3	9	2	4	1
Asset monitoring	4	5	3	5	2
Regulatory enforcement	5	5	3	7	17
Defence, peacekeeping and treaty monitoring	1	4	2	4	1
Tourism and recreation	6	6	3	5	16
Communications	5	9	3	7	17
Space science and exploration	2	8	3	5	3
Space technology transfer and spinoffs	4	4	3	4	4
Development of the space industry	4	4	2	5	3

Theory of Change

GOAL	EXPECTED OUTCOME	EXPECTED IMPACT
Goal 1: The development of a suite of space application products and services that directly respond to user needs	• A suite of products and services that assist with evidence based policy making • Stimulation of an inclusive and transformed local industry through the development of products and services • Use our international partnerships to enhance our product and services as global offerings	• Our socio-economic-environmental challenges are addressed in a rational and sustainable manner • An increased market share of the global space applications market
Goal 2: The building of core space infrastructure, both ground and space based, that will enable the delivery of essential space services	• Stimulation of an inclusive and transformed local industry through the development of space technologies and platforms • Comprehensive space infrastructure that allows South Africa to play across the space value chain • Position infrastructure as part of a global space network through international partnerships	• An increased market share of the global space technology market • Recognition as a leader of space infrastructure and a preferred partner on the African continent.
Goal 3: The generation of space relevant knowledge that supports the developmental agenda	• A research productivity score for the space sector that performs above the national average • Improved products and services through the innovative use of our knowledge base • Leverage off our international partnerships to enhance our knowledge base	• The space sector as a significant contributor to the knowledge based economy • Local solutions that address local challenges • Increased access to global research opportunities that promotes the national capability and expertise
Goal 4: The development of requisite human capacity that is needed for the implementation of key space initiatives	• A cohort of graduates, addressing transformation, that are well trained to service the needs of the space and other economic sectors • Increased excitement in science, technology and innovation • Increased public access to scientific general knowledge and platforms	• A skilled workforce that can effectively contribute to the knowledge economy • Increased public support for space enabled applications and platforms
Goal 5: The positioning of SANSA as a key enabler of government's policy imperatives	• A greater proportion of government institutions using space based services • The socio-economic-environmental challenges are responded to • SANSA is a known brand name	• Socio-economic priorities are achieved in a cost-effective and sustainable manner • The value proposition of space is appreciated by all South Africans

Alignment to DSI Outcomes

DSI Strategic Outcome	Appropriate SANSA Goals	Appropriate SANSA Targets
A transformed, inclusive, responsive and coherent NSI	Goal 5: The positioning of SANSA as a key enabler of government's policy imperatives	• The total contract expenditure to SMEs for core space projects • Number of active formal national partnerships • Number of public visibility programmes introduced
Increased knowledge generation and innovation output	Goal 3: The generation of space relevant knowledge that supports the developmental agenda	• The national research productivity score for space supported R&D • Centres of Excellence (CoE)
Human capabilities and skills for the economy and for development	Goal 4: The development of requisite human capacity that is needed for the implementation of key space initiatives	• Number of youths directly engaged • Number of students and interns supported for formalized training
Knowledge utilisation for economic development	Goal 1: The development of a suite of space application products and services that directly respond to user needs	• Number of products and applications • Number of new Centres of Competence (CoCs) • Number of new Business Incubator Platforms • Completion of the EO-Sat 1 Mission • Development of launch capabilities
Knowledge utilisation for inclusive development	Goal 1: The development of a suite of space application products and services that directly respond to user needs, and Goal 5: The positioning of SANSA as a key enabler of government's policy imperatives	• Number of products and applications • Number of awareness and training interventions to key users of space based products and services • Facilitate growth of space community through Communities of Practice (CoPs) • Number of social development programmes introduced
Innovation in support of a capable and developmental state	Goal 3: The generation of space relevant knowledge that supports the developmental agenda, and Goal 5: The positioning of SANSA as a key enabler of government's policy imperatives	• The number of direct jobs supported externally through SANSA programme contracting • Number of active formal oversees partnerships • Number of active formal African partnerships • Percentage of government departments and public using space products and services • Number of initiatives to transform SANSA into a high performing Agency

Alignment to MTSF

MTSF Priorities	Appropriate SANSA Goals	Appropriate SANSA Targets
Economic Transformation and Job Creation	Goal 3: The generation of space relevant knowledge that supports the developmental agenda, and Goal 5: The positioning of SANSA as a key enabler of government's policy imperatives	• The number of direct jobs supported externally through SANSA programme contracting • Number of active formal oversees partnerships • The total contract expenditure to SMEs for core space projects • Number of Centers of Competences (CoCs)
Education, Skills and Health	Goal 3: The generation of space relevant knowledge that supports the developmental agenda Goal 4: The development of requisite human capacity that is needed for the implementation of key space initiatives	• The national research productivity score for space supported R&D • Number of Centres of Excellence (CoE) • Number of youths directly engaged • Number of students and interns supported for formalized training
Consolidating the Social Wage through Reliable and Quality Basic Services	Goal 5: The positioning of SANSA as a key enabler of government's policy imperatives	• Percentage of government departments and public using space products and services
Spatial Integration, Human Settlements and Local Government	Goal 1: The development of a suite of space application products and services that directly respond to user needs, and Goal 5: The positioning of SANSA as a key enabler of government's policy imperatives	• Number of products and applications • Percentage of government departments and public using space products and services • Number of awareness and training interventions to key users of space based products and services • Facilitate growth of space community through Communities of Practice (CoPs)
Social Cohesion and Safe Communities	Goal 1: The development of a suite of space application products and services that directly respond to user needs, and Goal 5: The positioning of SANSA as a key enabler of government's policy imperatives	• Number of products and applications • Percentage of government departments and public using space products and services • Number of awareness and training interventions to key users of space based products and services • Facilitate growth of space community through Communities of Practice (CoPs)
A Capable, Ethical and Developmental State	Goal 3: The generation of space relevant knowledge that supports the developmental agenda, and Goal 5: The positioning of SANSA as a key enabler of government's policy imperatives	• Percentage of government departments and public using space products and services • Number of initiatives to transform SANSA into a high performing Agency • Number of National Partnerships
A better Africa and World	Goal 1: The development of a suite of space application products and services that directly respond to user needs, and Goal 5: The positioning of SANSA as a key enabler of government's policy imperatives	• Number of products and applications • Number of active formal African partnerships

Situational Awareness

Key Priority Areas	Specific Needs	Earth Observation										Navigation & Positioning	Communication	Space Exploration
		Spatial Resolution Required								Temporal Frequency	Geographic Area			
		< 50cm	50cm - 1m	1m - 2.5m	2.5m - 5m	5m - 10m	10m - 20m	20m - 30m	>30m					
Environmental Resource Management	Environmental and geospatial monitoring				•	•	•	•	•	Annual	National	•	•	•
	Ocean, coastal and marine management		•	•	•	•	•	•	•	Annual	SADC	•	•	•
	Land management				•				•	Seasonal	National	•	•	•
	Rural development and urban planning		•	•	•					Annual	National	•	•	•
	Topographic mapping						•	•		Annual	National	•	•	•
	Hydrological monitoring					•	•			Twice per annum	National	•	•	•
	Climate change mitigation and adaptation					•	•			Daily	SADC	•	•	•
	Meteorological monitoring		•	•	•	•	•	•	•	Daily	SADC	•	•	•
Health, Safety & Security	Disaster monitoring and relief	•	•	•	•	•	•		•	Daily when required	SADC	•	•	•
	Hazard forecasting and early warning					•	•	•	•	Twice per annum	SADC	•	•	•
	Cross-border risks	•	•	•		•			•	2-4 times per annum	SADC	•	•	•
	Disease surveillance and health risk					•	•			Twice per annum	National	•	•	•
	Asset monitoring									Continuous	SADC	•	•	•
	Regulatory enforcement	•	•	•		•			•	2-4 times per annum	National	•	•	•
	Defence, peacekeeping and treaty monitoring	•	•	•		•			•	High turn around time	Africa	•	•	•
Innovation & Economic Growth	Tourism and recreation				•	•	•	•	•	Annual	National	•	•	•
	Communication									Continuous	SADC	•	•	•
	Space science and exploration										National	•	•	•
	Space technology transfer and spin-offs			•	•	•					National	•	•	•
	Development of the space industry			•	•	•					National	•	•	•

Situational Analysis

STRENGTHS	WEAKNESSES
• A proven space heritage relating to historic missions. • A core skills base is in place to deliver on a national space programme. • There are strong strategic partnerships that SANSA is currently engaged in. • SANSA has the base space Infrastructure needed for a national space programme. • A suite of space products and services have already been produced, giving us the know-how for future developments. • SANSA's mandate is stipulated as a matter of law.	• Ineffective performance management system within SANSA. • Lack of capacity within SANSA to secure new opportunities. • Destructive organisational culture that hampers performance. • Lack of a common identity and strategic direction. • Lack of sufficient funding to achieve our full mandate. • Lack of internal and external visibility for SANSA. • Ageing infrastructure that needs to be replaced in the very near future.
OPPORTUNITIES	**THREATS**
• External partnerships with other countries or entities/universities in foreign countries. • Access to funding through strategic partnerships. • Potential to grow our own revenue stream by leveraging funds. • Organisation of choice in as far as space science and technology is concerned. • Building brand identity will help increase SANSA's institutional value. • Going back to the mandate to scope out new opportunities. • The district model provides an opportunity to ensure adoption of space products and services at a local level.	• Competing government priorities that could reduce potential funding streams. • Unhealthy competition within the South African national system of innovation. • Government/political environment becomes unstable, which affects the investment climate. • Technology advances faster that what SANSA is able to capitalise. • Radio and magnetic interference that could adversely hamper operations. • Many African countries are establishing space programmes, which impacts our competitive advantage.

Situational Analysis

- Financial Sustainability
  - SANSA's inability to fully meet its mandate, especially with regards to global navigation satellite services (GNSS) and satellite telecommunications solutions and applications;
  - Limited support to the local space industry, as per SANSA's mandate, and
  - As an implementing agency, SANSA's salary bill accounts for its major cost.

Our Strategic Focus and Approach

Vision and Mission

VISION

An integrated National Space Capability that responds to socio-economic challenges in Africa by 2030

MISSION

To provide leadership in unlocking the potential of Space for the advancement and benefit of humanity

Broadening our Focus

Strategic Goals

Products and Services

Infrastructure

Knowledge

Human Capital Development

Key Enabler

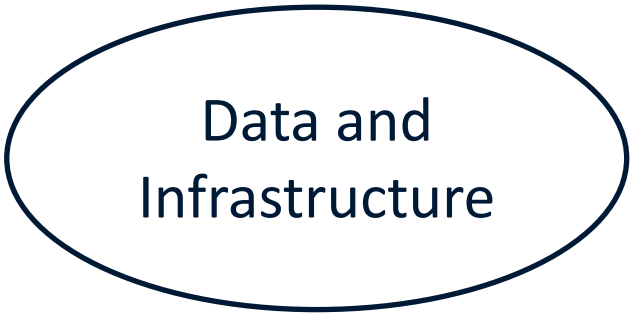
Strategic Goals

- Goal 1: The development of a suite of space application products and services that directly respond to user needs
- Goal 2: The building of core space infrastructure, both ground and space based, that will enable the delivery of essential space services
- Goal 3: The generation of space relevant knowledge that supports the developmental agenda
- Goal 4: The development of requisite human capacity that is needed for the implementation of key space initiatives
- Goal 5: The positioning of SANSA as a key enabler of government's policy imperatives

Strategic Objectives

1. To support the development of a critical mass of skills and expertise needed to give effect to local and regional space initiatives;
2. To expand and exploit our knowledge base for the development of essential services and products that respond to user needs;
3. To develop, grow and transform the indigenous space industry that is responsive to local needs and is globally positioned;
4. To build and host the appropriate infrastructure that will support the local space sector; and
5. To foster strategic partnerships that will allow us to respond to national and continental developmental agendas.

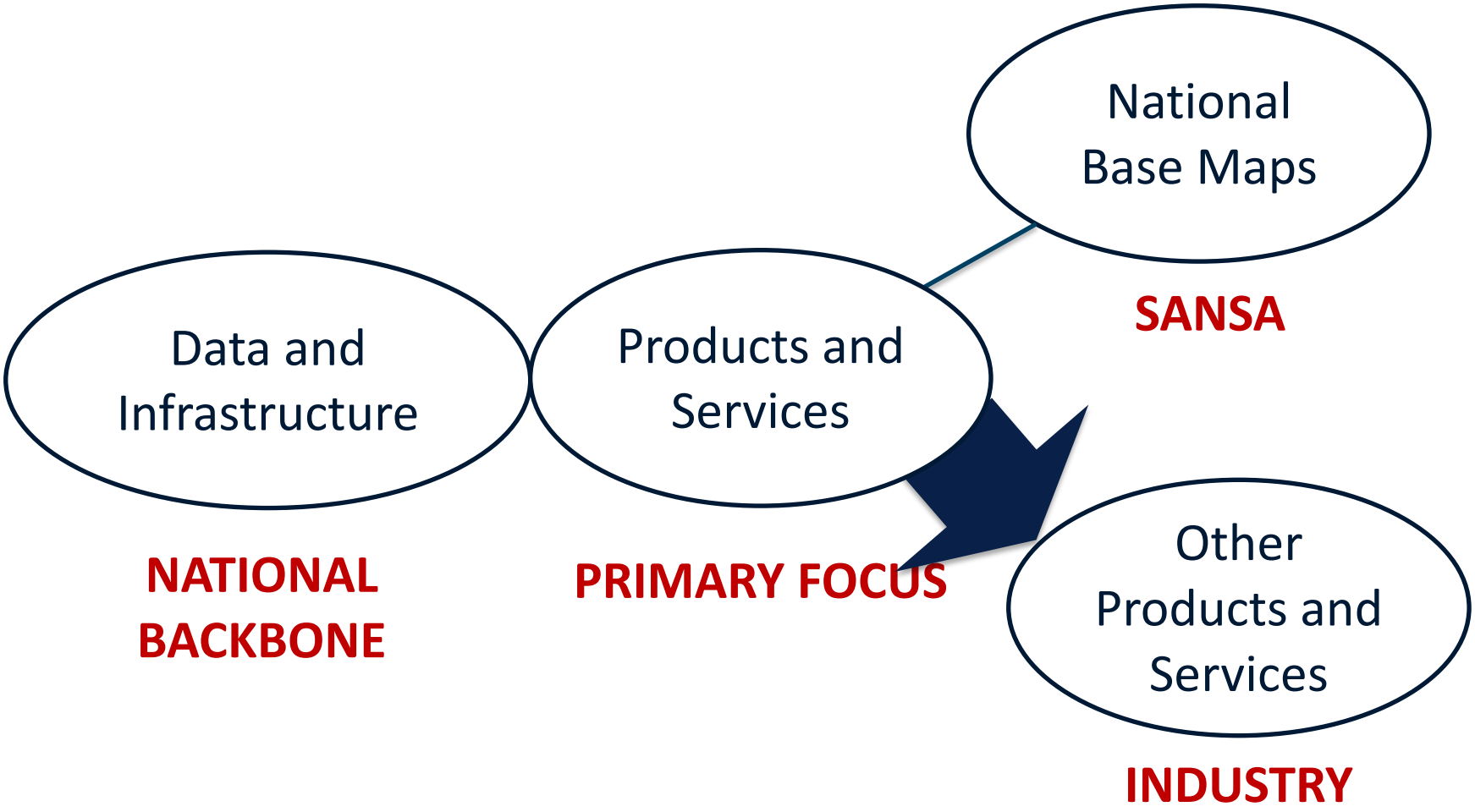
Earth Observation (Current)



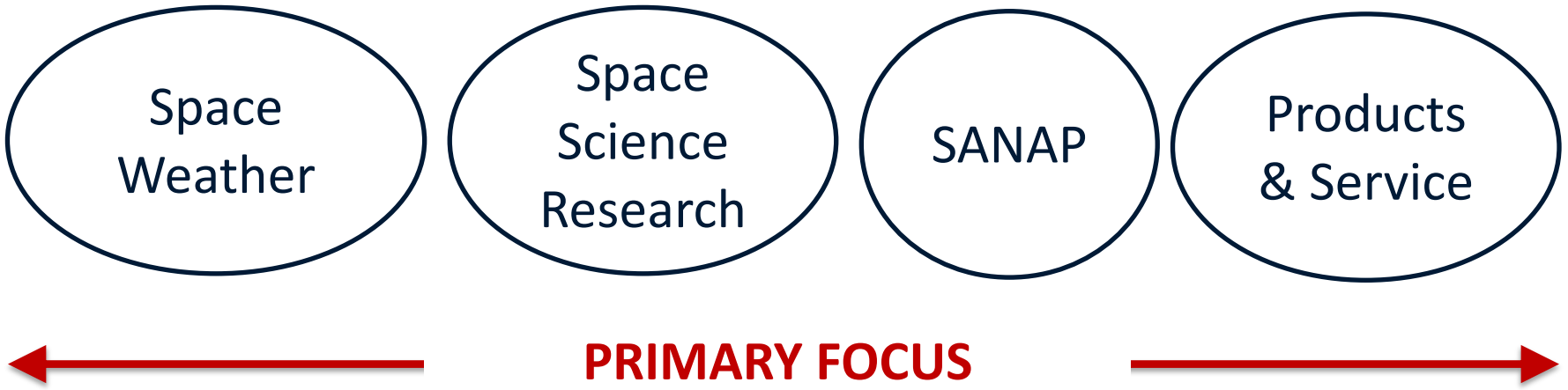
SUPPORT FUNCTION

PRIMARY FOCUS

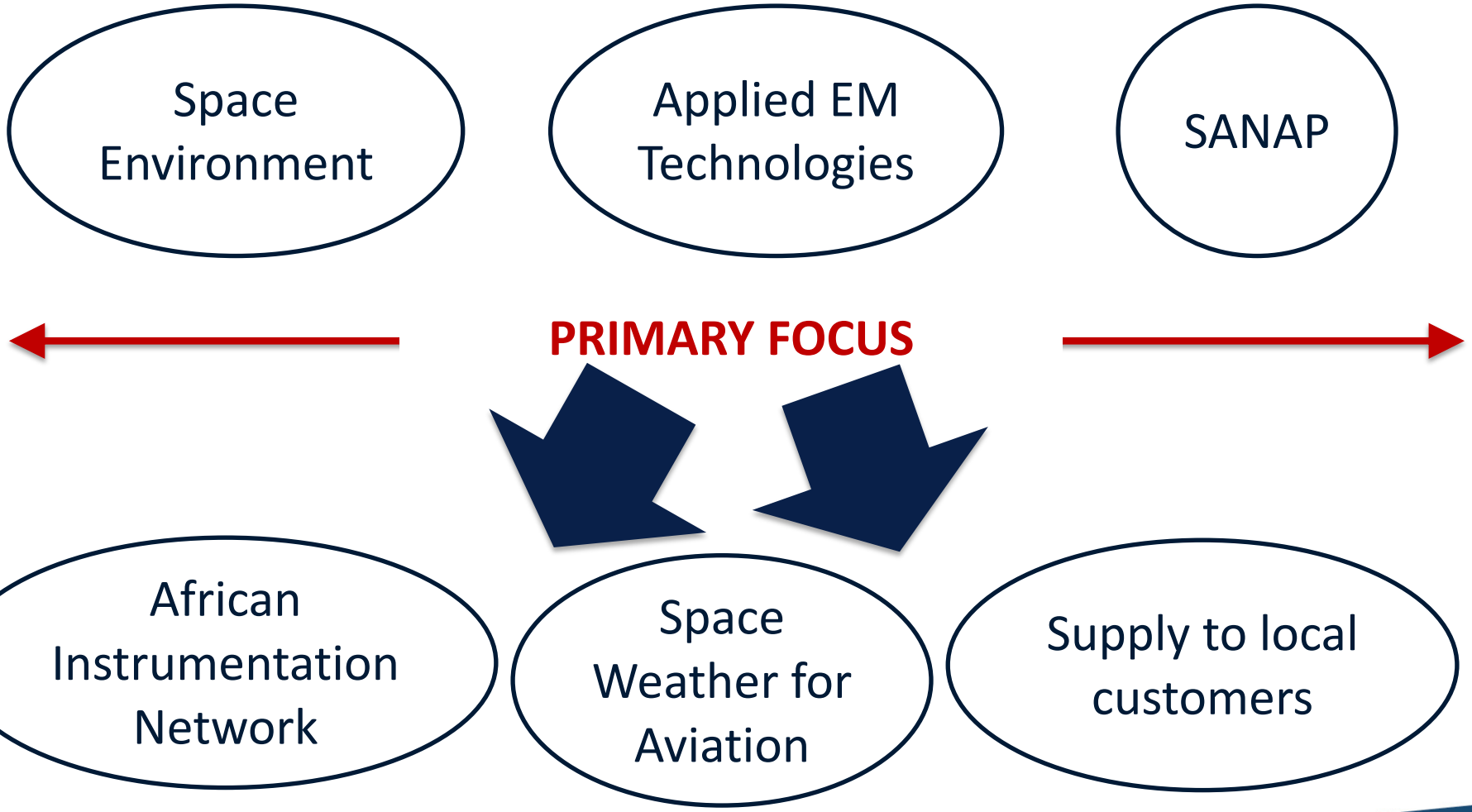
Earth Observation (Going Forward)



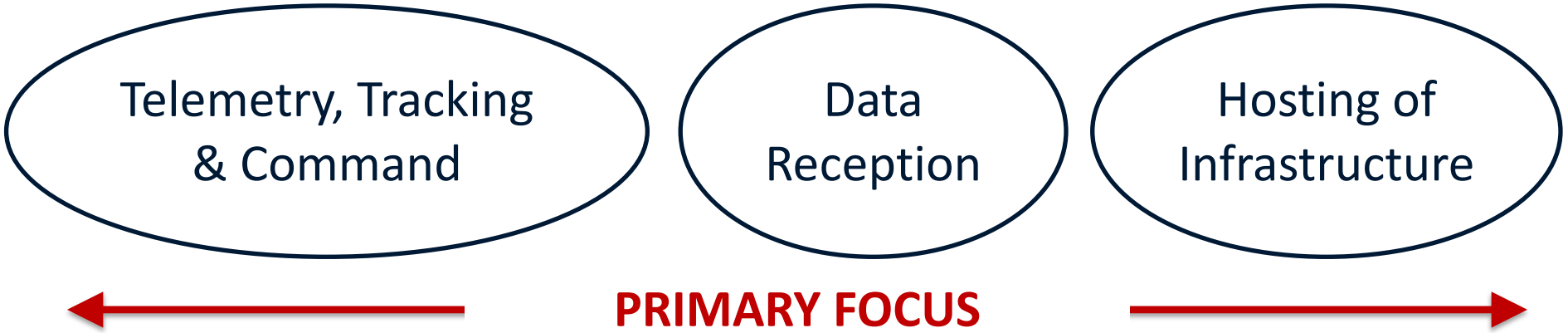
Space Science (Current)



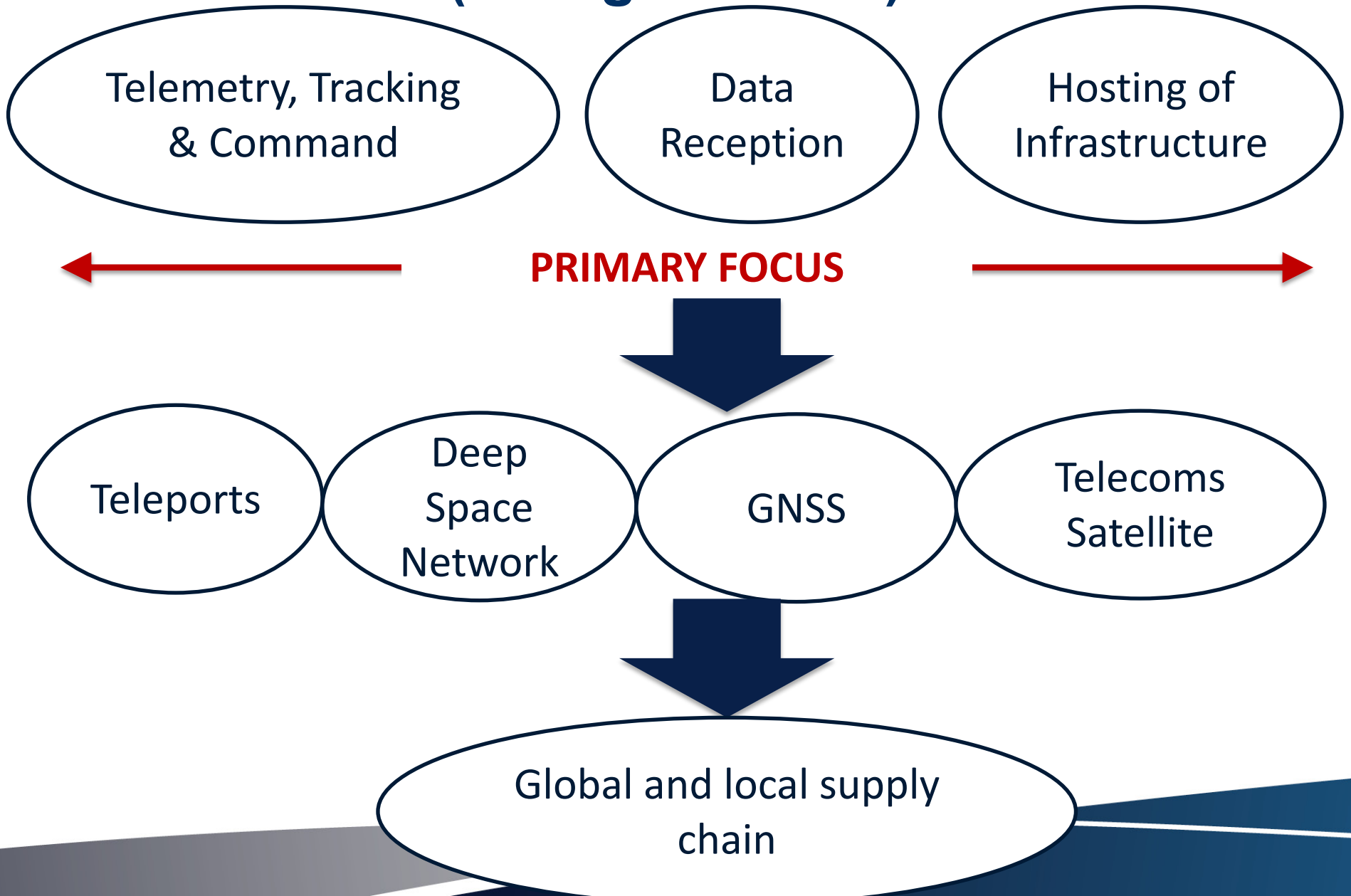
Space Science (Going Forward)



Space Operations (Current)



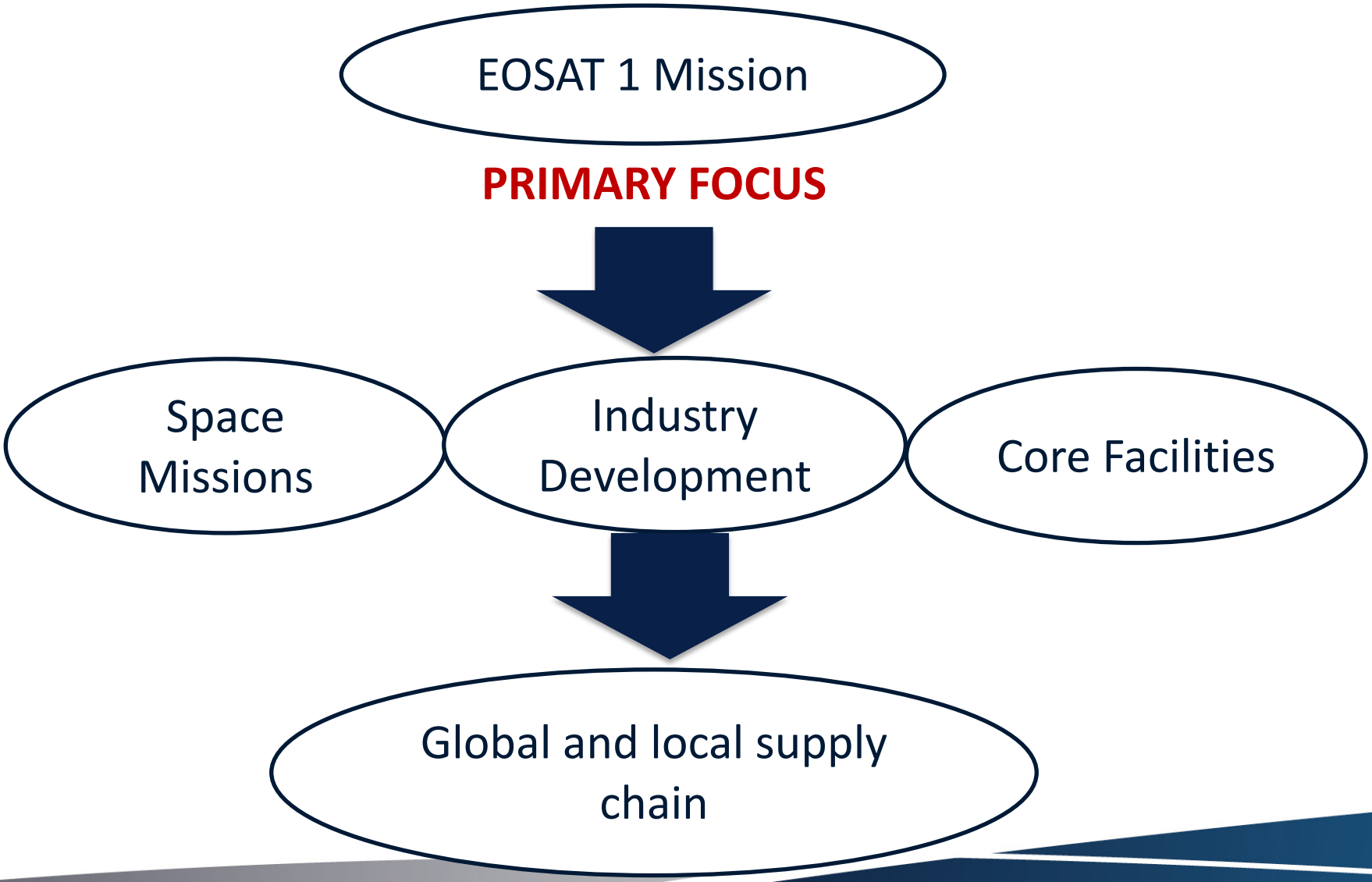
Space Operations (Going Forward)



Space Engineering (Current)

PRIMARY FOCUS

Space Engineering (Going Forward)



Approach

- A more expansive approach is being taken that aligns closer to the SANSA Mandate
  - Inclusion of aspirational programmes
  - Inclusion of Telecommunications and GNSS
  - Expansion of existing programmes and repositioning SANSA's role with respect to implementation
- Strong alignment between government policy and the relevance of space applications, if the full mandate can be implemented

Approach

- Dependencies for successful implementation
  - Organisational culture
  - Business Model/Organisational Design
  - Institutional Review
  - Implementation of Strategic Partnerships
  - International Partnerships
  - Financial sustainability

Organisational Values

Service - deliver superior customer value on time every time

Teamwor**k** - consult, inform and share knowledge

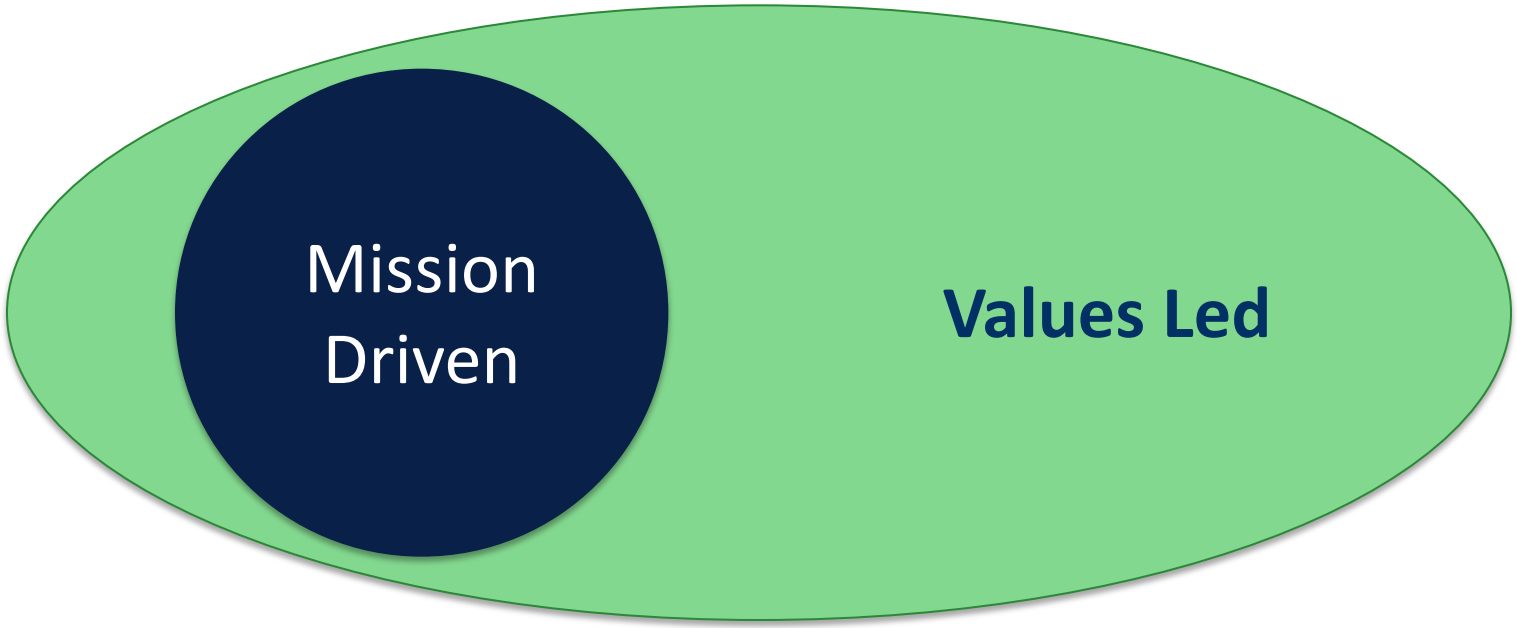
Respect - acknowledge and value what is good

Integrity- keep promises and own up to mistakes

Personal Growth- acknowledge potential and grow competence

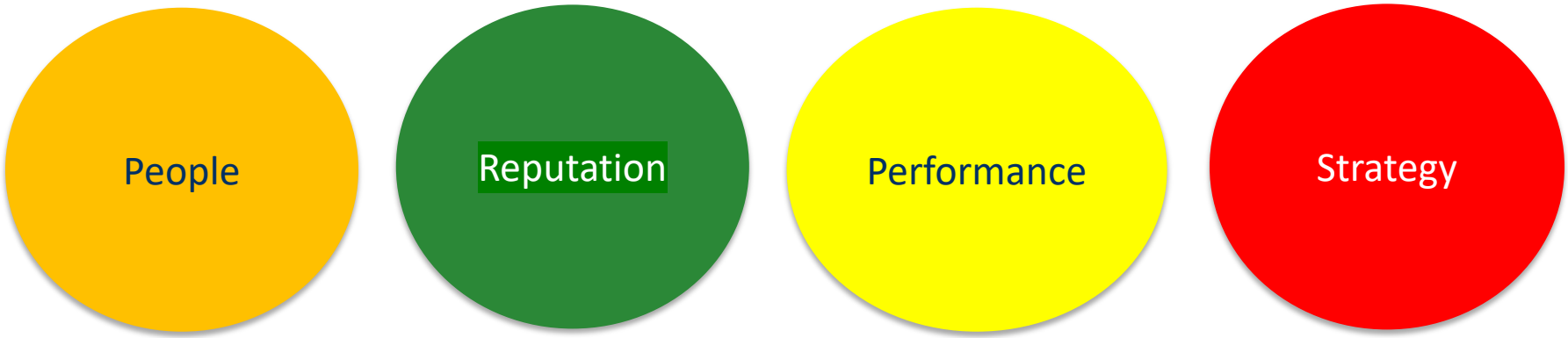
Excellence - go the extra mile and implement tasks to the best of our ability

Current Approach



New Approach

Corporate Approach



Organisational Culture

Business Model/Organisational Design

Structure follows Strategy

Financial Sustainability

Measuring Our Performance

Indicators and Targets

Strategic Objective 1: To support the development of a critical mass of skills and expertise needed to give effect to local and regional space initiatives								
Activities	**Measure**	**5-year Target**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Impact**
S1.1 Increase youth awareness of science	M1.1.1 Number of youths directly engaged	T1.1.1 Total of 185 000 young people directly engaged by March 2025	25 500	31 750	37 250	42 500	48 000	An increased uptake of STEM subjects by the youth
S1.2 Support students and interns	M1.2.1 Number of students and interns supported for formalized training	T1.2.1 Total of 350 students and interns supported by March 2025	50	50	70	80	90	A skilled workforce that can effectively contribute to the knowledge economy

Indicators and Targets

Strategic Objective 2: To expand and exploit our knowledge base for the development of essential services and products that respond to user needs								
Activities	**Measure**	**5-year Target**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Impact**
S2.1 Lead and facilitate the creation of high-impact applications to address society's needs and challenges	M2.1.1 Number of products and applications	T2.1.1 7 operational space-related applications by March 2025	6	6	6	7	7	Coordinated and streamlined development of products and services that responds to the socio-economic priorities of the country
S2.2 Increase the national space research output	M2.2.1 The national research productivity score for space supported R&D	T2.2.1 Achieve a total research productivity score of 2000 by March 2025	1 300	1 300	1 500	1 800	2 000	Creation of new knowledge; developing the knowledge economy; providing a foundation for the enhancement of the understanding and development of applications.

Indicators and Targets

Strategic Objective 3: To develop, grow and transform the indigenous space industry that is responsive to local needs and is globally positioned								
Activities	**Measure**	**5-year Target**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Impact**
S3.1. Generate greater benefit for the space programme through space operations activities	M3.1.1 Successful satellite pass monitoring rate for Earth Observation	T3.1.1 Successful satellite pass monitoring maintained at a rate of 98% by March 2025	98%	98%	98%	98%	98%	A quality service in line with international standards to maintain relevance in the global space value chain thus ensuring SANSA's market share for teleport services in Africa
	M3.1.2 Total income generated from space operations activities	T3.1.2 Total income of R352 million generated from space operations activities by March 2025	R68 million	R69 million	R70 million	R72 million	R73 million	An increased market share of the global space operations market and recognition as a preferred partner in Africa

Indicators and Targets

Strategic Objective 3: To develop, grow and transform the indigenous space industry that is responsive to local needs and is globally positioned								
Activities	**Measure**	**5-year Target**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Impact**
S3.2 Grow the local space industry	M3.2.1 The total contract expenditure to SMEs for core space projects	T3.2.1 A total contract expenditure of 20% to SMEs for core space projects by March 2025	20% of total contracted value	20% of total contracted value	20% of total contracted value	20% of total contracted value	20% of total contracted value	Growth of the sector through the establishment of SMEs and ensuring the transformation of the sector.
	M3.2.2 The total contract expenditure to the broad space related industry for core space projects	T3.2.2 The total contract expenditure of R306 million to the broad space related industry for core space projects by March 2025	R50 million	R55 million	R61 million	R67 million	R73 million	Growth of the space sector and the creation and maintenance of high-level engineering skills

Indicators and Targets

Strategic Objective 4: To build and host the appropriate infrastructure that will support the local space sector								
Activities	**Measure**	**5-year Target**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Impact**
S4.1 Successful launch and operations CubeSat missions	M4.1.1 Progress status on the follow on ZaCube2 mission	T4.1.1 Proportional progress based on Key Defining Points as per project lifecycle culminating in Cubesat launch	Launch and Commission and post Launch Satellite reliability and validation assessment of segment 1 (3 nanosatellites)	Operational phase of segment 1 Launch and Commission and post Launch Satellite reliability and validation assessment of segment 2 (6 nanosatellites)	Operational phase of segments 1 and 2	Operational phase of segments 1 and 2	Operational phase of segments 1 and 2	A state of the art facility that will ensure protection of technological infrastructure and systems including aviation safety and therefore the safety of citizens traveling, working and living on the African continent
	M4.1.2 Progress status on ARMC nanosatellite mission	T4.1.2 Proportional progress based on Key Defining Points as per project lifecycle culminating in Cubesat launch	Conceptualisation and design of ARMC Constellation Preliminary Design Review (PDR) completed for the Space System in preparation for Critical Design review	Critical Design Review (CDR) completed for the Space System Flight Model Completion of the qualification phase and Flight model Phase in preparation for launch in late 2022	Launch and Commissioning of satellite	Operational phase	Operational phase	The effective management of the natural resources on the African continent

Indicators and Targets

Strategic Objective 4: To build and host the appropriate infrastructure that will support the local space sector								
Activities	**Measure**	**5-year Target**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Impact**
S4.2 Development or upgrade of infrastructure	M4.2.1 A new operational space weather centre	T4.2.1 Proportional progress of an operational space weather centre, as per an approved Business Case	20% completion	70% completion	100% completion	An operational space weather centre	An operational space weather centre	A state of the art facility that will ensure aviation safety and therefore the safety citizens traveling on the African continent
	M4.2.2 Development of Digital Earth South Africa	T4.2.2 Proportional progress towards an operational Digital Earth South Africa	Ingestion of SPOT archive	Ingestion of additional (1) sensor & product development	Ingestion of additional (1) sensor & product development	Ingestion of additional (1) sensor & product development	Ingestion of additional (1) sensor & product development	Raw data transformed into fundamental geospatial data sets that are used as input in a variety of services and products for use by key decision makers.
	M4.2.3 An upgraded AIT Facility	T4.2.3 AIT facility upgraded as per approved plan by March 2025	20%	60%	100%	An operational AIT facility	An operational AIT facility	An AIT facility that is modernised to international standards that promotes industry development and positioned for use by local, regional and international users.

Indicators and Targets

Activities	Measure	5-year Target	2020/21	2021/22	2022/23	2023/24	2024/25	Impact
S5.1 Leverage a significant benefit for the space programme through global partnerships	M5.1.1 Number of active formal oversees partnerships	T5.1.1 A total of 15 active formal oversees partnerships by March 2025	9	10	11	13	15	Access to international opportunities through joint collaborative initiatives
	M5.1.2 Number of active formal African partnerships	T5.1.2 A total of 15 active formal African partnerships by March 2025	9	10	11	13	15	Local products and services positioned for use in the Africa
	M5.1.3 Number of active formal national partnerships	T5.1.3 A total of 15 active formal national partnerships by March 2025	12	13	13	14	15	Public sector institutions working on resolving common challenges

Indicators and Targets

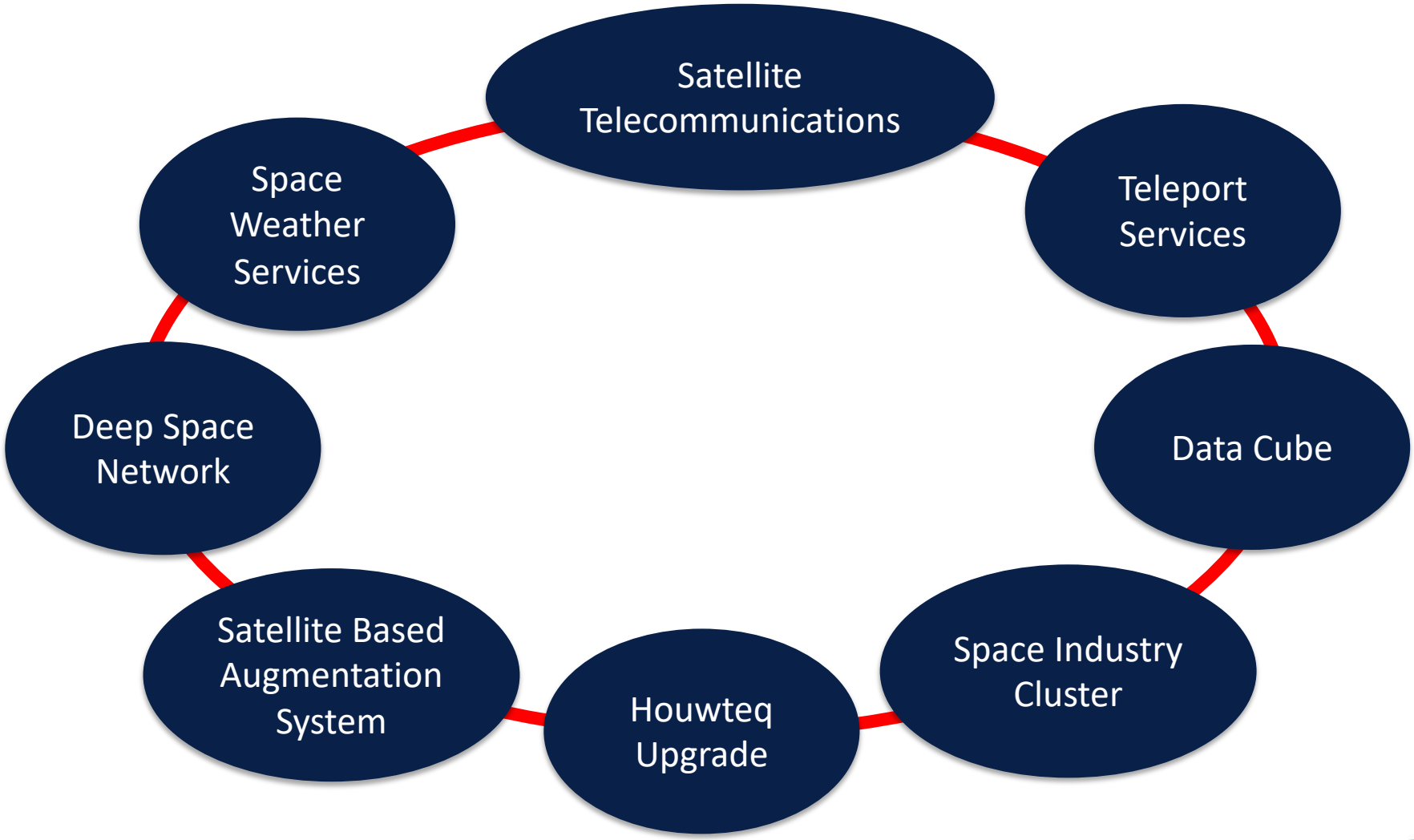
Activities	Measure	5-year Target	2020 /21	2021 /22	2022 /23	2023 /24	2024 /25	Impact
S5.2 Develop and implement an Organisation Redesign and Marketing Initiatives	M5.2.1 Percentage of government departments and public that use geospatial information using space products and services	T5.2.1 80% of government departments and public entities that use geospatial information using space products and services by March 2025	30%	40%	50%	70%	80%	Improved access to data by users and developers of services and products that support spatial planning and decision making across government
	M5.2.2 Number of awareness and training interventions to key users of space based products and services	T5.2.2 39 awareness and training interventions conducted by March 2025	7	8	8	8	8	An end user community that is capacitated to use the products and services produced by the sector
	M5.2.3 Number of initiatives to transform SANSA into a high performing Agency	T.5.2.3 7 initiatives to transform SANSA by March 2025	4 Initiatives	2 Initiatives	1 Initiative	-	-	A high performing Agency that is effective and efficient

Projected Financial Requirements for the Full Mandate

COST OF ALL PROGRAMMES						
Programme	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Total**
Operational Programme	**562.47**	**788.04**	**1641.27**	**1763.73**	**1598.11**	**6353.42**
Administrative Support Services	47.57	48.21	50.92	52.93	55.13	254.76
Cross Cutting Programmes (HCD, Outreach, Community Programmes)	51	73	83	99	81	387
Total Funding Required	**661.04**	**909.25**	**1774.92**	**1915.66**	**1734.24**	**6995.18**

On the Horizon

BREAKING NEW GROUND



Structural Refinements

- EO - refinement of structure
  - DataCube, industry development
- SS - tweaking of existing structure
  - Operational space weather centre
- SE - strengthening the structure
  - Houwteq facilities, industry development, Spaceteq absorption
- SO – growing the structure
  - Teleport services, deep space network

Thank you

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