Independent Communications Authority of South Africa

25th Anniversary

AFRICAN DATA SCIENCE CONFERENCE 2026

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Connectivity & Computing

as Enablers of

Artificial Intelligence (AI)

Tshifhiwa Maumela | Councillor, ICASA

Independent Communications Authority of South Africa

Presentation Agenda

01

Connectivity

5G & Spectrum for AI Applications

02

Computing Infrastructure

Data Centres, IXPs & DPI

03

Key AI Applications

Education, Health, Dynamic Pricing & More

04

Regulatory Perspective

ICASA's Role in the AI Ecosystem

01

Connectivity for AI

5G, Spectrum Policy & Next-Generation Networks



Why Connectivity is the Backbone of AI

AI is only as powerful as the network that carries it.

AI systems depend critically on fast, reliable, low-latency network connectivity. Without robust connectivity, AI cannot:

- Access large-scale distributed datasets
- Deliver real-time responses at the edge
- Support mobile AI in remote or rural areas
- Enable IoT sensor aggregation at scale
- Power autonomous decision-making systems

South Africa's 5G rollout and ICASA's spectrum decisions directly determine whether AI can reach all citizens — urban and rural.

< 1ms

Target latency
for real-time AI

10 Gbps

Peak 5G download
speed potential

1M/km²

Device density
5G supports

5G Key Features & AI Relevance



Ultra-Low Latency (uRLLC)

Sub-millisecond latency enables real-time AI inference for autonomous vehicles, remote surgery, and industrial automation.



Enhanced Mobile Broadband (eMBB)

Multi-gigabit speeds support HD video analytics, cloud AI, augmented reality, and large model downloads.



Massive Machine-Type Comms (mMTC)

Connects millions of IoT sensors simultaneously — powering smart agriculture, city monitoring, and predictive analytics.



Network Slicing

Dedicated virtual network segments ensure guaranteed QoS for mission-critical AI workloads in health and emergency services.



Edge Computing Integration

5G enables AI processing at network edge — reducing round-trip times and protecting data sovereignty.



Satellite-Terrestrial Integration

LEO satellite links extend 5G AI capabilities to rural and underserved African communities.

Spectrum Allocation for AI-Driven Applications

Key Spectrum Bands & AI Use Cases

Band	Frequency	Coverage	AI Application	Latency Profile
Sub-1GHz (700/800MHz)	Low Band	Wide / Rural	Rural IoT, Smart Agri, e-Health	Moderate (5–20ms)
2.6GHz / 3.5GHz	Mid Band	Balanced	Smart Cities, Education, Industry 4.0	Low (1–5ms)
mmWave (26GHz/28GHz)	High Band	Dense Urban	Real-time AI, AR/VR, Autonomous Vehicles	Ultra-low (<1ms)
Licensed Shared Access	Dynamic	Flexible	AI-driven dynamic spectrum management	Configurable
TV White Space (TVWS)	Sub-1GHz	Rural Reach	AI Education hubs, Telemedicine	Moderate

★ *ICASA's 5G spectrum auction (700MHz, 2.6GHz, 3.5GHz) is a critical enabler for AI deployment across South Africa.*

South Africa's 5G Landscape & Opportunities

Commercial 5G Rollout

Vodacom, MTN and Rain have launched commercial 5G. Coverage expanding to secondary cities.

Spectrum Assignment (2022)

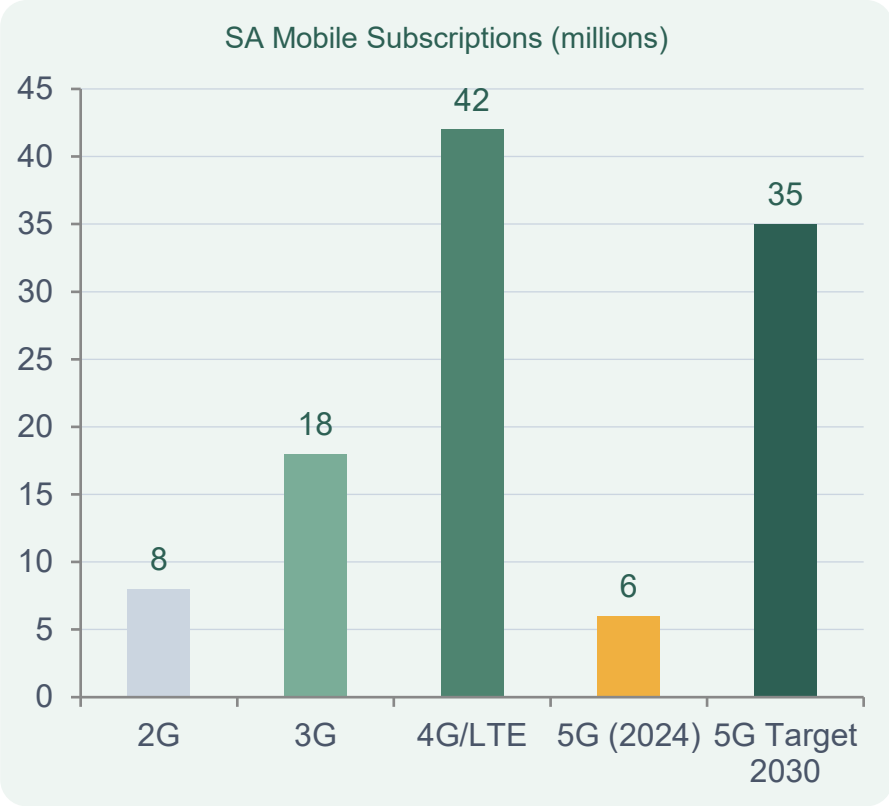
ICASA assigned temporary spectrum in 700MHz, 2.6GHz, 3.5GHz and 26GHz bands.

Undersea Cable Connectivity

WACS, SAT-3, SEACOM, ACE & 2Africa provide global low-latency international reach.

Fibre Backbone Expansion

Metro fibre supports 5G backhaul and fixed wireless access for AI data centre interconnects.



02

Computing Infrastructure

Data Centres, Internet Exchange Points & Digital Public Infrastructure



The Computing Ecosystem: Three Pillars of AI Infrastructure

Data Centres

- Hyperscale GPU clusters for model training
- Co-location for enterprise AI
- Sovereign cloud infrastructure
- Power & cooling optimisation

Internet Exchange Points

- Local traffic retention (lower latency)
- Reduced international bandwidth costs
- Redundancy & resilience
- Supports edge AI processing

Digital Public Infrastructure

- National ID & credentials systems
- Open data platforms for AI training
- Government cloud services
- Shared AI compute for public good

Data Centres: Africa's Growing AI Engine Room

~200+
Data centres across Africa

~60%
Located in South Africa

$5B+
Investment 2023–2028

Infrastructure Considerations for AI Workloads

Power & Renewable Energy

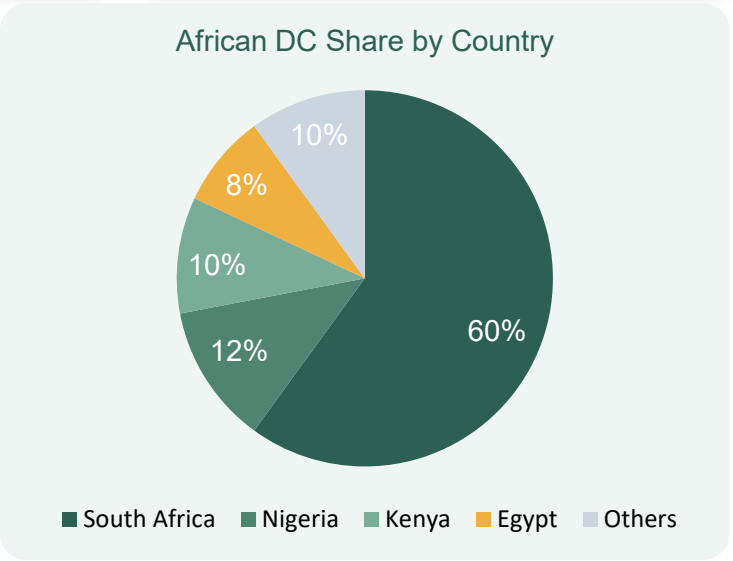
AI training is energy-intensive. Eskom stability and solar co-location are critical — SA must develop green data centre policy.

GPU & TPU Compute Density

Inference and training require specialised accelerators. Local NVIDIA H100/A100 clusters limited but growing.

Hyperscale & Edge Tiers

Tiered: hyperscale central + edge micro-DCs at base stations enable national AI coverage at low latency.



Internet Exchange Points: Keeping AI Traffic Local

What is an IXP?

An Internet Exchange Point allows ISPs, cloud providers, and content networks to exchange traffic directly — avoiding expensive international routing and dramatically reducing latency for local AI applications.

South Africa's IXP Ecosystem

NAPAfrica (Johannesburg)

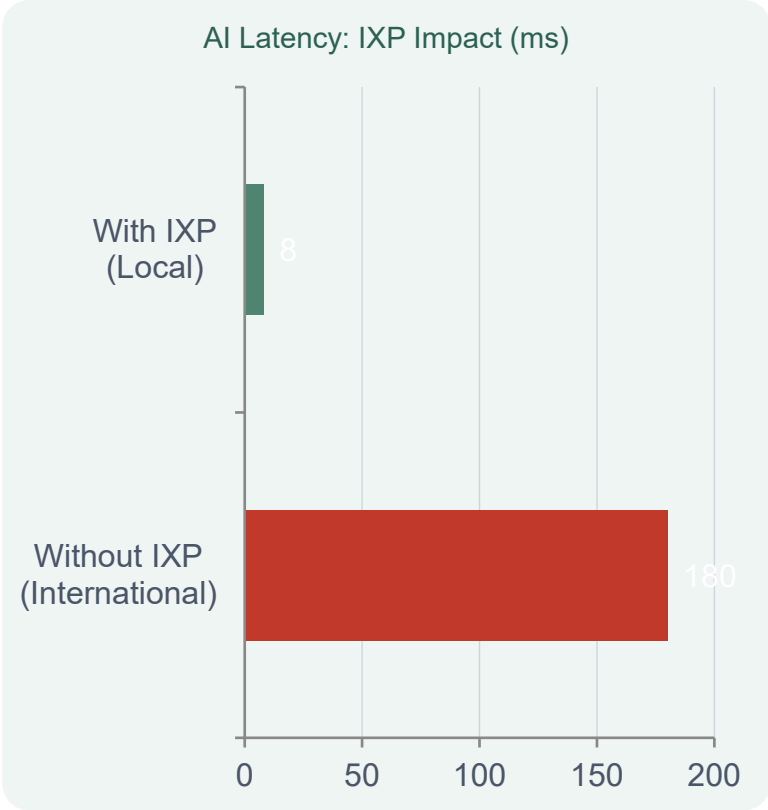
Largest IXP on the continent — 400+ connected networks, 1Tbps+ peak traffic

CINX (Cape Town)

Serves the Western Cape AI ecosystem with low-latency local interconnect

NAPAfrica (Durban)

KZN-based peering supporting port, logistics and healthcare AI systems



Digital Public Infrastructure (DPI) as an AI Foundation

DPI refers to shared digital systems serving as backbone for public and private AI services — analogous to physical roads and power grids.

Digital Identity (e-ID)

Smart ID systems enable authenticated AI services in health, banking, and social grants — ensuring no citizen is left behind.

National Data Platforms

Open government datasets fuel AI training for agriculture, traffic, health surveillance and economic modelling.

Government Cloud (G-Cloud)

Sovereign cloud reduces dependency on foreign AI infrastructure and lowers cost for public sector AI deployments.

Payment & Financial Rails

Real-time payment data (e.g. PayShap) powers AI fraud detection, dynamic credit scoring and financial inclusion tools.

Cybersecurity Infrastructure

AI-powered threat detection relies on national SOC networks and shared threat intelligence to protect critical systems.

Environmental Data Systems

Climate and utility data grids feed AI models for smart grid management, water, and food security planning.

03

Key AI Applications

Education, Health, Dynamic Pricing & Real-Time Use Cases

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AI Applications: Latency & Connectivity Requirements

Different AI applications have fundamentally different latency and bandwidth requirements.

Application	Latency Need	Bandwidth	Network	Criticality
Remote Surgery / Telemedicine	< 1ms	High	5G uRLLC	Critical
Autonomous Vehicles	< 1ms	Very High	5G + V2X	Critical
AI Proctoring / Education	5–20ms	High	4G/5G eMBB	High
Dynamic Pricing Systems	< 10ms	Medium	4G/5G	High
Smart Grid Management	1–10ms	Medium	5G / NB-IoT	Critical
AI Language Translation	50–100ms	Medium	4G/5G	Medium
Smart Agriculture / IoT	100–500ms	Low	NB-IoT/LPWAN	Medium
AI Research / Training	> 1s	Very High	Fibre / Cloud	High

Dynamic Pricing & the AI-Enabled Economy

AI-driven dynamic pricing requires near-real-time data flows — a connectivity and latency policy challenge for regulators.

Retail & E-Commerce

Real-time price adjustments based on demand, competitor pricing and consumer behaviour. Requires <10ms API response times.

Energy & Smart Grids

AI optimises electricity tariffs based on real-time grid load, renewable availability and consumer demand via 5G IoT sensors.

Ride-Hailing & Mobility

Surge pricing algorithms balance supply/demand for Uber, Bolt and SA mobility platforms. Needs dense 4G/5G urban coverage.

Telecoms Spectrum Pricing

AI enables dynamic spectrum access pricing — ICASA can optimise spectrum use through real-time market mechanisms (LSA).

Financial Markets

Algorithmic trading and credit scoring require ultra-low-latency fibre connections to the JSE and national payment infrastructure.

Agricultural Commodities

AI price discovery for maize, wheat and livestock equalises information asymmetry for smallholder farmers via mobile-first platforms.

Economic Value

- *Most focus has been on AI applications in Language*
- *Most report no financial value from Agentic AI Applications*
    - *Expected since no clear applications*
- *SA AI ecosystem is predominately AI Inference Economy*
- *Digital Infrastructure was built for training AI models*
- *Mismatch is not due to lack of skills*
    - *Due to misallocation of resources*
    - *Technical Experts aren't hired in big corporates because they speak "technical" language*

Thank You


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