

INDEPENDENT COMMUNICATIONS AUTHORITY OF SOUTH AFRICA

Future Overall Agenda on the use of Spectrum and Market Oversight: Enforcement of Infrastructure Sharing, Universal Service Compliance and Social Obligations

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Why is Spectrum Management so important?



Spectrum is a finite, scarce resource.

It is a key enabler of a wide range of communications services and digital transformation of the economy and society, a driver of broadband expansion, economic growth, cultural enrichment, a key lever for achieving universal access.



In terms of Section 30(1) of the Electronic Communications Act No. 36 of 2005, *"…the Authority **controls, plans, administers and manages the use of and licensing** of the radio frequency spectrum …"*



Spectrum management needs to cater for many competing demands & use cases: mobile telephony; radio & television broadcasting; data transmission & Internet access; Wi-Fi offload & home networks; private networks; scientific research & astronomy; navigation; disaster management, military & security services etc



The future agenda of spectrum must thus **balance efficiency, competition, investment certainty and public interest** outcomes.

Spectrum Management Hierarchy & Dependencies

The International Telecommunication Union's ITU-R sector ITU-R sector plans & manages radio-frequency spectrum and satellite orbits globally to ensure interference-free, efficient, and equitable use of spectrum

The ITU holds a **World Radio Conference** every four years - **WRC-27** upcoming in late 2027 - leading to the **Final Acts** & updated **Radio Regulations**, a global spectrum treaty

ITU spectrum work leading up to each WRC is supported by study groups and working parties

ICASA then develops & revises the **National Radio Frequency Plan (NRFP)**, for approval by the Minister, to align spectrum management in SA to the post-WRC ITU Radio Regulations

All other ICASA spectrum regulations and processes - e.g. IMT Roadmap, Radio Frequency Spectrum Assignment Plans (RFSAPs), Frequency Migration Plan, Dynamic Spectrum Assignment, High-Demand Spectrum Assignment (auctions), etc - depend on and must be aligned to the NRFP

Interfaces of Spectrum Management in SA

Legislative and Regulatory Framework

- Electronic Communications Act No 36, 2005
- Several government policies that inform radio frequency spectrum planning.
  - National Development Plan 2030 ('NDP'), published in 2011
  - SA Connect policy provides South Africa's national broadband plan, which includes targets for broadband speeds, among other objectives.
  - National Next Generation Spectrum Policy
  - Strategic Infrastructure Plan 15 - Expanding access to communication technology ('SIP-15').

Additionally:

- Communications Regulators' Association of South Africa ('CRASA') regulatory principles for mobile financial services.
- African Telecommunications Union ('ATU') has launched spectrum recommendations that are relevant for radio frequency spectrum planning.

Efficient and Optimal Use of Spectrum



Efficient Use of Spectrum

Aims to use the minimum amount of spectrum (bandwidth, power and time occupancy) necessary to provide required radiocommunication services & applications with acceptable quality and reliability, while avoiding harmful interference.



Optimal use of spectrum

Extends beyond technical efficiency, aims to maximise economic value, promote innovation and new technologies, support spectrum sharing, re-assess bands for underutilisation and migrate away from inefficient legacy systems.

Spectrum allocation = ensuring each spectrum band set aside for highest value use

Spectrum assignment = awarding specific spectrum to highest value user(s)

Efficient and Optimal Use of Spectrum

- Some South African regulations & policies supporting efficient and optimal spectrum use (such as 5G, Dynamic Spectrum Access, Spectrum sharing and trading):

Relevant Regulation/Policy in South Africa	Mechanism to support efficient and optimal use of spectrum	Details
Electronic Communications Act, 2005 (Act No. 36 of 2005)	Spectrums Licensing Framework	Primary statute governing spectrum licensing, assignment, and use, ensuring all transmitters are licensed and spectrum use is regulated. ICASA's licensing processes for services like wireless broadband and IMT are anchored in this Act.
Next-Generation Radio Frequency Spectrum Policy for Economic Development (Government Gazette No. 50725, 28 May 2024)	Next generation Mobile Networks (such as 5G, 6G)	National spectrum policy that guides spectrum allocation, efficient use, spectrum refarming to free up spectrum for 5G
	Spectrum Sharing and Spectrum Trading	Provides policy basis for market-based approaches including spectrum trading, sharing, subletting and dynamic access, and introduces "use it or lose it" to discourage hoarding and promote efficient use.
Regulations on the Use of TV White Spaces (implemented April 2021)	Use of TV White spaces	Enables the use of TV White space spectrum (underutilised broadcast spectrum) for broadband services
Draft National Radio Frequency Plan 2025 (Government Gazette No. 52449)	National Radio Frequency Plan (Frequency allocation Band Plan)	Defines the National Radio Frequency Allocations, taking into account WRC-23 outcomes/decisions.
Digital Sound Broadcasting Regulations (DSB)	DSB Licensing Framework	Introduces Digital Sound Broadcasting services in the Country. The project enhances Social Cohesion and National Building.

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Efficient and optimal use of spectrum

Rationale for GE-84 Optimisation project

The Radiocommunication Bureau ("BR") of the International telecommunications Union ("ITU"), in collaboration with the African Telecommunication Union ("ATU"), launched a process for the optimization of the Geneva 1984 ("GE84") Plan for African countries.

The main purpose of the project was to achieve an efficient use of the VHF 87.5-108 MHz ("FM") band for analogue sound broadcasting and to allocate new frequencies to FM broadcasting to meet the increasing need for additional frequencies in African countries.

Cross-Border Frequency Coordination



Mozambique:

28 South African sites were coordinated



Namibia:

02 South African sites were coordinated.



Kingdom of Eswatini:

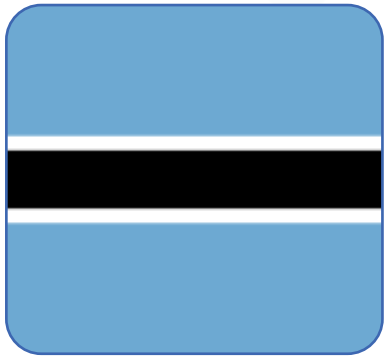
28 South African sites to be coordinated.

(09 sites are considered by SA)



Zimbabwe:

23 South African sites to be coordinated.



Botswana:

48 South African sites were coordinated.

Project Outcome

Output	Comments
26 new assignments were identified	14 are categorised as CTY 7 are categorised as CML 5 are categorised as PBS
22 assignments were identified for suppression	Suppression is necessary as these assignments are duplicated in the plan
19 assignments were identified for modification	The modifications are necessitated the amendments made to the technical specification, particularly the site locations and names.
Amendment process for assignments that are not part of the GE-84	The amendment process will ensure that all assignments are well coordinated
Updated the VHF/FM Table of the Terrestrial Broadcasting Plan	The VHF/FM Table is updated as assignments are made.



INDEPENDENT COMMUNICATIONS AUTHORITY OF SOUTH AFRICA

Future Overall Agenda on the Use of Spectrum

Future overall agenda on the use of the spectrum - Forecasts of overall IMT demand - ITU

	Total spectrum requirements for RATG 1	Total spectrum requirements for RATG 2	Total spectrum requirements for RATS 1 and 2
Lower user density settings	**440 MHz**	**900 MHz**	**1 340 MHz**
Higher user density settings	**540 MHz**	**1 420 MHz**	**1 960 MHz**

RATG 1 : Radio Access Technologies Group (i.e. Pre-IMT and IMT2000 and enhancements)
RATG 2: Radio Access Technologies Group (i.e. IMT Advanced Technologies)

IMT Demand in South Africa

Growing demand:

SA for high-speed Internet capabilities (FTTx, IMT, Wi-Fi, LEOs, D2D)

Smartphone uptake & usage driven by dmand for mobile Internet services & advanced digital applications.

Mobile cellular subscription growth - 95m (2020) → 117m (2024)

Machine-to-machine ("M2M") devices.

According to ICASA's 2025 ICT Sector Report, South Africa had approximately 14m M2M SIM mobile subscriptions in 2024.

Future overall agenda on the use of the spectrum (Cont.).

The Authority is in the process of planning for the development of the "Long-Term Spectrum Outlook" spanning between ten (10_and twenty (20) years.

The document will contain an analysis of regulatory, technical and economic factors, including relevant Regional and International best practices.

The main aspects of spectrum planning include:

- Setting spectrum management goals for the future and to establish steps to achieve those goals;
- Provide a framework within which spectrum is made available for the constantly evolving radio spectrum needs, and the spectrum management system;
- Facilitate decision-making by creating the basis for consideration and evaluation of the course of action; and
- Support and follow the major directions and needs of the current and future spectrum users.
- The spectrum management process should attempt to anticipate those developments and ensure that adequate spectrum will be allocated to the mobile service to meet those needs;

To achieve this goal: capacity analysis, coordination procedures, frequency shifts and supporting databases are necessary to be able to support the accommodation of mobile systems.

Future overall agenda on the use of the spectrum (Cont.)

Amount of spectrum Assigned currently or potentially in the future to IMT spectrum

Band	Identified for IMT and RFSAP available or licensed (MHz)	Identified for IMT but no RFSAP yet (MHz)	Assigned – IMT (MHz)	Not assigned to IMT (MHz)
450 FDD	10		0	10
700 FDD	60		40	20
750 TDD	5			5
800 FDD	60		40	20
900 FDD	70		70	
1500 TDD	90			90
1800 FDD	150		144	6
1900 TDD	Feasibility study	40		40
2100 FDD	120		120	
2100 TDD	Feasibility Study	15		15

Band	Identified for IMT and RFSAP available or licensed (MHz)	Identified for IMT but no RFSAP yet (MHz)	Assigned – IMT (MHz)	Not assigned to IMT (MHz)
2300 TDD	100		60	40
2600 TDD	190		160	30
3300-3400 TDD	100			100
3400-3600 TDD	200		160	40
3600-3800 TDD		200		200
4800-4990	Feasibility Study	190		190
6425-7125	Feasibility Study	700		700
26 GHz	Feasibility Study	3 250		3 025
40 GHz	Feasibility Study	6 050		6 050
46 GHz	To be considered	1 500		1 500
48 GHz	To be considered	1 000		1 000
66-71 GHz	To be considered	4 000		4 000
Total	**1 155**	**18 395**	**794**	**18756**

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Future overall agenda on the use of the spectrum (Cont.)

Amount of spectrum allocated currently or potentially in the future to IMT spectrum

Band	2025-26	2027-28	2028+	Comment
1800 FDD	Development Draft RSAPs	Development of Final RFSAP	Spectrum Licensing Frameworks	Frameworks to align with provisions of the Next Generation Radio Spectrum Policy.
1900 TDD				
3600 TDD				
4800-4990				
6425-7125				
26 GHz				
40 GHz				
46 GHz				
48 GHz				
66-71 GHz				

Future overall agenda on the use of the spectrum (Cont.)

Dynamic and Opportunistic Spectrum Access, is a Regulatory Mechanism that is placed between the "Traditional Exclusive Model of Spectrum Assignment" and the "Spectrum Commons", that is "Apparatus Exempt from Spectrum Licensing" that introduces flexibility to improve spectrum efficiency as another way to bring Citizens Innovative New Wireless Technologies.

- Demand for wireless broadband capacity is growing much faster than the availability of new spectrum for supporting wireless infrastructure deployment, this requires new approaches to spectrum management. Efficient use of Spectrum.
- DSA is an umbrella term used to describe a set of technologies and techniques that enable radio communications devices to opportunistically transmit on available radio spectrum.
- Television White Spaces (TVWS) was implemented in the first phase of implementation of Dynamic and Opportunistic Spectrum Management in the frequency Band 470-694MHz
- The second phase, currently being implemented is in the identified spectrum that can be used for Dynamic and Opportunistic Spectrum Management outside TVWS in the frequency Band 3.8-4.2GHz and Lower 6GHz.
- The Regulatory Framework for Dynamic Spectrum Access and Opportunistic Spectrum Management has just been approved by the Council of the Authority.

Future overall agenda on the use of the spectrum (Cont.)

- The aim is to empower small (SMME) wireless network operators to leverage TVWS for providing cost-effective broadband services in rural, unserved, and hard-to-reach areas.
- Empower beneficiary SMMEs to deliver affordable broadband services to schools, households, small businesses, and public Wi-Fi hotspots in rural and township communities across five provinces.

Benefits

- To support the bridging of the digital divide. Increased network reach to some unserved and underserved rural and township communities
- Partnerships - UNDP/FCDO/CSIR
- Provide beneficiary SMMEs with capacity building, technical support, support digital literacy, commission networks, write report and disseminate results

Opportunities

- Utilize beneficiary SMMEs networks to implement applications of the 4IR in rural and township communities
- Utilize beneficiary SMMEs networks to implement digital skills support initiatives in the communities
- Collaborative projects with MNOs for supporting more SMMEs

Future overall agenda on the use of the spectrum (Cont.)

Spectrum Sharing of Assigned Spectrum using Dynamic and Opportunistic Spectrum Management

Description	2025-26	2026-28	2029+	Comment
Dynamic and Opportunistic Spectrum Management	Dynamic Spectrum Access Regulations (phase 2) in the 3800 – 4200 MHz	Implementation of Dynamic Spectrum Access Regulations (Phase 2)	Identification of other bands that can be shared using Dynamic Spectrum Access principles and development of the DSA Framework (phase 3)	Enable access to spectrum by SMMEs and Rural Communities on a non harmful interference to primary services

Digital Sound Broadcasting

Description	2026-28	Comment
Framework for Licensing of Digital Sound Broadcasting Service	Licensing Framework for Digital Sound Broadcasting in line with the National Radio Frequency Plan 2026 and Digital Broadcasting Regulations	Enhance Social Cohesion and National Building. Increased content.

Future overall agenda on the use of the spectrum (Cont.)

Long-Term Spectrum Outlook

- Post the 2021 National Radio Frequency Plan **(NFRP-2021)** exercise, the Authority, initiated the **Long-Term Spectrum Outlook (LTSO) inquiry (Notice 738 of 2021) to establish a 5–10+ year framework for spectrum planning**, aligned with SA Connect and ITU-R methodologies.
- The Authority subsequently received 17 written submissions from operators, broadcasters, ISPs, vendors, satellite operators, and industry associations, followed in April 2022 by Public Hearings.
- The NRFP 2026 has reinforced the need for the Authority's Long Term Spectrum Outlook Plan
- The table overleaf provide a Summary of the Findings as well forward-looking LTSO set out and what the study concluded per Radiocommunications Service. .

Future overall agenda on the use of the spectrum (Cont.)

- A full Spectrum Outlook Plan and a Spectrum Roadmap are needed to support the efficient use of spectrum that will create/support new use cases, improve spectrum utilization, create new market demand, and promote efficiency across current and future spectrum allocations.
- *The Authority is taking steps to develop a Long-term Spectrum Outlook Plan and Spectrum Road Map 2026-2036 to guide the allocation, assignment and efficient management of radio frequency spectrum in South Africa.*
- The Spectrum Outlook Plan and Spectrum Roadmap will provide information to commercial operators, stakeholders and users of ICASA's planned activities to meet expected demand for commercial mobile services, broadcasting/PMSE, Public/Utility services, License-exempt Applications, Satellite Services, Wireless Backhaul Services and other Wireless Services in the next 10 to 20 years.
- The Spectrum Outlook Plan will provide the schedule/Work Plan for the Short, Medium and Long Term to address issues related to Spectrum access, reflect current usage and efforts to maximize the use of this limited resource.
- The Long-Term Spectrum Outlook and Roadmap [2026-2036] is envisaged to have a 10–20-year horizon, consistent with ITU-R planning cycles.

Future overall agenda on the use of the spectrum (Cont.)

Sub-Sector	2021 Long Term Spectrum Outlook Key Message	Position / Authority Finding	Assessment post NRFP 2025
Mobile / IMT	Demand for Low/Mid/High-band spectrum: 10 MHz, 100 MHz, and 1,000 MHz, respectively, for IMT-2020 and beyond (5G→6G). AI, AR/VR, URLLC and mMTC drive exponential traffic growth.	*Bandwidth targets confirmed. Authority to develop IMT RFSAPs. 5G/6G/Wi-Fi 7 are flagged as key technologies requiring proactive spectrum release up to 2040.*	*ICASA develops regular IMT Roadmaps and IMT-based RFSAPs*
Fixed Wireless	Backhaul demand is rising in traditional bands (7–38 GHz) and E-band; co-existence with IMT requires interference mitigation studies.	*Coordination studies mandated. Spectrum sharing with IMT to be managed via RFSAP and migration plans.*	*ICASA's IMT-inspired Feasibility Studies, FMPs and RFSAPs typically cover spectrum sharing and coordination studies.*
Satellite	LEO/MEO constellations (ESIMs, HIPS) will extend broadband into underserved areas; regulatory automation is needed for orbit/spectrum coordination.	*Authority to put licensing, RFSAP, and automated spectrum management in place; HIPS/drone IMT platforms to be incorporated post-WRC-23.*	*Regulatory Framework & Guidelines for HIBS vs. IMT (as promised) – still outstanding*
Broadcasting	Digitalisation dividend frees up UHF; NAB cautions against premature reallocation of C-band to IMT before WRC-23 outcomes.	*C-band and L-band reallocation decisions deferred to post-WRC-23; Authority to consider DTT co-existence in band plans.*	*3.6 - 3.8GHz 'Concerns' & L-Band*
PPDR / Emergency	PPDR convergence with commercial IMT (700 MHz, dedicated PPDR bands) is essential for public safety networks.	*Authority to align the PPDR spectrum with the IMT roadmap and ensure dedicated capacity for emergency services.*	*PPDR Spectrum is largely considered unavailable*
Spectrum Sharing & SRDs	Wi-Fi 6E/7 in 6 GHz and mmWave licence-exempt use growing rapidly; LSA and dynamic sharing mechanisms needed.	*Authority to assess 5 925–6 425 MHz for Wi-Fi 6E; LSA framework and secondary market trading to be studied urgently.*	*5 925–6 425 MHz for Wi-Fi is largely settled after NRFP-25*
Other Vertical Industry needs	None was proffered in earnest	*Paper mused that Vertical markets (PPDR, PMSE rail, ports, mining) will receive focused attention.*	However, poor considerations TO DATE of Spectrum for these other vertical Industry needs



Universal Service Compliance

Focal areas:

Coverage Targets

Verification of geographic rollout commitments.

Independent audits by the Authority on coverage claims using drive testing methods and geo-mapping tools.

Quality of Service

Monitoring network performance benchmarks in underserved areas.

Expand on the network performance framework to include Network Performance Management Systems, which are connected to network operators' live networks and to include crowdsourcing.

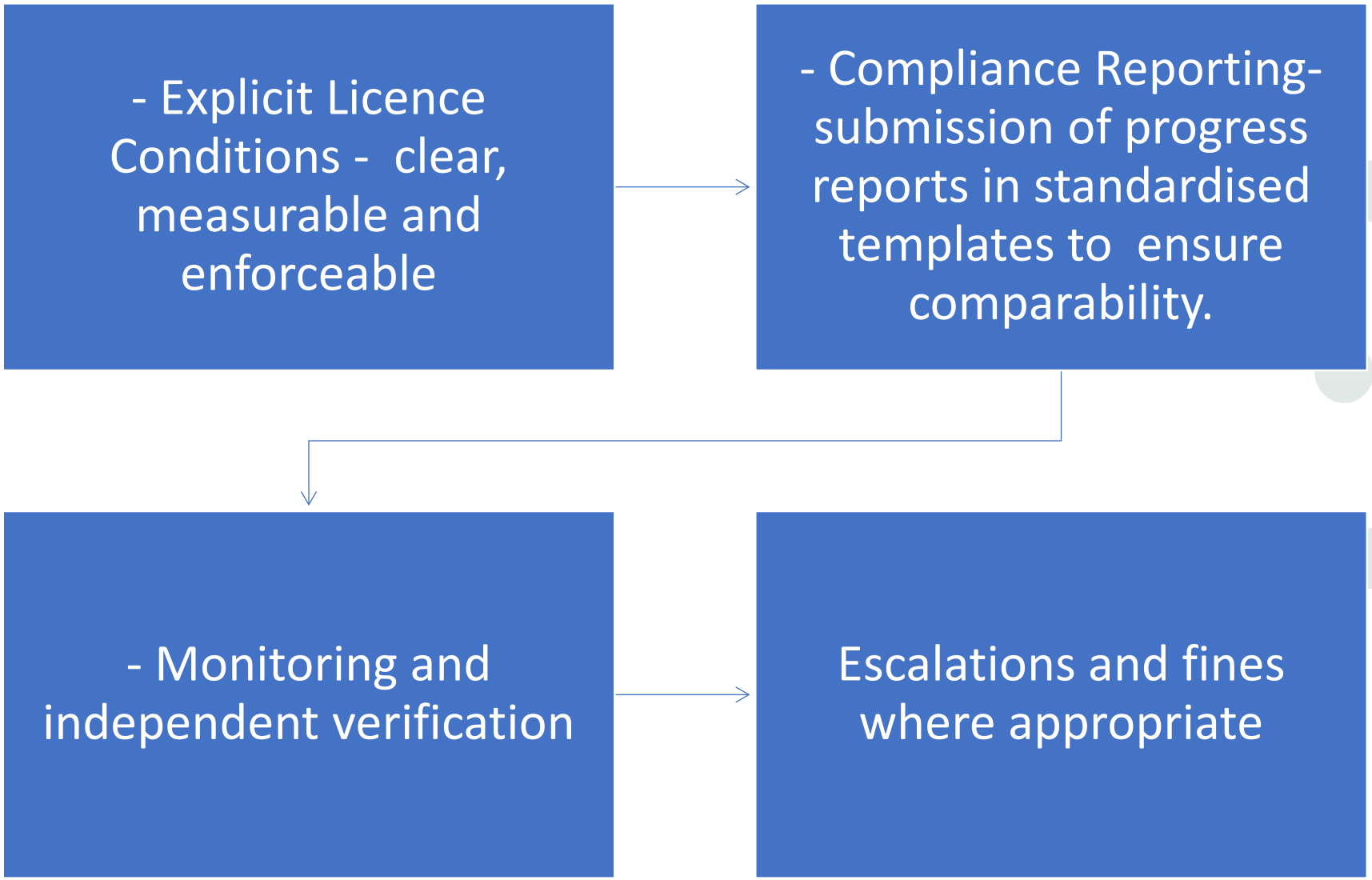
Time-Bound Milestones

Enforcing compliance with rollout obligations and imposing remedial measures where delays occur.

The Authority to actively participate in the Project Management Office (PMO) of the USO obligations in order to address the deployment challenges with the stakeholders/beneficiaries on time.

Create standardised reporting templates and periodic performance assessments egg quarterly bi annually.

Social Obligations attached to the spectrum auction



Conclusion

Effective enforcement of infrastructure sharing, universal service obligations, and auction-related social commitments will ultimately determine whether spectrum allocation translates into inclusive and sustainable digital growth.

Thank You