5G Deployment and Policy Framework

Working Group on Infrastructure Development

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Contents

1 Introduction

Since the 1980s, mobile communications technologies have evolved in successive generations, each delivering significant improvements in capacity, speed, and functionality. These advancements have transformed economies and societies, enabling digital services such as mobile banking, e-government, e-commerce, and cloud-based applications.

As demand for high-speed, reliable, and low-latency connectivity continues to grow, existing 4G networks are approaching their technical and economic limits. The introduction of Fifth Generation (5G) technology represents a critical enabler of the next phase of digital transformation.

This document provides policy and regulatory guidance to West Africa Telecommunications Regulators Association (WATRA) Member States to support efficient, inclusive, and sustainable 5G deployment.

1.1 What is 5G?

5G is the fifth generation of mobile network technology, designed to support significantly enhanced performance compared to previous generations:

- 2G: Digital voice and SMS
- 3G: Mobile broadband and internet access
- 4G: High-speed data and multimedia services.

5G builds on these capabilities by delivering:

- Peak data rates of up to 10–20 Gbps
- Ultra-low latency (as low as 1 millisecond)
- Massive device connectivity (up to 1 million devices per km²)

These capabilities enable both evolutionary improvements in mobile broadband and transformational use cases across multiple sectors.

The initial 5G technical standards were released in December 2017 by the 3rd Generation Partnership Project (3GPP), with further work culminating in the IMT-2020 specification issued by the International Telecommunication Union (ITU)

1.2 Core Differences Between 5G and 4G

5G introduces three fundamental performance improvements:

- **Enhanced Speed**: Up to 10x improvement over 4G
- **Massive Capacity:** Ability to support dense device environments
- **Ultra-Low Latency**: Enabling real-time applications

These features enable advanced applications such as smart agriculture, logistics optimization, remote healthcare, and industrial automation.

1.3 Benefits of 5G

5G is expected to deliver significant economic and social benefits, including:

- Improved broadband access and user experience
- Acceleration of digital transformation across sectors
- Increased productivity and innovation
- Expansion of the digital economy

5G use cases fall into three broad categories:

a. **Enhanced Mobile Broadband (eMBB)**
   High-speed connectivity for consumers and businesses leading to improved consumer mobile broadband experience through faster speeds, greater reliability, wireless home broadband, and support for virtual and augmented reality.

b. **Massive Machine Type Communications (mMTC)**
   Large-scale deployment of IoT devices in sectors such as agriculture, energy, and environmental monitoring.

c. **Ultra-Reliable Low-Latency Communications (URLLC)**
   Mission-critical applications such as emergency services, industrial automation, and transport systems.

1.4 5G in Africa

5G deployment in Africa is at an early but growing stage, with commercial services launched in nearly 30 countries, according to GSMA Intelligence (2025). Adoption remains low, accounting for a small share of total mobile connections, but is expected to increase significantly by 2030.

Rollout is largely urban-focused and predominantly based on non-standalone (NSA) architectures, leveraging existing 4G networks. The primary early use case is Fixed Wireless Access (FWA), which provides a cost-effective alternative to fibre broadband.

Key constraints include limited backhaul infrastructure, fragmented spectrum policies, high spectrum costs, energy challenges, low device affordability, and weak investment incentives linked to low ARPU levels. Despite these challenges, 5G is expected to play a growing role in supporting digital transformation across sectors.

1.5 Status of 5G Deployment in West Africa

The WATRA Working Group on Infrastructure Development conducted a survey to determine the status of 5G deployment in West Africa. Responses received from twelve (12) WATRA Member States showed that 5G deployment in West Africa remains largely at an early stage, with most countries limited to policy development, trials, or ongoing licensing processes..

1. Burkina Faso

Burkina Faso has conducted initial 5G trials, with operators requesting additional testing for use case development. The trials were conducted in the 700 MHz and 3500 MHz bands. However, in line with the principle of technological neutrality, operators are permitted to deploy 5G services using any frequency bands previously assigned to them, subject to regulatory approval and compliance with existing licensing conditions. A commercial launch is planned for 2026, but no licensing or deployment has yet occurred.

2. Côte d'Ivoire

Côte d'Ivoire has a formal 5G roadmap (2021) and has made progress in spectrum planning (3.3–3.6 GHz) and pilot deployments. However, no commercial licences have been issued, and services are not yet operational. The

country is currently focused on spectrum reorganisation and regulatory preparations, indicating an advanced preparatory stage.

3. The Gambia

The Gambia has established a 5G regulatory framework and authorised two operators for deployment following testing. Spectrum has been assigned (700 MHz and 3.3–3.8 GHz). However, deployment is still nascent and driven by operator initiatives, with regulatory constraints (e.g. pricing and spectrum refarming) affecting progress.

4. Ghana

A national 5G policy has been announced, and one wholesale 5G licence has been issued to facilitate a shared infrastructure model. A tender process commenced in March 2026 to conduct auctions for additional 5G licences. Spectrum has been assigned in the 2100 MHz, 2.6 GHz, and 3.5 GHz bands, with the 700 and 2300 MHz bands also earmarked for 5G services. Ghana launched commercial 5G services in March 2026. Initial deployment faced delays due to reported interference in the 2.6 GHz and 3.5 GHz bands, as well as the reluctance of some major mobile network operators to adopt the shared RAN infrastructure.

5. Guinea

Guinea is at a planning and pilot stage, with no national 5G strategy yet, though one is under development. Spectrum (700 MHz and 3.5 GHz) has been identified, and limited testing has been authorised, but no licences or commercial services exist.

6. Guinea-Bissau

Guinea-Bissau is at a very early stage of 5G readiness. There is no national 5G strategy, no licensing, and no commercial deployment. While the 3.5 GHz band has been identified, there has been no concrete regulatory or market activity.

7. Mali

Mali is progressing through technical and regulatory studies, including a proposed roadmap. Pilot tests in the 3.5 GHz band have been conducted in Bamako and other regions. However, there are no licences or commercial deployments, placing the country in an early trial phase.

8. Mauritania

Mauritania is at the licensing stage, with a formal tender process launched in 2025–2026. Spectrum bands (700 MHz, 2100 MHz, 3.5 GHz) have been identified, but no licences have yet been awarded, placing the country at a transition stage toward deployment.

9. Niger

Niger remains at a pre-strategic stage, with no national 5G strategy and no licences issued. Although 700 MHz and 3.5 GHz bands are being considered, there is no formal spectrum allocation or deployment activity.

10. Nigeria

Nigeria is the most advanced 5G market in West Africa, with commercial services launched in 2022 and ongoing nationwide expansion. It represents the only fully operational large-scale 5G market in the sub-region, serving as a benchmark for deployment and adoption.

11. Senegal

Senegal is one of the leading 5G markets in West Africa, having transitioned to early commercial deployment.

- 5G licences issued in 2023
- Commercial services launched in 2024 by operators including Sonatel (Orange) and Free
- Deployment currently covers major cities such as Dakar, Thiès, Saint-Louis and others, with ongoing expansion

Despite this progress, deployment remains limited in coverage and still expanding, positioning Senegal as an early adopter but not yet mature market.

12. Sierra Leone

Sierra Leone is at a trial stage, with no national strategy and no commercial licences. Spectrum has been identified across low-, mid-, and high-bands, and trial licences have been issued to operators, but no commercial market exists.

13. Togo

Togo does not yet have a formally published national 5G strategy, but has made notable progress through spectrum planning and early deployment. Several key frequency bands—including 700 MHz, 3400–3800 MHz, and millimetre wave

ranges—have been identified for 5G, and the operator YAS Togo has been offering commercial 5G services since 2020 using 100 MHz in the 3400–3500 MHz band. Despite this early rollout, market adoption remains limited, with only about 1% of devices being 5G-compatible.

Regional Synthesis

The survey confirms that 5G deployment in West Africa is highly uneven and predominantly at an early stage.

Overall, the region remains in a nascent phase, with most countries yet to transition from policy and testing to full commercial rollout, highlighting the need for regional coordination, spectrum harmonisation, and infrastructure investment.

2 5G Rollout

2.1 5G Deployment Modes

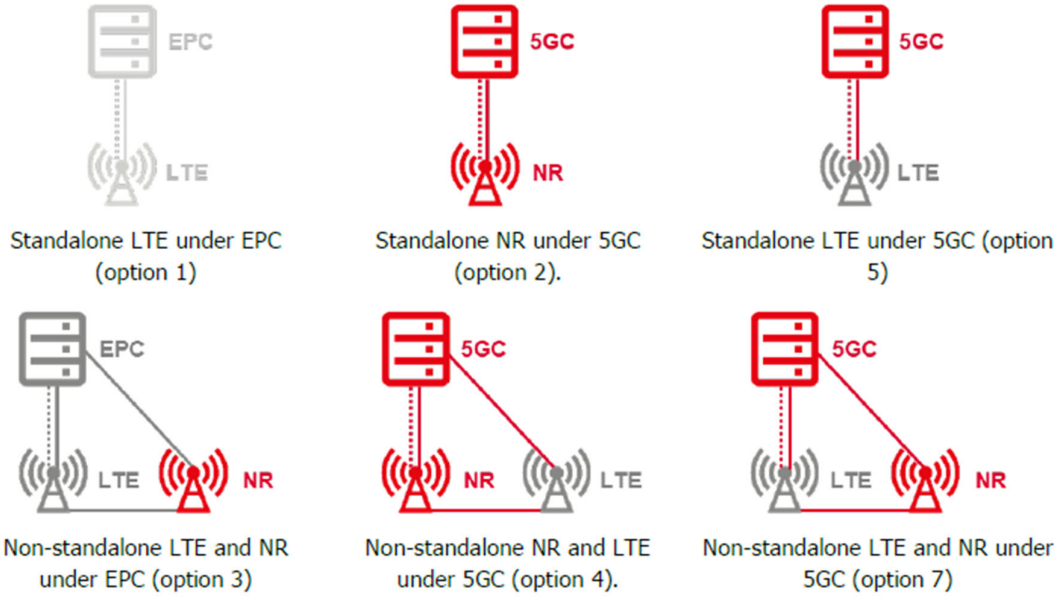
The 3rd Generation Partnership Project (3GPP) has defined both a new 5G core network, referred to as 5GC, as well as a new radio access technology called 5G "New Radio" (NR). Unlike previous generations that required that both access and core network of the same generation to be deployed (e.g. Evolved Packet Core (EPC) and LTE together formed a 4G system), with 5G 5G can be deployed in two primary configurations – Standalone (SA) and Non-Standalone 5G (NSA).

Standalone (SA)

SA 5G requires a dedicated 5G core network in addition to 5G RAN infrastructure. One key feature enabled by 5GSA is 'network slicing'. With network slicing, a carrier could tailor a network to meet several requirements like low latency, higher throughput or increased capacity. It, however, requires higher investment costs.

Non-Standalone (NSA)

In non-standalone (NSA) scenario, the NR radio cells are combined with LTE radio cells using dual connectivity to provide radio access and the core network may be either EPC or 5GC depending on the choice of operator. This scenario may be chosen by operators that wish to leverage existing 4G deployments, combining LTE and NR radio resources with existing EPC and/or that wish new 5GC to deliver 5G mobile services. This solution will require tight interworking with the LTE RAN. The end user experience will be dependent on the radio access technology(ies) used. NSA 5G uses new 5G equipment for the Radio Access Network (RAN, which transmits wireless signals to user devices such as smart phones) but relies on 4G infrastructure for the 'core' network (which enables connectivity to the wider internet). As it utilises existing infrastructure, NSA 5G is relatively quick to deploy. The limitations of the 4G core network means that NSA 5G is not capable of providing the mass connectivity and ultra-low latency required for more advanced 5G use cases. In practice this means that deploying NSA 5G is effectively used for the embb and hence most peoples' experience with 5G is mainly limited to faster mobile broadband.



SA and NSA Options (GSMA)

2.2 5G Implementation Strategy

Although 4G will continue evolving, demand for connectivity, capacity, and ultra-reliable networks will exceed 4G capabilities. Forecasts by Cisco previously projected exponential growth in mobile data traffic.

WATRA Member States should adopt a coordinated approach to 5G deployment, focusing on:

- Enabling regulatory frameworks
- Investment-friendly policies
- Public-private collaboration
- Regional harmonization

Governments and regulators are encouraged to:

- Facilitate timely access to spectrum
- Reduce barriers to infrastructure deployment
- Promote investment in fiber and backhaul networks
- Support innovative ecosystems

2.3 Enablers of Successful 5G Rollout

2.3.1 Building the Economic Case for 5G

Much focus has been on the innovative use cases enabled by 5G. However, these potential benefits that could be derived from 5G have to be situated in the context of it being profitable for operators to commit investments into deploying 5G infrastructure.

5G deployment requires significant investment, which is borne by industry. Governments and Regulators have an important role to play in creating the conditions for the market to develop and deploy 5G as rapidly and efficiently as possible, whilst supporting innovation in the ecosystem.

Regulators are encouraged to:

- Ensure predictable and transparent regulatory environments
- Avoid excessive spectrum pricing
- Encourage infrastructure sharing
- Support demand stimulation (e.g., digital services, e-government)

2.3.2 Backhaul Infrastructure

5G requires robust backhaul infrastructure. Although in more remote areas it is possible to use fixed wireless links for backhaul, the need to transport the higher rates of data possible over 5G will make access to fibre a vital element of 5G rollout.

Administrations need to implement policies that encourage fibre roll-out through several initiatives such as:

- Promote national fiber backbone expansion
- Encourage open-access wholesale networks
- Facilitate access to ducts and rights-of-way
- Support development of local and Regional Internet Exchange Points (IXPs)
- Deployment of sufficient international bandwidth required for 5G services
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2.3.3 Infrastructure sharing

Infrastructure sharing is a critical enabler of cost-effective and rapid 5G deployment, particularly in WATRA Member States where duplicative infrastructure is economically inefficient.

Broadly speaking, infrastructure sharing can be broken into two categories - passive and active. Passive sharing is usually defined as the sharing of space or physical supporting infrastructure that does not require active operational coordination between network operators. Site and mast sharing are forms of passive sharing. Active sharing is where operators share a Radio Access Network (RAN) or other active elements, such as in network roaming.

Regulatory and legal frameworks can impact the extent of infrastructure sharing. National Administrations may identify and tackle unnecessary barriers to infrastructure sharing and explore the potential for clearer and more robust framework for sharing, while preserving investment incentives to reduce the cost of capital needed for the rollout of 5G.

Administrations are encouraged to incentivize the sharing of towers, masts, sites, power infrastructure and ducts. This can be done through:

- Reduced fees
- Offering tax incentives
- Streamlined approvals
- Using Universal Service Funds for shared infrastructure
- Ensuring open access to publicly funded networks
- Establishing transparent Service Level Agreements (SLAs) and dispute resolution mechanisms

Infrastructure Sharing for Landlocked Countries

Landlocked countries face unique structural challenges, including higher international connectivity costs and dependence on neighbouring countries for access to submarine cables.

To address these challenges, the following measures are recommended:

- Development of regional fibre corridors connecting landlocked countries to multiple submarine cable landing points

- Promotion of shared national backbone networks to ensure fair and affordable access to capacity
- Establishment of multiple cross-border routes to improve resilience
- Regional coordination to reduce transit costs and improve pricing transparency

2.3.4 Fit for purpose regulations

The speed of technological progress means that a flexible regulatory framework is needed to keep pace with developments and innovations. Governments need to create regulatory frameworks that accelerate investment in infrastructure and helps to create opportunities for the development of 5G.
Some recommendations include:

- Simplify licensing regimes
- Encourage technology neutrality
- Support innovation and new business models

2.3.5 Planning regulations

Planning regulations are a key factor influencing a network infrastructure provider's ability to expand its network, as they govern where sites can be built and the physical appearance of the equipment that can be installed on such sites.

The meet the requirements of 5G networks, deployment will require a significant increase in the number of small radio cells. Therefore, flexible and fit for purpose planning regulations will be required to support the deployment of 5G networks.

Governments might have to introduce planning reforms which may include a significant relaxation of restrictions on the siting and installation of small cells that will support both 4G and future 5G rollout.

2.3.6 5G security systems

The expanded role of 5G in supporting critical infrastructure increases the potential for systemic impact of cyber threats.

Recommendations to mitigate these threats to 5G networks should be situated in the broader National Cybersecurity framework.

2.3.7 Spectrum Policy

The main frequency bands for 5G are generally categorized into three groups based on coverage, capacity, and performance characteristics.

Low-band spectrum (typically below 1 GHz, such as the 600 MHz and 700 MHz bands) provides wide geographic coverage and strong indoor penetration, making it well suited for rural and nationwide deployments.

Mid-band spectrum (approximately 1 GHz to 6 GHz, including the globally prioritized 3.3–3.8 GHz range identified by the International Telecommunication Union for International Mobile Telecommunications) offers a balance between coverage and capacity and is widely considered the primary band for early 5G rollouts.

High-band spectrum, commonly referred to as millimetre wave (mmWave) and typically above 24 GHz (e.g., 26 GHz and 28 GHz bands), delivers extremely high data speeds and ultra-low latency but over much shorter distances, requiring dense network deployment. Together, these bands enable 5G to support enhanced mobile broadband, massive device connectivity, and ultra-reliable low-latency communications across diverse deployment scenarios.

Administrations are encouraged to:

- Make available at least 80-100 MHz of contiguous spectrum per MNO in mid-bands for the first wave of 5G deployment.
- Ensure reasonable pricing

- Consider flexible payment models
- Promote regional harmonization
- Consider spectrum sharing and refarming
- Promote harmonizing spectrum bands regionally among Member States
- Ensuring transparent and predictable assignment processes;
- Harmonizing spectrum bands regionally among Member States.

3 Implementation Roadmap

It is recommended that countries seeking to implement 5G proceed in a phased approach.

In the **short term (0–2 years)**, priority actions include spectrum assignment and policy reform, pilot 5G deployments, infrastructure mapping, and the establishment of enabling frameworks for passive infrastructure sharing.

In the **medium term (2–5 years)**, efforts should focus on expanding fibre networks, promoting active infrastructure sharing, scaling urban deployments, and strengthening cross-border connectivity.

In the **long term (5+ years)**, the focus should shift towards transitioning to standalone 5G networks, enabling advanced use cases, and developing integrated smart infrastructure ecosystems.

Administrations should assess their readiness for 5G deployment by evaluating key enablers, including the availability and affordability of spectrum, the existence of effective infrastructure sharing frameworks, the adequacy of fibre infrastructure, the extent to which planning and permitting regulations facilitate network deployment, and the presence of cross-border coordination agreements.

4 Conclusion

5G presents a significant opportunity for WATRA Member States to accelerate digital transformation, enhance competitiveness, and drive economic growth. However, successful deployment will depend on strong regulatory leadership, effective regional coordination, investment-friendly policies, and innovative infrastructure strategies. A proactive and harmonised approach will be essential to ensure that the benefits of 5G are widely realised across all Member States, including those facing structural constraints such as landlocked geography.

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