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30 May 2025

RE: Public Consultation on Draft National Radio Frequency Plan 2025

Please find attached Qualcomm's comments on the Public Consultation on the Draft National Radio Frequency Plan issued by the Independent Communications Authority of South Africa.

Please feel free to contact me should you have any questions.

Kind regards,

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Formatted: English (South Africa)

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Qualcomm Inc. (Qualcomm) welcomes the opportunity to provide input to the Independent Communications Authority of South Africa (ICASA) on the Draft National Radio Frequency Plan (NRFP-25).

Qualcomm is the world's leading wireless technology innovator and the driving force behind the development, launch, and expansion of 5G. When we connected the phone to the internet, the mobile revolution was born. Today, our technologies serve as the foundation of the mobile ecosystem and are found in every 3G, 4G, and 5G smartphone. We are bringing the benefits of mobile to new industries, including automotive, the internet of things (IoT), and compute, and are creating a world where everything and everyone communicates and interacts seamlessly. Qualcomm's Wi-Fi solutions build on our world-class engineering capabilities to provide highly reliable multi-gigabit connectivity to users and devices in homes, businesses, libraries, and on school campuses. Today, we are laser-focused on advancing 5G, developing 6G, and continuing to improve Wi-Fi connectivity.

The remainder of this submission presents information on Qualcomm's views on the content of the Draft NRFP-25.

1 General comments

Qualcomm supports ICASA's development and planned publication of a revised Draft National Radio Frequency Plan, taking into account the outcomes of the 2023 World Radiocommunication Conference (WRC-23) as reflected in the 2024 edition of the International Telecommunication Union (ITU) Radio Regulations. These updates ensure that South Africa's spectrum use is harmonized with internationally and regionally agreed uses, creating the optimal conditions for maximizing the value of this critical national resource for all types of spectrum users.

In particular, Qualcomm continues to support policies and regulations that enable the deployment of both Wi-Fi and mobile devices in the 6 GHz band and IMT devices in mid-band spectrum. Specifically, we support South Africa's adoption of allocations that enable the operation of radio local access networks (RLANs) in the 5925-6425 MHz range as well as International Mobile Telecommunications (IMT) systems in the C band and the 6425-7125 MHz range, with potential for future expansion of the upper mid-band spectrum in 7/8 GHz.

2 Comments on specific frequency ranges

2.1 Lower 6 GHz band (5925-6425 MHz)

The 5925-6425 MHz band, also known as the lower 6 GHz band, is particularly important due to growing demand for wireless internet access, the need to facilitate the deployment of new networks, and promoting the efficient use of internet access technologies. Global demand for connectivity continues to grow, especially driven by the rapid rise in the number of users working, learning, and consuming entertainment from home. Qualcomm continues to support policies and regulations that enable and promote Wi-Fi in the 6 GHz band, noting that the availability of a new allocation of wide and contiguous mid-band spectrum is critical to meet demands for license-exempt wireless access systems (WAS)/RLAN technologies, including Wi-Fi 6E.

Qualcomm applauds South Africa for taking an important step in helping to meet the rising demand in connectivity by amending the Radio Frequency Spectrum Regulations, 2015 to make the lower 6 GHz band

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available for WAS/RLAN technologies, including low power indoor (LPI) and very low power (VLP) RLAN, on a license-exempt basis, and now by noting this update in the Draft NRFP-25. Expanding the spectrum available for Wi-Fi will enable increased capacity for local-area networks that deliver an increasing percentage of traffic to users' mobile devices. The 2.4 GHz and 5 GHz bands used globally for Wi-Fi have become increasingly congested due to their popularity and ease of use. Unencumbered 6 GHz spectrum occupied only by efficient Wi-Fi 6 – and soon, Wi-Fi 7 – traffic designed to deliver significant reductions in latency will not only add capacity but will increase responsiveness for latency-sensitive applications.

The actions being taken to enable the use of Wi-Fi 6 and Wi-Fi 7 devices in the lower 6 GHz band will allow users across South Africa to enjoy high-speed connectivity on a higher number of connected devices.

2.2 Upper 6 GHz band (6425-7125 MHz)

The upper 6 GHz band (6425-7125 MHz) is not only well-suited to the operation of IMT systems but is necessary for the continued growth of 5G and future 6G services. According to a July 2022 GSMA report, 5G networks require an average of 2 GHz of mid-band spectrum per market and without access to capacity in the 6 GHz band, mobile networks could become slower, more expensive, and cause higher carbon emissions.[1] There are active global efforts considering and enabling the use of the upper 6 GHz band for IMT use, including in countries in the European Union (EU), China, and India, including the late 2024 award of upper 6 GHz/lower 7 GHz band spectrum for use by IMT services in Hong Kong. Qualcomm encourages ICASA to prioritize the licensing of spectrum in the upper 6 GHz band for IMT use.

Wireless connectivity has become the backbone of global digital transformation. The relentless demand for wireless data will continue to reshape the connectivity landscape as we march toward 2030 and the dawn of 6G deployments. The proliferation of smartphones, Internet of Things (IoT) devices and connected vehicles — each supported by wireless broadband — has driven a massive surge in data consumption. It is expected that by 2030, global mobile data traffic will quadruple, reaching a staggering 465 exabytes per month, with a compound annual growth rate (CAGR) of 23%[2] from 2023. 6G deployments will be essential to meeting this surge in demand. This surge is going to be driven by enhanced video streaming quality, the rise of extended reality (XR), cloud gaming, and the increasing prevalence of AI-driven applications and services. AI is reshaping data flows, with global wide-area network (WAN) traffic projected to grow five to nine times from 2023 to 2033. By then, AI is estimated to account for 33% of all WAN traffic.[3]

The discussions at WRC-23 were vital in securing spectrum for emerging applications while ensuring the protection of incumbent services. It is now incumbent upon national regulators, including in South Africa, to integrate these international decisions into their national regulatory frameworks, thereby increasing spectrum availability for the wireless industry and all of the industries enabled by wireless connectivity.

As South Africa considers how best to enable and contribute to the development and deployment of 6G, it is important to get an early start. Spectrum planning takes time, and 6G standards are targeted for completion in 2030 – only about five years away. Qualcomm encourages ICASA to note that multiple spectrum bands are

[1] GSMA, 6 GHz in the 5G Era: Global Insights on 5925-7125 MHz, July 2022, https://www.gsma.com/connectivity-for-good/spectrum/wp-content/uploads/2022/07/6-GHz-in-the-5G-Era.pdf.
[2] GSMA. (2024). The Mobile Economy 2024, available at : https://www.gsma.com/solutions-and-impact/connectivity-for-good/mobile-economy/.
[3] Nokia. (2024). Global network traffic report, available at: https://onestore.nokia.com/asset/213660.

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currently being studied ahead of WRC-27 for possible IMT identification. Such forward-looking planning will ensure that South Africa's approach to 6G spectrum is harmonized in Region 1 and beyond, enabling rapid deployment of 6G technology.

2.3 C band (3600-3800 MHz)

Perhaps the most important challenge related to IMT is ensuring that adequate spectrum is available. South Africa will need to continue to make spectrum available across various bands to enable the full realization of 5G's benefits. WRC-23 made significant strides in supporting the expansion of mobile broadband, identifying new harmonized spectrum for IMT. These identifications will facilitate the continued deployment of 5G and pave the way for the implementation of 6G. Qualcomm supports the updates to the Radio Regulations and the Draft NRFP-25 that support the use of the 3600-3800 MHz range for IMT services. The addition of a primary allocation for the Mobile service (except aeronautical mobile) and an IMT identification will further enable the deployment of 5G services in South Africa and elsewhere in Region 1.

Mid-band frequencies, including the C band, are crucial for 5G coverage and capacity. The addition of a primary mobile allocation and IMT identification for the 3600-3800 MHz band in the Draft NRFP-25 will provide operators and users with additional mid-band spectrum resources, expanding C-band capacity for the delivery of high-speed, ultra-reliable connectivity. These changes are aligned with a mature global device ecosystem. According to the Global Suppliers Association (GSA), the largest ecosystems of announced 5G devices are in 3GPP bands n78 (3300-3800 MHz), n41 (2496-2690 MHz), n1 (2100 MHz), and n77 (3300-4200 MHz), in that order respectively.[4]

Qualcomm encourages ICASA to enable access to the 3600-3800 MHz range at the earliest possible opportunity, facilitating increased capacity and connectivity for South African operators and users.

2.4 Upper mid-band (7125-8400 MHz)

In addition to the changes in the 3600-3800 MHz range, WRC-23 approved a new item (WRC-27 agenda item 1.7) calling for studies on new frequency bands for IMT, a crucial step towards the development of 6G technologies. WRC-27 agenda item 1.7 will consider studies on sharing and compatibility and develop technical conditions for the possible use of IMT in certain bands, including 7125-8400 MHz (the 7/8 GHz band). This will be an important band for 6G services, in conjunction with the upper 6 GHz spectrum range. Upper mid-band spectrum such as the 7/8 GHz band has been widely identified for 6G consideration and can support wide-area coverage as well as high capacity, enabled by Qualcomm's innovations that will underpin 6G technology.

Qualcomm particularly emphasizes the importance of enabling IMT deployment in the 7125-8400 MHz range, as this range is the natural extension of the upper 6 GHz band – which should be allocated for IMT as soon as possible. The upper 6 GHz band and 7/8 GHz band will be critical to support 6G mobile broadband, improve connectivity for smart cities, and support advanced applications. Qualcomm is carefully following and participating in these ITU discussions. In particular, the identification of the 7/8 GHz band for IMT, combined with the adjacent upper 6 GHz band, would create an important contiguous block of the mid-band spectrum that is crucial for enabling high-quality mobile broadband in South Africa and beyond. We recommend that

[4] GSA, Mid-Band Spectrum, December 2024, https://gsacom.com/download.php?id=18910.

ICASA begin studying the mechanisms to make this band available (in parallel with the ongoing ITU studies) in the long term and also note in the Draft NRFP-25 that such studies are underway.

As published by the ITU in Recommendation ITU-R M.2160 on the framework for IMT-2030 (or 6G), the next generation of IMT is expected to support enriched and potential immersive experience, enhanced ubiquitous coverage, and enable new forms of collaboration. In addition, IMT-2030 is envisaged to support expanded and new usage scenarios compared to those of IMT-2020, while providing enhanced and new capabilities.

In alignment with the ITU conclusions, the upper mid-band range combines the wide-area coverage of bands below 5 GHz with the greater throughputs of millimeter wave (mmWave) bands. Potential use cases will be more capacity for wide-area broadband, expanded use of extended reality (XR), and support for high-resolution radio frequency (RF) sensing. These use cases will provide additional benefits to smartphone users in the mass market, enhance smart cities and automotive connectivity, and improve support of industry verticals.

Qualcomm encourages ICASA's participation in international fora, including activities in ITU-R study groups leading up to and including WRC-27, to ensure early alignment and harmonization of future 6G bands, including the 7125–8400 MHz band.

As South Africa considers its plans for enabling the successful deployment of 6G services, consideration of international and regional developments and domestic use will be important inputs into the planning process. Qualcomm would be pleased to engage with ICASA to provide compatibility study updates, as appropriate, and relevant technical information as a contribution into the South African WRC-27 preparation process.

3 Comments on references to external instruments

Recognizing that instruments referenced in the Draft NRFP-25, such as ITU-R recommendations, are subject to periodic revision, Qualcomm recommends that ICASA refer to the latest version of such documents rather than specific versions. For example, the Draft NRFP-25 has multiple references to Recommendation ITU-R M.1036, which addresses frequency arrangements for the terrestrial component of IMT. At present, these references include mentions of Recommendation ITU-R M.1036-6, which was replaced by Recommendation ITU-R M.1036-7 in December 2023, and M.1036-8, which has not yet been adopted by ITU-R Study Group 5.

By comparison, the Draft NRFP-25 refers to Recommendation ITU-R F.748 "latest version" in ranges between 24.25 GHz and 29.5 GHz. This approach ensures that South Africa's NRFP always refers to the current version of the referenced instrument and eliminates the need to revise multiple references each time the NRFP is updated. Qualcomm suggests that ICASA employ a similar approach for references to Recommendation ITU-R M.1036 and other external resources, except in cases where there is a particular need to refer to a specific version.]

4 Conclusion

Qualcomm welcomes the opportunity to convey our views to ICASA regarding the Draft NRFP-25 and look forward to continuing engagement with ICASA on the issues raised in this and future consultations.

Should you have any questions or comments on this submission, please do not hesitate to contact me at +27 82 616 3604 or emigwall@qualcomm.com.

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