Feasibility Study

6425 MHz to 7125 MHz

1 Glossary of Terms, Abbreviations, and Acronyms

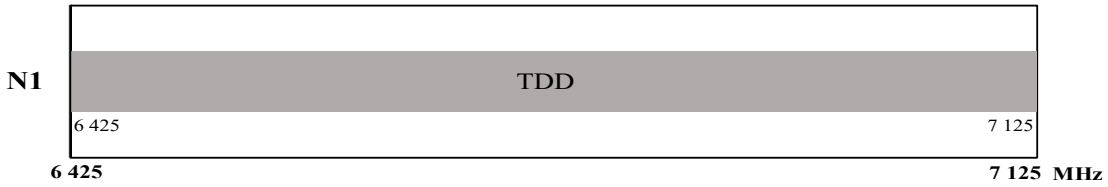
Acronym	**Explanation**
3G	Third generation mobile telecommunications is a generation of standards for mobile phones and mobile telecommunication relating to the ITU-R IMT-2000 specifications.
4G	Fourth Generation Network Technology relating to ITU-R IMT-Advanced specifications.
5G	Fifth Generation Network Technology, relating to the ITU-R IMT-2020 specifications.
6G	Sixth Generation Network Technology, relating to the ITU-R IMT-2030 specifications.
Act	Electronic Communications Act, 2005 (Act No. 36 of 2005).
AAS	Active antennae systems.
Administration	Members States of the International Telecommunications Union.
Allocation	Entry in the Table of Frequency Allocations of a given frequency band for the purpose of its use by one or more terrestrial or space *radiocommunication services* or the *radio astronomy service* under specified conditions.
Assignment	The authorisation given by the authority to a licensee to use a radio frequency or radio frequency channel under specified conditions.
ATU	African Telecommunications Union.
Authority	The Independent Communications Authority of South Africa.
BFWA	Broadband Fixed Wireless Access.
CEPT	Conference of European Posts and Telecommunications Authorities.
CRASA	Communications Regulators' Association of Southern Africa.
DC-MSS-IMT	Direct Connectivity between Mobile-Satellite Service space station and IMT UEs.
DECT	Digital Enhanced Cordless Telecommunications 1880 - 1900 MHz which is a digital communication standard, primarily used for creating cordless phone systems.
ECA	The Electronic Communications Act of South Africa, Act No 36 of 2005.
EIRP	Effective isotropically radiated power.
ERP	Effective radiated power, which is the product of the power supplied to an antenna and its gain relative to a half wave dipole in a given direction.
FDD	Frequency Division Duplex.
FWA	Fixed Wireless Access.
FS	Fixed Service.
FSS	Fixed Satellite Service.
Gbps	Gigabits per second.
GHz	Gigahertz of Radio Frequency Spectrum.
GSM	Global System for Mobile Communications, (originally Groupe Spécial Mobile), and is a standard set developed by the European Telecommunications Standards Institute (ETSI) to describe technologies for second generation (2G) digital cellular networks.
GSMA	Global System for Mobile Communications Association.
IMT	The name that encompasses IMT-2000, IMT-Advanced, IMT-2020 and IMT-2030 collectively known as International Mobile Telecommunications.
IMT-2000	The International Mobile Telecommunications, as envisioned in ITU-R Recommendation ITU-R M.687 and M.816.
IMT-Advanced	The International Mobile Telecommunications, as envisioned in Recommendation ITU-R M.1645.
IMT-2020	The International Mobile Telecommunications, as envisioned in Recommendation ITU-R M.2083.

Acronym	Explanation
IMT-2030	The International Mobile Telecommunications, as envisioned in Recommendation ITU-R M.2160.
IoT	Internet of Things.
ITU	International Telecommunication Union.
ITU RR	International Telecommunication Union Radio Regulations.
kHz	Kilohertz of Radio Frequency Spectrum.
LTE	Long Term Evolution and is a standard for wireless communication of high-speed data for mobile phones and data terminals. It is based on the GSM/EDGE and UMTS/HSPA network technologies.
M2M	Machine to Machine.
MHz	Megahertz of Radio Frequency Spectrum.
MIMO	Multiple-Input and Multiple-Output and is the use of multiple antennas at both the transmitter and receiver to improve communication performance.
NRFP	The National Radio Frequency Plan for South Africa.
NTN	Non-terrestrial Network
PMSE	Programme making and special events applications (PMSE)
PRASA	Passenger Rail Agency of South Africa.
PTM	Point to Multipoint.
PTP	Point to Point.
Radio-communication	All electronic communication by means of radio waves.
RATG	Radio Access Technology Group.
Revocation Period	A period of transition during which incumbent users are migrated out of the band in question to clear sufficient spectrum for new service providers.
RFSAP	Radio Frequency Spectrum Assignment Plan.
RLAN	Radio Local Access Network and is the high data rate two-way (duplex) wireless data communications network.
SABRE	South African Band Re-Planning Exercise.
SADC	Southern African Development Community.
SADC RFSAP	Southern African Development Community Frequency Allocation Plan.
SAPS	South African Police Service.
Service licence	BS, ECS or ECNS licence.
SF	Single Frequency.
SFN	Single Frequency Network.
TDD	Time Division Duplex.
VSAT	Very small aperture terminal used for fixed satellite services.
WAS	Wireless Access Systems and is end-user radio connections to public or private core networks.

2 Introduction

2.1 The frequency range 6425-7125MHz has a TDD band plan (N1). The frequency arrangement is shown below on Figure 4. The band is used for FS and FSS. This band is considered to be "*key mid-band spectrum for 5G expansion*" in Africa.[37]

Figure 4: Frequency arrangements between 6425MHz-7125MHz



Source: ITU WG5D

3 Regulatory context

3.1 The ITU has identified this band for IMT. The NRFP for this band has primary allocations for FS, FSS, and mobile services.

4 Economic feasibility

4.1 It is likely that the highest value use for this band is a combination of outdoor IMT services and FSS and FS links being deployed on a coordinated basis.

4.2 Auction results in Hong Kong[38] suggest that the band is highly valued for IMT. Specifically, 300 MHz of spectrum in the 6570-7025 MHz range were awarded to three licensees during the 2024 auction, with an approximate value of R50.25 million per 10 MHz (expressed in 2025 Rands).[39]

4.3 In order to provide an indicative valuation of assigning the band to IMT, 500MHz of mid-band spectrum was added to the Authority's call termination rate cost model.[40] This

[37] See Miller et al. 2021, available at: https://www.gsma.com/connectivity-for-good/spectrum/wp-content/uploads/2023/07/Sub-Saharan-Africa-Roadmaps-for-5G-Spectrum.pdf

[38] See Hong Kong Office of Communications Authority Auction of Radio Spectrum in the 6/7 GHz Band for the Provision of Public Mobile Services: Successful Bidder Notice, available at: https://www.ofca.gov.hk/en/news_info/press_releases/index_id_2365.html

[39] In Hong Kong's 2024 auction, 300 MHz of spectrum were awarded for the value of HK$21 000 000 per 10MHz. This figure is converted to 2024 Rands using an exchange rate of HK$0.4314/R and subsequently inflated to 2025 Rands. For exchange rate data, see: https://www.resbank.co.za/en/home/what-we-do/statistics/key-statistics/selected-historical-rates ; for CPI data see: https://www.statssa.gov.za/publications/P0141/CPIHistory.pdf

[40] See https://www.icasa.org.za/legislation-and-regulations/bu-mobile-cost-model-v6-2

resulted in additional TDD spectrum being used by the hypothetical mobile network operator, which is able to avoid costs of approximately R2.3bn. This would result in avoided costs of almost R7bn if awarded to three operators. This suggests that this spectrum is highly valued for IMT.

4.4 The band is thus highly valued for IMT services.

5 Technical feasibility

5.1 The use of this band for IMT may not come at the expense of migration of all other services (FS in the entire band, and FSS in the band 6425-7075MHz), given the opportunities for coordination and coexistence. In particular, the ITU has drafted a document that provides guidance on coordination between FS and IMT stations.[41] The ITU has also identified measures that can be implemented to mitigate interference in related bands.[42] Techniques that can be implemented include:

5.1.1 Sector pointing to reduce emission power towards FSS earth station;

5.1.2 Multiple input, multiple output ("MIMO") technique;

5.1.3 Antenna downtilting;

5.1.4 Low/medium power networks for local coverage;

5.1.5 Filtering of unwanted emissions of IMT transmitting stations;

5.1.6 Inter-service frequency separation; and

5.1.7 Distance-based mitigation.

5.2 The ITU also suggests the compilation of a registry of all FSS earth stations to gather information regarding geographical location and radio frequency allocations. This will ensure that regulators are aware of incumbent users and can implement appropriate coordination strategies[43]. The Global Satellite Operators' Association supports this recommendation.[44]

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[41] See ITU Radiocommunication Study Groups. 2025. Guidance for national and bilateral coordination of stations in the fixed service with IMT stations in the frequency band 6 425-7 125 MHz. Document 5/88-E

[42] See ITU Radiocommunication Study Groups. 2024. Mitigation measures between FSS and IMT in the frequency band 3 400-3 600 MHz. Document 4/28-E, available at: https://www.itu.int/dms_pub/itu-r/opb/rep/R-REP-S.2546-2025-PDF-E.pdf

[43] See ITU Radiocommunication Study Groups. 2024. Mitigation measures between FSS and IMT in the frequency band 3 400-3 600 MHz. Document 4/28-E, available at: https://www.itu.int/dms_pub/itu-r/opb/rep/R-REP-S.2546-2025-PDF-E.pdf

[44] See GSOA Adjacent band sharing 5G and FSS receiving stations in C-band, available at: https://www.icasa.org.za/uploads/files/GSOA-supplementary-submission-on-Draft-Consultation-Document-on-Spectrum-Outlook.pdf

5.3 Alternatively, incumbent users may be migrated from the band to allocate more spectrum to IMT.

6 Maturity of the IMT ecosystem

6.1 The device ecosystem is limited. There are no devices that support this band.[45]

7 International considerations

7.1 The band 6425-7125MHz was identified for IMT at WRC-23 (Resolution 220). The allocation of the band for IMT was also the African common proposal to WRC-23 in relation to allocation to mobile and identification for IMT.

8 Stakeholder comments

8.1 Refer to Table 4 for a summary of stakeholders' comments on the Draft IMT Roadmap 2024, Second Draft IMT Roadmap 2025, and Draft Radio Frequency Migration Plan 2024, alongside the Authority's response.

Table 4: Stakeholder comments and the Authority's responses for the 6425 – 7125 MHz band

Stakeholder comments	Authority's comment
Huawei, Telkom, Cell C, Qualcomm, and MTN support the allocation of this band for IMT. Vodacom supports the feasibility study yet recommends a consultative process before the migration of existing incumbents. MTN and Vodacom also explain that this is a key capacity expansion band for IMT services. MTN explains that the large and contiguous nature of the block means that it is valuable for IMT, suggesting that large blocks of 200MHz may be needed by mobile network operators in future. Huawei comments on a range of countries that are in the process of allocating either the entire band or the bulk of it to IMT.	The Authority is in the process of developing an RFSAP for IMT services in this band given that it has been identified for IMT in WRC-23.
Huawei supports a feasibility study regarding the coexistence and migration frameworks for fixed services.	The Authority will consider how coexistence / shared use of the band could be included in the RFSAP. See Section 5. Stakeholders are encouraged to share further comment in this regard.
MTN encourages the development of a migration plan for incumbent FS links, taking into account equipment life and alternative spectrum allocations. Telkom cites studies indicating not all FS links will need to be migrated, as these could coexist with IMT in rural areas. Vodacom comments that a feasibility needs to be carried out on how microwave assignments in 6GHz and lower 7GHz can be migrated to suitable alternatives sub-8GHz that achieve similar throughputs and distances.	
Viasat has previously expressed, in its response to the Draft Radio Frequency Migration Plan 2024, that it does not support the deployment of this band for IMT due to its current use for	

[45] See ATU-R recommendation relating to International Mobile Telecommunications (IMT) Spectrum Roadmap For Africa. 2025, available at: https://atuuat.africa/wp-content/uploads/2025/08/Project-4-IMT-Spectrum-Roadmap-for-Africa-Final.pdf

Stakeholder comments	Authority's comment
mobile satellite services.	
The Dynamic Spectrum Alliance (DSA) previously disputed, in its response to the Draft Radio Frequency Migration Plan 2024, that the WRC-23 has allocated the use of this band for IMT on a primary basis, citing that as per WRC-23, identification for IMT should not take preference over the current allocation of the band to RLAN/WAS. The DSA further urged that the band should be used for RLAN/WAS to avoid migration costs. Similarly, the Wireless Access Providers' Association of South Africa (WAPA) suggests that despite the identification by WRC-23, this band is not suitable for IMT, citing the lack of device ecosystem. WAPA further suggests that IMT allocation will unavoidably result in interference for incumbents. WAPA further notes that 25% of the spectrum available in the band was unsold in the Hong Kong auction, and the assignment process in Brazil has been delayed. The Wi-Fi Alliance (WFA) previously proposed using the band for RLAN/WAS, in its response to the 2024 Draft Radio Frequency Migration Plan. The WFA reiterated the high costs involved in an unavoidable migration process should the band be deployed for IMT. The WFA further cited the advantages of the use of this band by RLAN/WAS, such as the support of over 296 million devices that will be introduced to the Wi-Fi 7 market in 2024. The performance of Wi-Fi 7, as per the WFA, would be reduced substantively without access to the entire band. However, Telkom does not support the use of this band for RLAN/WAS systems, since coordination is not possible between IMT and RLAN/WAS in the same area, and permitting RLAN/WAS will thus negatively impact on the valuation of spectrum for IMT. Similarly, Vodacom considers that there is a proliferation of RLAN/WAS devices that would make future use of IMT difficult in this band, and it is thus important for the Authority not to permit RLAN/WAS in the band. MTN adopts a similar position, setting out that coordination between IMT and RLAN/WAS is not feasible. Huawei suggests that while there are possibilities for shared use, this requires the deployment of sophisticated methods. Huawei also comments that the lower-6GHz band, already allocated to RLAN/WAS, is currently unlikely to be substantially used, and so it is unnecessary to expand the use of RLAN/WAS to the upper-GHz band too.	The Authority will not consider spectrum usage by RLAN/WAS systems as this band has been allocated to IMT on a primary basis in the NRFP.

9 Considerations in favour of and against IMT allocation

9.1 There are a number of advantages to allocating this band to IMT services:

9.1.1 The band has been identified for IMT use by the ITU and in the NRFP;

9.1.2 The band is likely of high value for IMT;

9.1.3 Shared use with incumbent users is technically feasible;

9.2 There are also several disadvantages:

9.2.1 The device ecosystem is limited;

9.2.2 There is a lack of regional harmonisation of this band;

9.2.3 While most IMT stakeholders consider the band suitable for IMT, some stakeholders do not.

9.3 Despite the limited device ecosystem and concern from incumbent stakeholders regarding alternative applications, it is evident from auction results in Hong Kong and the estimated avoided costs of using the band for IMT suggest that it is highly valued for IMT. The considerations in favour of the allocation of this band for IMT, therefore, outweigh those against doing so.