



Feasibility Study

45.5 GHz to 47 GHz

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 <i>radiocommunication services</i> or the <i>radio astronomy service</i> 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 arrangements for this band are set out in Section 12 of ITU-R M.1036-7. The frequency range 45.5-47GHz has a TDD band plan (K1), as shown on Figure 7. This band is suitable for IMT and falls under the mmWave frequency range. Uses of this band include mobile and radionavigation services.

Figure 7: Frequency arrangements between 45.5GHz-47GHz

GHz	45.5	47
K1		
	TDD	
	45.5	47

M.1036-12

Source: ITU-R M.1036

3 Regulatory context

- 3.1 This band is allocated to mobile services on a primary basis in Region 1. It has been identified as a band for IMT in the NRFP.

4 Economic feasibility for IMT

- 4.1 The GSMA has indicated the potential use of this band for IMT following initial feasibility studies. However, no spectrum auctions have been held for IMT, and no licensees have been recorded for this band.
- 4.2 As is the case with other mmWave bands, the feasibility of IMT deployment is hindered by economic barriers and deployment costs.⁷⁵

5 Technical feasibility

- 5.1 The identification of this band for IMT does not preclude the application of other services within the band, nor does it give IMT services priority use of the band.⁷⁶ Incumbent users may pose an interference risk for IMT, and compatibility with adjacent bands must also be considered.

⁷⁵ See GSA. 2025. Hot Topic Millimetre Wave, available at: <https://gsacom.com/paper/millimetre-wave-spectrum-july-2025/>

⁷⁶ See WRC-19 Footnote 5.553A.

6 Maturity of the IMT ecosystem

- 6.1 The device ecosystem is limited at present. There are no devices that are compatible with this band.⁷⁷

7 International considerations

- 7.1 The ITU has identified the band for IMT use and the GSMA supports the consideration of this band for IMT following initial feasibility studies.⁷⁸

8 Stakeholder comments

- 8.1 Table 7 below 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 7: Stakeholder comments and the Authority's responses for the 45.5 – 47 GHz band

Stakeholder comments	Authority's comment
Cell C and Vodacom support the allocation of this band for IMT, following the development of a feasibility study and RFSAP. Telkom supports RFSAP development for this band, however, notes that this band is of lesser priority in terms of licensing than the 26 GHz and 40 GHz bands. Telkom also proposes that in fact no feasibility study is needed for this band because it is either unused, or there is minimal use of it currently.	The Authority is in the process of developing an RFSAP for this band given that it has been recommended for IMT in WRC-23. While the band may be unused, part of the reason for preparing this feasibility study is to solicit feedback from stakeholders on the use or otherwise of the band.

9 Considerations for and against IMT allocation

- 9.1 The ITU has identified the band for IMT, and the band has been allocated to IMT in the NRFP.
- 9.2 However, the device ecosystem is limited.
- 9.3 The advantages arising from the ITU's identification and the NRFP's proposal to allocate the band to IMT, outweigh the limited device ecosystem, since the latter may develop in the coming years given the identification of the band for IMT. The band should therefore be allocated for IMT.

⁷⁷ 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>

⁷⁸ See GSMA. 2018. IMT Spectrum Between 24.25 and 86 GHz GSMA Public Policy Position. 2018, available at: <https://www.gsma.com/connectivity-for-good/spectrum/wp-content/uploads/2018/12/AI-1.13-Positions.pdf>