



27 July 2021

**Vodacom's Submission on ICASA request for comments regarding
DRAFT NATIONAL RADIO FREQUENCY PLAN 2021 FOR PUBLIC CONSULTATION
(NRFP-21) 8.3 kHz – 3000 GHz; ICASA NOTICE 403 OF 2021, gazette no. 44803 published on
9 July 2021.**



1. Introduction

Vodacom Pty Ltd (“Vodacom”) wishes to thank the Authority for the opportunity to make submissions in regard to its review of the NATIONAL RADIO FREQUENCY PLAN 2021 (NRFP-21), 8.3 kHz – 3000 GHz; ICASA NOTICE 403 OF 2021, gazette no. 44803 published on 9 July 2021, (the “Regulations”).

Vodacom looks forward to participating in the industry-wide public hearings that will be held within 7th – 9th September 2021 and any other further engagements the authority may wish to have regarding the aforementioned regulations.

2. General Comments

Vodacom is encouraged by the movement in recent years to expand the allocation of IMT Mobile spectrum in line with the exponential growth in global demand for these services. The approach followed by the Authority appears, in principle, to be one that is support of growth of the South African ICT industry, as well as being supportive of local consumer demand. We support the Authority’s view that “*The pattern of radio use is not static as it is continuously evolving to reflect the many changes that are taking place in the radio environment, particularly in the field of technology*”.

In the spirit of moving our society forward together, Vodacom has set out comments in the remainder of this document to support the Authority’s ambition as stated above. In particular, we draw the Authority’s attention to the following themes:

1. The demand of IMT mobile services is unprecedented, and needs to be supported. There is a clear shortage of spectrum available for licensing to satisfy current needs. Where the Authority has confirmed an allocation for IMT, it needs to expedite the licensing process.
2. To make way for new technologies and services that are in greater demand, legacy services need to be migrated more expeditiously out of their respective bands. This is particularly true for small-scale legacy services that inhibit the growth of other services that satisfy a far greater need, such as that provided by IMT Mobile.
3. In cases where sole PRIMARY allocation of IMT Mobile is not possible, there are IMT Mobile use cases that support a co-ordinated or secondary allocation of IMT Mobile, without material risk of interference to other PRIMARY services.

In considering comments from the industry, Vodacom recommends that the Authority consider both short-term, as well as long-term needs of South Africa as it makes its interventions. We re-iterate our offer to assist the Authority further as it embarks on the finalisation of the 2021 Draft National Radio Frequency Plan.



3. Specific Comments

450-470MHz Range

1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
450-455 MHz FIXED MOBILE 5.286AA	450-450.25 MHz FIXED MOBILE 5.286AA NF9 SPACE OPERATION (Earth-to-space)	Fixed links (450 – 453 MHz) (International Mobile Telecommunications (IMT)) Government Services	Resolution 224 (Rev WRC-19)
5.209 5.271 5.286 5.286A 5.286B 5.286C 5.286D 5.286E	SPACE RESEARCH (Earth-to-space) 5.209 5.286 5.286A 5.286B 5.286C 450.25-455 MHz FIXED MOBILE 5.286AA NF9	Fixed links (450 – 453 MHz) Single Frequency Mobile (453 – 454 MHz) Government Services Paging (454 – 454.425 MHz) Trunked Mobile BTX (454.425 – 460 MHz) IMT450 (450 – 470 MHz) Fixed links (PTP) IMT (450-470 MHz) PMR and/or PAMR (International Mobile Telecommunications (IMT))	Paired with 460 – 463 MHz Recommendation ITU-R M.1036-6 Paired with 464.425 – 470 MHz This band is currently used for a variety of fixed and mobile systems in the various SADC countries. This band is also identified for IMT (Res.224 applies). Resolution 224 (Rev WRC-19)
455-456 MHz FIXED MOBILE 5.286AA	455-456 MHz FIXED MOBILE 5.286AA NF9	Trunked mobile BTX (454.425 – 460 MHz) IMT450 (450 – 470 MHz) Government Services	Paired with 464.425 – 470 MHz Recommendation ITU-R M.1036-6 Resolution 224 (Rev WRC-19)
5.209 5.271 5.286A 5.286B 5.286C 5.286E	5.209 5.286A 5.286B 5.286C	(International Mobile Telecommunications (IMT))	
456-459 MHz FIXED MOBILE 5.286AA	456-459 MHz FIXED MOBILE 5.286AA NF9	Trunked mobile BTX (454.425 – 460 MHz) IMT450 (450 – 470 MHz) Government Services	Paired with 464.425 – 470 MHz Recommendation ITU-R M.1036-6



5.271 5.287 5.288	5.287	(International Mobile Telecommunications (IMT))	Resolution 224 (Rev WRC-19)
459-460 MHz FIXED MOBILE 5.286AA 5.209 5.271 5.286A 5.286B 5.286C 5.286E	459-460 MHz FIXED MOBILE 5.286AA NF9 5.209 5.271 5.286A 5.286B 5.286C	Trunked Mobile BTX 454.425 – 460 MHz IMT450 (450 – 470 MHz) Government Services (International Mobile Telecommunications (IMT))	Paired with 464.425 – 470 MHz Radio Frequency Spectrum Assignment Plan (GG N. 38640) as amended 30 March 2015 Recommendation ITU-R M.1036-6 Resolution 224 (Rev WRC-19)
460-470 MHz FIXED MOBILE 5.286AA	460-470 MHz FIXED MOBILE 5.286AA NF9	Fixed Links (460 – 463 MHz) Single Frequency Mobile (463.025 – 463.975 MHz) Low Power Mobile Radio (463.975 MHz, 464.125 MHz, 464.175 MHz, 464.325 MHz, 464.375 MHz)	Paired with 450 – 453 MHz Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015). Recommendation ITU-R M.1036-6

Vodacom Comments:

The 2021 National Radio Frequency Plan (NRFP) allocates 450 MHz to 470 MHz to International Mobile Telecommunications (IMT) MOBILE and FIXED on a co-primary basis. While the band was identified for IMT, it does not preclude the use of this band for any other services or applications¹. However, the IMT Roadmap 2019² stated that the current licensees will be migrated out of the band by 2021 with deployment of IMT450 to commence within the same year.

Given the growing need for rural IMT MOBILE coverage, as well as the demand for deep in-building coverage for M2M applications, Vodacom requests that this band be allocated only to IMT MOBILE on a primary basis, and to fixed services on a secondary basis. This will allow Transnet to migrate out of the band by 2022², after which time the band can be allocated for IMT MOBILE only.

According to the Global Mobile Suppliers Association (GSA)³, there are currently 14 operators who are investing in 450 MHz with at least 10 of them launching commercial LTE networks in this band. This includes countries in the Nordic region, Russia and the Philippines.

There are currently 3 3GPP (3rd Generation Partnership Project) bands that lie within the IMT450 range, namely B31, B72 and B73, with a mature ecosystem consisting of a total of 190 devices according to GSA⁴ (B31 with 190 devices, B72 with 34 devices and B73 with 3 devices). Each band has a maximum of 2x5 MHz

¹ Resolution 224 Rev.WRC-19; NRFP 2021 Pg. 294 5.286AA

² Government Gazette No. 42361 of 2019 Pg. 131

³ <https://gsacom.com/paper/low-band-spectrum-for-lte-and-5g-may-2021/> Pg. 3

⁴ <https://gsacom.com/>



bandwidth and all three bands have not yet been standardized for 5G yet (as at Release 17). B31 seems to be the popular choice of deployment for IMT450 since it currently has the largest ecosystem of devices available.

Therefore, Vodacom recommends that ICASA harmonise the 450 MHz band to 3GPP B31 in finalising the IMT450 Radio Frequency Spectrum Assignment Plan (RFSAP).



470-694MHz Range

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
470-694 MHz BROADCASTING	470-606 MHz BROADCASTING	DTT Broadcasting (470-694 MHz) Radio Astronomy (606 – 614 MHz) SAP/SAB Applications	Broadcasting Allotments in accordance with GE89 and GE06. Broadcast assignments in accordance with the latest version of the Terrestrial Broadcasting Frequency Plan as amended (GG No.36321) 02 April 2013. Band IV/V Analogue television is to be migrated to digital television and ensure harmonisation with SADC. The use of ‘WhiteSpaces’ in this band is under consideration

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
5.149 5.291A 5.294 5.296 5.300 5.304 5.306 5.311A 5.312	Land mobile 5.149 5.311A 5.296 5.304 5.306	Applications ancillary to broadcasting and programme-making	(subject to Non Interference Non Protection basis to users under a primary allocation).470 - 606 MHz, max. 50 mW ERP 606 - 614 MHz, max. 50 mW ERP Radio Frequency Spectrum Assignment Plan, Government Gazette 43341 (Notice 284 of 2020)
	606-614 MHz BROADCASTING RADIO ASTRONOMY Land mobile 5.149 5.296 5.304 5.306	DTT Broadcasting (470-694 MHz) Radio Astronomy (606 – 614 MHz) SAP/SAB Applications Applications ancillary to broadcasting and programme-making	Broadcasting Allotments in accordance with GE89 and GE06. Broadcast assignments in accordance with the latest version of the Terrestrial Broadcasting Frequency Plan as amended (GG No.36321) 02 April 2013. Band IV/V Analogue television is to be migrated to digital television and ensure harmonisation with SADC. The use of ‘WhiteSpaces’ in this band is under consideration (subject to Non Interference Non Protection basis to users under a primary allocation).470 - 606 MHz, max. 50 mW ERP 606 - 614 MHz, max. 50 mW ERP

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
			Radio Frequency Spectrum Assignment Plan, Government Gazette 43341 (Notice 284 of 2020)
	614-694 MHz		



	Land mobile 5.149 5.296 5.304 5.306	DTT Broadcasting (470-694 MHz) SAP/SAB Applications Applications ancillary to broadcasting and programme-making	Broadcasting Allotments in accordance with GE89 and GE06. Broadcast assignments in accordance with the latest version of the Terrestrial Broadcasting Frequency Plan as amended (GG No.36321) 02 April 2013. Band IV/V Analogue television is to be migrated to digital television and ensure harmonisation with SADC. The use of 'WhiteSpaces' in this band is under consideration (subject to Non Interference Non Protection basis to users under a primary allocation).470 - 606 MHz, max. 50 mW ERP 606 - 614 MHz, max. 50 mW ERP Radio Frequency Spectrum Assignment Plan, Government Gazette 43341 (Notice 284 of 2020)
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Vodacom Comments:

The UHF band will be reviewed at WRC-23 under agenda item 1.5⁵, with the expectation that additional spectrum could be allocated to IMT on a primary basis. The frequency range of 614-698 MHz, also known as the “digital dividend 3” lies within this range.

The band is well placed for improving rural coverage and capacity, as well as indoor penetration in urban and suburban areas. Indications are that countries such as Canada, Mexico, Peru, Hong-Kong and Saudi Arabia⁶ have allocated this range for IMT and are planning to auction it ahead of WRC-23 in order to accelerate digital inclusion of rural communities.

3GPP has already identified a band for this range, namely B71.

Respecting the rights of broadcasters, and the South African Broadcast TV migration plan, Vodacom would like to like to propose that the range of 614-698 MHz be allocated to IMT Mobile on a secondary basis. This will allow for co-ordinated deployment without interference to broadcasters, and in so doing provide additional benefit to South African consumers. Such a secondary assignment would also not negatively affect neighbouring states.

Once the DTT migration is completed in South Africa, Vodacom requests that the plan be considerate of the WRC-23 resolution regarding the 470-694 MHz range.

⁵ <https://www.gsma.com/spectrum/wp-content/uploads/2021/04/WRC-23-IMT-Agenda-Items.pdf>

⁶ <https://gsacom.com/paper/low-band-spectrum-for-lte-and-5g-may-2021/>



1427 MHz to 1518 MHz (L Band)

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
1 427-1 429 MHz SPACE OPERATION (Earth-to-space) FIXED MOBILE except aeronautical mobile 5.341A 5.341B 5.341C 5.338A 5.341	1 427-1 429 MHz SPACE OPERATION (Earth-to-space) FIXED NF14 MOBILE except aeronautical mobile 5.341A 5.341B 5.341C 5.338A 5.341	1 427-1 452 MHz Fixed links (duplex) (International Mobile Telecommunications (IMT))	Paired with 1 375 – 1 400 MHz In accordance with Recommendation ITU-R F.1242 ITU Res. 223 (Rev.WRC-15) Recommendation ITU-R M.1036-6
1 429-1 452 MHz FIXED MOBILE except aeronautical mobile 5.341A 5.338A 5.341 5.342	1 429-1 452 MHz FIXED MOBILE except aeronautical mobile 5.341A 5.338A 5.341	1 427-1 452 MHz Fixed links (duplex) (International Mobile Telecommunications (IMT))	Paired with 1 375 – 1 400 MHz) In accordance with Recommendation ITU-R F.1242 Recommendation ITU-R M.1036-6
1 452-1 492 MHz FIXED MOBILE except aeronautical mobile 5.346 BROADCASTING BROADCASTING-SATELLITE 5.208B 5.341 5.342 5.345	1 452-1 492 MHz FIXED NF14 MOBILE except aeronautical mobile 5.346 BROADCASTING BROADCASTING-SATELLITE 5.208B 5.341 5.345 NF12	(Sound)(digital audio) (Sound)(digital audio) (International Mobile Telecommunications (IMT))	studies called for Resolution 761 (WRC-15) on the “Compatibility of International Mobile Telecommunications and broadcasting-satellite service and take appropriate regulatory and technical studies, with a view to ensuring the compatibility of IMT and BSS (sound) are undertaken within the ITU-R ITU-R Res. 223 (Rev.WRC-15) Recommendation ITU-R M.1036-6 Digital Sound Broadcasting (DSB) Regulations was published in GG44469 Notice 215 of 2021 ITU-R Res. 223 (Rev.WRC-15)
1 492-1 518 MHz FIXED MOBILE except aeronautical mobile 5.341A 5.341 5.342	1 492-1 518 MHz FIXED MOBILE except aeronautical mobile 5.341A 5.341	Fixed Links (1 492 – 1 517 MHz) Single Frequency Links (1 517 – 1 525 MHz) (International Mobile Telecommunications (IMT))	Paired with 1 350 – 1 375 MHz In accordance with Recommendation ITU-R F.1242 ITU-R Res. 223 (Rev.WRC-15) (Sharing and Compatibility Studies called for by Resolution 223 (Rev. WRC-15) are underway within the ITU-R) Recommendation ITU-R M.1036-6

Vodacom Comments:

The 2021 NRFP allocates 1427 MHz to 1518 MHz to IMT MOBILE on a co-primary basis with several other applications, including SPACE OPERATION, FIXED, BROADCASTING and BROADCASTING-SATELLITE.

Vodacom sees the 1427 MHz to 1518 MHz band as a key band for IMT mobile usage going forward, as it will be able to provide better coverage and indoor penetration as compared to IMT1800, as well as additional capacity with 91 MHz bandwidth available. It also provides MNOs with flexibility in deployment, as it can be



deployed in a time division duplexing (TDD) or supplemental downlink (SDL) configuration, allowing Mobile Network Operators (MNOs) to tailor the configuration based on their network needs.

There are currently 5 3GPP bands that lie within this range, namely B76, n51, B32, B75 and n50. Vodacom recommends that the band be harmonized for B75/ n75 as this band will allow operators flexibility in terms of technology deployment, being standardized for both 4G & 5G, and having the largest bandwidth from all of the other bands defined in this range. The spectrum has been auctioned in part of Europe.

In order to allow for further application and use cases, Vodacom further recommends that the emissions limits indicated by Footnote 5.338A (referencing Resolution 750 of WRC-19) apply only to outdoor locations, as indoor locations would not pose an impact to EESS passive sensors.



1880 MHz to 2200 MHz

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
1 710-1 930 MHz FIXED MOBILE 5.384A 5.388A 5.388B	1 710-1 718.8 MHz FIXED MOBILE 5.384A 5.388A NF9 5.149 5.341 5.385 5.388 5.388B	FWA (1880 – 1900 MHz) FWA TDD (1900 – 1920 MHz) Fixed Broadband data applications (1 785 – 1 805 MHz) IMT1800 MTX (1710 – 1785 MHz) Cordless telephones (1880 – 1900 MHz) IMT1900 TDD (1900 – 1920 MHz) IMT2100 MTX (1920 – 1980 MHz) (International Mobile Telecommunications (IMT)) 1 805-1 880 MHz IMT 1 920-1 980 MHz IMT (terrestrial)	Paired with BTX 1805 – 1880 MHz Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015). Paired with 1710-1785 MHz IMT TDD applications Paired with BTX 2110 – 2170 MHz Paired with 2110-2170 MHz See NF8 for IMT frequency band - terrestrial

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
	1 718.8-1 722.2 MHz FIXED MOBILE 5.384A 5.388A NF9 Radio astronomy 5.149 5.341 5.385 5.388 5.388B	FWA (1880 – 1900 MHz) FWA TDD (1900 – 1920 MHz) Fixed Broadband data applications (1 785 – 1 805 MHz) IMT1800 MTX (1710 – 1785 MHz) Cordless telephones (1880 – 1900 MHz) IMT1900 TDD (1900 – 1920 MHz) IMT2100 MTX (1920 – 1980 MHz) (International Mobile Telecommunications (IMT)) 1 805-1 880 MHz IMT 1 920-1 980 MHz IMT (terrestrial)	Paired with BTX 1805 – 1880 MHz Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015). Paired with 1710-1785 MHz IMT TDD applications Paired with BTX 2110 – 2170 MHz Paired with 2110-2170 MHz



5.149 5.341 5.385 5.386 5.387 5.388		(International Mobile Telecommunications (IMT))	
	1 722.2-1 885 MHz		
	FIXED	FWA (1880 – 1900 MHz) FWA TDD (1900 – 1920 MHz)	Paired with BTX 1805 – 1880 MHz
	MOBILE 5.384A 5.388A NF9		

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
	5.149 5.341 5.385 5.388 5.388B	Fixed Broadband data applications (1 785 – 1 805 MHz) IMT1800 MTX (1710 – 1785 MHz) Cordless telephones (1880 – 1900 MHz) IMT1900 TDD (1900 – 1920 MHz) IMT2100 MTX (1920 – 1980 MHz) (International Mobile Telecommunications (IMT)) 1 805-1 880 MHz 1 920-1 980 MHz IMT (terrestrial)	Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015). Paired with 1710-1785 MHz IMT TDD applications Paired with BTX 2110 – 2170 MHz Paired with 2110-2170 MHz
	1 885-1 930 MHz FIXED MOBILE 5.384A 5.388A NF9 5.149 5.341 5.385 5.388 5.388B	FWA (1880 – 1900 MHz) FWA TDD (1900 – 1920 MHz) Fixed Broadband data applications (1 785 – 1 805 MHz) IMT1800 MTX (1710 – 1785 MHz) Cordless telephones (1880 – 1900 MHz) IMT1900 TDD (1900 – 1920 MHz) IMT2100 MTX (1920 – 1980 MHz)	Paired with BTX 1805 – 1880 MHz Radio Frequency Spectrum Regulations as amended (Annex B) (GG. No. 38641, 30 March 2015). Paired with 1710-1785 MHz IMT TDD applications Paired with BTX 2110 – 2170 MHz Paired with 2110-2170 MHz



ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
		(International Mobile Telecommunications (IMT)) 1 805-1 880 MHz IMT 1 920-1 980 MHz IMT (terrestrial) [FIXED (HAPS) (base stations for IMT)]	
1 930-1 970 MHz FIXED MOBILE 5.388A 5.388B 5.388	1 930-1 970 MHz FIXED MOBILE 5.388A NF9 5.388 5.388B	IMT2100 MTX (1920 – 1980 MHz) [FIXED (HAPS) (base stations for IMT)] (International Mobile Telecommunications (IMT))	Paired with 2110 – 2170 MHz See NF9 for IMT frequency bands
1 970-1 980 MHz FIXED MOBILE 5.388A 5.388B	1 970-1 980 MHz FIXED MOBILE 5.388A NF9	IMT2100 MTX (1920 – 1980 MHz) [FIXED (HAPS) (base stations for IMT)] (International Mobile Telecommunications (IMT))	Paired with 2110 – 2170 MHz

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
5.388	5.388 5.388B		
1 980-2 010 MHz FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.351A 5.388 5.389A 5.389B 5.389F	1 980-2 010 MHz FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.351A 5.388 5.389A 5.389F NF13	Fixed links (1980 – 2010 MHz) CGC/ATC fixed systems (1980 –2010 MHz) IMT Satellite IMT (satellite) (1980-2010 MHz) (International Mobile Telecommunications (IMT))	Paired with 2170 – 2200 MHz) The development of satellites for IMT services to be monitored.
2 010-2 025 MHz FIXED MOBILE 5.388A 5.388B	2 010-2 025 MHz FIXED MOBILE 5.388A NF9	IMT TDD (2010 – 2025 MHz) [FIXED (HAPS) (base stations for IMT)]	IMT TDD applications Recommendation ITU-R M.1036



5.388	5.388 5.388B	(International Mobile Telecommunications (IMT))	
2 025-2 110 MHz SPACE OPERATION (Earth-to-space) (space-to-space) EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space) FIXED	2 025-2 110 MHz SPACE OPERATION (Earth-to-space) (space-to-space) EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space) FIXED NF14	Fixed Links (2025 – 2110 MHz)	Paired with 2200 – 2285 MHz

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
MOBILE 5.391 SPACE RESEARCH (Earth-to-space) (space-to-space) 5.392	MOBILE 5.391 SPACE RESEARCH (Earth-to-space) (space-to-space)		Radio Frequency channel arrangement according to ITU-R F.1098.
2 110-2 120 MHz FIXED MOBILE 5.388A 5.388B SPACE RESEARCH (deep space) (Earth-to-space) 5.388	2 110-2 120 MHz FIXED MOBILE 5.388A NF9 SPACE RESEARCH (deep space) (Earth-to-space) 5.388 5.388B	IMT2100 BTX (2110 – 2170 MHz) [FIXED (HAPS) (base stations for IMT)] (International Mobile Telecommunications (IMT))	Paired with 1920 – 1980 MHz Recommendation ITU-R M.1036
2 120-2 160 MHz FIXED MOBILE 5.388A 5.388B	2 120-2 160 MHz FIXED MOBILE 5.388A NF9	IMT-2100 BTX (2110 – 2170 MHz) [FIXED (HAPS) (base stations for IMT)] (International Mobile Telecommunications (IMT))	Paired with 1920 – 1980 MHz Recommendation ITU-R M.1036



ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
5.388	5.388 5.388B		
2 160-2 170 MHz FIXED MOBILE 5.388A 5.388B 5.388	2 160-2 170 MHz FIXED MOBILE 5.388A NF9 5.388 5.388B	IMT2100 BTX (2110 – 2170 MHz) [FIXED (HAPS) (base stations for IMT)] (International Mobile Telecommunications (IMT))	Paired with 1920 – 1980 MHz Recommendation ITU-R M.1036
2 170-2 200 MHz FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A 5.388 5.389A 5.389F	2 170-2 200 MHz FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A 5.388 5.389A 5.389F NF13	Fixed Links (2170 – 2200 MHz) CGC/ATC fixed systems (1980 – 2010 MHz) IMT (satellite) (2170-2200 MHz) (International Mobile Telecommunications (IMT))	Paired with 1980 – 2010 MHz
2 200-2 290 MHz SPACE OPERATION (space-to-Earth) (space-to-space) EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space)	2 200-2 290 MHz SPACE OPERATION (space-to-Earth) (space-to-space) EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space)	TT&C received from space	Radio Frequency Channel arrangements in accordance with ITU-R F.1098

Vodacom Comments:

The 2021 NRFP allocates 1880 MHz to 2025 MHz to MOBILE on a co-primary basis with several other applications including FIXED and MOBILE-SATELLITE (1980 MHz to 2010 MHz and 2170 MHz to 2200 MHz), also noting that Radio astronomy is allowed on a secondary basis for the range of 1718.8 MHz to 1722.2 MHz. 1880 MHz to 1920 MHz is currently not being used for IMT.

Several key 3GPP bands have been identified by Vodacom in the vicinity of B1/ n1, as illustrated below. These bands include n39, n65 and n34/ n95. All these bands are to support 5G technology.





Operators in America have begun to sunset their legacy 3G networks and are re-farming their 3G spectrum to the newer and faster 4G & 5G technologies. This will likely follow in Europe as well. In Africa, the situation is a bit different, as there are still many users on the network using legacy 3G devices. The additional spectrum adjacent to Band 1 (1920-1980 MHz/ 2110-2170 MHz) can promote additional capacity, by allowing for the migration and extension of existing deployments.

The band will provide good coverage in urban and sub-urban areas, allowing for extended eMBB connectivity.

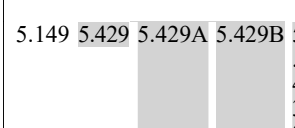
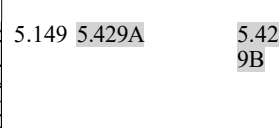
From the IMT Roadmap 2019⁷, Vodacom notes that 1880-1900 MHz is license exempt and that Telkom uses 1900-1920 MHz for fixed wireless access (FWA) systems, of which 1915-1920MHz is a guard band and is not used for the service that was delivered. It is not clear as to the extent that Telkom's legacy FWA service is still relevant, given the age of the technology and the likely prospect that a large proportion of the original user-base may have abandoned the service in favour of IMT mobile.

Vodacom recommends that 1880-1920 MHz (band n39) be allocated to IMT on a primary basis in the NRFP 2021 and be made available to other operators, allowing for greater national benefit for a far greater number of customers, and further recommends that legacy fixed services that have limited coverage are changed to a secondary fixed allocation, with a schedule for migration of legacy services out of the band.

⁷ Government Gazette No. 42361 of 2019 Pg. 92



3300 MHz to 3600 MHz

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
<p>3 300-3 400 MHz</p> <p>RADIOLOCATION</p> 	<p>3 300-3 400 MHz</p> <p>RADIOLOCATION</p> <p>MOBILE except aeronautical mobile</p> 	<p>IMT Res. 223 (Rev.WRC-15)</p> <p>(International Mobile Telecommunications (IMT))</p>	<p>Subject to outcome of the sharing and compatibility studies called for by Resolution 223 (WRC-15) currently underway within the ITU- R, there might be a need to migrate Radars out of this band. This will be addressed through an update of the migration plan.</p> <p>Recommendation ITU-R M.1036-6</p>
<p>3 400-3 600 MHz</p> <p>FIXED FIXED-SATELLITE (space-to-Earth)</p> <p>MOBILE except aeronautical mobile 5.430A</p> <p>Radiolocation</p>	<p>3 400-3 600 MHz</p> <p>FIXED FIXED-SATELLITE (space-to-Earth)</p> <p>MOBILE except aeronautical mobile 5.430A NF9</p> <p>Radiolocation</p>	<p>IMT3500 TDD (3400 – 3600 MHz)</p> <p>(International Mobile Telecommunications (IMT))</p>	<p>International Mobile Telecommunication Roadmap (GG No.38213) 14 November 2014. Radio Frequency Spectrum Assignment Plan (GG N. 38640) as amended 30 March 2015. Recommendation ITU-R M.1036 The band 3400 -3600 MHz is also used for BFWA in some SADC countries</p> <p>Recommendation ITU-R M.1036-6</p>

Vodacom Comments:

Frequencies in the 3.5 GHz range are used as the basis for commercial 5G networks globally. The band provides a good balance between coverage and capacity for the early adopters of 5G. A channel size of 80-100 MHz per operator lowers network density and reduces the cost of 5G while providing the greatest user experience, that has the best potential to approximate the ITU IMT-2020 ambitions.

Noting as per footnote 5.429B that the 3300-3400MHz band has been identified for IMT on a non-interfering basis in a number of countries in Region 1 subject to sharing with the radiolocation service and notification to neighbouring states, Vodacom recommends the immediate allocation of the range 3300-3400 MHz for IMT Mobile usage, on a secondary basis. Once ratified at WRC-23, and should there be



manageable interference mitigation in South Africa and with neighbouring states, then the allocation should be changed to IMT Mobile on a primary basis. The notes in the current DRAFT NRFP suggest that the use of this band is still subject to ITU-R studies, which unfortunately does not align with the wording of the footnote.

The 2021 NRFP allocates 3400 MHz to 3600 MHz to IMT MOBILE on a co-primary basis with FIXED, and FIXED-SATELLITE and on a secondary basis with Radiolocations.

There are currently 2 3GPP bands that overlap the range of 3300-3800MHz, namely band n77 and n78. According to GSA, currently 551 of the 873 available 5G devices support either band n77 or n78. This indicates that the ecosystem is quite mature worldwide.

Vodacom recommends that the 3400-3600 MHz to be cleared and harmonized for IMT MOBILE only on a primary basis to enable national use of the band by MNOs once auctioned.

3600 MHz to 3800 MHz

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
3 600-4 200 MHz FIXED FIXED-SATELLITE (space-to-Earth) Mobile	3 600-4 200 MHz FIXED FIXED-SATELLITE (space-to-Earth) NF14	Fixed links (4 GHz) (3600 – 4200 MHz) C-band downlink (VSAT/SNG/PTP links)	The sub-band 3 600-3 800 MHz could be used for BFWA where frequency sharing with FS PTP and/or FSS is feasible. The channelling arrangement for PTP links in this band is based on ITU-R Recommendation F.635 Annex 1. The sub-band 3 600-4 200 MHz is used for medium and high capacity PTP links and FSS. In the band 3 600-3 800 MHz, FS PTP and FSS applications will have to operate on coordinated basis.

Vodacom Comments:

The 2021 NRFP allocates 3600 MHz to 3800 MHz to FIXED on a co-primary basis with FIXED-SATELLITE. The ITU Region 1 allocation assigns mobile on a secondary basis for the range of 3600-3800 MHz, which was excluded from the South African allocation.

A number of European countries, such as Italy, Spain, Switzerland, Germany, Finland, Hungary and Ireland have already completed auctions and have assigned this range for 5G usage, while countries such as the



U.K, France, Greece, Sweden, Romania and Czech Republic have planned auctions for this band⁸. Europe’s plan is to use the 3400 – 3800 MHz range to enable Gigabit connectivity.

According to GSA, currently 551 of the 873 available 5G devices support either band n77 or n78. This indicates that the ecosystem is quite mature worldwide as nearly 63% of all 5G devices support this band.

Vodacom would like to propose that the range of 3600 – 3800 MHz be assigned to Mobile on a secondary basis for consumers to benefit from the economies of scale of this mature 5G band. There are current use cases that would allow for immediate deployment of IMT technology without interfering with the services that have a primary allocation in this band. As this band is already high demand in other markets, and will likely become high demand in South Africa, Vodacom recommends that the Authority consult on any process of conversion of legacy licensees in this band to allow for Mobile services, even if on a secondary basis.

4400 MHz to 4800 MHz

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
4 400-4 500 MHz FIXED MOBILE 5.440A	4 400-4 500 MHz FIXED NF14 NF15 MOBILE	Fixed links (4.8 GHz) (4400 – 5000 MHz) Government services Outside Broadcast links Electronic News Gathering	
4 500-4 800 MHz FIXED FIXED-SATELLITE (space-to-Earth) 5.441 MOBILE 5.440A	4 500-4 800 MHz FIXED NF14 FIXED-SATELLITE (space-to-Earth) 5.441 MOBILE NF15	Fixed links (4.8 GHz) (4400 – 5000 MHz) Government services Outside Broadcast links Electronic News Gathering (International Mobile Telecommunications (IMT))	Appendix 30B Plan The band 4 500-4 800 MHz is part of the APP30B Plan (FSS space-to- Earth). Refer to Annex B. Recommendation ITU-R M.1036-6

The 2021 NRFP allocates 4400 MHz to 4800 MHz to MOBILE on a co-primary basis with FIXED and FIXED-SATELLITE, however it does not refer to IMT in the typical applications throughout the entire range, specifically excluding the range of 4400MHz to 4500MHz.

⁸ <https://www.qualcomm.com/media/documents/files/spectrum-for-4g-and-5g.pdf> Pg.11



The 3GPP band of interest in this range is band n79 which is defined from 4400-5000 MHz. According to GSA, there are currently 329 devices that support this band.

Vodacom would like to propose that the range 4400-4500 MHz be allocated for IMT MOBILE usage which will likely result in an extension of this band's range to 4990 MHz. In addition, Vodacom recommends that ICASA proceed with finalising the IMT4500 RFSAP to clear the band for assignment.

4800 MHz to 4990 MHz

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
4 800-4 990 MHz FIXED MOBILE 5.440A 5.441A 5.441B 5.442 Radio astronomy	4 800-4 825 MHz FIXED NF14 MOBILE 5.441B Radio astronomy NF15	Fixed links (4.8 GHz) (4400 – 5000 MHz) Government services Outside Broadcast Links Electronic News Gathering Radio astronomy on 4825 – 4835 MHz and 4950 – 4990 MHz	
	4 825-4 835 MHz FIXED NF14 NF15 MOBILE except aeronautical mobile 5.441B Radio astronomy 5.149	(International Mobile Telecommunications (IMT))	Recommendation ITU-R M.1036-6
			Recommendation ITU-R M.1036-6



ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
5.149 5.339 5.443	4 835-4 950 MHz FIXED NF14 NF15 MOBILE 5.441B Radio astronomy	(International Mobile Telecommunications (IMT))	
	4 950-4 990 MHz FIXED NF14 MOBILE except aeronautical mobile 5.441B Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.339	(International Mobile Telecommunications (IMT))	Recommendation ITU-R M.1036-6

Currently the range of 4800-4825 MHz is not assigned for exclusively IMT Mobile, however 4825-4990 MHz is allocated to IMT MOBILE on a co-primary basis with FIXED.

According to GSA, there is currently 329 devices supporting band n79. The ecosystem is growing due to assignments in countries with large populations and allows for more 5G mid-band spectrum to be deployed.

Vodacom would like to propose that the range 4800-4825 MHz be allocated for IMT MOBILE usage and recommends that ICASA proceed with public consultation on the IMT4500 RFSAP to evaluate the band for assignment. Given that 4825-4990MHz is allocated to IMT usage (which we support), the proposed assignment of 4800-4825MHz for IMT MOBILE will ensure that the entire band n79 (4400-4990 MHz) is contiguous.

5855 MHz to 5925 MHz

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
5 850-5 925 MHz FIXED FIXED-SATELLITE (Earth-to-space) MOBILE	5 850-5 925 MHz FIXED FIXED-SATELLITE (Earth-to-space) MOBILE	C-band uplink (VSAT/SNG/PTP links)	FS could be used for temporary OB links.



5.150	5.150	ISM applications (5725 – 5875 MHz) Fixed-satellite uplinks (PTP/VSAT/SNG) (5850-6425 MHz) FIXED links (5850-5925 MHz) ISM (5725-5875 MHz)	
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The 2021 NRFP allocates 5855 MHz to 5925 MHz to MOBILE on a co-primary basis with FIXED and FIXED-SATELLITE, however it does not refer to IMT in the typical applications.

The frequency range 5855 MHz to 5925 MHz has been identified by 3GPP as B47/ n47 and has been marked for C-V2X applications. In addition, the subset of this band, 5875 MHz to 5905 MHz has been standardized by IEEE (ITS-G5 IEEE 802.11p) which has been harmonized in Europe (ITU Region 1). The band is to be used for intelligent transport systems (ITS).

The IMT Roadmap 2019⁹ refers to the harmonization of frequency bands, to the maximum extent possible, for the implementations of evolving ITS. Unfortunately, neither IMT nor C-V2X is referenced in applications for this frequency range.

Vodacom requests to include C-V2X and IMT MOBILE applications to this frequency range. In addition, Vodacom also requests that ICASA publish a IMT5800 RFSAP.

6425 MHz to 7125 MHz

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
5 925-6 700 MHz FIXED 5.457 FIXED-SATELLITE (Earth-to- space) 5.457A 5.457B MOBILE 5.457C	5 925-6 425 MHz FIXED 5.457 NF14 FIXED-SATELLITE (Earth-to- space) 5.457A 5.457B MOBILE	Fixed links - Lower 6 GHz (5925- 6425 MHz) and Upper 6 GHz (6425-7110 MHz), BFWA	Channelling plan for L6 GHz band in accordance with ITU-R Rec. F.383. Channelling plan for U6 GHz band in accordance with ITU-R Rec. F.384.

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
	5.149 5.440 5.458	Fixed-satellite uplinks (PTP/VSAT/SNG) (5850-6425 MHz) ESVs (5925 – 6425 MHz)	Earth Station onboard vessels (ESV) also allowed under FSS. Resolution 150 (WRC-12)
	6 425-6 429 MHz		

⁹ Government Gazette No. 42361 of 2019 Pg. 126



5.149 5.440 5.458	FIXED 5.457 NF14 FIXED-SATELLITE (Earth-to- space) 5.457A 5.457B MOBILE STANDARD FREQUENCY AND TIME SIGNAL- SATELLITE (6 427 MHz) (space-to- Earth)	Upper 6 GHz (6425-7110 MHz), BFWA	Channelling plan for U6 GHz band in accordance with ITU-R Rec. F.384. Earth Station onboard vessels (ESV) also allowed under FSS Resolution 150 (WRC-12)
5.149 5.440 5.458	6 429-6700 MHz FIXED 5.457 NF14 FIXED-SATELLITE (Earth-to- space) 5.457A 5.457B MOBILE 5.458	Upper 6 GHz (6425-7110 MHz), BFWA	Channelling plan for U6 GHz band in accordance with ITU-R Rec. F.384. Earth Station onboard vessels (ESV) also allowed under FSS Resolution 150 (WRC-12)

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
6 700-7 075 MHz FIXED FIXED-SATELLITE (Earth-to- space) (space-to-Earth) 5.441 MOBILE 5.458 5.458A 5.458B	6 700-7 075 MHz FIXED NF14 FIXED-SATELLITE (Earth-to- space) (space-to-Earth) 5.441 MOBILE 5.458 5.458A 5.458B	Fixed Links (U6) (6425 – 7110 MHz) S-DAB feeder links (uplinks) Fixed links - Upper 6 GHz (6425- 7110 MHz) Feeder links of non-GSO-satellite systems in the MSS	Channelling plan for U6 GHz band in accordance with ITU-R Rec. F.384. The band 6 725-7 025 MHz is part of the APP30B Plan (FSS Earth-to- space); refer to Annex B.

The 6425-7125 MHz band will be reviewed at WRC-23 under agenda item 1.2⁵.

Currently there is 1 3GPP band that lies within this range, namely band n96, spanning from 5925-7125 MHz. Band n96 is license exempt and will be used for license assisted access (LAA). There needs to be a balance



between backhaul services, licensed 5G services, unlicensed 5G services and Wi-Fi 6E which all will make use of this band ¹⁰.

Vodacom recommends that the typical applications for this band be updated to reflect some of the more recent services, as mentioned above.

24.25 GHz to 29.50 GHz

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
24.25-24.45 GHz FIXED MOBILE except aeronautical mobile 5.338A 5.532AB	24.25-24.45 GHz FIXED MOBILE except aeronautical mobile 5.338A 5.532AB	(International Mobile Telecommunications (IMT))	Temporary fixed links for ENG/OB Resolution 242 (WRC-19) Recommendation ITU-R M.1036-6 currently being updated revised within the ITU-R
24.45-24.65 GHz FIXED INTER-SATELLITE	24.45-24.65 GHz FIXED NF14 INTER- SATELLIT E	Fixed Links (26 GHz) (24.5 – 26.5 GHz) Fixed links - 26 GHz (24.5-26.5 GHz)	Channelling plan for 26 GHz band in accordance with ITU-R Rec. F.748 Annex 1.

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
MOBILE except aeronautical mobile 5.338A 5.532AB	MOBILE except aeronautical mobile 5.338A 5.532AB	BFWA (24.5-26.5 GHz) (International Mobile Telecommunications (IMT))	Resolution 242 (WRC-19) Recommendation ITU-R M.1036-6 currently being updated revised within the ITU-R
24.65-24.75 GHz FIXED FIXED-SATELLITE (Earth-to- space) 5.532B INTER- SATELLIT E MOBILE except aeronautical mobile 5.338A 5.532AB	24.65-24.75 GHz FIXED NF14 FIXED-SATELLITE (Earth-to- space) 5.532B INTER- SATELLIT E MOBILE except aeronautical mobile 5.338A 5.532AB	Fixed Links (26 GHz) (24.5 – 26.5 GHz) Fixed links - 26 GHz (24.5- 26.5 GHz) BFWA (24.5-26.5 GHz) (International Mobile Telecommunications (IMT))	Channelling plan for 26 GHz band in accordance with ITU-R Rec. F.748 Annex 1. Resolution 242 (WRC-19) Recommendation ITU-R M.1036-6 currently being updated revised within the ITU-R
24.75-25.25 GHz	24.75-25.25 GHz		

¹⁰ <https://www.gsma.com/spectrum/balanced-approach-to-6-ghz/>



FIXED FIXED-SATELLITE (Earth-to-space) 5.532B MOBILE except aeronautical mobile 5.338A 5.532AB	FIXED NF14 FIXED-SATELLITE (Earth-to-space) 5.532B MOBILE except aeronautical mobile 5.338A 5.532AB	Fixed Links (26 GHz) (24.5 – 26.5 GHz) Fixed links - 26 GHz (24.5- 26.5 GHz) BFWA (24.5-26.5 GHz) (International Mobile Telecommunications IMT))	Channelling plan for 26 GHz band in accordance with ITU-R Rec. F.748 Annex 1. Resolution 242 (WRC-19) Recommendation ITU-R M.1036-6 currently being updated revised within the ITU-R
25.25-25.5 GHz FIXED 5.534A INTER-SATELLITE 5.536	25.25-25.5 GHz FIXED NF14 INTER-SATELLITE (Earth exploration-satellite applications) 5.536	Fixed Links (26 GHz) (24.5 – 26.5 GHz) BFWA (24.5-26.5 GHz)	Channelling plan for 26 GHz band in accordance with ITU-R Rec. F.748 Annex 1.

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
MOBILE 5.338A 5.532AB Standard frequency and time signal-satellite (Earth-to-space)	INTER-SATELLITE (space research applications) 5.536 INTER- SATELLITE (transmissions of data originating from industrial and medical activities in space) MOBILE 5.338A 5.532AB Standard frequency and time signal- satellite (Earth-to-space)	(International Mobile Telecommunications IMT))	Resolution 242 (WRC-19) Recommendation ITU-R M.1036-6 currently being updated revised within the ITU-R
25.5-27 GHz EARTH EXPLORATION- SATELLITE (space-to Earth) 5.536B FIXED 5.534A INTER-SATELLITE 5.536 MOBILE 5.338A 5.532AB SPACE RESEARCH (space-to- Earth) 5.536C	25.5-27 GHz EARTH EXPLORATION- SATELLITE (space-to Earth) 5.536B FIXED NF14 INTER-SATELLITE (Earth exploration-satellite applications) 5.536 INTER-SATELLITE (space research applications) 5.536 INTER- SATELLITE (transmissions of data originating from industrial and medical activities in space) MOBILE 5.338A 5.532AB SPACE RESEARCH (space-to- Earth) 5.536C	National Polar-Orbiting Operational Environment Satellite System (NPOESS) Fixed Links (26 GHz) (24.5 – 26.5 GHz) BFWA (24.5-26.5 GHz)	Channelling plan for 26 GHz band in accordance with ITU-R Rec. F.748 Annex 1. Resolution 242 (WRC-19)

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
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Standard frequency and time signal-satellite (Earth-to-space) 5.536A	Standard frequency and time signal- satellite (Earth-to-space) 5.536A	(International Mobile Telecommunications (IMT))	Recommendation ITU-R M.1036-6 currently being updated revised within the ITU-R
27-27.5 GHz FIXED INTER-SATELLITE 5.536 MOBILE 5.338A 5.532AB	27-27.5 GHz FIXED INTER-SATELLITE (Earth exploration-satellite applications) 5.536 INTER-SATELLITE (space research applications) 5.536 INTER-SATELLITE (transmissions of data originating from industrial and medical activities in space) MOBILE 5.338A 5.532AB	(International Mobile Telecommunications (IMT))	Recommendation ITU-R M.1036-6 currently being updated revised within the ITU-R Resolution 242 (WRC-19)
27.5-28.5 GHz FIXED 5.537A FIXED-SATELLITE (Earth-to- space) 5.484A 5.516B 5.517A 5.539	27.5-27.501 GHz FIXED 5.537A NF14 NF18 FIXED-SATELLITE (Earth-to- space) 5.484A 5.516B 5.517A 5.539 FIXED-SATELLITE (space-to- Earth)	Fixed Links (28 GHz) (27.5 – 29.5 GHz), LMDS (27.5 – 28.35) Base to Subscriber Beacon transmission for up-link power control	LMDS (31.000 – 31.300 MHz) Subscriber to Base Channelling plan for 28 GHz band in accordance with ITU-R Rec. F.748 Annex 2.

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
MOBILE	MOBILE 5.538 5.540	[HIGH-DENSITY APPLICATIONS IN THE FSS (space-to-Earth)]	The band 27.5-27.82 GHz is identified for HDFSS; Res.143 applies. The band 27.5-30 GHz may be used by the FSS for BSS feeder links. Resolution 169 (WRC-19)
	27.501-27.82 GHz FIXED 5.537A NF14 NF18 FIXED-SATELLITE (Earth-to- space) 5.484A 5.516B 5.517 A 5.539 MOBILE Fixed-satellite (space-to-Earth)	Fixed Links (28 GHz) (27.5 – 29.5 GHz), LMDS (27.5 – 28.35) Base to Subscriber Beacon transmission for up-link power control) HIGH-DENSITY APPLICATIONS IN THE FSS (space-to-Earth)]	LMDS (31.000 – 31.300 MHz) Subscriber to Base Channelling plan for 28 GHz band in accordance with ITU-R Rec. F.748 Annex 2. The band 27.5-27.82 GHz is identified for HDFSS; Res.143 applies. The band 27.5-30 GHz may be used by the FSS for BSS feeder links.



	5.538 5.540		Resolution 169 (WRC-19)
	27.82-28.45 GHz FIXED 5.537A NF14 NF18 FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.517A 5.539 MOBILE Fixed-satellite (space-to-Earth)	Fixed Links (28 GHz) (27.5 – 29.5 GHz), LMDS (27.5 – 28.35) Base to Subscriber Beacon transmission for up-link power control)	LMDS (31.000 – 31.300 MHz) Subscriber to Base Channelling plan for 28 GHz band in accordance with ITU-R Rec. F.748 Annex 2.

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
	MOBILE 5.538 5.540		The band 27.5-27.82 GHz is identified for HDFSS; Res.143 applies. The band 27.5-30 GHz may be used by the FSS for BSS feeder links.
5.538 5.540	28.45-28.5 GHz FIXED 5.537A NF14 NF18 FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.517A 5.539 MOBILE Fixed-satellite (space-to-Earth) 5.538 5.540	Fixed Links (28 GHz) (27.5 – 29.5 GHz), LMDS (27.5 – 28.35) Base to Subscriber Beacon transmission for up-link power control) HIGH-DENSITY APPLICATIONS IN THE FSS (space-to-Earth)]	LMDS (31.000 – 31.300 MHz) Subscriber to Base Channelling plan for 28 GHz band in accordance with ITU-R Rec. F.748 Annex 2. The band 27.5-27.82 GHz is identified for HDFSS; Res.143 applies. The band 27.5-30 GHz may be used by the FSS for BSS feeder links.
28.5-29.1 GHz FIXED FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.517A 5.523A 5.539 MOBILE Earth exploration-satellite (Earth-to-space) 5.541	28.5-28.94 GHz FIXED NF14 FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.517A 5.523A 5.539 MOBILE Earth exploration-satellite (Earth-to-space) 5.541 Fixed-satellite (space-to-Earth)	Fixed Links (28 GHz) (27.5 – 29.5 GHz) Transfer of data between stations	Channelling plan for 28 GHz band in accordance with ITU-R Rec. F.748 Annex 2. Resolution 169 (WRC-19) The band 28.45-28.94 GHz is identified for HDFSS; Res.143 applies.



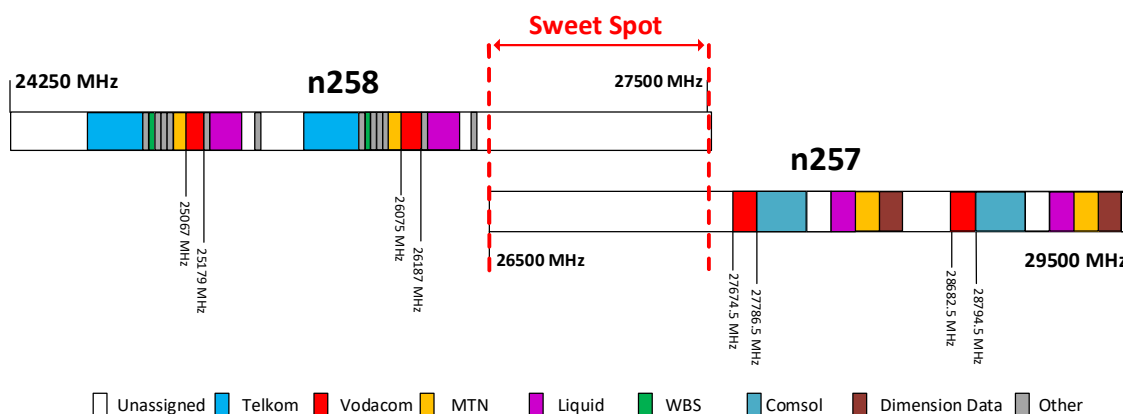
ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
5.540	5.540	Beacon transmission for up-link power control HIGH-DENSITY APPLICATIONS IN THE FSS (space-to-Earth)	The band 27.5-30 GHz may be used by the FSS for BSS feeder links.
	28.94-29.1 GHz FIXED NF14 FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.517A 5.523A 5.539 MOBILE Earth exploration-satellite (Earth-to-space) 5.541 Fixed-satellite (space-to-Earth) 5.540	Transfer of data between stations Beacon transmission for up-link power control	Resolution 169 (WRC-19)
29.1-29.5 GHz FIXED FIXED-SATELLITE (Earth-to-space) 5.516B 5.517A 5.523C 5.523E 5.535A 5.539 5.541A	29.1-29.46 GHz FIXED NF14 NF18 FIXED-SATELLITE (Earth-to-space) 5.516B 5.517A 5.523C 5.523E 5.535A 5.539 5.541A FIXED-SATELLITE (GSO) (Earth-to-space)	Fixed Links (28 GHz) (27.5 – 29.5 GHz) Feeder links of non-GSO-satellite systems in the MSS	Resolution 169 (WRC-19)
ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
MOBILE Earth exploration-satellite (Earth-to-space) 5.541	MOBILE Earth exploration-satellite (Earth-to-space) 5.541 Fixed-satellite (space-to-Earth) 5.540	Transfer of data between stations Beacon transmission for up-link power control	
	29.46-29.5		



5.540	FIXED NF14 NF18 FIXED-SATELLITE (Earth-to-space) 5.516B 5.517A 5.523C 5.523E 5.535A 5.539 5.541A FIXED-SATELLITE (GSO) (Earth-to-space) MOBILE Earth exploration-satellite (Earth-to-space) 5.541 Fixed-satellite (space-to-Earth) 5.540	Feeder links of non-GSO-satellite systems in the MSS Transfer of data between stations Beacon transmission for up-link power control HIGH-DENSITY APPLICATIONS IN THE FSS (space-to-Earth)	Resolution 169 (WRC-19)
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The 2021 NRFP allocates 24.25 GHz to 29.50 GHz to MOBILE on a co-primary basis with FIXED, INTER-SATELLITE, FIXED-SATELLITE and SPACE RESEARCH.

Vodacom estimates that the frequency range of 26.5-27.5 GHz may be currently unallocated to any services, as illustrated below and labelled as the “sweet spot”. This view is supported by the 26 GHz assignments that were published in the IMT 2019 Roadmap¹¹, and an estimation of the 28 GHz assignments (based on ICASA’s spectrum usage table and equipment capabilities in 28 GHz).



According to GSA, there are currently 25 devices supporting band n257 and 14 devices supporting band n258. By allocating the “sweet spot” to IMT MOBILE, both ecosystems will be supported, without interfering with the other services that are active within both bands.

¹¹ Government Gazette No. 42361 of 2019 Pg. 163



Vodacom would like to propose that the frequency range of 26.5-27.5 GHz be harmonized for IMT MOBILE usage, and that a IMT27000 RFSAP be finalised for assignment to operators. The spectrum can be released immediately to MNOs as there would appear to currently be no other applications deployed in this range.

5G devices can support a bandwidth of either 50 MHz, 100 MHz, 200 MHz or a maximum of 400 MHz. The ability to deploy carrier sizes greater than 100 MHz is one of the main advantages for 5G NR above 6 GHz bands. It is the greater carrier size and ability to access larger contiguous bandwidths of spectrum which enables 5G technology to deliver higher throughput and lower latency. The allocation of the 1GHz, within the sweet spot, of spectrum to IMT will allow ICASA to assign key capacity spectrum in lots of either 200 MHz or 400 MHz, allowing licensees to provide 5G services with high throughput and low latency in hot spot areas with high demand.

This band will be used for 5G applications of the future, including virtual and augmented reality applications, remote control of industrial robots, autonomous vehicles, as well as entertainment services, such as downloading 4K movies in seconds¹².

Vodacom notes that the entire range (from 24250 MHz to 29500 MHz) may not be immediately made available to IMT, since there are existing microwave services which coincide with this range as depicted in the graph above. As such, for frequencies in the range of 24250MHz-26500MHz and 27500MHz-29500MHz, Vodacom recommends that the Authority develop a service migration plan in consultation with current assignees.

31.50 GHz to 31.80 GHz

The ITU region 1 allocation for 31.5 – 31.8 GHz allocates EARTH EXPLORATION SATELLITE (passive), RADIO ASTRONOMY, SPACE RESEARCH (passive) on a co-primary basis with Fixed and Mobile (except aeronautical mobile) on a secondary basis. Footnote 5.546 notes a different category of service for South Africa and that Fixed and Mobile is to be allocated on a primary basis, which ICASA has proposed.

While there are currently no 3GPP bands that lie within this range, Vodacom welcomes the proactive move taken to through the co-primary allocation of this band to MOBILE. We recommends that the service description be updated to allow use of IMT services

¹² <https://www.gsma.com/newsroom/press-release/gsma-wrc-19-opens-door-to-exciting-new-5g-services/>



37.00 GHz to 43.50 GHz

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) 5.149 5.550A	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) 5.149 5.550A	Government Services Passive Sensing	
37-37.5 GHz FIXED MOBILE except aeronautical mobile 5.550B SPACE RESEARCH (space-to- Earth) 5.547	37-37.5 GHz FIXED NF14 MOBILE except aeronautical mobile 5.550B SPACE RESEARCH (space-to- Earth) 5.547	Fixed Links (38 GHz) (37.0 – 39.5 GHz) (International Mobile Telecommunications (IMT))	Resolution 243 (WRC-19) Recommendation ITU-R M.1036-6 currently being updated revised within the ITU-R
37.5-38 GHz FIXED FIXED-SATELLITE (space-to- Earth) 5.550C MOBILE except aeronautical mobile 5.550B SPACE RESEARCH (space-to- Earth) Earth exploration-satellite (space- to- Earth) 5.547	37.5-38 GHz FIXED NF14 FIXED-SATELLITE (space-to- Earth) 5.550C MOBILE except aeronautical mobile 5.550B SPACE RESEARCH (space-to- Earth) Earth exploration-satellite (space- to- Earth)	Fixed Links (38 GHz) (37.0 – 39.5 GHz) (International Mobile Telecommunications (IMT))	The band 37-40 GHz is identified for HDFS; Res.75 applies. Resolution 770 (WRC-19) Resolution 243 (WRC-19) Channelling plan for 38 GHz band in accordance with ITU Rec. F.749 Annex 1. Recommendation ITU-R M.1036-6 currently being updated revised within the ITU-R



ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
	5.547		
38-39.5 GHz FIXED 5.550D FIXED-SATELLITE (space-to-Earth) 5.550C MOBILE 5.550B Earth exploration-satellite (space-to-Earth) 5.547	38-39.5 GHz FIXED 5.550D NF14 FIXED-SATELLITE (space-to-Earth) 5.550C MOBILE 5.550B Earth exploration-satellite (space-to-Earth) 5.547	Fixed Links (38 GHz) (37.0 – 39.5 GHz) [FIXED (HAPS)] [International Mobile Telecommunications (IMT)]	Channelling plan for 38 GHz band in accordance with ITU Rec. F.749 Annex 1. The band 37-40 GHz is identified for HDFSS; Res.75 applies. Resolution 770 (WRC-19) Resolution 243 (WRC-19) Recommendation ITU-R M.1036-6 currently being updated revised within the ITU-R
39.5-40 GHz FIXED FIXED-SATELLITE (space-to-Earth) 5.516B 5.550C MOBILE 5.550B MOBILE-SATELLITE (space-to-Earth) Earth exploration-satellite (space-to-Earth)	39.5-40 GHz FIXED FIXED-SATELLITE (space-to-Earth) 5.516B 5.550C MOBILE 5.550B MOBILE-SATELLITE (space-to-Earth) Earth exploration-satellite (space-to-Earth)	HIGH-DENSITY APPLICATION S IN THE FSS (space-to-Earth)] [International Mobile Telecommunications (IMT)]	Resolution 770 (WRC-19) Resolution 243 (WRC-19) The band 37-40 GHz is identified for HDFSS; Res.75 applies. The band 39.5-40 GHz is identified for HDFSS; Res.143 applies. Recommendation ITU-R M.1036-6 currently being updated revised within the ITU-R

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
5.547 5.550E	5.547 5.550E		
40-40.5 GHz EARTH EXPLORATION-SATELLITE (Earth-to-space) FIXED FIXED-SATELLITE (space-to-Earth) 5.516B 5.550C MOBILE 5.550B MOBILE-SATELLITE (space-to-Earth) SPACE RESEARCH (Earth-to-space) Earth exploration-satellite (space-to-Earth)	40-40.5 GHz EARTH EXPLORATION-SATELLITE (Earth-to-space) FIXED FIXED-SATELLITE (space-to-Earth) 5.516B 5.550C MOBILE 5.550B MOBILE-SATELLITE (space-to-Earth) SPACE RESEARCH (Earth-to-space) Earth exploration-satellite (space-to-Earth)	Government Services HIGH-DENSITY APPLICATION S IN THE FSS (space-to-Earth)] [International Mobile Telecommunications (IMT)]	The band 40-40.5 GHz is identified for HDFSS; Res.143 applies. Resolution 770 (WRC-19) Resolution 243 (WRC-19) Recommendation ITU-R M.1036-6 currently being updated revised within the ITU-R



5.550E	5.550E		
40.5-41 GHz FIXED FIXED-SATELLITE (space-to-Earth) 5.550C BROADCASTING BROADCASTING-SATELLITE LAND MOBILE 5.550B Mobile Aeronautical mobile	40.5-41 GHz FIXED NF14 FIXED-SATELLITE (space-to-Earth) 5.550C BROADCASTING BROADCASTING-SATELLITE LAND MOBILE 5.550B Mobile Aeronautical mobile		Resolution 770 (WRC-19) BFWA or MWS (40.5-43.5 GHz). The band 40.5-43.5 GHz is identified for HDFS; Res.75 applies. Resolution 243 (WRC-19)

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
Maritime mobile 5.547	Maritime mobile 5.547	(International Mobile Telecommunications (IMT))	Recommendation ITU-R M.1036-6 currently being updated revised within the ITU-R
41-42.5 GHz FIXED FIXED-SATELLITE (space-to- Earth) 5.516B 5.550C BROADCASTING BROADCASTING-SATELLITE Mobile LAND MOBILE 5.550B Aeronautical mobile Maritime mobile 5.547 5.551F 5.551H 5.551I	41-42.5 GHz FIXED NF14 FIXED-SATELLITE (space-to- Earth) 5.516B 5.550C BROADCASTING BROADCASTING-SATELLITE LAND MOBILE 5.550B Aeronautical mobile Maritime mobile 5.547 5.551F 5.551H 5.551I	(International Mobile Telecommunications (IMT))	Resolution 143 (WRC-19) Resolution 770 (WRC-19) BFWA or MWS (40.5-43.5 GHz). The band 40.5-43.5 GHz is identified for HDFS; Res.75 applies. Recommendation ITU-R M.1036-6 currently being updated revised within the ITU-R
42.5-43.5 GHz FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE except aeronautical mobile 5.550B RADIO ASTRONOMY	42.5-43.5 GHz FIXED NF14 FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE except aeronautical mobile 5.550B RADIO ASTRONOMY	Government Services (43.5-45.5 GHz)	BFWA or MWS (40.5-43.5 GHz). The band 40.5-43.5 GHz is identified for HDFS; Res.75 applies. Resolution 243 (WRC-19)



The 2021 NRFP allocates 37 GHz to 43.5 GHz to IMT MOBILE on a co-primary basis with FIXED, SPACE RESEARCH and several satellite applications.

There are currently 2 key 3GPP bands that lie within this range, namely band n259 and n260. Both bands have their full bandwidth allocated for IMT usage.

According to GSA, there are currently 49 devices supporting band n260 presently.

This band will be used for 5G applications of the future, including virtual and augmented reality applications, remote control of industrial robots, autonomous vehicles, as well as entertainment services, such as downloading 4K movies in seconds¹².

Vodacom notes that the entire range (from 37 GHz to 43.5 GHz) may not be made available to IMT currently, since there are existing microwave services which coincide with this range. However, as the demand for IMT services increase over time, this is a band that can assist with additional IMT capacity.

Vodacom notes that the secondary allocation for (non-land) mobile is retained in South Africa while having been removed from Region 1, though it is not clear as to the reasons behind such a move. As such, we recommend that the Authority correct the allocation to align with Region 1, or alternatively provide reasons for the deviation from Region 1.

43.50 GHz to 45.50 GHz

The 2021 NRFP allocates 43.5 – 45.5 GHz to MOBILE on a co-primary basis with MOBILE-SATELLITE, RADIONAVIGATION, RADIONAVIGATION-SATELLITE.

Footnote 5.553(A) indicates that South Africa wishes to utilize the band for terrestrial IMT, provided it causes no harmful interference to space radiocommunication services.

Vodacom recommends to not make any changes to this range for now.

45.50 GHz to 48.20 GHz

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
5.149 5.547 5.551H	5.149 5.547 5.551H	(International Mobile Telecommunications (IMT))	Recommendation ITU-R M.1036-6 currently being updated revised within the ITU-R
43.5-47 GHz	43.5-45.5 GHz		



MOBILE 5.553 5.553A MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE	MOBILE 5.553 5.553A MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.554		Resolution 244 (WRC-19)
5.554	45.5-47 GHz MOBILE 5.553 5.553A MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.554	(International Mobile Telecommunications (IMT))	Resolution 244 (WRC-19) Recommendation ITU-R M.1036-6 currently being updated revised within the ITU-R
47-47.2 GHz AMATEUR AMATEUR-SATELLITE	47-47.2 GHz AMATEUR AMATEUR-SATELLITE	Amateur Amateur satellite	
47.2-47.5 GHz	47.2-47.5 GHz		

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
FIXED FIXED-SATELLITE (Earth-to- space) 5.550C 5.552 MOBILE 5.553B 5.552A	FIXED FIXED-SATELLITE (Earth-to- space) 5.550C 5.552 MOBILE 5.553B 5.552A	[FIXED (HAPS)] (International Mobile Telecommunications (IMT))	Resolution 770 (WRC-19) Resolution 243 (WRC-19) Recommendation ITU-R M.1036-6 currently being updated revised within the ITU-R
47.5-47.9 GHz FIXED FIXED-SATELLITE (Earth-to-space) 5.550C 5.552 (space-to-Earth) 5.516B 5.554A MOBILE 5.553B	47.5-47.9 GHz FIXED FIXED-SATELLITE (Earth-to-space) 5.550C 5.552 (GSO) (space-to-Earth) 5.516B 5.554A MOBILE 5.553B	The band 47.5-47.9 GHz is identified for HDFSS; Res.143 applies. HIGH-DENSITY APPLICATIONS IN THE FSS (space-to-Earth)]	Resolution 770 (WRC-19) Resolution 243 (WRC-19) Recommendation ITU-R M.1036-6 currently being updated revised within the ITU-R



		<u>(International Mobile Telecommunications (IMT))</u>	
47.9-48.2 GHz FIXED FIXED-SATELLITE Earth to space) 5.550C 5.552 MOBILE 5.553B	47.9-48.2 GHz FIXED FIXED-SATELLITE Earth to space) 5.550C 5.552 MOBILE 5.553B	[FIXED (HAPS)] <u>(International Mobile Telecommunications (IMT))</u>	Resolution 770 (WRC-19) Resolution 243 (WRC-19) Recommendation ITU-R M.1036-6 currently being updated revised within the ITU-R

The 2021 NRFP allocates 45.2 GHz to 48.2 GHz to IMT MOBILE (excluding 47-47.2 GHz, which is allocated to AMATEUR and AMATEUR-SATELLITE) on a co-primary basis with MOBILE-SATELLITE, RADIONAVIGATION, RADIONAVIGATION-SATELLITE, FIXED and FIXED-SATELLITE.

The band was only recently considered for IMT harmonization and as such, currently only 1 3GPP band lies within the range, namely n262. Vodacom supports the allocation of this band for IMT usage.

47.90 GHz to 48.20 GHz

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
47.9-48.2 GHz FIXED FIXED-SATELLITE Earth to space) 5.550C 5.552 MOBILE 5.553B	47.9-48.2 GHz FIXED FIXED-SATELLITE (Earth to space) 5.550C 5.552 MOBILE 5.553B	[FIXED (HAPS)] <u>(International Mobile Telecommunications (IMT))</u>	Resolution 770 (WRC-19) Resolution 243 (WRC-19) Recommendation ITU-R M.1036-6 currently being updated revised within the ITU-R

The 2021 NRFP allocates 47.9 – 48.2 GHz to MOBILE on a co-primary basis with FIXED and FIXED-SATELLITE. Footnote 5.553(A) indicates that South Africa wishes to utilize the band for terrestrial IMT, provided it causes no harmful interference to space radiocommunication services.

Currently there are no 3GPP bands defined for this range. The band is currently being studied for IMT application¹³. Vodacom recommends to not make any changes to this range for now.

¹³ <https://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2019/RED-2019/presentation/4.5-%D0%A0%D0%B5%D1%81%D1%82%D1%80%D0%B5%D0%BF%D0%BE.pdf> Pg. 42



48.20 GHz to 52.60 GHz

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
5.552A	5.552A		
48.2-48.54 GHz FIXED FIXED-SATELLITE (Earth-to-space) 5.550C 5.552 (space-to-Earth) 5.516B 5.554A 5.555B MOBILE	48.2-48.54 GHz FIXED FIXED-SATELLITE (Earth-to-space) 5.550C 5.552 (GSO) (space-to-Earth) 5.516B 5.554A 5.555B MOBILE	HIGH-DENSITY APPLICATIONS IN THE FSS (space-to-Earth)]	The band 48.2-48.54 GHz is identified for HDFSS; Res.143 applies. Resolution 770 (WRC-19) Recommendation ITU-R M.1036-6 currently being updated revised within the ITU-R
48.54-49.44 GHz FIXED FIXED-SATELLITE (Earth-to-space) 5.550C 5.552 MOBILE	48.54-48.94 GHz FIXED FIXED-SATELLITE (Earth-to-space) 5.550C 5.552 MOBILE 5.149 5.340 5.555		Resolution 770 (WRC-19)
	48.94-49.04 GHz FIXED FIXED-SATELLITE (Earth-to-space) 5.550C 5.552 MOBILE RADIO ASTRONOMY 5.149 5.340 5.555		
	49.04-49.44 GHz		

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
5.149 5.340 5.555	FIXED FIXED-SATELLITE (Earth-to-space) 5.550C 5.552 MOBILE 5.149 5.340 5.555		Resolution 770 (WRC-19)
49.44-50.2 GHz FIXED FIXED-SATELLITE (Earth-to-space) 5.338A 5.550C 5.552 (space-to-Earth) 5.516B 5.554A 5.555B MOBILE	49.44-50.2 GHz FIXED FIXED-SATELLITE (Earth-to-space) 5.338A 5.550C 5.552 (GSO) (space-to-Earth) 5.516B 5.554A 5.555B MOBILE		Resolution 770 (WRC-19) The band 49.44-50.2 GHz is identified for HDFSS; Res.143 applies.



		HIGH-DENSITY APPLICATIONS IN THE FSS (space-to-Earth)]	
50.2-50.4 GHz EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 5.340	50.2-50.4 GHz EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 5.340		
50.4-51.4 GHz FIXED FIXED-SATELLITE (Earth-to- space) 5.338A 5.550C MOBILE	50.4-51.4 GHz FIXED FIXED-SATELLITE (Earth-to- space) 5.338A 5.550C MOBILE		Resolution 770 (WRC-19)

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
Mobile-satellite (Earth-to-space)	Mobile-satellite (Earth-to-space)		
51.4-52.4 GHz FIXED 5.338A FIXED-SATELLITE (Earth-to-space) 5.555C MOBILE 5.338A 5.547 5.556	51.4-52.4 GHz FIXED 5.338A FIXED-SATELLITE (GSO) (Earth-to-space) 5.555C MOBILE 5.547 5.556		The band 51.4-52.6 GHz is identified for HDFS; Res.75 applies.
52.4-52.6 GHz FIXED 5.338A MOBILE 5.547 5.556	52.4-52.6 GHz FIXED 5.338A MOBILE 5.547 5.556		
52.6-54.25 GHz	52.6-54.25 GHz	Passive Sensing (53.6 – 59.3 GHz)	

Vodacom notes that the entire range, excluding 50.2-50.4 GHz is allocated to MOBILE (non IMT) on a co-primary basis with other services.

Vodacom recommends that no change occurs in this range for now.



55.78 GHz to 66.00 GHz

The 2021 NRFP allocates 55.78 – 66 GHz to MOBILE on a co-primary basis with FIXED, EARTH EXPLORATION SATELLITE, FIXED, INTER-SATELLITE (GSO) and SPACE RESEARCH (passive) for the range 55.78-56.9 GHz, on a co-primary basis with EARTH EXPLORATION SATELLITE, FIXED, INTER-SATELLITE (GSO), INTER-SATELLITE (non-GSO) and SPACE RESEARCH (passive) for the range 56.9-57 GHz, on a co-primary basis with EARTH EXPLORATION SATELLITE, FIXED, INTER-SATELLITE and SPACE RESEARCH (passive) for the range 57-58.2 GHz, on a co-primary basis with EARTH EXPLORATION SATELLITE, FIXED and SPACE RESEARCH (passive) for the range 58.2-59 GHz, on a co-primary basis with EARTH EXPLORATION SATELLITE (passive), FIXED, INTER-SATELLITE (GSO), RADIOLOCATION and SPACE RESEARCH (passive) for the range 59-59.3 GHz, on a co-primary basis with FIXED, INTER-SATELLITE and RADIOLOCATION for the range 59.3-64 GHz and finally, on a co-primary basis with FIXED and INTER-SATELLITE for the range 64-66 GHz.

There are currently no 3GPP bands that lie within this range. Vodacom recommends to not make any changes to this range for now.

66.00 GHz to 71.00 GHz

ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
RADIOLOCATION 5.559 5.138	RADIOLOCATION 5.559 5.138		The band 61-61.5 GHz is designated for ISM applications (5.138). The band 59 - 61 GHz reserved for government use. Common international SRD band; see ITU-R RecSM. 1896
64-65 GHz FIXED INTER-SATELLITE MOBILE except aeronautical mobile 5.547 5.556	64-65 GHz FIXED INTER-SATELLITE MOBILE except aeronautical mobile 5.547 5.556		The band 64-66 GHz is identified for HDFS; Res.75 applies. Radio Frequency Spectrum Regulations Amendments (Government Gazette Number 40436, 22 November 2016.
65-66 GHz EARTH EXPLORATION-SATELLITE FIXED INTER-SATELLITE MOBILE except aeronautical mobile SPACE RESEARCH 5.547	65-66 GHz EARTH EXPLORATION-SATELLITE FIXED INTER-SATELLITE MOBILE except aeronautical mobile SPACE RESEARCH 5.547		The band 64-66 GHz is identified for HDFS; Res.75 applies. Radio Frequency Spectrum Regulations Amendments (Government Gazette Number 40436, 22 November 2016



ITU Region 1 allocations and footnotes	South African allocations and footnotes	Typical Applications	Notes and Comments
INTER-SATELLITE MOBILE 5.553 5.558 5.559AA MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION - SATELLITE 5.554 5.561	INTER-SATELLITE MOBILE 5.553 5.558 5.559AA MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION - SATELLITE 5.554 5.561	<u>International Mobile Telecommunications (IMT)</u>	Resolution 241 (WRC-19) Recommendation ITU-R M.1036-6 currently being updated revised within the ITU-R

The 2021 NRFP allocates 66 GHz to 71 GHz to IMT MOBILE on a co-primary basis with INTER-SATELLITE, MOBILE-SATELLITE, RADIONAVIGATION, RADIONAVIGATION-SATELLITE.

Vodacom supports the allocation of this band for IMT usage.

The band will be used for unlicensed 5G and will co-exist with non-IMT applications¹⁴.

71.00 GHz to 76.00 GHz

The 2021 NRFP allocates 71 GHz to 66 GHz to MOBILE on a co-primary basis with FIXED, FIXED-SATELLITE, MOBILE-SATELLITE for the range of 71 – 74 GHz and on a co-primary basis with FIXED, FIXED-SATELLITE, BROADCASTING and BROADCASTING-SATELLITE for the range of 74 – 76 GHz.

Currently there are no 3GPP bands defined for this range. The band is currently being studied for IMT application¹³. Vodacom recommends to not make any changes to this range for now.

81.00 GHz to 275.00 GHz

The 2021 NRFP allocates 71 GHz to 66 GHz to MOBILE on a co-primary basis with FIXED, FIXED-SATELLITE, MOBILE-SATELLITE and RADIO ASTRONOMY for the range 81 – 84 GHz and on a co-primary basis with FIXED, FIXED-SATELLITE and RADIO ASTRONOMY for the range of 84 – 86 GHz.

The range of 81 – 86 GHz was studied for IMT applications¹³. Vodacom is monitoring further developments that may occur within this range for IMT and recommends to not make any changes to this range for now.

¹⁴ <https://www.gsma.com/spectrum/wp-content/uploads/2018/12/AI-1.13-Positions.pdf>