



13 JANUARY 2023

Vodacom's Submission on:

Draft Radio Frequency Spectrum Assignment Plan for the frequency band 138 MHz to 144 MHz of 2022, Gazette 47559 of 25 November 2022.

Draft Radio Frequency Spectrum Assignment Plan for the frequency band 157 MHz to 174 MHz of 2022, Gazette 47559 of 25 November 2022.

Draft Radio Frequency Spectrum Assignment Plan for the frequency band 335 MHz to 380 MHz of 2022, Gazette 47559 of 25 November 2022.

Draft Radio Frequency Spectrum Assignment Plan for the frequency band 380 MHz to 399 MHz of 2022, Gazette 47559 of 25 November 2022.

Draft Radio Frequency Spectrum Assignment Plan for the frequency band 406 MHz to 410 MHz of 2022, Gazette 47559 of 25 November 2022.

Draft Radio Frequency Spectrum Assignment Plan for the frequency band 410 MHz to 430 MHz of 2022, Gazette 47559 of 25 November 2022.

Draft Radio Frequency Spectrum Assignment Plan for the frequency band 440 MHz to 450 MHz of 2022, Gazette 47559 of 25 November 2022.

Draft Radio Frequency Spectrum Assignment Plan for the frequency band 1518 MHz to 1525 MHz of 2022, Gazette 47559 of 25 November 2022.



1. General Comments

Vodacom continues to be encouraged by the Authority's proactivity in reviewing spectrum assignments in South Africa, but most importantly in this case, lower frequency bands that have the ability to enable improved basic coverage and enhance connectivity capacity where there is already coverage.

Whilst there is still a significant need for IMT spectrum assignment¹ for the purpose of providing national coverage and capacity, the bands for which the Authority has published draft assignment plans provide a valuable opportunity for the Authority to advance digital connectivity in South Africa (and consequently the economy), if implemented in a prudent and forward-looking manner.

We wish to bring to the Authority's attention that there are other complementary bands (to 450-470MHz) which are either being considered, or indeed already have been allocated by some countries to IMT, in order to increase the capacity of their ultra-wide broadband coverage layers. These include the 410MHz (410-430MHz) and the 380MHz (380-400MHz) spectrum ranges. Without having to migrate existing PPDR/PAMR services in the low-frequency bands, IMT can be allocated and assigned in order to introduce a greater diversity of services, enabling more efficient use of the band. Moreover, in the L-band a co-existence (with a 3MHz guard band) of MSS and IMT may be possible in the near future.

It would serve the Authority's strategic forward-looking approach to consider further IMT 5G uses in some of these lower frequency bands including the L-Band, in order to enable additional capacity and enhance the quality of IMT services where IMT is deployed. We urge the Authority to consider and consult further on the assignment of these complementary bands for IMT services.

2. Comments on Frequency 138 – 144MHz

Vodacom agrees with the Authority's approach of migrating legacy users out of the band 410-430MHz, as per its stated intention in paragraph 2.6., to migrate Eskom UHF repeaters using 407/417MHz. We recommend that this approach be followed nationally for the band 410-430MHz. This will enable a faster allocation and assignment for IMT use, complementing other low-frequency IMT bands, and improving digital inclusion over a much larger area of South Africa.

3. Comments on Frequency 380 – 399MHz

The 380 MHz range is currently in the process of a 3GPP band being standardized for it. There are trials ongoing in the band in Uganda as well as in Columbia (snapshot found in Figure 3). As the band standardizing by 3GPP is concluded and an ecosystem is developed, this band will be complimentary to the IMT450 band, as well as the 410–430 MHz range. The band has the same capacity and similar propagation characteristics, and as such, will be able to provide similar services.

It is prudent for the Authority to recognise that numerous essential services in South Africa, including emergency services, currently use commercial IMT services, instead of relying solely on dedicated PPDR/PAMR services. This approach has allowed for network redundancy, with essential service workers across the country being able to benefit from the vast scale of commercial IMT network investment. An allocation of the band to both traditional PPDR/PAMR services, as well as IMT for broadband use, will likely allow for greater redundancy going forward in regard to areas that are difficult to cover with current assigned IMT frequencies, further improving the accessibility by essential service workers. As the band is unlikely to be used 100% of the time for PPDR/PAMR applications, especially in areas with lower population

¹ <https://www.gsma.com/spectrum/wp-content/uploads/2021/07/Estimating-Mid-Band-Spectrum-Needs.pdf>



density, it is possible for commercial IMT consumer services to leverage off the same network to provide broadband coverage in areas that currently have a high mobile access feasibility deficit.

By way of example, other countries are approaching the allocation and assignment of the band in a similar manner as recommended above. The approach followed by the United States government and mobile operator AT&T, allows for both PPDR/PAMR and IMT services to make use of this band, whilst maintaining the prioritization of PPDR/PAMR as and when the need arises on the network. This approach results in the more effective use of the band. If the Authority were to follow a similar approach, it would provide greater benefit to South Africa than using the band solely for PPDR/PAMR applications. A further benefit would be that, in deep rural areas where traditional PPDR/PAMR are not consistently available, there would be an alternative means to provide emergency response communication via IMT.

A 3GPP work item is planned for this band in the next 3GPP RAN 4 and RAN Plenary meetings, expected to kick off in late February 2023. The standardization of this band is expected to be concluded within the next 1-2 years, opening up many more connectivity opportunities as the ecosystem develops. As such, Vodacom recommends that the Authority postpones any key decisions on the use of this band (including the finalisation of this RFSAP) until such time as the 3GPP standardisation has been concluded. Assignment of the band towards less efficient technologies, would jeopardize the additional benefits that could be realised in the not-so-distant future, to the detriment of South Africa.

4. Comments on Frequency 410 – 430MHz

Vodacom once again highlights the complementary bands to IMT450 namely 410 MHz (410–430 MHz) and 380 MHz (380–400 MHz). Whilst IMT450 provides an entry point for IMT services to reach access constrained areas, especially capacity for indoor network services in deep rural areas, the IMT410 band will enable better quality and capacity for a wider suite of applications in the rural areas.

Vodacom strongly recommends that band 410 – 430 MHz should be considered as high demand spectrum and as such, should be assigned via a fair and transparent ITA process, rather than a standard assignment, as currently proposed by the Authority. The band can be used for commercial consumer IMT services when PPDR/ IoT services are not being requested, maximizing the use of the band. Doing so will promote competition in the PAMR, PPDR and IoT industry in South Africa, maximizing efficient use of the band and promote a diverse range of band applications. In addition, similar to our comments on the 380 MHz band, the 410MHz band can be used for IMT purposes when mission-critical services (such as PPDR) are not being requested, further improving the use of the band. Operators that have rural coverage obligations emanating from the Authority's 2022 IMT auction have already deployed significant infrastructure to enable the faster deployment of lower band frequencies as they become available for IMT. The IMT380 band will further improve quality of connectivity, especially to deep rural areas.

According to the GSA², there are currently 6 device variants supporting 3GPP B87 and 2 device variants supporting 3GPP B88, separated by form factor as illustrated below:

² <https://gsacom.com/>

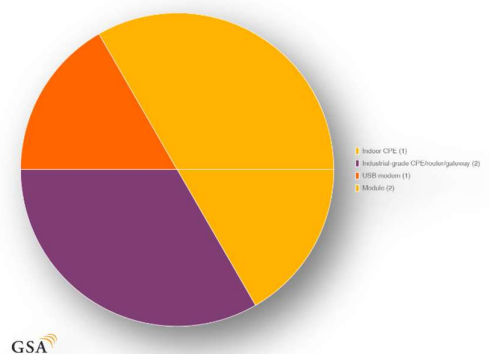


Figure 1: Device Variants supporting B87

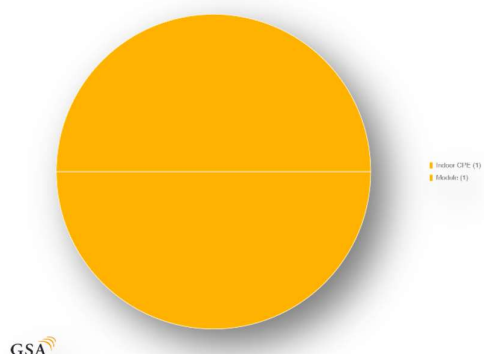


Figure 2: Device Variants supporting B88

In addition, according to the 450 Alliance Member Report³, there are at least 24 vendors that have released device variants supporting 3GPP B87 suggesting that the GSA device count may be lower than that which is currently available.

According to the 450 Alliance⁴, a number of Region 1 countries are either currently using, or have started consultations to use the 410 MHz band for LTE. Vodacom supports the proposal for a 3GPP B87 channel arrangement, due to the likelihood of a stronger equipment ecosystem. Countries such as Botswana, United Kingdom, Ireland, Bahrain, Poland and more have already assigned LTE410 in this band, as seen below. To the best of Vodacom's knowledge, B87 is deployed internationally with no B88 deployments that are currently known.

Beyond PPDR/PAMR and LTE there are firm possibilities of IMT 5G in the 410 – 430MHz band which the Authority ought to consider when taking a strategic forward-looking approach, potentially allowing for an accelerated national 5G coverage expansion.

³ Annual Equipment Report, Member version Confidential 450 MHz Alliance, April 2022

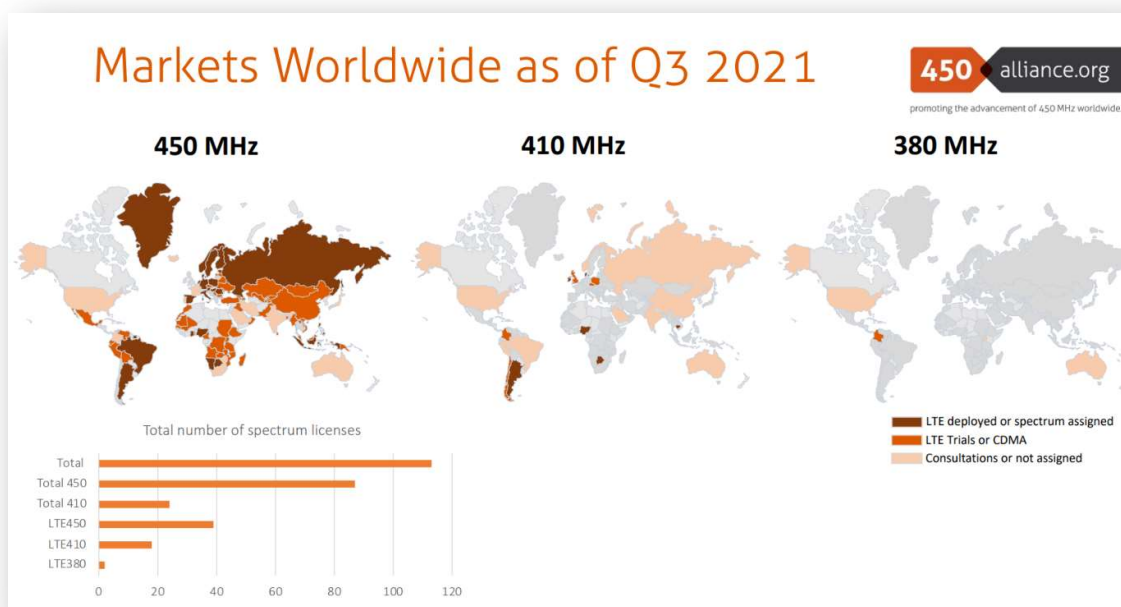


Figure 3: Global Snapshot of 380, 410 and 450 MHz used for LTE⁴

5. Comments on Frequency 1518 – 1525MHz

In general, the 1518–1525 MHz range was intended to act as a guard band between IMT and MSS services. However, recent studies⁵ between IMT SDL and MSS conclude that they can coexist with a guard band of 3 MHz. This conclusion is also applicable to the case between FDD-IMT and MSS.

In order to maximise the benefits of IMT in the 1500 MHz range, ideally allowing for full 90MHz of IMT in the range 1427-1518MHz, countries and regions should work towards harmonised use of the band. As per the GSMA⁶, the development of the 1500 IMT range as a driver for mobile broadband is already well underway. Once this is achieved, the extended L-Band (1518-1525MHz) allows for further incremental gains, by potentially expanding the L-band IMT allocation from 90MHz to 97MHz once a 3GPP band has been standardised.

In the CITC public consultation response published in 2021⁷, they recognised Huawei’s input that “ Critical MSS services are not directly adjacent to 1427-1518 MHz. GMDSS maritime services operate in the band 1530-1544 MHz. Aeronautical AMS(R)S services operate in the band 1525-1559 MHz”. Importantly, CITC states in their assessment that they “note that there is no MSS use below 1527 MHz in the Kingdom. We do not plan to allocate spectrum below 1527 MHz for MSS”.

Therefore, Vodacom encourages the Authority allocate this band for terrestrial IMT use in anticipation of 3GPP standardisation, in addition to acting as an MSS guard band (where required).

⁴ https://450alliance.org/wp-content/uploads/2022/06/450MHz-Alliance-Brief_JUN2022.pdf

⁵ <https://www.gsma.com/spectrum/wp-content/uploads/2017/06/L-band-1500-MHz-IMT-Range.pdf>

⁶ <https://www.gsma.com/spectrum/wp-content/uploads/2017/06/L-band-1500-MHz-IMT-Range.pdf>

⁷ <https://www.cst.gov.sa/ar/new/publicConsultation/Documents/Fostering%20Commercial%20and%20Innovative%20use%20of%20Radio%20Spectrum.pdf>