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INDEPENDENT COMMUNICATIONS AUTHORITY OF SOUTH AFRICA

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RADIO FREQUENCY SPECTRUM REGULATIONS

REASONS DOCUMENT

IMT 450

IMT 850

IMT 1500

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1 Introduction

1.1 This Reasons Document provides the background and basis for the decisions made in finalising final radio frequency spectrum assignment plans (RFSAPs) for the IMT450, IMT850 and IMT1500 bands. The RFSAPs follow from an inquiry for the implementation of the radio frequency migration plan and the IMT roadmap (Government Gazette 45247), the findings of that inquiry (Government Gazette 45690), a first consultation on the Draft RFSAPs for the IMT450, IMT850 and IMT1500 bands (Government Gazette 46160, notices 1961, 1965 and 1967), and a follow-up second consultation (Government Gazette 48078, notices 3064, 3065, and 3066) on these bands.

1.2 The reasons for the decisions on each of the three bands are provided in the respective sections that follow this one. For each band, the Authority provides highlights from the RFSAP, a summary of general comments and the Authority's analysis of those comments, and detailed stakeholder comments and the Authority's analysis.

2 450 - 470 MHz (IMT450)

2.1 Highlights from RFSAP

2.1.1 The Authority has developed an RFSAP for the 450 - 470 MHz band allocating this band primarily for the International Mobile Telecommunications (IMT) and digital services only, allowing for temporary coexistence with analogue narrowband services that do not interfere with IMT, such as those used by Transnet. The Authority has decided to implement the D14 band plan, which provides for 2x5 MHz. The RFSAP also considers exclusion zones that may be published to accommodate some Government services. All other users will need to switch off their services in the band and vacate. A migration plan to clear the band has been in place since the publication of Government Gazette Number 38755, 30 March 2015, which set out the end of the dual-illumination period in 2022.

2.2 General Comments and the Authority's Analysis

General Comments:

2.2.1 There is significant interest in this band, with a number of parties suggesting it can be used for IMT, and there is also demand for alternative uses. The band is thus in high demand.

2.2.2 Stakeholders, including Cell C, MTN, Telkom and Vodacom, are in support of the allocation of this band to IMT using the D14 band plan. In earlier submissions, Huawei, Liquid Telecoms, Nokia, SACF, Telkom, Transnet and Vodacom were all in support of allocating this band to IMT.

2.2.3 Telkom has proposed that their Swiftnet assignment be retained in this band and used for narrowband services. Vodacom commented that the Authority should allocate this band exclusively to IMT services, with no secondary services to be made available in this band. In Cell C's submissions, they state the methodology used by the Authority to determine the demand for this band outweighing supply is unclear. They further comment that any Government service utilising this band needs to be migrated out. MTN has requested the Authority to list which operators currently have spectrum assigned in this band. Transnet has

asserted that they will help in harmonising the band with SADC members and will supply a migration plan to ensure a smooth transition to IMT technologies.

Authority's Analysis:

2.2.4 There is consensus among stakeholders on the use of the 450 MHz band for IMT, applying the D14 band plan. Transnet has requested that they continue to share this band despite being required to migrate since 2015. Transnet made a number of mitigating representations to the Authority in this regard which are credible, for example that the destination band of 406.1 - 410 MHz or 406 - 426 MHz that they were to migrate to turned out to not be an appropriate band for them since there is no digital equipment to test in that band for their current analogue services. Transnet demonstrated willingness to migrate to digital by carrying out a trial with LTE equipment. Transnet conducted a Digital trial and pilot tests in the remote area of Thabazimbi, and has a clear preference now for an IMT450 digital solution for all its 2500 locomotives and 15000 handheld devices across RSA. Transnet would have to rely on the new IMT450 licensee in the band to facilitate the digital switchover of its current analogue communication services for all its locomotives. The Authority also considers the Transnet's current services as critical national infrastructure (CNI) and safety communications systems. It would be disproportionate to force them to shut down given these circumstances. Rather, a migration plan needs to be put in place with the licensee ultimately awarded spectrum in the band.

2.2.5 Telkom/Swiftnet, by contrast, do not present any such set of mitigating circumstances as to why it has not migrated out of the band even though this has been a requirement since 2015. For instance, Telkom/Swiftnet has never carried out a trial to migrate out of the band that the Authority is aware of. Their infrastructure is not critical and there are no safety implications in respect of migrating them out of the band. The Authority thus considers that Swiftnet has no equivalent mitigating circumstances to Transnet, and that it is therefore proportionate and right that they vacate the band.

2.3 Detailed Stakeholder Comments

2.3.1 The table below provides a summary of pertinent feedback from stakeholders, to recent inquiries and consultations, with the Authority's analysis on that feedback.

		Authority's analysis
450 Alliance	<p><u>March 2023</u>: 450 MHz Alliance supports the proposed RFSAP. They propose a slow migration starting with 1.5 MHz, then 3 MHz, then 5 MHz. They also have proposals around detailed technical specifications.</p> <p><u>May 2022</u>: The 450 MHz Alliance supports the Authority's proposals.</p>	<p>The 450 MHz Alliance's support is acknowledged.</p> <p>[ICASA: to consider migration proposal and detailed technical specifications]. ICASA has since had technical meetings with the 450 MHz Alliance.</p>
Cell C	<p><u>March 2023</u>: The device ecosystem for 3GPP and Band B31 are maturing, and so the Band 14 plan makes sense. LTE 450 supports M2M and IoT applications, where strong growth is expected from 2021 onwards. The band ought to be cleared of other users. Cell C reiterated its point about the methodology for determining whether demand exceeds supply.</p> <p><u>February 2022</u>: Cell C states that the government services in this band need to be migrated out. Cell C is unsure of the methodology the Authority</p>	<p>Cell C's comments about the band plan support the Authority's position. Transnet needs to remain in the band, for the reasons explained above in the main text.</p> <p>There is significant interest in this band, with a number of parties suggesting it can be used for IMT, and there is contestation for use of this band by other stakeholders, suggesting it is indeed in high demand. Demand clearly exceeds supply, since there is only 2 x 5MHz</p>

	used to determine that the demand for this band outweighs the supply.	available in the band, likely suitable for only one licensee. This is a common feature of IMT bands, which have substantial commercial value in South Africa.
Eskom	<u>May 2022</u> : Eskom commented that they use 450 - 453 MHz paired with 460 - 463 MHz for fixed UHF links services. They have largely migrated across to 1.4 GHz even though there are large obstructed areas in this band and its use is prohibited in the KCAAA. Request to be included next to government services in this band.	The Authority has decided that all incumbents, except Transnet, be migrated out of this band, and this should not affect Eskom substantially, since it has already largely migrated.
eThekweni Municipality	<u>February 2022</u> : eThekweni Municipality raised concerns about the allocation of the band to IMT, as they feel it would be better served as a specialised PPDR network, which has high availability, dedicated capacity, prioritised capacity, extensive coverage and fits better within the procurement rules.	The Authority has allocated alternative bands for PPDR services that eThekweni Municipality and similar stakeholders can use for PPDR services. There is no new evidence showing that the value of PPDR services outweighs the value of IMT services in this band, given the alternative bands the Authority has made available for PPDR.
MTN	<u>March 2023</u> : Approves of the Band 14 arrangement. Comments on differences in ICASA documents regarding the radio frequency spectrum assigned to Transnet in this band which adds 2MHz of spectrum bandwidth within IMT450 to Transnet, and requests clarity on this. <u>February 2022</u> : MTN does not consider the ecosystem for this band to be mature yet. Requests clarity on the current assignments in this band.	The Authority is in the process of developing a radio frequency spectrum register which will include all current assignments, save for any government services that are of a sensitive nature.
SANDF	<u>December 2021</u> : The SANDF commented about their concerns for safety of life issues in parts of this band.	The Authority will consider exclusion zones for government services where applicable.
Telkom	<u>March 2023</u> : Telkom is in support of the allocation of this band to IMT. Telkom proposes its Swiftnet assignments will not interfere with IMT deployments. Telekom states that if Swiftnet is expected to migrate from this band, the Authority needs to issue a notice, including a designation band for the migration, to Swiftnet. <u>February 2022</u> : Telkom is in support of the Authority's proposal to apply the D14 (3GPP Band 31 plan). Telkom makes the same comments as in December 2021 regarding unaffected fixed links, existing users and exclusion zones. <u>December 2021</u> : Telkom considers that unaffected fixed links should not be migrated out of the band. Telkom proposes that the Authority makes available the locations of all deployments in the band (including government services) so new users can plan around this, and Telkom similarly recommends that exclusion zones be clearly identified.	The Authority is in the process of developing a radio frequency spectrum register which will include all current assignments, save for any government services that are of a sensitive nature. Telkom needs to migrate out of this band, for the reasons explained in the text above. See The Authority Analysis on the IMT450 Band above.
Transnet	<u>March 2023</u> : Transnet supports the D14 plan, and acknowledges uses of the band for PPDR or	See The Authority Analysis on the IMT450 Band above.

	<p>machine type communication. Transnet would also include the designation of this band for mission critical communication needs.</p> <p>Transnet requests a commitment from the Authority to set up exclusion zones in this band, to protect any government services.</p> <p>Transnet undertakes to manage all coordination issues to eliminate interference in the bands, including cross-border.</p> <p><u>May 2022:</u> Transnet requests additional time for the migration to IMT, as they currently use the band for various services and have experienced harmful interference at the borders of South Africa. Transnet has requested this band to not be auctioned, but rather to be used by state enterprises in line with the national development plan, rail policy etc. Transnet has indicated that it already has plans to deploy an IMT network.</p>	<p>Exclusion zones are considered in the RFSAP.</p> <p>The Authority acknowledges Transnet's undertakings to manage coordination to eliminate interference. This will need to be incorporated in a migration plan developed with the licensee awarded spectrum in the band.</p> <p>See The Authority Analysis on the IMT450 Band above.</p>
Vodacom	<p><u>March 2023:</u> Vodacom is concerned that Transnet remaining in the band will impact on IMT deployments. Vodacom also suggests that there are complementary bands below 450 MHz that might also be used for IMT, and incumbents using the spectrum for PPDR services. These bands, including 380 - 400 MHz & 410 - 430 MHz, should not be destination bands for migration.</p> <p><u>February 2022:</u> Vodacom is in support of the Authority's proposal to apply the D14 (3GPP band 31 plan). Vodacom states the Authority should consider this band for IMT services only, with no secondary services. They propose 335.4 - 387 MHz band for migration.</p>	<p>For the reasons explained above in the main text, Transnet's links need to remain in the band.</p> <p>Additional IMT bands below 450 MHz will be considered by the Authority for future RFSAPs.</p>

3 825 - 830 MHz and 870 - 875 MHz (IMT850)

3.1 Highlights from RFSAP

3.1.1 The Authority has developed an RFSAP for this band in order to provide for the migration of the sole incumbent out of this band so as to fully free up the IMT800, which has already been partly auctioned. The incumbent is to be migrated to the IMT900 band. The RFSAP will be repealed once this migration has taken place.

3.2 General Comments and the Authority's Analysis

General Comments:

3.2.1 Stakeholders largely agree on the migration of the incumbent operator to an alternative band; however each stakeholder presented different recommendations and reasonings on which the alternative band for migration should be.

3.2.2 Liquid, the incumbent in the 850 MHz band, commented that the position advanced by the draft IMT850 RFSAP stands to benefit both the affected operators, their subscribers, and South African consumers generally. Liquid welcomes the migration of its legacy IMT850 assignment to the 900 MHz destination band.

3.2.3 Telkom proposes that IMT450 is a more appropriate alternative to IMT850 than IMT900, since IMT450 band is much less valuable based on auction results, and IMT900 spectrum assigned to Liquid might be used to provide roaming or similar services to MTN and/or Vodacom, which would harm competition. MTN does not object to the proposal but states that the RFSAP for IMT900 currently provides for an auction, which would no longer be applicable if the spectrum is assigned to Liquid. Vodacom's recommendations are the following bands as replacement bands: 2010 - 2025 MHz or 1x10 MHz in 2300 MHz. Cell C states that it is unclear how the Authority has reached its decision to assign the incumbent in the 850 MHz band prime IMT900 MHz spectrum in circumstances where Cell C, for instance, had to forego some spectrum in the same band with no target band for migration. In the past in respect of IMT2600, additional spectrum was awarded to licensees during migration.

3.2.4 Nokia states that all existing transmissions from 825 - 830 MHz paired with 870 - 875 MHz band should be cleared, and no new assignment for these bands should be approved.

The Authority's Analysis:

3.2.5 The Authority will consider the potential impact on competition from migrating the incumbent to the 900MHz band as a result of the submissions made by Telkom for this band before a new licence for the band is issued to Liquid, including obligations to mitigate any future competition harms. Cell C's concerns compare quite different situations, with Cell C foregoing a very small amount of spectrum together with MTN and Vodacom in order to free-up the band. This compares to Liquid foregoing all its valuable sub-1GHz spectrum in the present matter. In this case, Liquid is foregoing almost 2x5 MHz in the 850 MHz band, and is being migrated to 2x5 MHz in IMT900, and so it is not migrating to a different band with a significantly different physics. Responses by Cell C, Telkom, and Vodacom do not provide significant evidence of harm to them against Liquid's migration to 900 MHz. All these main operators possess valuable

sub-1GHz spectrum too. Therefore, the Authority has decided to proceed with the consultation's proposal of IMT900 as the destination band for Liquid.

3.2.6 Regarding alternatives proposed by Telkom and Vodacom:

- 450 MHz: This band has quite different physics characteristics to the IMT850 band, since the 450 MHz band will likely have fixed-wireless characteristics, while 900 MHz provides for a fully-mobile offering as IMT850 did.
- 2010 - 2025 MHz: This band does not have the same propagation characteristics as sub-1 GHz spectrum. Furthermore, the ecosystem for IMT/FWA in the band is not highly developed, and PMSE is arguably the highest value use of this band to date. HIBS is also proposed in this band for Region 1, subject to WRC 2023 deliberations.¹ It was also *not* on the list of alternative destination bands consulted on in the second consultation. This band is therefore not suitable as a target for migration.
- 2300 MHz: This band does not have the same propagation characteristics as sub-1 GHz spectrum.

3.3 Detailed stakeholder comments

3.3.1 The table below provides a summary of pertinent feedback from stakeholders to recent inquiries and consultations, with the Authority's analysis on that feedback.

		Authority Analysis
Cell C	<u>March 2023</u> : Cell C commented that the Authority should be consistent in its approach to migrating licensees to ensure regulatory certainty. In particular, the Authority seems to be treating Cell C differently when requiring them to relinquish spectrum in the 900MHz band with no target band for migration, while offering Liquid a migration option in return for vacating the 850 MHz band. In previous migrations in respect of IMT2600, additional spectrum was awarded. Cell C further states the Authority needs to ensure they comply with the Electronic Communications Act, and in particular the non-discrimination requirements.	See comments in text above in response to Cell C's concerns.
Huawei	<u>February 2022</u> : Huawei do not recommend the introduction of LTE in this band in Africa, due to the overlap with existing bands and planned 800 MHz bands.	This is noted, the RFSAP will be repealed once the migration is complete.
Liquid Telecoms	<u>March 2023</u> : Liquid Telecoms comments the position advanced by the Draft IMT850 RFSAP stands to benefit affected operators, their subscribers, and South African consumers generally. Liquid Telecoms concurs with the legal framework applied in the implementation of the final IMT850 RFSAP and welcomes the migration of legacy IMT50 assignment to the destination band, 2x5 MHz in IMT900 extending from 900 - 905 MHz. <u>December 2021</u> : Liquid Telecoms comments that the 825 - 830/870 - 875 MHz band is currently unused and is unusable for the device system for IMT.	The Authority notes Liquid's approval for the RFSAP.
MTN	<u>March 2023</u> : Does not object to the proposal of migrating the sole incumbent from the band to protect the assignments of operators in the neighbouring 800 MHz	ICASA will amend and reissue the IMT900 RFSAP.

¹ Agenda Item 1.1 at WRC-23 (Res. 247)

	band. Suggests that the IMT900 RFSAP be amended to reflect that an ITA will no longer be possible here. <u>February 2022</u> : MTN does not object to the proposal but does clash with RFSAP for IMT900. Recommends the Authority amend this assignment to not be in breach of their own regulations.	The IMT850 MHz RFSAP will be repealed once the migration has taken place.
Nokia	<u>March 2023</u> : Acknowledges the Authority's proposal to repeal IMT850 RFSAP, and notes that no new assignments will be approved.	Nokia's submissions do not suggest any changes to the RFSAP.
Telkom	<u>March 2023</u> : The 450 MHz band is more suitable since it is less valuable than 900MHz based on auction outcomes. If IMT900 is considered by the Authority as the replacement for IMT850, then Telkom requests the Authority to critically consider the use of 2x5 MHz assignment in IMT900 by the IMT850 incumbent licensee, where the approval is granted for the use of IMT900 band to ensure there is no negative impact on competition, since this spectrum is likely to be shared with mobile incumbents MTN and Vodacom. <u>May 2022</u> : Telkom commented that in several places, the content in the IMT850 RFSAP is in fact the same as the IMT800 RFSAP and the lines between the two plans are crossed several times, suggesting various corrections. <u>February 2022</u> : Telkom stated the Authority had planned to use the 'lower' part of this band for IMT but is unclear on what exactly this will entail. Telkom proposes that IMT450 is more appropriate alternative to IMT850 than IMT900.	See response above in main text regarding competition concerns and differing values. As explained above, the RFSAP for 850 MHz will be repealed once the migration has taken place.
Vodacom	<u>March 2023</u> : Vodacom proposes that the 850 MHz incumbent be migrated to IMT 2010-2025 MHz (1x15 MHz) or 1 x 10 MHz in 2300 MHz. 450 MHz is not suitable for migration as it is a critical coverage band. IMT750 is an unsuitable band as the incumbent doesn't have any low-band spectrum holdings, and it won't be possible to provide services on it. 2.3 GHz is a possible destination band, being used initially for fixed links before being harmonised for IMT. It is most suited to the current incumbent in IMT850. 3.3 GHz is a 5G only band that does not allow the current incumbent to deploy the services offered in IMT850, and it would result in an inefficient use of the spectrum. 26 GHz band is considered in high demand and should rather be allocated in contiguous blocks and is not suited to the current incumbent. <u>February 2022</u> : Vodacom recommends negotiating with Liquid to find a suitable alternative band to migrate to as they are currently not using the frequency. Vodacom proposes 2010 - 2025MHz. <u>December 2021</u> : Vodacom recommends negotiating with Liquid to find a suitable alternative band to migrate to as they are currently not using the frequency.	See the discussion above on reasons for not selecting alternative bands.

4 1427 - 1518 MHz (IMT1500)

4.1 Highlights from RFSAP

4.1.1 The Authority has developed an RFSAP assigning the band 1427 - 1518 MHz to IMT, expanding the original proposal which ended at 1492 MHz as the upper bound. The Authority has decided that the 1427 - 1517 MHz Band would be both allocated to Mobile/Fixed Communications Networks Supplemental Downlink (MFCN SDL) and to IMT 5G-NR TDD/SDL.

4.2 General Comments and the Authority's Analysis

General Comments:

4.2.1 There are disagreements among stakeholders on the proposed RFSAP for this band, mainly between satellite providers and the mobile operators, and between the latter regarding TDD versus MFCN SDL.

4.2.2 The satellite providers, including the GSOA, Inmarsat, and Thuraya/Yahsat, all commented that there are mobile satellite services (MSS) adjacent to 1518 MHz, the upper bound of the Authority's proposed IMT band. MSS are used for maritime applications and in aircraft, and are used in the agriculture and mining sectors, among others. They stress the all-weather resiliency of the L-band used for MSS. They stress that satellite services are available in locations where mobile networks are not. There are studies that show IMT deployments between 1492 MHz and 1518 MHz will cause harmful interference to MSS above 1518 MHz. The mobile operators and equipment vendors Huawei and Nokia, on the other hand, support the Authority's proposal to implement IMT in most of the band.

4.2.3 Cell C, MTN and Vodacom are proposing a TDD band plan for efficient spectrum usage. Telkom states an MFCN SDL configuration is best as it would be in alignment with Europe's approach, and proposes an upper bound of 1517 MHz to provide 1MHz protection to MSS services. MFCN SDL (Band 32 SDL) also allows for carrier aggregation with 800MHz and 900MHz spectrum, and there is a substantial ecosystem developed for this. 5G-NR TDD/SDL (Bands 75/76) in IMT1500 is still the subject of compatibility studies in the ITU's Working Party (WP) 5D, whereas MFCN SDL is already well studied in ECC Recommendations such as ECC/DEC/(17)06². Nokia explains that the 5G-NR SDL and TDD configurations both have limited ecosystems, though there are currently more 5G-NR SDL devices. At the same time, the selection of MFCN TDD in markets in Africa, Asia, Middle East and Latin America mean that the TDD ecosystem will develop too.

The Authority's Analysis:

4.2.4 The responses to the consultation for this band were particularly impressive. Some stakeholders made a very evidenced-based case for preferring Mobile/Fixed Communications Networks Supplemental

² ECC/DEC/ (17)06, ECC Decision of 17 November 2017 on the harmonised use of the frequency bands 1427-1452 MHz and 1492-1518 MHz for Mobile/Fixed Communications Networks Supplemental Downlink (MFCN SDL), Approved 17 November 2017, Corrected 2 March 2018 (<https://docdb.cept.org/document/1016>)

Downlink (MFCN SDL), particularly Band 32 SDL, in this 1427-1517MHz band over IMT 5G-NR TDD/SDL (Bands 75/76). They cited both the much more plentiful devices ecosystem for Band 32 SDL as well as the many countries in Europe that have made decisions to deploy Band 32 SDL in this band, particularly in 1451 - 1492 MHz and less so in 1427 - 1452/1492 -1518 MHz.

4.2.5 The Authority has carefully considered all these sets of representations from IMT and Satellite Stakeholders, as well as other stakeholders. The Authority has decided that the 1427 - 1517 MHz Band will be allocated both to Mobile/Fixed Communications Networks Supplemental Downlink (MFCN SDL) and to IMT 5G-NR TDD/SDL. To address the out-of-band emission concerns of the Satellite community, the new licensees closer to the top of the band (i.e. closer to 1528MHz) would be required to reduce the allowed EIRP down to 58 dBm/5MHz [instead of 61 dBm/5MHz] in order to minimise out-of-band interference into satellite terminals using 1518 - 1525 MHz. Specifically, Base Station transmissions in 1512 - 1517 MHz should not exceed 58 dBm/5MHz EIRP as recommended per ECC/DEC/(17)06. Furthermore, 1517 - 1518 MHz is designated as a guard band to provide 1 MHz of further protection to MSS services. The Authority acknowledged that in exceptional cases, there may be a case for geographical separation of IMT and MSS systems, including PFD limits at ports/waterways and airports to ensure that IMT base stations keep adequate separation from ship earth stations and aircraft earth stations (ESIMs). If these scenarios are likely to arise in the future, the Authority will work with future licensees to mitigate such risks using geographical separation.

4.3 Detailed Stakeholder Comments

4.3.1 The table below provides a summary of pertinent feedback from stakeholders, to recent inquiries and consultations, with the Authority's analysis on that feedback.

		Authority's Analysis
Cell C	<p><u>March 2023</u>: Cell C approves of ICASA's proposal for the band. A TDD configuration is the best means of arranging this band. Existing users of this band may cause interference, but in-band migration can be easily managed to resolve this. There is sufficient bandwidth in 1300 - 1427 MHz to accommodate incumbents. They reiterate their question about why the Authority considers that demand exceeds supply.</p> <p><u>February 2022</u>: Cell C welcomes the proposal to allocate the entire 1427 - 1518 MHz contiguous band for IMT services as this is the most efficient use of available spectrum. They note though that a TDD configuration allows for more efficient spectrum usage (adaptability to allow for adjustments and corrections based on current use case patterns / requirements).</p> <p>Cell C is unclear with regards to how and what methodology was used to determine that demand exceeds supply in IMT1500 band. Cell C recommends Authority include in regulations the</p>	<p>European auctions/competitive processes have realised high bids for sub-parts of this band. For example in 2015, Italy raised EUR462m selling L-Band spectrum in the 1452 MHz - 1492 MHz range³. In the same year, UK operators Vodafone and H3G bought the equivalent spectrum for £200M⁴.</p> <p>In the consultation, many submissions were made on this band by a variety of operators, suggesting there is substantial interest (if not demand), as is the case for many IMT bands. Given that there is only approximately 90 MHz available in the band, and there were comments from 4 mobile operators saying they approve of IMT in the band, a maximum of approximately 20 MHz per operator is possible if all four operators applied. Licensees have recently bid in the Authority's auction for significantly more spectrum at very high valuations. There are also operators</p>

³ [Italy raises EUR462m selling L-Band spectrum \(commsupdate.com\) - https://www.commsupdate.com/articles/2015/09/11/italy-raises-eur462m-selling-l-band-spectrum/](https://www.commsupdate.com/articles/2015/09/11/italy-raises-eur462m-selling-l-band-spectrum/)

⁴ [Qualcomm sheds UK spectrum holdings for £200 million | TelecomTV](#)

	reasons for the determination that this band demand exceeds supply.	that have IMT spectrum but did not comment, and who may seek spectrum in this band. Furthermore, Nokia recommends 40 MHz per licensee, as mentioned below. There is thus limited supply relative to demand. This means that a competitive ITA process is appropriate.
Huawei	<u>February 2022</u> : Huawei recommend this band be released together with 1427 - 1452 MHz and 1492 - 1518 MHz for IMT licensing purposes. They propose this will be a more efficient use of the band. Huawei also proposes the arrangement for this band should be TDD Band n50+n51 and not merely for supplementary downlink.	The Authority notes Huawei's support for the Authority's proposed RFSAP. See the Authority's Analysis above for IMT1500.
MTN	<u>March 2023</u> : MTN supports the rendering of the entire spectrum within this band in a G3 channel arrangement for the future assignment in the medium term. <u>February 2022</u> : MTN, recommend this band be released together with 1427 - 1452 MHz and 1492 - 1518 MHz for IMT licensing purposes. They propose this will be a more efficient use of the band. MTN states there is no economic value in licensing this band for now. <u>December 2021</u> : MTN recommend this band be released together with 1427 - 1452 MHz and 1492 - 1518 MHz for IMT licensing purposes, proposing this will result in more efficient use of the band.	The Authority notes MTN's support for the Authority's proposed approach. See the Authority's Analysis above for IMT1500.
Nokia	<u>March 2023</u> : Nokia notes the TDD and SDL ecosystems are currently limited but will continue to grow. There are currently more devices available for the SDL configuration. Nokia provides the equipment for both 5G-NR configurations, TDD and FDD. The decisions made across markets (Latin America, Middle East, Africa and Asia) to allocate 1427 - 1518 MHz spectrum for TDD operations will have a positive impact on the market demand. Nokia expects this ecosystem to grow accordingly. Nokia's recommendation is for the highest contiguous bandwidth per licensee to allow carriers of at least 20MHz, with increments of 10MHz for the efficient use of this spectrum. Licensees should be assigned 40MHz in total in this band. <u>February 2022</u> : Nokia asserts The DD configuration proposed by the Authority, fall into 3GPP standardised sub-bands 1432 - 1517 MHz, complemented at its lower end by 1427 - 1432 MHz. These two sub-bands are 3GPP standardised in TDD configurations – they have little ecosystem. <u>December 2021</u> : Nokia recommend this band be released together with 1427 - 1452 MHz and 1492 - 1518 MHz for IMT licensing purposes. They propose this will be a more efficient use of the band.	See the Authority's Analysis above for IMT1500.

Vodacom	<p><u>March 2023:</u> Vodacom agrees that the entire band be made available for IMT services in a TDD configuration. This will result in significant consumer benefits due to the provision of capacity for coverage bands, and due to its propagation characteristics. The previous B32 configuration (1452 – 1496 MHz) provided excessive guard bands with adjacent services and was designed for 4G only. There are a range of improvements with the TDD configuration in 3GPP B50/ B51 OR n50/ n51, including the availability of 5G, uplink capability, better coverage for uplink and downlink, and flexibility for deployment. However, Vodacom notes the current limited ecosystem.</p> <p><u>February 2022:</u> Vodacom stated it was in support, and recommended the Authority monitor the global developments to allow them to react in a timely manner, once there is traction within the ecosystem for this band.</p> <p>Vodacom also recommend this band be released together with 1427 – 1452 MHz and 1492 – 1518 MHz for IMT licensing purposes. They propose this will be a more efficient use of the band.</p> <p><u>December 2021:</u> Vodacom is in support, recommending the Authority monitors global developments to react in a timely manner once there is traction within the ecosystem for this band.</p>	See the Authority’s Analysis above for IMT1500.
GSOA	<p><u>March 2023:</u> The GSOA has commented that the adjacent frequency band 1518 - 1599 MHz paired with 1626.5 - 1660.5 MHz (L-band) is a core spectrum resource for the deployment of mobile satellite service networks across the globe. L-band MSS networks are catalysing digital transformation across various sectors, from agriculture to mining, to enable connection of IoT assets that are beyond the coverage envelopes of terrestrial networks. GSOA refers to a number of technical studies and reports that recommend the development of a number of compatibility measures to assist administrations in protecting MSS operations in the band 1518 – 1559 MHz. Measures include:</p> <ul style="list-style-type: none"> • In-band power limits on the effective isotropic radiated power of IMT emitters (base stations and user equipment) • Unwanted emission limits on IMT emitters (base stations and user equipment) • Geographical separation of IMT and MSS systems, including PFD limits at ports/waterways and airports to ensure that IMT base stations keep adequate separation from ship earth stations and aircraft earth stations. 	See the Authority’s Analysis above for IMT1500.

	<ul style="list-style-type: none"> Identifying spectrum below 1518 MHz to serve as a guard band between MSS receivers and IMT emitters. <p><u>February 2022:</u> GSOA states the adjacent frequency band 1518 - 1599 MHz paired with 1626.5 - 1660.5 MHz and 1668 - 1675 MHz (L-band) is core spectrum resource for deployment of mobile satellite service (MSS) networks across the globe.</p>	
Inmarsat	<p><u>March 2023:</u> Inmarsat stresses the importance of MSS used in locations where mobile networks are not available and the agricultural sector in particular. MSS are used in maritime and aviation applications. Inmarsat urges the Authority to consider international obligations in operations of its Rescue Coordination Centre ('RCC') as part of an international treaty to support Search and Rescue operations covering the largest navigation areas across the two ocean regions, Atlantic and Indian, and to Antarctica. In their submissions, Inmarsat has proposed that the use of IMT systems based on TDD technology will create significant levels of interference with MSS terminals. This makes the issue particularly difficult, as interference from both IMT base stations and IMT user equipment needs to be considered. This will cause MSS to not operate due to out of band emissions and receiver overload. Inmarsat recommends the Authority consider the potential effects of 5G deployment on incumbents in 1427 - 1517 MHz band and the impact towards critical MSS services deployed in adjacent bands. Inmarsat comments that several interventions may be needed, including on power-flux density limits at ports and airports, unwanted emissions limits of -41 dBm/MHz EIRP, specific limitations in certain areas, including near ships, and power limits of -70 dBm/MHz on user equipment.</p> <p><u>February 2022:</u> Inmarsat commented in earlier submissions to suggest the potential IMT deployments in this band are limited, and the interference can be experienced with the L-band above 1518 MHz if the 1492 - 1518 MHz band is used for IMT.</p> <p>Inmarsat comments the proposed use of IMT systems based on TDD technology makes the issue particularly difficult – need to consider interference from both IMT base stations and IMT user equipment. This will cause MSS to not operate due to out of band emissions and receiver overload. The Authority should consider potential effects of 5G deployment on incumbents in 1427 - 1517 MHz band and the impact towards critical MSS services deployed in adjacent bands.</p>	See the Authority's Analysis above for IMT1500.
Yahsat and Thuraya	<p><u>March 2023:</u> Yahsat and Thuraya submit the proposal to open the entire band to IMT is detrimental to adjacent bands (1518 - 1559 MHz) and sensitive MSS terminals. This creates a risk to</p>	See the Authority's Analysis above for IMT1500.

	<p>the current and future MSS operations in South Africa. Yahsat and Thuraya recommend the establishment of suitable technical and regulatory conditions to guarantee interference free operations of MSS networks in South Africa. The introduction of 5G into this band could jeopardise the continued reliability of essential satellite communication systems, and cause disruptions to critical operations in South African territory.</p> <p><u>February 2022:</u> Yahsat and Thuraya recommend only considering the bands below 1492 MHz for IMT operations, to avoid major compatibility issues with MSS. Introducing 5G in this band could jeopardise the continued reliability of essential satellite communication systems, disrupting critical operations in SA territory.</p>	
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