



11 February 2022

Mr. Makgotlho  
Independent Communications Authority of South Africa  
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Via e-mail: [rmakgotlho@icasa.org.za](mailto:rmakgotlho@icasa.org.za)  
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Dear Mr. Makgotlho,

**RE: INMARSAT'S WRITTEN SUBMISSION ON THE DRAFT IMPLEMENTATION OF THE  
RADIO FREQUENCY MIGRATION PLAN AND THE INTERNATIONAL MOBILE  
TELECOMMUNICATIONS ROADMAP**

Inmarsat welcomes the opportunity to submit written representations on the draft Implementation of the Frequency Migration Regulations and International Mobile Telecommunications Roadmap ("draft FMP and IMT Roadmap") published in terms of section 34(16) of the Electronic Communications Act.

Please find herewith Inmarsat's written submission on the draft FMP and IMT Roadmap.

I am available to provide you with further information or clarification on this submission if required.

Yours Sincerely

A handwritten signature in black ink, appearing to read "Naidoo", positioned above a horizontal line.

Dr. Nigel Naidoo  
Director: Market Access and Regulatory, Africa

## 1. INTRODUCTION

Inmarsat would like to thank the Independent Communications Authority of South Africa (“the Authority”) for the opportunity to comment on the draft FMP and IMT Roadmap. As outlined by the Authority, the objectives of these regulatory instruments are to ensure universal availability of broadband services, foster the development of a vibrant and competitive electronic communications sector, and promote economic growth and development. Inmarsat wishes to highlight that the attainment of the Authority’s objectives is underpinned by, amongst others, the deployment of a diverse technology suite encompassing terrestrial, subsea, and satellite networks.

Satellite networks bolster the resiliency of terrestrial mobile deployments and are often the only means of connectivity in sparsely populated rural areas. In addition, satellite technology plays a pivotal role in delivering secure communications and safety services to the maritime and aeronautical sectors. Therefore, it is imperative that the proposed introduction of new IMT networks does not adversely impact current operational satellite systems or undermine the sustainable development of next-generation satellite services. In this regard, Inmarsat encourages the Authority only to consider the identification of IMT frequency bands when:

- There is justifiable demand for additional bandwidth, and the relevant device and equipment ecosystems have reached a sufficient level of maturity
- The introduction of new IMT networks does not disrupt the operations of existing mature networks, particularly those that are used to deliver safety-related services to the maritime and aeronautical segments and other critical services

Inmarsat’s comments on the draft FMP and IMT Roadmap are geared towards ensuring access to L, XL, and Q/V band frequency ranges, which are fundamental to the delivery and future growth of satellite services in South Africa. Inmarsat sincerely hopes that the Authority benefits from our practical insights gained from active participation in satellite markets across the continent and primarily through working with other national agencies, including Maritime and Aeronautical bodies.

## 2. INMARSAT COMMENTS

### 2.1 Frequency Range 1518 – 1525 MHz (Space to earth segment of the XL Band)

Inmarsat notes with concern the Authority’s plan to implement mixed-use of 1518 -1525 MHz for Fixed, Mobile, and Mobile-Satellite services. This decision is seemingly informed by the Authority’s view that the XL band is unoccupied and that sharing between the incumbent mobile satellite service (MSS) and terrestrial services is feasible.

Inmarsat would like to highlight that its Alphasat satellite currently utilises the 1518-1559 MHz (space-to-earth) and 1626.5-1660.5 and 1668-1675 MHz (earth-to-space) frequency bands and has been in operation for a considerable amount of time. Alphasat provides full geographic coverage over South Africa and is used to deliver a range of essential and critical communication services such as Global Maritime Distress and Safety System (GMDSS), including maritime safety

Information (MSI)<sup>1</sup>, Public Protection and Disaster Relief (PPDR), and Aeronautical Mobile Route Service (AMRS). Moreover, Inmarsat has recently deployed “Inmarsat-6 F1” (I6 F1), our next-generation dual payload satellite, which is set to come into service during the first quarter of 2023. I6 F1 will also utilise the L and XL frequency bands to deliver additional satellite bandwidth to complement the essential and critical communication services which have been offered by Alphasat.

Various technical studies conducted to date have demonstrated that the introduction of IMT networks in the frequency range 1492-1518 MHz will cause significant harmful interference towards sensitive MSS receiver terminals operating in the adjacent band 1518-1559 MHz. In this regard, Inmarsat would like to encourage the Authority to review the outcomes of the following technical studies:

- ECC Report 263 - Adjacent band compatibility studies between IMT operating in band 1492-1518 MHz and the MSS operating in 1518-1525 MHz
- ECC Report 199 - Measures to address potential blocking of MES operating in bands adjacent to 1518 MHz (including 1525-1559 MHz) at seaports and airports
- ITU [Preliminary] Draft New Report ITU-R M.[REP.MSS & IMT L-BAND COMPATIBILITY

Inmarsat has also conducted technical studies to determine the impact of IMT deployment on the various types of MSS terminals operating above 1518 MHz. Our key findings are as follows:

- Land Terminals - Existing land terminals were not usable in the same areas where high power IMT is deployed
- Maritime Terminals - Ship operators could not use Inmarsat terminals at the port, including testing safety-related communications and receiving safety-related information
- Aeronautical Terminals - Interference may impact most commercial airlines during take-off and landing, in a country's territory

The above situation relates to the adjacent band compatibility issues resulting from IMT and MSS use in the same country. The difficulties in achieving adjacent band compatibility illustrate that co-frequency sharing of MSS and IMT is not practicable. A similar situation applies for the possible use of this band by fixed links – there are no apparent technical means to have both fixed links and MSS operating in South Africa.

Inmarsat respectfully submits that the use of the band 1518 – 1525 MHz should be limited only to the MSS. Inmarsat is ready to make use of this band in South Africa immediately and to provide MSS users with additional capacity for essential and critical communication services. Inmarsat, therefore, encourages the Authority to withdraw the proposed introduction of fixed and mobile allocations in 1518 – 1525 MHz and instead leverage unassigned spectrum in frequency bands such as 2.3 GHz and 3.5 GHz to fulfill the requirements for those services. The band 1518 – 1525 MHz should remain allocated to the MSS.

## **2.2 Frequency Range 1452 – 1492 MHz**

Inmarsat welcomes the Authority's proposal to limit potential IMT deployments to 1452 - 1492 MHz. This proposal will yield a substantial guard band of 26 MHz between IMT emitters and extremely

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<sup>1</sup> As South Africa covers vast NAV areas for the shipping traffic, both in the Atlantic and Indian ocean and airspace corridor to Australia, maritime safety information provided is vital and critical to the users.

sensitive MSS receiver terminals operating above 1518 MHz. Therefore, Inmarsat is of the view that no technical or regulatory measures are necessary to ensure the protection of MSS operations from IMT. However, if the Authority decides to extend the upper limit of IMT emitters beyond 1492 MHz in the future, in that case, this will trigger a need for public consultations on the necessary protective measures for MSS. These measures would likely cover one or a combination of the following:

- Limits on the effective isotropic radiated power of IMT emitters
- Geographical separation of IMT and MSS systems
- Establishment of additional guard bands between MSS and IMT emitters

### **2.3 Frequency Range 37.5-39.5 GHz, 39.5-42.5 GHz, 47.2-50.2 GHz, and 50.4-51.4 GHz (Q/V Band)**

Inmarsat wishes to highlight that the Q/V bands will play a vital role in delivering feeder links to future high throughput satellite services. The Q/V band is highly favorable due to its sizeable contiguous bandwidth and the opportunity to alleviate bandwidth constraints in the Ka-band (dual-use for feeder links and broadband). The utilisation of Q/V bands is also fuelled by the rapidly falling costs of Q/V band components, making satellite systems that operate in these bands more affordable.

While using the Q/V frequency band presents technical challenges such as atmospheric impairments to signal propagation, the satellite community is actively working on various technical solutions, such as site diversity for feeder links. In addition, the Inmarsat Alphasat satellite is carrying a test and development payload (on behalf of the European Space Agency), which operates uplinks and downlinks in the Q/V band - this will provide further critical insights into the real-world performance of Q/V feeder link systems.

Inmarsat understands that the draft FMP and IMT Roadmap do not contemplate the introduction of IMT networks in the Q/V frequency bands in the medium term. However, Inmarsat thought it prudent to raise awareness regarding the ongoing satellite developments in the Q/V frequency band so that these may be considered in future spectrum planning exercises.

----- *End of Submission* -----