

## **Telecommunications Authority of Trinidad and Tobago**

## CONSULTATION COMMENT SUBMISSION FORM

**Name of Document:** Consultative Document on the Spectrum Plan for the Accommodation of Non-Terrestrial Networks (First of Two Rounds) (Version 0.1)

## 1. Respondent Category:

- [] (a) Regional regulatory or governmental agencies
- [] (b) Existing service and/or facility providers and affiliates
- [] (c) Potential service and/or facility providers and affiliates
- [X] (d) Service provider associations/clubs/groups
- [] (e) Consumers/consumer groups
- [] (f) General public

## 2. Interest:

(Provide details of any relationship with or interest in any of the above respondent categories.)

The Mobile Satellite Services Association (MSSA) is a non-profit industry association, founded in 2024, that seeks to promote and advance the emerging mobile satellite service (MSS) direct-to-device (D2D) ecosystem and supports the efforts of D2D solutions providers, including terrestrial mobile and satellite operators, OEMs, infrastructure providers, chip vendors, and others. MSSA's vision is to integrate terrestrial and 3GPP standards-based non-terrestrial networks (NTN) to deliver scalable, sustainable and affordable connectivity to any device, anytime, anywhere. Its members are steering this important new initiative together, to bring significant scale and choice to promote and advance the emerging D2D and IoT ecosystems. MSSA is working to ensure mobile satellite services L- and S-band<sup>1</sup> operators play a

<sup>&</sup>lt;sup>1</sup>L and S band allocations are as follows:

<sup>• 1518-1525</sup> MHz (space-to-Earth) paired with 1668-1675 MHz (Earth-to-space)

<sup>• 1525-1559</sup> MHz (space-to-Earth) paired with 1626.5-1660.5 MHz (Earth-to-space)

<sup>• 1610-1626.5</sup> MHz (Earth-to-space and space-to-Earth) paired with 2483.5-2500 MHz (space-to-Earth)

<sup>• 1980-2010</sup> MHz (Earth-to-space -- 1980-2025 MHz in Region 2) paired with 2170-2200 MHz (space-to-Earth - 2160-2200 in Region 2)

central role in facilitating the future of a robust and competitive D2D services market. Through the coordinated deployment of technical standards and enhancement of regulatory frameworks, MSSA is driving new initiatives to foster support for MSS-based services leveraging the 3GPP mobile standards.

MSSA provided comments to the Telecommunications Authority of Trinidad and Tobago's (TATT/the Authority) first consultative document on this matter in October 2024 and welcomes the opportunity to provide comments on its Second Consultative Document on the Spectrum Plan for the Accommodation of Non-Terrestrial Networks in the chart that follows in section 4. As reflected in the specific comments and recommendations offered below, MSSA appreciates that the Authority has considered several of our recommendations to facilitate the introduction of NTN services in Trinidad and Tobago. That said, MSSA remains concerned with certain aspects of the proposed framework including the band plan, the mandate to partner with a mobile network operator, and the spectrum cap which will inadvertently limit the capability/performance of the services and the flexibility with which those services can be offered or erect unnecessary barriers to market entry. We would welcome the opportunity to further engage with the Authority—including by meeting with the TATT to further discuss our proposals.

#### 3. Contact Information:

Respondent's Name: Michele Lawrie-Munro, MSSA Executive Director Postal Address: Mobile Satellite Services Association 5000 Executive Parkway, Suite 302 San Ramon, CA 94583

Email Address: ED@mss-association.org Contact Number: +1.925.275.667

# 4. Section-Specific Comments:

Document Section	Comments	Recommendations
Definitions	The Consultative Document adds a definition of NTN as "Non-terrestrial networks: Networks, or segments of networks, using an airborne or space- borne vehicle to embark on a transmission equipment relay node or base station (3GPP, 2024)."	In its comments in the Authority's first consultation, MSSA recommended that TATT add a definition for NTN and clarify that the definition does not favor any specific technology. MSSA appreciates that TATT added this NTN definition to the document and recommend that it be used consistently throughout the document.
1.1 Background	In Section 1.1. Background, the Consultative Document continues to describe "NTN" as "wireless communication systems that operate above the Earth's surface, involving high-altitude platform stations (HAPS), unmanned aerial vehicles (UAVs <sup>2</sup> ) such as balloons, drones, etc. and satellites in geostationary Earth orbit (GEO), medium Earth orbit (MEO) and low Earth orbit (LEO), or a combination of these elements." No source for this definition is provided.	In its previous response, MSSA recommended that a source be cited for this statement. Based on Internet research, it appears that the reference may come from the url: <u>https://www.everythingrf.com/community/what-are-non-terrestrial-networks</u> . We suggest including this source.

	In Section 1.1 Background, the Consultative Document has removed the statement, "LEO satellites provide the foundation for many NTN use cases." The new text reads "Currently, many NTN applications use GEO, MEO and LEO satellites."	MSSA appreciates the Authority for considering our comment that current NTN operators successfully use a wide variety of satellite technologies (e.g., GEO, MEO, and LEO) to support wireless communication links, including direct satellite-to-mobile handset connections. These connections have been used to serve mobile users for decades. Indeed, "NTN" use cases involving MSS spectrum are merely an extension of the well-established MSS concept. As a result, this type of NTN can be provided today without the need for additional national or international regulatory measures.
		MSSA applauds the Authority for adopting an orbit- neutral approach to NTN, acknowledging that LEO, MEO, and GEO systems can all be employed. We appreciate that the Authority is orbital neutral and is not promoting any specific orbital positions for wireless communication links.
1.4 Scope	The Consultative Document incorporates a proposed frequency assignment plan for the 2 GHz band and specifies how licenses would be awarded to concessionaires under that plan. The Consultative Document states, "This Plan accommodates the operation of NTNs using allocated spectrum to extend the coverage of domestic terrestrial network operators for the provision of public telecommunications services. This Plan addresses neither the allocation nor licensing of spectrum bands for terrestrial networks, including public mobile networks, fixed wireless access and private mobile networks. The provision of direct-to-device communication directly to consumers or using spectrum bands for public domestic mobile services is also not addressed."	<ul> <li>MSSA suggests the sentences in this section be rewritten as follows:</li> <li><i>"This Plan accommodates the operation of NTNs using spectrum to the mobile satellite service for the provision of MSS including direct-to-device (D2D) and Internet of Things (IoT). This Plan addresses neither the allocation nor licensing of spectrum bands for terrestrial networks, including public mobile networks, fixed wireless access and private mobile networks. The provision of direct-to-device communication using spectrum bands for public domestic mobile services is also not addressed."</i></li> <li>In its previous comments MSSA requested clarification regarding the purported exclusion of "domestic mobile services using direct-to-device communication using spectrum bands for public services using direct-to-device communication using spectrum bands for public services is not addressed."</li> <li>However, offering direct-to-device services directly to</li> </ul>

		consumers using mobile satellite services (MSS)
		spectrum which has long been allocated should be
		foosible within the existing regulatory fromework
		without requiring the use of a mobile network operator
		Satallita connectivity has been provided directly to
		"devices" in MSS spectrum hands, including in the
		devices in MISS spectrum bands, including in the
		mobile context, for decades. Emerging NTN/D2D
		services are simply an application of the long-existing
		wiss concept in which terrestriat and satellite bands can
		be accessed using a single device. Certainly, one
		application of NTN is to extend the coverage of domestic
		terrestrial network operators for the provision of public
		telecommunications services, but there are many
		applications including lifesaving emergency services
		which satellite operators are today providing directly to
		consumers. In addition, critical and important maritime
		and aeronautical communications solutions do not
		require the involvement of a mobile network operator.
		We appreciate that the Authority acknowledged MSSA's
		comments as they relate to the two approaches to D2D
		services, i.e., the use of allocated and licensed MSS
		spectrum and the use of spectrum allocated to terrestrial
		services and licensed to mobile operators.
2.1 The Global Environment	The Consultative Document specifically	MSSA supports the 3GPP ecosystem for NTN and
	describes 3GPP Release 17 and Release 18 and	supports technology neutrality, so that operators should
	suggests that these standards will provide a basis	have the flexibility to choose the technology that best
	for future NTN deployments.	aligns with their business model and serves the interests
		of consumers.
		Notably, most of TATT's current proposed band plan
		does not support 3GPP NTN standards. Currently only 2
		x 5 MHz of the band plan aligns with 3GPP standardized
		bands. As it currently stands, the assignment plan would
		not allow for the deployment of 3GPP NTN NR because
		a minimum of 5 MHz is needed for one channel and at
		least 2 x 10 MHz or 2 x 15 MHz needs to be allocated so
		a reuse plan can be implemented. Even in a small

		the country efficiently. Considering the amount of 2 GHz spectrum available for MSS in other markets, a minimum of 2 x 20 MHz, and ideally 2 x 30 MHz should be allocated.
		In addition, channels 8-15 proposed by TATT are not standardized by 3GPP nor used in the United States. This band is currently primarily used for terrestrial mobile services in the United States. As highlighted in its previous submission and below, MSSA strongly suggests that TATT follow the new 3GPP band n252 created for North America which is 2000-2020 MHz uplink paired with 2180-2200 MHz downlink. This band will be finalized at the June 2025 3GPP meeting and will be published in July 2025. This band will be able to be utilized immediately.
2.2. NTN Frequency Bands	The Consultative Document updated Table 1 to reflect the satellite bands found in document 3GPP TS 38/101-5 which clearly distinguishes between uplink and downlink frequencies.	MSSA appreciates that the Authority considered our recommendation to include this reference to ensure consistency with 3GPP standards documents and avoid unnecessary confusion.
	The Consultative Document notes that 3GPP band n256 spans 1980-2010 MHz paired with 2170-2200 MHz, providing a 190 MHz duplex. This band is optimized for the globally harmonized frequency band, primarily used in Region 1 due to the absence of PCS operators. TATT is proposing a 2 GHz band plan with a hybrid 180 MHz / 190 MHz duplex separation, covering 2005-2020 MHz paired with 2185-2200 MHz.	MSSA strongly recommends that the Authority change the band plan to use 3GPP band n252, 2000-2020 MHz (uplink) paired with 2180-2200 MHz (downlink) expected to be approved and published by July 2025. This will ensure more efficient use of spectrum and the ability to offer more robust NTN services, including both NBIoT and NTN NR. Trinidad and Tobago has sufficient spectrum available to utilize this band and it will prevent a mis-matched duplex band plan between band n256 and a band channelization that not used in the United States.

2.3 National Considerations	The Consultative Document outlines the existing uses of the 2 GHz band in Trinidad and Tobago and the availability for NTNs to operate on a non- interference basis noting that 1995-2020 MHz is unassigned and available and that 2180 – 2200 MHz is unassigned and available.	Given the availability of spectrum in Trinidad and Tobago, there is no need to limit the amount of spectrum available for NTN to 2 x 15 MHz. Due to the growing demand for D2D services and the available spectrum in Trinidad and Tobago, MSSA recommends allocating 2 x 20 MHz for NTNs dedicated to MSS, rather than the initially suggested 2 x 15 MHz. This adjustment will enable TATT to leverage the 3GPP n252 frequency band and support a wider range of band channelization options.
3. Frequency Planning Principles	The Consultative Document provides that "All plans shall have a reference channel bandwidth that serves as the minimum assignable channel bandwidth. Frequency channels that require larger bandwidths can be achieved by concatenating multiple contiguous frequency channels of the reference channel bandwidth, which would equate to contiguous spectrum. All assignments to an operator shall be contiguous as far as possible."	Given the requirements for NR NTN with 5 MHz channel bandwidths, MSSA has concerns regarding the proposed minimum assignable channel bandwidth of 1 MHz. Even though the goal is to have contiguous frequency blocks, concatenating multiple non-contiguous frequency channels may not result in contiguous spectrum, or it might not be feasible at all.
4.1 Frequency Assignment Plan	The Consultative Document notes that the frequency plan presented therein is a mix of 3GPP band n256 and the FCC's MSS 2 GHz band plan with both accommodating FDD but with different duplex spacings. Channels 1 to 5 are based on n256 and channels 6 to 15 are based on the FCC's band plan. The Authority is of the view that the adoption of a channel assignment plan based on 3GPP's band n256 and the FCC's MSS 2 GHz band accommodates a wider range of NTN systems that support duplex spacings from both band plans.	MSSA previously commented that this band plan is not aligned with 3GPP standards, particularly blocks 8-15. Given that TATT has the 1995-2005 MHz unassigned and available, the Authority has the opportunity to follow the new 3GPP band 252 2000-2020 MHz band (uplink) paired with the 2180-2200 MHz band (downlink). Based on the spectrum availability in Trinidad and Tobago, this solution best aligns with 3GPP standards and Region 2 band planning. Of note, the FCC's band channelization plan is not in use in the United States. Following a 3GPP band plan will help ensure standard handset devices are available. MSSA also advises against assigning all blocks in 1 MHz channels, as operators aiming to deploy systems with greater bandwidth would require at least 2 x 10 MHz of

		spectrum for NR NTN. The ideal allocation would be 2 x 15 MHz to support a reuse pattern of 3 x 5 MHz. We would welcome the opportunity to engage in a technical discussion with the Authority to further explore the specifics of the band plan.
4.2 Licensing Process and Conditions	The licensing rules specified in the Consultative Document provide that: "A point-to-multipoint spectrum license shall be granted by the Authority in order for spectrum in the 2 GHz band to be assigned. The minimum assignment shall be 2 MHz (i.e., 2 x 1 MHz)."	MSSA recommends assigning 3 blocks of 2 x 5 MHz and 5 blocks of 2 x 1 MHz instead of 15 blocks of 2 x 1 MHz. This could accommodate both narrowband NTN and NR NTN.
	The licensing rules specified in the Consultative Document provide that "The assignment of spectrum shall be via first come first served or a competitive licensing process, based on demand for this spectrum, as determined by the Authority."	MSSA advocates for administrative licensing processes (such as first come first served) for satellite spectrum rather than a competitive licensing process. This approach enables licensees to optimize their resources for providing high-quality services.
	The licensing rules specified in the Consultative Document provide that: "The allocated spectrum in the 2 GHz band shall be licensed in accordance with the frequency assignment plan (as seen in Table 4)."	See MSSA's response above. We recommend aligning with the upcoming 3GPP band n252 and making 2 x 20 MHz of spectrum available for NTN MSS in 2000-2020 MHz paired with 2180-2200 MHz.
	The licensing rules specified in the Consultative Document provide that: "The spectrum cap for the 2 GHz band shall be 10 MHz (i.e. 2 x 5 MHz)."	MSSA respectfully disagrees with the proposed spectrum cap for the 2 GHz band. For operators planning to deploy an NR NTN system, 2 x 5 MHz is insufficient to support a robust system with adequate bandwidth and quality of service. A minimum of 2 x 10 MHz, or preferably 2 x 15 MHz, is necessary. Therefore, MSSA recommends against setting spectrum caps on this band.

The licensing rules specified in the Consultativ	e MSSA respectfully disagrees with the requirement for an
Document provide that: "An established	agreement between the NTN operator and a local
agreement between the NTN operator and a loc	al terrestrial operator as a prerequisite for the issuance of a
terrestrial network operator is a requirement fo	license in the 2 GHz band. Such a requirement would
the issuance of a license in the 2 GHz Band."	allow MNOs to influence the ability of NTN operators to
	enter the market, which could be anti-competitive. NTN
	operators may choose to provide stand-alone services
	such as IoT, Maritime or lifesaving emergency services
	that don't require a mobile operator, or they may choose
	to partner with one or more MNOs for D2D services. A
	mandatory agreement with an MNO is unnecessarily
	restrictive and, as there are no concerns about using
	mobile network operator frequency bands as this 2 GHz
	spectrum is allocated to MSS. MSSA suggests that this
	be not imposed as a mandatory condition to allow for
	competitive market approach which is in the benefit of
	end customers.

## Confidentiality

The information and comments stated above can be published by the Authority for consultation purposes.

[X] Agree

[ ] Do not agree because:

□ All comments submitted are confidential.

□ Some of the comments submitted are confidential. (In the information submitted in section 4 above, please indicate what information should be considered as confidential by the Authority.)

□ Name of respondent/organisation is confidential.

If you do not want part of your response, your name or the name of your organisation to be published, can the Authority still publish a reference to the contents of your response (including, for any confidential parts, a general summary that does not disclose the specific information or your identity)?

[] Yes

[ ] No

#### 2. Declaration

I confirm that the comments and recommendations submitted under this cover sheet is a formal consultation response that the Authority can publish, exclusive of those comments marked confidential.

Signature: A. Michele Jaurie Munro

Position of signatory: Executive Director, MSSA (This is only applicable for stakeholder categories a to e.)