



**GSOA position on AI 1.12, 1.13 and 1.14**

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# Global Association Representing the Entire Satellite Industry

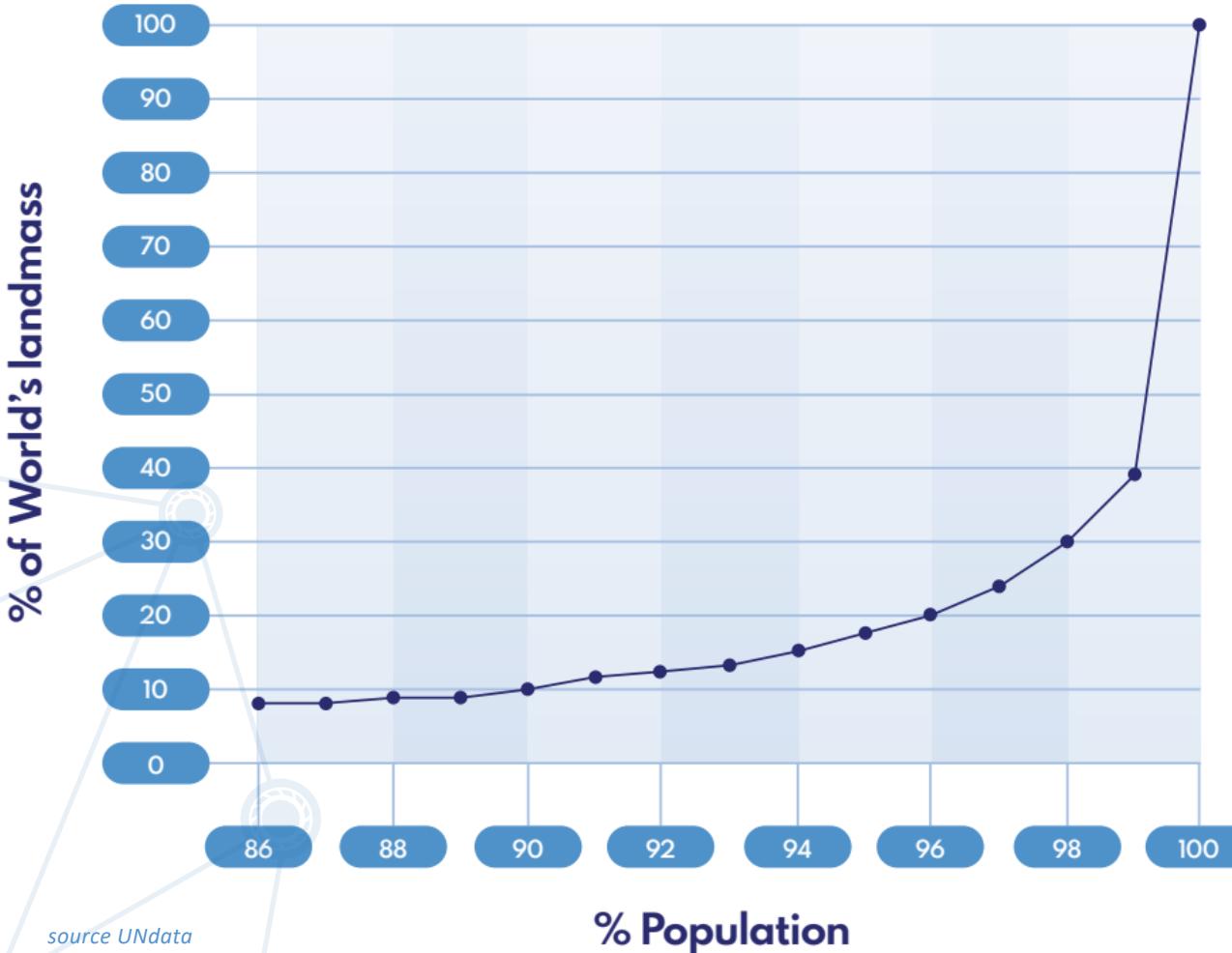


GSOA provides a platform for collaboration between member companies involved in the satellite ecosystem globally and a unified voice for the sector



# Economics of Digital Divide and Diminishing Returns

## World's population distribution



Terrestrial solutions currently cover 96% of the population using infrastructure deployed across 20% of the landmass.

Extending this coverage to 99% would necessitate doubling the terrestrial infrastructure footprint to 39%.

Achieving 100% requires a multiple increase in current investment.

# Two Variants of D2D

## **D2D in MSS bands**

- *Uses spectrum allocated to Mobile Satellite Service*
- *Leverages 3GPP Release 17 and later NTN specifications*
- *Requires no additional regulatory action if MSS authorized*
- *Support L- and S-Band, and Ka- Ku in future release*
- *Additional MSS spectrum allocations studies in WRC-27 Agenda Items 1.12 and 1.14*

## **Challenges:**

- *Needs mobile chipset vendors to include those 3GPP bands*

## **D2D in Terrestrial bands**

- *Uses terrestrial spectrum*
- *Can use off-the-shelf mobile handsets*
- *Requires partnerships with MNOs*
- *Complements existing mobile coverage*
- *Using IMT bands < 3GHz*
- *Coexistence being studied under WRC-27 Agenda Item 1.13*

## **Challenges:**

- *Interference management between MNOs and satellite operators*
- *International regulatory hurdles (ITU RR 4.4)*



- **1.11: MSS space-to-space links**  
to consider the technical and operational issues and regulatory provisions for space-to-space links among GSO and non-GSO satellites in frequency bands 1 518 - 1 544 MHz, 1 545 - 1 559 MHz, 1 610 - 1 645.5 MHz, 1 646.5 - 1 660 MHz, 1 670 - 1 675 MHz and 2 483.5 - 2 500 MHz allocated to the MSS
- **1.12: NGSO MSS Allocation for low data rate**  
to consider possible allocations to the MSS and possible regulatory actions in the frequency bands 1 427 - 1 432 MHz (space-to-Earth), 1 645.5 - 1 646.5 MHz (space-to-Earth)(Earth-to-space), 1 880 - 1 920 MHz (space-to-Earth)(Earth-to-space) and 2 010 - 2 025 MHz (space-to-Earth)(Earth-to-space) required for future development of low-data-rate non-GSO MSS.
- **1.13: MSS IMT Allocation for Direct to Device**  
to consider studies of a possible new allocation in the frequency range 694/698 MHz to 2.7 GHz to the MSS for direct connectivity between space stations and IMT user equipment to complement terrestrial IMT network coverage.
- **1.14: Additional MSS Allocation in 2 GHz**  
to consider possible additional allocations to the MSS in the frequency bands 2 010 - 2 025 MHz (Earth-to-space) and 2 160 - 2 170 MHz (space-to-Earth) in Regions 1 and 3 and 2 120 - 2 160 MHz (space-to-Earth) in all regions.



# possible allocations to MSS and regulatory actions required for the future development of low-data-rate non-geostationary MSS systems

*to consider possible allocations to the MSS and possible regulatory actions in the frequency bands 1427-1432 MHz (space-to-Earth), 1645.5-1646.5 MHz (space-to-Earth)(Earth-to-space), 1880 - 1920 MHz (space-to-Earth)(Earth-to-space) and 2010-2025 MHz (space-to-Earth)(Earth-to-space) required for future development of low-data-rate non-GSO MSS*



## BACKGROUND

- Agenda Item 1.18 (WRC-23) tried to address potential new allocation of MSS spectrum to narrow band systems. However, the ambiguity of Resolution 248 (WRC-19) and the lack of agreed technical & operational characteristics of narrowband MSS led to incomplete sharing and compatibility studies thereby resulting in a no-change. With the new resolution Res. 252 (WRC-23), there is an opportunity to conduct studies on potential new allocation to the MSS for the development of non-GSO low data rate systems.



## GSOA POSITION

- GSOA supports studies on the potential allocations to MSS for non-GSO low-data-rate MSS systems with technical and operational conditions that allow coexistence of these systems in the same frequency band, as long as the protection of existing primary services, including MSS, are ensured
- GSOA supports studies aiming at defining the spectrum requirements, technical and operational characteristics and conditions for non-GSO low-data-rate MSS.
- GSOA also supports studies on sharing and compatibility between the non-GSO low-data-rate MSS systems and existing primary services in-band and in the relevant adjacent frequency bands.
- The 1 645.5-1 646.5 MHz frequency band is reserved for distress, safety, and urgency communications within the GMDSS and requires further input from the International Maritime Organization before being considered under this AI

*new allocations to the mobile-satellite service (MSS) for direct connectivity between space stations and International Mobile Telecommunications (IMT) user equipment (herein referred to as 'DC-MSS-IMT') to complement terrestrial IMT network coverage in the frequency range between 694/698 MHz and 2.7 GHz, taking into account the IMT frequency arrangements addressed in the most recent version of Recommendation ITU-R M.1036*



## BACKGROUND

- DC-MSS-IMT satellite system which communicates directly with IMT user equipment utilized spectrum in terrestrial IMT networks may provide complementary coverage for mobile connectivity from space
- Several DC-MSS-IMT satellite systems are being launched or planned for launch aiming to work with IMT user equipment (pre 3GPP Release 17 NTN specifications) by utilizing spectrum allocated to the Mobile Service (MS)
- The risk of not having a clear regulatory framework may either deter the deployment of DC-MSS-IMT or lead to further national authorizations by using RR No. 4.4 for international spectrum management



## GSOA POSITION

- GSOA supports studies for a possible new allocation to MSS in existing frequency bands identified for terrestrial IMT
- DC-MSS-IMT systems should not constrain the development of incumbent services and systems operating under those service allocations
- GSOA is of the view that the DC-MSS-IMT system should follow the same transmission directionality of the terrestrial IMT in the frequency range as deployed within the national territory where such DC-MSS-IMT is authorized to operate.
- GSOA is of the view that the studies must confirm the protection of incumbent services, particularly the protection of current MSS allocations from new potential MSS allocations proposing operations in opposite directions
- No additional regulatory measure would be needed for IMT user equipment in the MSS uplink direction when operating under the same technical characteristics as terrestrial IMT uplink

## Studies on possible new frequency allocations to the Mobile-Satellite Service (MSS)

*Studies on possible new frequency allocations to the mobile-satellite service in the frequency bands 2010-2025 MHz (Earth-to-space) & 2160-2170 MHz (space-to-Earth) in Regions 1 and 3 and 2 120-2 160 MHz (space-to-Earth) in all Regions, in accordance with Res. 254 (WRC-23);*



### BACKGROUND

- The tremendous growth in mobile communications has led to growth in MSS which complements MS to satisfy connectivity everywhere. Since the last MSS allocations, the range of applications and use-cases using MSS, including Direct-to-Device (D2D) and Internet of Things (IoT), has expanded significantly, as has the spectrum demand for suitable MSS allocations.
- New MSS allocations in the frequency bands 2 010-2 025 MHz (Earth-to-space) and 2 160-2 170 MHz (space-to-Earth) in Regions 1 and 3 and 2 120-2 160 MHz (space-to-Earth) in all Regions will harmonize spectrum allocations and help to address MSS spectrum demands.



### GSOA POSITION

- GSOA supports studies under Resolves 1, 2 & 3 of Resolution **254 (WRC-23)** & new spectrum allocations to the MSS.

# Thank You!

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