

**3GPP TSG RAN 93-e**

September 13<sup>th</sup> – September 17<sup>th</sup> 2021

**RP-212324**

Agenda Item 9.0.2

# **NTN IoT Enhancements (RAN1)**

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# Introduction

- Release-17 is the first 3GPP release for NTN IoT supporting minimum essential functionality for a working NTN IoT system
- Release 18 should prioritize NTN IoT *minimum* additional enhancements to Release-17 NTN IoT functionalities as needed in terms of data rate, long connection and mobility

# NTN IoT Enhancements

## RAN1-led

Additional enhancements for NTN IoT access: data rates, long connection, mobility

### Objective I: Rel-17 Leftovers [RAN1, 2]

*[subject to R17 status]*

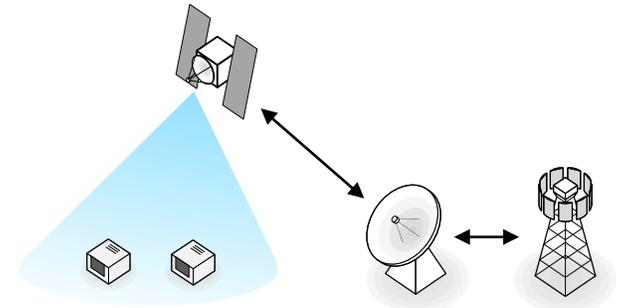
- HARQ enhancements to support higher UE data rates
- Enhancements to support long connection times

### Objective II: Mobility enhancements [RAN2, 1]

- Connected mode mobility: Scope depends on whether Release-17 NTN IoT can significantly benefit from additional enhancements in some scenarios and use cases

3GPP TUs (Total w/ 9 meetings)			
RAN1	RAN2	RAN3	RAN4
TBD	TBD	TBD	TBD

SA/CT Dependency: **Yes**



See next slide

# NTN IoT Enhancements

## RAN1-led

- With Rel-17 enabling minimum essential functionality for a working IoT NTN system (NB-IoT and LTE-M), Rel-18 need to **prioritize** the following:
  - **Disabling of HARQ feedback** to mitigate impact of HARQ stalling on UE data rates
  - **Improved GNSS operations** for a new position fix for UE pre-compensation during long connection times
  - Support of **(Rel-17) neighbour cell measurements** and corresponding measurement triggering before RLF for NTN.
  - Support of **(Rel-17) NB-IoT carrier selection based on the coverage level**, and associated carrier specific configuration for NTN.
  - Support **legacy (Rel-16) LTE Conditional Handover (CHO) for eMTC NTN and RLF/reestablishment mechanisms for NB-IoT NTN** to mitigate packet interruption for NTN to mitigate packet interruption for NTN
- We propose the following **NOT** be included in Rel-18
  - NOMA enhancement: In our understanding Rel-16 Contention-Based Preconfigured UL Resources (PUR) can be supported in very low UL SNR cases in NTN with proprietary implementation of NOMA in the eNB.
  - DL capacity enhancements: cellular IoT releases specified numerous spectral efficiency enhancements benefiting both UL and DL – i.e. Rel-15 EDT, Rel-16 PUR, Rel-17 specified 16QAM on DL and UL, Rel-16 multi-TBS scheduling