**3GPP TSG RAN Meeting #109 RP-252932**

**Beijing, China 15th – 18th September, 2025**

**Source: Telstra, T-Mobile USA, KDDI, SpaceX, Apple, Mediatek, Qualcomm**

**Title: New WID on** **Introduction of NR-NTN in terrestrial bands**

**Document for: Approval**

**Agenda Item: 9.13**

3GPP™ Work Item Description

Information on Work Items can be found at <http://www.3gpp.org/Work-Items>
See also the [3GPP Working Procedures](http://www.3gpp.org/specifications-groups/working-procedures), article 39 and the TSG Working Methods in [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm)

Title: Introduction of NR-NTN in n7 band for Australia

Acronym:

{Propose an acronym. The sign "-" is a level separator between (Feature)-(Building Block)-(Work Task). The sign "\_" can be freely used. Studies have to start by "FS\_". Each acronym level has to be simple and short, 7 characters max recommended}

Unique identifier:

{A number to be provided by MCC at the plenary}

|  |  |
| --- | --- |
| **This WID includes a Core part** | **X** |
| **This WID includes a Performance part** | **X** |

Potential target Release: Rel-20

# 1 Impacts

{For Normative work, identify the anticipated impacts. For a Study, identify the scope of the study}

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Affects:** | UICC apps | ME | AN | CN | Others (specify) |
| **Yes** |  | X | X |  |  |
| **No** | X |  |  | X | X |
| **Don't know** |  |  |  |  |  |

# 2 Classification of the Work Item and linked work items

### 2.1 Primary classification

|  |
| --- |
| Normative Work Item:*tick applicable boxes below* |
|  | Stage 1 |
|  | Stage 2 |
| X | Stage 3 |
|  | Other (e.g. testing) |

### 2.2 Parent Work Item

For a brand-new topic, use “N/A” in the table below. Otherwise indicate the parent Work Item.

|  |
| --- |
| Parent Work / Study Items  |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
| N/A |  |  |  |

### 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work/Study Items (if any) |
| **Acronym** | Unique ID | Title | Nature of relationship |
| NR\_NTN\_solutions | 860046 | Solutions for NR to support non-terrestrial networks (NTN) | Rel-17 work item defining NR-NTN band n256, n255 |
| NR\_NTN\_LSband | 981043 | Introduction of the satellite L-/S-band | Rel-18 work item defining NR-NTN band n254 |
| NR\_NTN\_Sband | 1040129 | Introduction of another NR NTN S-band (MSS band 2000-2020 MHz UL and 2180-2200 MHz DL) | Rel-19 work item defining NR-NTN band n252 |

# 3 Justification

One of the objectives of Rel-17 NR\_NTN\_solutions WI was to study and identify relevant NTN bands. The outcome of this work is a definition of two NTN bands – part of ITU-R L band and S band - defined as band n256 and n255 in the 3GPP specifications [1, 2]. Since then, additional NTN bands have been defined.

Over the last few years, the LEO satellite landscape has changed considerably, and it is expected to continue to evolve. Mobile network operators (MNOs) are entering commercial partnerships with satellite network operators (SNOs) to provide “direct-to-handset” coverage to customers as a new connectivity layer which is complementary to existing terrestrial based mobile networks. Currently, “direct-to-handset” services are provided using LTE, leveraging MNOs’ existing terrestrial spectrum. To deliver expanded services in the near future and to enable optimal device performance, 3GPP support for terrestrial bands alongside existing NTN bands is critical in forthcoming releases.

At RAN#108, companies representing partnerships between MNOs and SNOs indicated their commitment to deploying commercial services using NR NTN technology with terrestrial spectrum (RP-251803).

In particular, the supporting companies require the addition of support in the NR-NTN specifications for the following terrestrial bands:

* n7 in Australia

Telstra and Starlink currently operate a direct to handset service in dedicated spectrum within Band 7 using legacy LTE devices. In Australia, operators potentially face regulatory obligations to deliver a universal mobile voice and SMS service over an entire population by 2027 [4]. In September 2024, the Australian Communications and Media Authority published their Regulatory guide on the Operation of an IMT Satellite direct-to-mobile service [5] which places the onus on spectrum licensees allowing IMT satellite direct-to-mobile services to undertake their own due diligence to manage coexistence with other spectrum uses and users.

The outcome of the work will be a new NR NTN band specified in [2]. The new band is an enabler for devices to implement NR NTN capability and reuse existing radio front end implementations. The new band identifies such devices as supporting standard NR NTN capability. The band is for operation in Australia only. The regulatory framework is under Article 4.4 of the ITU-R Radio Regulations [6] and operates under “no-interference, no-protection” basis. As a result, any coexistence with other existing services in the band is coordinated between the MNO and the SNO. No border issues have been identified that impact this work. Under the deployment scenario, there is no overlap between terrestrial coverage in n7 and those areas where NTN operates in the new NR NTN band.

The band will be subject to the regulatory framework under development in ITU-R to address cross-countries interference scenarios.

***Reference:***

[1] TR 38.863, “Solutions for NR to support non-terrestrial networks (NTN): Non-terrestrial networks (NTN) related RF and co-existence aspects” (Rel-17)

[2] TS 38.101-5, “User Equipment (UE) radio transmission and reception; Part 5: Satellite access Radio Frequency (RF) and performance requirements”

[3] Single Network Future: Supplemental Coverage from Space, REPORT AND ORDER AND FURTHER NOTICE OF PROPOSED RULEMAKING, U.S. Federal Communications Commission, March 14, 2024 <https://www.fcc.gov/document/fcc-advances-supplemental-coverage-space-framework-0>

[4] [Universal Outdoor Mobile Obligation to improve outdoor mobile coverage across Australia](https://www.infrastructure.gov.au/department/media/news/universal-outdoor-mobile-obligation-improve-outdoor-mobile-coverage-across-australia)

[5] [https://www.acma.gov.au/sites/default/files/2025-05/Regulatory guide\_Operation of an IMT satellite direct-to-mobile service\_0.pdf](https://www.acma.gov.au/sites/default/files/2025-05/Regulatory%20guide_Operation%20of%20an%20IMT%20satellite%20direct-to-mobile%20service_0.pdf)

[6] <https://www.itu.int/dms_pub/itu-r/opb/reg/R-REG-RR-2024-ZPF-E.zip>. Article 4.4 is published in document “2400594-RR-Vol 1-E-A5” p31

# 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

The objective of the core part of this WI is to:

* Identify the possible coexistence issues, if any, that relate to the new band,
	+ Try to reuse Rel-17 TN-NTN coexistence study outcomes for FR1, captured in TR 38.863, as much as possible.
* Specify a new NR-NTN FDD band with a UE transmitting at 2500 MHz – 2570 MHz and SAN transmitting at 2620 MHz – 2690 MHz;
	+ For operation with LEO satellite orbit
	+ Re-use NR band n7 requirements as much as possible
	+ Support for Channel BW and SCS will be specified as per Table 4.1-1

**Table 4.1-1: Channel bandwidth and SCS system parameters.**

| **SCS (kHz)** | **Channel bandwidth** **(MHz)** |
| --- | --- |
| 15 | 5 | 10 | 15 | 20 |
| 30 |  | 10 | 15 | 20 |
| 60 |  | 10 | 15 | 20 |

* The band will be subject to the regulatory framework under development in ITU-R to address cross-countries interference scenarios.
* The specification work of this WI shall,
* re-use the UE requirements of the terrestrial band as much as possible.
* Support UE PC3 (+23dBm)
* Introduce the corresponding SAN and UE RF core requirements
* Introduce the corresponding RRM requirements
* Introduce the new bands with appropriate definitions in the specifications thatexclude usage of these bands in countries/regions where existing regulatory rules do not allow NR-NTN in the mobile terrestrial bands.

The specification work of this WI shall leverage the studies and requirements for n7 and NR NTN n256, n255, n254, n252 where applicable.

All UE requirements specified as part of this WI shall be Release-independent from Rel-17.

### 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

The objective of the performance part is to:

- Define conformance requirements for SAN.

### 4.3 RAN time budget request (not applicable to RAN5 WIs/SIs)

NOTE: For all new RAN related WIs/SIs which are not led by RAN WG5 the WI/SI rapporteur has to fill out the attached Excel table to request time budgets for corresponding RAN WG meetings.
The Excel table has to be filled out for all affected RAN WGs and up to the target date of the WI/SI.
One time unit (TU) corresponds to ~ 2 hours in the meeting.
If no TU is needed, then leave the field empty otherwise enter a number >0 in the field.

 For revisions of already approved WI/SI descriptions: Please remove the Excel table from the WID/SID's zip file. The time budgets are already recorded. If you want to modify them, then this has to be done via the status report and not via a revised WID/SID.

 If this WID is covering Core and Performance part, then please fill out one line for each part in the attached Excel table.

**additional comments to the time budget request in the attached Excel table:**

# 5 Expected Output and Time scale

|  |
| --- |
| **New specifications** *{One line per specification. Create/delete lines as needed}* |
| Type  | TS/TR number | Title | For info at TSG#  | For approval at TSG# | Remarks |
| Internal TR | 38.xxx | Non-terrestrial networks (NTN) in terrestrial bands | RAN#110 (Dec. 2025) | RAN#110 (Dec. 2025) | *Core part**Rapporteur:**Alexander Sayenko, Apple Inc.* |

NOTE: If this is a RAN WI including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Remarks for each spec.
By default a new specs can only be new for one of both parts.

|  |
| --- |
| **Impacted existing TS/TR** *{One line per specification. Create/delete lines as needed}* |
| TS/TR No. | Description of change  | Target completion plenary# | Remarks |
| TR 38.863 | Support for new NR NTN bands  | RAN#111 (Mar. 2026) | Core |
| TS 38.101-5 | Support for new NR NTN bands | RAN#111 (Mar. 2026) | Core |
| TS 38.108 | Support for new NR NTN bands  | RAN#111 (Mar. 2026) | Core |
| TS 38.133 | Support for new NR NTN bands  | RAN#111 (Mar. 2026) | Core |
| TS 38.181 | Support for new NR NTN bands  | RAN#111 (March 2026) | Perf |

# 6 Work item Rapporteur(s)

Toni Laehteensuo, Qualcomm, tlaehtee at qti.qualcomm.com

# 7 Work item leadership

RAN4

# 8 Aspects that involve other WGs

None

# 9 Supporting Individual Members

|  |
| --- |
| Supporting IM name |
| Telstra |
| T-Mobile USA |
| KDDI |
| SpaceX |
| Apple |
| Mediatek |
| Qualcomm |
|  |