**3GPP TSG RAN WG1 #99 R1-1911800**

**Reno, USA, November 18th – 22nd, 2019**

**Source: Chairman**

**Title:** **Draft Agenda**

**Document for:** **Decision**

**Tdoc request: The deadline is Friday 8th November, 5pm CET**

**Tdoc submission: The deadline is Friday 8th November, 11pm PST**

# Opening of the meeting (Day 1: 9.00 AM)

# Approval of Agenda

# Highlights from RAN plenary

This section is void

# Approval of Minutes from previous meetings

# Incoming Liaison Statements

## RAN1 Aspects for RF requirements for NR frequency range 1 (FR1)

Refer to [RP-192282](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_85/Docs/RP-192282.zip) for details regarding RAN4-led WID on RF requirements for NR frequency range 1 (FR1)

Note: although contributions are allowed, RAN1’s work is “*reactive*” as follows:

* RAN1 will further study by Dec 2019 if there are any RAN1 potential impacts based on RAN4 LS if any
  + No new TDM pattern will be defined, i.e. scheduling-based switching is assumed.
  + Finalization of RAN4 requirements and approval of RAN4 CRs shall be based on RAN1 LS
  + Strive to minimize RAN1 impact.
  + Strive to achieve no impact to RAN1 E-UTRAN spec
  + Strive to avoid defining location of switching period impacting RAN1 spec

## RAN1 Aspects for RF Requirement Enhancements for FR2

Refer to [RP-192227](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_85/Docs/RP-192227.zip) for details regarding RAN4-led WID on NR RF Requirement Enhancements for FR2

Note: although contributions are allowed, RAN1’s work is “*reactive*” as follows:

* RAN4 will provide further details on the RAN4 agreed solution(s) to RAN1/RAN2 before RAN1/RAN2 start their work if RAN1/RAN2 help is needed.
* This objective does not aim to propose the same alternatives which were not agreed (i.e. Alt1, Alt2 and Alt3 not agreed in RAN1#98 under Rel-16 NR eMIMO work item)

# E-UTRA

## Maintenance of E-UTRA Releases 8 – 15

### Maintenance of E-UTRA Release 8 – 14

### Maintenance of E-UTRA Release 15

### Others

## LTE Release 16

***Limit to maximum 1 contribution per 1 company/organization/university for any agenda item for LTE in Rel-16, including “Others”***

### Additional MTC Enhancements

*LTE\_eMTC5-Core; WID in* [*RP-191356*](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_84/Docs/RP-191356.zip)*. Please refer to the WID for detailed scoping*

#### UE-group wake-up signal

#### Support for transmission in preconfigured UL resources

#### Scheduling of multiple DL/UL transport blocks

#### Coexistence of LTE-MTC with NR

#### MPDCCH performance improvement

#### CE mode A and B improvements for non-BL UEs

#### Use of RSS for measurement improvements

#### Others

### Additional Enhancements for NB-IoT

*NB\_IOTenh3-Core; WID in* [*RP-192313*](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_85/Docs/RP-192313.zip)*. Please refer to the WID for detailed scoping*

#### UE-group wake-up signal

#### Support for transmission in preconfigured UL resources

#### Scheduling of multiple DL/UL transport blocks

#### Coexistence of NB-IoT with NR

#### Presence of NRS on a non-anchor carrier for paging

#### Others

### DL MIMO efficiency enhancements for LTE

*LTE\_DL\_MIMO\_EE-Core; WID in* [*RP-182901*](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_82/Docs/RP-182901.zip)*. Please refer to the WID for detailed scoping*

#### Support of enhancing SRS capacity and coverage

##### Additional SRS symbols

##### Others

#### Others

### LTE-based 5G Terrestrial Broadcast

*LTE\_terr\_bcast-Core; WID in* [*RP-191924*](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_85/Docs/RP-191924.zip)*. Please refer to the WID for detailed scoping*

#### New numerology(ies) for PMCH for support of rooftop reception

#### Necessity and detailed enhancements to the physical channels and signals in the CAS

#### New numerology for support of mobility of up to 250km/h

#### Others

### LTE Rel-16 TEIs

*Please refer to* [*RP-191602*](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_84/Docs/RP-191602.zip) *for details regarding TEI management*

### Others

# NR

## Maintenance of Release 15 NR

***Only essential corrections*** *– a rejected draft CR will be marked in red*

### Maintenance for Initial access and mobility

### Maintenance for MIMO

### Maintenance for Scheduling/HARQ aspects

### Maintenance for NR-LTE co-existence

### Maintenance for UL power control

### Others

## NR in Release 16

***Limit to maximum 1 contribution per 1 company/organization/university for any agenda item for NR in Rel-16, including “Others”***

### Two step RACH for NR

*NR\_2step\_RACH-Core; WID in* [*RP-192330*](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_85/Docs/RP-192330.zip)*. Please refer to the WID for detailed scoping*

#### Channel Structure for Two-Step RACH

*Including mapping between the PRACH preamble and the time-frequency resource of PUSCH in msgA+ DMRS, supported MCS(s) and time-frequency resource size(s) of PUSCH in msgA, etc.*

#### Procedure for Two-step RACH

*Including power control for Msg A, msg content for Msg A & Msg B, fallback procedure, etc.*

#### Others

### NR-based Access to Unlicensed Spectrum

*NR\_unlic-core; WID in* [*RP-191575*](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_84/Docs/RP-191575.zip)*. Please refer to the WID for detailed scoping*

*Please also refer to NR-U work prioritization as endorsed in* [*RP-191581*](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_84/Docs/RP-191581.zip)

#### Physical Layer Signals and Channels

##### Initial access signals/channels

*DRS design, PRACH under OCB requirement, identify if 60KHz PRACH is needed,*

##### DL signals and channels

*Impact to PDCCH, dynamic PDCCH monitoring, impact to PDSCH to support flexible starting point due to LBT, mechanism to detect COT start for UE power saving, COT structure indication*

*Also for DM-RS design take into account aspects related to Dynamic Spectrum Sharing (DSS) as endorsed in* [*RP-191599*](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_84/Docs/RP-191599.zip)

##### UL signals and channels

*Block interlaced PUCCH design, block interlaced PUSCH design (including PUSCH on a 10 MHz SCell in 5 GHz), flexible starting point for PUSCH due to LBT, SRS enhancement*

#### Physical Layer Procedure

##### Channel access procedures

*channel access mechanisms for LBE and FBE, potential LBT requirement exceptions (notes in TR for channel access); extension to channel access mechanisms, CWS adjustment enhancement, possible extension on top of ED for coexistence, CG COT sharing and CWS update, channel access mechanism for wideband operation.*

##### Enhancements to initial access procedure

*DRS transmission, frame timing and QCL from detected SSB, 4-step RACH enhancement, SR enhancements, RLM/RRM, etc.*

##### HARQ enhancement

*NR HARQ enhancements, additional A/N transmission opportunities, multi-TTI grants*

##### Configured grant enhancement

##### Wide-band operation

*Including wide band operation for DL/UL with multiple serving cells, and wideband operation for DL/UL with one serving cell,* except channel access mechanisms

#### Others

### Integrated Access and Backhaul for NR

*NR\_IAB-core; WID in* [*RP-192188*](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_85/Docs/RP-192188.zip)*. Please refer to the WID for detailed scoping*

#### Mechanisms for resource multiplexing among backhaul and access links

#### Others

*Other remaining issues*

### 5G V2X with NR sidelink

*5G\_V2X\_NRSL; WID in* [*RP-191723*](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_85/Docs/RP-191723.zip)*. Please refer to the WID for detailed scoping*

*Please also refer to guidance for Rel-16 V2X work as endorsed in* [*RP-191547*](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_84/Docs/RP-191547.zip)

#### Physical layer structure for sidelink

*Including sidelink signals, channels, bandwidth parts, and resource pools*

#### Resource allocation for NR sidelink

##### Mode 1

##### Mode 2

##### Others

*Including transmitter UE operation of simultaneous configuration of Mode 1 and Mode 2 for a UE (this is to be discussed after the design of mode 1 only and mode 2 only)*

#### Sidelink synchronization mechanism

#### In-device coexistence between LTE and NR sidelinks

#### Physical layer procedures for sidelink

*Including HARQ, CSI acquisition for unicast, and power control*

#### QoS management for sidelink

*Including congestion control and support for QoS management*

#### Support of NR Uu controlling LTE sidelink

#### Others

*Including other aspects as led by other WGs (with RAN1 as secondary) as in the WID, e.g., UE report to assist gNB scheduling, AS level link management for unicast, etc.*

### Study on solutions for NR to support Non Terrestrial Network (NTN)

*FS\_NR\_NTN\_solutions; SID in* [*RP-190710*](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_83/Docs/RP-190710.zip)*. Please refer to the SID for detailed scoping*

#### Link-Level and System-Level Evaluations

*Including evaluation methodology, deployment scenarios, etc.*

#### Physical layer control procedures

#### Uplink timing advance/RACH procedure

*Including PRACH sequence/format/message*

#### More delay-tolerant re-transmission mechanisms

*Include capability to deactivate the HARQ mechanisms*

#### Others

### Physical Layer Enhancements for NR URLLC

*NR\_L1enh\_URLLC-Core; WID in* [*RP-191584*](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_84/Docs/RP-191584.zip)*. Please refer to the WID for detailed scoping*

*Also include:*

* *NR\_IIOT-Core; WID in* [*RP-192324*](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_85/Docs/RP-192324.zip)*. Please refer to the WID for detailed scoping*

*Also refer to* [*RP-192287*](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_85/Docs/RP-192287.zip) *for some details on down-scoping*

#### PDCCH enhancements

#### UCI enhancements

*Including i) more than one PUCCH for HARQ-ACK transmission within a slot; ii) at least two HARQ-ACK codebooks simultaneously constructed, intended for supporting different service types for a UE; iii) UL data/control and control/control resource collision as detailed in* [*RP-192324*](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_85/Docs/RP-192324.zip)

#### PUSCH enhancements

#### Enhancements to scheduling/HARQ

#### Enhanced inter UE Tx prioritization/multiplexing

#### Enhanced UL configured grant transmission

#### Others

*Including other aspects led by RAN2 (with RAN1 as secondary) as in* [*RP-192324*](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_85/Docs/RP-192324.zip)*, e.g., addressing resource conflicts between dynamic grant (DG) and configured grant (CG) PUSCH and conflicts involving multiple CGs, support for multiple simultaneous active semi-persistent scheduling (SPS) configurations for a given BWP of a UE, support for TSC message periodicities with non-integer multiple of NR supported CG/SPS periodicities, support for shorter SPS periodicities than the existing ones, etc.*

### Void

*This section is intentionally left as void*

### Enhancements on MIMO for NR

*NR\_eMIMO-Core; WID in* [*RP-192271*](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_85/Docs/RP-192271.zip)*. Please refer to the WID for detailed scoping*

*Evaluation methodology, if necessary, can be discussed in each respective sub-agenda.*

#### CSI Enhancement for MU-MIMO Support

#### Enhancements on Multi-TRP/Panel Transmission

#### Enhancements on Multi-beam Operation

#### Full TX Power UL transmission

#### Others

*Including any remaining issues of low PAPR RS*

### UE Power Saving for NR

*NR\_UE\_pow\_sav-Core; WID in* [*RP-191607*](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_84/Docs/RP-191607.zip)*. Please refer to the WID for detailed scoping*

#### PDCCH-based power saving signal/channel

#### Procedure of cross-slot scheduling power saving techniques

#### UE adaptation to maximum number of MIMO layers

#### Others

*In particular, aspect related to RAN2-led item w.r.t mechanism to provide UE assistance information*

### NR positioning support

*NR\_pos-Core; WID in* [*RP-191156*](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_84/Docs/RP-191156.zip)*. Please refer to the WID for detailed scoping*

#### DL Reference Signals for NR Positioning

#### UL Reference Signals for NR Positioning

#### UE and gNB measurements for NR Positioning

#### Necessity and details for physical-layer procedures to support UE/gNB measurements

#### Others

### Void

*This section is intentionally left as void*

### NR Mobility Enhancements

*NR\_Mob\_enh-Core; WID in* [*RP-192277*](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_85/Docs/RP-192277.zip)*. Please refer to the WID for detailed scoping*

#### Physical Layer Aspects for Mobility Enhancements during HO and SCG Change

#### Others

### Multi-RAT Dual-Connectivity and Carrier Aggregation enhancements (LTE, NR)

*LTE\_NR\_DC\_CA\_enh-Core; WID in* [*RP-192336*](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_85/Docs/RP-192336.zip)*. Please refer to the WID for detailed scoping*

#### Uplink Power Control for Supporting NR-NR Dual-Connectivity

*Including both synchronous & asynchronous, covering only cases not covered in Rel-15*

#### Potential Enhancements to Single Tx Switched Uplink Solution for EN-DC

#### Support of efficient and low latency serving cell configuration/activation/setup

*Including aspects as in* [*RP-192326*](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_85/Docs/RP-192326.zip) *for clarification of RAN1 scope for combining dormancy and power saving signals*

#### Support of aperiodic CSI-RS triggering with different numerology between CSI-RS and triggering PDCCH

#### Support of unaligned frame boundary with slot alignment and partial SFN alignment for R16 NR inter-band CA

#### Others

*Including any remaining issues for cross-carrier scheduling with different numerologies, etc.*

### NR Rel-16 TEIs

*Please refer to* [*RP-191602*](http://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_84/Docs/RP-191602.zip) *for details regarding TEI management*

### Others

## Others

# Closing of the meeting (Day 5: 5:00PM at the latest)