3GPP TSG-RAN WG1 Meeting #106bis-e Tdoc R1- 21XXXXX

E-meeting, October 11th – 19th, 2021

Agenda Item: 8

Source: Moderator (Ericsson)

Title: Summary of Email discussion on Rel-17 RRC parameters for LS to RAN2

Document for: Discussion, Decision

# 1 Introduction

This document summarizes the discussions in input contributions and during RAN1#106bis-e under the following email thread assigned by RAN1 Chair:

[106bis-e-R17-RRC] Email discussion on Rel-17 RRC parameters for LS to RAN2 – Sorour (Ericsson)

* Email discussion to start on October 18
* LS to RAN2 to be finalized and endorsed on October 22

There have been ongoing email discussions since Post RAN1#106-e meeting across Rel-17 WIs in order to provide the preliminary RRC parameter list for supported PHY functionalities by RAN1. The discussions on RRC parameters in respecitve Rel-17 WIs are resumed in RAN1#106bis-e with a final check point on October 19th. Moreover, aiming for a consistent and efficient approach for preparing RRC parameters in RAN1, [1] was prepared that suggests a set of recommendations and guidelines to achieve this goal.

Within this email discussion, i.e. [106bis-e-R17-RRC], the RRC parameter lists across different WIs are merged into an Excelsheet for final review by the group and approval by Chair to be sent via an LS to RAN2/RAN3 by October 22nd.

**Moreover, as described in [1], it is benficail to consider only stable (not necessarily complete) RRC parameters in the LS to RAN2. The remaining RRC parameters can be discussed further in RAN1 at the next meetings and be included in the earleist LS to RAN2, when identified as stable**.

Please note that due to the ongoing RRC parameter email discussions per WI, the coordination between RRC email discussions per WI and this email discussion is considered as the following:

* The Moderator of each WI RRC email discussion [106bis-e-R17-RRC-WI], has provided the “WI input RRC list”. These lists are collected in an Excelsheet by the Moderator of [106bis-e-R17-RRC].
* The collective Excelsheet is reviewed under [106bis-e-R17-RRC] email discussion using section 2.1 below.
* If the collective Excelsheet is subject to update based on any input from a WI RRC email discussion Moderator, for example due to the agreements made at the late stage of the meeting, the update of the Excelsheet would be announced in this email discussion.
	+ Each WI input RRC list includes a column at the end for “Status” to identify most impotantly the “stable” rows in the list. Please note that this column is for RAN1 information only and will not be included in the LS to RAN2.

Comapnies are encouraged to consider the discussion in the following section and provide their input, if any.

# 2 Discussion

## 2.1 RRC parameter lists of Rel-17 Ws

The sub-sections below are organized for collection of comments on RRC parameters per WI. Please provide you comments, if any, for the input RRC list of a WI in the corresponding sub-section using the **latest version of Excelsheet** available at folder [Collection of RRC parameters](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_106b-e/Inbox/drafts/8/%5B106bis-e-R17-RRC%5D/Collection%20of%20RRC%20parameters).

### 2.1.1 feNR-MIMO [106bis-e-R17-RRC-MIMO]

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.** **Please note that status Column is not available for this list. The assumption is that the entries are “stable”. If an issue raised in this email discussion for an entry that can not be resolved, changes the status of that entry to “unstable”.** |
| **Company** | **Comment** |
| Ericsson | Row 5: There is an important piece of information missing in the excel sheet for SourceRS-Info\_r17. According to RAN1 agreements, the possibly RS types included in SourceRS-Info\_r17 is different for UL and DL TCI states. This makes it impossible for RAN2 to design the signaling.Propose to add the following to the description of SourceRS-Info\_r17:The applicable source RS type is different for UL and joint/DL TCI states: SRS is applicable for UL TCI states, but not for joint/DL TCI states. |
| Moderator | **@All:** For Sheet feNR-MIMO in the next **version of Excelsheet (i.e. v006)** at folder [Collection of RRC parameters](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_106b-e/Inbox/drafts/8/%5B106bis-e-R17-RRC%5D/Collection%20of%20RRC%20parameters)* The proposed suggestion by Ericsson, Row 5 will be adopted
* Based on received feedback from FL, Row 73 would be marked as “unstable”. The remaining rows are considered stable.
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| Apple | Row 15:We think whether TCI-StateIndicationType is needed should depend on the design of TCI state pools. This RRC parmeter may not be needed as it is not reasonable for gNB to configure both joint and separate TCI by RRC, and use an explicit RRC to tell UE which TCI should be used. In our view, to be aligned with the agreement, gNB should configure only 1 type of TCI state, i.e. joint or separate, by RRC. We suggest we add a bracket for this parameter and add a note that detailed design is up to RAN2.Row 31:We think SourceRS-Info\_r17-PLRS should be removed. We failed to see the relevant agreement.Row 63 and 64: We think both parameters should be removed. We failed to see the relevant agreement. |
| Huawei, HiSilicon | Row 15:Somehow we disagree with the comment from Apple. Reading the conclusion below, we think it has been concluded in RAN1 that a UE can be configured with both joint TCI and separate DL/UL TCI, and the switch between joint TCI and separate DL/UL TCI is based on RRC signalling. RAN1#105**Conclusion**On Rel-17 unified TCI framework, for a UE configured with both joint TCI and separate DL/UL TCI, configuration of joint TCI or separate DL/UL TCI is based on RRC signaling * There is no consensus in RAN1 on how to support dynamic switching (either MAC-CE or codepoint based)

Row 27/28:Based on latest agreement pasted below, the description and candidate values of Row #27/28 should be updated. In particular, the candidate value for Row #27 should not include AP-SRS for BM. In addition, in description of Row #28, what is to be shared is not the TCI state for PDSCH/CORESET, instead it should be that for PUSCH/PUCCH. And AP-SRS for BM should be added to either the description or candidate value for Row #28 (for SRS for BM, it is aperiodic-only, but SRS for antenna switching/codebook-based/non-codebook-based UL transmissions, there is no such restriction). RAN1#106b**Agreement**On Rel.17 unified TCI framework, for Rel-17 unified TCI, for DL or UL channels/signals that can share the same indicated Rel-17 TCI state as UE-dedicated reception on PDSCH/PDCCH or dynamic-grant/configured-grant based PUSCH, all of dedicated PUCCH resources (via Rel-17 MAC-CE/DCI TCI state update):* For DL: A non-UE dedicated PDCCH/PDSCH associated with the serving cell PCI or AP CSI-RS for BM or CSI (per previous agreements) sharing the same indicated Rel-17 TCI state as UE-dedicated reception on PDSCH/PDCCH (via Rel-17 MAC-CE/DCI TCI state update) is configured via RRC.
* For UL: An SRS for BM, for antenna switching, or for codebook/non-codebook based uplink transmission (per previous agreements) sharing the same indicated Rel-17 TCI state as dynamic-grant/configured-grant based PUSCH, all of dedicated PUCCH resources (via Rel-17 MAC-CE/DCI TCI state update) is configured via RRC.

Note: The details of this RRC configuration (e.g. whether via a new RRC parameter or other means) is up to RAN2. This does not imply that a new RRC parameter(s) is necessary from RAN1 point of view.FFS: Relevant UE capability to be discussed under UE feature agenda item.RAN1#106AgreementOn Rel.17 unified TCI framework:* Aperiodic SRS resources or resource sets for BM can share the same indicated Rel-17 TCI state as dynamic-grant/configured-grant based PUSCH, all or subset of dedicated PUCCH resources in a CC
	+ FFS: Discuss if/which restriction is necessary, e.g. only for aperiodic, apply to all resources in a set
	+ Note: This doesn’t imply that all time-domain behaviours are automatically supported
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### 2.1.2 60GHz [106bis-e-R17-RRC-60GHz]

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
| vivo | Comment 1:Row 16, need to add new IE and the value range of *DL-DataToUL-ACK-r17* inside *PUCCH-Config* is (-1 .. 127) applicable to 480 and 960 kHzComment 2:Row 17, need to add new IE and the value range of *DL-DataToUL-ACK-DCI-1-2-r17* inside *PUCCH-Config* is (0 .. 127) applicable to 480 and 960 kHzAgreement:For NR operation with 480 kHz and/or 960 kHz SCS, the value range of k1 indicated in RRC is -1 ~ 127 for DCI format 1\_1 and 0 ~ 127 for DCI format 1\_2.* Note: this does not imply that DCI format 1\_2 supports multi-PDSCH scheduling

Comment 3:Row 26, need to add to Column J “when the field k2 is absent, the UE applies the value 11 when PUSCH SCS is 480 kHz; and the value 21 when PUSCH SCS is 960 kHz for k2.” and add to column P with the following agreementAgreement:* When the field k2 is absent in RRC, the UE applies the value 11 when PUSCH SCS is 480 kHz; and the value 21 when PUSCH SCS is 960 kHz for k2.
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| Moderator | **@vivo:** Thanks for careful review and comments.Rapporture recoomendation is to wait with Comment#1 and Comment#2. The reason is that they may need RAN2 to decide how to add them, given it may or may not be easy to extend the range in legacy IEs. For comment 3, it is additional default values in field descriptions. I hope you are fine with this recommendation.**@All:** For Sheet 60 GHz in the next **version of Excelsheet (i.e. v006)** at folder [Collection of RRC parameters](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_106b-e/Inbox/drafts/8/%5B106bis-e-R17-RRC%5D/Collection%20of%20RRC%20parameters)* The proposed suggestion by vivo for Row 5 will be adopted
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| Apple | Comment#1:* Row 4/Column #P:
	+ ‘480KHz - 139, w/ FFS 571’. The FFS should be removed for ‘571’ based on the latest agreement:
* Row7/Column J:
	+ ‘Field description requires updating to capture that L = 1151 is not supported for SCS 480 and 960 kHz and L = 571 is not supported for 960 [and 480] kHz.’. The ‘[and 480]’ should be removed.

**Agreement*** Additionally support PRACH length L=571 for 480kHz
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### 2.1.3 IIoT&URLLC [106bis-e-R17-RRC-IIoT-URLLC]

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
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### 2.1.4 NR-NTN [106bis-e-R17-RRC-NR-NTN]

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
| Apple | On row 25, the value range of nrofHARQ-ProcessesForPDSCH-r17, we prefer to add some values between 16 and 32 for flexibility.  |
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### 2.1.5 Positioning [106bis-e-R17-RRC-NR-ePos]

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
| Ericsson | Row 5 and 6: the parameter srs-PosResourceSetId and srs- PosResourctId are use both for UL-TDOA (where it goes via RRC from the UE to the gNB) as well as in multi-RTT (where it goes from the UE to the LMF via LPP). We suggest to clarify that both the RRC and LPP protocols are impacted. Regarding row 63, 64, 65, the PRS priority window, measurement gap activation and priority indicator, are not yet fully resolved in RAN1 (for example, whether to use MAC CE or RRC to signal the processing window). We think they could be marked as “unstable”. The parameters could be either omitted from the table for now until we have a more stable design, or put in brackets.  |
| CATT | Row 5 and 6: Share the similar as Ericsson. “FFS for RAN2” can be changed to. “FFS for RAN2/RAN3”Regarding the parameters for measurement gap activation (Row 75, 77, 78 in the latest spreadsheet), the parameters can be considered as stable based on the latest agreements. Agreement:Support the following options (in the agreement made in RAN1#106-e) for a new mechanism of MG activation request for the purpose of positioning.* Option 2: by UE (via UCI or UL MAC CE)
	+ Select only one of UCI and UL MAC CE in RAN1#106bis-e
* Option 1: by LMF (via an NRPPa message)
	+ Note: This is transparent to the UE

Agreement:Support using UL MAC CE for MG activation request by UE (Option 2) for the purpose of positioning.Agreement:Support the following option (from the agreement made in RAN1#106-e) for a new MG activation procedure to be performed by the gNB for the purpose of positioning.* Option 2: DL MAC CE

FFS: Deactivation processFor the parameter for priority window and PRS priority indicator (Row 79, 80), we think they can also be considered as stable based on the following agreement. Agreement:• With regards to UE determining the PRS priority with other DL signal/channels within the PRS processing window for PRS measurement outside MG, **support the priority indicated by gNB**.* FFS: What are the other DL signals/channels

• With regards to the PRS processing window for PRS measurement outside MG, ***at least support the window indicated by gNB***. |
| Moderator | **@Ericsson/CATT**: Based on Rapporteure’s recommendation, Moderator suggests adopting the suggested updates for Row 5 and 6 while keep the status of remaining rows uchanged. I hope this recommendation is fine with Ericsson.**@All:** For Sheet Positioning in the next **version of Excelsheet (i.e. v006)** at folder [Collection of RRC parameters](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_106b-e/Inbox/drafts/8/%5B106bis-e-R17-RRC%5D/Collection%20of%20RRC%20parameters)* The proposed suggestion by Ericsson/CATT for Row 5 and 6 will be adopted by changing “FFS: RAN2” to “FFS: RAN2/RAN3”.

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| Nokia/NSB | Thanks for all the efforts. Nokia has the following wo comments. Sorry for not providing them earlier.:1. In Row 84 it should be updated to reflect the latest agreement. We suggest updating column J and P as follows. We also suggest to align column K with the above rows.

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| NR\_pos\_enh | Multipath/NLOS mitigation |   |   |   |   |  losNlosIndicator |  New |   | This parameter is used for LMF to include LoS/NLoS information for UE-based positioning. Indicators can be associated with either: Option 1: Each DL PRS resource for each TRP (working assumption) Option 2: Each TRP | [0, 0.1, …, 0.9, 1] |   |   |   | FFS: RAN2 | Agreement:• Positioning assistance data from LMF is enhanced for UE-based positioning by including LoS/NLoS indicators.Agreeement:* For UE-based positioning, support the following options for LoS/NLoS indicators within positioning assistance data:
	+ Option 1 (Working assumption): LMF associates UE-based LoS/NloS indicators with each DL PRS resource for each TRP
	+ Option 2: LMF associates UE-based LoS/NloS indicators with each TRP
* Note: For option 1, one LoS/NloS indicator is associated with one DL-PRS resource
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1. Row 87 could also be updated to reflect the latest agreement. Suggest to update Columns J and P as follows:

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| NR\_pos\_enh | Multipath/NLOS mitigation |   |   |   |   | ULAoAOfAdditionalPathPerSRSResource |  New |   | UL-AoA values per SRS resource for the additional path to be reported from gNB to LMF. Up to M=8 UL-AoA values can be reported per additional path.  | FFS |   |   |   |  FFS: RAN3 | Agreement:Reporting multiple UL-AoA values per SRS resource for the additional path is supported for at least UL TDOA and multi-RTT.• FFS: maximum number of UL-AoA values per additional path.Agreement: For hybrid positioning methods where UL TDOA and multi-RTT are used in addition to UL AoA, support reporting of up to M=8 UL-AoA values per additional path  |

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| Moderator | **@Nokia**: Based on Rapporteure’s recommendation, Moderator suggests adopting the suggested updates.**@All:** For Sheet Positioning in the next **version of Excelsheet (i.e. v006)** at folder [Collection of RRC parameters](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_106b-e/Inbox/drafts/8/%5B106bis-e-R17-RRC%5D/Collection%20of%20RRC%20parameters)* The proposed suggestion by Nokia for Row 84 and Row 87 will be adopted.
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### 2.1.6 RedCap [106bis-e-R17-RRC-REDCAP]

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
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### 2.1.7 Power saving [106bis-e-R17-RRC-PowSav]

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
| Apple  | For **row 4 to row 12**, further agreements have been made for [TRS-ResourceConfig], including the common parameters for a TRS resource set. In [106bis-e-NR-R17-PowSav-04] email discussion, we agreed that the agreements will be directly reflected in the RRC parameter list. The spreadsheet should be updated accordingly to reflect the agreements. In case the time is too tight for the update, can we at least include the agreement on the “comment” column of row 4?**Agreement**Configuration of TRS/CSI-RS occasion(s) for idle/inactive UEs include a list of one or more TRS resource sets, where:        a TRS resource set can be configured to includeo   a set of TRS resources up to two consecutive slots,  Note: a TRS resource is same as Rel-15/16, i.e. a CSI-RS in a symbol.o   at least common configuration parameters:  a QCL reference  firstOFDMSymbolInTimeDomain,  ‘frequencyDomainAllocation for row1’, ‘startingRB’ ,‘nrofRBs’,’powerControlOffsetSS’, periodicityAndOffset’  FFS        scramblingID,        a TRS resource set ID, number of slots {1, 2} or number of symbols {2, 4} if supported        Note: the ‘TRS resource set’ configuration is not (necessarily) identical to ‘NZP-CSI-RS-ResourceSet’ configuration for TRSin R15/16. |
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### 2.1.8 Coverage [106bis-e-R17-RRC-CovEnh]

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
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### 2.1.9 eIAB [106bis-e-R17-RRC-eIAB]

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
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### 2.1.10 Sidelink [106bis-e-R17-RRC-Sidelink]

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
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### 2.1.11 MBS [106bis-e-R17-RRC-MBS]

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
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### 2.1.12 DSS [106bis-e-R17-RRC-DSS]

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
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### 2.1.13 MR-DCs Scell Act. [106bis-e-R17-RRC-NR-DC]

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
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### 2.1.14 NB-IoT&eMTC [106bis-e-R17-RRC-NB-IoT-eMTC]

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
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### 2.1.15 IoT NTN [106bis-e-R17-RRC-IoT-NTN]

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
| Apple | 1. Rows 2 and 23, we do not think the parameter “UEPre-compensationNB-r17” is necessary since uplink time and frequency precompensation should always be supported for basic IoT NTN operation.
2. Rows 4-15 and 25-36 should be “unstable” since they are based on working assumption from NR NTN, which need to be confirmed.
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### 2.1.16 5G-Broadcast [106bis-e-R17-RRC-LTE-Bcast]

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
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## 2.2 Draft LS to RAN2 on RRC parameters

A draft for LS to RAN2 is provided and available at folder [Draft LS](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_106b-e/Inbox/drafts/8/%5B106bis-e-R17-RRC%5D/Draft%20LS). Please provide your comments, if any, on the **latest version of draft LS**. Your review, specially from 20th of Oct. ia very appreciated.

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| **Company** | **Comment** |
| Moderator | **@All**: After uploading the next **version of Excelsheet (i.e. v006)** at folder [Collection of RRC parameters](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_106b-e/Inbox/drafts/8/%5B106bis-e-R17-RRC%5D/Collection%20of%20RRC%20parameters), Moderator will upload two files with clean version of consolidated lists of stable rows for LTE and NR in [Draft LS](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_106b-e/Inbox/drafts/8/%5B106bis-e-R17-RRC%5D/Draft%20LS) for the final review. |
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## 2.3 Improve RRC parameters preparation activity

The document in [1] was an attempt to address our challenges in RAN1 for the task of RRC parameters preparation based on our previous experiences. However, it was not feasible to seek input from all delegates in RAN1 on identify what the challenges are and how they can be handled.

Please consider this section to share your questions, comments and suggestions that could help to further improve our WoW within RAN1, as well as inter-action with RAN2 with respect to RRC parameter preparation. The more we know, the more we can improve. Thank You!

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| **Company** | **Comment** |
| Moderator | Differentiation between RRC IE and UE capability signalling triggered by following Q&A:

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| **Question/comment by Youngwoo (IDC):**For 60 GHz, timeDurationForQCL, beamSwitchTiming, beamReportTiming and maxNumberRxTxBeamSwitchDL are captured as existing RRC parameters with new candidate values. However, those parameters are actually UE capability signaling not RRC IE. So, if my understanding is correct, then those parameters should removed from this sheet. **Answer from 38.331 Rapporteure**I agree it is a bit unfortunate with this mix. UE capabilities have to be in the Feature List. In RAN2, Parameter List and Feature List are handled separately and (of course) impacts completely different parts of the signalling.So the parameters listed below should clearly appear in the Feature List. The parameters COULD be kept also in the Parameter list for information purpose if there is a reason. But then this fact should be clearly indicated in those cases. E.g.* NOTE: This is a UE capability parameter and is listed here for information. It appears also in the Feature List

Maybe even better would be to add free text* For Information: Existing UE capability parameters, timeDurationForQCL, beamSwitchTiming, beamReportTiming and maxNumberRxTxBeamSwitchDL appear with new candidate values in the Feature List.

Maybe we had cases like this before, I tend to recall RAN2 “discovered” a UE capability had been squeezed in into the Parameter list, and this of course creates confusion in RAN2. I might recall wrongly, though. |

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# 3 Conclusion

TBD

# 4 References

1. R1-2110415, Recommendations for RAN1 RRC Parameter Preparation; Moderator (Ericsson)