**3GPP TSG RAN meeting #90e RP-20xxxx**

**Electronic Meeting, December 7-11, 2020**

## Status Report to TSG

**Agenda item:** 9.8.3

|  |  |
| --- | --- |
| **WI / SI Name** | NR sidelink enhancement |
| included in this status report | Study Item: No | Core part: Yes | Performance part:Yes | Testing part:No |
| **Acronym** | NR\_SL\_enh |
| **Unique ID** | 860042 |
| **TSG Tdoc of latest approved WI/SI description (if any)** | RP-201516 |
| **Target Completion Date****(indicate if changed)** | Study Item: mm/yyyy | Core part: 09/2021 | Performance part: 03/2022 | Testing part: mm/yyyy |
| **Overall Completion level** | Study Item: xx % | Core part: 15% | Performance Part: 0% | Testing part: xx% |

Note: Overall completion level percentage numbers should use one of the colors below:

* xx%: Normal progress, no RAN plenary action needed
* xx%: Progress behind schedule, may need RAN plenary intervention. If so, SR should clearly define requested action
* xx%: Progress critically behind, RAN plenary shall intervene. SR should define requested action

**Source:**

|  |  |
| --- | --- |
| **Leading WG** | RAN WG1 |
| **Rapporteur** | **Name** | Seungmin Lee |
| **Company** | LG Electronics |
| **Email** | edison.lee@lge.com |

## 1 Work plan related evaluation

|  |  |
| --- | --- |
| **Do you want to modify the time budget for this WI/SI compared to what was endorsed at the last RAN meeting?** | No |

*If you answered No: Then please remove the Excel file from the zip file of this status report.*

*If you answered Yes: Then please fill out the attached Excel template to request a modification of the time budgets for your WI /SI. The Excel table has to be filled out for all affected RAN WGs and up to the target date of the WI/SI. The basis are the endorsed time budgets of the last RAN meeting. Please highlight all changes of the values.
 One time unit (TU) corresponds to ~ 2 hours in the meeting.
 If this status report covers a WI with Core and Performance part, then please have one line for each in the attached Excel table.
 Note: If no Excel table is attached, then this means no time budget change.*

**Additional explanations/motivations for the time budget changes in the attached Excel table:**

## 2. Detailed progress in RAN WGs since last TSG meeting (for all involved WGs)

 NOTE: Agreements and Open issues impacted cross-TSG aspects shall be explicitly highlighted

## 2.1 RAN1

#### 2.1.1 Agreements

**RAN1#103-e**

Regarding sidelink evaluation methodology update for power saving, the following agreements were made:

* Agreements on power consumption scaling for adaptation
	+ Confirm the following agreement with red changes:
		- (Working assumption) Scaling of SL BWP size adaptation in RX perspective
			* ~~X MHz is~~ by (0.4 +0.6\*(X-20)/80), where X is in MHz ~~\*100 MHz~~
* Agreements on power consumption level
	+ Confirm the following agreement with red changes:
		- (Working assumption) For “PSCCH/PSSCH RX”,
			* In non-PSFCH-slot (i.e., the number of PSCCH/PSSCH symbols is 13),
				+ the power consumption level is the same as that of “PDCCH+PDSCH”
		- (Working assumption) For power consumption level of “PSFCH RX”,
			* The power consumption level is power consumption level of “PDCCH-only” for cross-slot scheduling
				+ its minimum value is 50
	+ Remove the square brackets in the following agreements with red-colored clarification.
		- Agreements made in RAN1#102-e meeting:
			* For power consumption level of “1st SCI/2nd SCI RX”,
				+ the power consumption level is ~~[~~0.7~~]~~\* power consumption level of “PSCCH/PSSCH RX”
			* For power consumption level of “PSFCH TX”,
				+ the power consumption level is ~~[~~0.35~~]~~\*power consumption level of “UL” for long PUCCH or PUSCH
			* For power consumption level of “S-SSB RX”,
				+ the power consumption level is ~~[~~1.5~~]~~\*power consumption level of “Uu SSB-processing”
* Agreements on channel model for V2P/P2V links
	+ Support following three states for V2P/P2V links.
		- LOS
			* A link is in LOS state if two UEs are in the same street and the LOS path is not blocked by vehicles
		- NLOS (i.e., LOS path blocked by buildings)
			* A link is in NLOS state if the two UEs are in different streets.
		- NLOSv (i.e., LOS path blocked by vehicles)
			* A link is in NLOSv state if the two UEs are in the same street and the LOS path is blocked by vehicles
	+ For two UEs are in the same street in V2P/P2V links, reuse the probability of LOS and NLOSv states for Urban case specified in TR 37.885 (see below)

|  |
| --- |
| Urban |
| LOS | $$P\left(LOS\right)=min\left\{1, 1.05\*exp⁡(-0.0114\*d)\right\}$$ |
| NLOSv | $$P\left(NLOSv\right)=1-P(LOS)$$ |

Note: d denotes the distance between transmit and receive UEs

* + For V2P/P2V links, reuse “additional vehicle blockage loss” specified in TR 37.885 (see below).

|  |
| --- |
| When a link is in NLOSv, additional vehicle blockage loss is added as follows:* The blocker height is the vehicle height which is randomly selected out of the three vehicle types according to the portion of the vehicle types in the simulated scenario.
* The additional blockage loss is max {0 dB, a log-normal random variable}.
* Case 1: Minimum antenna height value of TX and RX > Blocker height
* No additional blockage loss
* Case 2: Maximum antenna height value of TX and RX < Blocker height
* Mean: 9 + max(0, 15\*log10(d)-41) dB, standard deviation: 4.5 dB
* Case 3: Otherwise
* Mean: 5 dB + max(0, 15\*log10(d)-41), standard deviation: 4 dB
 |

* + For V2P/P2V links, reuse the fast fading parameters of V2V link specified in TR 37.885.
		- Note: this does not imply that a Ped UE is required to use the same antenna configuration of a Veh UE
* Agreements on traffic model for P2V link
	+ For P2V link, at least following traffic model is supported:
		- Option 1: Traffic model for P-UE’s transmission specified in TS 36.885
			* The message size is fixed at 300 bytes and transmission frequency is 1 Hz
			* ‘100ms’ latency requirement
		- Option 4: Aperiodic Model 1 specified in TR37.885 with following changes:
			* Inter-packet arrival time: 250 ms + an exponential random variable with the mean of 250 ms
			* Packet size: Uniformly random in the range between 200 bytes and 800 bytes with the quantization step of 200 bytes
			* Latency requirement: 250 ms or 100 ms
* Agreements on traffic model for V2P link
	+ For V2P link, V2V traffic model and the following options for traffic model are supported. Companies declare which traffic model is used for their V2P evaluation.
		- Option 7: Periodic Model 2 specified in TR 37.885 with following change:
			* Inter-packet arrival time: 500ms
			* Latency requirement: 500 ms or 100 ms
		- Option 8: Aperiodic Model 1 specified in TR 37.885 with following change:
			* Inter-packet arrival time: 250 ms + an exponential random variable with the mean of 250 ms
			* Packet size: Uniformly random in the range between 200 bytes and 800 bytes with the quantization step of 200 bytes
			* Latency requirement: 250 ms or 100 ms
* Agreements on pedestrian UE drop modelling for V2X case
	+ For the pedestrian UE dropping in V2X evaluation, reuse those specified in TR 36.885.
		- Support that total number of pedestrian UEs is 1000 as optional
* Agreements on channel model for P2P link
	+ For the channel model for P2P link,
		- Option 2: LOS, NLOS, NLOSv are supported.
			* Option 2-2: Reuse definition of NLOS state, the probability of LOS/NLOSv, and additional vehicle blockage loss for V2V/V2P/P2V, and modify the definition of LOS/NLOSv states as follow
				+ LOS

A link is in LOS state if two UEs are in the same sidewalk in the same street ~~and the LOS path is not blocked by vehicles~~

A link is in LOS state if two UEs are in the different sidewalk in the same street and the LOS path is not blocked by vehicles

* + - * + NLOS (i.e., LOS path blocked by buildings)

A link is in NLOS state if the two UEs are in different streets.

* + - * + NLOSv (i.e., LOS path blocked by vehicles)

A link is in NLOSv state if the two UEs are in the different sidewalk in the same street and the LOS path is blocked by vehicles

* + Note that the intention of channel model above is at least for modeling the interference generation in P2P link. The modeling P2P link is not applied to the scenario of V2P only, optionally applied or not to the scenario of P2V only, but applied to the scenario of combination of V2P and P2V.
	+ For the fast fading parameters for P2P link, reuse fast fading parameters of V2V/V2P/P2V links.
		- Pedestrian UE speed is 3 km/h
		- Location update is not modelled for pedestrian UE
	+ Note that the intention of channel model above is at least for modeling the interference generation in P2P link. The modeling P2P link is not applied to the scenario of V2P only, optionally applied or not to the scenario of P2V only, but applied to the scenario of combination of V2P and P2V.
* Agreements on reference system deployments for public safety and commercial use cases
	+ For the public safety and commercial use cases, reuse the parameters of “Reference system deployments” specified in Section A.2.1.1 of TR 36.843 with following modification:
		- Carrier frequency:
			* Include 3.5 GHz for commercial use case (optional)
		- System bandwidth:
			* Include 40 MHz for commercial use case (optional) and 20 MHz dedicated spectrum for out-of-coverage scenarios (optional)
		- “eNB” is replaced by “gNB”
		- FFS any refinement/variation is necessary, e.g., 19 vs. 7 sites, etc.
	+ For the layout for public safety and commercial use cases, support “7 macro sites with 3 cells per site in the layout”
	+ For public safety use case, at least following layout option is supported:
		- Option 5 of TR 36.843: Urban macro (1732m ISD)
			* UE dropping as in Table A.2.1.1-1
				+ All UEs are outdoors UEs
				+ Mix of outdoor and indoor UEs
	+ For public safety and commercial use cases, at least following option is supported for UE RF parameters:
		- Reuse the number of TX AP, the number of RX AP, antenna gain for P-UE specified in TR 37.885.
	+ For public safety and commercial use cases, one OFDM symbol of NR SL slot is used for AGC
* Agreements on channel model for public safety and commercial use cases
	+ For the public safety and commercial use cases, reuse the parameters of “Channel models” specified in Section A.2.1.2 of TR 36.843 with following modification:
		- Each component of channel model reuses what is specified in TR 38.901.
* Agreements on traffic model for commercial use case
	+ For commercial use case, at least following option is supported for traffic model:
		- Option 7: Periodic traffic model 3 specified in TR 37.885
* Agreements on performance metrics for public safety and commercial use cases
	+ For public safety and commercial use cases, at least performance metrics for communication specified in A2.1.4.2 of TR 36.843 are reused with following modification:
		- “FTP2 traffic model” is replaced with “FTP traffic model or periodic traffic model”
		- Power consumption model agreed in R-17 NR sidelink enhancement WI is used
		- the metrics for latency and WAN are not needed
* Agreements on in-band emission model for public safety and commercial use cases
	+ For public safety and commercial use cases, reuse in-band emission model used for NR V2X specified in section 6.4E.2.4 in TS 38.101

Regarding resource allocation for power saving, the following agreements and conclusions were made:

* Conclusions on sidelink reception types for evaluation and designing of SL power saving features
	+ SL reception Type A and Type D should be used as the reference for evaluation and designing of SL power saving features in R17.
		- Type A: UE is not capable of performing reception of any SL signals and channels, FFS with exception of performing PSFCH and S-SSB reception (aim to conclude in RAN1#104-e)
		- Type D: UE is capable of performing reception of all SL signals and channels defined in R16. It does not preclude UE to perform reception of a subset of SL signals/channels
		- If there are evaluations with assumptions other than the above reference, the detailed assumptions need to be reported
		- Note: the types and the associated capability defined here are not intended to be defined as Rel-17 UE features as is.
* Agreements on resource allocation schemes for power saving
	+ Partial sensing based RA is supported as a power saving RA scheme
		- FFS details
	+ Random resource selection is supported as a power saving RA scheme
		- FFS any changes or enhancement
		- FFS on conditions to apply random resource selection
* Agreements on resource pool (pre)configuration for power saving
	+ In R17, a SL Mode 2 Tx resource pool can be (pre-)configured to enable full sensing only, partial sensing only, random resource selection only, or any combination(s) thereof
		- FFS details, including usage, potential restrictions, whether/how any enhancement or condition is needed for the coexistence of full sensing and power saving RA scheme(s) in a same resource pool, etc.
* Agreements on re-evaluation and pre-emption for power saving
	+ Re-evaluation and pre-emption checking are not supported by UEs that do not perform any sensing (i.e. PSCCH reception)
	+ Re-evaluation and pre-emption checking are supported by UEs that perform sensing
		- FFS details and any conditions(s) in which re-evaluation and pre-emption can be performed
	+ FFS whether/how re-evaluation and pre-emption can be supported by UEs performing random resource selection that do perform sensing
	+ Note: details about sensing in this context, including when it is performed, are not decided yet.
* Agreements on congestion control for power saving
	+ Further study congestion control based on CBR and CR for power saving RA schemes
		- Identify necessary changes from R16 CBR/CR (if any), including transmission resource selection and transmission parameters that can be adjusted and applicable to power savings RA schemes
		- Note: this is not intended to require all UEs to perform sensing for the purpose of CBR measurement

Regarding inter-UE coordination in mode 2 enhancements, the following conclusions were made:

* Conclusions on categories of schemes for inter-UE coordination
	+ The schemes of inter-UE coordination in Mode 2 are categorized as being based on the following types of “A set of resources” sent by UE-A to UE-B:
		- UE-A sends to UE-B the set of resources preferred for UE-B’s transmission
			* e.g., based on its sensing result
		- UE-A sends to UE-B the set of resources not preferred for UE-B’s transmission
			* e.g., based on its sensing result and/or expected/potential resource conflict
		- UE-A sends to UE-B the set of resource where the resource conflict is detected
		- FFS: details of resource conflict, e.g., including type of resource conflict
		- FFS: details of sensing operation at UE-A side
		- FFS: which type(s) of resource set information is(are) beneficial/feasible to which cast type(s)
		- Note: these different types may be used in combination with each other
	+ From RAN1 perspective, further study on the feasibility/benefit of inter-UE coordination is required
	+ Send an LS to RAN plenary
* Conclusions on further consideration aspects for feasible/beneficial inter-UE coordination schemes
	+ For the schemes of inter-UE coordination identified as feasible/beneficial, at least the following aspects are further discussed.
		- How/when UE-A determines the contents of ”A set of resources”, including consideration of UL scheduling
		- When UE-A sends ”A set of resources” to UE-B, including which UE(s) sends it
		- How UE-A and UE-B are determined
		- How UE-A sends ”A set of resources” to UE-B, including container used for carrying it, implicitly or explicitly or both
		- How/when/whether UE-B receives “A set of resources” and takes it into account in the resource selection for its own transmission
		- How/whether to define the relationship between support/signaling of inter-UE coordination and cast type

#### 2.1.2 Remaining Open issues

The followings are the remaining open issues:

* Physical layer aspects on resource allocation to reduce UE’s power consumption including;
	+ Details and applicability condition(s) of partial sensing based resource selection and random resource selection
	+ Details and condition(s) in which re-evaluation and pre-emption can be performed by UEs performing sensing
	+ Whether/how to support congestion control for power saving resource allocation schemes
* Conclusion on the feasibility and benefit of mode 2 enhancement(s) for enhanced reliability and reduced latency from physical layer aspects

## 2.2 RAN2

#### 2.2.1 Agreements

**RAN2#112-e**

Regarding sidelink DRX, the following agreements and working assumptions were made:

* Agreements on sidelink DRX
	+ Sidelink DRX needs to support sidelink communications for both in and out of network’s coverage scenarios.
	+ RAN2 will prioritize normal use case without consideration of relay UE use case in Rel-17.
	+ Support SL DRX for all casting types.
	+ If a UE is in SL active time, UE should monitor PSCCH. FFS on PSSCH. FFS for sensing impacts.
	+ RAN2 is not going to introduce SL paging and SL PO for SL DRX.
	+ As baseline, for Sidelink DRX for SL unicast, it is proposed to inherit and use timers similar to what are used in Uu DRX. FFS for SL broadcast/groupcast. FFS on detailed timers.
	+ Working assumption: SL DRX should take PSCCH monitoring also for sensing (in addition to data reception) into account if SL DRX is used.
	+ Support of long DRX cycle for SL unicast should be assumed as a baseline. FFS on the need of short DRX cycle.
	+ Deprioritize SL WUS from RAN2 point of view in Rel-17.

Regarding geo-area confinement for non-ITS sidelink bands, the following agreements were made:

* Agreements on geo-area confinement for non-ITS sidelink bands
	+ The Objective 5 in Rel-17 SL enhancement WI can be supported by Rel-16 SA2 spec, TS 23.287. RAN2 confirms that no extra standard efforts need to be done in RAN WGs towards this objective. RAN2 consider this objective completed.

#### 2.2.2 Remaining Open issues

The followings are the remaining open issues:

* Protocol layer aspects on resource allocation to reduce UE’s power consumption
* Protocol layer aspects on sidelink DRX for broadcast, groupcast, and unicast including;
	+ Details of timer for unicast, and whether/how to support timer for broadcast/groupcast
	+ Whether/how to support short DRX cycle for unicast
	+ Mechanism aiming to align sidelink DRX wake-up time among the UEs communicating with each other
	+ Mechanism aiming to align sidelink DRX wake-up time with Uu DRX wake-up time in an in-coverage UE
* Protocol layer aspects of mode 2 enhancement(s) for enhanced reliability and reduced latency

## 2.3 RAN3

#### 2.3.1 Agreements

#### 2.3.2 Remaining Open issues

## 2.4 RAN4

#### 2.4.1 Agreements

**RAN4#97-e**

RAN4 agreed work plan for SL enhancements in Rel-17 as follow

* Left over issue:
	+ Supporting PC2 NR SL UE RF requirements
		- Power Class 2 (high power) UE for single at n47, PC2 SL-MIMO at n47, PC2 inter-band con-current operation
	+ Partial used SL operation in a carrier including n79 and other interesting bands
		- Cover the frequency separation issue and timing alignment issue
* New SL enhancement RF requirements:
	+ RAN4 adds new SL operating bands for public safety service
	+ RAN4 can specify additional RF requirements when the necessity of additional RF requirements identified from other WG.
	+ RAN4 can specify additional RF requirements at FR2 according to request the exact operating bands based on the coexistence evaluation
* Frequency aspect
	+ Frequency ranges at FR1
		- Based on Operator input, RAN4 specifies the operating bands for SL operation in licensed bands including candidate public safety spectrum. Before to specify the operating bands, RAN4 can study for co-existence evaluation if needed.
	+ Frequency ranges at FR2
		- Based on Operator input, RAN4 decides the frequency ranges in licensed bands only. Before to specify the operating bands for SL operation, RAN4 needs to study on co-existence evaluation with exact operating band at FR2. The 63-64GHz ITS dedicated spectrum is not scope in the WID.
		- Decide the deadline for requesting of FR2 frequency band as RAN4 #98-e meeting.

Also, RAN4 agreed way forward for SL enhancements in Rel-17 as follow

* In order to align with the objective in the WI, the following items are adopted
	+ Based on Operator input, RAN4 specifies the operating bands for SL operation in FR1 including candidate public safety spectrum as part of the WI in RP-201516
		- Before specifying the operating bands, RAN4 can study for co-existence evaluation if needed
	+ RAN4 to collect Operator input for new SL operating bands in FR1 for public safety service
		- Requests based on input papers from Operators with justification
		- Cut-off for requests to be defined in the Work Plan in R4-2016924
	+ Future NR SL operating bands for FR1 after Rel-17 cut-off can be managed with the basket WI approach
* NR Band n14
	+ Operator Request
		- In R4-2016464, AT&T, FirstNet request to specify n14 for NR Sidelink Operating Bands.
			* NR Band n14 is dedicated for first responder communications in the United States.
			* NR Band n14 is included as one of the NR sidelink licensed operating bands in FR1
		- Some additional information can be provided for SL operation in n14 by RAN4 #98-e
			* PC1 or PC3 for SL operation or both PC1 & PC3 in n14
			* Is there any legacy Uu operation in n14 or B14?

#### 2.4.2 Remaining Open issues

RAN4 will study and specify the above leftover issues and new SL enhancement RF requirements based on operator requested SL operating bands.

## 2.5 RAN5

#### 2.5.1 Agreements

#### 2.5.2 Remaining Open issues

#### 2.5.3 Remaining Open issues with cross-WG dependencies

## 2.6 RAN6

#### 2.6.1 Agreements

#### 2.6.2 Remaining Open issues

## 3. Detailed progress in SA/CT WGs since last TSG meeting (for all involved WGs)

NOTE: This section only needs to be filled in for WI/SIs where there is a corresponding relevant WI/SI in SA/CT.

## 3.1 SA2

#### 3.1.0 SA2 FS\_eV2XARC\_Ph2 status – general

SA2 has progressed FS\_eV2XARC\_Ph2 (Study on architecture enhancements for 3GPP support of advanced V2X services – Phase 2) with TR 23.776 to investigate 5G System enhancements based on what has been specified in Rel-16, for enhanced support of V2X operation for pedestrian UEs (i.e. UEs for Vulnerable Road Users), e.g. V2X communication with power efficiency, according to vehicular services requirements defined in TS 22.185 and TS 22.186.

#### 3.1.1 Agreements with cross-TSG impacts

In SA2#141E (October 2020), some principles were captured as the interim conclusion regarding NR PC5 DRX operations for Key Issue #1 (Support of QoS aware NR PC5 power efficiency for pedestrian UEs) in clause 7.2 of TR 23.776.

#### 3.1.2 Remaining Open issues with cross-TSG impacts

NOTE: This section should also flag any critical dependencies that need TSG attention.

Because NR PC5 DRX operations have RAN dependency, SA2 sent the following LS to RAN WGs in SA2#141E (October 2020).

* S2-2008326: LS on PC5 DRX operation (To: RAN2 / Cc: RAN1) in order to get feedback on the following questions from RAN2:
	+ Q1) For all the modes of communication (i.e. unicast, groupcast, and broadcast), whether the existing PC5 QoS parameters provided by the V2X layer to the AS layer are sufficient for the AS layer to determine the PC5 DRX parameters? Or, whether additional information is required or desired to be provided by the V2X layer to the AS layer?
		- In TR 23.776 some solutions propose that additional information could include, e.g.:
			* Default PC5 DRX cycles per V2X service type/PQI/RAT type (e.g., PC5 DRX cycle and on duration)
			* Application traffic pattern information (e.g., periodicity and burst sizes of V2X messages)
			* The length of an offset that the AS layer can add to extend the PC5 DRX "ON periods"
		- Note that, none of the parameters listed above has reached consensus in SA2.
	+ Q2) Once the AS layer determines the PC5 DRX parameters, whether the AS layer can provide the PC5 DRX related information to the V2X layer, e.g., the PC5 DRX cycle, ON duration and starting point of the ON duration?
	+ Q3) Once the AS layer determines the PC5 DRX parameters, whether sharing the PC5 DRX related information amongst UEs in the vicinity in V2X layer, is beneficial or feasible for broadcast and groupcast?
	+ Q4) What is the relationship between the PC5 DRX and the Uu DRX if both are activated on a UE?

The following is SA2 meeting in Q1 2021:

* SA2#143E February 24 – March 9, 2021

To finalize the pending issues in the conclusion having RAN dependency, it is considered that timely feedback on the SA2 questions from RAN2 is needed.

## 4. References

NOTE: This can be e.g. a list of all related Tdocs in the affected WGs since last TSG, references to LSs, produced TRs/TSs, the work/study item description or status reports of previous TSGs.

 09.11.2020 minor adaptations for RAN #90e

 31.08.2020 minor adaptations for RAN #89e

 20.04.2020 minor adaptations for RAN #88e

 18.02.2020 minor adaptations for RAN #87e

 14.11.2019 minor adaptations for RAN #86

 18.08.2019 minor adaptations for RAN #85

 12.05.2019 minor adaptations for RAN #84

 27.02.2019 minor adaptations for RAN #83

 21.11.2018 completion levels with colours added (for RAN #82)

v04.81 31.07.2018 simplification of template and addition of cross-TSG aspects (for RAN #81)

v04.80 21.05.2018 minor adaptations for RAN #80

v04.79 26.02.2018 minor adaptations for RAN #79

v04.78 18.11.2017 minor adaptations for RAN #78

v04.77 06.08.2017 minor adaptations for RAN #77

v04.76 15.05.2017 minor adaptations for RAN #76

v04.75 31.01.2017 minor adaptations for RAN #75

v04.74 28.10.2016 minor adaptations for RAN #74

v04.73 01.09.2016 adaptations for RAN #73 (time units in extra Excel table, RAN6 reporting included)

v04.72 26.05.2016 adaptations for RAN #72 (introduction of NR & GERAN TUs)

v04.71 10.02.2016 minor adaptations for RAN #71

v04.70 30.10.2015 minor adaptations for RAN #70

v04.69 12.08.2015 minor adaptations for RAN #69

v04.68 21.05.2015 minor adaptations for RAN #68

v04.67 01.02.2015 minor adaptations for RAN #67

v04.66 16.11.2014 minor adaptations for RAN #66

v04.65 16.08.2014 minor adaptations for RAN #65

v04.64 22.05.2014 minor adaptations for RAN #64

v04.63 24.01.2014 restructuring for RAN #63 to cover Core & Perf. in one doc file

v03.62 11.11.2013 section 1.2.3 adapted for RAN #62

v03 11.08.2013 section 1.2.3 added on time budget

v02 07.05.2010 history added, some spelling corrections

v01 13.11.2009 First version of the template

**RAN1#103-e**

1. R1-2007553 Power consumption reduction for sidelink resource allocation FUTUREWEI
2. R1-2007554 Views on resource allocation enhancements for sidelink communication FUTUREWEI
3. R1-2007614 Sidelink evaluation methodology update for power saving Huawei, HiSilicon
4. R1-2007615 Sidelink resource allocation to reduce power consumption Huawei, HiSilicon
5. R1-2007616 Inter-UE coordination in sidelink resource allocation Huawei, HiSilicon
6. R1-2007621 Discussion of remaining issues for sidelink evaluation methodology update for power saving Nokia, Nokia Shanghai Bell
7. R1-2007622 Discussion of resource allocation for power saving Nokia, Nokia Shanghai Bell
8. R1-2007623 Discussion of feasibility and benefits for mode 2 enhancements Nokia, Nokia Shanghai Bell
9. R1-2007687 Discussion on sidelink evaluation methodology vivo
10. R1-2007688 Resource allocation for sidelink power saving vivo
11. R1-2007689 Discussion on mode-2 enhancements vivo
12. R1-2007690 Discussion on sidelink DRX vivo
13. R1-2007771 Inter-UE Coordination Mode 2 Kyocera Corporation
14. R1-2007787 Considerations on partial sensing in NR V2X Fujitsu
15. R1-2007788 Considerations on inter-UE coordination for mode 2 enhancements Fujitsu
16. R1-2007832 Discussion on sidelink evaluation methodology for power saving CATT
17. R1-2007833 Discussion on resource allocation for power saving CATT
18. R1-2007834 Discussion on feasibility and benefits for mode 2 enhancements CATT
19. R1-2007878 Discussion on enhancement for NR V2X Mode 2 ITRI
20. R1-2007879 Discussion on sidelink resource allocation for power saving ITRI
21. R1-2007880 Enhancement of Mode 2 Latency Performance ITRI
22. R1-2007881 Discussion on NR sidelink enhancements ITRI
23. R1-2007892 Resource allocation for power saving TCL Communication Ltd.
24. R1-2007893 Feasibility and benefits for mode 2 enhancements TCL Communication Ltd.
25. R1-2007894 Discussion on remaining aspects of sidelink evaluation methodology update for power saving LG Electronics
26. R1-2007895 Discussion on resource allocation for power saving LG Electronics
27. R1-2007896 Discussion on feasibility and benefits for mode 2 enhancements LG Electronics
28. R1-2007897 Discussion on physical layer design considering sidelink DRX operation LG Electronics
29. R1-2008031 Discussion on resource allocation for power saving CMCC
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**RAN2#112-e**

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**RAN4#97-e**

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