**3GPP TSG RAN Meeting #93-e RP-21xxxx**

**Electronic Meeting, September 13 - 17, 2021**

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**Source:** LG Electronics (moderator)

**Title:** Email discussion [93e-10-SL-Positioning-TR] on Study on scenarios and requirements of in-coverage, partial coverage, and out-of-coverage NR positioning use cases

**Document for:** Report

# **Introduction**

This contribution summarizes the email discussion [93e-10-SL-Positioning-TR] on “Study on scenarios and requirements of in-coverage, partial coverage, and out-of-coverage NR positioning use cases.” Input contributions covered: RP-211808, 2004, 2022, 2036, 2037, 2105, 2131, 2132, 2410, 2498, 2460, 2038, 2035.

# **Discussion: Initial round**

2.1. Changes for “5.1 Network coverage”

Q1: [RP-211808, OPPO] proposed to remove the TS 38.304 reference of in-coverage definition as this definition is made in a carrier specific manner.

Please provide your view on this.

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| Company | Comment |
| LGE | Okay with the proposal. |
| Xiaomi | ok |
| Futurewei | ok |
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Q2: One FFS in the editor’s note is about “the need for transitions between coverage states.” [RP-212004, Intel] proposed to clarify that network coverage scenarios may change in time. Similarly, [RP-212131, Huawei] proposed to capture that there are operation scenarios in V2X and PS that need to support transitions between different coverage states.

Please provide your view on this.

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| Company | Comment |
| LGE | We support the wording proposed by Intel. |
| Xiaomi | Agree with the wording by intel |
| Futurewei | Support |
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Q3: [RP-212036, LGE], [RP-212410, ZTE], [RP-212460, Lenovo] proposed to add a figure illustrating the three coverage scenarios.

Please provide your view on this.

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| Company | Comment |
| LGE | Support. We prefer the figure in RP-212036 as the others used vehicles as UEs and thus may not be suitable in covering non-vehicle operation scenarios. |
| Xiaomi | Agree to add the figure in 212036 |
| Futurewei | Support |
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Q4: [RP-212131, Huawei] proposed to add that some V2X and public safety use cases require to be in network coverage while some other use cases are independent of the network coverage. It also proposed to add that there are scenarios operating with no network and GNSS coverage.

Please provide your view on this.

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| Company | Comment |
| LGE | Support in general. But we don’t want to specify which use cases require network coverage as this may lead to solution-level discussions not for the positioning but for the data communication. So we prefer simple clarification that there are V2X and public safety use cases that require positioning with no network and GNSS coverage. |
| Xiaomi | Ok to add this clarification |
| Futurewei | Ok with it |
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Q5: [RP-212498, Ericsson] proposed to capture that the description of the partial coverage scenario needs to include whether GNSS is available and whether autonomous network deployment or coverage extension is possible.

Please provide your view on this.

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| Company | Comment |
| LGE | Not support. The coverage extension mentioned in RP-212498 is considered as a part of network coverage so we understand the current network coverage description already covers the cases in the proposal. The text discussed in Q4 is enough to deal with the GNSS coverage. |
| Xiaomi | Not agree, covered by Q4 |
| Futurewei | Do not support. Same understanding as LGE. |
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Q6: If you think other changes are necessary for this sub-section, please specify them.

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2.2. Changes for “5.2 Radio link”

Q1: One FFS in the editor’s note is about “RAT independent positioning.”

[RP-212004, Intel], [RP-212036, LGE], [RP-212410, ZTE], [RP-212498, Ericsson] proposed to add RAT independent positioning (e.g., GNSS, sensors, etc.) which can complement RAT dependent positioning.

Please provide your view on this.

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| Company | Comment |
| LGE | We support the text proposal in RP-212004 or RP-212036. |
| Xiaomi | We are ok with intel’s proposal |
| Futurewei | Support |
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Q2: [RP-212131, Huawei] proposed to include that a Uu-based solution consists of UL and/or DL positioning and a PC5-based solution consists of SL positioning.

Please provide your view on this.

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| Company | Comment |
| LGE | Support in general. We prefer a simple general clarification that Uu interface uses UL and/or DL and PC5 interface uses sidelink. |
| Xiaomi | No need for this clarification |
| Futurewei | Prefer not to add wording wrt ‘solution’. So, LGE proposal is ok. |
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Q3: [RP-212410, ZTE] proposed to capture that, in the context of “Uu based solution with assistance of PC5 interface and PC5 based solution with assistance of Uu interface,” PC5 interface can forward the Uu based positioning measurement and vice versa.

Please provide your view on this.

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| Company | Comment |
| LGE | We don’t think the wording “Uu based solution with assistance of PC5 interface and PC5 based solution with assistance of Uu interface” is necessary. We can clarify that the measurement can be sent to the positioning calculation entity using Uu or PC5 interface. This wording can be merged to the text to be discussed Q1 for 5.3 Positioning calculation entity. |
| Xiaomi | Unclear to us |
| Futurewei | Same comment as Q2 above. |
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Q4: If you think other changes are necessary for this sub-section, please specify them.

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2.3. Changes for “5.3 Positioning Calculation Entity”

Q1: [RP-212131, Huawei] proposed to mention that, for UE based positioning, the UE may receive necessary information from another UE or the network for the positioning calculation at the UE, at least for SL positioning.

Please provide your view on this.

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| Company | Comment |
| LGE | We can simply say that necessary information for positioning, including the measurement, can be sent using Uu or PC5 interface. |
| Xiaomi | Ok with the proposal |
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Q2: [RP-212131, Huawei] proposed to capture that positioning with SL measurements can be done at the network or at a UE.

Please provide your view on this.

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| Company | Comment |
| LGE | We don’t think this is strictly necessary because there is no limitation in using PC5-based solution under the architecture of network-based and UE-based positioning. The same understanding applies to Uu-based solution. |
| Xiaomi | Not need for the clarification |
| Futurewei | Not seeing this as important clarification at this time |
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Q3: [RP-212410, ZTE] proposed to add that the network based architecture is preferred for in-coverage scenario and UE based architecture is suitable for out-coverage scenario.

Please provide your view on this.

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| Company | Comment |
| LGE | Not support. The issue of which solution is better needs to be discussed in a WG-level study. |
| Xiaomi | Can be discussed in WG level study |
| Futurewei | Cant agree with such conclusive wordings. |
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Q4: If you think other changes are necessary for this sub-section, please specify them.

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2.4. Changes for “5.4 UE types”

Q1: Several contributions made proposals on the power consumption aspect.

* [RP-212004, Intel], [RP- 212022, vivo], [RP-212036, LGE], [RP-212460, Lenovo] proposed to add that a UE installed in a device of VRU may have more limited battery capacity. In addition, [RP- 212022, vivo] proposed to add a requirement that sidelink positioning for VRU type of devices should not impact the duration of VRU type of device by more than [5]%.
* [RP- 212022, vivo], [RP-212460, Lenovo] proposed to add that UEs in public safety use case are battery limited.

Please provide your view on this.

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| Company | Comment |
| LGE | Support. The TR needs to capture that some UEs in VRU and public safety may have limited battery and/or processing capability. But we don’t think there is a concrete numerical requirement on the power saving aspect, so capturing some quantitative requirement is not preferred. |
| Xiaomi | Agree to add battery limited UEs |
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Q2: [RP- 212022, vivo], [RP-212036, LGE], [RP-212131, Huawei] proposed to reference the antenna configuration and panel distribution in TR 37.885 as an example of a distributed antenna system.

Please provide your view on this.

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| Company | Comment |
| LGE | Support. We can simply give a reference to 37.885 as in RP-212036 since this is for the evaluation purpose and the detailed information can be found there. |
| Xiaomi | Agree to simply add a reference to 37.885 |
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Q3: [RP- 212022, vivo] proposed to reference the UE antenna configurations for 700MHz in TR38.802 as an example of UE antenna in public safety use cases.

Please provide your view on this.

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| Company | Comment |
| LGE | No strong view but we think such detailed antenna configuration can be discussed in WGs, e.g., as a part of evaluation methodology. |
| Xiaomi | Agree to add the referece of 38.802 |
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Q4: [RP-212036, LGE] proposed to add that some UEs may be capable of transmissions with higher power such as Power class 1 in public safety use cases.

Please provide your view on this.

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| Company | Comment |
| LGE | Support. |
| Xiaomi | Agree |
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Q5: If you think other changes are necessary for this sub-section, please specify them.

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2.5. Changes for “5.5 Spectrum”

Q1: [RP-212004, Intel] proposed to clarify that the spectrum currently captured for V2X use case can be considered for both Uu and PC5 interfaces.

Please provide your view on this.

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| Company | Comment |
| LGE | Okay. |
| Xiaomi | agree |
| Futurewei | Support |
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Q2: Several contributions made proposals on the spectrum for public safety use case.

* [RP-212004, Intel] proposed to add that licensed and unlicensed spectrum can be considered for public safety use cases.
* [RP- 212022, vivo] proposed to add that licensed spectrum can be considered for public safety use cases.

Please provide your view on this.

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| Company | Comment |
| LGE | We think licensed spectrum can be mentioned for public safety and would like to get feedback from the public safety players about the potential usage of unlicensed spectrum. |
| Xiaomi | Agree with intel’s proposal |
| Futurewei | Support |
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Q3: [RP-212036, LGE] proposed to add possible bandwidth and frequency locations of ITS-dedicated, licensed, and unlicensed spectrum.

Please provide your view on this.

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| Company | Comment |
| LGE | Support. |
| Xiaomi | Agree |
| Futurewei | Support |
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Q4: [RP-212131, Huawei] proposed to add that the use of unlicensed bands for SL positioning would only be efficient to introduce after there is support for sidelink in unlicensed spectrum in general.

Please provide your view on this.

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| Company | Comment |
| LGE | Not support. We cannot preclude at this moment a scenario where only positioning measurement is done in the unlicensed band and all the necessary communications take place in ITS/licensed spectrum. |
| Xiaomi | Not agree. TR already captures that “with a note that there is no mechanism corresponding to regulatory requirements to use unlicensed spectrum in Rel-17 NR sidelink”. No need for further mis-leading interpretation. |
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Q5: If you think other changes are necessary for this sub-section, please specify them.

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2.6. Changes for “6 Conclusion”

Q1: Several contributions proposed text for the conclusion section: [RP-212004, Intel], [RP-212036, LGE], [RP-212105, Qualcomm], [RP-212132, Huawei]

Please provide your view on how to prepare the conclusion text.

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| Company | Comment |
| LGE | We think the conclusion should simply summarize what has been considered in identifying the requirements and operation scenarios instead of recommending future works. In this sense, we prefer the wording in RP-212004 or RP-212036. |
| Xiaomi | We prefer intel’s proposal. It is much clearer. |
| Futurewei | Agree with LGE suggestion |
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2.7. Other aspects

Q1: [RP-212036, LGE] proposed to send the final version of the TR to 5GAA and SAE Advanced Applications Technical Committee.

Please provide your view on this.

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| Company | Comment |
| LGE | Support. |
| Xiaomi | Ok |
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Q2: If you think any other aspects need to be discussed, please specify them.

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