**Input collected during the initial discussion phase**

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| Company | Comment |
| Intel | We appreciate Hanbyul (LG)’s initiative and we support the activity.  We have understood this activity is mainly about 3GPP’s willingness to show industry that 3GPP is taking care of sidelink positioning particularly concerning competitive circumstance with other RAT based technology (this kind of activity is not the first time in our understanding). Thus, we would like to see the scopes being reasonable and practical as RAN-led SI not by bringing WG-level expertise such as design and architecture aspects – if architecture aspects are to be discussed, we can simply send an LS to SA2/SA for their attention, if needed.  In our view, the ‘e.g.’ would not be helpful either as it would give biased starting point but would not limit the scopes. We prefer to make it more general.  Having said that, our proposed objectives are as follows:   1. Identify the ~~existing~~ use cases and requirements relevant to the sidelink positioning considering~~, e.g., in V2X, public safety, commercial services~~ 2. Identify potential deployment and operation scenarios ~~and design considerations in the aspects of, e.g.,~~    * ~~Network coverage, including in-coverage and out-of-coverage conditions~~    * ~~Candidate frequency bands~~    * ~~Usage scenario and deployment of UEs~~    * ~~RAT-dependent and RAT-independent positioning, and hybrid of them~~    * ~~Mobile-based and mobile-assisted sidelink positioning~~    * ~~Absolute and relative positioning~~    * ~~Architecture~~ |
| Huawei, HiSilicon | We support establishing this SI in Rel-17. It has the joint purposes of making it clear to the world that 3GPP RAN is engaged with the task to provide sidelink positioning, in order to make a strong case in a competitive global market where time for such statements is limited; and to answer a number of questions in contexts which are not well suited to individual WG-level deliberations.  The requirements defined in various SA1 TSs/TRs have gaps in them which would need to be filled for stage 3 work. Taking these TSs/TRs, it is clear that sidelink positioning has applicability beyond V2X. Some other applications include, for example: 1st responders, handhelds/wearables, smart factories (see our paper RP-201065). Since there is interest in SL positioning from various directions which could generate relevance to a number of organizations outside 3GPP, it makes sense to decide at RAN level which of those requirements and gaps are going to be filled, rather than leaving it to often laborious inter-WG exchanges which occur in absence of a guiding directive. In our paper RP-201065 section 4, we have given some non-exhaustive examples of the requirement gaps that currently exist. Further to this, the nature of the requirements on sidelink positioning may be different around the world depending on national or regional priorities, different in the views of various external bodies (not only 5GAA), and on different timelines, making RAN the best place to conduct the necessary investigation and collation of the global commercial and political dispositions.  Regarding the situation of 5GAA, there is a problematic chicken-and-egg situation where an MRP (or other organization) is not likely to expend effort to define requirements for a service which they have requested of 3GPP, but that might not be standardized; which might not be standardized if they do not define requirements for it. Whereas if it becomes clear SL positioning will be introduced, there is a clear target for especially 3GPP’s MRPs to provide their inputs to. RAN is a good place to send such requirements since it tasks the WGs jointly rather than in isolation as would tend to be the case if external input to requirements was received at WG level. |
| ZTE, Sanechips | Regarding to whether the plenary-level SI should be setup, we wonder what a plenary-level SI (covering scenario and requirements but nothing more) would mean at all to future work. Does it mean a promise of timely followup of WG's WI? But 3GPP rarely promises features in future release. In addition, just having scenario and requirements are far from justfying a WI. On the other hand, if we do not intend to plan a WI immeditately after this plenary-level SI, what if the conclusions made in this SI (like scenario and requirements) gets out-dated at the time when the WI is started? Additionally, according to the past WG experience, the determination of requirements normally needs the considerations of technical solutions and implementation feasibilities, both of which are normally get well discussed and understood in WGs, not on plenary level. Therefore it seems making more sense to have such SI study in a regular 3GPP pattern --- to put it in a WG-level with a planning of WI follow-up. With this in mind, and by looking at the fact that RAN already have a positioing SI undergoing in WGs, we prefer NOT to have this plenary level SI in Rel-17.  Regarding to the objectives for potential further discussion, RAN chair sets a guidance that the SI (if agreed to have) should not go beyond scenario and requirements. We interprete this guidance as to at least remove objective #2 from the table and only to keep objective #1 for further discussion in this week. |
| FUTUREWEI | We strongly support a RAN level SI on sidelink positioning.  Our view is that “customer” requests from the likes of 5GAA and SAE are the exact reason we are having the discussion here to define future nominal work for sidelink positioning. This is pretty clear from the 2 LSs (RP-200567 and RP-200546) emphasizing the importance to the industry. Of course, we should defined suitable scope for a RAN level study which is what we are doing now. As stated by RAN chair in December, use cases/scenarios/requirements can be looked into.  Note that we get service level use cases from our “customers” and RAN would need to translate/adapt to ran/radio level use cases and requirements. We should not expect SAE or 5GAA to write down radio (e.g. PHY latency, upper layer latency, traffic scenario model etc. ) level use cases and requirements. In R17 Positioning, we are doing the use cases and requirements in RAN1 and we have taken SAE inputs into considerations. It works and no one has raised problems with it, thus far. |
| FirstNet | As a co-source company of this contribution, we strongly support this RAN level SI in Rel-17.  Accurately locating a first responder who is injured or incapacitated during mission critical operations is of utmost important to the global first responder community. This need exists in normal and critical operations during both on and off-network scenarios. Any delay in making this service available could cost human lives.  Those of us, who were present during December 2019 Plenary meeting, do recall that First Responder community wanted sidelink positioning to be a part of then approved SID RP-193237. Unfortunately, due to the deletion of Note 1 in the SID (Note1: sidelink is not part of the objective), the sidelink positioning could not be a part of the SID.  The Chair then suggested that the interested parties could bring a new study item to next Plenary for discussion on this topic. Hence this contribution now.  Now coming to this email thread, 5GAA represents only interests of automotive industry and nothing more. Whereas, the FirstNet represents the global public safety community interests that depend on the advanced tools that technology can provide through 3GPP specifications for saving human lives.  Some of the requirements for sidelink positioning include (could be refined in WG discussions):  - Accuracy\* < [1m] horizontal [95%], < [2] meters vertical [95%]  - Latency < [1] second  - TTFF < [10] seconds  - Availability > [95%]  \*: Both absolute position and relative position can be used to meet the accuracy requirements based on operational needs.  In summary, we request the 3GPP community to support this SID to provide the positioning accuracy that is much more stringent than that required by regional regulatory agencies for emergency calls. Once available, this feature does save human lives. |
| AT&T | AT&T input concerning RP-200859 “New SID: Study on use cases, scenarios, and requirements of sidelink positioning”.   1. Public Safety continues to be a major factor in the advancement of technology dealing with communications and positioning of communications components throughout the world. 2. RAN SID RP-200859 is an important part of the overall Public Safety development in 3GPP RAN. 3. The reasons FirstNet provided in their submission above (in this document) are sound and factual. 4. This is not the first time that RAN Plenary has taken on a SID that was necessary to be developed. 5. AT&T supports the continuation of this RAN SID in Rel-17. |
| CATT | About the use cases and scenarios for SL positioning, we assume there can be many: from the network coverage point of view, it can be in-coverage, out of coverage and partial coverage; from RF environment point of view, it can be indoor/outdoor, urban/suburban/rural, IIoT scenarios; and from the application point of view, it can be V2X and many other applications. Thus, it seems there is a need to identify the priorities of the use cases and scenarios.  About SL positioning requirements, different use cases and scenarios may have different target performance requirements in terms of accuracy, latency, reliability, availability, integrity, etc. It is desirable to define the target performance requirements for the identified use cases and scenarios. Besides, we might also need to consider the feasibility when defining the target performance requirements, which may require the support of efficient SL positioning architecture, advanced SL positioning techniques, etc. Thus, we may also need to discuss the high-level requirements on the potential SL positioning architecture (e.g., centralized or localized positioning architecture) and the SL positioning techniques (standalone, hybrid, UE/network-based, etc.). The details of the design and development of SL positioning architecture and techniques for supporting these requirements will obviously be handled in WG-level SI/WI. |
| vivo | This might not be the right timing and place for sidelink positioning, considering the following facts:   * Not the right timing:   + There are ongoing related SA1 studies for potential new use cases and requirements for sidelink positioning (e.g., Ranging based services, Personal IoT Network), how to include the related study results? A unified framework is preferred to consider all these use cases;   + This is targeting a Rel-18 item at a time when Rel-17 has not been fully studied; * Not the right place: quite a few design consideration related stuff, they are more appropriate to be studied in WG level.   For those who supports such RAN-level study, one listed reason is that this is related to multiple groups, RAN needs to adapt the input from outside as input for the items in RAN and a RAN-level study is needed to do gap analysis. We fail to understand that last year it seemed people were ready to do WG level item even without such RAN-level synthesizing and gap analysis and then after half year, such need becomes necessary. |
| Panasonic | We support to have RAN level activity. To clarify the scope, we support the modification by Intel Seunghee. When we start the activity also needs to be taken into account. It would not be required to start immediately. |
| OPPO | We are fine with this RAN level SI to address the requirement from 5GAA and SAE.  In another perspective, we also see the concern from some companies on the work load increase on R17 and the scope of the SI, so   * We can further discuss the kick-off the time of this SI, i.e., whether it is urgent to start this work now. * On the SI objective #2, i.e., according to the guidance from RAN Chair, this item should not go beyond the scenario and use case. So we are find to leave #2 out, or at least the sub-objectives which are high solution-related, i.e., Candidate frequency bands /   RAT-dependent and RAT-independent positioning, and hybrid of them / Mobile-based and mobile-assisted sidelink positioning / Absolute and relative positioning / Architecture. |
| LGE | We support this RAN activity and the objective updated by Intel is fine to us. We think this activity can serve at least the following two purposes that cannot be addressed by another organization:  - This study will show the 3GPP V2X evaluation path considers SL positioning which is an essential component to complete the full V2X technology package, though the start of the normative work is up to the normal RAN procedure. It will reinforce the position of 3GPP V2X family in the competitive situation in several regions.  - The operation scenario of SL positioning is expected to be different depending on the region as well as use cases. For example, V2X may be able to use the ITS spectrum whose bandwidth might be dependent of the region while public safety may not. The study will give a good high level picture on how different use cases can operate SL positioning in different regions. |
| KT | We support to initiate RAN level SI identifying use cases and requirements for sidelink positioning.  SI should include the case when eNB/gNB is not available due to earthquake, fire, and other disaster cases. We expect this study to be done in Rel-17 with normative work to be followed in Rel-18. |
| Qualcomm | * 3GPP RAN should lead the study on sidelink positioning including the use cases and requirements, as it is the best place to address requirements from different verticals or industries. RAN had received inputs from 5GAA (RP-200546) and SAE (RP-200567), and can work closely with other verticals that are already participating in 3GPP, e.g., Public Safety, and IoT. * We support that sidelink positioning is studied at RAN for Release 17, so that the working groups may start the Release 18 work based on the outcomes of this RAN SI. * Use cases and requirements should be under the scope of this SI. To support V2P and public safety, power consumption should be included in requirements. Other aspects, such as the use of unlicensed spectrum in addition to ITS spectrum and licensed spectrum, should also be discussed to support the discussions on requirements, e.g., the requirements of 0.1m or 0.5m accuracy for sidelink applications. * We expect that the SI will produce a guidance and framework for the working groups in Release 18, therefore it’s necessary to discuss the potential operation scenarios and design considerations, e.g., distributed sidelink positioning (relative/absolute), both in coverage and out of coverage. |
| MediaTek | We support the SI effort at RAN level as guidance towards future WG-level work (e.g. in Rel-18), and as an indication that 3GPP are working on the topic.  There are some problems if we leave it to other organisations, e.g.: (1) those organisations are already asking 3GPP to address sidelink positioning, creating a risk of ping-pong or industry confusion if we come back and say “no, someone else should do it”; (2) the involved organisations do not represent all the verticals and use cases where sidelink positioning would be needed; (3) such external requests would anyway require some “translation” work to render them actionable for the WGs.  In general, we agree with the direction of Intel’s proposed modifications.  However, it might be good to keep the coverage aspects in the objectives, because the appropriate requirements may vary according to the coverage environment (e.g. there can be OOC scenarios where only relative positioning is applicable because of no involved device having a known absolute position).  As noted above by LG, there may also be regional dependencies; maybe a reasonable construction for the second part of the objectives would be to “identify potential deployment and operation scenarios, considering in-coverage and out-of-coverage conditions, operational regions, and candidate frequency bands”. |
| Home Office | UK Home Office supports this contribution and would like to have Public Safety use cases considered.  Understanding the location of emergency services personnel during off-network operations could be vital under various scenarios  On a more general note; other verticals might have other options to provide their views and requirements but for Public Safety this is the only route. |
| ESA | We are in favour of a RAN level SI on sidelink positioning in Rel-17. The analysis carried out by SAE, 5GAA and FirstNet is very compelling and provide enough grounds to carry this item forward.  We like very much Intel´s suggestion regarding objectives. In our interpretation, this potential item represents a blue sky research, and therefore, should be unconstrained. |
| Nokia | 1. The benefit of a RAN-led SI would be to reach consensus on the justifications for a next step. Hence such a study before considering a WG-level activity could help to bring useful clarity. 2. It should not be assumed that V2X is the only (or even the main) focus. Any RAN-led SI should consider all relevant use cases, for example including potential public safety related use cases. 3. The scope of a RAN-level SI should be on identifying potential use cases, scenarios and corresponding requirements, as described in RAN#86. The draft SID submitted in 859 goes far beyond this. We agree with the scope modification proposed by Intel, with some further modification as follows:    1. Identify potential use cases and requirements relevant to sidelink positioning    2. Identify potential deployment and operation scenarios 4. As the sidelink does not support unlicensed band operation, any RAN-led SI should focus on licensed and ITS bands. 5. The start time of a RAN-led SI should be carefully considered, for example being after finalisation of Rel-16 sidelink work in order to avoid distracting from that important work. |
| Philips | We are supportive of this initiative to start a study in RAN level. We have to collect all the different use cases and deployment scenarios, which are much broader than just V2X, but also include e.g. smart factories and healthcare related use cases. Doing such study during release 17 timeframe will certainly kick-start the release 18 WG level work. |
| Fraunhofer | We support a RAN level SI on sidelink positioning.  NR sidelink positioning  is an essential additional method to obtain accurate positioning results with minimum delay to meet the accuracy requirements. That is especially important for relative positioning to calculate the accurate distance, e.g. between vehicles, vehicles and pedestrians, e.g. in safety critical scenarios in V2X and further applications.  This study should discover all relevant use cases on the sidelink, e.g. V2X, 5G service and operational requirements  (TS 22.261) and automation in vertical domains (TS 22.804), especially for relative positioning.   To get a common understanding on sidelink based positioning, we propose an early study on NR sidelink positioning in Rel-17 to define the relevant use cases and scenarios, including the requirements. |
| BMWi | We rather prefer not to have such a plenary-level SID in Rel-17 timeframe to target potential new Rel-18 work when Rel-17 is still under work. Instead, we propose to wait for Rel-18 timeframe and then to follow the normal process.  Regarding the discussions on the scoping of the SID in this week, we propose to remove the 2nd objective, especially when thinking about commercial use cases together with out-of-coverage conditions and frequency bands stated in the first two bullet points. These points require a thorough and detailed investigation at WG-level with the corresponding experts. In-line with the discussions from yesterday and the guidance from the RAN chair, the scope of this SID should be limited to use cases and requirements only. |
| Novamint | We need to distinguish between the use cases and what are their situation in regards of sidelink.  For V2X and may be public safety, there is a real need to address positioning aspects for sidelink.  For other use cases (for example IoT in the large sense of its definition – not only LPWA), we believe there is a strong need for D2D solution and positioning is always a strong aspect to address.  However, for those other use cases, we should not assume that Sidelink as it is designed currently should be the de facto solution corresponding to the requirements for D2D of these use cases. We even believe that many key requirements for D2D of those use cases (such as range, power consumption…) are not supported by current sidelink.  Therefore, we believe there is a need for a general study on D2D for many use cases to identify the use cases requirements for D2D including positioning aspect and a gap analysis with existing solutions and then to work on devising the proper solutions to match those requirements use case per use case which could lead to adaptation of sidelink or completely new approaches.  Trying to push into RAN to address sidelink positioning for other cases than V2X and Public safety would be a recipe for disaster and would not help adoption of 3GPP technologies by other industries. It will be basically asking the use cases to adapt to the technology and not the other way around which is not accepted by the verticals.  So, if study on sidelink positioning should start in RAN it should be limited only to V2X and Public Safety use cases. |
| Lenovo, Motorola Mobility | We support a RAN-level SI only focused on the use cases, scenarios, and performance requirements for sidelink positioning, however care should be taken in order to avoid duplicated studies which may overlap with ongoing SIDs in SA1 related to Ranging and P-IoT. We hope that this SI is only within RAN-level for Rel-17 and should serve as a basis for detailed work by the relevant WGs in Rel-18. So the proposed modification from Intel is fine with us.  Furthermore, we are also wondering if the time frame of this RAN-led Rel-17 study item (RAN#89-RAN#92) should be revised based on the updated objectives and also account for any delays to the completion of Rel-17. |