

The vivo logo is displayed in white lowercase letters in the top left corner of the slide. The background of the entire slide is a dark blue, abstract, fiber-optic-like pattern with glowing points and lines.

**3GPP TSG RAN Meeting #97e**

**RP-222143**

**Electronic Meeting, September 12-16, 2022**

# **Views on sidelink positioning in unlicensed spectrum**

**Source: vivo**

**Document for: Discussion & Decision**

**Agenda Item: 9.2.5**

# Objective of sidelink positioning in Rel-18 positioning

- Study solutions for sidelink positioning considering the following: [RAN1, RAN2]
  - Scenario/requirements
    - Coverage scenarios to cover: in-coverage, partial-coverage and out-of-coverage
    - Requirements: Based on requirements identified in TR38.845 and TS22.261 and TS22.104
    - Use cases: V2X (TR38.845), public safety (TR38.845), commercial (TS22.261), IIOT (TS22.104)
    - Spectrum: ITS, licensed
  - Identify specific target performance requirements to be considered for the evaluation based on existing 3GPP work and inputs from industry forums [RAN1]
  - Define evaluation methodology with which to evaluate SL positioning for the uses cases and coverage scenarios, reusing existing methodologies from sidelink communication and from positioning as much as possible [RAN1].
  - Study and evaluate performance and feasibility of potential solutions for SL positioning, considering relative positioning, ranging and absolute positioning: [RAN1, RAN2]
    - Evaluate bandwidth requirement needed to meet the identified accuracy requirements [RAN1]
    - Study of positioning methods (e.g. TDOA, RTT, AOA/D, etc) including combination of SL positioning measurements with other RAT dependent positioning measurements (e.g. Uu based measurements) [RAN1]
    - Study of sidelink reference signals for positioning purposes from physical layer perspective, including signal design, resource allocation, measurements, associated procedures, etc, reusing existing reference signals, procedures, etc from sidelink communication and from positioning as much as possible [RAN1]
    - Study of positioning architecture and signalling procedures (e.g. configuration, measurement reporting, etc) to enable sidelink positioning covering both UE based and network based positioning [RAN2, including coordination and alignment with RAN3 and SA2 as required]
- Note: When the bandwidth requirements have been determined and the study of sidelink communication in unlicensed spectrum has progressed, it can be reviewed whether unlicensed spectrum can be considered in further work. Checkpoint at RAN#97 to see if sufficient information is available for this review.**

- **Observation 1: RAN#97 is a checkpoint to see if sufficient information is available for the review of unlicensed spectrum considered in sidelink positioning in Rel-18.**

# Progress on requirement and evaluation of SL positioning



- In RAN1#110, the positioning accuracy requirements were confirmed for V2X and IIoT use cases.
- In RAN1#110, the following agreements were achieved for SL positioning evaluation, which only include evaluation assumptions and results collection templates.

## Agreement

For SL positioning evaluation in IIOT use case, companies should report how to drop anchor UEs and how to select anchor UEs

## Agreement

Adopt the tables in section 3 of R1-2207606 as templates to collect SL positioning simulation results from each company.

## Agreement

In the evaluation, relative positioning or ranging is performed between two UEs within X m, where X value(s) are reported by companies, and companies should also report the minimum distance used in the evaluations for each use case. The assumption used for X will be included in the TR for each set of results.

## Agreement

For SL positioning evaluation purpose, the following assumptions are further adopted

- Companies should report whether SL-PRS and other SL signals are FDMed or not FDMed, and whether other SL signals are present
- Adopting system level simulations (rather than the link level simulations) as the baseline tool
- For SL positioning evaluation in highway scenario or urban grid scenario, the performance metrics can include absolute horizontal accuracy, relative horizontal accuracy, ranging with distance accuracy, and ranging with direction accuracy (optionally).
- In highway and urban grid scenarios, companies can further consider other UE types, e.g. pedestrian UE or VRU devices.

- **Observation 2: As of RAN1#110, RAN1 mainly discussed **positioning accuracy** requirements and evaluation assumptions, and did not output any performance observations for sidelink positioning **bandwidth requirements**.**

# Progress on SL-U in Rel-18

- RAN1 has discussed channel access and physical channel design for SL-U in RAN1#109e and 110.
  - For SL-U channel access, there are still many open issues to be studied, including the study of channel access mechanism, sharing of channel occupancy time, short control signaling transmission, multi-channel access, multi-consecutive slots transmission, etc.
  - For physical channel design, there are also many open issues to be studied, including the study of SL BWP and resource pool, slot structure, PSCCH/PSSCH, PSFCH and SL-HARQ, S-SSB and synchronization, etc.
- RAN1 will further study SL-U until RAN1#111 meeting.
- **Observation 3: Current progress on SL-U, in RAN#97e, is not enough for review of whether unlicensed spectrum for positioning can be considered or not.**

Therefore, we propose

- **Proposal 1: Considering no sufficient information available for the review of unlicensed spectrum for sidelink positioning in RAN#97, defer the review to later meetings.**

**THANK YOU.**

**谢谢。**