3GPP TSG RAN Rel-18 workshop
Electronic Meeting, June 28 - July 2, 2021

RWS-210496

Discussion on Sidelink Positioning

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Sidelink Positioning | Background

- 3GPP R17
  - RAN plenary study on V2X/PS use cases for both in coverage and out-of-coverage.
  - TR 38.845 has captured the positioning requirements and scenarios for V2X and public safety

- SAE
  - SAE has sent LS on Sidelink Positioning for advanced V2X applications (RP-200567) in June 2020

- 5GAA has studied V2X positioning use case:
  - Positioning use case examples:
    - High-accuracy relative positioning is vital to V2X applications to ensure vehicle and pedestrian/VRU safety.
    - Remote driving depends on the knowledge of very accurate positioning of the vehicle
    - Other examples: Automated intersection passing, automated valet parking.
  - 5GAA survey ranked “positioning enhancement” as No.1 priority among 5GAA members.
  - 5GAA Liaisonto 3GPP to clarify the requirements (RP-210040) and recommend sidelink-based positioning.

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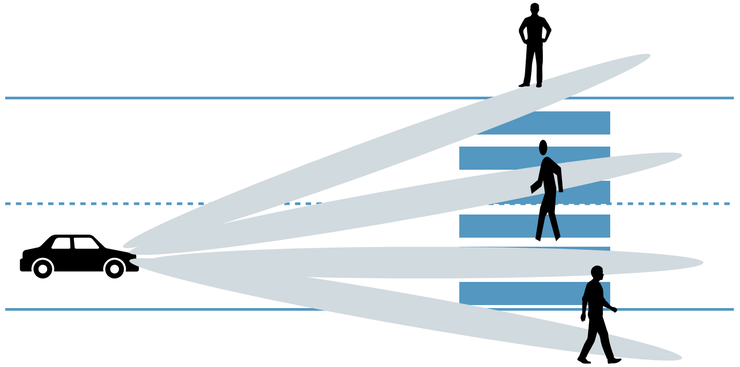
Sidelink Positioning | Relative Positioning

- Relative positioning (ranging)
  - Absolute positioning coordinates are not always needed in V2X and public safety scenarios.
  - Calculating the relative distance and angle to another UE is sufficient in many applications.
  - Vital for scenarios where GNSS positioning is not available or reliable



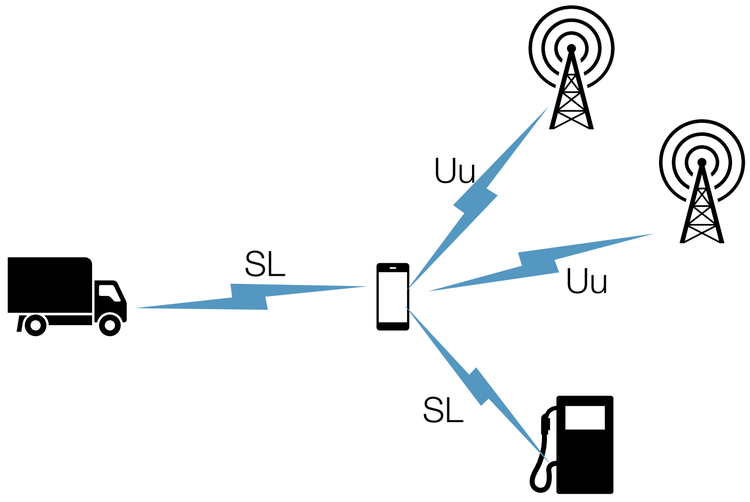
High accuracy positioning to detect pedestrian crossing

- Objectives to be considered
  - Relative positioning/ranging over sidelink
    - Sidelink positioning reference signals and measurements
    - Configurations to support both in-coverage and out-of-coverage scenarios
    - Algorithms to estimate distance and angle
    - UE-based methods and procedures for sidelink positioning

Sidelink Positioning | Hybrid Positioning

- For in-coverage scenarios, UE can benefits from the positioning methods in both Uu and PC5 interface
- RAN work can support a combined Uu and sidelink positioning mode.
  - In-coverage hybrid positioning (Uu+sidelink)

- Objectives to be considered
  - Messages/signaling protocol enhancements (e.g. LPP) to enable hybrid positioning
  - Both UE-based and UE-assisted methods are supported.



V2X Hybrid positioning

Sidelink Positioning | Summary

- Recommend the following objectives to Rel-18 WI on Sidelink positioning:
  - Objective 1: Relative positioning/ranging over sidelink
    - Sidelink positioning reference signals and measurements
    - Configurations to support both in-coverage and out-of-coverage scenarios
    - Algorithms to estimate distance and angle
    - UE-based methods and procedures for sidelink positioning
  - Objective 2: Hybrid Positioning
    - Messages/signaling protocol enhancements (e.g. LPP) to enable hybrid positioning
    - Both UE-based and UE-assisted methods are supported.

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