

# Sidelink Enhancement prioritization for Rel 19

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**Sourced by: CEWiT, IITK, IITH, IITM**

# Categorization of topics based on WS contributions

- AI/ML Air Interface
- MIMO Evolution
- Duplex Evolution
- Ambient IoT
- Network Energy Saving Enhancements
- Mobility Enhancements
- NTN Evolution
- XR Evolution
- AI/ML for NG-RAN
- SON/MDT
- Channel Modeling (& possibly additional aspects e.g., for ISAC) for further evolution

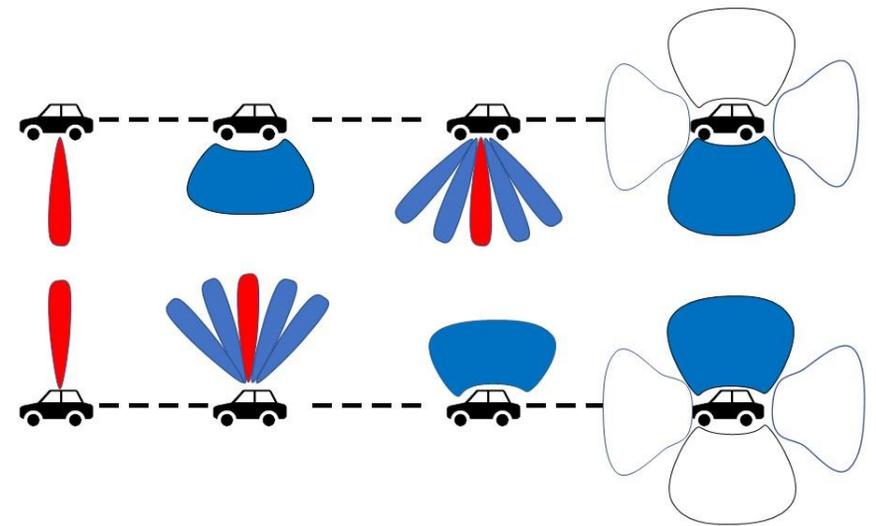
- Additional RAN1-led Candidate Topics
  - LP-WUS/WUR
  - Multi-carrier Enhancements
  - Coverage Enhancements
  - Positioning Enhancements
  - SL Evolution**
- Additional RAN2-led Candidate Topics
  - NCR
  - SL Relay Enhancements
  - UAV/UAM
  - MU-SIM
  - Broadcast/multicast
  - UE aggregation, collaboration, and backup
- Additional RAN3-led Candidate Topics
  - Topological enhancements
    - IAB/WAB/Femto
    - E.g., for public safety/emergency services
  - QoE

This contribution discusses our SL link enhancement priorities for Rel 19.

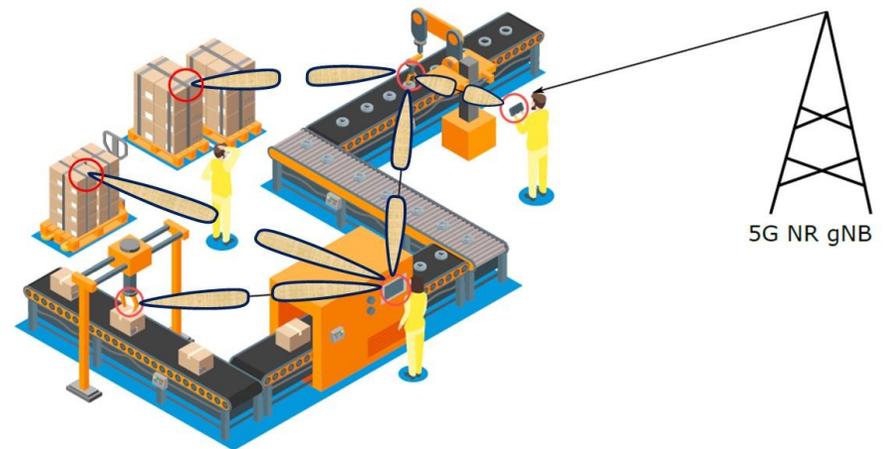
- Protocol stack/High-speed
- Layer 2 UP enhancements
- Architectural enhancements/AS
- Priority Enhancements
- Network/Outer coding
- RedCap Enh./High reliability and low complexity IoT
  - Combination w/ SL or NTN can be discussed in the SL/NTN topics, respectively)
- TaaS (Timing as a service)/High Accuracy Timing Service
- SDT enhancements
- LTE enhancements
- Dynamic UE capability update
- Others (e.g., Idle/Inactive enhancements, RAN slicing enhancements, etc.)

# Use cases in Sidelink Communication in FR2

- Sidelink foresees increasing demand in commercial applications in vehicular communication as well as in industrial communication.
  - Two key requirements have been identified in Rel 18:
    - Increased sidelink data rate
    - Support of new carrier frequencies for sidelink
- Increase data rate applications such as sensor information (video) sharing between vehicles with a high degree of driving automation need requirement of FR2 optimization to explore services in the FR2 spectrum with large available bandwidth.
- Improving the device positioning accuracy in critical scenarios such as in dense areas and out-of-coverage devices (e.g., devices in tunnels) mm-wave spectrum will be crucial.
- Further new IMT 2030 use cases scenarios like integrated sensing and communication will need FR2 optimization in sidelink for better scenarios assisted navigation, activity detection, & and movement tracking (e.g., posture/gesture recognition, fall detection, vehicle/pedestrian detection), environmental monitoring (e.g., rain/pollution detection), and provision of sensing data/information on surroundings for AI, XR, and digital twin applications.



Case 1: Exemplary V2X wireless links. Better through but this can be achieved in FR2 with beam pairing and tracking in the V2X use case.



Case 2: Industrial wireless links. A better link margin in FR 2 can be achieved with proper beam pairing.

# Sidelink FR2 Enhancement Justification

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- To support the new use cases like high data rate, better localization, and sensing capability over sidelink, FR2 optimization is necessary.
- Rel. 18 studies have identified the key areas to be enhanced related to beam management support over sidelink including
  - Beam pairing procedure before, during, and after unicast link
  - Reference signal for beam management
  - Beam maintenance procedure
  - Beam failure recovery procedure
- 📶 **Observation: The study is sufficient to enable a beam management framework in sidelink communication. Normative work can start in Rel 19.**

# Sidelink Enhancement Proposal in Rel. 19

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- In Rel 19, the normative phase for Sidelink FR2 optimization should be considered including,
  - Introduction of beam management framework which may include
    - Beam pairing procedure before, during, and after unicast link
    - Reference signal design for beam management
    - Beam maintenance procedure
    - Beam failure recovery procedure

# THANK YOU

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