

**3GPP TSG-RAN Meeting #102**  
**Edinburgh, Scotland, Dec 11-15, 2023**  
**Agenda Item: 9.1.1.7**  
**Document for: Discussion**

**RP-233598**



# **Consideration on the Additional Techniques of Integrating Sensing and Communication**

**Source: China Unicom**

# Motivation on supporting Integrated Sensing and Communication

## □ Motivation:

- Integrated Sensing and Communication (ISAC) provides one set of devices with the new type of service combining of communication and sensing on the basis of 5G network. ISAC is designed to utilize NR bands ( e.g. FR2, FR1) to provide new sensing services, e.g. objective detection, tracking and monitoring. ISAC can provide new service at a low cost by supporting the integrating of the sensing function for commercial deployed gNB in 5G network.
- Although there is a list of ISAC potential application use cases and scenarios, the important commercial use cases are considered as Intelligent transportation, UAV monitoring.



**UAV Assurance**

- ISAC can be used for UAV supervision, intrusion detection, UAV collision monitoring, path management, etc. The sensing distance is more than 1km, and distance accuracy is sub-meter.



**V2X driving**

- ISAC can provide vehicle monitoring, obstacle monitoring, intrusion detection, and it can assist the safety driving. The sensing distance and accuracy are 3~5 times higher than industry radars.



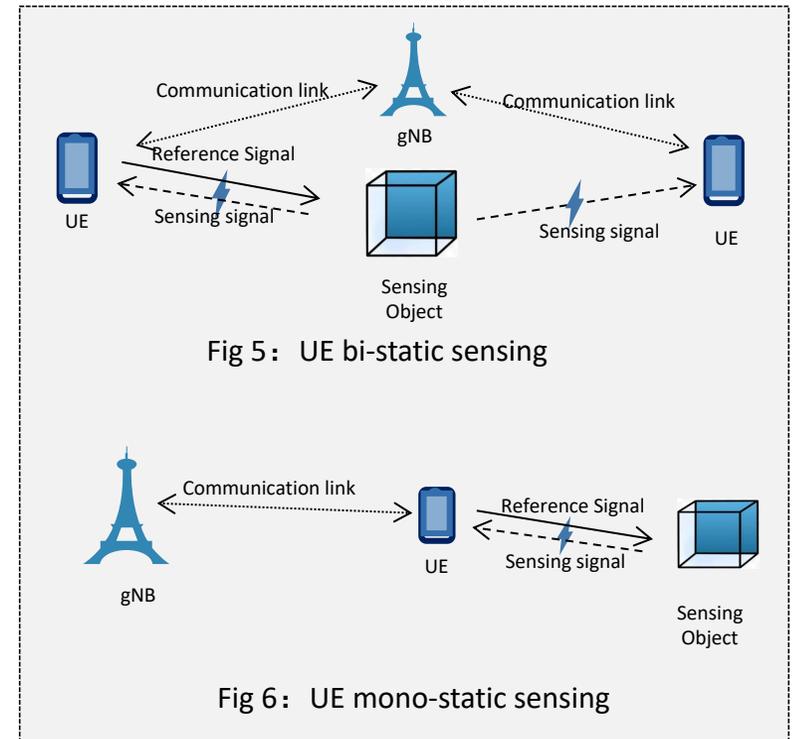
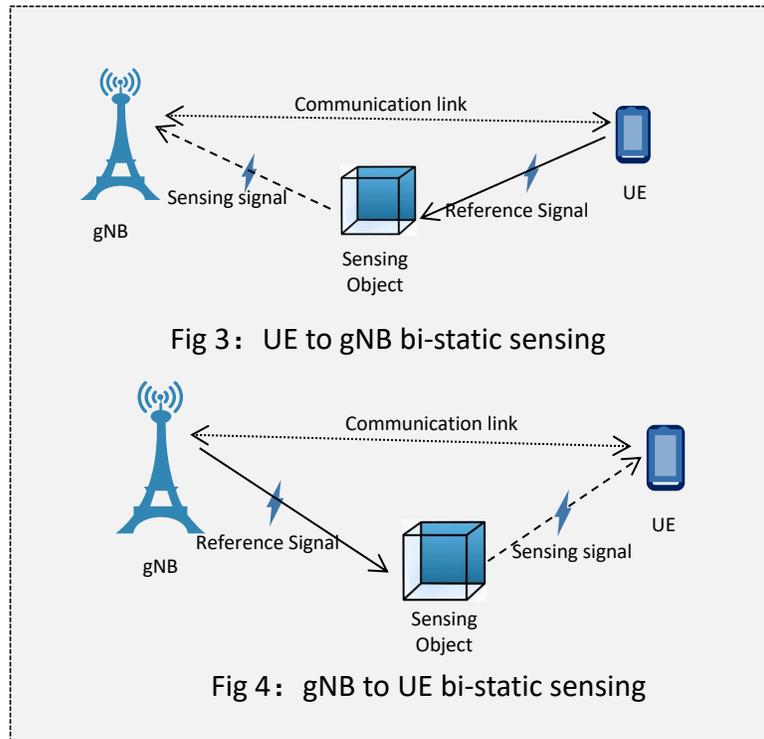
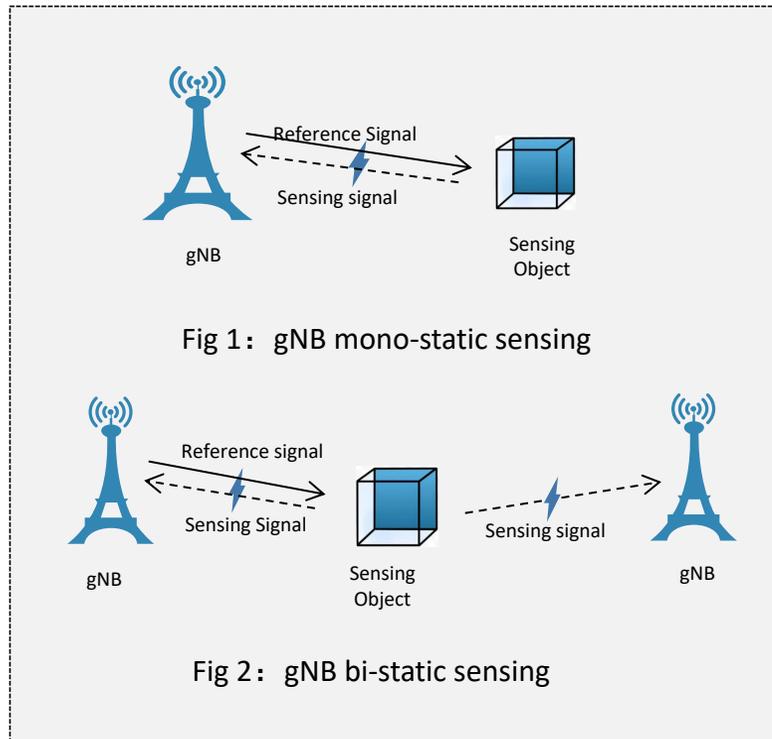
**High-speed rail perimeter**

- ISAC can provide the intrusion detection in the rail transportation and railway station.

**Proposal 1: Confirm to support the above use cases of integrated sensing and communication in high priority.**

# Sensing Mode of Integrated sensing and communication

- There are six sensing modes in three categories during the discussion.
  - gNB sensing mode:** gNB mono-static sensing, gNB bi-static sensing.
  - gNB and UE bi-static sensing mode:** gNB to UE bi-static sensing, UE to gNB bi-static sensing.
  - UE sensing mode:** UE bi-static sensing, UE mono-static sensing.

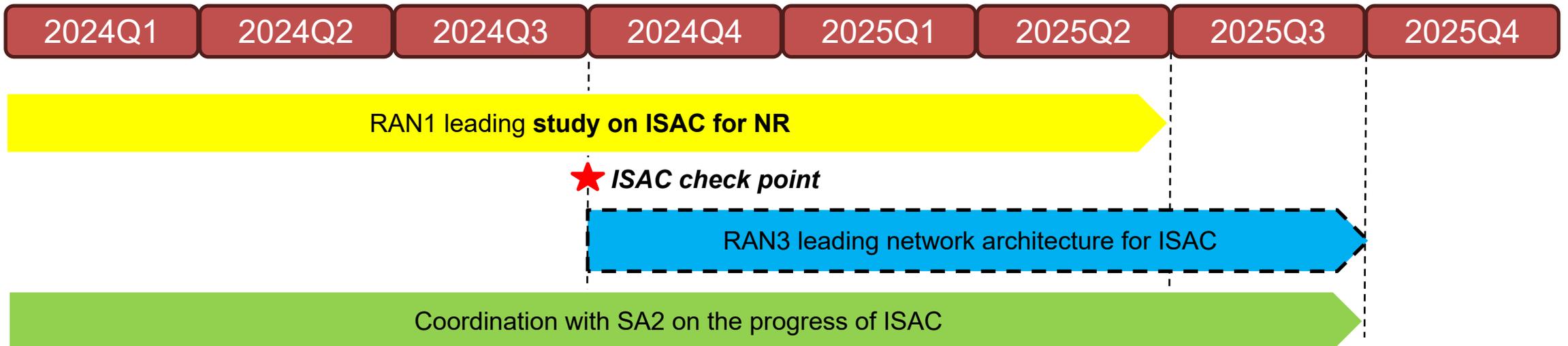


**Proposal 2: Considering the complexity, it is proposed to firstly support gNB mono-static/bi-static sensing modes in R19.**

# Consideration on the timeline of Integrated sensing and communication

- It is proposed to continue discussing the ISAC time plan.
  - Coordinating with SA2 progress on ISAC, it is proposed to continue to discuss whether to support ISAC with RAN network architecture impacts in R19 in 2024 Q3 (e.g. September).
  - If agreed, the details of RAN network architecture impacts (e.g. in RAN3) can be discussed and decided in 2024.

**Proposal 3: It is proposed to agree to further check with the progress in RAN1, additional techniques and whether to support ISAC with RAN network architecture impacts in 2024Q3.**



## □ It is proposed to further discuss on the potential RAN architecture of ISAC.

- Study and specify the ISAC candidate sensing architecture if supporting gNB mono-static sensing modes and/or gNB bi-static sensing modes.
- Support for new sensing functionality, e.g. sensing capability reporting, sensing modes selection for different scenarios, sensing nodes selection, sensing resource configuration, sensing information report, etc.
- Support for sensing service continuity when sensing object moves in the coverage of multiple gNBs (lower priority).

*Thanks !*