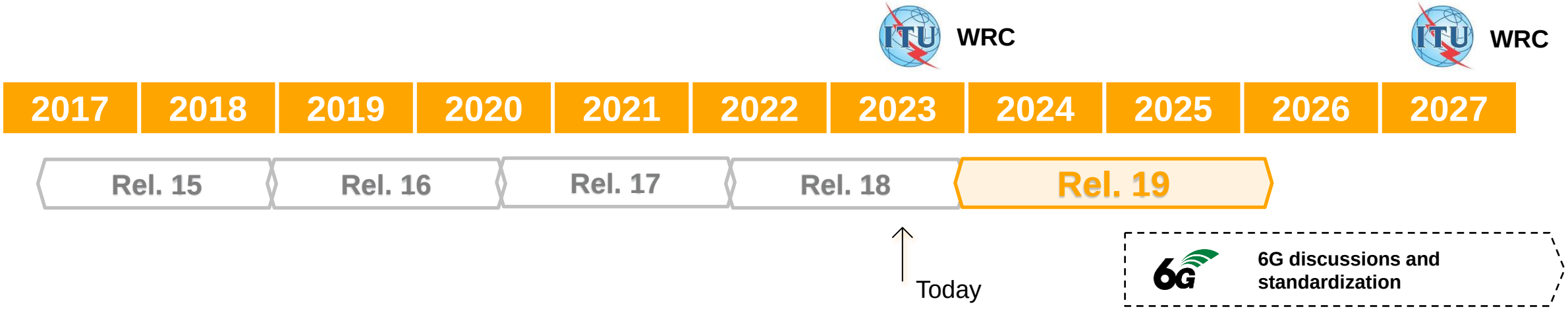
Views on 3GPP RAN Release 19

Continental Automotive

3GPP TSG RAN Rel-19 Workshop
Taipei, June 15 –16, 2023
Agenda Item: 4

RWS-230471

Timeline for 5G Evolution and Beyond



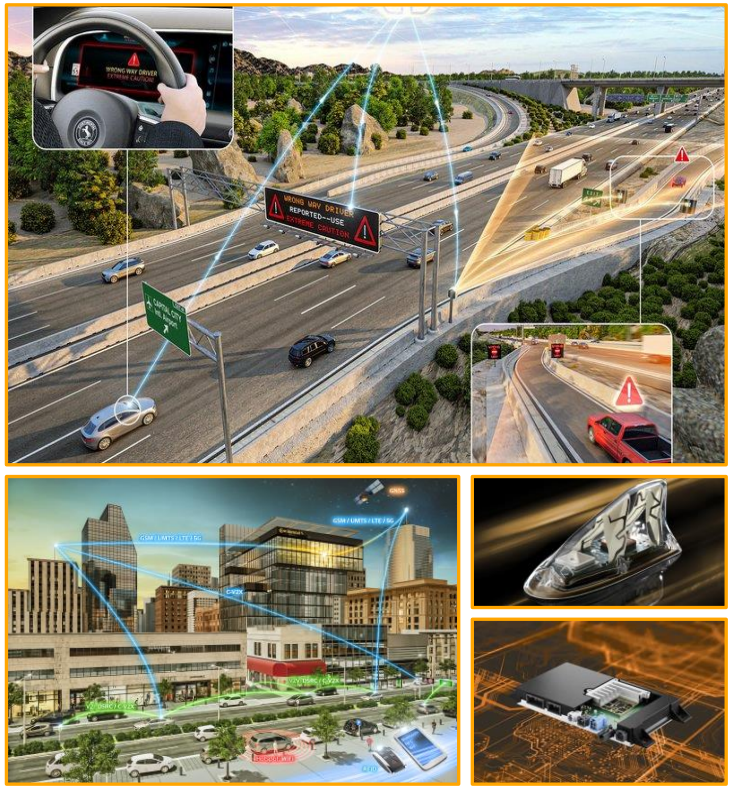
Release 19

- Back to normal work (after Covid19) → 18 months, *extended* scope.
- Potentially first 5G release overlapping with 6G discussions.

Automotive

- High expectations (e.g., continue adding **new** features)!
- **Key** for successful adoption and deployment of **C-V2X**.

Continental's Priorities & Expectations from Release 19



Short-term impact

- Sidelink enhancements, positioning, and relaying
- Non-terrestrial connectivity (NTN)
- Network Sustainability

Medium-term impact

- Artificial Intelligence and Machine Learning (AI/ML)
- Reconfigurable Intelligent Surface (RIS)
- Integrated Sensing and Communication (ISAC)
- Ambient Internet of Things (IoT)

Short-term impact for Automotive

- **Seamless integration of TN/NTN for ubiquitous automotive user experience.**
- **Enable the evolution of automotive use cases.**
- **Consider specific automotive UE characteristics.**

RAN Scope:

☑ Enhancements of mobility and service continuity between TN and NTN and vice versa (incl. cell re-selection, RACH-less handover).

☑ Support higher data rates (broadband) for evolving automotive use cases leveraging satellite connectivity.

☑ Consider additional NR NTN capable automotive UE characteristics (adapted to vehicle-mounted constraints, enhancements to, e.g., antenna gain, UE Tx power, noise figure) to support satellite connectivity scenarios (e.g., for coexistence analysis).

☑ Support satellite connectivity for RedCap UE.

- **Communication: Use cases with high data rates and (relaying) scenarios with high density of vehicles.**
- **Positioning: Accuracy in the order of 0.1-0.5m is needed.**

RAN Scope:

☑ Communication:

- Enhancements for FR2 on several possible spectrum/band alternatives (ITS, unlicensed).
- Support of Carrier Aggregation, e.g., FR1 + FR2.
- Continue further enhancing UE-to-network/UE-to-UE sidelink relaying.

☑ Positioning:

- Larger bandwidths in FR2 and unlicensed spectrum in FR1 and FR2 for sidelink positioning.
- Consider carrier phase positioning for sidelink.
- Consider cooperative positioning using sidelink.

Short-term impact for Automotive

- **Further eco-friendly and sustainable 5G technology.**
- ***Smart* transfer of huge amounts of data with no latency requirements to enhance energy efficiency.**

RAN Scope:

- ☑ Network Energy Saving (“NES”) has been started in Rel-18, but important functionality is missing. This includes network wake-up support, SSB/SIB-less cell support, etc.
- ☑ Based on the Rel-19 work in SA1 in their “Study on Energy Efficiency as service criteria”, RAN should study/define potential realization for the defined SA1 requirements.

Medium-term impact for Automotive

- **Enhancement of AI/ML-based data fusion for automated driving.**
- **Increasing adoption of intelligent high-performance computing solution for automotive.**

RAN Scope:

- ☑ Further enhancement of Rel.18 AI/ML framework.
- ☑ Study on automotive-specific AI/ML scenarios and/or applications.
- ☑ Further study on AI/ML Life Cycle Management (LCM) for automotive by considering evolving vehicle-mounted capabilities (e.g., sensor fusion-based data collection, high-performance computing-based AI/ML processing, etc.).

- **Applicability to both communication and positioning/sensing.**
- **For Rel-19, a Study Item is preferred.**

RAN Scope:

- ☑ Study various use cases and requirements, including those relevant for automotive.
- ☑ Study system models for RIS and performance evaluation criteria for various network configurations.
- ☑ Include possibility of both network control and user equipment control of RISs in the studies.

Medium-term impact for Automotive

- **Many use cases require battery-free devices.**
- **The use of a single/common wireless technology will be beneficial in factories and other industrial scenarios.**

RAN Scope:

☑ Support for positioning/localization/ranging.

☑ Compact protocol layers design.

☑ Coverage enhancement techniques with low device complexity.

☑ Anti-collision methods / random access procedure / tag-reaction load distribution.

- **Need for enhanced environment perception (e.g., safety use cases).**
- **Better communication performance.**

RAN Scope:

☑ Consider both Uu- and PC5-based ISAC.

☑ Conduct a RAN SI to evaluate the feasibility of supporting the outcomes (use cases and KPIs) from SA's ISAC SI with current RAN specifications (i.e., signals, waveforms, channel models, radio protocols).

☑ If feasible, identify 5G-compatible ISAC features and establish design objectives for a subsequent WI (in Rel. 19 or after).

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The Future in Motion