



The new 5GAA 2030 Roadmap for Automotive Connectivity

Press Briefing



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C-V2X
PROVEN, TRUSTED AND READY TO HIT THE ROAD.



02:09



Practical Information

- Attendees are by default on mute to avoid background noise
- The Press Briefing has two parts:
 - Presentations from the speakers (30 minutes)
 - Q&A session (30 minutes)
- We kindly ask you to submit your questions in a **written form**, using the **question bar**, rather than raising your hand

Agenda

- **5GAA leadership introduction:**
 - Joerg Plechinger, 5GAA Board Member, Audi
 - Johannes Springer, 5GAA Director-General, Deutsche Telekom
 - Uwe Puetzschler, 5GAA Vice-Chair, Nokia
- **Highlights of the new 5GAA Roadmap:**
 - Maxime Flament, 5GAA CTO
- **Open Q&A session (moderated by Maxime Flament)**
 - Alin Stanescu, 5GAA Roadmap Lead, Volkswagen
 - Georg Schmitt, 5GAA Roadmap Co-Lead, BMW
 - Reza Karimi, 5GAA WG4 Vice-Chair, Huawei

Joerg Plechinger

5GAA Board Member, Audi



C-V2X Roadmap – result of collaboration

- 5GAA started in 2016 by the eight founding members and has grown to an important organization representing major automotive OEMs, suppliers and telecommunication industry players
- The C-V2X roadmap presented today is a result of the long-standing collaborative work of the 5GAA members
- 5GAA delivered the target to bring industries together
- The roadmap is an important milestone for 5GAA towards the next step of all partners to jointly deliver what we promised
- Automotive industry will be part of the 5G ecosystem

C-V2X Roadmap – role for automobile manufactures

- Connected vehicles are here to stay and importance of connectivity will even raise in future
- Mobile communication technology continuously evolves and opens a range of new possibilities for automotive use cases
 - 5G is a key element for a fully connected cooperative vehicle
 - Combination of long-range and short-range connectivity delivers the optimal setup for safety and efficiency of traffic
- 5GAA enabled the automotive industry to develop various C-V2X and future 5G use cases in events around the globe
- The C-V2X roadmap will help to make the fully connected cooperative vehicle a reality
- Collaboration between all industry partners is a key for success and automotive industry will contribute
- The role of the 5GAA gets even more important in future

Johannes Springer

5GAA Director-General





C-V2X Roadmap paves the way for timely realization

- The 5GAA roadmap is the tip of the iceberg: Underlying work includes membership survey and a market prediction study
- The Roadmap is tool for synchronization of the various decisions and activities of the 5GAA members and other market stakeholders to bring the use cases into reality
- Call to action to for 5GAA members to contribute to the realization of the roadmap it in a timely fashion

C-V2X Roadmap – role for mobile network operators

- 5G delivery has successfully started in several countries around the globe, reaching out to more than 50% of our costumers, already today.
- The cars as such, but also the drivers and passengers are expecting continuous connectivity, so continuous mobile network coverage is a key objective for network operators.
- Upcoming 5G network capabilities are based on co-creation between the automotive and telco industry, also synchronized on the timeline.
- In addition to the automotive industry, we cooperate with road operators achieving the digitalization of roads
- Finally and very important, also other road users such as cyclists, pedestrians, and others, need to included, so we make sure that also the so-called vulnerable road users are benefitting in higher traffic safety and efficiency

Uwe Puetzschler

5GAA Vice-Chair



C-V2X Roadmap – A key part of 5GAA strategy work

- Roadmap is a great part of cooperation of all represented segments
- Result of work on 5GAA priority areas
 - **Sustained Technology Evolution** - Accelerate evolution of cellular technologies from 4G towards 5G V2X
 - **Mobile Networks** - Build upon cellular network deployments to fast track new mobility services
- 5GAA has 130 members from all regions- an excellent representation of the ecosystem
- Key focus in the coming years: make sure that we deliver on time
- Started to setup market monitoring activities to measure success

C-V2X Roadmap – Role for network supplier segment

- Network suppliers are the hidden back bones enabling the swift deployment of 5G around the world and safeguard its seamless evolution
- 5G provides many new technology solutions used to make automotive connectivity a success by meeting advanced requirements on capacity, latency and reliability; e.g.:
 - guaranteed quality of service
 - network slicing
 - edge computing resources
- Network feature availability has to be aligned with deployment timelines of use cases and applications

Maxime Flament

5GAA Chief Technology Officer



Timeline from the initial introduction to mass market deployment of C-V2X use cases

≤ 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029

3GPP
Release 15

3GPP
Release 16

3GPP
Release 17

3GPP
Release 18

**Traffic Efficiency
(Safety Related)**
Use case examples:
Local Hazard and
Traffic Information

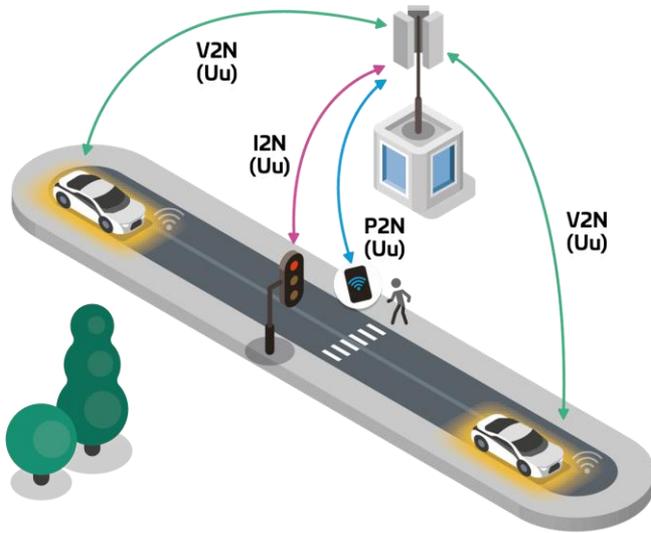
**Safety
(Traffic Efficiency)**
Use case examples:
Emergency Electronic Brake Light
Left Turn Assist

**Advanced Safety
Automated Driving (Step I)**
Use case examples:
Automated Valet Parking
for AVs

**Advanced Safety
Automated Driving (Step II)**
Use case examples:
HD Sensor Sharing for AVs

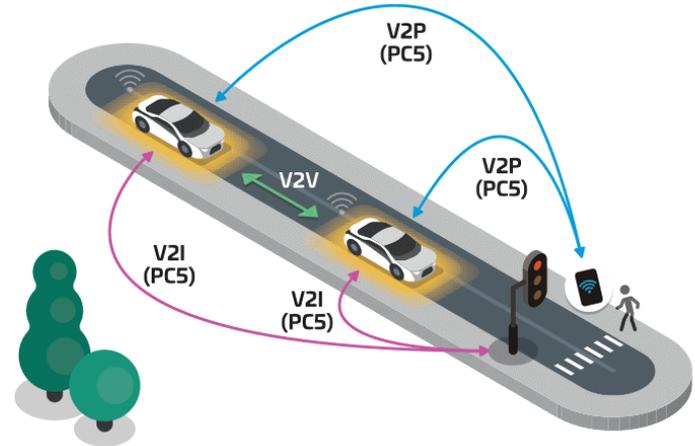
Network based

V2N/I2N/P2N in bands designated for mobile communication networks

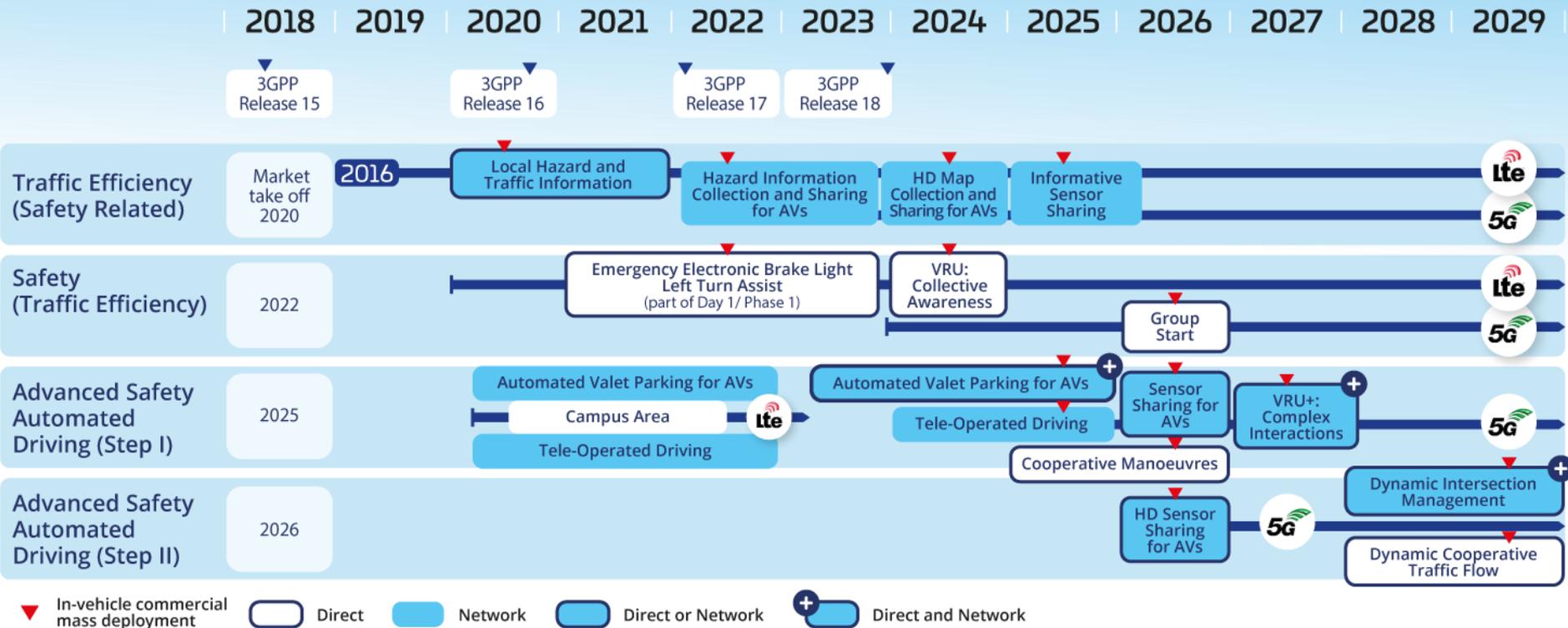


Direct

V2V/V2I/V2P in ITS bands (e.g. ITS 5.9 GHz) independent of cellular network



Expected timelines for mass deployment of C-V2X use cases



Spectrum needs

- Based on our studies of C-V2X direct communications (V2V/I/P):
 - We expect that the delivery of **day-1** use cases via **LTE-V2X** for the support of **basic safety** ITS services will require between **10 and 20 MHz** of spectrum at **5.9 GHz** for V2V/I communications.
 - We expect that the delivery of **advanced** use cases via **LTE-V2X** and **NR-V2X** for the support of **advanced driving** services will require an additional **40 MHz or more** of spectrum at **5.9 GHz** for V2V/I/P communications.
- Based on our studies of C-V2X network-based (V2N) communications:
 - At least **50 MHz** of additional¹ service-agnostic **low-band (< 1 GHz)** spectrum would be required for **mobile operators** to provide advanced automotive V2N services in **rural** environments with affordable deployment costs.
 - At least **500 MHz** of additional¹ service-agnostic **mid-band (1 to 7 GHz)** spectrum would be required for **mobile operators** to provide high capacity **city wide** advanced automotive V2N services.

¹ In the above, the term “additional” means availability of spectrum in addition to the bands that are currently identified for IMT use by mobile communication networks.

Open Q&A Session for all

Moderated by **Maxime Flament**, *5GAA Chief Technology Officer*

Key editors of the Roadmap ready to answer questions:

- **Alin Stanescu**, *5GAA Roadmap Lead, Volkswagen*
- **Georg Schmitt**, *5GAA Roadmap Co-Lead, BMW*
- **Reza Karimi**, *5GAA WG4 Vice-Chair, Huawei*

Please send your questions in a written form
using the question bar

Potential follow-up interviews

Please contact 5GAA at marcom@5gaa.org

