The new 5GAA 2030 Roadmap for Automotive Connectivity

Press Briefing
C-V2X PROVEN, TRUSTED AND READY TO HIT THE ROAD.
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
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 a 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 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 customers, 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 be 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

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<th>Year</th>
<th>3GPP Release</th>
<th>Use Case Examples</th>
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<tr>
<td>≤ 2017</td>
<td>Release 15</td>
<td>Traffic Efficiency (Safety Related): Local Hazard and Traffic Information</td>
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<td>Release 16</td>
<td>Safety Efficiency: Emergency Electronic Brake Light, Left Turn Assist</td>
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<td>Advanced Safety Automated Driving (Step I): Automated Valet Parking for AVs</td>
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<td>Advanced Safety Automated Driving (Step II): HD Sensor Sharing for AVs</td>
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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
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 additional\(^1\) 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 additional\(^1\) 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