Connectivity for Automated Driving

Needs and Challenges

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CARTRE: Coordination action for Automated Road Transport For Europe
Objective: Support faster deployment of connected and automated driving across Europe

- October 2016 – September 2018
- Coordination & Support Action
- 2 EU-funded Projects
- 36 consortium partners
- 30+ associated partners

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Connectivity
For Automated Driving
CARTRE thematic area Connectivity consolidates many inputs from different European Initiatives.

“High Level Group GEAR 2030 report on automotive competitiveness and sustainability”
https://ec.europa.eu/docsroom/documents/26081
Statement 1:

Current C-ITS standards do not yet answer the needs for automated driving and safety critical applications.

Risk Assessment:
Numerous unknown along data chain:
- Position and sensing quality,
- Map Matching,
- Vehicle warning triggers,
- Message error and integrity,

No guaranteed quality.

Source: ISO 26262/Functional Safety - embitel
Statement 2:

There will be a need for a next generation of V2V-V2I protocols and communication technologies

Next steps:

• Short range secure exchange of sensor and maneuvering data
• High degrees of reliability and quality control.

Source: Autonet2030
Statement 3:

Lower levels of automation cannot (and will not) wait for wider penetration of the V2V/V2I short range communication.

Source: Intel

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Statement 4:

V2X communication stack needs further independence between its layers in order to guarantee forward compatibility

Source: Qualcomm

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Vehicle clouds will be needed as an extension of their sensor platform; APIs will open data to other services

Source: CLEPA/ACEA

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Main outcomes of the connectivity discussions
(as reflected in “High Level Group GEAR 2030 report on automotive competitiveness and sustainability”)

<table>
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<th>Outcome</th>
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<tr>
<td>V2X → Enabler for AD</td>
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<td>Fast V2X standardisation for AD (3GPP and ETSI) → Convergence towards 5G</td>
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<td>Technology neutrality → market driven approach</td>
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<td>Flexible regulatory approaches → stay open to innovation</td>
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<td>mission-critical need V2X channels with quality control</td>
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Conclusions

- Connectivity for Automated Driving is still at its infancy but will eventually be needed!
  - C-ITS / DSRC standards at 5.9GHz were not designed with automation in mind
  - There is no guarantee of full penetration of V2X on which automated vehicles can rely
  - New standards will be needed taking the requirements of AD into account
  - Integration of V2X data in the functional safety framework will be a next major step
- Concept of Extended Vehicle and neutral server will prove to be a great support for the next CAD deployment steps