C-ITS & Automated Driving

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Volkswagen – Spearheading Connectivity

Volkswagen presents new individual connectivity ...

... and shows the next stage of intuitive control.

Volkswagen combines the digitally connected world with an electrically powered car ...

... which can drive fully autonomously if you wish.
Volkswagen – Technology Deployment Roadmap

Communication Technology Capabilities

- 2G
- 3G
- 4G
- 5G

Scalability

Support Road Safety

Connected ACC
Crossing Assistance
Local Hazard Warning

Audio & Text
Mobile Data
Mobile Broadband
+ ITS-G5 / 802.11p
Automatic Driving

Guide & Inform
e-Remote
App-Connect
Security & Service

Crossing Assistance
Local Hazard Warning
Automatic Driving

Crossing Assistance
Local Hazard Warning
Automatic Driving
5G – Towards Connectivity-on-Demand

new use-cases
- car-sharing
- individualization
- see-through
- platooning
- tele-operated driving

new technical requirements
- network quality indication
- predictability
- availability
- guaranteed QoS
- SLA-based billing
- coverage extension
- individual connectivity
- device/user virtualization

new user-centric services
- Eco-System integration
- automatic driving

Network-Slicing is one of the 5G key-enablers for scalable connectivity solutions!
ITS-G5 / 802.11p – Towards Cooperative Driving
based on the C2C-CC Roadmaps

Phase 1
Awareness Driving

status data
- e.g.
  - hazard warning
  - intersection warning
  - motorcycle approach
  - roadworks warning
  - ...

Phase 2
Sensing Driving

sensor data
- e.g.
  - VRU warning
  - Connected ACC
  - overtaking warning
  - GLOSA
  - ...

Phase 3
Cooperative Driving

intention data
- e.g.
  - merge-in assistance
  - roadworks assistance
  - Platooning
  - GLOSA 2.0
  - ...

Phase 4
Synchronized Driving

coordination data
- e.g.
  - cooperative overtaking
  - intersection assistance
  - ...

time & automation level
C-ITS Platform activities are well underway for supporting C-ITS deployment. However, there are several topics with direct impact on the deployment process:

- Certificate Policy should focus on enabling a broad deployment in 2019 and integrate existing solutions and protocols
- Legal-Basis for exchanging CAM and DENM information
- Challenging Spectrum developments and the availability of harmonized norms
- *Transparent policies* regarding IPRs inside standards as well as clear guidelines that prevent an abusive use of SEPs and in consequence slow down innovation.
Thank you for your attention