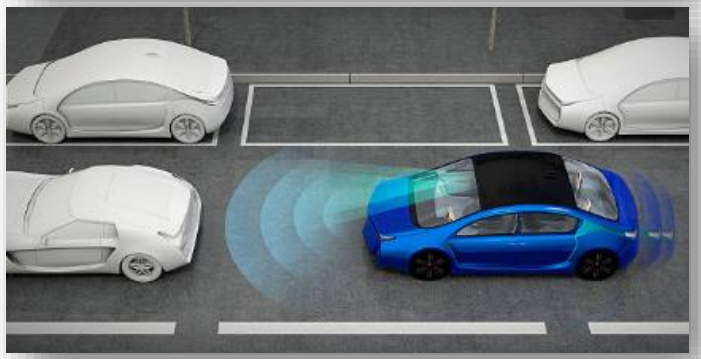
2020 Future Networked Car

05 March 2020

Geneva,

Status report on WP.29 activities related to Automated and Connected Vehicles



François E. Guichard

Mechanical Engineer

(Technical) Secretary of the Working Party on Automated/Autonomous and Connected Vehicles (GRVA)

Content

- The World Forum for Harmonization of Vehicle Regulations (WP.29)
- Automated vehicles – strategic and organizational views
- Requirements for automated vehicles – as of today

Agenda 2030 – Sustainable Development Goals

Some transport related challenges potentially addressed by AVs:

- Environmental issues
- Road safety tragedy
- Urban transport
- Access / inclusion
- …

UNECE and vehicle regulations

What is WP.29 doing?

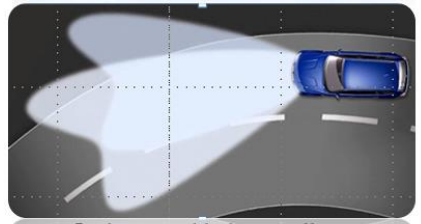

Emissions of pollutants and CO_2


General safety

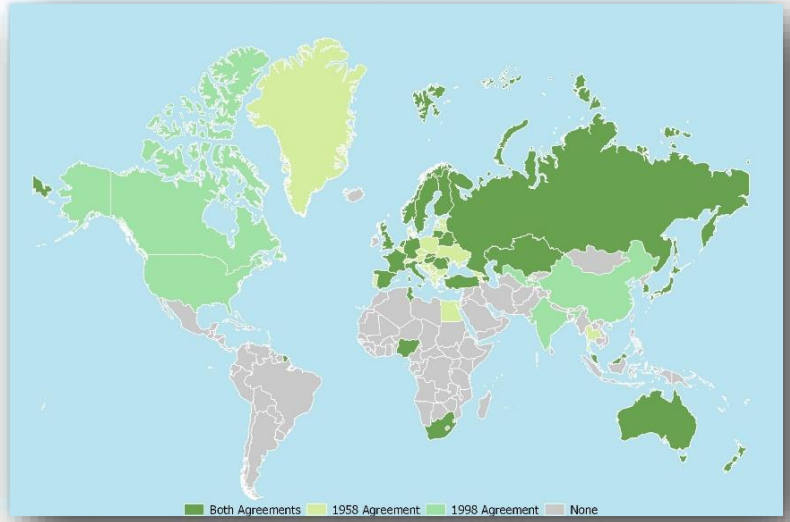

Passive safety


Noise and tires


Automated/autonomous and connected vehicles


Lighting and light signalling

Where?



Our structure:

➔ WP.29, 6 working groups, ~40 informal working groups

Notes:

- Some countries not marked here apply unilaterally (some of) the UN vehicle Regulations
- Concept of mutual recognition of approvals for a number of countries

Our stakeholders

~60 UN member States
(Contracting Parties)

Manufacturers:

AAPC American Automotive Policy Council (FCA, Ford, GM)

@OICA

Suppliers:

CLEPA European Association of Automotive Suppliers

MEMA

JAPIA 一般社団法人 日本自動車部品工業会 Japan Auto Parts Industries Association

Testing centers

CITA

Consumer's representatives:

FIA

CONSUMERS INTERNATIONAL

Standard Developing Organizations:

IEC

ISO

ITU

SAE INTERNATIONAL

Road and Public Transport Federations:

UITP

IRU

Observers & others

…

Content

- Presentation of WP.29 and GRVA
- Automated vehicles – Strategic and organizational views
- Requirements for automated vehicles

Framework document for automated vehicles

Authors

Purpose

Guides WP.29's groups

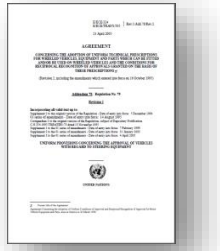
Programme management

Highlights

Safety vision

Key safety elements

Timeline



Adopted in June 2019

Safety vision

<u>According to the Framework Document on Automated Vehicles:</u>

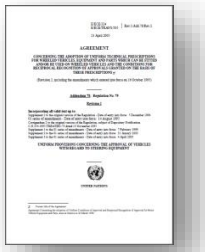
(Adopted by WP.29 in June 2019)

- The level of safety to be ensured by automated vehicles:

➔ “An automated vehicles shall not cause any non-tolerable risk”

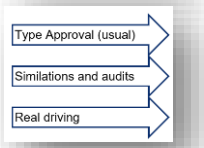
- Automated vehicles, under their Operational (Design) Domain (ODD), shall not cause any traffic accidents resulting in injury or death that are reasonably foreseeable and preventable.

Priorities for the near future



- Further development of a global Framework Document for Automated Vehicles

- Functional Requirements for Automated Vehicles (FRAV)



- Validation Method for Automated Driving (VMAD)

- Data Storage System for Automated Driving (DSSAD) vehicles + EDR

- Cybersecurity and (OTA) software updates

FRAV

Leaders

Secretary

Meetings

Geneva (Sept. 2019)

Berlin (Oct. 2019)

Tokyo (Jan 2020)

Focus on the following key safety elements:

- System safety
- Failsafe Response
- HMI /Operator information
- OEDR (Functional Requirements)

Delivery:

- Common functional requirements based on
  - existing national/regional guidelines
  - other relevant reference documents

VMAD

Leaders

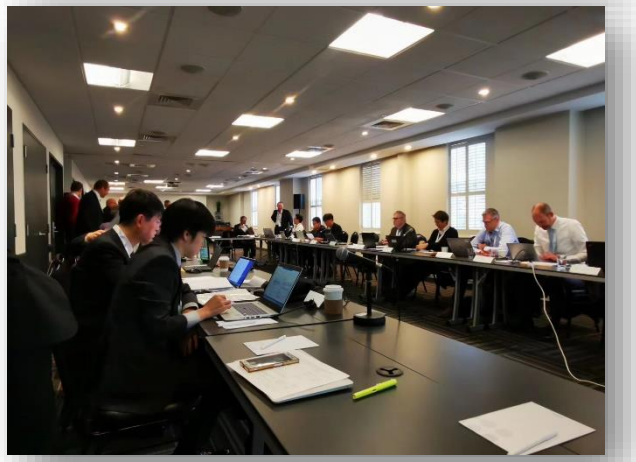
Secretariat

Structure

Audit / In use

“Foreseeable/Preventable”

Traffic scenarios



Focus on the following key safety elements:

- OEDR (Assessment Method)
- Validation for System Safety (including CEL)

Delivery:

- Review of the existing and upcoming methods
- Propose way forward for the assessment of AD

Cyber Security and OTA

Leaders

Secretariat

OICA

Cyber security

CSMS approval
Cyber security approval

(OTA) Software updates

SUMS approval
SU approval
SI requirements

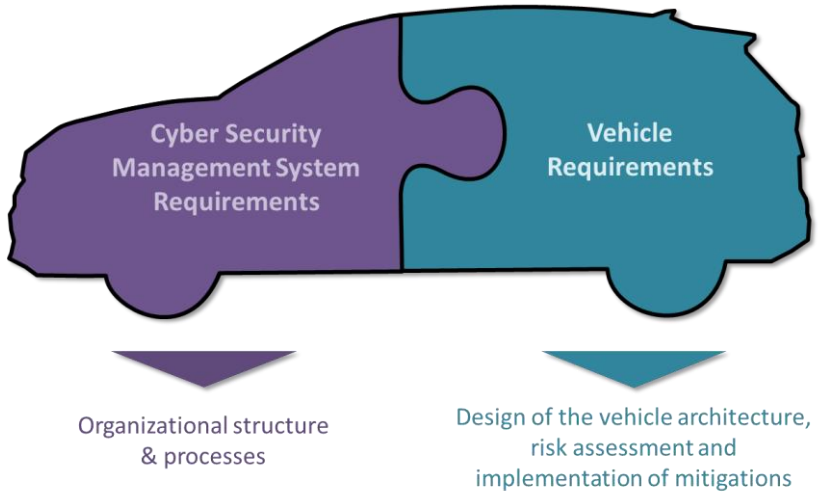
Work

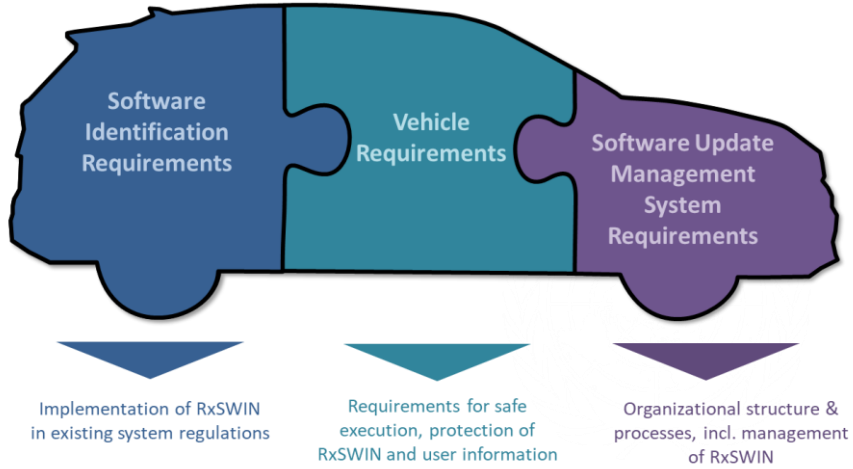
First drafts ✓
Testing Phase ✓
Fine tuning ⌛

Focus on the following key safety elements:

- Cyber security
- Software Updates

Ambition:
Completion in March 2020





EDR / DSSAD

Event Data Recorder and Data Storage System for Automated Driving

Leaders

Secretariat

OICA

EDR

Not only for ICVs

Harmonization work

C-EDR, US-EDR

➔Accident reconstruction

DSSAD

For ICVs

➔Purposes

- Research
- Monitoring
- Liability
- Legal responsibility

Outcome

EDR vs. DSSAD ✓

DSSAD ALKS level 3 ⏳

Focus on the following key safety elements:

- DSSAD/EDR

Delivery:

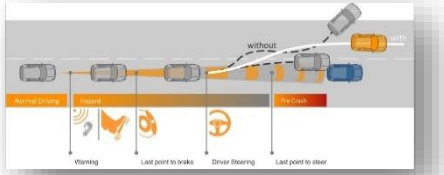
- DSSAD for Lane Keeping systems (levels 3/4)
- DSSAD / EDR

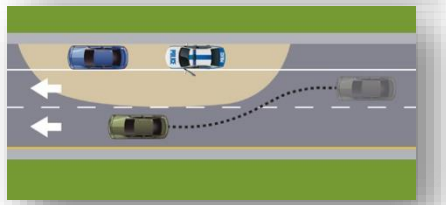
Content

- Presentation of WP.29 and GRVA
- Automated vehicles – Strategic activities
- Requirements for automated vehicles – as of today

UN Regulation No. 79 (Steering)

- Scope (active safety and ADAS):
  - Steering systems, incl.:
    - Emergency Steering Function
    - Corrective Steering Function
    - [Remote Maneuvering Systems]
    - Automatically Commanded Steering Function
      - Low speed «ACSF of category A» e.g. RCP
      - Lane keeping «ACSF of category B1» (Level 2)
      - Lane change «ACSF of category C» (Level 2)
- ADAS covered since November 2017





Automated Lane Keeping Systems – ALKS

- First Regulation in the area of vehicles of Level 3 and higher

  Use case

  – Motorway

  – Low speed

  – < 60 km/h

- Safety related provisions highlights:

  – Driver Monitoring Function

  – Emergency manoeuvre

  – Transition demand

  – Minimum Risk Manoeuvre

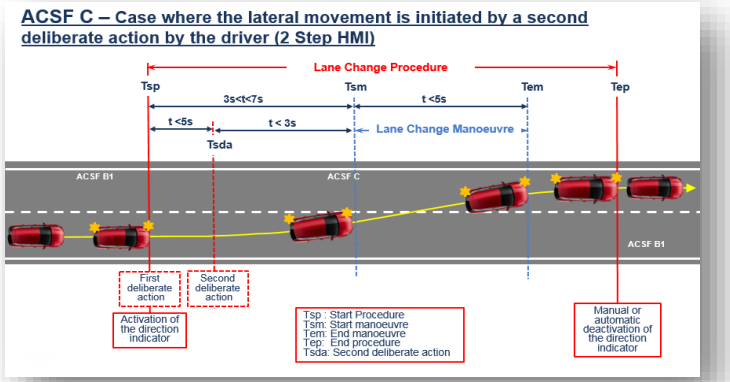
  – Activation criteria and system override provisions

  – …

Feedback received – amendments coming soon

- France, Germany, Korea
  - Analyzed UN R79
  - Performed tests
  - Proposed improved testing procedures

- Automotive sector
  - Vehicle manufacturers found ACSF C too conservative
  - They asked for parameter adjustments
  - They proposed an alternative for the HMI during a lane change maneuver ✓



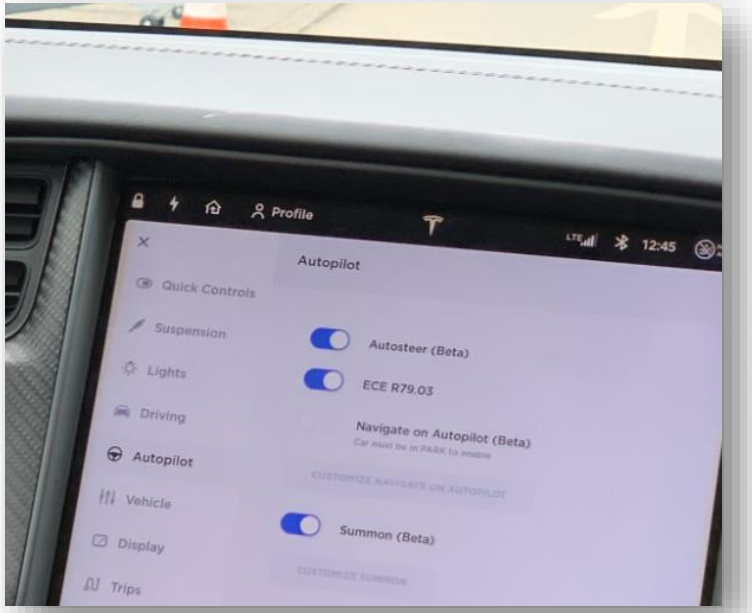
- Demo in September 2019

Contrast:

- Strict traffic rules application

and

- Real driving



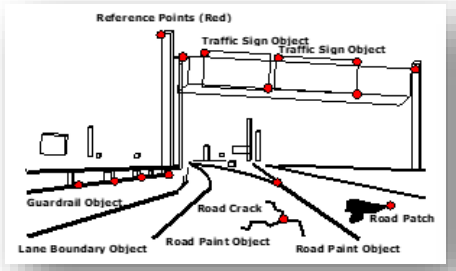
F. Guichard

Discussion items

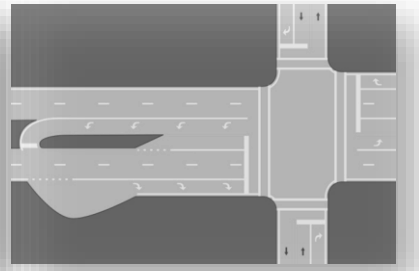
HD maps / Road databases

➔Exchange of views

- Localization
- Vehicle automation
- Redundancies
- AEBS (static objects)



Road database

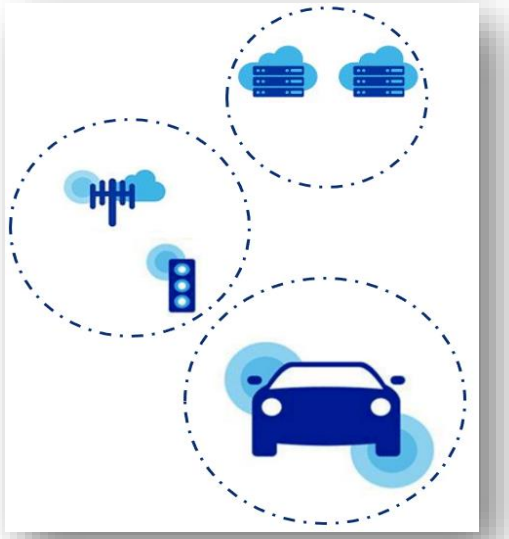


HD maps

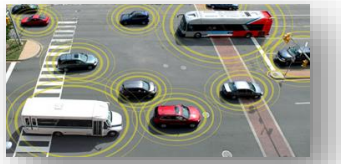
Vehicle connectivity (C-V2X)

➔Agreement that it belongs to the work programme

(Mid/long term)



Ongoing discussion items



Cyber security (OTA)

- Cyber security management
- Response plan
- (Access to data)
- Software management

Smart keys (card / 3rd party device)

- Authorization management
- Deactivation of key(s)
- Boundary of Functional Operation

Automated vehicle performance

- Safety evaluation
- Monitoring

These aspects go beyond the *new vehicle* performance
➔Vehicle Type Lifecycle requirements
➔Vehicle lifetime requirements

Only for passenger cars?

- The industry communicates that:
  - They need regulatory clarity for **Heavy Duty Vehicles** **too**
  - Systems identified as Level 3
  - Operating on motorways at speed below [60] km/h

- Ongoing discussions related to shuttles
  - Based on experiences gathered by the CPs

THANK YOU VERY MUCH FOR YOUR ATTENTION

UNECE

http://www.unece.org/automated-vehicles

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