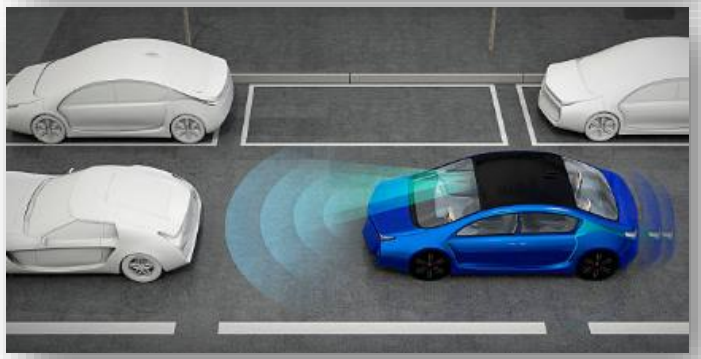
Side Event
"Legal framework governing the international application of emerging automotive technologies"
Stockholm, 18 February 2019

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






Dr. Antonio ERARIO

Vice Chairperson of the World Forum for Harmonization of Vehicle Regulations
UNECE WP.29

Content

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

UNECE and vehicle regulations

What is WP.29 doing?

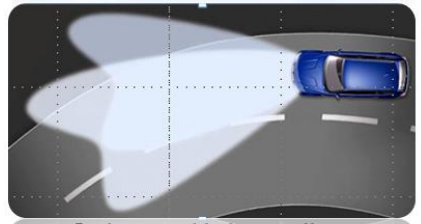

Emissions of pollutants and CO_2


General safety

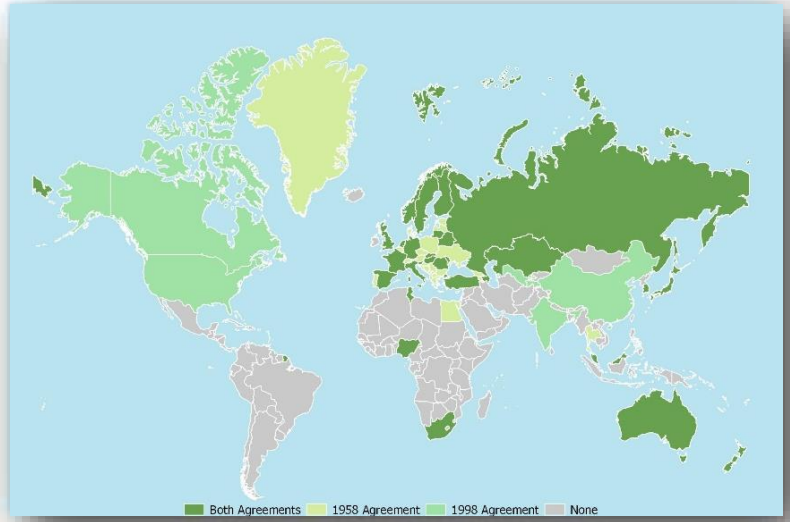

Passive safety


Noise and tires


Automated/autonomous and connected vehicles


Lighting and light signalling

Where?



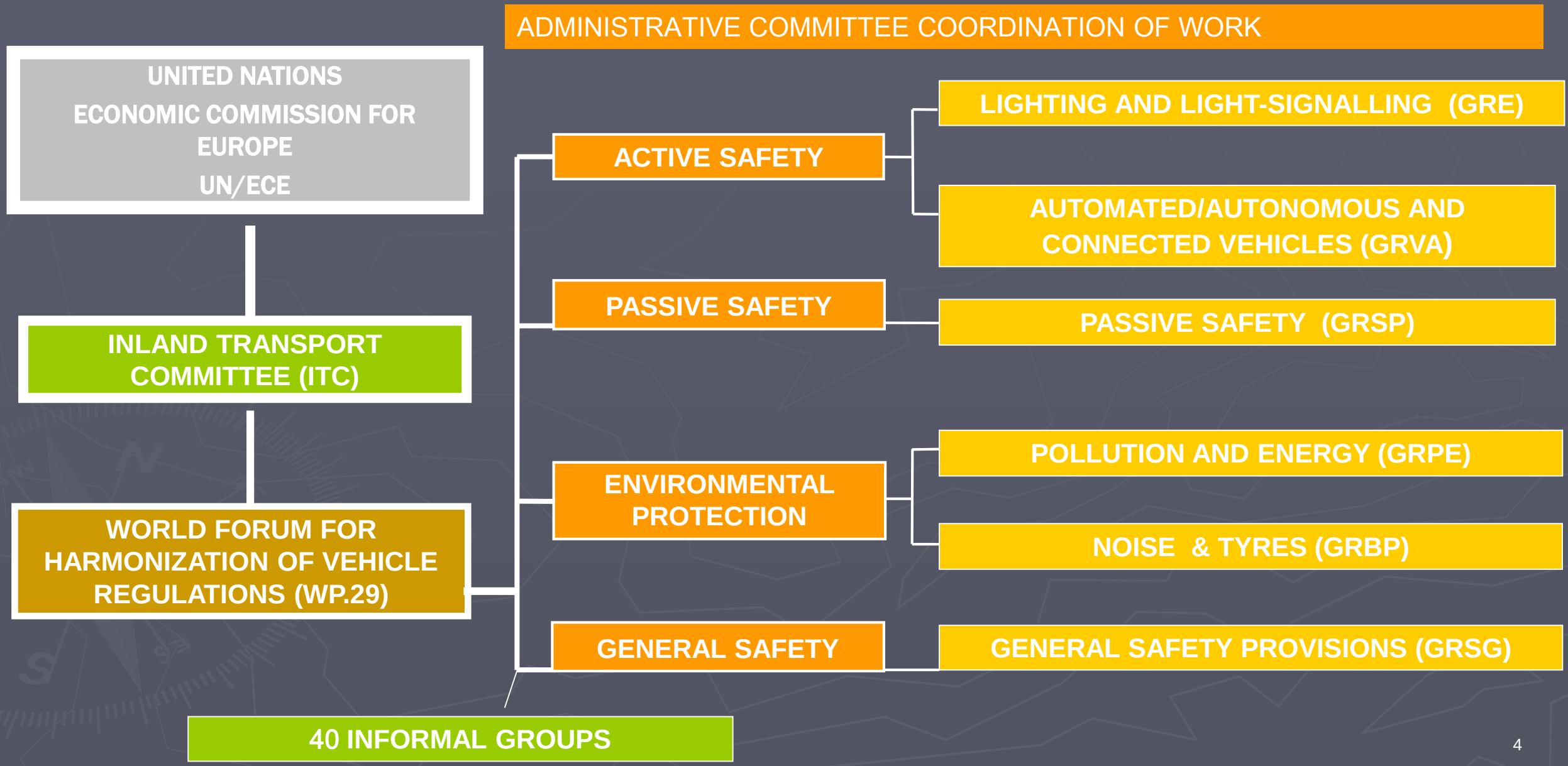
Our structure:

➔ 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

Structure of the World Forum WP.29



Agreements administered by WP.29

The World Forum administers 3 Agreements:

'58 Agreement concerning the adoption of uniform technical prescriptions for wheeled vehicles, equipment and parts which can be fitted and/or be used on wheeled vehicles and the conditions for *reciprocal recognition* of approvals granted on the basis of these prescriptions (56 Contracting Parties, 147 UNECE Regulations)

'98 Agreement concerning the establishing of global technical regulations (gtrs) for wheeled vehicles, equipment and parts which can be fitted and/or be used on wheeled vehicle (38 Contracting Parties, 20 GTRs, adopted)

'97 Agreement concerning the adoption of uniform conditions for periodical technical inspections of wheeled vehicles and the reciprocal recognition of such inspections (13 Contracting Parties, 4 Rules)

The 58 & 98 should have similar technical provisions (parallel)

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

Motorists:

FIA

Consumer's representatives:

Consumers International

Road and Public Transport Federations:

UITP

IRU

Observers & others

…

Standard Developing Organizations:

IEC

ISO

ITU

SAE International

Agenda 2030 – Sustainable Development Goals

Some transport related challenges potentially addressed by AVs:

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

Automated vehicles promises:

In 2014:

Continental presented:

Why do we strive for automation?

- Safety
- Ecology and Economy
- Comfort

Google X presented:

Why self driving cars?

- Road Safety
- Congestion
- Ageing population
- Social inclusion e.g. of Disabled Persons

https://www.unece.org/trans/events/2014/itc76_2014.html

Automated vehicles and expected benefits

In the USA

Road safety:

- 5,338,000 crashes
- 2,217,000 injuries
- 32,367 deaths

Congestion:

- 2,900,000,000 gallons of fuel
- 5,500,000,000 lost hours
- $121,000,000,000 fuel & time

Ageing:

- 41,394,141 (65+ in 2010)
- ➔ 72,774,000 (65+ in 2030)

Disabled persons:

- 56,700,000 disabled
- 46% working disabled

https://www.unece.org/fileadmin/DAM/trans/doc/2014/itc/1._Mr_Ron_Medford.pdf

Automated vehicles and society

- The World Blind Union stated:
- Autonomous vehicles have the potential to provide a level of mobility and independence that blind people have never experienced, enhancing our ability to live the lives they want.
  - Accessibility
  - Appropriate design
  - Possibility to share experience and provide feedback

The World Blind Union listed a number of suggestion to make automated vehicles suitable for their needs, including:

- Vehicle and HMI
- Environment of the vehicle e.g. MaaS.

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

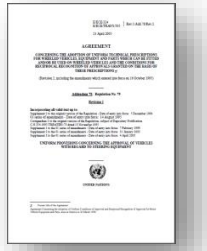
Programme management

Highlights

Safety vision

Key safety elements

Timeline



Adopted in June 2019

Safety vision

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

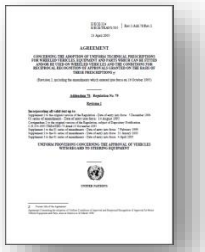
(Adopted by WP.29 in June 2019)

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

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

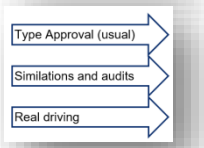
- Automated vehicles, under their Operational (Design) Domain (ODD), shall not cause any traffic accidents resulting in injury or death that are reasonably foreseeable and preventable.

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 - Functional Requirements for Automated Vehicles

Leaders

Secretary

AAPC
AMERICAN AUTOMOTIVE POLICY COUNCIL
FCA Ford GM

Meetings

Geneva (Sept. 2019)

Berlin (Oct. 2019)

Tokyo (Jan 2020)

Focus on the following key safety elements:

- System safety
- Failsafe Response
- HMI /Operator information
- Object Event Detection and Response (OEDR**)** (Functional Requirements)

Delivery:

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

VMAD- Validation Method for Automated Driving

Leaders

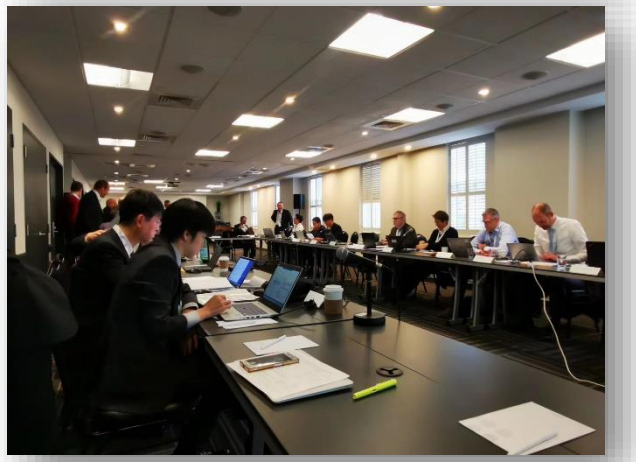
Secretariat

Structure

Audit / In use

“Foreseeable/Preventable”

Traffic scenarios



Focus on the following key safety elements:

- Object Event Detection and Response (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

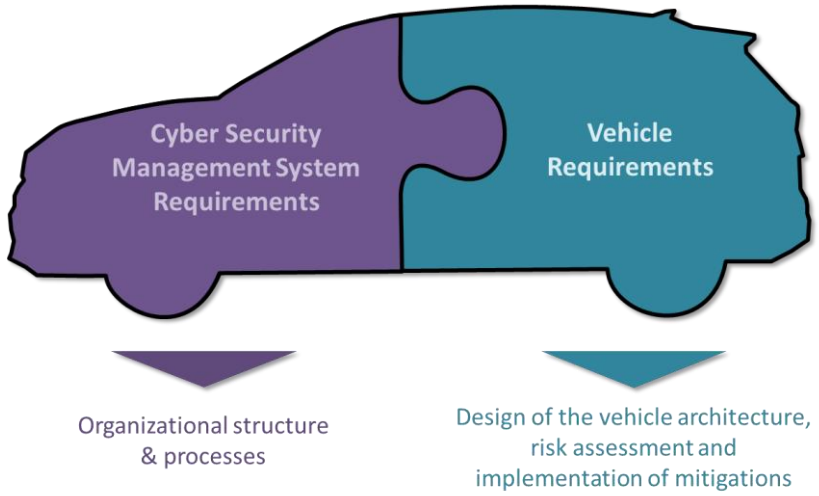
Work

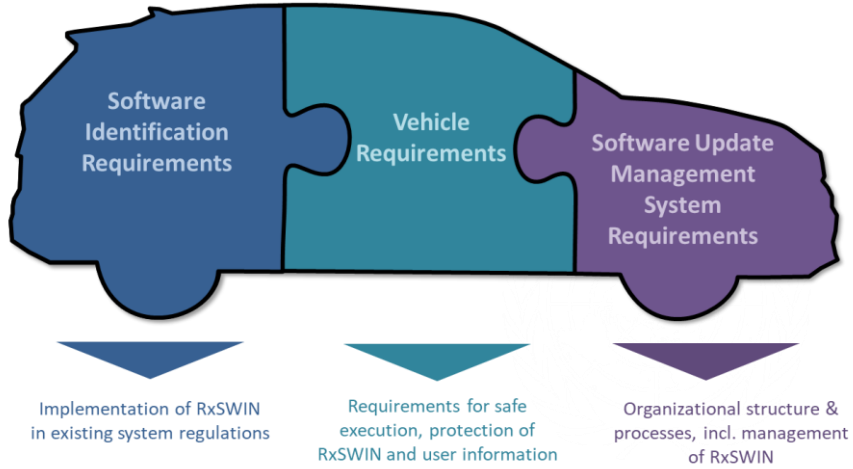
First drafts ✓
Testing Phase ✓
Fine tuning ⌛

Focus on the following key safety elements:

- Cyber security
- Software Updates

Ambition:
Completion in March 2020





EDR / DSSAD

Event Data Recorder and Data Storage Systems 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:

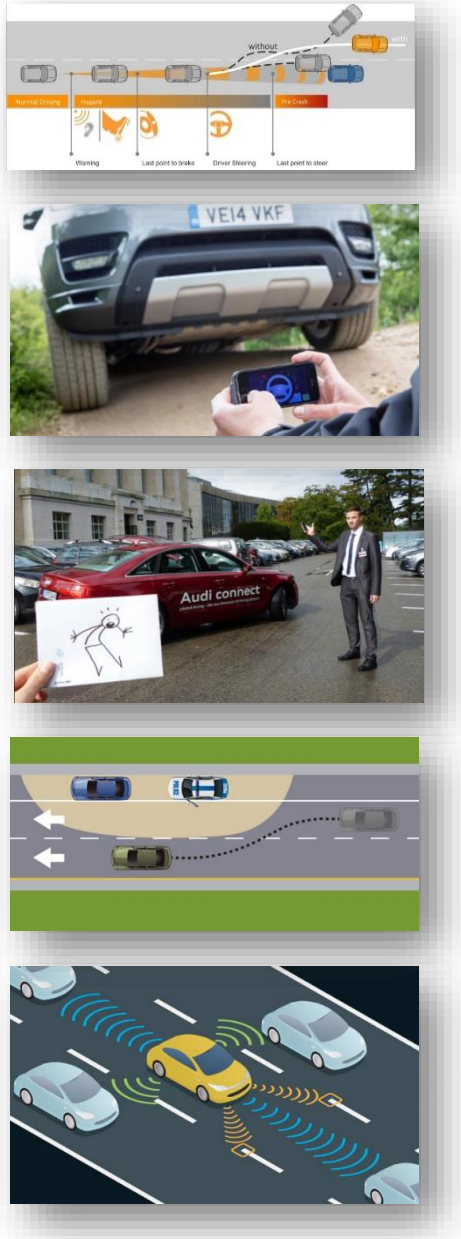
- DSSAD for Lane Keeping systems (levels 3/4)
- New UN Regulations DSSAD / EDR

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- ACSF
      - 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 for «Level 3» vehicles

  Operational Domain

  – Motorway

  – Low speed

  – < 60 km/h

- Safety related provisions highlights:

  – Driver Monitoring Function

  – Emergency manoeuvre

  – Transition demand

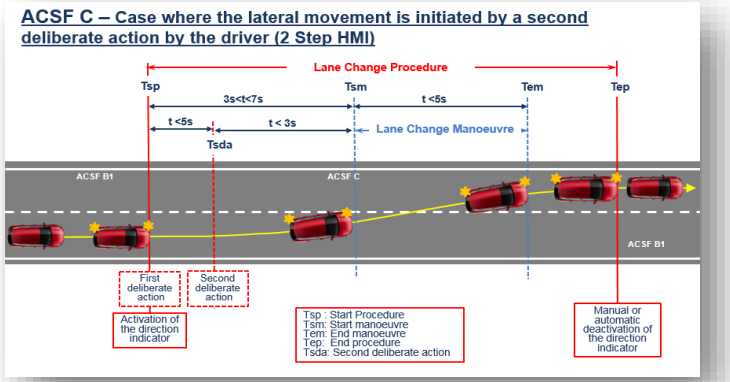
  – Minimum Risk Manoeuvre

  – 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 ✓



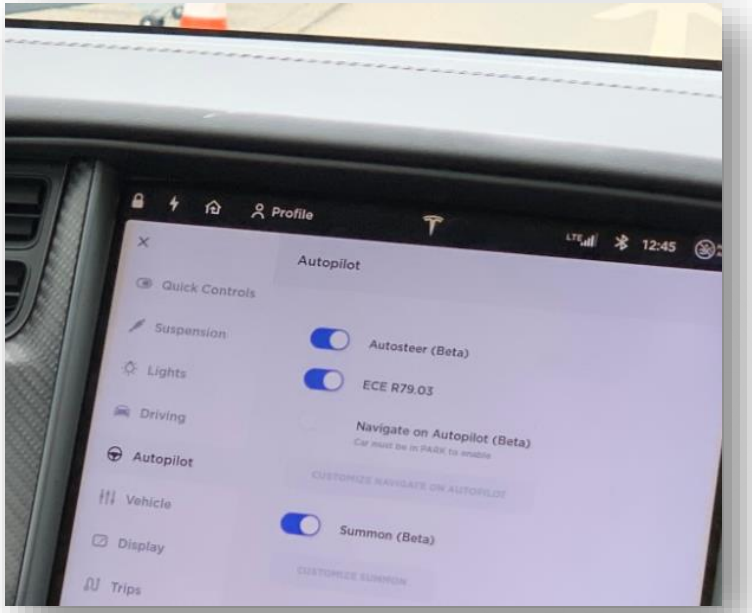
- Demo in September 2019

Contrast:

- Strict traffic rules application

and

- Real driving



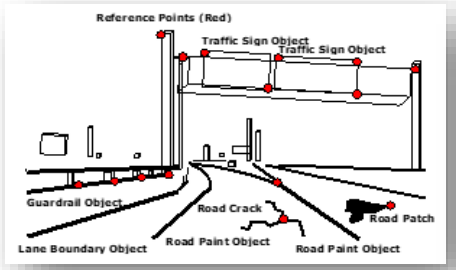
F. Guichard

Discussion items

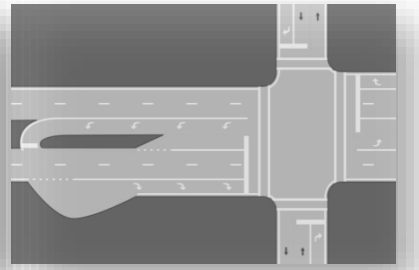
HD maps / Road databases

➔Exchange of views

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



Road database

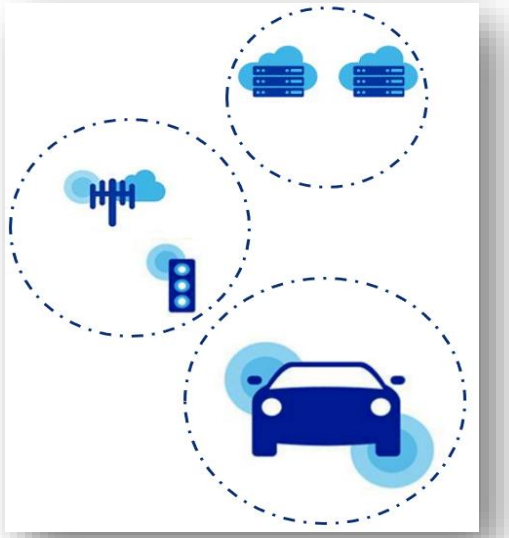


HD maps

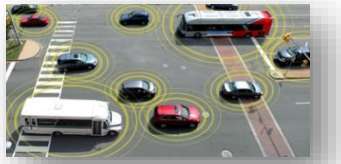
Vehicle connectivity (C-V2X)

➔Agreement that it belongs to the work programme

(Mid/long term)



Ongoing discussion items

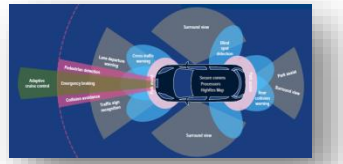


Cyber security (OTA)

- 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
➔Performance once the vehicle is in the field
➔These can overlap with other (national) regulatory fields

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
FOR YOUR ATTENTION

Further information may be obtained at

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

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