



ARCADE Stakeholder workshop

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Scenario introduction, Society related

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Society related Thematic Areas

- Safety validation and roadworthiness testing
- Policy and regulatory needs, European harmonisation
- User awareness, users and societal acceptance and ethics, driver training
- Socio-economic assessment and sustainability

Possible new areas that could influence the themes are:

- Liveable cities
- Safety of the intended function (SOTIF)
- Equity and accessibility

Background: CARTRE thematic papers & CARTRE Scenarios D5.3

- Scenario-based assessment, aimed at comparing the impacts of four potential future scenarios
- Experts from industry, research and road authorities, discussed the socioeconomic impacts of automated car driving
- Built on the work of the Trilateral ART Working Group on Impact areas and KPIs
- For each KPI, it was discussed what would be the direction of change from the societal perspective



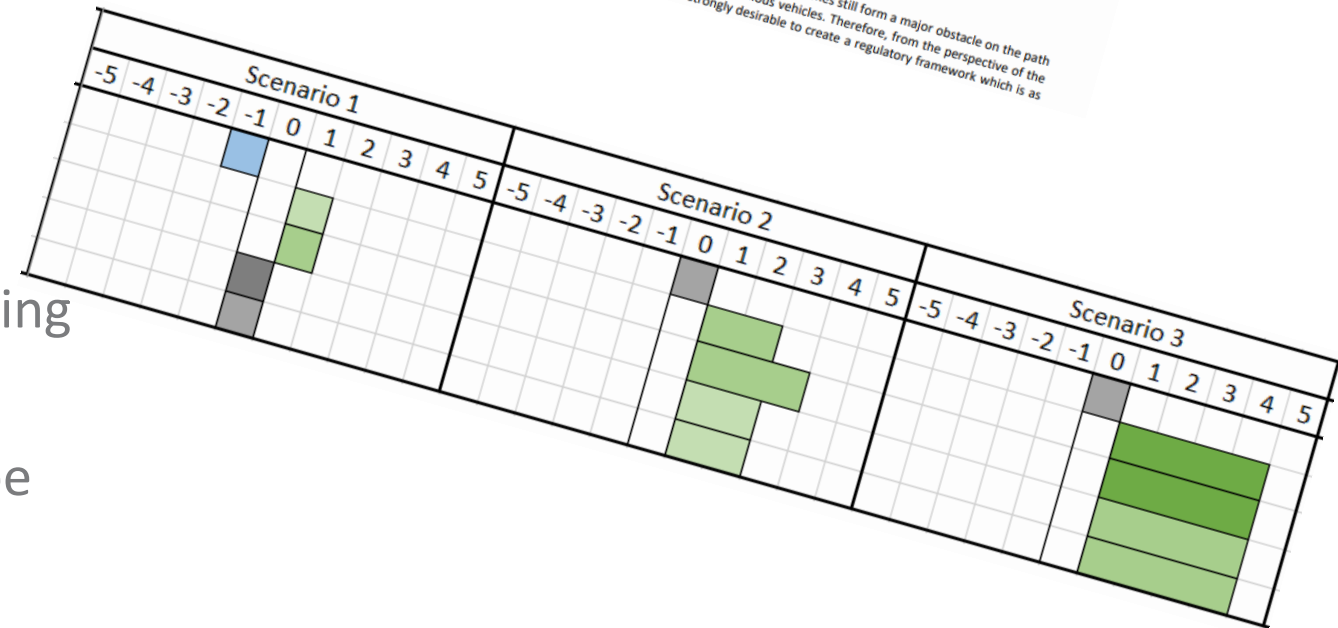
Position Paper on Policy and regulatory needs, European harmonisation

CARTRE
Coordination of Automated Road
Transport Deployment for Europe

Munich, Tuesday, 30 October 2018

Summary

Currently, non-existent, incomplete or diverging national legislative approaches still form a major obstacle on the path to the market introduction of automated and especially autonomous vehicles. Therefore, from the perspective of the European industry and CAD research community, it is strongly desirable to create a regulatory framework which is as



Scenarios CARTRE D5.3

- The impact of CAD on social aspects will be significant.
- The implementation of full automation will be gradual and will involve reshaping of:
 - vehicle usage
 - mobility schemes
 - required skills
 - professions
 - actors with new entrants in the mobility market
- The level of acceptance will be different for different users: citizens, public and private operators, professional drivers.
- Regulation will need to be adapted to guarantee safety, security and sustainability of the new mobility frameworks.

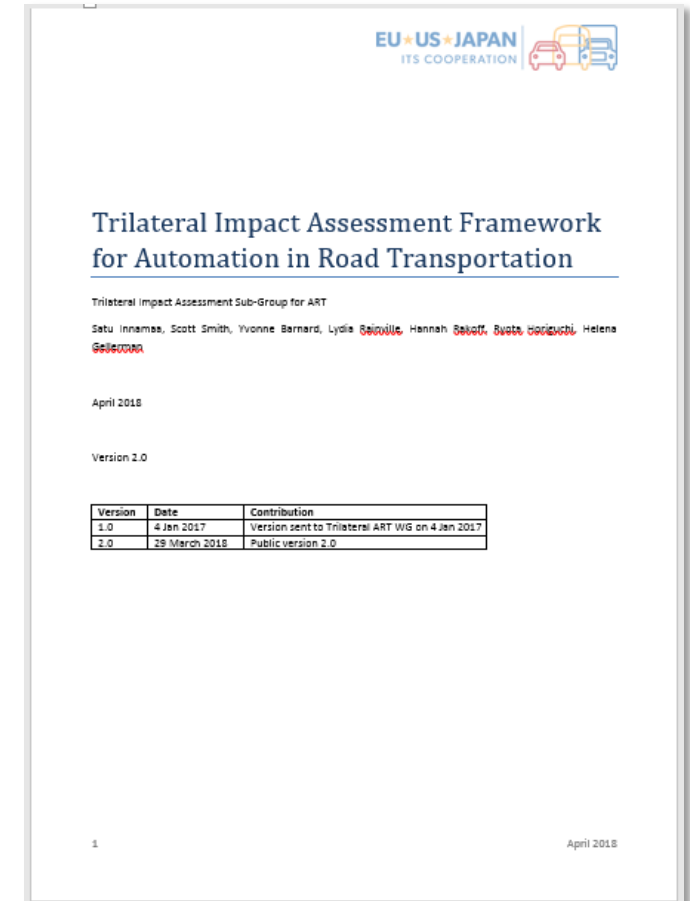
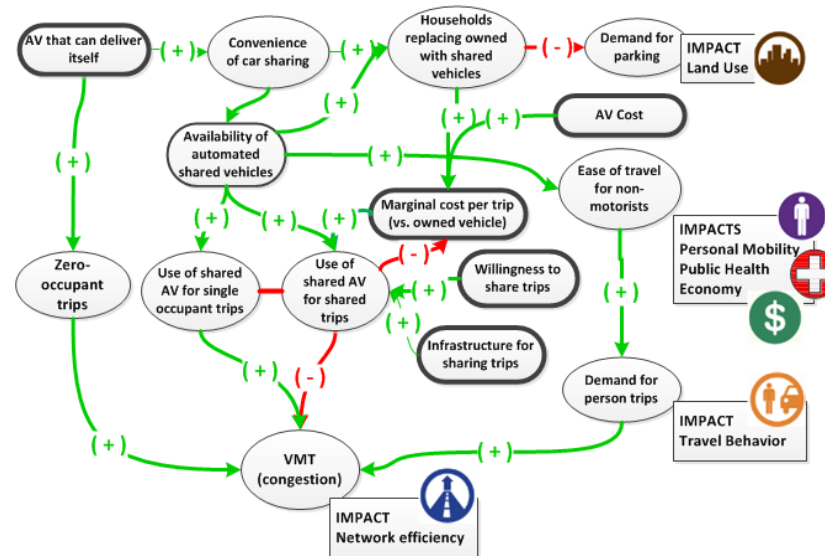
	SHORT-TERM SCENARIO (~2025)	LONG-TERM SCENARIOS (~2035)		
	Scenario 1 Gradual extrapolation of automated services	Scenario 2 Market-operated fleets of shared automated vehicles	Scenario 3 Authority driven shared automated transportation	Scenario 4 Proliferation of private automated vehicles
Automated vehicle technology	Gradual introduction of automated functions	Mature SAE L4 automated vehicles, penetration >50% in mixed traffic		
Use of shared mobility services	High interest, early adaptors use	High	High	Low
Locus of control	Cautious but enthusiastic public support to automated vehicles & mobility services	Private	Authority driven, public-private collaboration	Private

D5.3 CARTRE scenarios



High-level impact assessment framework

- Classification of evaluated system/service
- Direct and indirect impacts: 12 impact areas
- Impact mechanisms & paths
- Recommendations for experimental procedures
- Recommendations for data sharing
- KPI repository



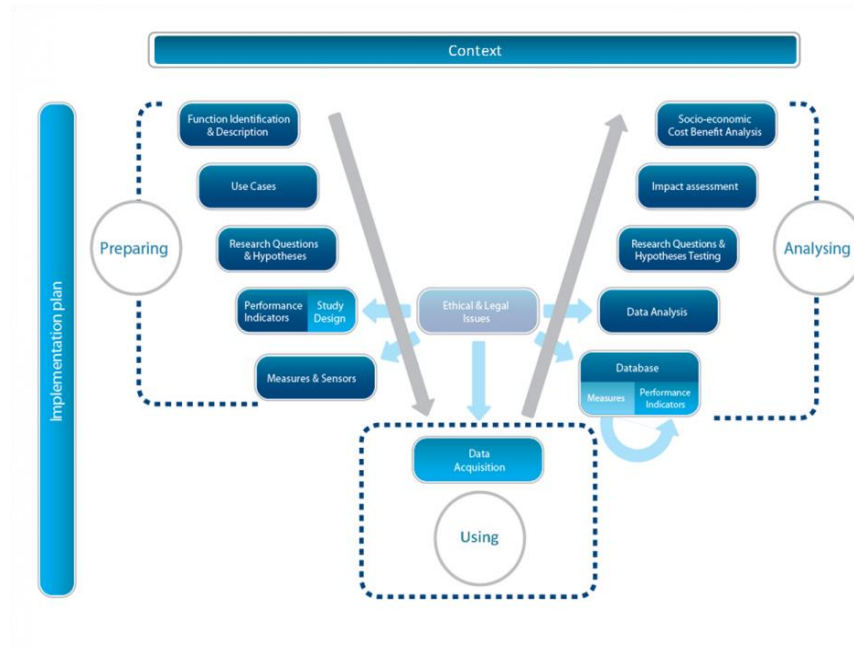
KPI recommendations and repository

- Results of international survey on the most important KPIs to be used in impact assessment, 12 impact areas
- Scores and detailed distributions
 - Overall
 - By SAE level
 - For automated passenger car and mixed traffic



FESTA Handbook

- Practical guide how to do impact assessment
- Made for FOTs, valid also for other field experiments
- Version 7, also addressing automation pilots
- Advice for
 - Planning and running of FOTs
 - Legal and ethical issues
 - Research questions, hypotheses, performance indicators
 - Experimental procedures
 - Data acquisition, databases
 - Analysis tools, modelling
 - Impact assessment



FESTA Handbook
Version 7

Updated and maintained by
FOT-Net (Field Operational Test Networking and Methodology
Promotion) and CARTRE (Coordination of Automated Road Transport
Deployment for Europe)



December 2018



Scenarios 2030

Private use

- Commuting patterns in large, urban areas results into more private car use
- CAVs and electric vehicles are dominant while car sharing and car rental declines

Shared mobility

- Large variety of mobility platforms (e.g. MaaS)
- Lack of suitable infrastructure and clear traffic signals
- CAVs used for shared mobility along with shuttle buses
- Car sharing and other modes of transport (e.g. e-scooters)



Both

- Mixed traffic confronts users with CAD
- Proven safety of CAVs will convince users/increase acceptance
- Harmonised regulation on TEN-T network
- Safety validation and roadworthiness testing clearly defined
- Some jobs are lost, some professions will be reinvented
- Driver training and license is still needed if the vehicle has to be manually driven in certain circumstances.
- AV costs still high
- Some partial automation may be affordable
- 2 worlds: deployment and experimentation
- Always need for human, driver or supervisor
- Limited ODD

Scenarios 2050

Private use

- Private vehicle use is reduced in favour of shared mobility, public transport, and walking and cycling

Shared mobility

- A variety of new mobility services is available

Both

- Mixed traffic confronts users with CAD, penetration of AVs significantly higher than in 2030
- EU regulation for CAD-based services
- Methodologies and procedures for road worthiness testing adopted as standards, roadworthiness testing method defined for SAE L5.
- Validation also performed at “macro” level: traffic flow, emissions reduction, mobility enhancement validation
- CAVs offer social inclusion to vulnerable user groups (elderly, reduced mobility)
- Less land use for roads and parking space
- Vehicles are self-learning and there is social network for cars – so they learn to drive socially acceptable from each other
- Dedicated network defined in Europe for (ad hoc) platooning



Safety validation & roadworthiness testing

Methodologies and procedures harmonisation

AVENUE, Headstart

(reviewing/updating) Recommendations to regulations

AVENUE, Enable S3, Headstart

New processes and tools dealing with validation/verification of CAD

AVENUE, Headstart, ICT4CART

Assessment of (safe) driving behaviour and interaction between human driver, vehicle and infrastructure in real-life

AUTOMATE, TransformingTransport

Cooperation between industry, service providers and public authorities

AUTOCITS, DriveSweden, Enable S3, FABULOS, Headstart, ICT4CART, Maven, TransAID

Test track and/or open road testing of CAD vehicles

FABULOS, Headstart

Policy & regulatory needs	
Political & policy process	DriveSweden, TransAID
Traffic regulations	Maven, TransformingTransport
Type approval regulations & process	Enable S3, Headstart, TransformingTransport
International harmonisation of regulations	Enable S3, TransformingTransport

Socio-economic assessment	
Driving behaviour impacts	L3Pilot, AUTOMATE, TransAID
Safety impacts	L3Pilot, AUTOMATE
Environmental impacts	L3Pilot
Transport network efficiency impacts	DriveSweden, L3Pilot

User awareness, ethics, driver training	
Road users perception of CAVs on urban roads + implications on road safety and liability	
Impact of CAVs on driver training & drivers skills required	
Incentives that will speed up user acceptance of CAVs	AVENUE
Data privacy assessment	



Join us this afternoon....

- Scenarios, challenges and enablers
- Discussion on challenges related to cooperation between industry, service providers and public authorities
- Round the table discussions: how do projects investigate:
 - Type approval regulations & process, what are the problems they encounter and what are the lessons learned?
 - Safety validation & roadworthiness testing, what are the problems they encounter and what are the lessons learned?
 - Driving behaviour impacts, what are the problems they encounter and what are the lessons learned?
- What should be the next steps, how can ARCADE support the projects?





Thank you!



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