EU perspective on CCAM

interACT Final Event, 19 June 2020

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European Commission

HORIZON 2020

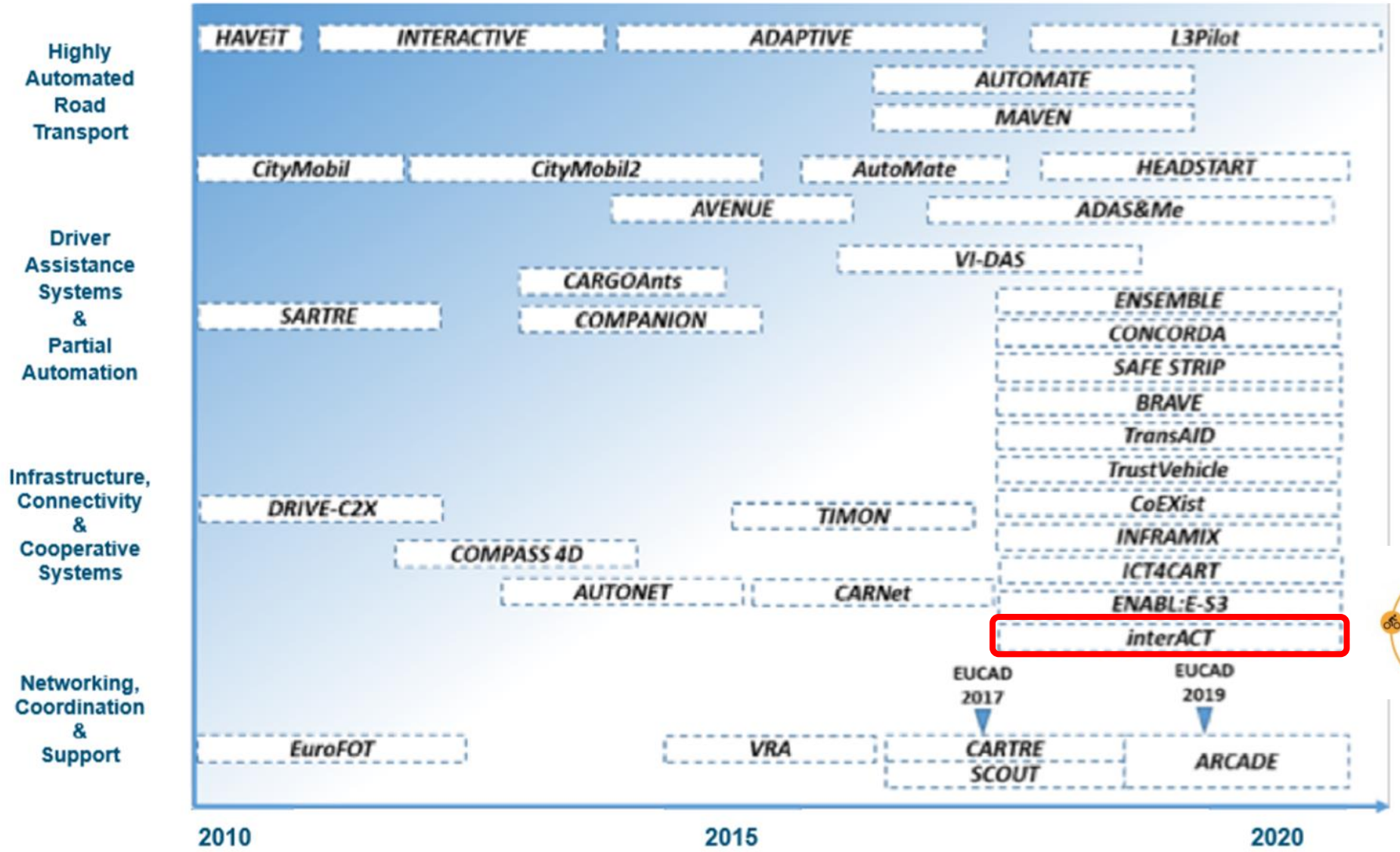
H2020 - Calls on "Automated Road Transport"

- Budget: € 300 Mio (2014-2020)
- Focus
  - Large-scale demos of automated driving systems for passenger cars, trucks and urban transport
  - Safety and end user acceptance
  - Road infrastructure to support automation
  - Traffic management solutions
  - Connectivity for automation
  - Testing and validation procedures
  - Assessment of impacts, benefits and costs of CAD systems
  - Support for cooperation and networking activities
  - Human centered design of AV

5 Calls for proposals

2016 → 2017 → 2018 → 2019 → 2020

H2020 - Calls on "Automated Road Transport"



interACT
Designing cooperative interaction of automated vehicles with other road users in mixed traffic environments

H2020 Projects related to human centered design, consumer trust and acceptance of AVs

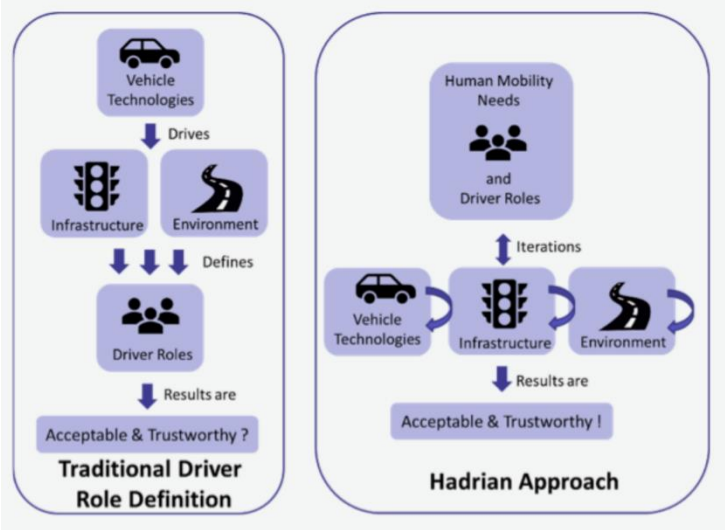
- **ADAS&ME** - Developing cooperative intelligent transport systems that compensate human errors, facilitate driving behavior, avoid collisions and increase safety on road
- **AutoMate** - Teaming up driver and automation for safe, efficient, comfortable driving
- **BRAVE** - Increasing society's confidence in automated vehicles
- **InterACT** - Improving the communication and cooperation strategy between automated vehicles and other traffic participants
- **TrustVehicle** - Advancing technical solutions for automated driving to better assess critical situations in mixed traffic scenarios
- **VI-DAS** - Integrating the monitoring of the exterior and interior of the vehicle in order to improve transportation safety
- **MEDIATOR** - MEdiating between Driver and Intelligent Automated Transport systems on Our Roads
- **DriveToTheFuture** - Needs, wants and behaviour of 'Drivers' and automated vehicle users today and into the future

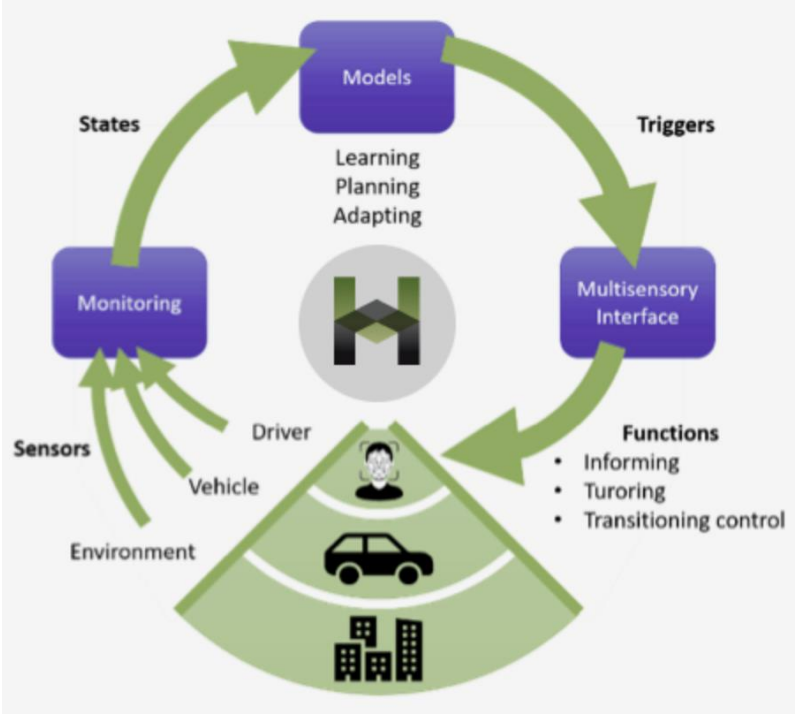
https://ec.europa.eu/inea/en/horizon-2020/h2020-transport/projects-by-field/480

Human centered design for the new driver role in highly automated vehicles

HADRIAN

Holistic Approach for Driver Role Integration and Automation Allocation for European Mobility Needs





VIF – KOMPETENZZENTRUM – DAS VIRTUELLE FAHRZEUG, FORSCHUNGSGESELLSCHAFT MBH	**AT**
UGR – UNIVERSIDAD DE GRANADA	ES
NTUA – NATIONAL TECHNICAL UNIVERSITY OF ATHENS	GR
VDI/VDE-IT – VDI/VDE INNOVATION + TECHNIK GMBH	DE
TEC – FUNDACION TECNALIA RESEARCH & INNOVATION	ES
IKA – RHEINISCH-WESTFAELISCHE TECHNISCHE HOCHSCHULE AACHEN	DE
BASt – BUNDESANSTALT FUER STRASSENWESEN	DE
CEA – COMMISSARIAT A L'ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES	FR
IESTA – INSTITUT FUR INNOVATIVE ENERGIE & STOFFAUSTAUSCHSYSTEME	AT
NVT – NERVTECH, RAZISKAVE IN RAZVOJ DOO	SI
TUD – TECHNISCHE UNIVERSITEIT DELFT	NL
ASF – ASFINAG – AUTOBAHNEN- UND SCHNELLSTRASSEN-FINANZIERUNGS- AKTIENGESELLSCHAFT	AT
AVL – AVL LIST GMBH	AT
FORD – FORD OTOMOTIV SANAYI ANONIM SIRKETI	TR
USR – UNIVERSITY OF SURREY	UK
PLUS – PARIS-LODRON-UNIVERSITAET SALZBURG	AT

The *HADRIAN f*-HMI (fluid HMI)

https://hadrianproject.eu/

Major issues that were discussed

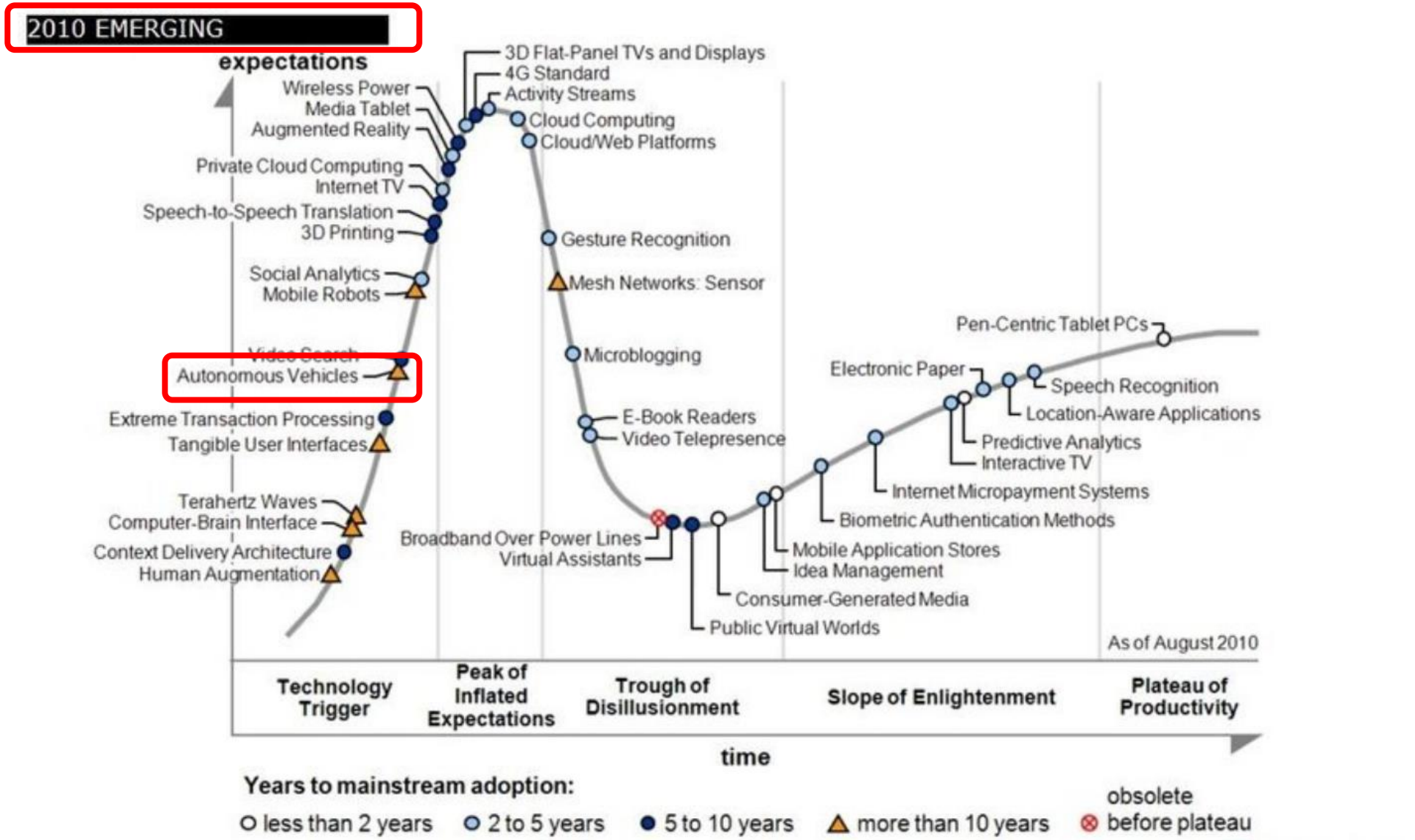
- Safety validation Automated Vehicles
  - ✓ How safe do these systems have to be? How safe is safe enough? How can we prove that the new automated driving functions are really safe and reliable?
- Ways to gain trust / societal and user acceptance of CAD systems
- Ethical issues raised by CAD
- Cybersecurity and data protection
  - ✓ What needs to be done to secure data flow and communication devices?
- Cooperation:
  - ✓ Between public and private stakeholders to agree on long-term strategy at European level
  - ✓ Share data on critical scenarios
  - ✓ International cooperation for sharing information about research and testing

Exhibition & demonstrations

Conclusions

- We passed the hype of automated vehicles – and realism is settling in.
- Shift from potential and promises to practice and public involvement.
- Compared to the first European Conference on Connected and Automated Driving there is a shift from more technological topics towards non-technology related aspects such as user centric design, ethical issues, etc.

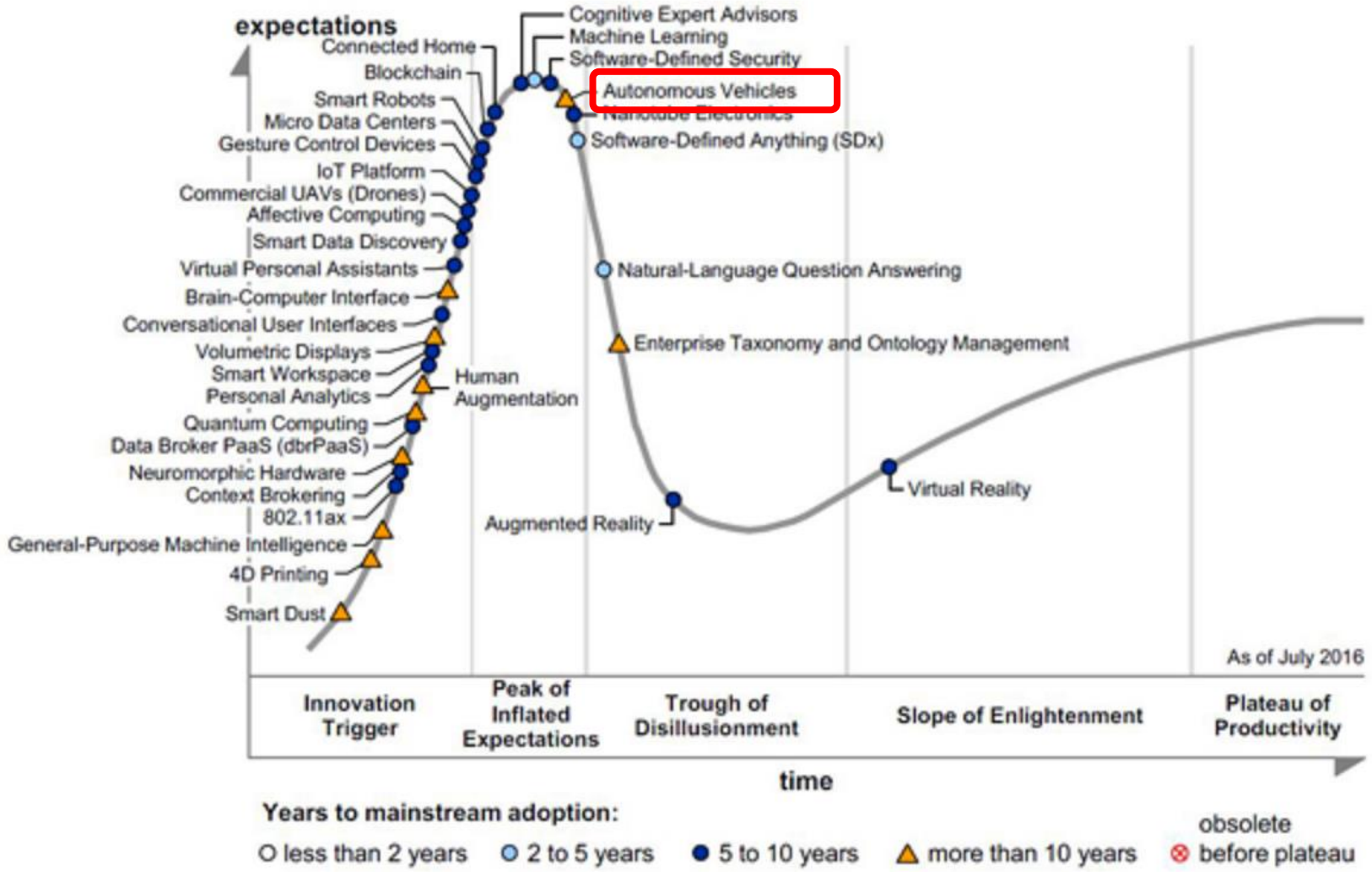
Gartner Hype Cycles 2009 - 2019



Gartner

Gartner Hype Cycles 2009 - 2019

Figure 1. Hype Cycle for Emerging Technologies, 2016



Source: Gartner (July 2016)

Gartner Hype Cycles 2009 - 2019

The single EU-wide platform on CCAM

Objectives

- develop an EU agenda for testing to better coordinate research, testing, piloting, and pre-deployment activities
- Agree on a common evaluation methodology in order to allow for comparison of results between tests
- facilitate access and exchange of data from testing
- assist the Commission in thematic areas, such as data access and exchange, road transport infrastructure, digital infrastructure, communication technology, cybersecurity, road safety, and legal frameworks, etc.
- provide advice on and support the generation of the work program for a future public private partnership on CCAM

The single EU-wide platform on CCAM

Working Groups

1. Develop an EU agenda for testing
2. Coordination and cooperation of R&I and testing activities
    - Knowledge base
    - Common evaluation methodology
    - Framework for data exchange and lessons learned
3. Physical and digital road infrastructure
4. Road Safety
5. Connectivity and digital infrastructure for CCAM
6. Cybersecurity and access to in-vehicle data linked to CCAM

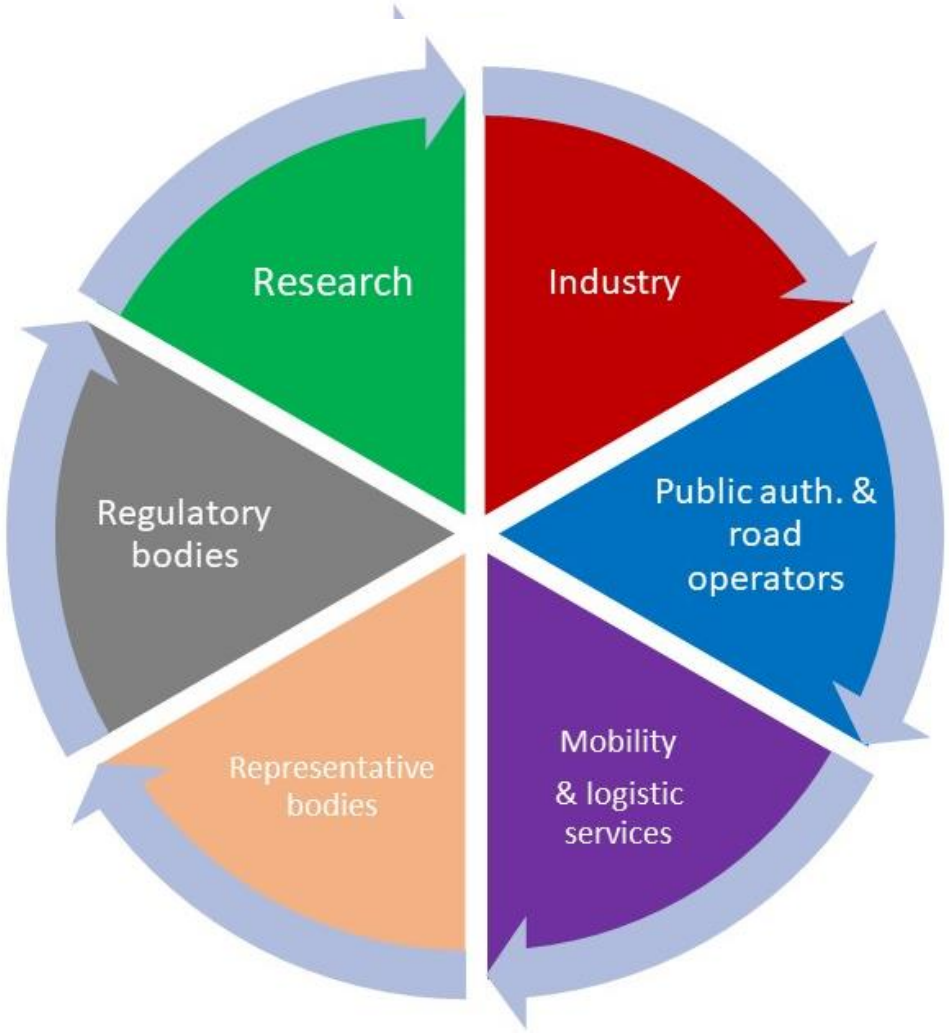
European leadership in safe and sustainable road transport through automation

- Combining **connectivity, cooperative systems and automation** will enable automated and fully orchestrated manoeuvres, bringing us closer to **Vision Zero**.
- The goal is to create more **user-centred, all-inclusive mobility**, while increasing **safety, reducing congestion** and contributing to **decarbonisation**.
- CCAM will also enable the provision of **new mobility services for passengers and goods**, fostering benefits for users and for the mobility system as a whole.

CCAM Vision and Expected Impacts for Society

- The development of CCAM shall provide benefits to **all citizens**. With full integration of CCAM in the transport system, the **expected positive impacts** for society will be:
- **Safety**: Reducing the number of road fatalities and accidents caused by human error;
- **Environment**: Reducing transport emissions and congestion by optimising capacity, smoothening traffic flow and avoiding unnecessary trips;
- **Inclusiveness**: Ensuring inclusive mobility and goods access for all; and
- **Competitiveness**: Strengthen competitiveness of European industries by technological leadership, ensuring long-term growth and jobs.

CCAM Partnership Sectors and Stakeholder

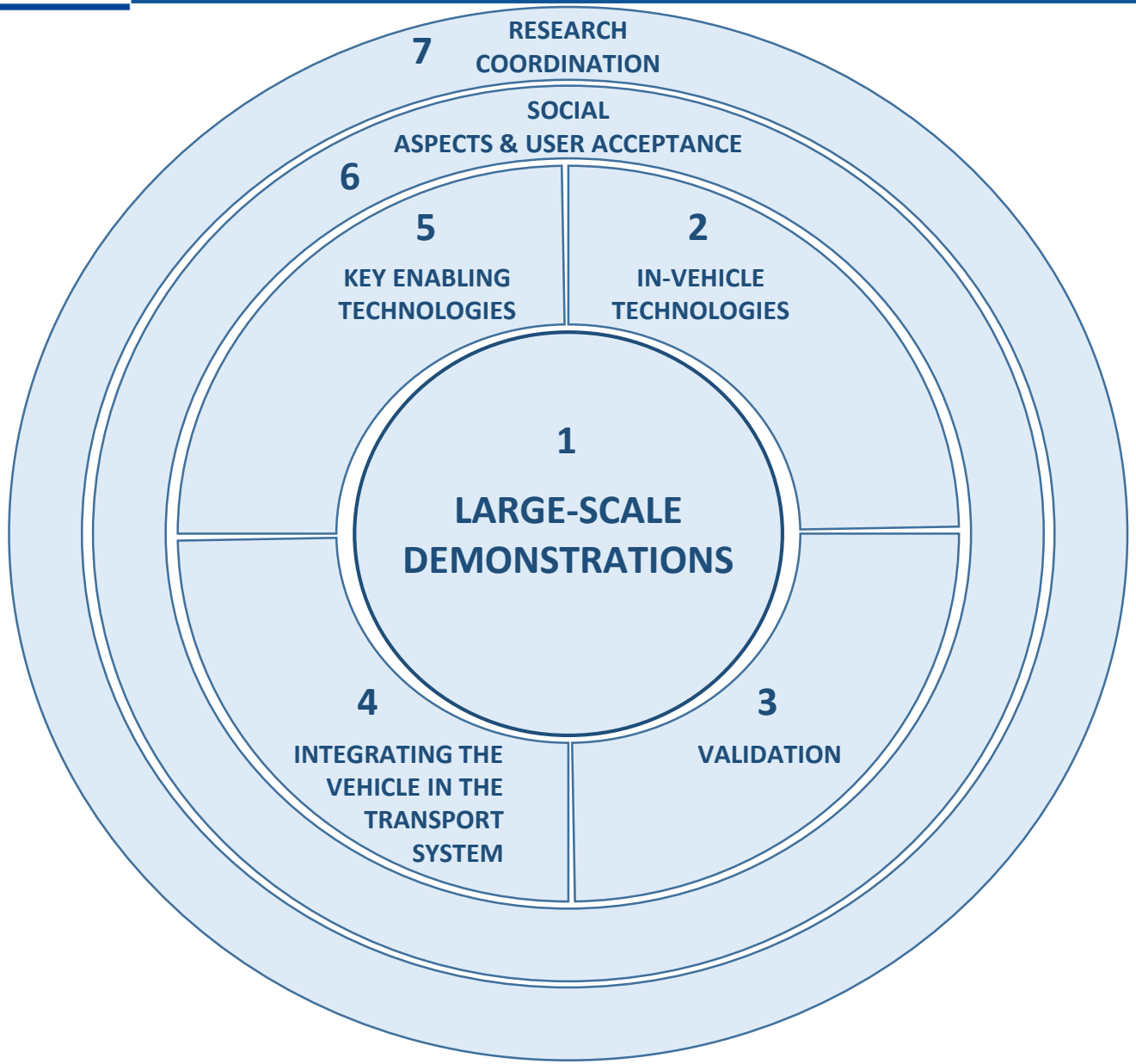


Industry	- Automotive industry, including supply chain - ITS solutions, telecom providers, connectivity - Data handling and storage industry, ...
Public authorities & road operators	- Cities and regions - Transport authorities, road authorities and operators - Member States
Mobility & logistic services	- Public transport providers - Mobility and logistics service providers - Insurance, maintenance, ...
Representative bodies	- Road users - Stakeholder associations - Road safety, society, the environment, ...
Regulatory bodies	- National, European and international
Research	- Universities - Public research institutes - Private research institutes

Background of CCAM Partnership preparation and SRIA Strategic Research & Innovation Agenda

- 24 January: at CCAM Platform meeting, EC called for the preparation of the Proposal
- 17 February: public workshop to gather stakeholders interests
- 13-23 March: stakeholders public consultation on draft Proposal
- End March - beginning April: stakeholders feedback was used to further strengthen the Proposal
- 13 April: submission of the Partnership Proposal to the EC
- May/June: drafting the SRIA and building the stakeholder community
- 18-19-20 May: first stakeholders meetings for the SRIA on the CCAM 7 clusters
- 3 June: Member States Advisory Board preparation meeting
- Early June: distribution of draft SRIA to stakeholders and collection of feedback
- 16-17-18 June: second stakeholders meetings for the SRIA on the CCAM 7 clusters
- End of June: objective of SRIA finalisation

CCAM – 7 clusters



1
- Shared automated mobility solutions (11)
- Highly automated passenger vehicles (13)
- Automated commercial/freight vehicles (14)

2
- Environment perception (1)
- Passive & active safety (3)
- On-board decision making (4)
- Human Factors requirements (6.1)

3
- Validation of CCAM systems (5)
- Validation of Human Factors (6.2)

4
- Remote operation and surveillance (7)
- Physical and digital infrastructure (8)
- Connectivity / Cooperative Systems (9)
- Fleet and (mixed) traffic management (12)

5
- Cyber-secure electronics (2)
- Artificial Intelligence (10)
- Data Storage and sharing (21)

6
- Societal needs analysis (15)
- Socio-economic and environmental impact analysis (16)
- Workforce development (22)

7
- European framework for testing on public roads (17)
- Data exchange platform (18)
- EU-wide knowledge base (19)
- Common evaluation framework (20)

ODD framework- theory

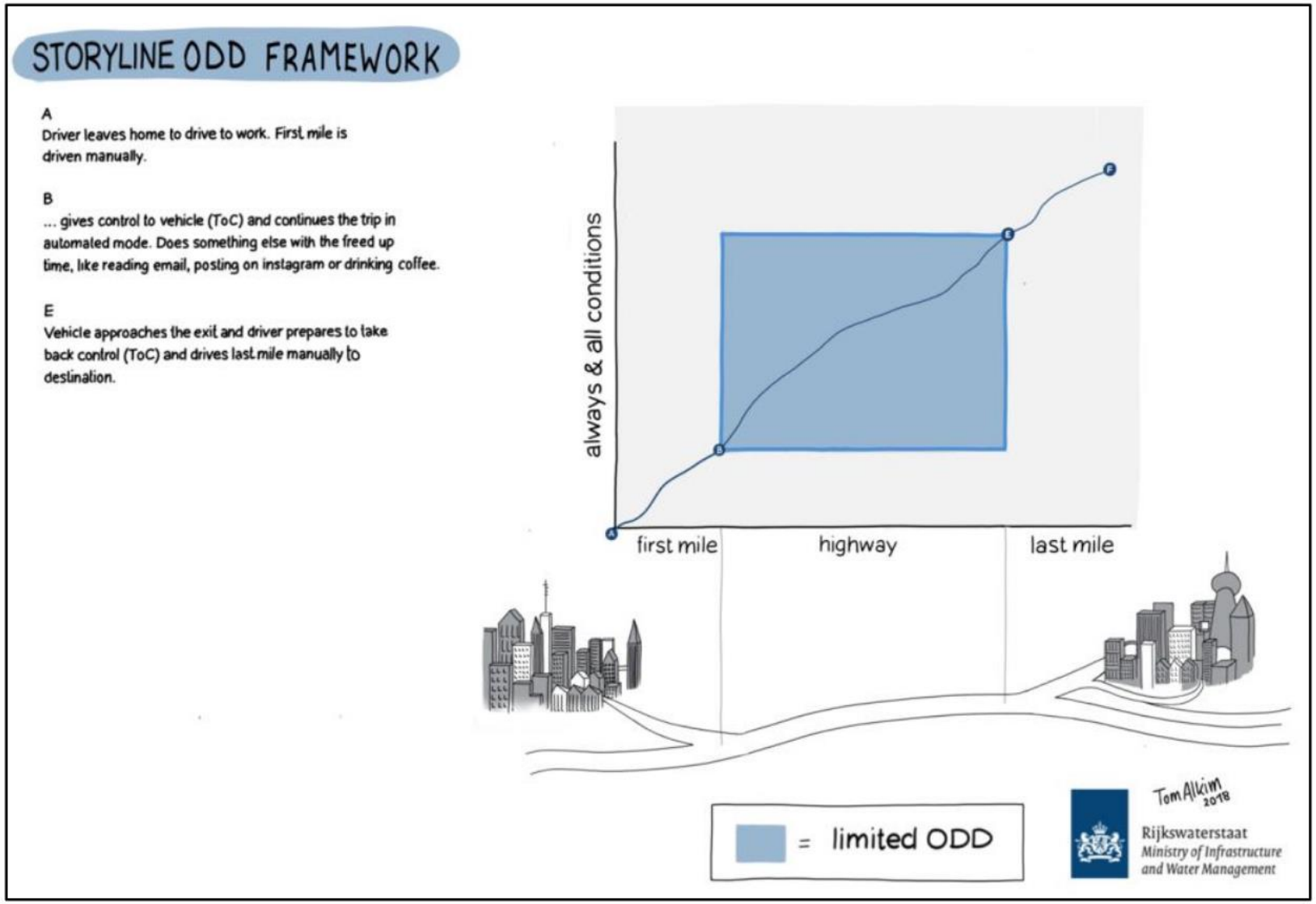


Figure 3: Visual representation of limited ODD

ODD framework - practice

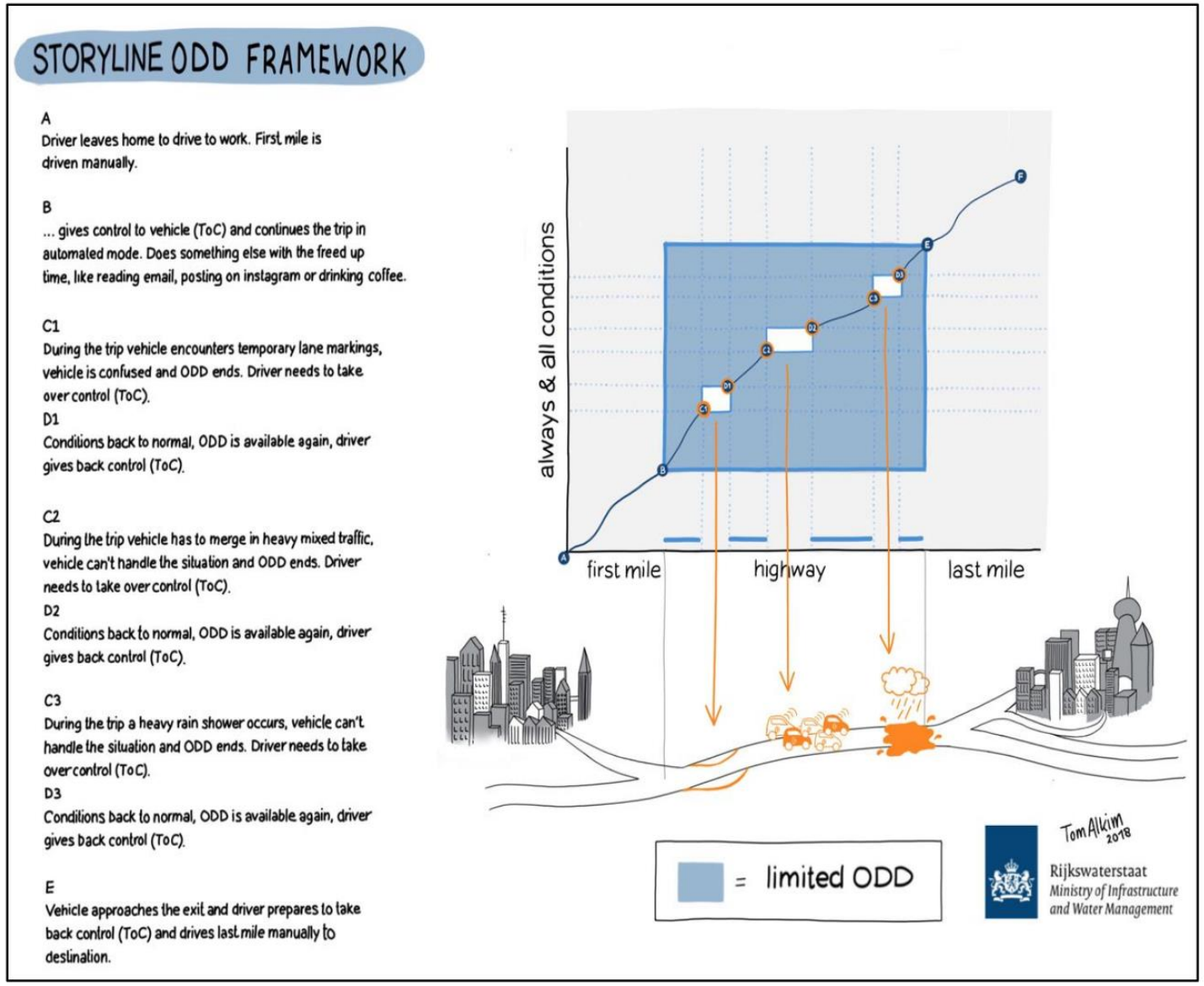


Figure 4: Visual representation of ODD in practice

Thank you for your attention!