ROAD SAFETY ON THE EUROPEAN HORIZON

Foto: Todd Diemer, Unsplash

Ordförande: Ingrid Skogsmo
Ingrid.skogsmo@vti.se
VTI

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ROAD SAFETY ON THE EUROPEAN HORIZON

European Horizons: 2020 and Europe

Mikael Sundh – Vinnova

The road to Road Safety -- ERTRAC roadmap

Magnus Granström – SAFER

On the horizon: connected & automated driving – an enabler for safer road travel
Mats Rosenquist – Volvo Group

At the horizon: the future mobility – EARPA Roadmap

Margriet van Schijndel - EARPA

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European Horizons: 2020 and Europe

MIKAEL SUNDH

NATIONAL CONTACT POINT
SOCIETAL CHALLENGE 4: SMART GREEN AND INTEGRATED TRANSPORT

VINNOVA
Sveriges innovationsmyndighet

Presentation Areas of Focus

1. Vinnova
2. Horizon 2020
3. Work Program 2020
4. Horizon Europe

VINNOVA

The Framework Programme is not a research programme, it is a

POLITICAL INSTRUMENT

where research and innovation are needed to achieve political priorities

VINNOVA

Vinnova EU-Node

National Contact Agency

Information & Advice

Policy & Expert Support

Participation Statistics

National Contact Point (NCP) för Horisont 2020

Supports and stimulates Swedish participation in Horizon 2020 (EU-commission's extended arm)

VINNOVA

Vetenskapsrådet

FORMAS

MSB

FORTE:
Forskningsrådet för hälsa, arbetsliv och välfärd

Energimyndigheten

Rymdstyrelsen
Swedish National Space Agency

Member state's role in Horizon 2020

Programme committee (PC) and National Contact Point (NCP)

Decide work programs

⇔

Support and stimulate participation in Horizon 2020

⇔

Monitor evaluation and selection of projects

PC

NCP

VINNOVA

Vetenskapsrådet

FORMAS

MSB

FORTE: Forskningsrådet för hälsa, arbetsliv och välfärd

Energimyndigheten

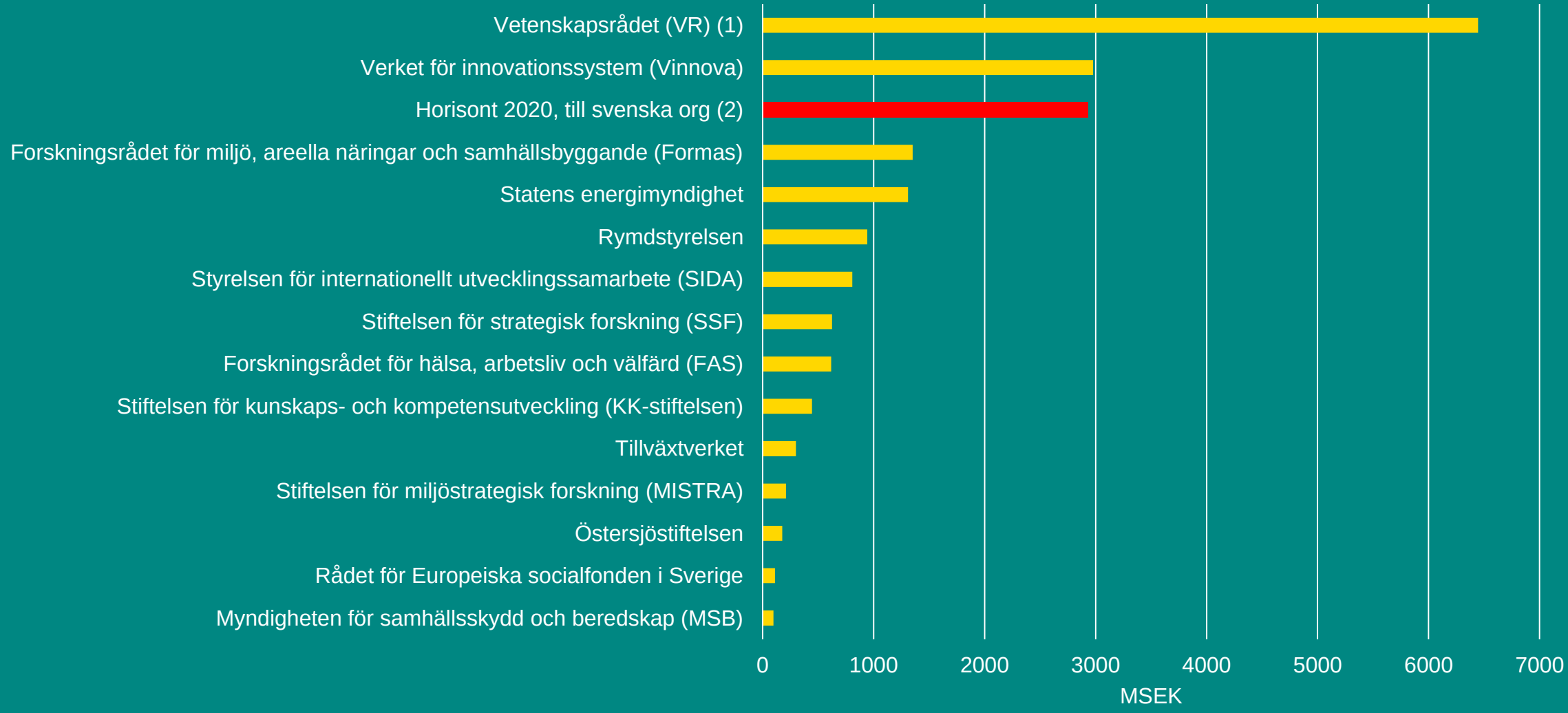
RYMDSTYRELSEN Swedish National Space Board

PC

VINNOVA

Research funding in Sweden

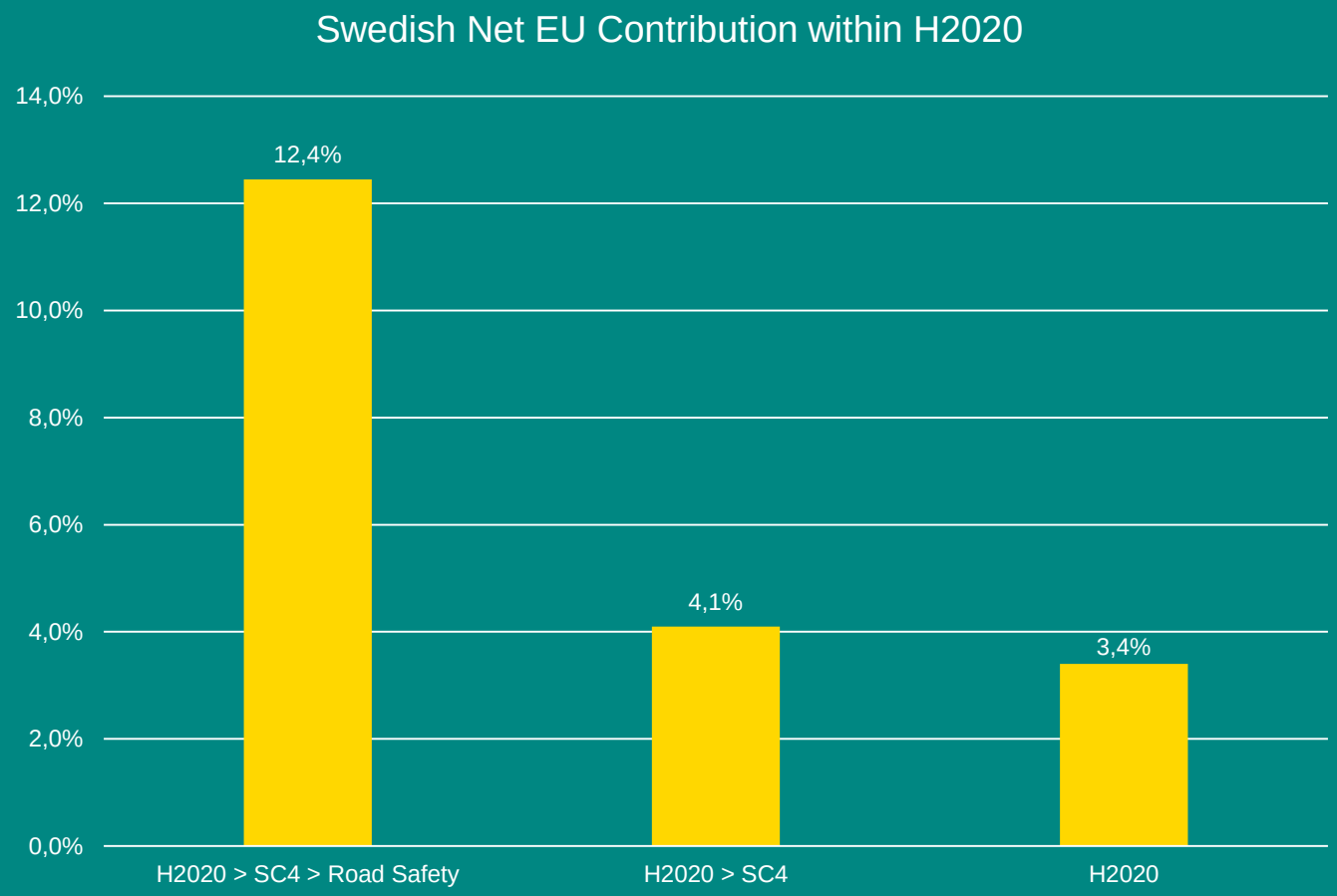
R&D financing support reported to Statistics Sweden for 2017 (latest available data) + eCORDA (Horizon 2020 for 2017)



1) For the Swedish Research Council, records also include funds to international organisations as well as foreign government entities (SEK 1180 million).
(2) For Horizon 2020, funds are estimated with respect to data from eCORDA, from KOM's Dashboard. There are several assumptions, including linear payout over the years and an average project length of 3 years, taking into account projects signed in 2015, 2016 and 2017.

For questions regarding assumptions made regarding Horizon 2020 Data please contact:
katrin.danerlov@vinnova.se

Sweden + Safety = True



H2020: 8th Place
> SC4: 8th Place
> Road Safety: 2nd Place

3 out of the 5 participants receiveing the most Net EU contributions are Swedish

Source: eCorda 2019-12-23

Calls included in ”Road Safety”:
MG-3.4-2014, MG-3.5a-2014, MG-3.5b-2014, MG-8.2a-2014, MG-8.2b-2014, MG-3.6a-2015, MG-3.6b-2015, MG-3.4-2016, MG-3.5-2016, MG-3.6-2016, ART-04-2016, MG-3.2-2017, MG-2-1-2018

VINNOVA

WP 2018-2020, SC4 (Smart, green and integrated transport)

Calls for proposals
SC4, WP 2018-2020

- **Mobility for Growth (MG)**
  - Building a Low-Carbon, Climate Resilient Future:
    Low Carbon and Sustainable Transport (LC-MG-1)
  - Safe, Integrated and Resilient Transport Systems (MG-2)
  - Global Leadership and Competitiveness (MG-3)
  - Accounting for the People (MG-4)
  - Blue Growth (MG-BG)
- Digitising and Transforming European Industry and Services:
  Automated Road Transport (DT-ART)
- Building a Low-Carbon, Climate Resilient Future:
  Green Vehicles (LC-GV)
- Other Actions

4 tvärmodala delområden
+1 kopplad till SDG 14

2 av 4 fokusområden

3x calls for proposals

Indikativ budget	2020
SC4	340,96 M Euro

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Horisont Europa 2021-2027

Horizon Europe 2021-2027

Key Novelties

[See Impact Assessment]

- **Support breakthrough innovation** → European Innovation Council
- **Create more impact through mission-orientation and citizens' involvement** → R&I Missions

More impact

- **Strengthen international cooperation** → Extended openness to association and international cooperation
- **Reinforce openness** → Open science policy
- **Rationalise the funding landscape** → New approach to Partnerships

More Openness

European Commission

European Innovation Council

The EIC will support innovations with breakthrough and disruptive nature and scale up potential that are too risky for private investors.

European Innovation Council

Helping innovators create markets of the future, leverage private finance, scale up their companies,
Innovation centric, risk taking & agile, pro-active management and follow up

Two complementary instruments bridging the gap from idea to investable project

Pathfinder: grants
(from early technology to pre- commercial)

Accelerator:
grants & blended finance
(from pre-commercial to market & scale-up)

European Innovation eco-system

European Commission

EIC och Vinnova

Pathfinder
(based on FET)
Early research with its sights set on innovation

Contributions to Collaborative projects

Vinnova's SMF program

Ideas up to first prototype

Contributions to individual SMEs (SMEs)

Accelerator
(Evolution of the SME instrument)

First prototype to market

Grants and/or owner capital to individual SMF

Other SMFs (From other government programs, that has not received grants before)

VINNOVA

New approach to European Partnerships

New generation of objective-driven and more ambitious partnerships in support of agreed EU policy objectives

Key features

- **Simple architecture and toolbox**
- **Coherent life-cycle approach**
- **Strategic orientation**

Co-programmed

Based on Memoranda of Understanding / contractual arrangements; implemented independently by the partners and by Horizon Europe

Co-funded

Based on a joint programme agreed by partners; commitment of partners for financial and in-kind contributions & financial contribution by Horizon Europe

Institutionalised

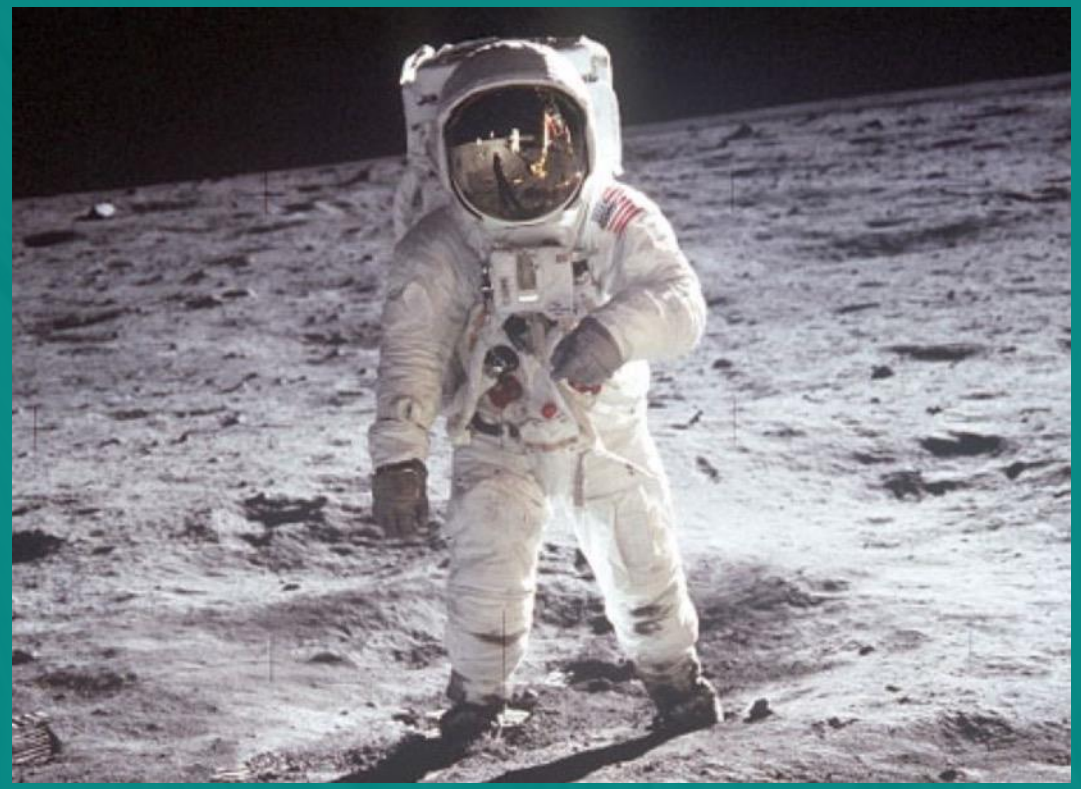
Based on long-term dimension and need for high integration; partnerships based on Articles 185 / 187 of TFEU and the EIT-Regulation supported by Horizon Europe

Missions

MAXIMIZE THE INVESTMENT IN RESEARCH AND INNOVATION

Missions should:

- Be bold and inspiring, but firmly rooted in society
- Be ambitious, but with realistic research and innovation measures
- Promote interdisciplinary and cross-sectoral innovation
- Point out a clear direction, as well as be measurable and time-limited
- Require several types of solutions



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Mission Areas

UNDER WHICH SPECIFIC MISSIONS ARE TO BE DEVELOPED

1. Adaptation to Climate Change, including Societal Transformation
2. Cancer
3. Healthy Oceans, Seas, Coastal and Inland Waters
4. Climate-Neutral and Smart Cities
5. Soil Health and Food

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Wherer are the negotiations currently regarding Horizon Europé?

- Partnership s
  - 40+ Partnerships are under negotiation
- Missions
  - 5 mission areas
  - Mission Boards, Assemblies, Sub groups…
- Co-design
  - Consultations
  - R&I days
- Framework/Contracs
  - Model Grant Agreement, Rights, responsibillities, financing models…

- Thematic Shadow-committees – planed during spring

VINNOVA

Mikael.Sundh@Vinnova.se

TACK!

VINNOVA

Sveriges innovationsmyndighet

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Future Road Safety Research Needs

Magnus Granström, Olaf Op den Camp, Peter Urban –
ERTRAC Road Transport Safety & Security Working Group

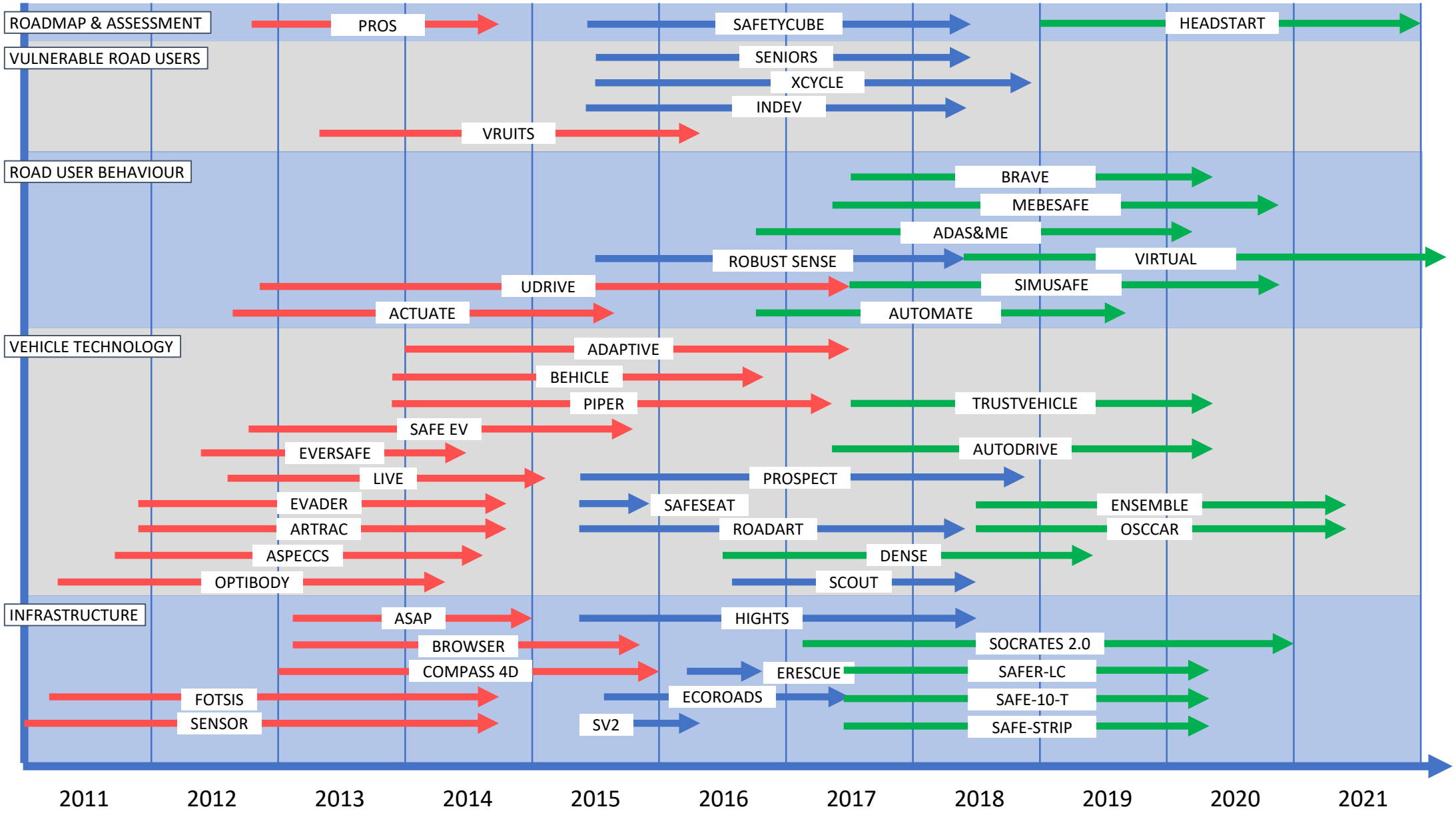
What is ERTRAC?

The European Road Transport Research Advisory Council. It is the European technology platform which brings together road transport stakeholders to develop a common vision for road transport research in Europe

The New Road Safety Roadmap

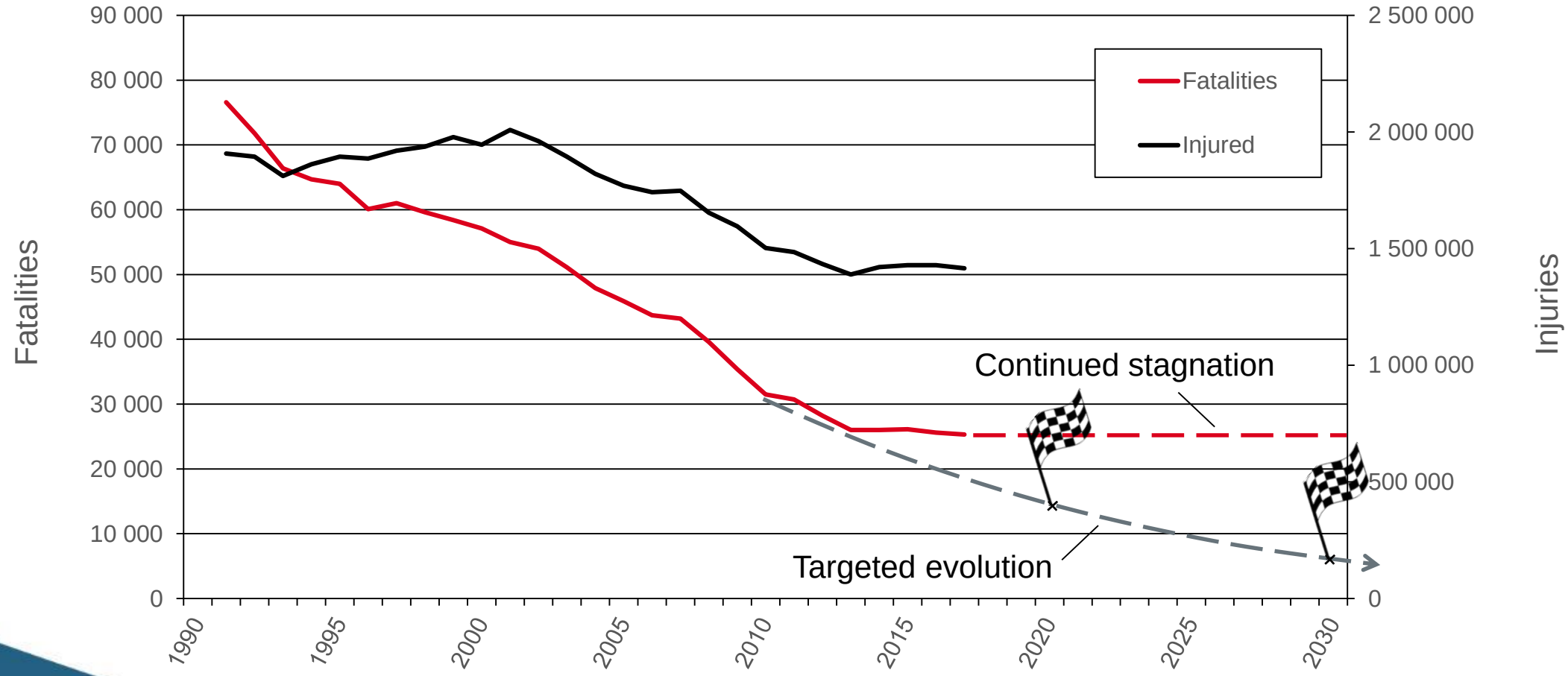
Safety as an important objective in the ERTRAC Vision

- People and goods can reach their destinations in cities in a way that is healthy, safe, affordable, reliable and comfortable.
- CO_2-neutral road transport with minimal environmental impact including circular economy for vehicles and infrastructure
- Infrastructure and traffic management provide high efficiency road network services at competitive cost with minimized congestion, regardless of actual conditions and disturbances.
- Digitalisation enables people to get the best service at highest level of comfort and safety.
- **Safe and secure at any time**
- Europe as world leader in innovation, production and services


ROADMAP & ASSESSMENT
PROS
SAFETYCUBE
HEADSTART
VULNERABLE ROAD USERS
SENIORS
XCYCLE
INDEV
VRUITS
ROAD USER BEHAVIOUR
BRAVE
MEBESAFE
ADAS&ME
ROBUST SENSE
VIRTUAL
UDRIVE
SIMUSAFE
ACTUATE
AUTOMATE
VEHICLE TECHNOLOGY
ADAPTIVE
BEHICLE
PIPER
TRUSTVEHICLE
SAFE EV
AUTODRIVE
EVERSAFE
LIVE
PROSPECT
EVADER
SAFESEAT
ENSEMBLE
ARTRAC
ROADART
OSCCAR
ASPECCS
DENSE
OPTIBODY
SCOUT
INFRASTRUCTURE
ASAP
HIGHTS
BROWSER
SOCRATES 2.0
COMPASS 4D
ERESCUE
SAFER-LC
FOTSIS
ECOROADS
SAFE-10-T
SENSOR
SV2
SAFE-STRIP
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021

The New Road Safety Roadmap

Road safety evolution in the EU: in a phase of stagnation



(Data source: https://ec.europa.eu/transport/road_safety/specialist/observatory/statistics/charts_and_figures_en)

Challenges

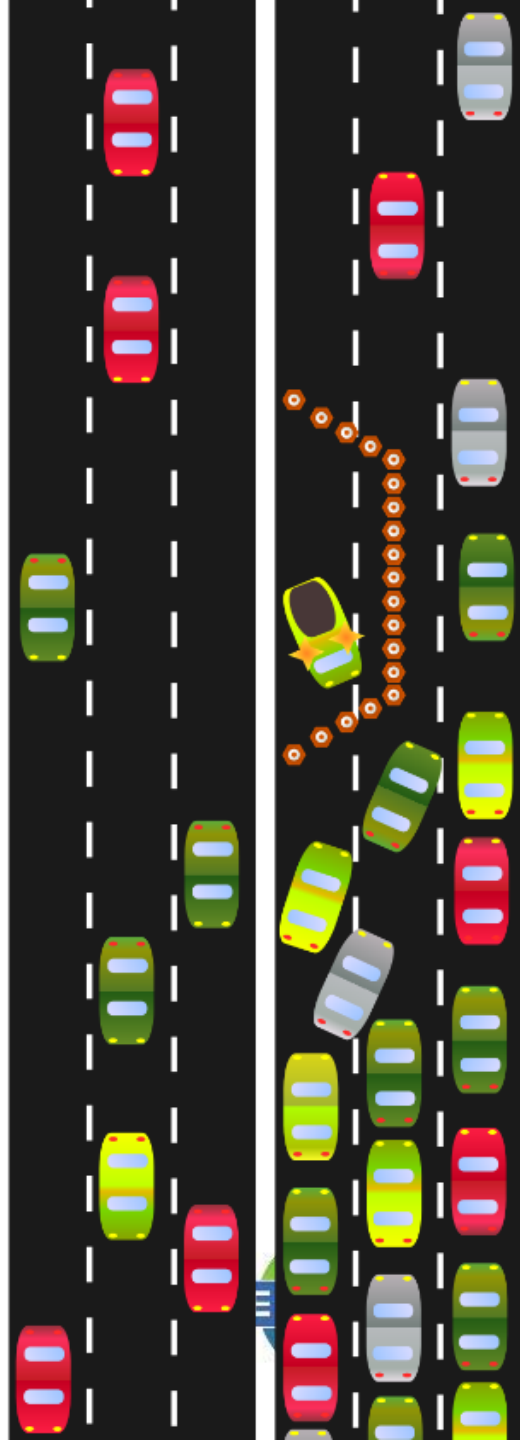
Connected ⟷ Not Connected

Automated ⟷ Non-Automated

New vehicles ⟷ Current vehicles

New roads ⟷ Current roads

- Single-vehicle crashes
- System failures
- Human errors
- Desire, acceptance & trust



What do we want to achieve?

- Reduced **human suffering** by saving thousands of lives and serious injuries
- Reduced burden on the **health care system** and total socio-economic costs by many billion euros
- Facilitation of **efficient investments** in road safety by public and private stakeholders
- Increased **trust and acceptance** and leveraging the potential of connected and automated driving in improving safety

The New Road Safety Roadmap

Complementarity with other ERTRAC roadmaps

Research Needs – the Way Forward

	Research Need
1	Building a framework to improve traffic safety culture in the EU
2	Safety of unprotected road users
3	Assessment of road user capabilities in future scenarios of road transport
4	Safe human-technology interaction in the digital traffic system
5	Safe inclusion of new means of transport into the traffic system
6	Safety of highly and fully automated vehicles
7	New ways of understanding and reducing long-term injuries
8	Care and rescue measures to minimize long-term effects
9	Infrastructure safety
10	Predictive safety assessment and validation framework
11	Radical improvement of road safety outside Europe and OECD countries

Research Needs – the Way Forward

2. Safety of unprotected road users

- Factors and causes of accidents and crashes with unprotected road users
- Effective training, education and enforcement
- Protective wear that is effective and capable to trigger higher usage rate
- Safety measures on unprotected road user's vehicles, measures for personal light electric vehicles (incl. mobility scooters)
- Improved detection of unprotected road users by V2V and V2I systems

(Source: Shutterstock/Bikeworldtravel)

Research Needs – the Way Forward

4. Safe human-technology interaction in the digital traffic system

- Reliable, seamless and adaptive interfaces between human and technology – not relying on trained knowledge
- Test methodologies for adaptive systems
- Unobtrusive human vitals and behaviour monitoring for fitness to drive
- Design of external/exterior interfaces for ease of interpretation by other road users regarding intentions and actions of automated systems

Research Needs – the Way Forward

10. Predictive safety assessment and validation framework

- New methods to efficiently predict the effects of road safety improvements on traffic and crash scenarios up to the level of socio-economic benefits
- Appropriate test scenarios using less critical but more frequent events than collisions
- Assessment framework allowing for the virtual prototyping, sign-off and continuous safety validation of systems, incl. systems based on self-learning technology and AI

(Source: www.ptvgroup.com)

Global targets – UN Conference 2020

The Academic Expert Group has proposed the following recommendations:

Sustainable Practices and Reporting: including road safety interventions across sectors as part of SDG contributions.

Procurement: utilizing the buying power of public and private organizations across their value chains.

Modal Shift: moving from personal motor vehicles toward safer and more active forms of mobility.

Child and Youth Health: encouraging active mobility by building safer roads and walkways.

Infrastructure: realizing the value of Safe System design as quickly as possible.

Safe Vehicles Across the Globe: adopting a minimum set of safety standards for motor vehicles.

Zero Speeding: protecting road users from crash forces beyond the limits of human injury tolerance.

30 km/h: mandating a 30 km/h speed limit in urban areas to prevent serious injuries and deaths to vulnerable road users when human errors occur.

Technology: bringing the benefits of safer vehicles and infrastructure to low- and middle-income countries.

The identified ERTRAC research needs fit well with the list above, although some of them are more related to legislation than research

Conclusions

- In its 2019 Road Safety Research Roadmap, ERTRAC proposes a set of eleven high priority road safety research needs for Horizon Europe.
- Four out of these are recommended for inclusion in the WP 2021 – 2022:
  - Safety of unprotected road users
  - Safe human-technology interaction in the digital traffic system
  - Safe inclusion of new means of transport into the traffic system
  - Predictive safety assessment and validation framework

  In addition, a CSA on “Radical improvement of road safety outside Europe and OECD countries” could be included.
- All these research needs contain aspects related to CCAM, but CCAM will not avoid or mitigate all crashes. Therefore, the above-mentioned research needs go well beyond the scope of CCAM.

Thanks for your attention!


Foto: Todd Diemer, Unsplash

Road Safety on the European Horizon

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Connected & automated driving – an enabler for safer road travel

Mats Rosenquist
Volvo Group, CTO Office, Public Projects
ERTRAC WG Connected Automated Transport

EU FP7/H2020 Research & Innovation project contribution examples;
CONNECTED AUTOMATED DRIVING & ADAS

Connected Cooperative Automated Driving
Collaboration, Network, Demonstration, Pilots
Field Operational Tests (FOT), Test verification and validation,
Platooning, V2x, Cooperative Driving, …

EUROFOT | VRA | CARTRE | ARCADE
SAFESPOT | CVIS | DRIVE-C2X | HeadStart
SARTRE | ENSEMBLE

Advanced Driver Assistance Systems
Advanced systems for Lane Change Support, Lane Keeping Support and Adaptive Cruise Control. Drowsiness detection. Driver Interaction. Emergency Brake, Distance Alert, …

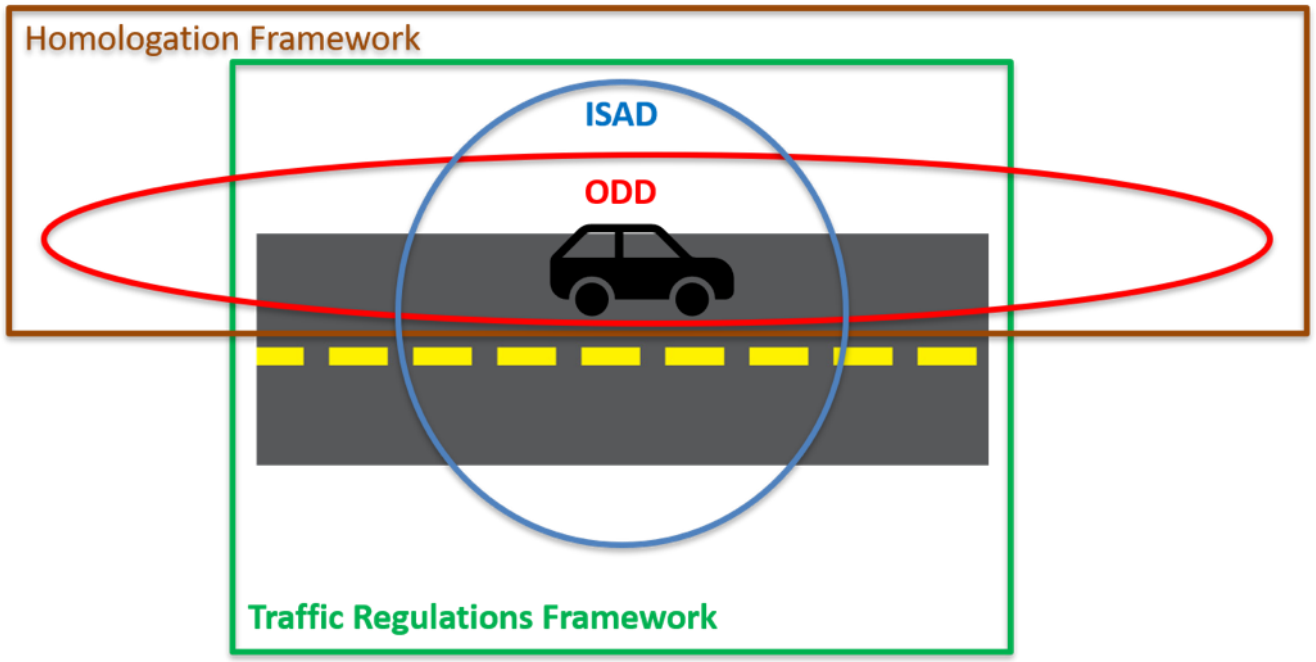
AIDE | PReVent | ADAPTIVE
HAVEit | XCYCLE

Results brought into products e.g. Volvo Trucks

CAD Roadmap version 8.0 - now available!

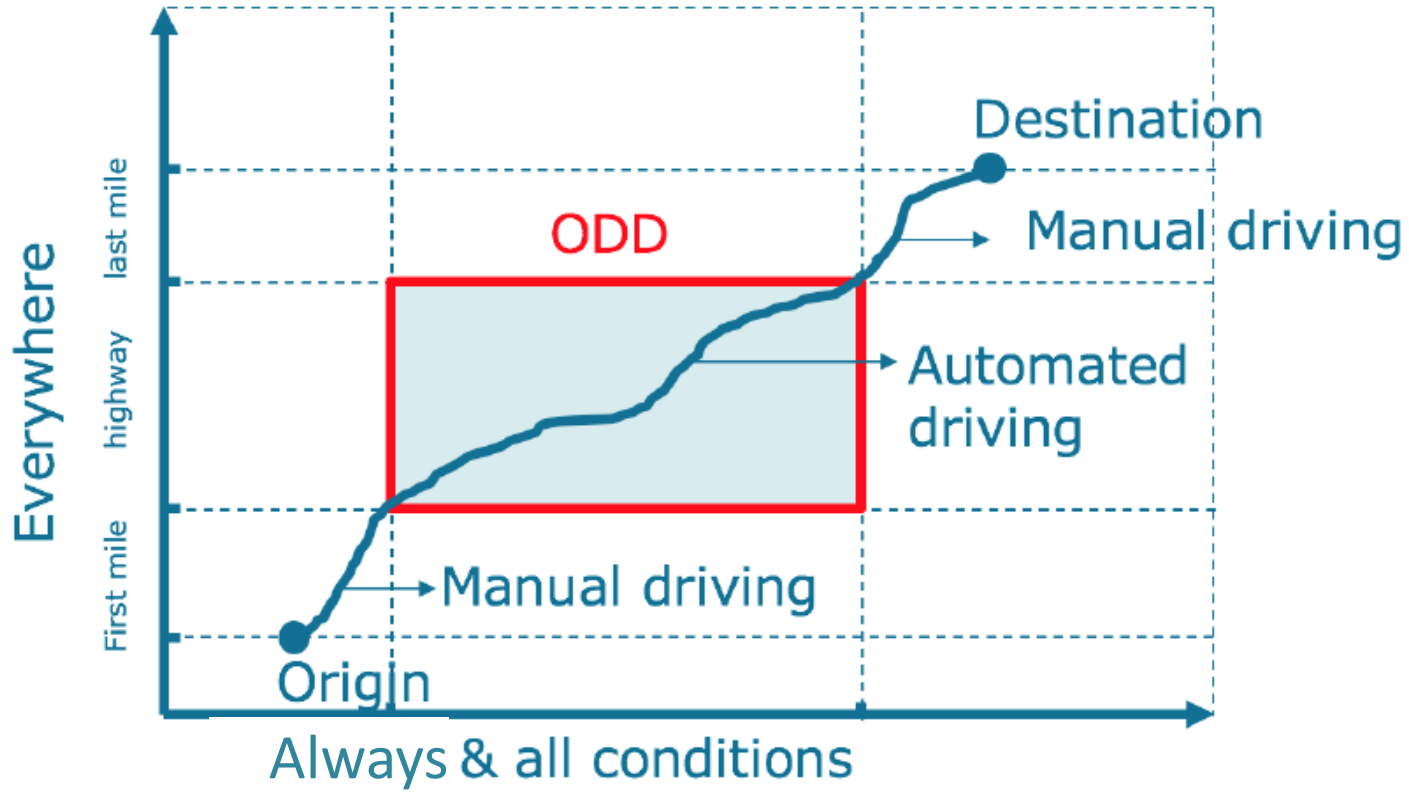
- Increased scope to better cover **Connected** Automated Driving, including cooperative and connected vehicles.
- Strengthen the link to the **Infrastructure**, through CEDR.
- Deeper dive into three use cases including requirements on 'connected & infrastructure':
  - **Automated Passenger Cars Path**
  - **Automated Freight Vehicles Path**
  - **Urban Mobility Vehicles**
- Connect to the CARTRE (CSA) results and the ARCADE (CSA) project and provide **a EU wide overview** (and beyond).
- Incorporate the STRIA CAD actions (2018) via **Key Challenges and Objectives**.

ODD / ISAD / Traffic regulations and Homologation Framework



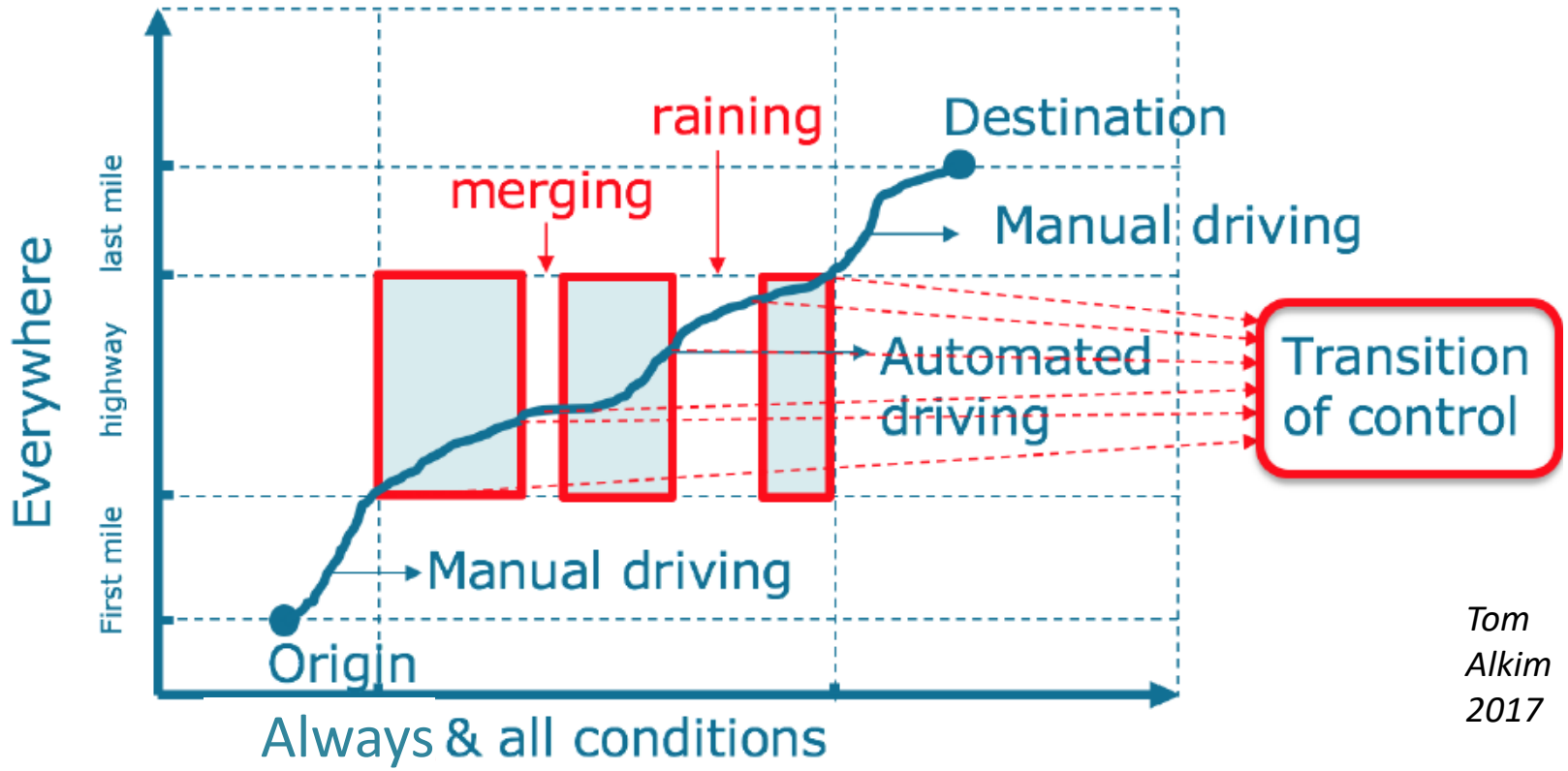
- Explanation, common definition of Operational Design Domains (ODD)
- Vehicle and Infrastructure Interaction (e.g. ISAD)
- Regulatory and standardisation framework for Automation
- Connectivity as a requirement for vehicle-infrastructure interaction

ODD – Operational Design Domain Example #1



Tom Alkim 2017

ODD – Operational Design Domain Example #2



Tom Alkim 2017

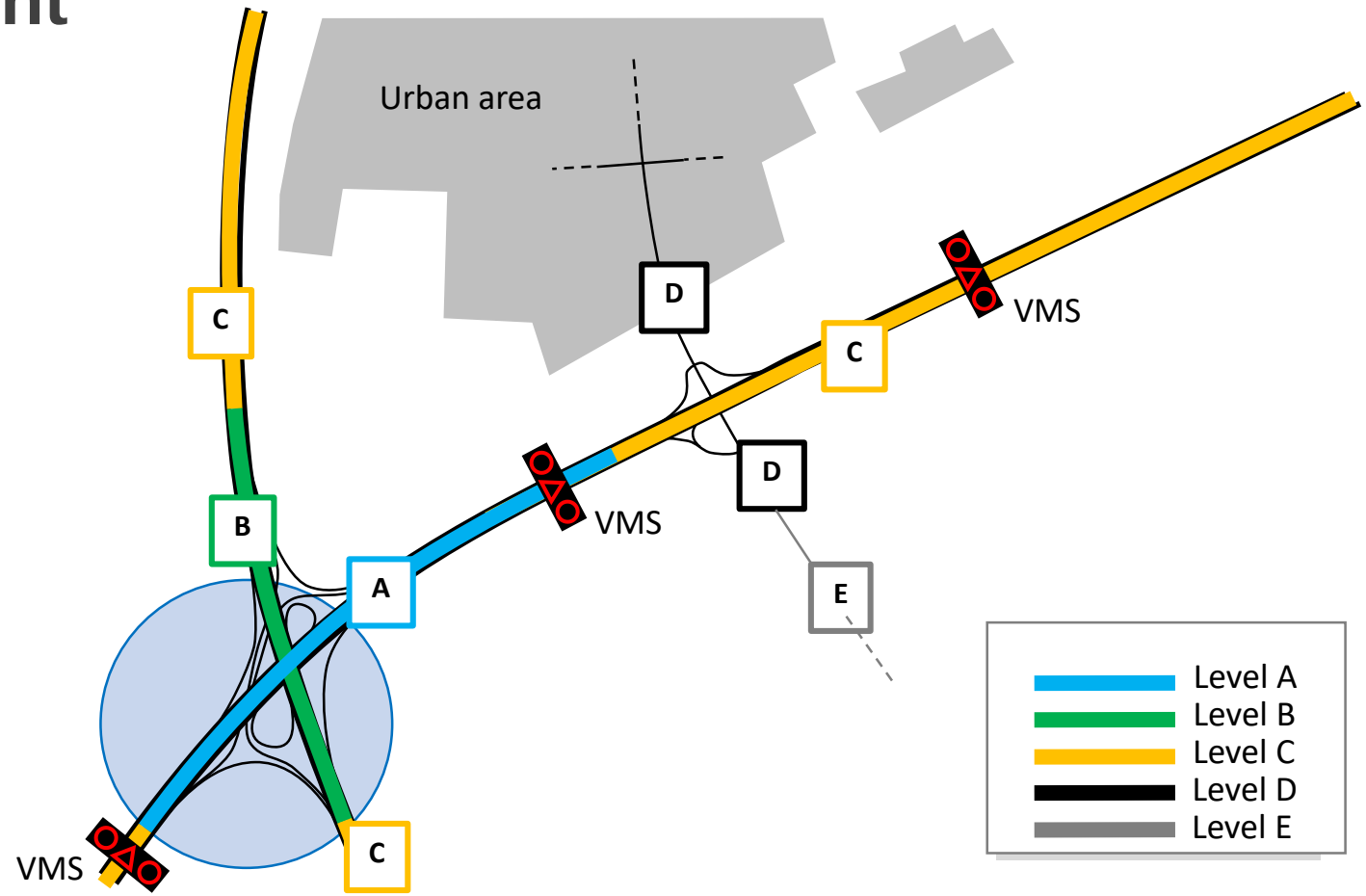
Infrastructure Support levels for Automated Driving (ISAD)

Elaborated in cooperation with INFRAMIX, see also ITS World Congress 2018 paper by AAE & ASFINAG

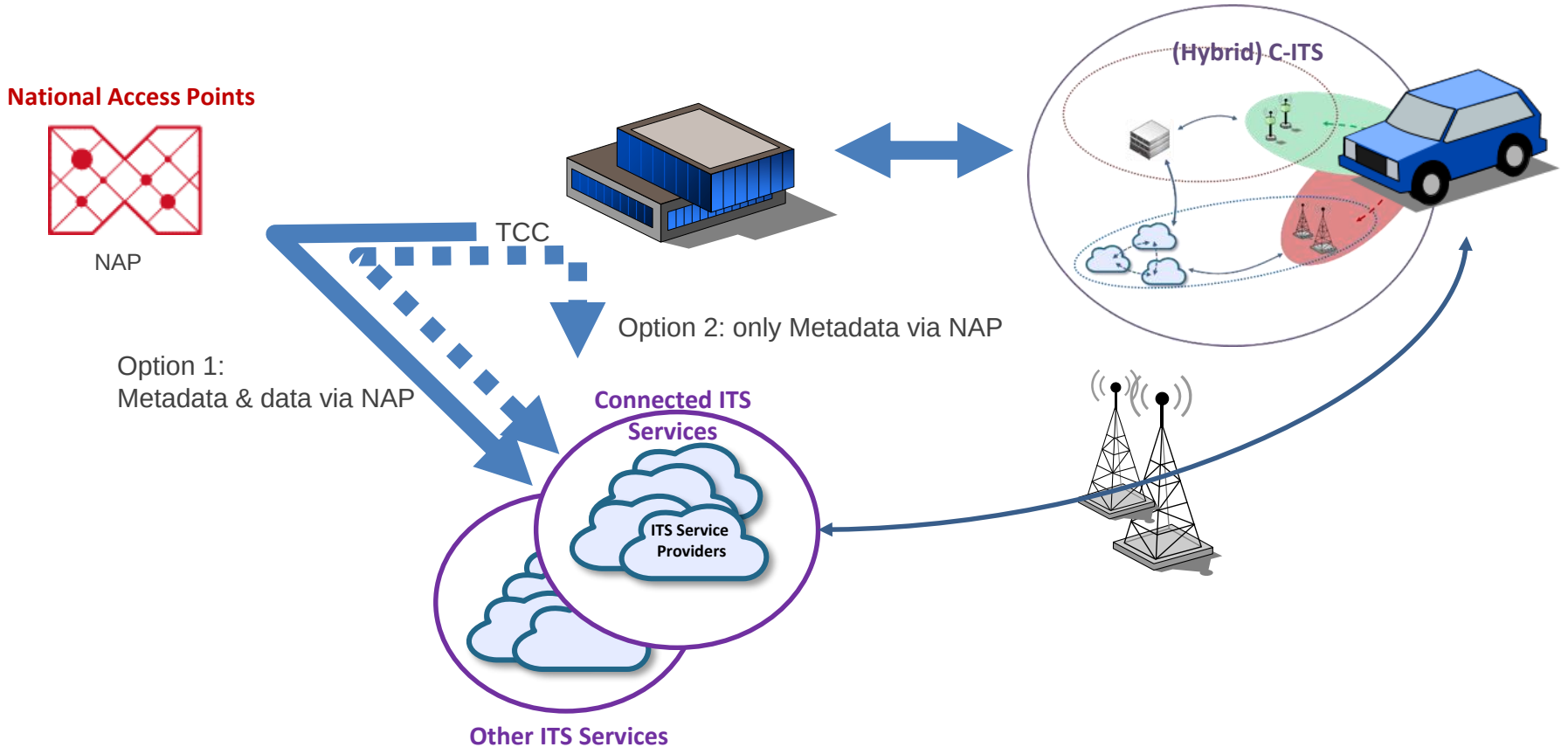
	Level	Name	Description	Digital information provided to AVs			
				Digital map with static road signs	VMS, warnings, incidents, weather	Microscopic traffic situation	Guidance: speed, gap, lane advice
Digital infrastructure	A	Cooperative driving	Based on the real-time information on vehicle movements, the infrastructure is able to guide AVs (groups of vehicles or single vehicles) in order to optimize the overall traffic flow.	X	X	X	X
	B	Cooperative perception	Infrastructure is capable of perceiving microscopic traffic situations and providing this data to AVs in real-time	X	X	X	
	C	Dynamic digital information	All dynamic and static infrastructure information is available in digital form and can be provided to AVs.	X	X		
Conventional infrastructure	D	Static digital information / Map support	Digital map data is available with static road signs. Map data could be complemented by physical reference points (landmarks signs). Traffic lights, short term road works and VMS need to be recognized by AVs.	X			
	E	Conventional infrastructure / no AV support	Conventional infrastructure without digital information. AVs need to recognise road geometry and road signs.				

Infrastructure Support levels for Automated Driving (ISAD) - on schematic road segment

- Based on the ISAD Level of information and services different on-board vehicle decisions can be supported
- CAVs will have to be able to drive on E-level, but the additional possibilities provided by A-level sections enable a much higher customer satisfaction as well as support road safety and capacity management related goals



Connectivity as a requirement for vehicle-infrastructure interaction



Automated Passenger Car Development Paths

Automation Level	Established	2018	2020	2022	2024	2026	2028	2030	...
Level 5: Full Automation									**Fully Automated Passenger Cars**
Level 4: High Automation				**Urban and Sub-Urban Pilot**					
				Highway Autopilot including Highway Convoy					
Level 3: Conditional Automation					**Highway Chauffeur**				
					Traffic Jam Chauffeur				
Level 2: Partial Automation	**Traffic Jam Assist** **Parking Assist**								
Level 1: Driver Assistance	**Adaptive Cruise Control** **Stop &Go** **Lane Keeping Assist** **Lane Change Assist** **Parking assist**								
Level 0: No Driving Automation, support beyond human capability to act	**Lane Departure Warning** **Blind-spot Warning** **Forward Collission Warning** **ABS, ESC** **Emergency Brake**								

Indicative development paths TRL 7-9

Passenger Cars: M1 category

Highway Autopilot (Level 4)

Highway Convoy (Level 4)

Urban and Suburban Pilot (Level 4)

Automated Freight Vehicle Development Paths

Automation Level	Established	2018	2020	2022	2024	2026	2028	2030	...
Level 5: Full Automation									**Fully Automated Freight Vehicles**
Level 4: High Automation			**Highly Automated Vehicles in Confined Areas**		**Highly Automated Vehicles on Dedicated Roads**		**Highly Automated Vehicles on Open Roads**		
					Highway Pilot Platooning				
Level 3: Conditional Automation				**Highway Chauffeur**					
			Traffic Jam Chauffeur						
Level 2: Partial Automation					**Automated Truck Platooning**				
		Traffic Jam Assist							
Level 1: Driver Assistance	**Adaptive Cruise Control** **Stop &Go** **Lane Keeping Assist** **Lane Change Assist**		**C-ACC Truck Platoning**						
Level 0: No Driving Automation, support beyond human capability to act	**Lane Departure Warning** **Blind-spot Warning** **Forward Collission Warning** **ABS, ESC** **Emergency Brake**								

Indicative development paths TRL 7-9

Highway chauffeur, open roads


Unmanned vehicles, confined and hub-to-hub

Truck: Freight vehicle > 3.5 tonnes categorie N2 or N3

Automated Urban Mobility Vehicle Development Paths

Automation Level	Established	2018	2020	2022	2024	2026	2028	2030	...
Level 5: Full Automation									**Fully automated Urban Mobility Vehicles**
Level 4: High Automation			**Automated PRT/Shuttles on Dedicated Roads**				**Automated PRT/Shuttles in Mixed Traffic**		
			Automated Buses on Dedicated Roads				**Automated Buses in Mixed Traffic**		
Level 3: Conditional Automation				**Automated Urban Bus Chaffeur**					
Level 2: Partial Automation					**Urban Bus Assist**				
					Traffic Jam Assist Parking Assist				
Level 1: Driver Assistance	**Adaptive Cruise Control Stop &Go Lane Keeping Assist Lane Change Assist Parking assist**								
Level 0: No Driving Automation, support beyond human capability to act	**Lane Departure Warning Blind-spot Warning Forward Collission Warning ABS, ESC Emergency Brake**								

Indicative development paths TRL 7-9

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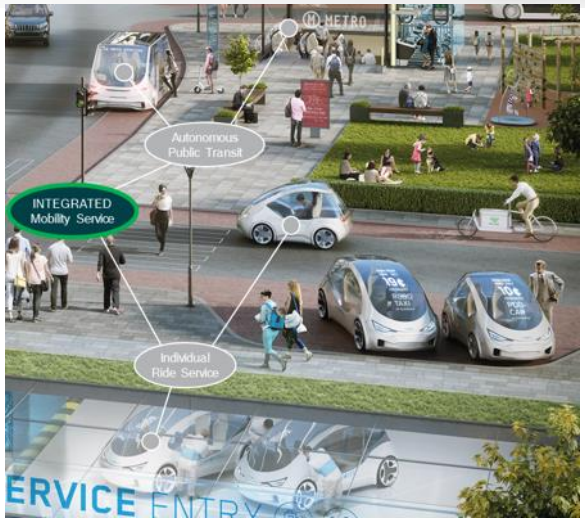


PRT (Personal Rapid Transit) incl. Urban Shuttle
City Bus/Coach: M2 < 5 tonnes < M3

Urban Mobility and Automation

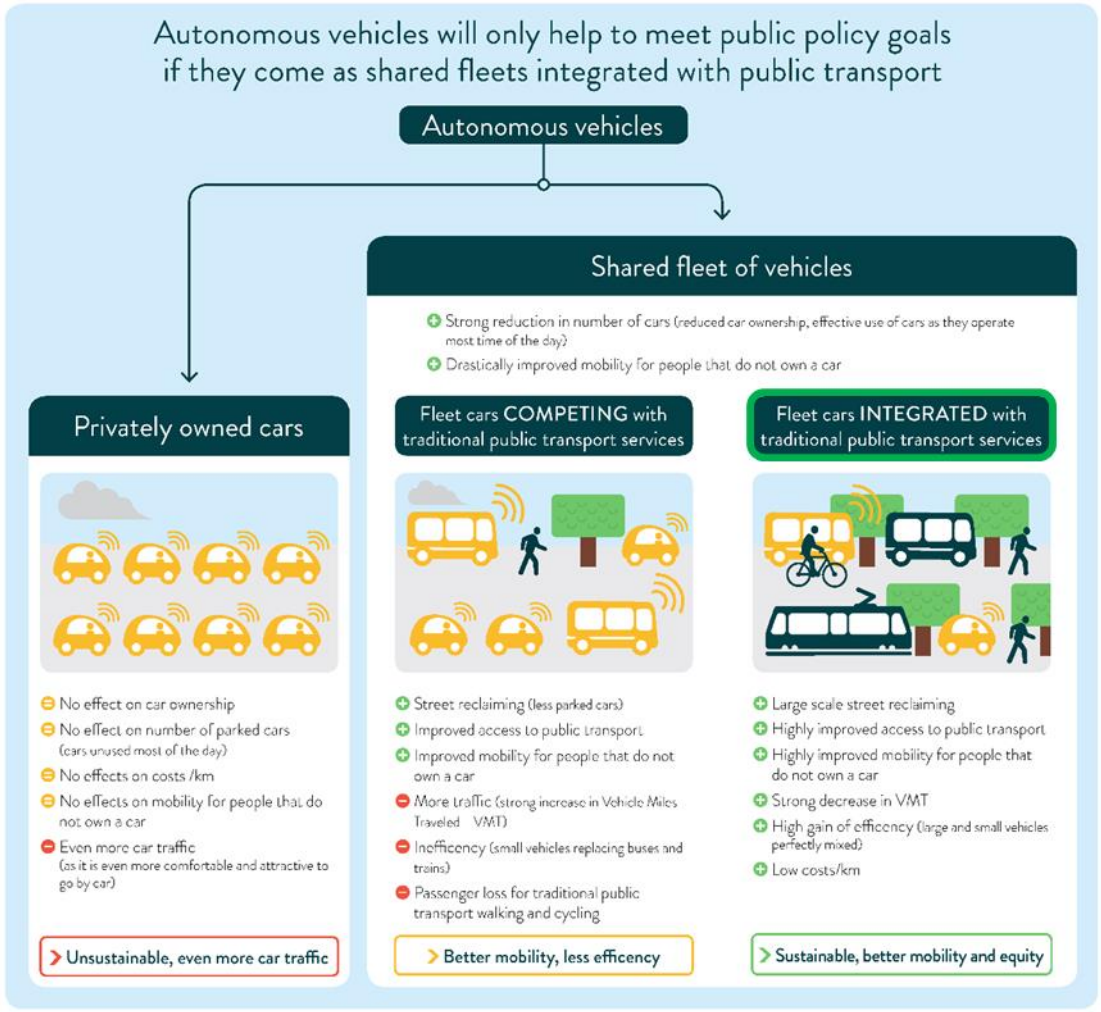
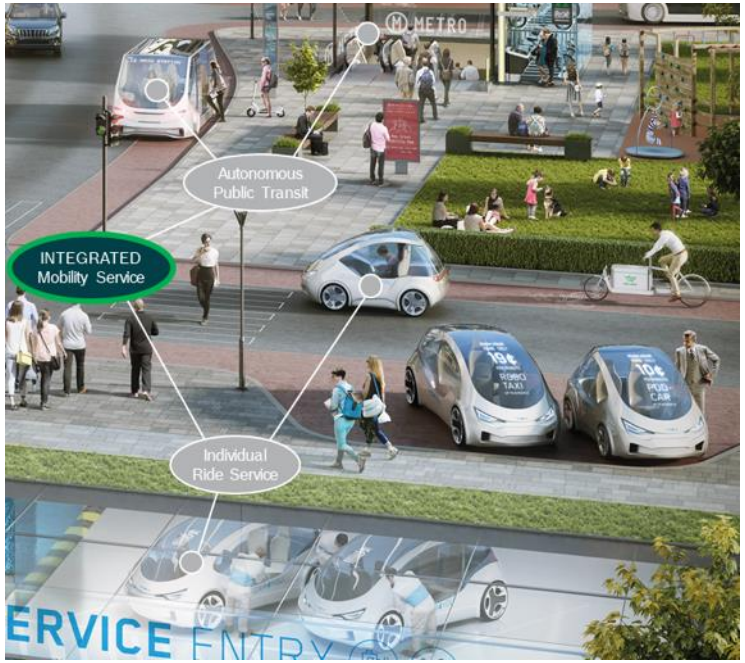
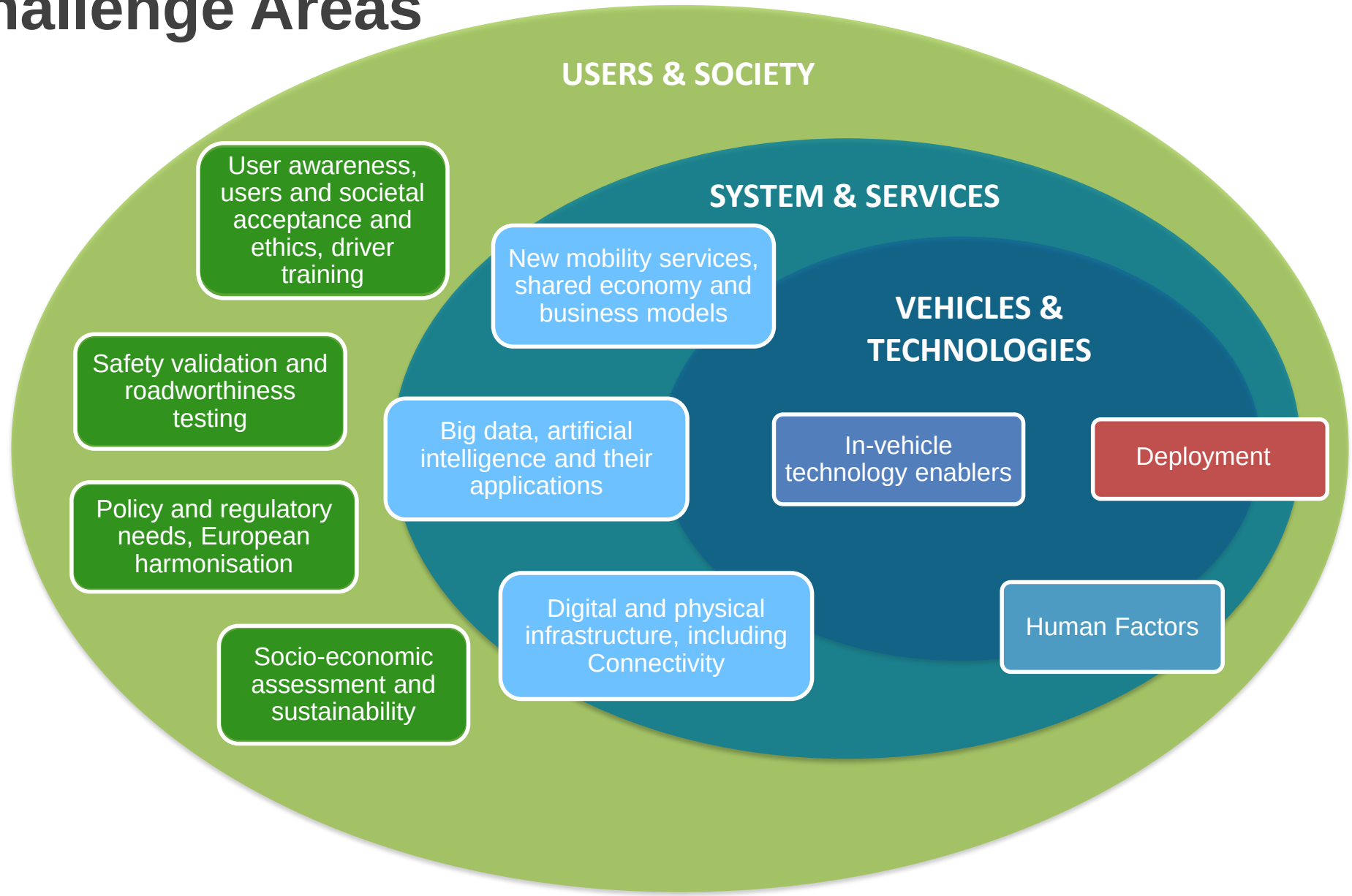


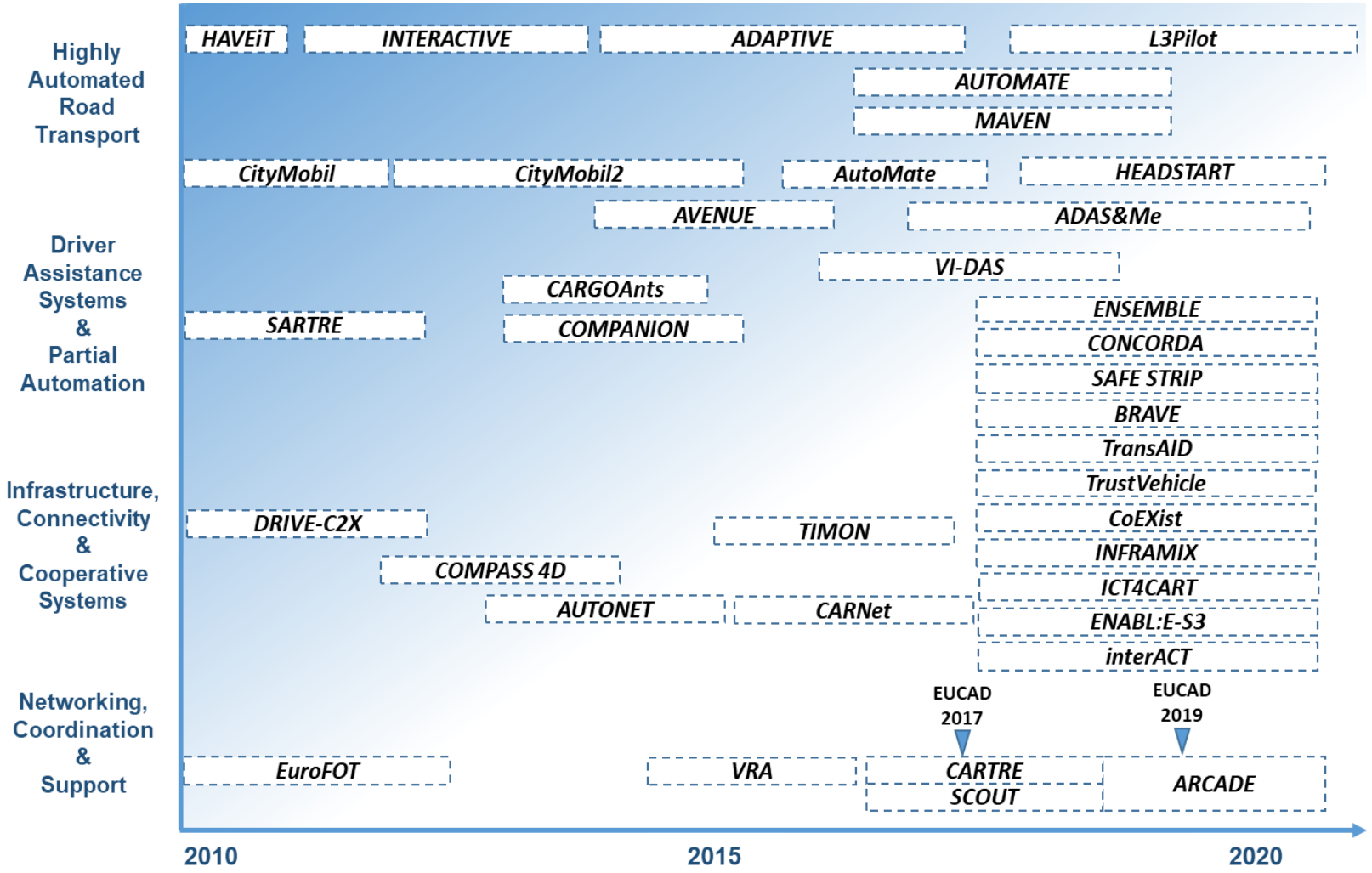
Image source: UITP, *Autonomous Vehicles: A potential game changer for urban mobility*. Brussels: International Association of Public Transport.



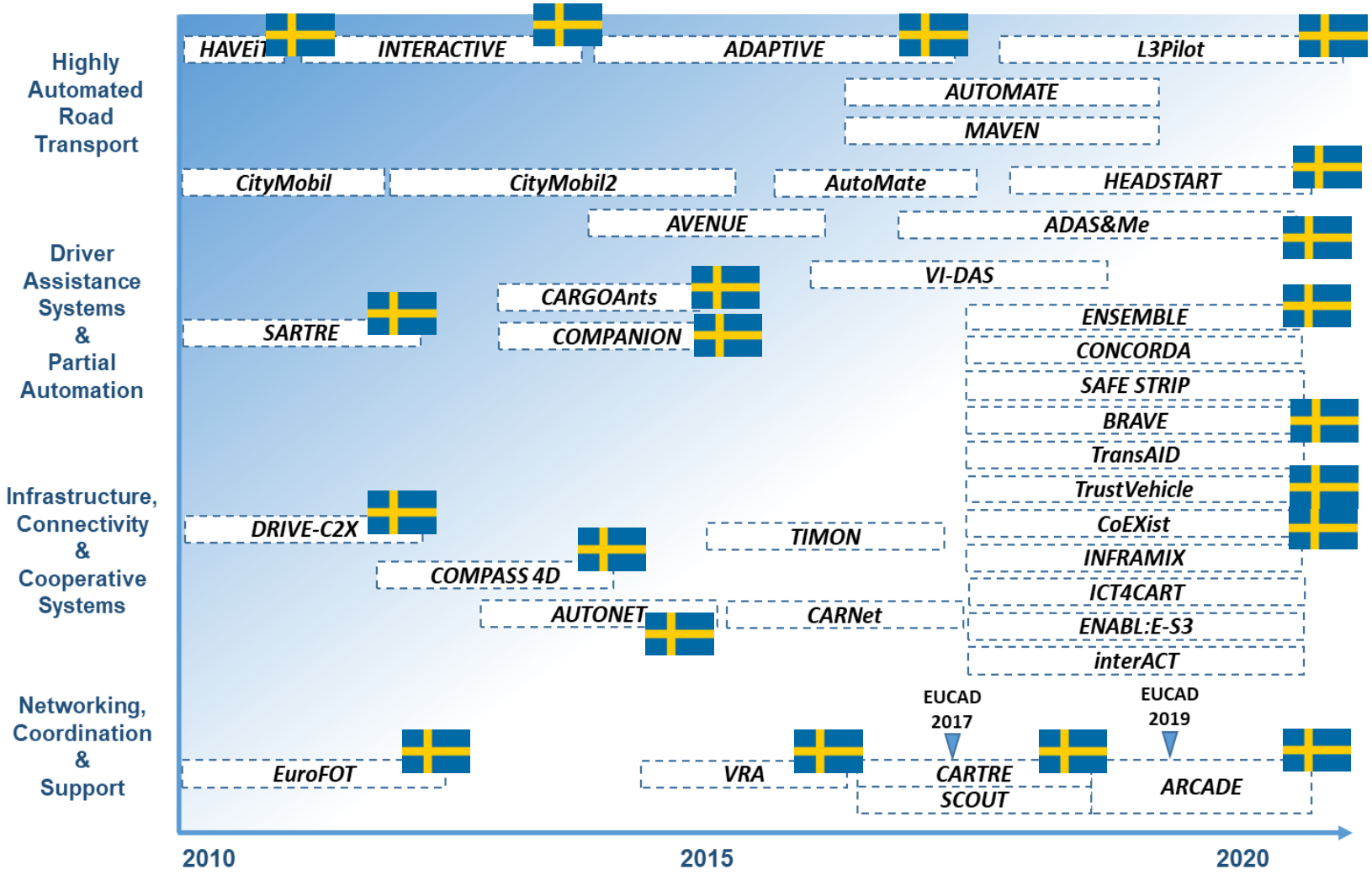
Key Challenge Areas



Overview of EU funded R&I projects that support the development of automated driving



Overview of EU funded R&I projects that support the development of automated driving



EU projekt med svensk medverkan;
https://connectedautomateddriving.eu/cad-knowledge-base/

Automated Road Transport Calls 2020

Grant

Efficient and safe connected and automated heavy-duty vehicles in real logistics operations DT-ART-05-2020

Digitisation and transformation

Types of action: Innovation action | **Programme:** Horizon 2020

Forthcoming

Opening date: *03 December 2019*

Deadline model: *single-stage*
Deadline date: *21 April 2020 17:00:00 Brussels time*

Grant

Large-scale, cross-border demonstration of connected and highly automated driving functions for passenger cars DT-ART-06-2020

Digitisation and transformation

Types of action: Innovation action | **Programme:** Horizon 2020

Forthcoming

Opening date: *03 December 2019*

Deadline model: *single-stage*
Deadline date: *21 April 2020 17:00:00 Brussels time*

Collaboration and Exchange of Key Importance!

Single platform for open road testing and pre-deployment of Cooperative, Connected, Automated and autonomous Mobility (CCAM)

STRIA

R&I initiatives and Action Sheets:

- In-vehicle enabler
- Vehicle validation
- Large scale demonstration pilots to enable deployment
- Shared and automated mobility services
- Human factors
- Physical and digital infrastructure
- Big data, Artificial Intelligence and their applications

ERTRAC

ARCADE Project (CSA)

- **Joint-stakeholder Workshops**
- **Roadmap** Consolidation
- **EUCAD** Conferences and Seminar
- **Tri-lateral** (Japan, USA, EU) and beyond
- **Thematic Areas** Clusters;
  - Society & Users
  - Systems & Services
  - Vehicle & Technology

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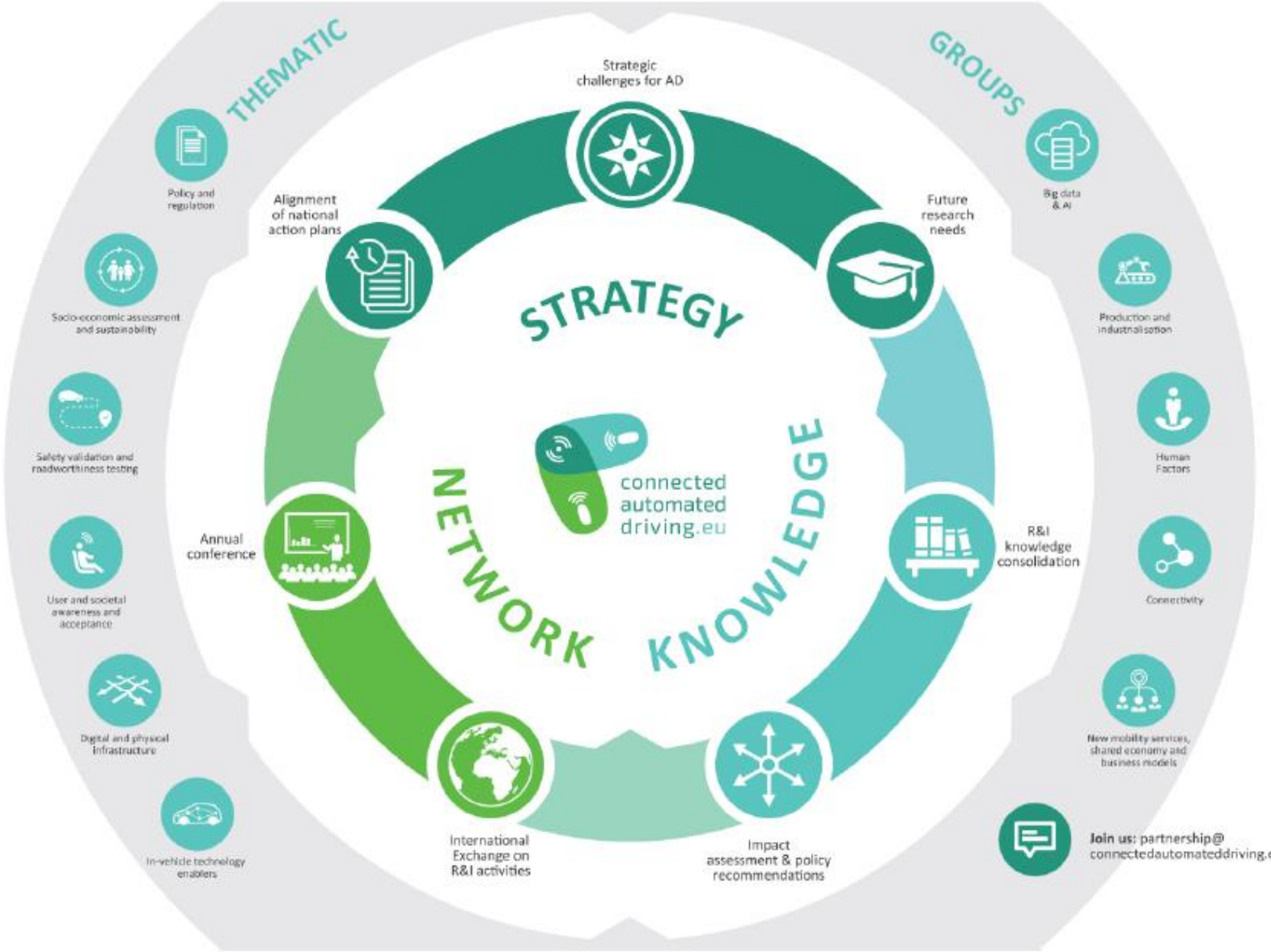
ERTRAC

Coordination of Automated Road Transport For Europe

CARTRE
Coordination of Automated Road Transport Deployment for Europe

Objective: Support faster deployment of connected and automated driving across Europe



European Commission funded

Coordination & Support Actions

VRA

- July 2013 – Dec 2016

CARTRE

- Oct 2016 – Sep 2018
- 36 consortium partners
- 51 associated partners

ARCADE

- Oct 2018 – Sep 2021
- 23 partners from 11 States
- 30 associated partners
- 2000 subscribers

Thematic Areas

Technology

- In-Vehicle Enablers
- Connectivity
- Human Factors
- Deployment

System & Services

- Physical & Digital Infrastructure
- Big Data, AI and applications
- New Mobility Services, shared economy
- Freight & Logistics

Society & Users

- Safety Validation Roadworthiness testing
- Policy and regulatory needs
- User awareness, societal acceptance and ethics
- Socio-economic assessment

- Visions
- Challenge
- SoA
- Gaps
- Positions

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Consolidated Key Priorities per Use-Case vs Thematic area

		D3.7 Society Challenges & Scenarios				D3.4 Systems and Services Challenges & Scenarios			D3.1 Technical Challenges & Scenarios			
		User awareness, users and societal acceptance and ethics, driver training	Safety validation and roadworthiness testing	Policy and regulatory needs, European harmonisation	Socio-economic assessment and sustainability	New mobility services, shared economy and business models	Big data, artificial intelligence and their applications	Digital and physical infrastructure	Human Factors	Connectivity	Deployment	In -vehicle technology enablers
Development Paths / Use Cases	Generic	Societal Needs Analysis from user and society perspectives	Alignment of vehicle regulation (and type approval) and corresponding assessment tools & procedures	Working for flexible AD regulation, enabling different solutions, within the boundaries of safety.	Impact assessment needs both pilots (low TRL) and FOTs (high TRL)	Foster the development of new ecosystems, new types of partnerships, new business models in the fields of services	Develop 'standard' model for sharing data that ensure data privacy and security	Define common EU standards for the interaction of PDI and AVs (e.g. ISAD, ODD)	Integrated Safety (passive, active, seating positions, crash impact, etc)	Definition of connectivity requirements for AD functions (performance, QoS, resilience, etc.)	Living labs to support tests and demonstration by including end users earlier	Harmonize definition of ODDs and functionalities needed for given ODDs
		Positive Risk analysis	Determine proper combinations of virtual testing, closed test track and open road testing of AVs	Learn from adaptation of regulation, work towards common approach	Development of EU-level databases to allow more reliable scaling up (data on accidents, mileage, etc. including ODD aspects, with sufficient details and granularity)	Pilots and FOTs to validate business case, operational models and specifications	Harmonisation, alignment needed for development and validation of AI functionalities for AV	Define Classifications of PDI	Interaction with external road users (mixed traffic)	Specification of Day 2 and Day 3 C-ITS services	L4 Pilots including cross-border applications	Define, develop, and validate robust and scalable perception systems and sensor sets
		Ethics evaluation based on technology understanding	Share and harmonise driving/traffic scenarios and best practices	Build common CAD framework	Development of commonly available (validated) AV simulation and other evaluation tools	Define the involvement of public authorities in the early stage of deployment to create trust among stakeholders	Standards and solutions (HW/SW) for data management and data quality (e.g. L3Pilot)	AV-ready road planning and self-explaining roads. (e.g traffic signs and lane marking for Avs)	New role of remote operators (sustain attention, control environments, etc)	Standardisation and further deployment of V2X technologies	L3 FOT including cross-border applications	Develop technologies supporting vehicle's own understanding of ODDs and cooperation between AD vehicles. (incl. maps, localization,..)
		Impact on driver/users and operator training	Consensus building with respect to validation of methodologies, including Data-labeling standards	Make cross-border testing easy	Commitment to use common impact assessment methodologies (like FESTA, Trilateral framework)	Integration of new services with existing services (e.g. public transport) from start	Develop new AI-concepts for cyber-physical road traffic systems	Investigate the use of common definitions (e.g. ISAD). Create Living lab with PDI	Behavioral change. Social inclusion	(Cyber)secure and safe communications respecting privacy and various levels of trust	Promote deployment through simulations of scenarios, road transport & traffic management	Maintain system integrity and well-functioning once in the field, monitor for updates
		Secure privacy for mobility users	Develop procedures to manage validation of vehicle updates monitoring during the whole lifecycle of the vehicle	Harmonisation of the interpretation of traffic rules, digitalization of traffic sign information	Research on the long-term indirect impacts of automation, equity etc.	Further develop urban delivery AD solutions	Harmonisation of AI investments development	Define the involvement of public authorities in the early stage of deployment to create trust among stakeholders	Learning, education	Interoperability of communication technologies / Hybrid connectivity solutions	Customer pilots with non-homologated vehicles	Reach efficient integration of overall system in fail-operational architectures (costs, energy, redundancy)
	Passenger Cars	(no specific)	Homologation framework and simulations, self-certification	(no specific)	Impacts on safety and travel behaviour	Peer-to-peer sharing	New robust AI-passenger-car solutions	(no specific)	(no specific)	(no specific)	(no specific)	(no specific)
	Freight Vehicles	New fleet operation schemes for AV	Homologation framework Hub-to-hub, semi-confined ODDs	Business case for platooning need to be clarified depending on regulation scenario	Impacts on transport network efficiency and environment	Logistics services Business need for AD (TCO)	New AI freight and logistics solutions	Hub-to-hub corridors Freight traffic management. Truck parking safe-zones for AD trucks	The role of professional truck drivers	Correctness and latency for multi-brand configuration	Commercial operational pilots	Superstructure, e.g. trailer)
	Urban Mobility Vehicles	City authority Perspectives	VRU scenarios for unmanned buses and shuttles	Support early introduction through exemptions	Impacts on transport mode choice and social inclusion	New infrastructure business models and financing tools	New AI urban mobility solutions	Traffic management complementing public transport	The role of professional bus drivers	Specific requirements for remote operation "control-tower"	Identify needs.	Low-speed, low-tech AVs

Single platform for open road testing and pre-deployment of cooperative, connected, automated and autonomous mobility (CCAM)

- The EC has launched a “Single platform for open road testing and pre-deployment of cooperative, connected, automated and autonomous mobility (CCAM)”.
- For details see: https://ec.europa.eu/digital-single-market/en/news/call-applications-selection-members-single-platform-open-road-testing-and-pre-deployment

Working Groups established

WG1 Develop an EU agenda for testing

WG2 Coordination and Cooperation of R&I

WG3 Physical and Digital road infrastructure

WG4 Road Safety

WG5 Access to and exchange of data & Cybersecurity

WG6 Connectivity and digital infrastructure

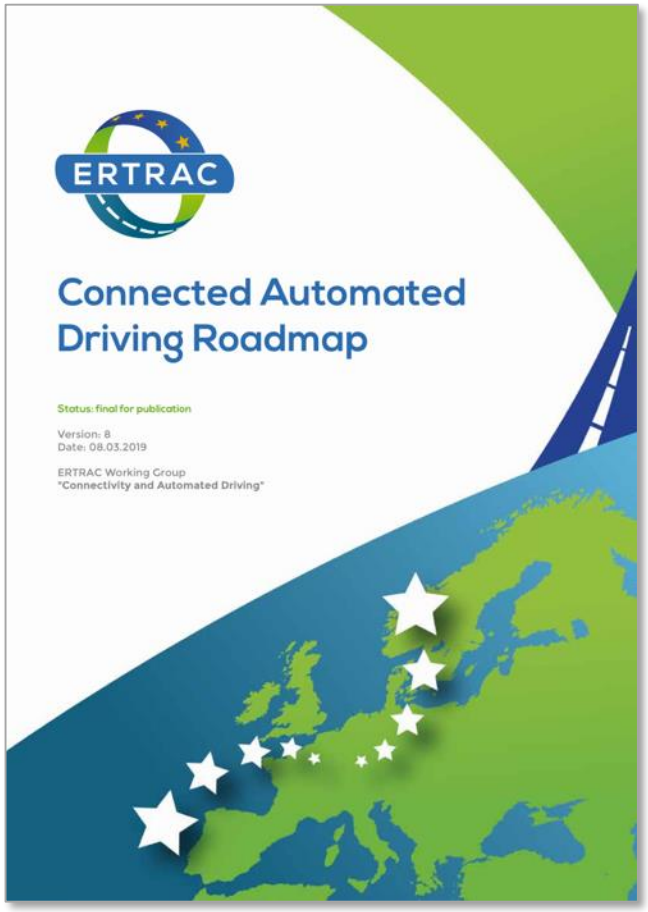
New Partnership to be established;
Safe Connected Cooperative Automated Mobility
(”MOSART” working name)

Horizon Europe 2021-2027

– Important to provide Swedish input to the future work program

- **4.2 Cross-sectoral solutions for decarbonisation**
  - 4.2.1 Establish a competitive and sustainable European battery value chain
  - 4.2.2 Strengthen the European value chain for low-carbon hydrogen and fuel cells
  - 4.2.3 Develop sustainable infrastructure, services and systems for smart and sustainable communities and cities
- **4.5 Develop low-carbon and competitive transport solutions across all modes**
  - 4.5.1 Achieve zero-emission road transport
  - 4.5.4 Enable low-carbon, clean and competitive waterborne transport
- **4.6 Develop seamless, smart, safe and accessible mobility systems**
  - 4.6.1 Make automated and connected road transport safe and competitive
  - 4.6.2 Develop efficient and innovative transport infrastructure
  - 4.6.3 Develop the future transport network and integrated traffic management
  - 4.6.4 Enable multimodal freight logistics and passenger mobility services
  - 4.6.5 Increase transport safety across all modes

Conclusions



- ERTRAC CAD Roadmap, an important common reference for European R&I and provides recommendations for the European Commission
- Two remaining calls related to Automated Road Transport 2020
- ARCADE CSA project maintains the Network, Knowlende Base, Thematic Areas towards further development of a Consolidated Roadmap
- CCAM Single Platform is important for common tests, R&I, Safety, data sharing, cyber-security, infrastructure etc.
- Horizon Europe will open 2021 – Important to provide Swedish input and align with FFI strategies.
- A new partnership for Safe Connected Cooperative Automated Mobility will be established (MOSART)


Foto: Todd Diemer, Unsplash

Road Safety on the European Horizon

European Horizons: 2020 and Europe

Mikael Sundh – Vinnova

The road to Road Safety -- ERTRAC roadmap

Magnus Granström – SAFER

On the horizon: connected & automated driving – an enabler for safer road travel
Mats Rosenquist – Volvo Group

At the horizon: the future mobility – EARPA Roadmap

Margriet van Schijndel - EARPA

Intresserad av presentationen?
Kontakta föreläsaren via konferensprogrammet i eventappen.
Klicka på pratbubblan för att skicka ett meddelande.

Transportforum | vti

earpa

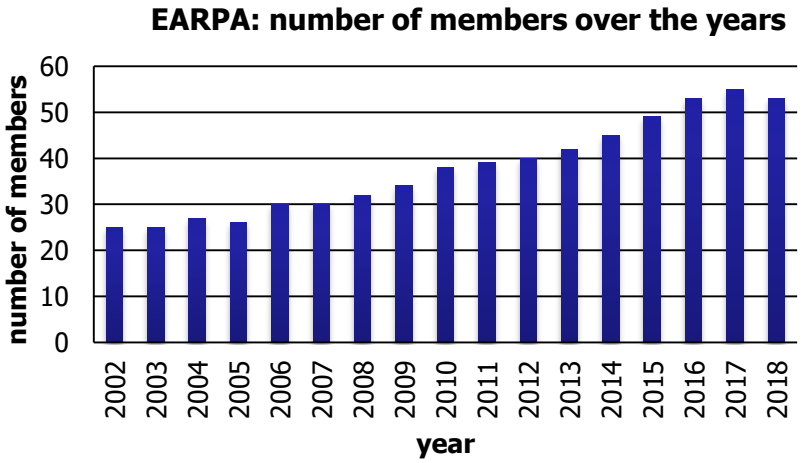
EUROPEAN AUTOMOTIVE
RESEARCH PARTNERS ASSOCIATION

Meeting	Transport Forum 2020
Speaker	Margriet van Schijndel-de Nooij
Date	8th January 2020

At the horizon: the future mobility

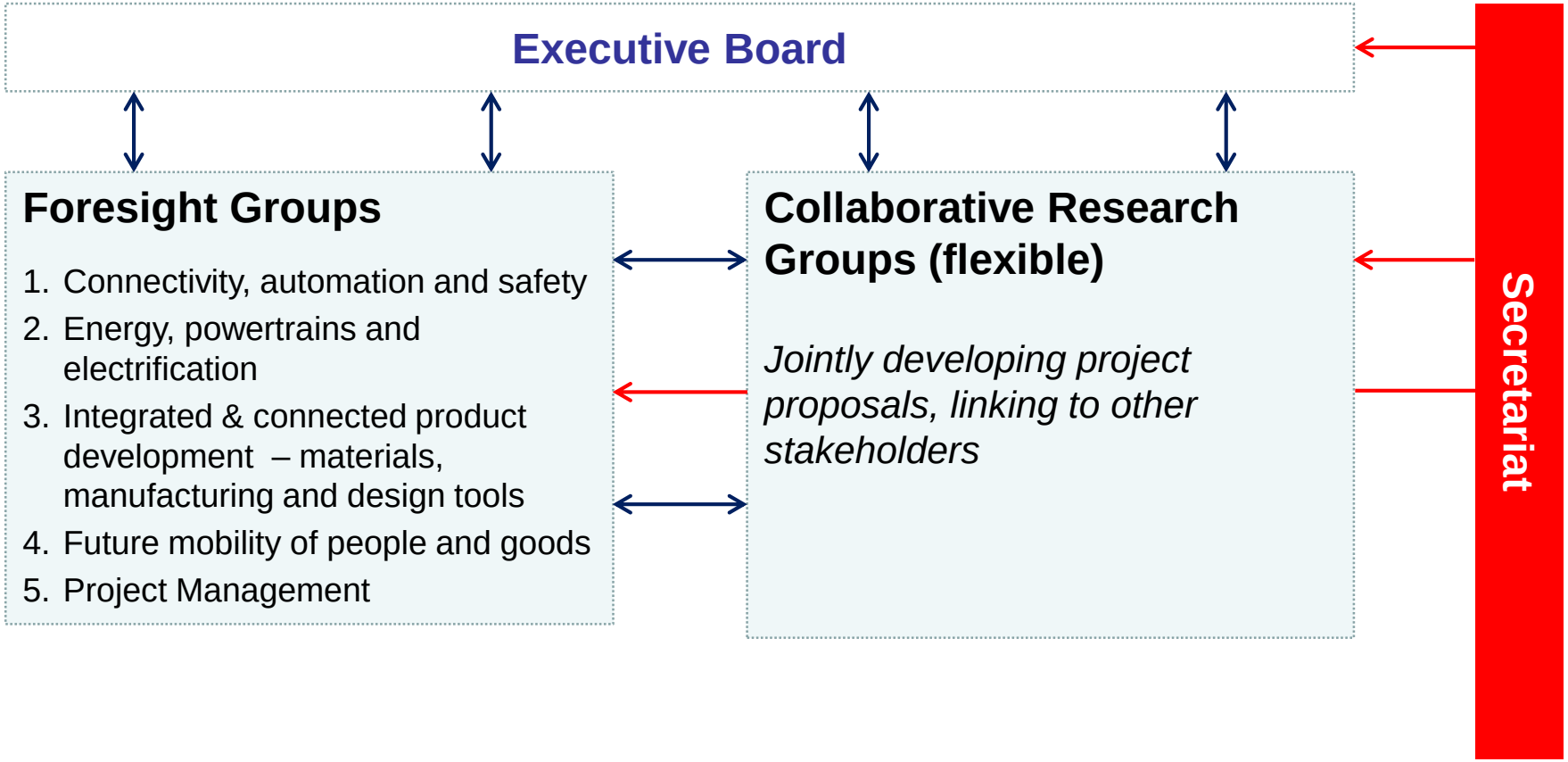
EARPA: who are we?

- EARPA = European Automotive Research Partners Association
- 49 members in 16 countries; around 400 active researchers
- About ½ are companies and RTOs, about ½ are universities



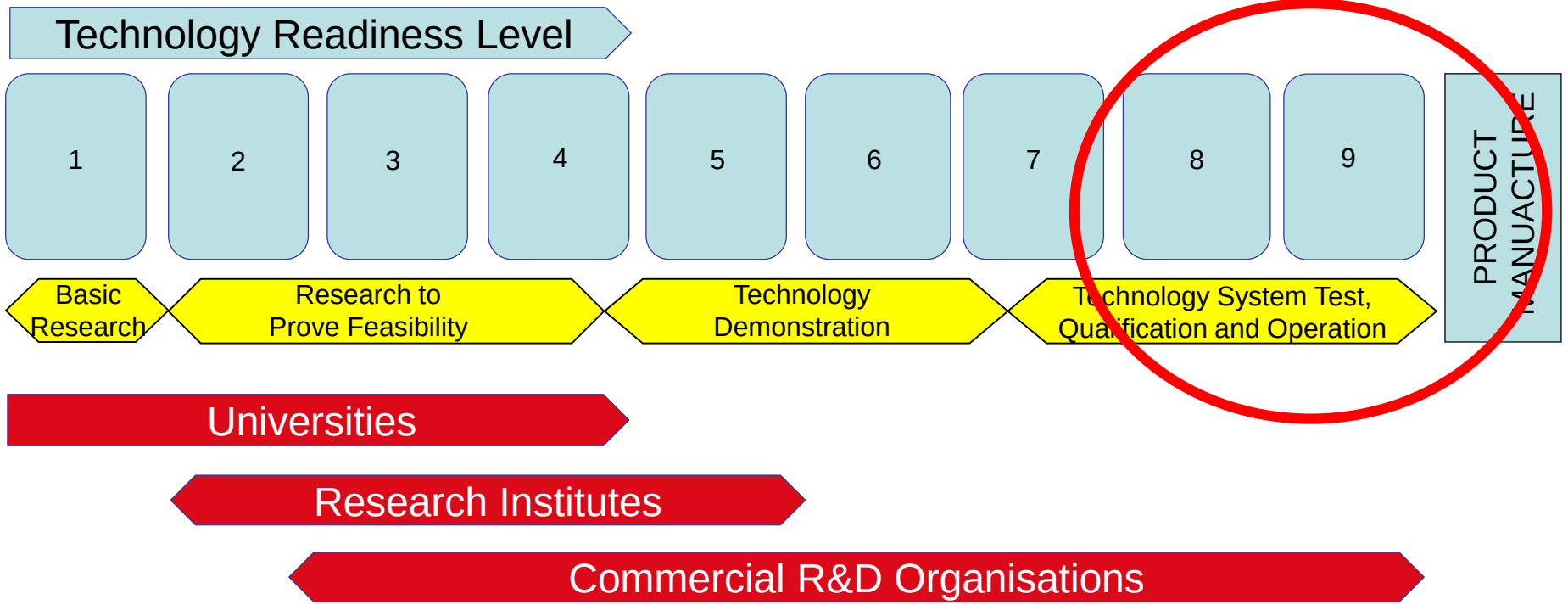
- Swedish members: Chalmers and RISE
- High level research, supporting the industry, cities, …
- Independent association

EARPA Structure

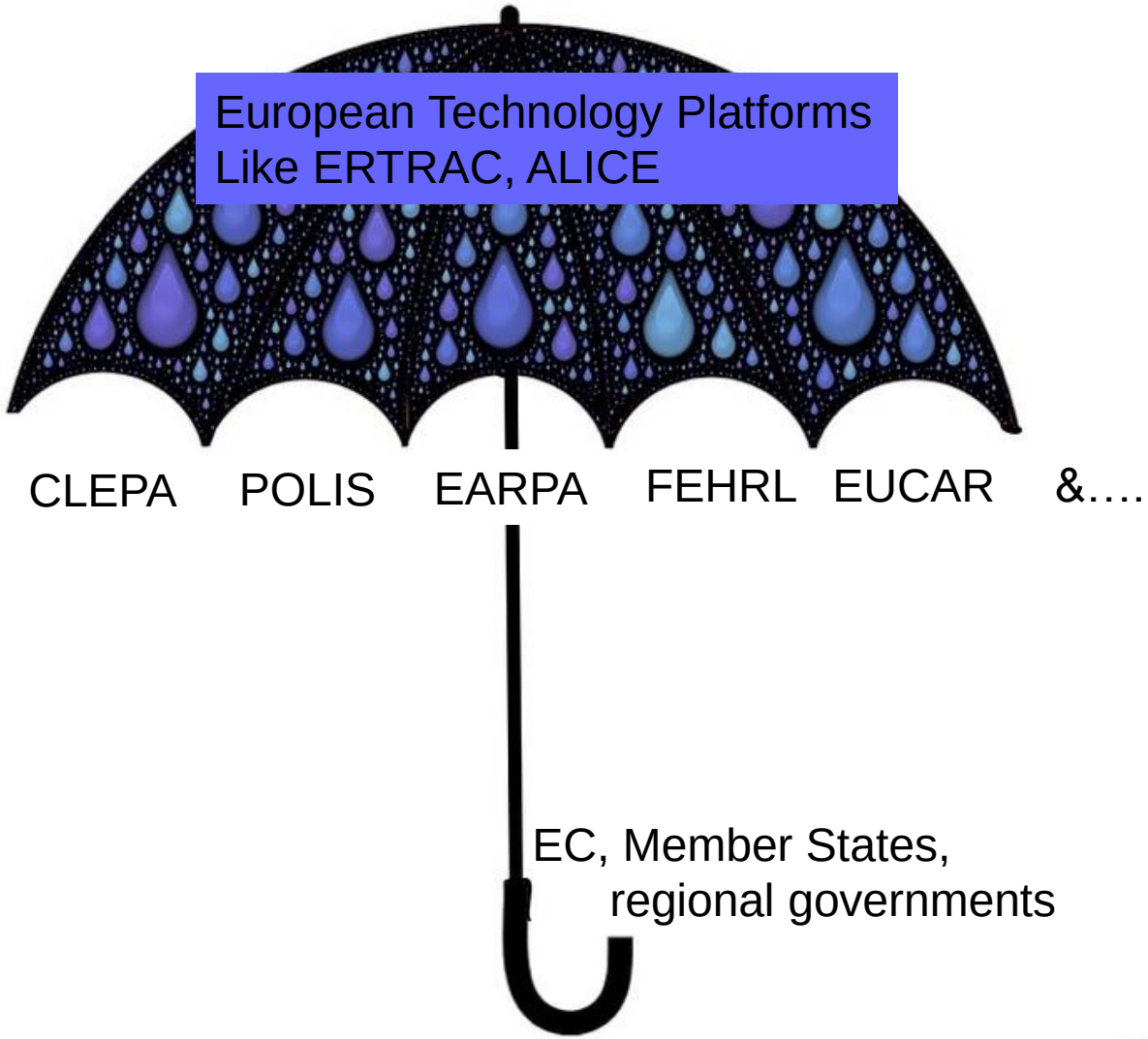


EARPA: Members operate over the full innovation process from basic research to product validation

Field testing, towards implementation



Collaboration is key



POLIS

- Network of 80 Local Authorities for Transport Innovation
- Peer to peer exchange
- Policy and advocacy
- Research: involvement in EU research projects
- Innovation and its regulation

- Founded in 1989, Brussels office
- Currently chaired by the city of Göteborg
- www.polisnetwork.eu
- Working streams:

POLIS – The New Paradigm for Safe City Streets – join the growing group of signatories!

1. **Our streets, our responsibility**
2. **Don't blame, protect**
3. **City streets are not motorways**
4. **Mobility must be safe, or it won't become sustainable**
5. **Safety leads to efficiency**
6. **Reduce risk at the source**
7. **Fairness and freedom of choice**
8. **The right to know**
9. **Technology can be a promise, not an alibi**
10. **10. Let cities lead**

We, the cities, act now.

Arnhem-Nijmegen - Barcelona - Berlin - Bilbao - Brussels - Budapest - Dublin Eindhoven - Farkadona - Glasgow Gothenburg - Manchester - Helmond Île-de-France - La Rochelle - Leon - Lisbon London - Madrid - Noord Brabant Rotterdam - Schaarbeek - Sofia

Bird - CIE - Donkey Republic - ECF - EuroRAP - FEVR - IFP - IRVA – Lime – MUBi – NTUA - Sustrans - Uber - VSV - VOI Technology AB - Walk21 - YOURS

EU funded H2020 “EARPA projects”

TWO PROJECT EXAMPLES

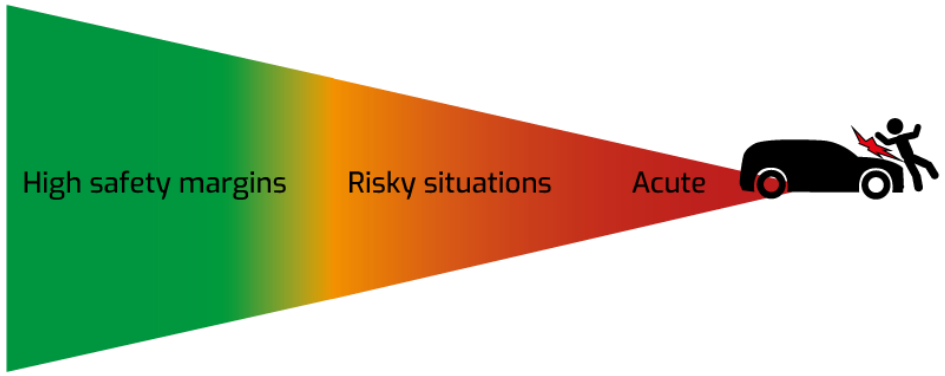
BuyZET project

- Procurement of innovative solutions for zero emission urban delivery of goods and services
- Cities involved
  - Core cities: Rotterdam, Oslo, Copenhagen
  - Observer (partner) cities: Southampton, Brussels, Munich, Jerusalem, Manchester, Bologna, Bielefeld
  - Timeline: Nov 2016 – May 2019
  - Website: www.buyzet.eu

Timeline: Nov 2016 – Apr 2019
Website: www.buyzet.eu

MeBeSafe, Measures for behaving safely in traffic

Traffic behaviour is mainly habitual…



… and many times we are in risky situations without even knowing it.

MeBeSafe intends to

- Change habitual traffic behaviour in order to increase safety margins
- Develop & validate behavioural feedback measures to vehicle drivers and cyclists

High level causation factors

- Lack of attention
- Excessive speed
- Impeded mental and/or physical condition

Selection of actions, field tests, results (1/2)

#1 In–vehicle Nudging solutions

- Novel HMI to direct driver attention to potential hazard
- Sensors to identify potential hazard
- Testing location: 32 km route in Eindhoven NL, field test with test vehicle is currently running

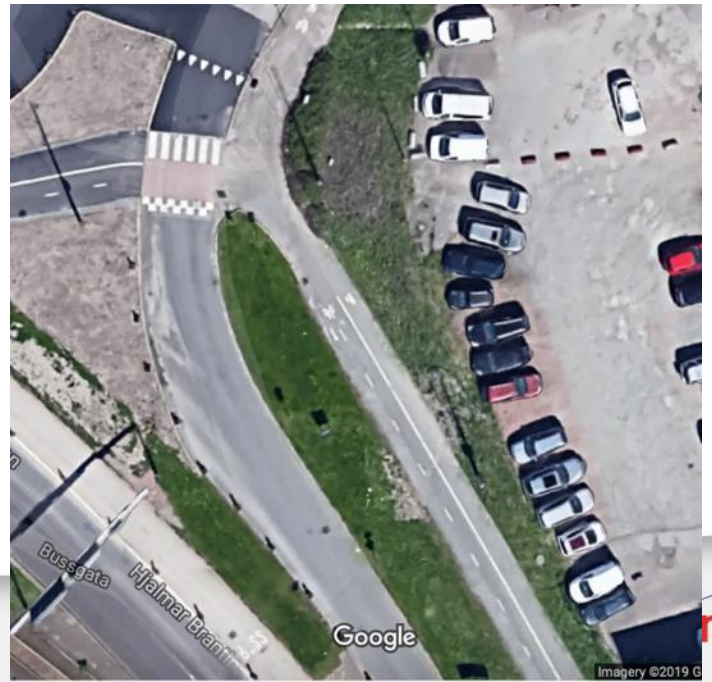
#2 Infrastructure Nudging solution

- Speed reduction through dynamic lights moving towards drivers identified to be speeding
- Testing location: Eindhoven NL, Exit from major road, John F Kennedylaan, with active participation of City of Eindhoven
- The developed solution is implemented into the exit and is now being examined

Selection of actions, field tests, results (2/2)

#3 Bicycle Nudging solution Speed reduction through lane markings

- <u>Testing locations:</u> The City of Gothenburg SE + Eindhoven NL
- Variety of solutions was tested in several test sites
- Winning option is implemented at the test sites
- Gothenburg targets speeding bicyclists at identified spots



In brief…

For next steps in Road Safety on the European Horizon, we need:

1. Collaboration of different types of stakeholders, directly and via associations
2. Understanding of the issues at hand, at a city/region/transport system level. Understand- and effectively nudge mobility users
3. A framework to improve traffic safety culture in the EU
4. Validation of solutions, in real life, and in a variety of situations
5. Cross-European learning from ongoing projects
6. Collaboration…

Thank you for your attention!

More info can be found on www.earpa.eu