Support the European R&I eco-system around connected & automated driving

1st European Conference on Connected and Automated Driving
Session "Research and Innovation Challenges of Connected and Automated Driving"
Brussels, April 3rd-4th 2017

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Valeo

ERTRAC is **the European Technology Platform** (ETP) **for Road Transport** recognized and supported by the European Commission.

ERTRAC has more than **50 members**, representing all the actors of the Road Transport System: transport industry, European associations, EU Member States, local authorities, European Commission services, etc.

ERTRAC Roadmap on Automated Driving

Automated Driving Roadmap

Status: final for publication

Version 5.0
Date: 21/07/2015

ERTRAC Task Force
"Connectivity and Automated Driving"

2015: first joint roadmap on vehicle automation between OEMs, suppliers, research actors, infrastructure providers, cities, Member States
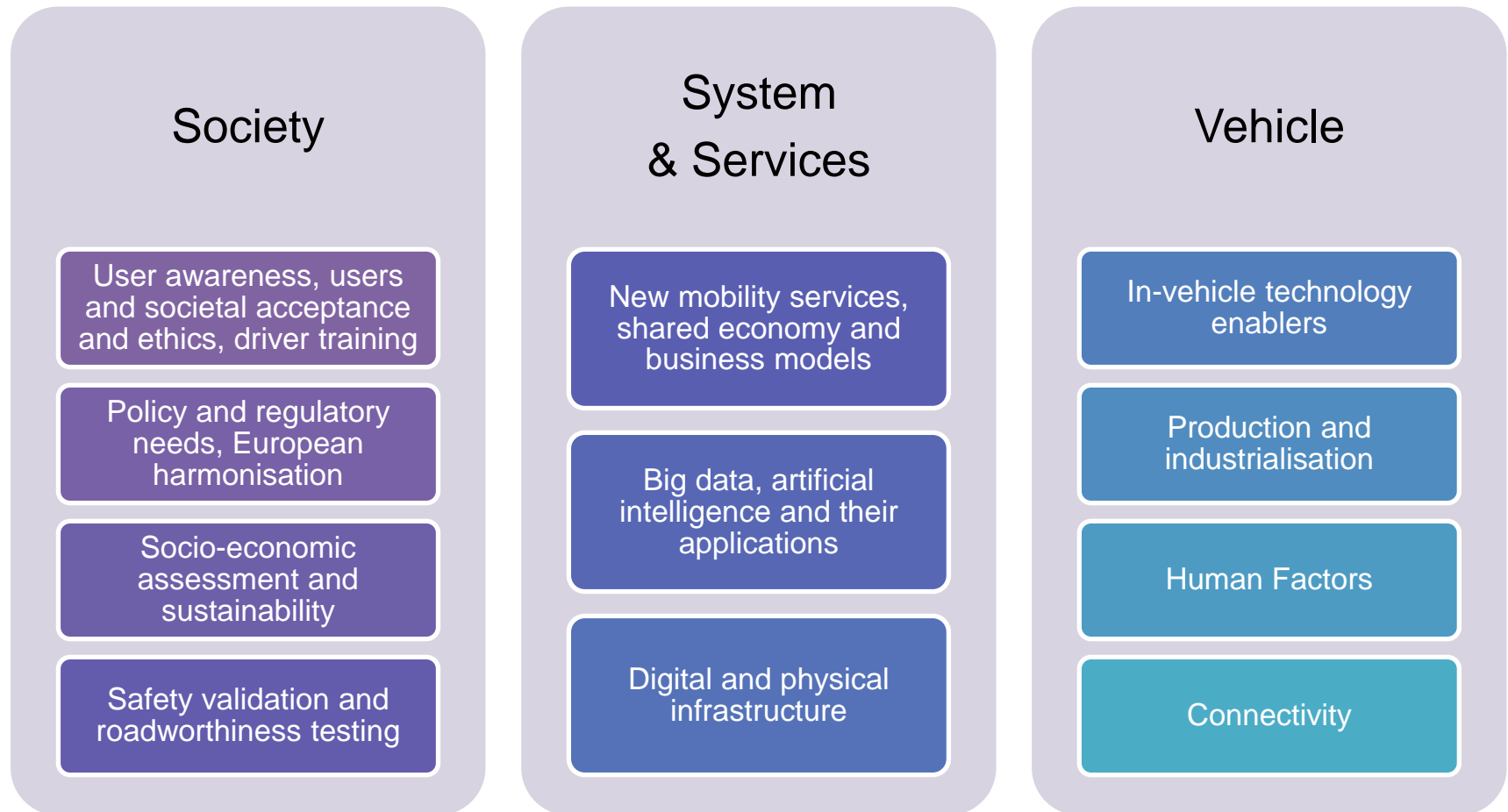
2017 status: draft of updated version distributed today at the conference (➜ERTRAC stand)

Open for public consultation:
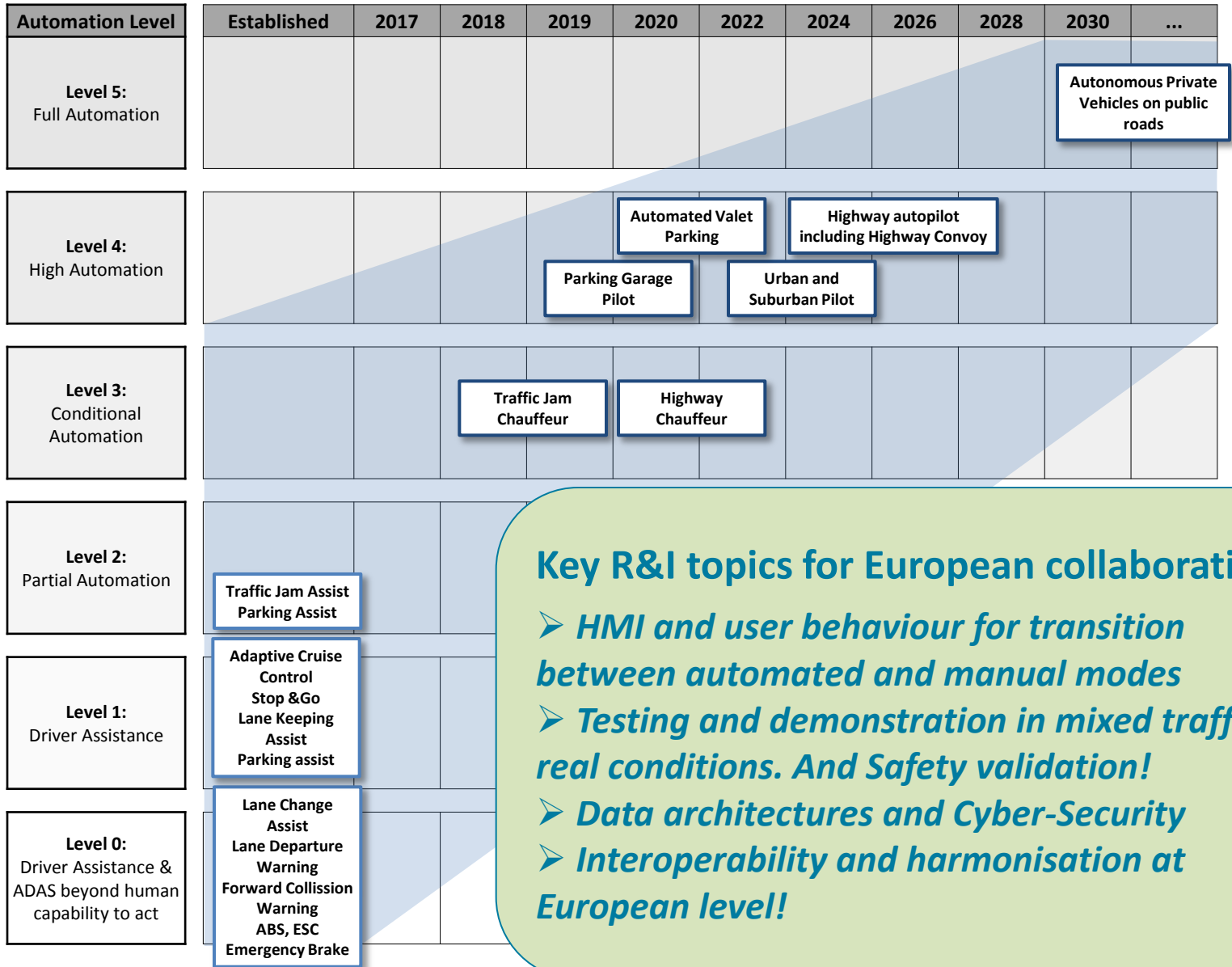*You are invited to participate!*

Final version at **ITS Strasbourg (June 2017)**

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Key R&I areas for collaborative research on automated driving*

Society

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

System & Services

- New mobility services, shared economy and business models
- Big data, artificial intelligence and their applications
- Digital and physical infrastructure

Vehicle

- In-vehicle technology enablers
- Production and industrialisation
- Human Factors
- Connectivity

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Developed within the CARTRE project

Automated Passenger Car Development Path

Automation Level	Established	2017	2018	2019	2020	2022	2024	2026	2028	2030	...
Level 5: Full Automation										Autonomous Private Vehicles on public roads	
Level 4: High Automation				Parking Garage Pilot	Automated Valet Parking	Urban and Suburban Pilot	Highway autopilot including Highway Convoy				
Level 3: Conditional Automation				Traffic Jam Chauffeur	Highway Chauffeur						
Level 2: Partial Automation	Traffic Jam Assist Parking Assist										
Level 1: Driver Assistance	Adaptive Cruise Control Stop &Go Lane Keeping Assist Parking assist										
Level 0: Driver Assistance & ADAS beyond human capability to act	Lane Change Assist Lane Departure Warning Forward Collission Warning ABS, ESC Emergency Brake										

Key R&I topics for European collaboration:

➢ *HMI and user behaviour for transition between automated and manual modes*
➢ *Testing and demonstration in mixed traffic in real conditions. And Safety validation!*
➢ *Data architectures and Cyber-Security*
➢ *Interoperability and harmonisation at European level!*

Automated Freight Vehicle Development Path

Automation Level	Established	2017	2018	2019	2020	2022	2024	2026	2028	2030	...
Level 5: Full Automation				Autonomous vehicles confined areas			Autonomous vehicles on dedicated lanes/roads/areas				Autonomous Hub-to-Hub on public roads
Level 4: High Automation						Truck Terminal Automation	Highway pilot with ad-hoc Platooning	Highly Automated Trucks on public roads			
Level 3: Conditional Automation				Traffic Jam Chauffeur	Highway Chauffeur						
Level 2: Partial Automation	Traffic Jam Assistance										
Level 1: Driver Assistance	Adaptive Cruise Control Stop &Go Lane Keeping Assist										
Level 0: Driver Assistance & ADAS beyond human capability to act	Lane Change Assist Lane Departure Warning Forward Collission Warning ABS, ESC Emergency Brake										

Key R&I topics for European collaboration:

➢ *From confined areas to open roads, and towards hub-to-hub complete logistic chain*

➢ *Implementation in multi-brand/multi-fleet real logistics operations*

➢ *Integration with infrastructure and with other road users*

➢ *User acceptance: resilience and cost!*

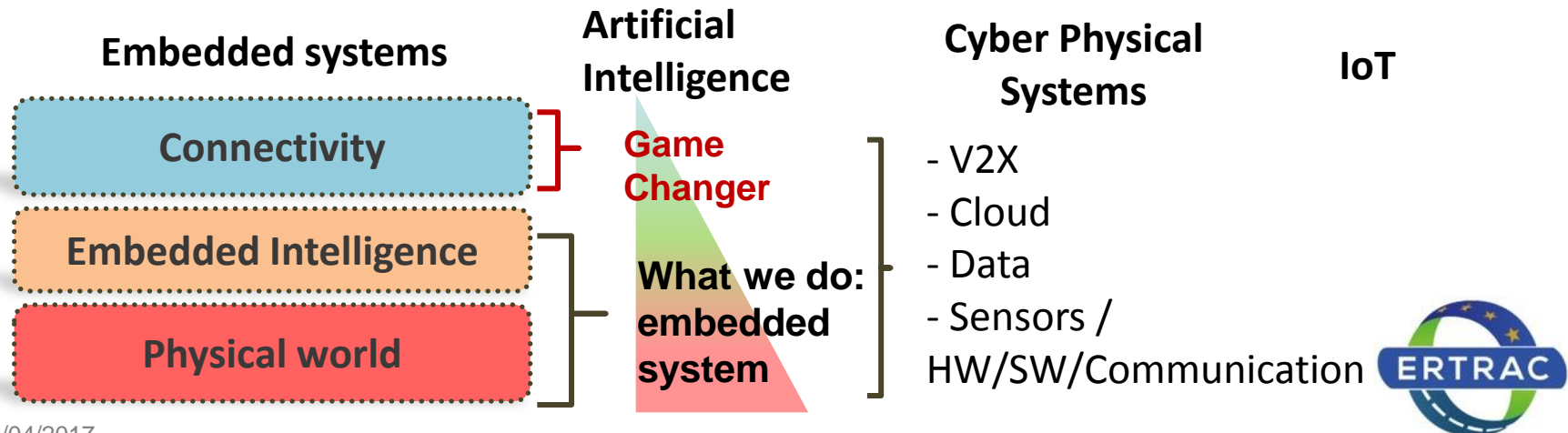# Automated Urban Mobility Vehicle Development Path

Automation Level	Established	2017	2018	2019	2020	2022	2024	2026	2028	2030	...
Level 5: Full Automation										Autonomous Taxi	
Level 4: High Automation			Automated PRT and last mile taxis in low speed		PRT in dedicated lane / Automated Bus/BRT in dedicated lane		Cybercars Last-mile taxis			Automated Bus/PRT in mixed traffix	
Level 3: Conditional Automation											
Level 2: Partial Automation	Traffic Jam Assist Parking Assist										
Level 1: Driver Assistance	Adaptive Cruise Control Stop & Go Lane Keeping Assist										
Level 0: Driver Assistance & ADAS beyond human capability to act	Lane Change Assist Lane Departure Warning Forward Collission Warning ABS, ESC Emergency Brake										

Key R&I topics for European collaboration:

➢ *Implementation of automated solutions in the Public Transport System of cities*
➢ *Enhanced mobility for all: automated solutions for impaired and elderly users*
➢ *Integration in the Urban Mobility System e.g. with other transport modes*
➢ *Impact assessment and user acceptance!*

Bus/Coach: M2 < 5 tonnes < M3

Tackling the challenge of R&I on connectivity

- Game changer in the automotive sector is the connectivity: in the vehicle systems / outside the vehicle (V2X) and is the key enabler of automation level 4/5,

➔ connectivity needs to be further adressed in European R&D, taking in account the various actors / sectors (automotive, semicon, telecoms, etc.) Link with J.U.

Embedded systems   **Artificial Intelligence**   **Cyber Physical Systems**   **IoT**

| Connectivity |
| Embedded Intelligence |
| Physical world |

Game Changer

What we do: embedded system

- V2X
- Cloud
- Data
- Sensors / HW/SW/Communication

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ERTRAC perspective on funding for automated & connected driving in Europe

Horizon 2020 funding for Automation of Road Transport (ART call)**: 114 Mn € for WP 2016-2017**
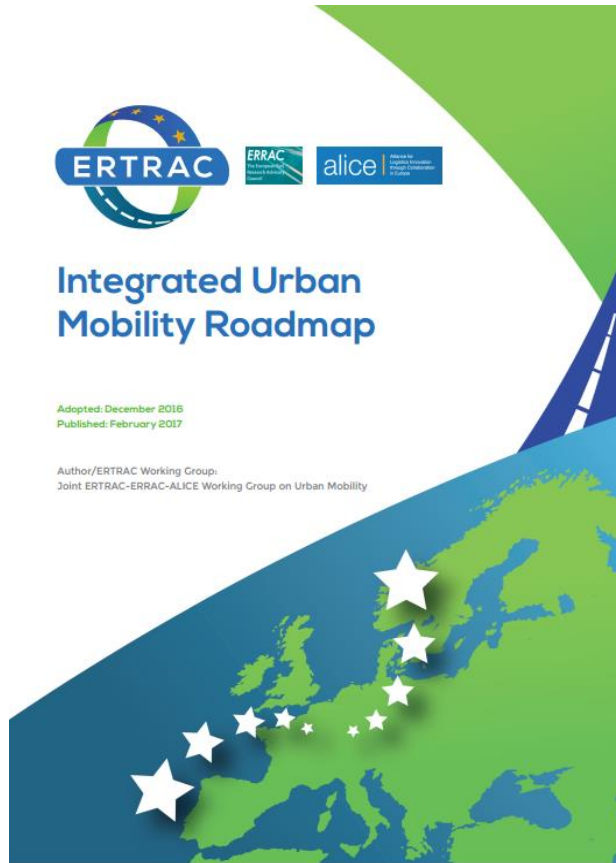
➢*High response from the industry, the research community and the national and local authorities*

ERTRAC calls for a **similar level of support** in the **next H2020 Work Programme 2018-2020**

Next funding period (FP9): need a specific initiative like a **Contractual Public Private Partnership** to give a long-term perspective and a strong dedicated budget for **Automated Driving R&I** in Europe

ERTRAC perspective on Urban Mobility:
new Roadmap 2017

ERTRAC **ERRAC** **alice**

**Integrated Urban
Mobility Roadmap**

Adopted: December 2016
Published: February 2017

Author/ERTRAC Working Group:
Joint ERTRAC-ERRAC-ALICE Working Group on Urban Mobility

- Addressing the **entire urban mobility system** (all types of urban transport users, vehicles, modes, infrastructures and services), in line with urban planning (space issues)
  ➢ **Objective of System Integration**

- **Link with Automation:**
  – Specific solutions for urban environments
  – Need to study the impacts!
  – Integrated in new shared mobility concepts + public transport

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Urban mobility and connected & automated driving: support cities for infrastructure development

- Growing demands of cities and habitants for life-quality in cities (air quality, less congestion, etc.) and re-definition of mobility in cities
  - Automation paving the way to answer social demand (life-quality) and multimodal mobility
  - Need for work on infrastructure for automated / connected mobility

- Need to support European cities beyond testing on automated driving
  - Most of funding projects were linked to testing (City2Mobil, etc.),
  - Infrastructure funding / decision is a State / EU level decision : need for a coordination action between the EU cities
  - Need for infrastructure development in cities (automation / connectivity), taking in account the scalability of research,
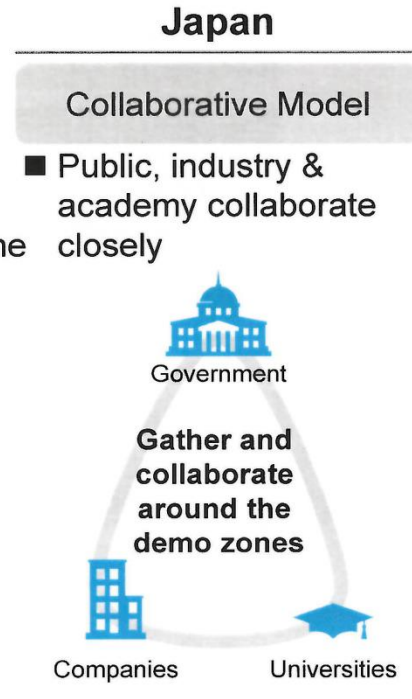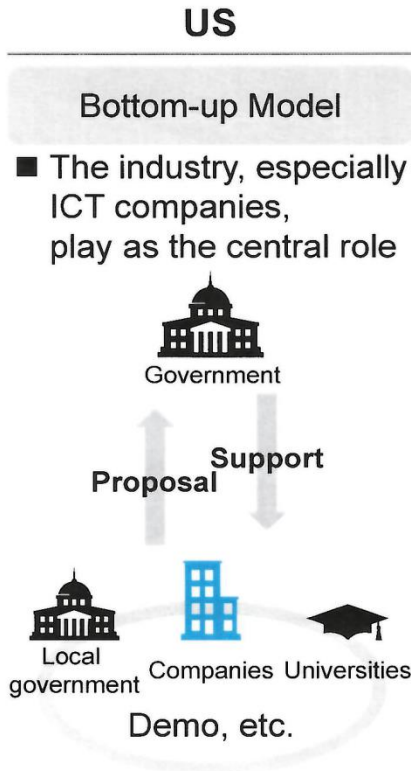 - Need for coordination role of the Commission in line with city needs

Smart Mobility Initiatives around the World

US
Europe
Japan
China

US

Bottom-up Model

- The industry, especially ICT companies, play as the central role

Government

Proposal / Support

Local government — Companies — Universities

Demo, etc.

Europe

Top-down Model

- EC[1] leads the policy direction; other players collaborate under the frame

European Commission (EC)

Policy Direction

Governments

Demo, etc.

Companies — Universities

Japan

Collaborative Model

- Public, industry & academy collaborate closely

Government

Gather and collaborate around the demo zones

Companies — Universities

China

Hybrid Model

- ICT giants and OEMs collaboratively work with the government

Government

Actively involved in policy making

Companies

Demo, etc.

Local Governments — Universities

Not limited to R&D, real world demonstrations are actively conducted around the world

[1]: EC = European Commission

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- **EU R&I funding** can act as <u>enabler to support European actors</u> to get strong market positions worldwide

- **Strong international competition** (USA, China, Japan) calls for a European coordinated approach in addition to national and local initiatives

- **Muti-sector R&I approach** to bring together European industries: automotive, telecom, electronics, data,...

- Need **a long-term and dedicated R&I funding scheme** at European level => PPP initiative in FP9

- **+ Link with the existing funding schemes:** EGVI, ECSEL, 5G, Cyber-Security, Photonics, etc., which contribute to develop enabling technologies for automation and connectivity.

Visit Ertrac stand in the Exhibition area!

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