



The digital transformation of the automotive sector – how can Europe get back in a lead position

Aachen Automotive Colloquium: Mobility meets AI

6 October 2026

Dr Max Lemke

Competitiveness of the EU Automotive sector - political dimension

Draghi Report on the future of European Competitiveness - 3 Sept 2024

Action Plan on the Future of the Automotive Sector - 5 March 2025

Launch of the European Connected and Autonomous Vehicle Alliance - October 2025

Tech Sovereignty Package - 3 June 2026

Snabe Envoy: Special Envoy for Industrial Artificial Intelligence - June 2026 - March 2027

State of the Union Address of President Von der Leyen - 15 Sept 2026

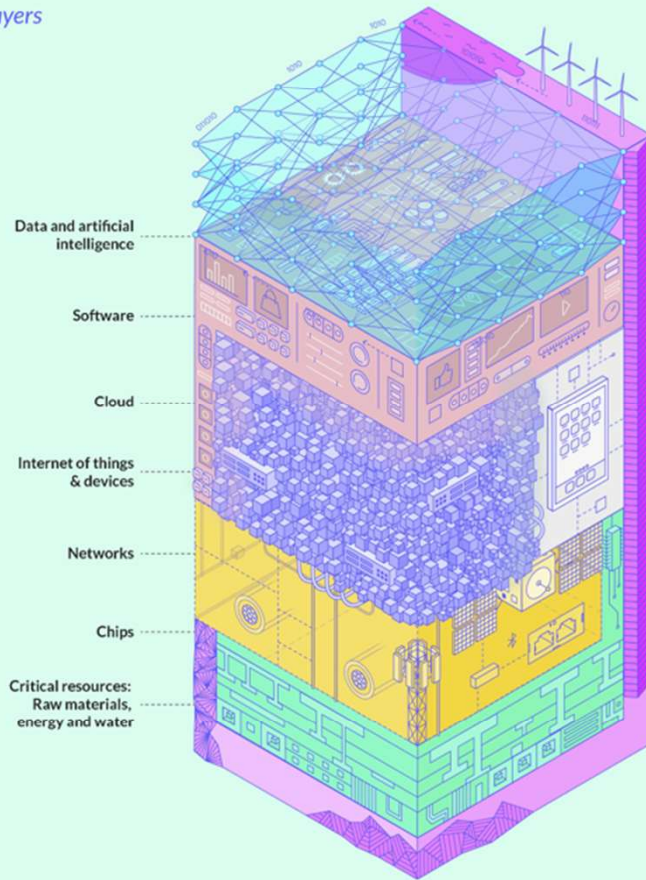
Autonomous Driving:

- **Investment gap:** no single European entity can finance an Autonomous Driving Technology Stack
- **No “true” single market:** the EU’s weight is not exploited while regulatory fragmentation persists
- **Scale-ups leave or are absorbed:** European start-ups/scale-ups fail to scale at home and relocate/exit

The sovereignty imperative

The current digital stack

The layers



KEY COUNTRIES

Data and Artificial Intelligence



Software



Cloud



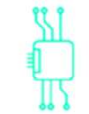
Internet of Things & Devices



Networks



Chips



Raw Materials, Energy and Water



US		China	
US	China	Germany	
US		China	
US	China	Korea	Germany
US	China	Europe	Japan
Taiwan	Korea	US	Netherlands
US		China	Russia

Foreign dependency of EU (indicative)

Up to 95%

50% - 70%

> 85%

50% ?

40%

0-90%

35-100%

Applying AI in the Automotive, Mobility & Transport Sector



Product AI:

- Autonomous Driving
- Intelligent Mobility Systems
- Fleet optimisation

Enterprise AI:

- Manufacturing
- Supply chain resilience
- Predictive Maintenance

Process AI:

- AI-enabled system engineering
- Software-defined vehicle platform
- OTA Update, testing, validation
- Standardisation

Legislation/regulation:

- Type approval
- Road regulation
- Cybersecurity
- Data and AI Act

EU Apply AI Strategy: Flagship actions for **mobility, transport and automotive**

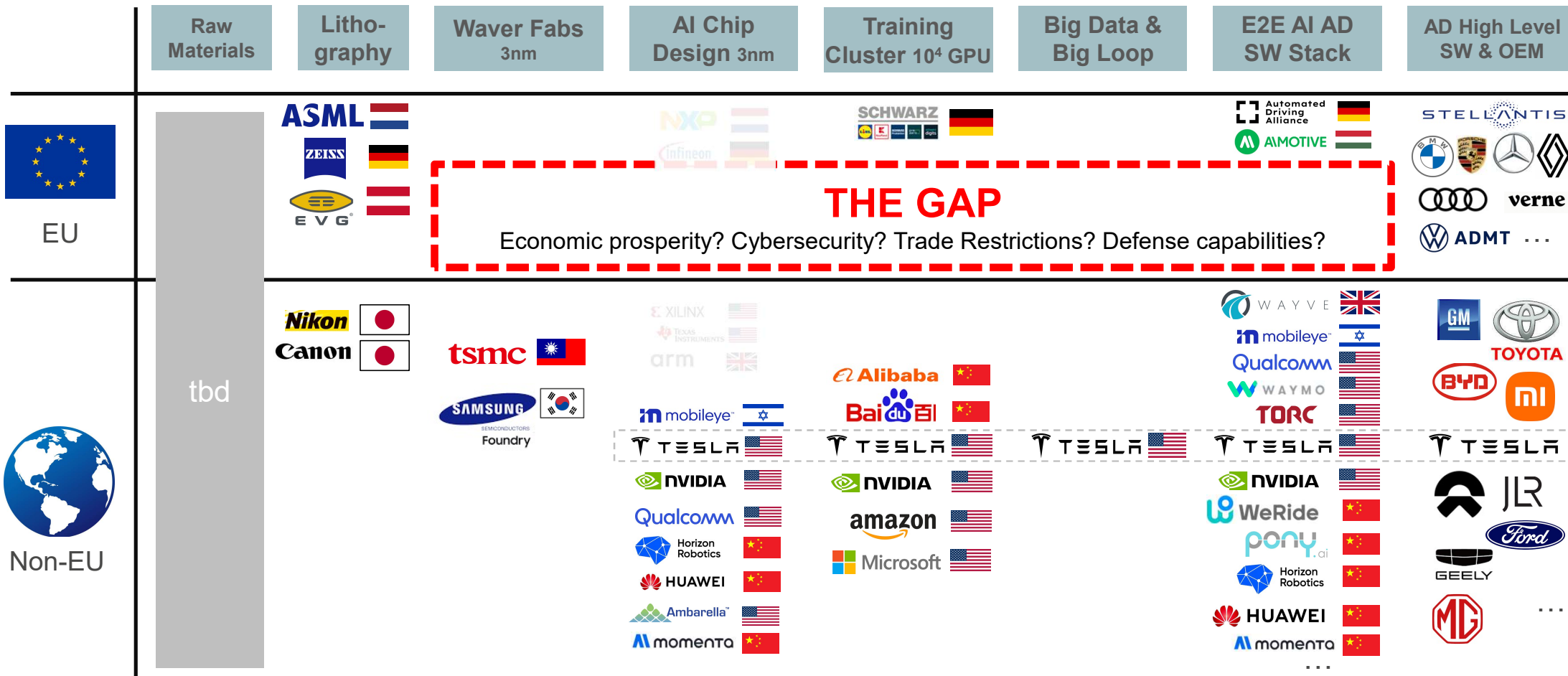
Fast track the development of **innovative AI models** and common software platforms for **automated driving** and **vehicle management systems**

- Leveraging AI factories and gigafactories

Launch an **Autonomous Drive Ambition Cities** initiative to accelerate the deployment of AI-enabled self-driving vehicles in cities

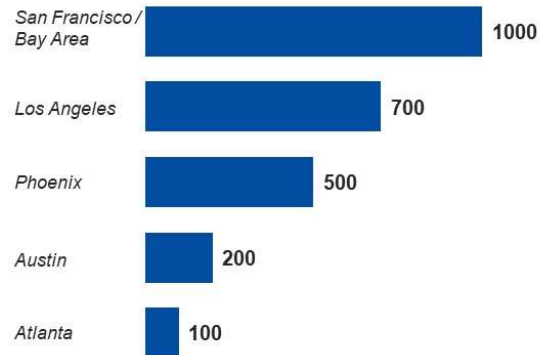
Under the European Connected and Autonomous Vehicle Alliance (ECAVA)

The AI-based Autonomous Driving Value Chain



No. Of Waymo AV deployments in selected US cities

Source: Waymo, 2025



Transition from cities to peri-urban areas and highways

- Current rollout in 11 US cities – first international deployments planned in Tokyo and London
- First freeway service piloted in SF, LA and Phoenix

No. Of Baidu Apollo Go AV rides per quarter

Source: Baidu, 2025, Thousands



Rollout in Chinese Urban areas, with planned overseas expansion:

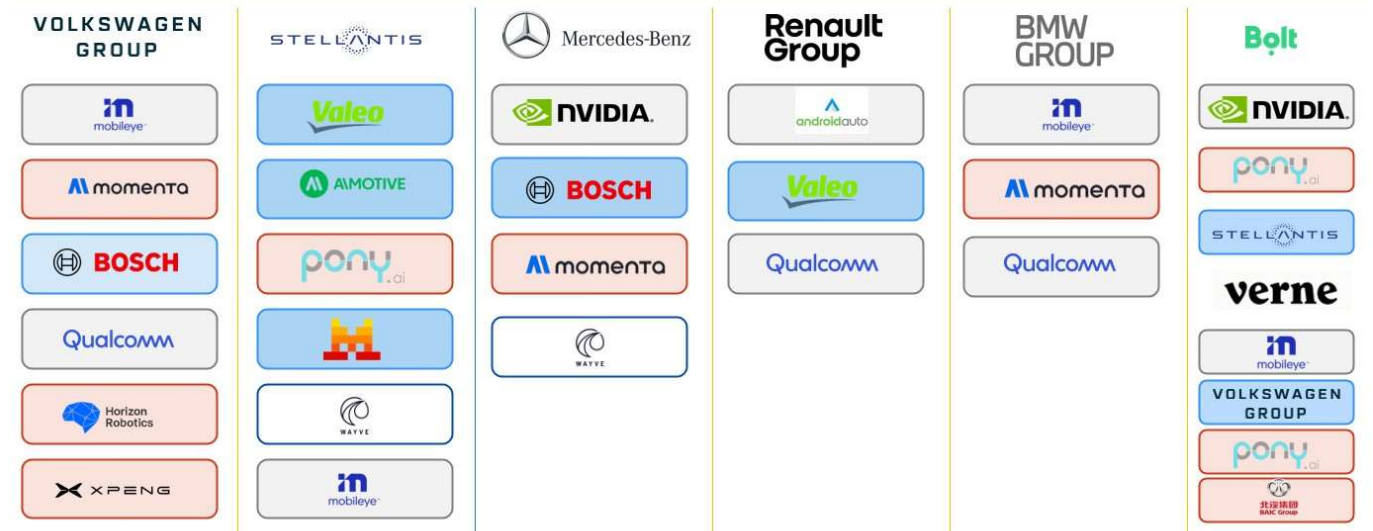
- Europe: partnership with Lyft, targeting Germany and the UK in 2026.
- APAC and Middle east: Emerging partnership with Uber

Autonomous Driving: State of Play

Alarming EU OEM dependency on non-EU tech stacks

Selected ADAS and AD partners chosen by EU OEMs and operators

Non-exhaustive



Sources: CNECT E4 desktop research of public press releases (Date of last update: September 2026)



European Connected and Autonomous Vehicle Alliance (ECAVA)

How can EU industry regain competitiveness ?



Technology Roadmaps (RM) by each WGs presented to Steering Committee on 23 September

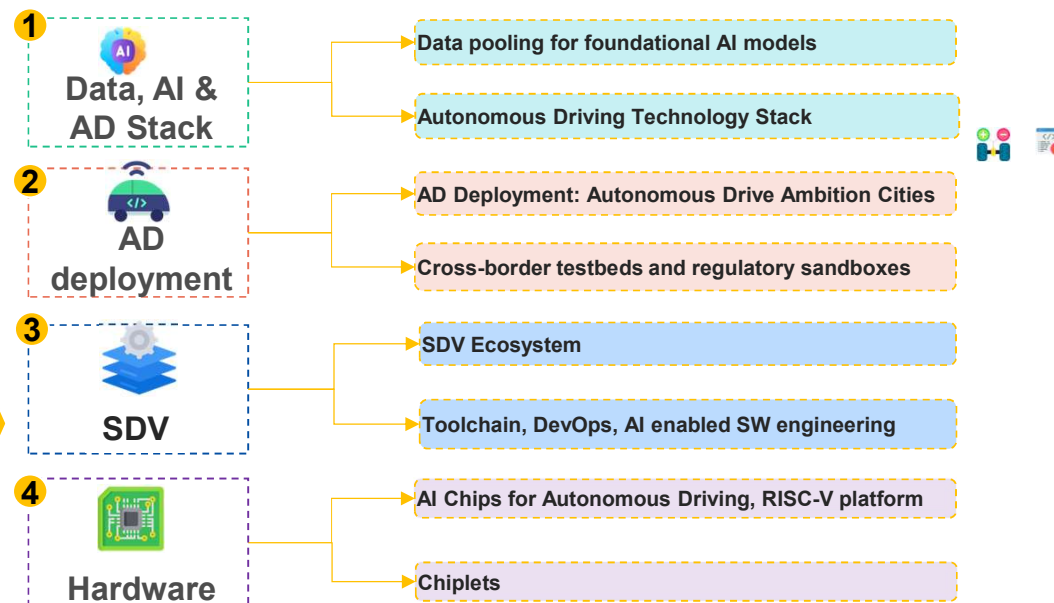
12 Oct 2026: presentation to ECAVA members at Paris Motor Show

Next steps:

- Align and prioritise RMs and collaboration
- Industrial commitment & implementation
- Seek well-sequenced public and private funds
- Improve regulatory Framework



Working Groups

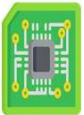


Steering Committee



Some conclusions from the ECAVA Forum on Autonomous Driving

- **Europe's OEMs buy AD Tech Stack from non-EU players - can Europe afford dependency forever or do we need alternatives?**



- Strong interest among start-ups, scale-ups, and academia in **fostering a European AD ecosystem to develop alternatives.**



- Very good progress on European HW and SDV platform: Turn open source promise into production grade reality and use as role model for AD stack.

- Critical need for a **European platform on data sharing & federated learning**



- Code Development with novel AI-based tools → **exponential increase of productivity in system engineering**: Reduced costs for development of SW systems, e.g. AD stack.

- Support by some groups of actors for a distinctly European anchor use case
 - **AD shuttles for public transport, incl. on-demand services, and delivery vans,**
 - **Aggregated cities demand** makes it commercially attractive for OEMs and investors



The European funding and investment framework

Selected „Traditional“ EU-level R&I funding

Non-Exhaustive



~600M
(EU, MS, industry)

SDV
HW

- Hardware Abstraction layer for SDV
- Service-oriented framework for SDV
- AI-assisted SW engineering for SDV
- RISC-V for Automotive
- RISC-V Automotive HW Platform
- European Automotive Chiplet system



~150M
(EU, industry)

- In-vehicle ECUs for CCAM
- Preparing large-scale demonstrators
- Large scale CCAM pilot (100M)



~30M (EU, MS, industry)

- Digital development Tools for SDV
- e/e architectures for SDVs



>2Bn (under planning)

- IPCEI AI – automotive pillar (AD, enterprise)

+ National projects

Dedicated start-up and scale-up funding

2.5M Grants

- Up to **2.5 MEUR** for SMEs and start-ups between proof of concept + market entry.
- For development and demonstration projects, pilot applications, validations, or initial industrial scaling.
- Non-repayable grants for up to **70% of eligible costs**.

0.5-10M Equity

- Minority stakes (10–25%)** provided by EC via EIC Fund. EIC Fund acts as anchor investor and can mobilise co-investors
- Funding provided **stand-alone or blended with grant**
- For market entry, industrialisation, scaling

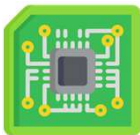
Up to 30M STEP Scale-Up

- Aim: strategically scale EU key technologies
- Targets businesses already significantly scaled that are planning a funding round **€50M - €150 MEUR**
- EIC contributes up to €30 MEUR in equity, typically alongside private and institutional investors.

Scale-up Europe fund

New, multi-billion late-stage and growth fund aimed at investing in the most promising EU companies in **strategic tech areas**, such as AI; quantum and semiconductor technologies; robotics and autonomous systems; energy, space technologies, bio, medical, agri technologies, advanced materials, **across EU**.

Future funding & investment instruments under discussion:
FP10, ECF, Tech Sovereignty Package



ECAVA Hardware Working Group

Mission: a sovereign, open and competitive European automotive hardware ecosystem

Why act now?

Value is moving to software and centralised computing: the **E/E architecture** is the car's new "engine". Yet Europe depends on **a few non-EU suppliers** for the high-performance chips at its core.

Key risks:

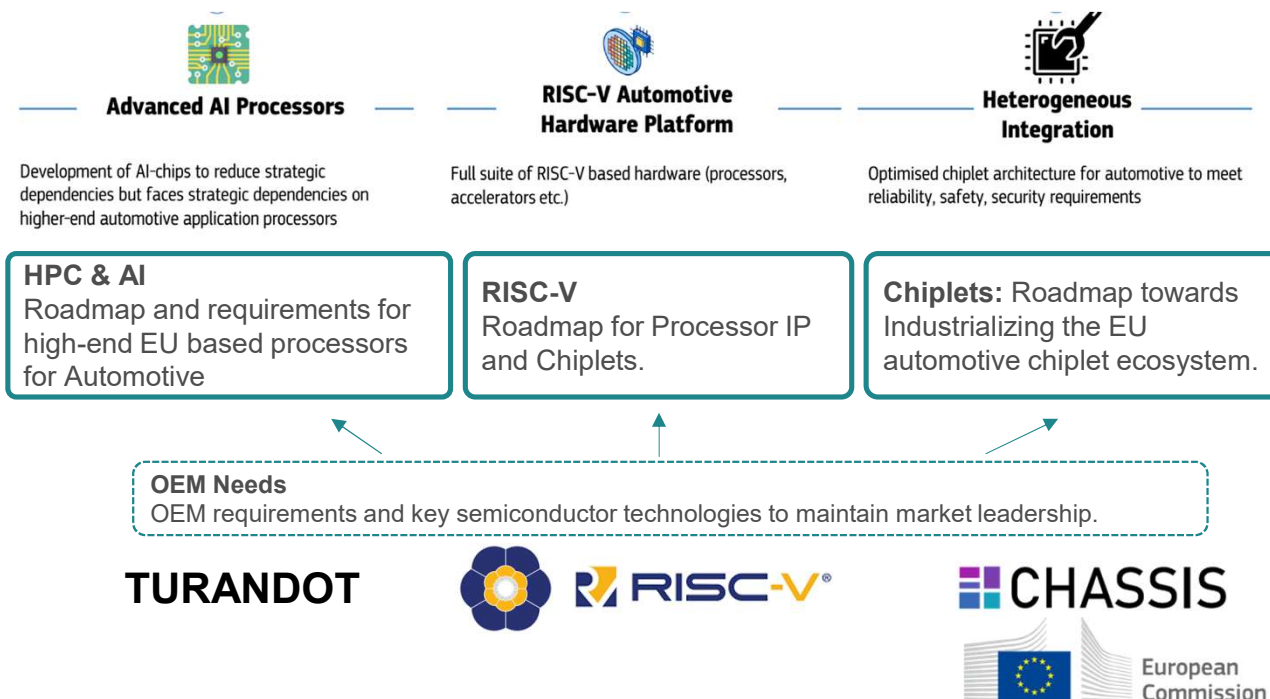
- **Vendor lock-in:** high costs, slow innovation, little roadmap control
- **Supply chain:** exposure to geopolitical instability
- **Competence gaps:** HPC, AI chip design, advanced nodes and packaging

EU strengths to build on:

- E/E architecture, functional safety (ASIL), in-vehicle networks and RISC-V real-time cores

ECAVA - Hardware Platform

3 central pillars defined & confirmed

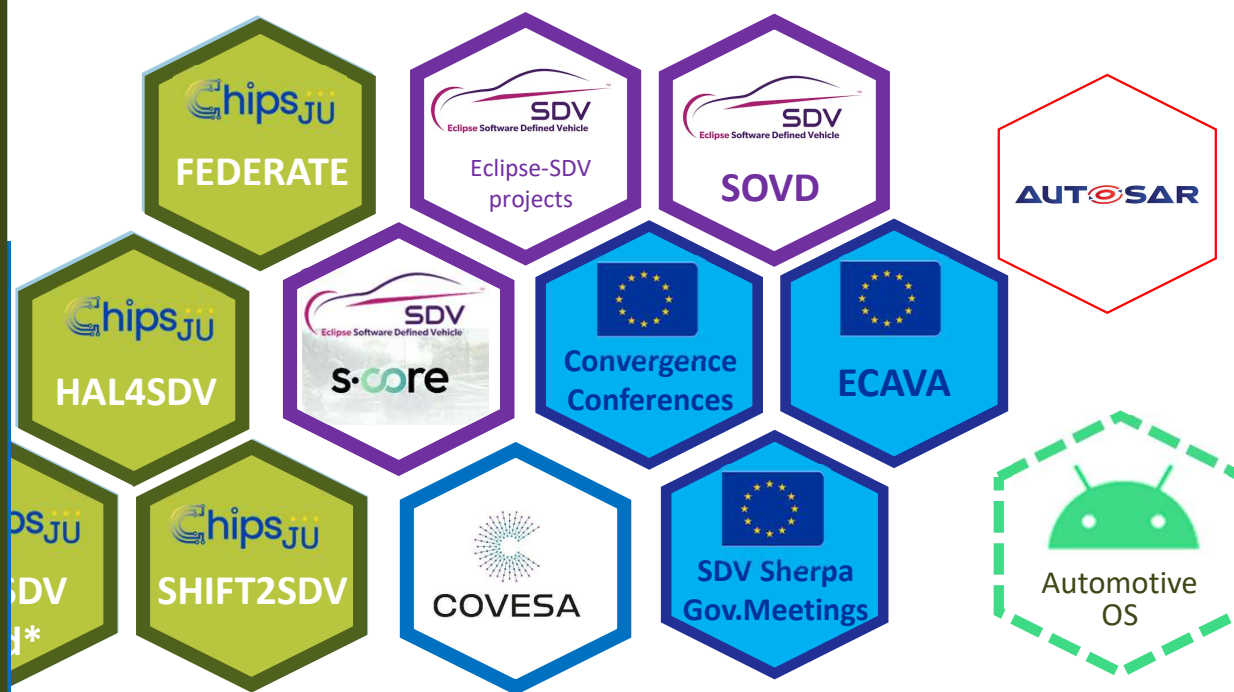
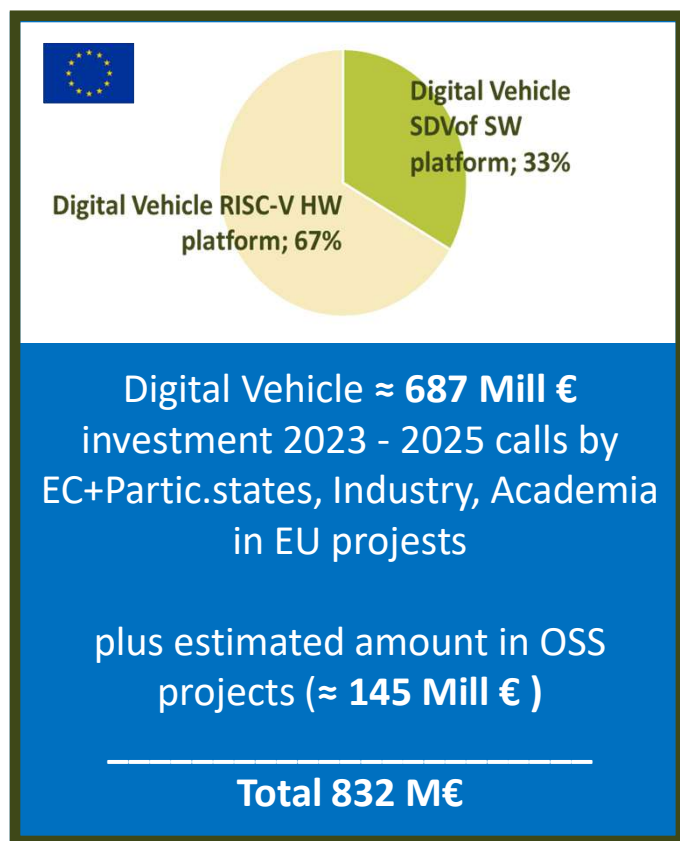




ECAVA Software-Defined Vehicle Working Group

- The litmus test lands **end of 2026**: open-source building blocks from EU Chips JU projects (HAL4SDV, Shift2SDV) entering OEM series development through contributions to ECLIPSE S-CORE — the point where up to 40% shared-development savings stop being a projection and become a track record
- By being ASIL-compliant, S-CORE SDV building blocks build on European strength in safety and thereby complement Android Auto functionalities.
- **EU Chips JU project AI4SDV** has begun applying AI to automotive software engineering, targeting order-of-magnitude productivity gains — the frontier where Europe can close ground fastest.

SDV in Europe: What happened since 2025?



Public funded projects collaborating with OSS initiatives

Projects in OSS initiatives

Open Source Development in the EU SDV Ecosystem

Benefits of joint development in open-source:

Shared development effort:

Up to 40% effort savings per company

Faster-time-to-market:

Up to 30% faster time-to-market

Lower integration costs:

Estimation: 10-20% reduction of application integration effort possible

Consistent application development environment:

Effort for Complete application SW
~ 8 times effort of an SDV Stack*)

Complexity management:

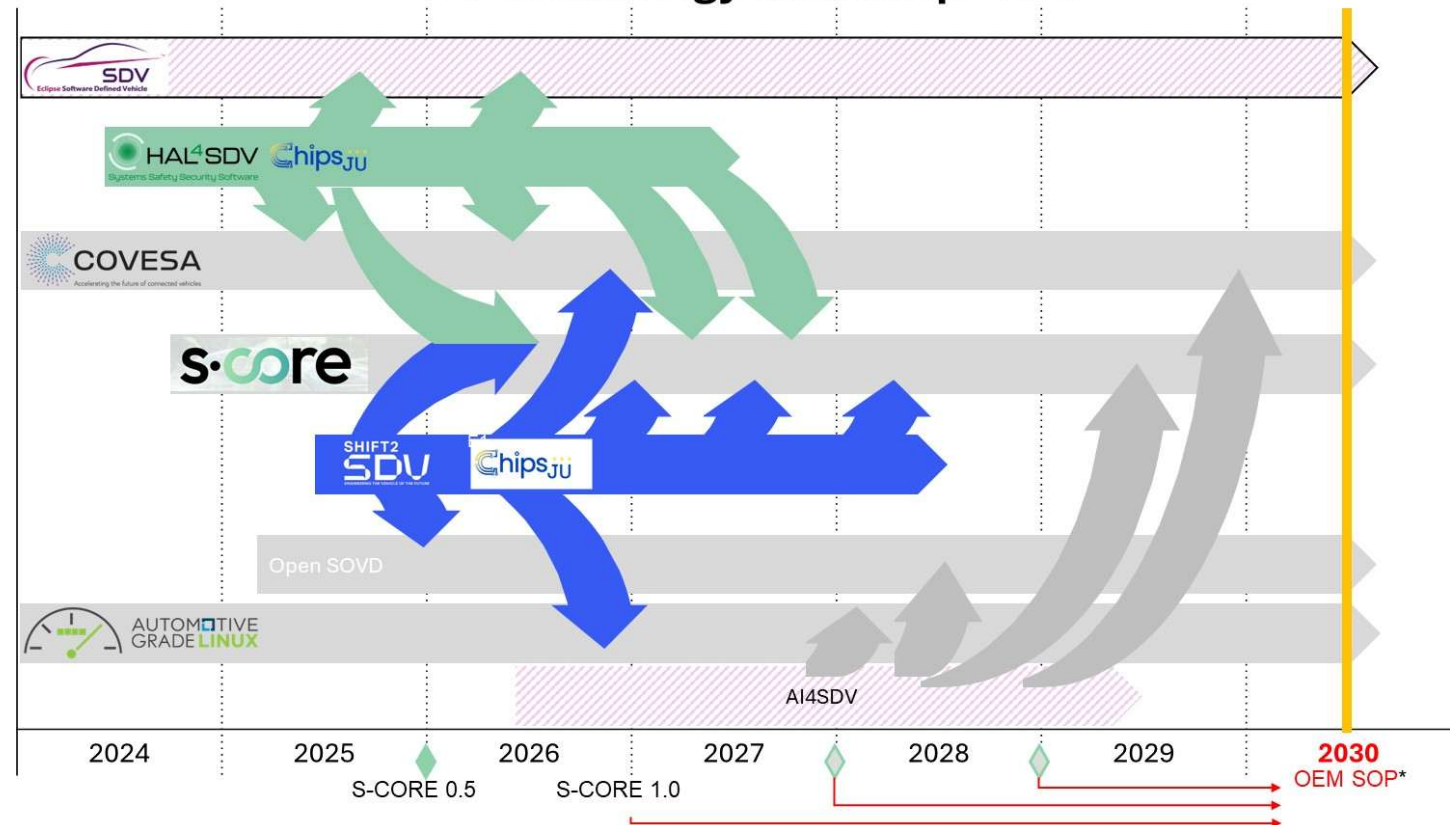
Not estimated (opportunity costs)

*) e.g. [McKinsey: The automotive software and electronics market through 2035](#)

Based on estimates by:



SDV Technology Roadmap 2025

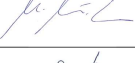


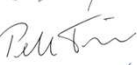
Software-Defined, Autonomous systems

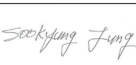
- 1 State of play 2 Current actions 3 Future opportunities

Growing to a global ecosystem with now more than 30 companies from across the industry

Announcement at CES 2026
from Eclipse and VDA

BMW GROUP BMW Group	Frank Weber Member of the Board of Management	
BOSCH Robert Bosch GmbH	Dr. Mathias Pillin CTO Mobility	
Continental Continental Automotive Technologies GmbH	Jean-François Tarabbia Head of Architecture and Network Solutions Business Area	
ETAS ETAS GmbH	Dr. Thomas Irawan CEO	
FORVIA HELLA GmbH & Co. KGaA	Guido Schütte EVP, Member of the Executive Board Electronics	
 Mercedes-Benz Group Mercedes-Benz Group AG	Markus Schäfer RD Chief Technology Officer, Development & Procurement	
QORIX QORIX GmbH	Markus Schupfner CEO / Managing Director Dr. Nico Hartmann CTO / Managing Director	 
Valeo Valeo BRAIN Division	Joachim Mathes CTO Valeo Brain Division	
VECTOR Vector Informatik GmbH	Dr. Matthias Traub Managing Director	
VOLKSWAGEN GROUP Volkswagen Aktiengesellschaft	Dr. Michael Steiner Member of the Extended Executive Committee Volkswagen AG, Group R&D Axel Andorff Group Chief Technology Engineer	 
ZF GROUP ZF Friedrichshafen AG	Torsten Gollewski Executive Vice President Corporate R&D Innovation & Technology	

42dot 42 dot Inc.	Song Chang Hyeon CEO	
AVL AVL List GmbH	Di Georg List Vice President Corporate Strategy	
accenture accenture	Dr. Christof Horn Global Lead SDV	
Capgemini Capgemini SE	Laurence Noël EVP Head of Global Automotive Industry Peter Fintl VP Technology & Innovation	 
coretura Coretura AB	Johan Lundén CEO	
Cummins Cummins Inc.	Jonathan Wood Vice President & Chief Technical Officer	
ecarx ECARX PTE. LTD.	Nicolas Persignat Executive VP, Head of Global R&D	
Elektrobit Elektrobit Automotive GmbH	Maria Anhalt CEO	
Infineon Infineon Technologies AG	Peter Schiefer President and CEO of the Automotive Division	
LEAR LEAR CORPORATION	Nick Roelli President E-Systems	
LG Electronics LG Electronics Vehicle Solution	Seok-hyun Eun President	

MICHELIN Michelin	Dr. Ali Rezgui VP Embedded Tire Digital Twin	
HYUNDAI MOBIS Hyundai Mobis / Automotive Electronics Business Unit	Sookyoung Jung Head of Automotive Electronics Business Unit	
QNX QNX	John Wall Chief Operating Officer QNX, Head of Product, Engineering & Services	
Qualcomm Qualcomm Technologies Inc.	Nakul Duggal EVP, Group GM, Automotive, Industrial and Embedded IoT, and Robotics	
Red Hat Red Hat Inc.	Chris Wright CTO & SVP Global Engineering	
STELLANTIS Stellantis LLC	Tara Vatcher Global SVP - Core Platform SW Development and Architecture	
SCHAEFFLER Schaeffler AG	Uwe Wagner Chief Technology Officer	
TRATON TRATON SE TRATON AB	Niklas Klingenberg Head of Group R&D TRATON SE David Holmgren Head of Group R&D EE Applications TRATON AB	 
T Systems T-Systems	Dr. Christian Hort SVP Automotive & Manufacturing Jörg Tischler VP Connected Mobility	 
USE BLOCKS Useblocks GmbH	Daniel Woste CEO	

Memorandum of Understanding
Automotive Grade
Open-Source Software
Ecosystem
May 2025



Open-Source Software Ecosystem

ECLIPSE
FOUNDATION

S-CORE

VDA | Verband der
Automobilindustrie



ECAVA Autonomous Driving Data, AI, AD Stack WG

Two complementary streams for collaboration across industry under discussion:

1. Technology enablers for ADAS and AD:

- platform for sharing data, data models, synthetic data generation, ...
- AI foundation models including affordable compute infrastructure for AI
- Toolchain for development, validation, and certification

2. A sovereign European AD stack and ecosystem:

- Anchor use case to initiate the ecosystem:
 - on demand shuttles and delivery vans in urban areas
 - gradual expansion to urban logistics with increasing complexity, and beyond
- Strong support by start- and scale-ups, universities and research centres
- Open source for a usable blueprint

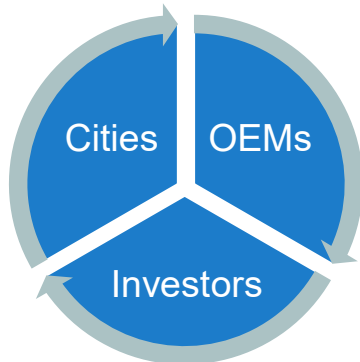


ECAVA Autonomous Driving Deployment Group

- Large **CCAM Demonstrator** to start end of the year (100M€)
- Need for a sovereign **EU-level playing field on data sharing**
- **ADACities** initiative well received - success highly depends on
 - fast availability of **regulatory sandboxes**
 - and **significant investments** beyond R&I funding

Apply AI: Autonomous Drive Ambition Cities – ADACities @ a glance

Support EU cities and industry in scaling L4 autonomous vehicles from pilots to market-ready deployment - crossing the chasm from expensive playgrounds to profitable business cases



Demand-supply-side aggregation:
Key condition for investments



2026: Call for Expression of Interest (CEoI)
2027 – 2029: Pioneering Adoption @ scale
2028 ++: Scaling: funding & investments

One vehicle platform per OEM

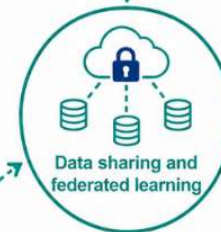
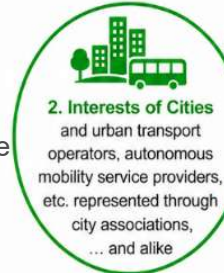


Competitiveness and Tech Sovereignty:

- **EU-centricity in international partnerships**
- Certification and homologation through EU OEMs
- Scale autonomous mobility across EU: make AD in cities a business case for EU industry
- Industrial governance through ECAVA

Support cities in improving public transport:

- performance
- safety
- sustainability
- quality
- congestions
- driver shortage



Ease regulatory compliance thru sandboxes:

- Type approval,
- Road Regulations
- Local implementation
- AI Act
- Data Act
- Cybersecurity Act



Need for regulatory sandboxes now:
we cannot wait with adoption until after revised regulations in force!

The CEoI is just the start: we need to mature and grow ADACities together

State of play EU Regulation on autonomous driving: ongoing initiatives

Objective, Automotive Action Plan

Boost **regulatory framework with rules on unlimited series** of vehicles of automated driving systems by 2026
Boost **single market for Driving Automation** through harmonised rules for testing (2026) and deployment across EU



AI Act and Digital Omnibus

Single Data Act, clarification on data rules for AI Model training

Key industrial players in ECAVA see data regulation is too constraining. They suggest:

- A purpose-based exemption from GDPR for the acquisition and use of big data for training and inference of automotive AI.
- A fast-track for antitrust clearance that avoids requiring the approval of every individual MS

AI Act: Measures supporting innovation



AI regulatory sandboxes (Art. 57 – 59):

- Controlled framework to develop, train, validate and test innovative AI systems
- For products, requirements for high-risk AI systems must be integrated into sectorial legislation

Real World Testing (Art 60 and 60a)

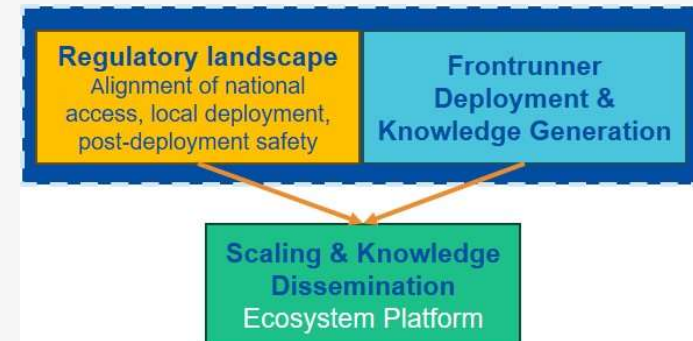
- Allowing testing of high-risk AI systems in real-world conditions
- Subject to harmonised safeguards
- Also possible for products



Cross border Testbeds

Joint Declaration of Intent signed by 18 Member States on June 8th 2026

Long term strategy for scaling and harmonisation at EU level

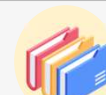


Automotive Omnibus

Vehicle Safety and Emissions

On-going discussion on whether to address AD as well, e.g.

- EU type approval of ADS - ready platforms
- Mutual recognition of national authorisations for testing and deployment



Autonomous Driving Systems Regulations

88 UN-Level regulations on ADS

- UN-Level regulations agreed by end of year
- Aim to finalise unlimited series approval for L4 vehicles in EU in early 2027



The rapid establishment of regulatory sandboxes is crucial for broad deployment of autonomous vehicles

Conclusions: How can Europe get back into a lead position ?

- Change of mindset: the **future vehicle is software-defined** and moving in a **V2X infrastructure**
- From 100 years of competition to **collaboration on non-differentiating elements**:
industry must be in the driving seat – European Commission and MSs can provide the platform
- **Open source platforms** are an excellent baseline for collaboration, but
JVs, Start-Ups, Associations needed for maintenance, value added services, validation, certification, ...
- Remove a key barrier for autonomous driving in Europe:
Swiftly establish across OEMs, Tiers, ... a **data sharing, data generation and federated training platform**
- For more tech sovereignty Europe needs to **grow its own autonomous driving ecosystem**:
 - exploit synergies with other verticals (drones, humanoids, ...)
 - strong role for start-ups, scale-ups and universities/RTOs
 - learn from SDV experience as a role model for data sharing, AI models, and AD stack
- R&I funding can support collaboration platforms and innovative projects, but
major investments - orders of magnitude higher – needed from **industry, investors, public procurement**, ...
- We cannot wait for revised regulation entering into force:
EU-wide **regulatory sandboxes** for roll-out at scale of autonomous driving in our cities are urgently needed
- **Speed** – speed - speed