Global CCAM Observatory

Mapping the global Connected, Cooperative and Automated Mobility ecosystem

Andromachi Mourtzouchou, Konstantinos Mattas, Ada Garus, Espedito Rusciano, Biagio Ciuffo



Project objectives

01 Map the global CCAM ecosystem

Capture where automated mobility services operate and where enabling technologies are developed and deployed.

02 Analyse the technology stack

Identify trends, maturity levels, and key actors across sensing, mapping, AI, connectivity, and control.

03 Assess Europe’s position

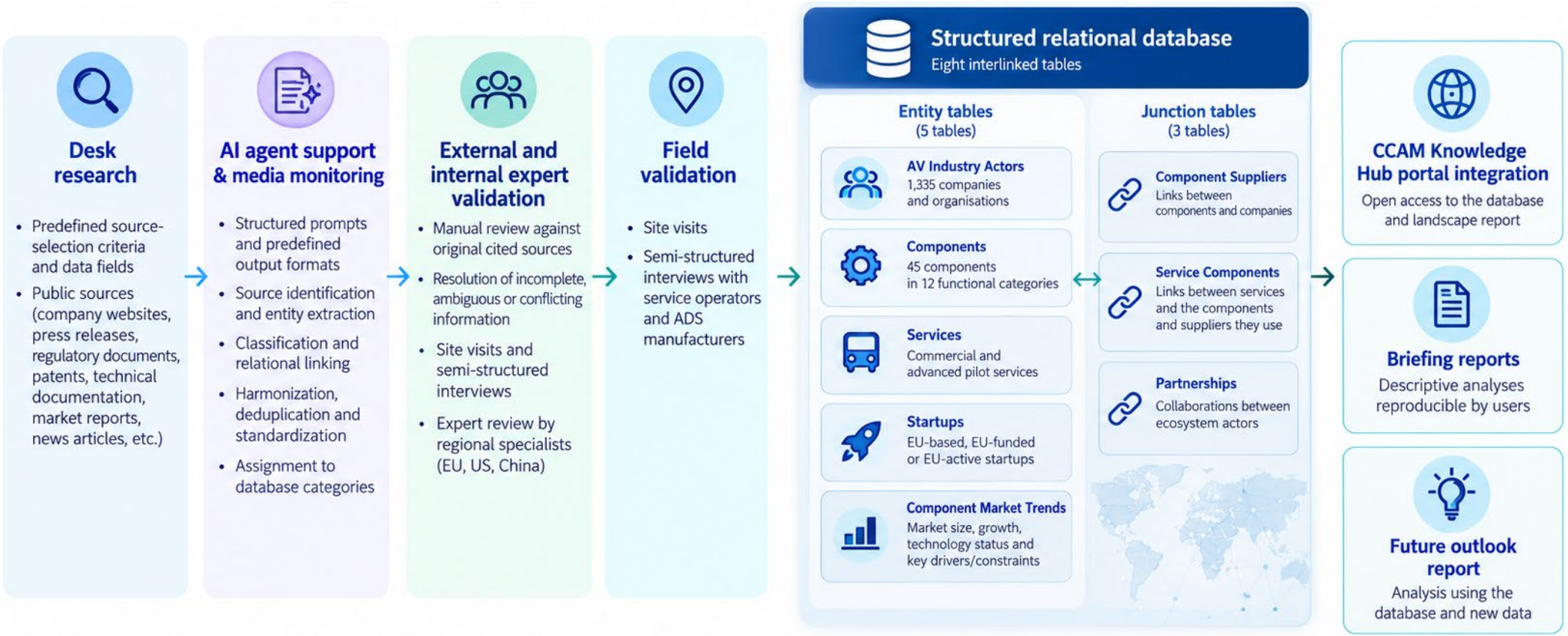
Highlight European stakeholders’ strengths and gaps compared with other regions.

04 Deliver insights for policy and industry

Provide an evidence base for research, industrial strategy, and policy planning.



Methodology and structure



Automatic weekly updates | Current release compiled between October 2025 and early February 2026.
Future releases will incorporate newly available information while maintaining compatibility with existing records.

Scope at a glance

937 **unique suppliers**

12 technology categories

Companies spanning sensing, compute, connectivity, AI/ML, cybersecurity, ADS development and other enabling technologies.

1,940 **component–supplier pairs**

supplier × component × deployment

The unit of analysis used to map supply-chain relationships across automated-mobility deployments.

122 **services**

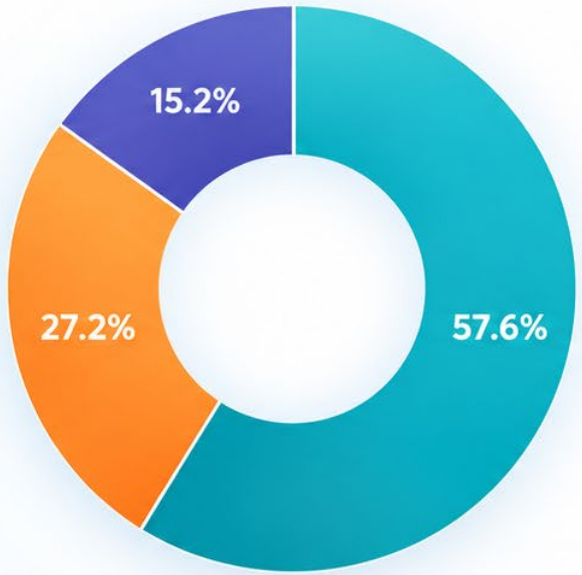
commercial or pilot operation

Robotaxis, autonomous trucking, automated shuttles and last-mile delivery services captured globally.

Suppliers, technology components and operational services are brought together in one relational Observatory view.



Supplier distribution



Emerging Suppliers (57%)
Majority of the market; specialized or newer firms.

Niche Suppliers (27%)
Specialized players in specific segments.

Major Tier Suppliers (15%)
Smallest group; highlights a fragmented, non-consolidated market.

KEY DRIVERS

- **Nascent technology** — Sector is in early-stage rapid transition.
- **Lack of incumbents** — No dominant group yet controls the full supply chain.

STRATEGIC IMPLICATIONS (EUROPEAN FOCUS)

- **The risk** — Scarcity of major players threatens domestic supply-chain resilience.
- **The opportunity** — Room for startups to lead before the market consolidates.

Emerging suppliers dominate, while major-tier players remain limited.

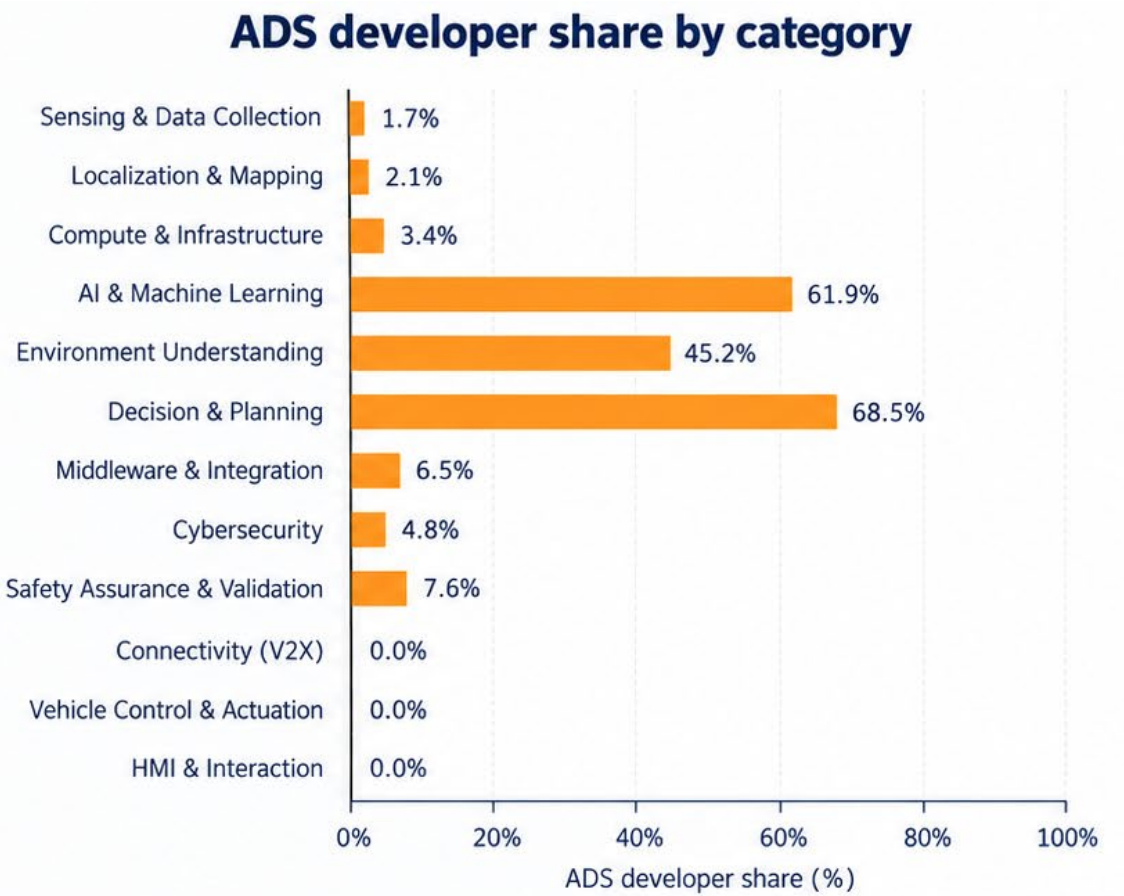
ADS developers

Software-centric
(high concentration)

- **Decision & Planning / AI & Machine Learning:** ADS developers internalize these core 'brain' functions.
- **Significance:** This is where the core algorithmic stack resides.

Hardware-centric
(low concentration)

- **Sensing & Data Collection / Vehicle Control:** Minimal developer presence.
- **Strategy:** Systems are typically sourced from specialized external manufacturers.



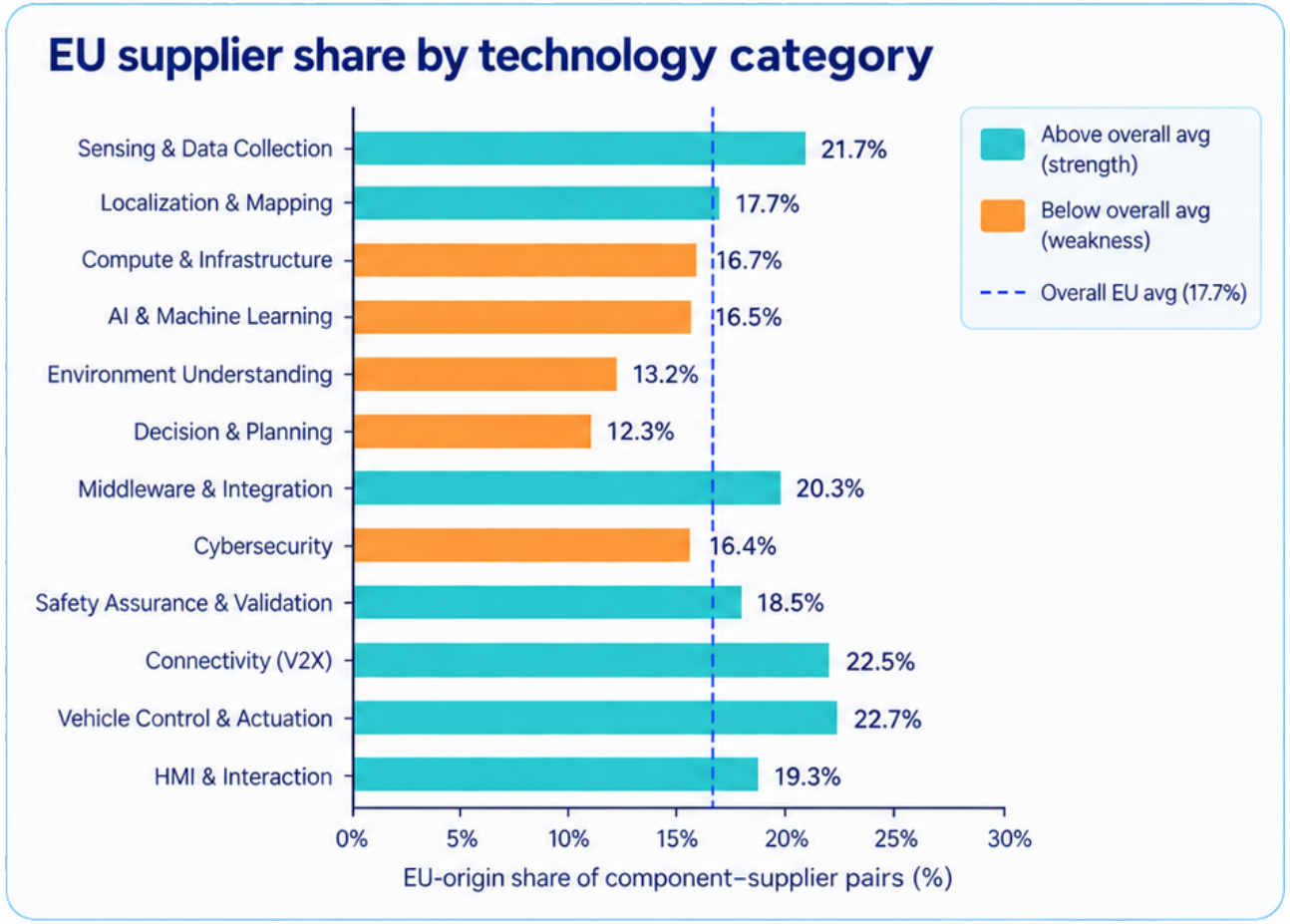
European Union Positioning

Areas of European Strength (Above 17.7% Average)

- **Top Categories:** Vehicle Control & Actuation, Connectivity (V2X), Sensing, and Middleware.
- **Foundation:** Built on long-standing traditions in automotive manufacturing and hardware engineering.

Areas of Structural Weakness (Below Average)

- Decision & Planning **(12%)**, Environment Understanding, and AI & Machine Learning.

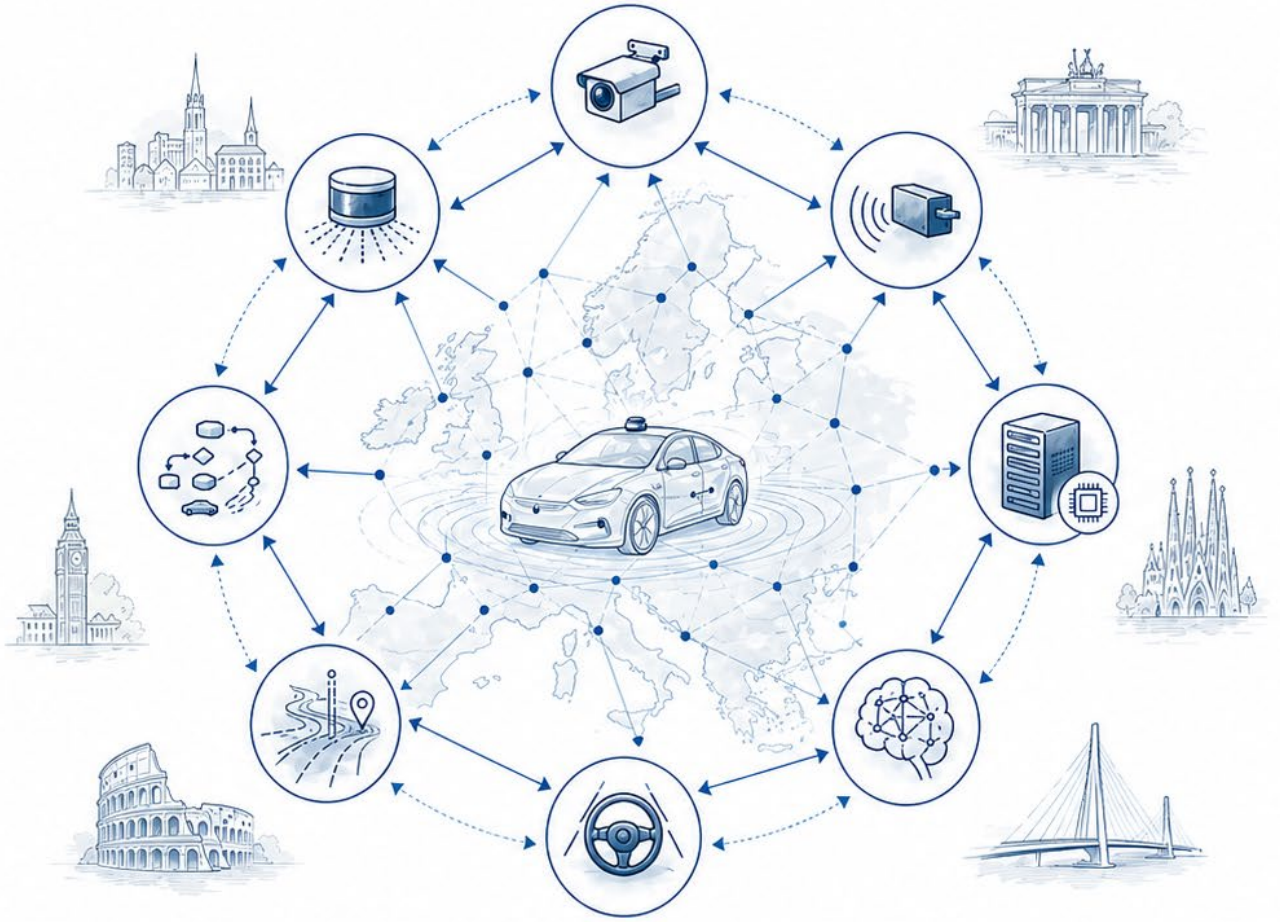


European Union Positioning

Strategic Misalignment

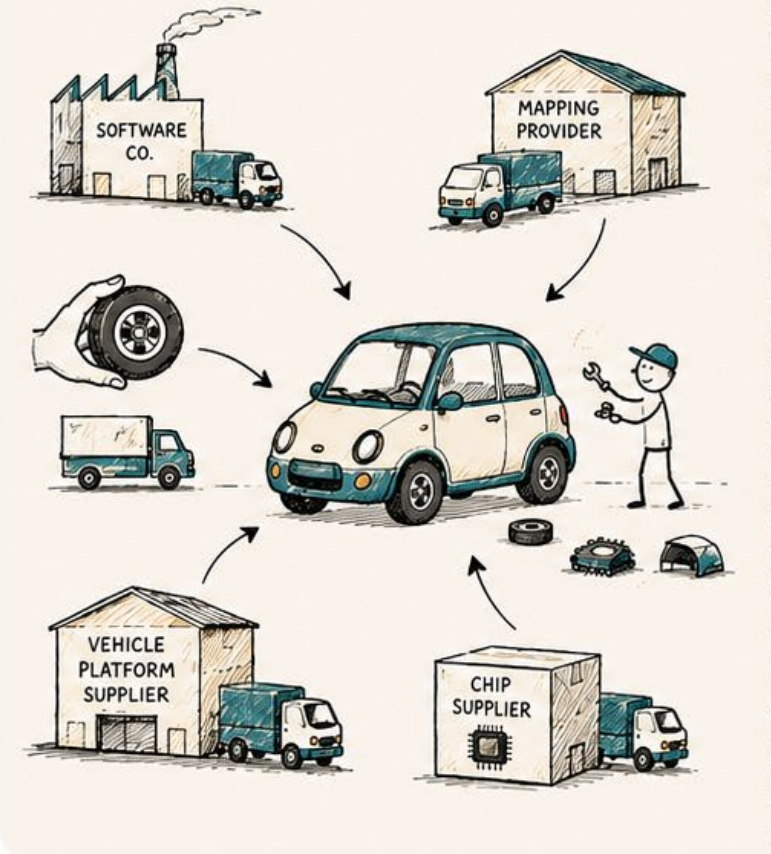
- **The Conflict:** The EU's weakest categories are exactly those where **ADS developers** are most concentrated.

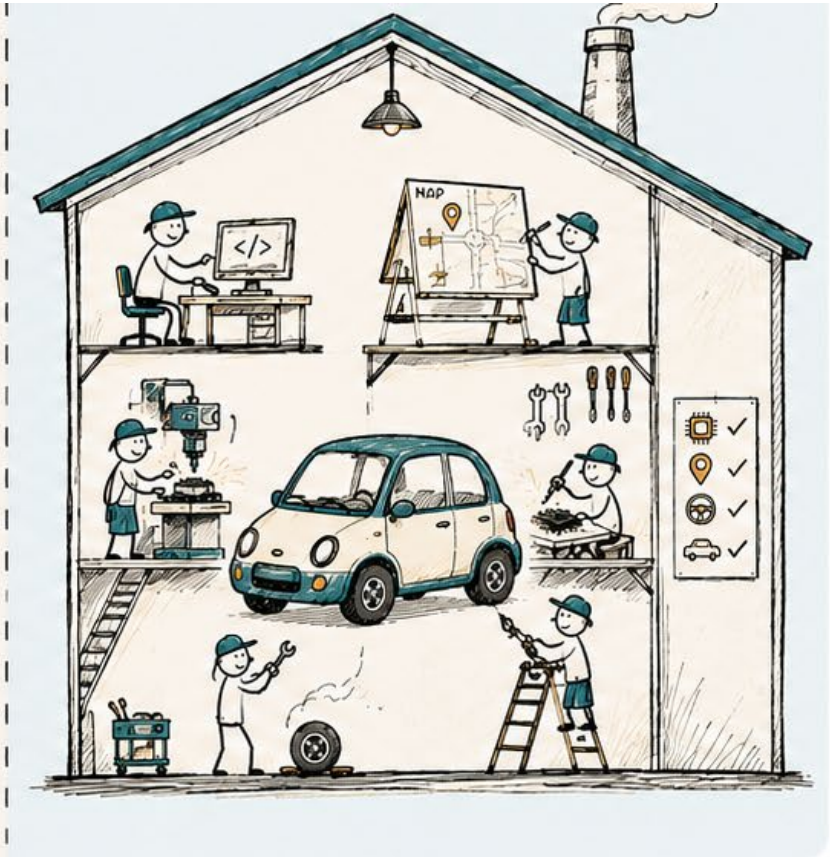
- **The Risk:** European firms are strong in hardware and integration but lack a leading share in the core algorithmic "stack" that defines the future of the industry.



EU strength remains concentrated in hardware and integration, while the strategic software core is less represented.

Is a company making each part of its product itself, or buying it in from someone else?





Thin supply base.
In a new market, specialised suppliers haven't emerged yet.

No double marginalisation.
When each firm in the chain layers its own profit markup on top of the last.

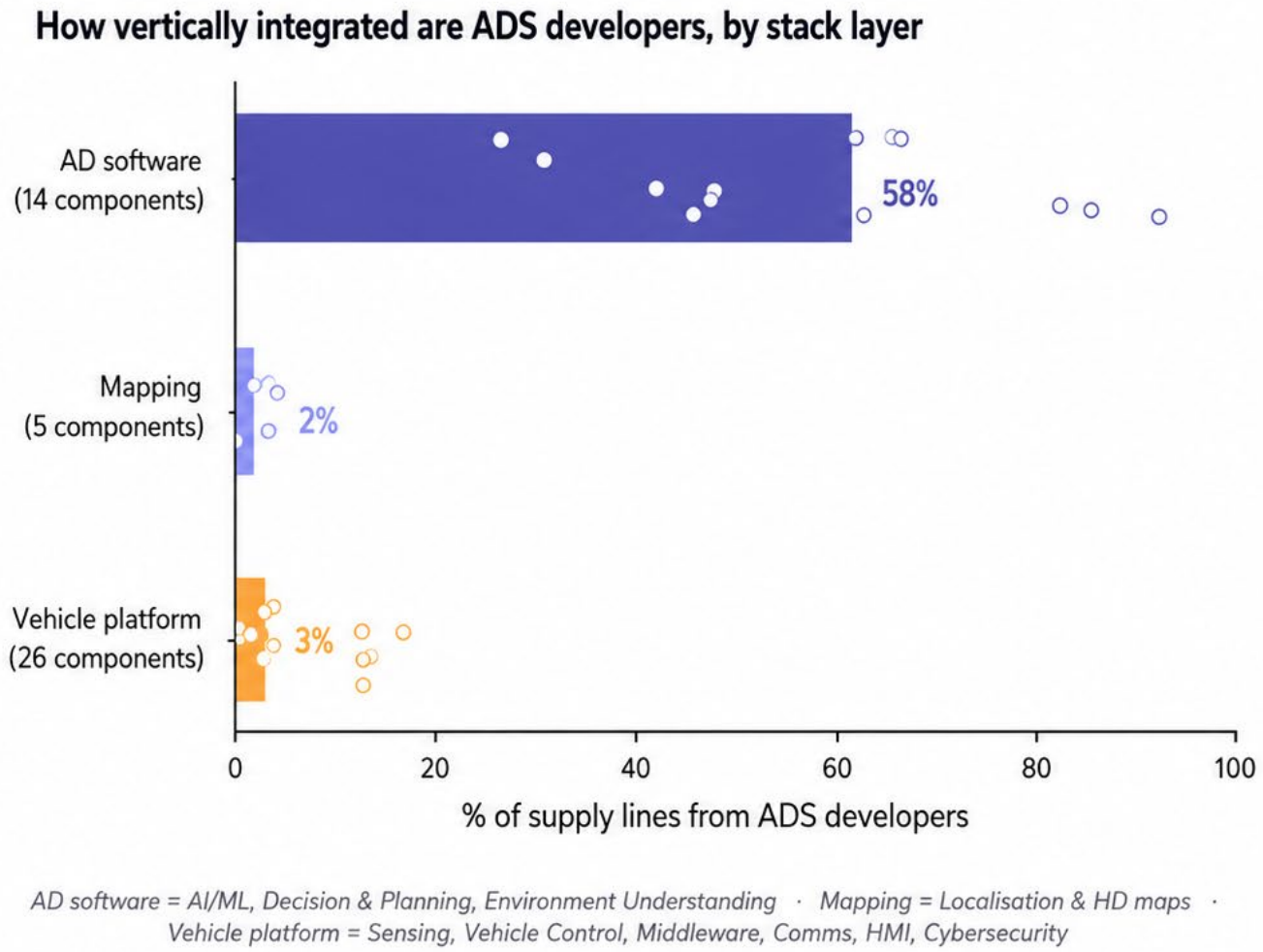
Big players can absorb the risk.
Only well-capitalised firms can carry the up-front cost and technical risk of building every layer at once.

ADS developers integrate the AD software layer

- **Integration follows value:**

  ADS developers keep the software brain in-house, and leave the mapping franchise and the vehicle platform almost entirely to external suppliers.

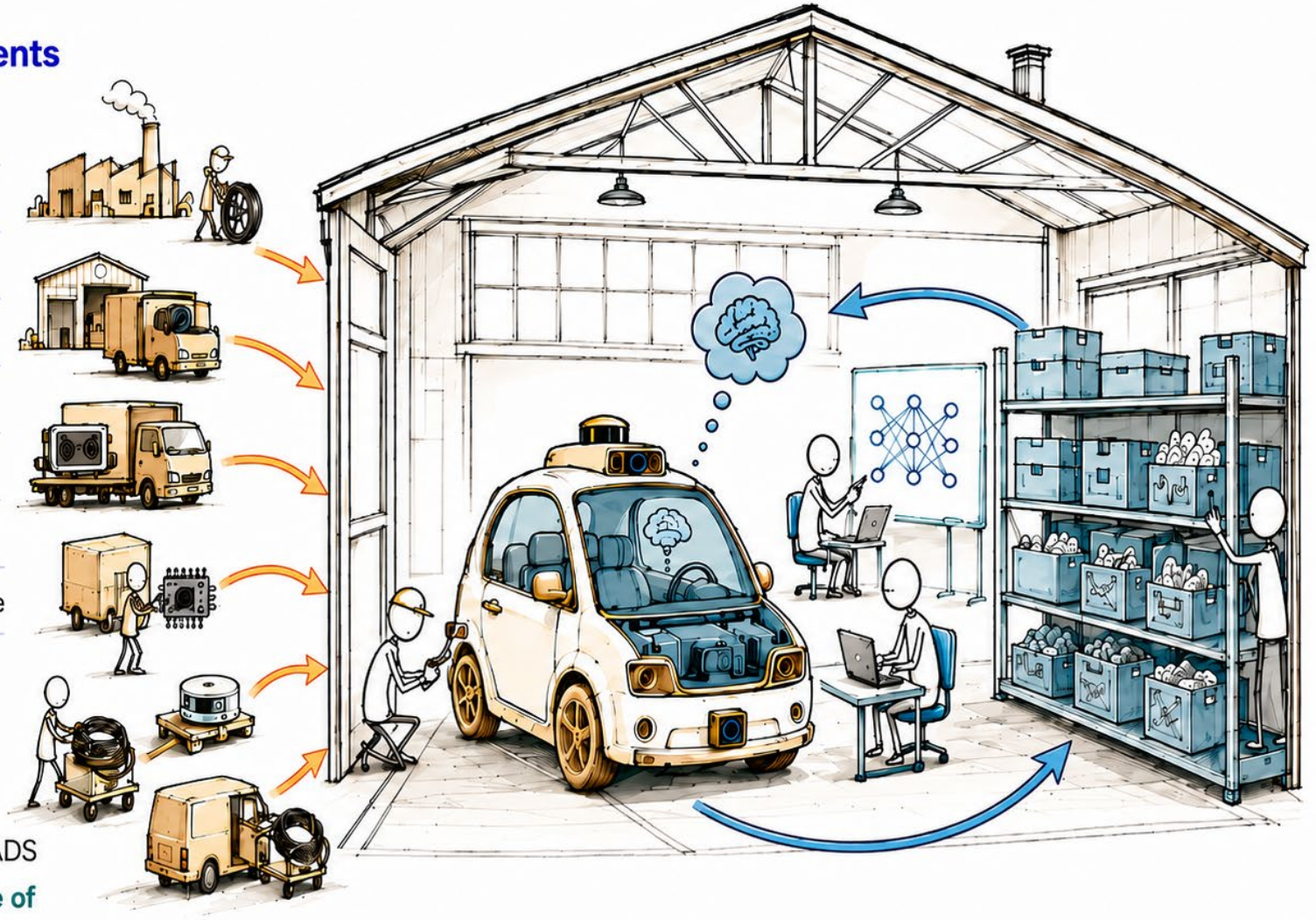
- **Most integrated components:**
  - End-to-end AI
  - Decision-Making
  - Modular AD Software Stack
  - Trajectory Optimization
  - Path Planning
  - Behaviour prediction
  - Environment Perception Fusion



The brain is kept in-house. The body is bought.

Most outsourced components

- Infrared camera
- HMI and Interaction
- ECUs
- Ultrasonic sensor
- Inertial Measurement Unit
- Wheel Encoders
- Drive-by-wire actuation systems
- In-Vehicle communication backbone
- Vehicle Control Unit



The closed data loop

By integrating the software stack, ADS developers also **capture every mile of operational data** the vehicle generates.

Regional context reshapes the picture

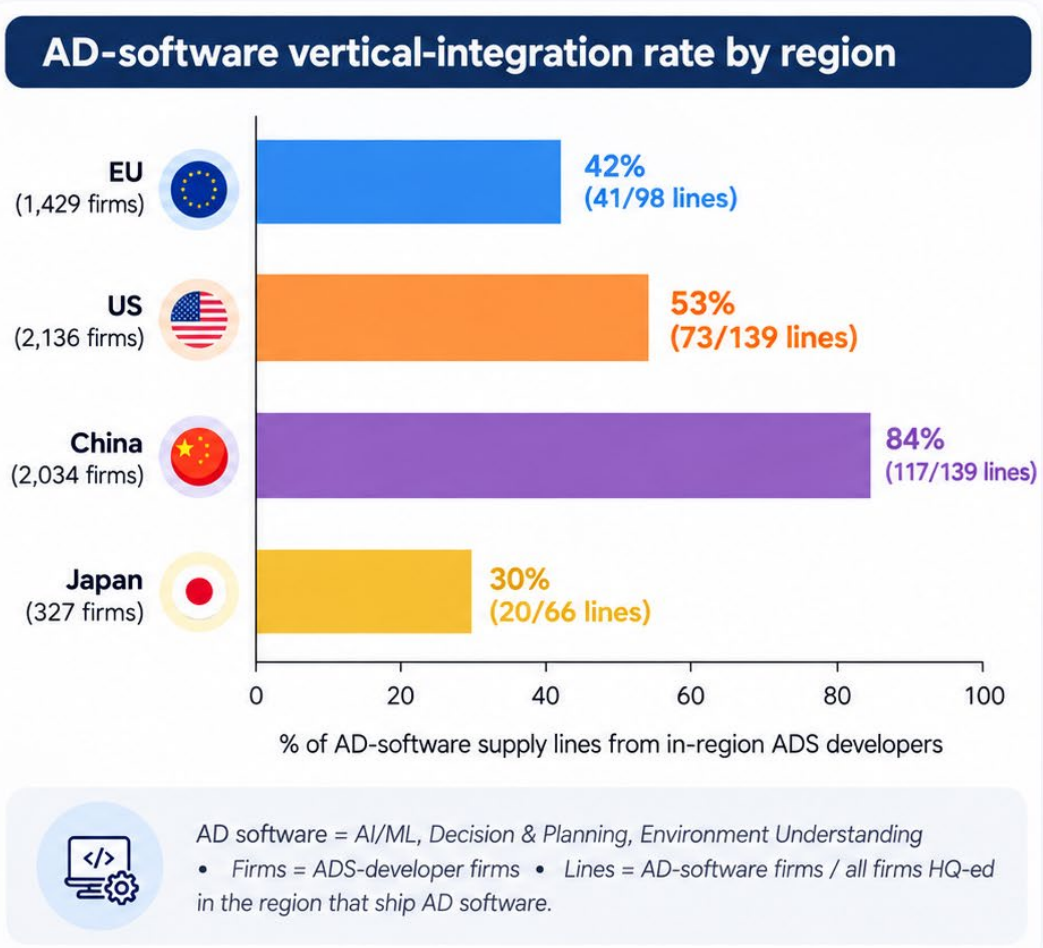
There is no single AD-industry architecture

China
Independent integration is the dominant model; local specialists build the stack end-to-end.

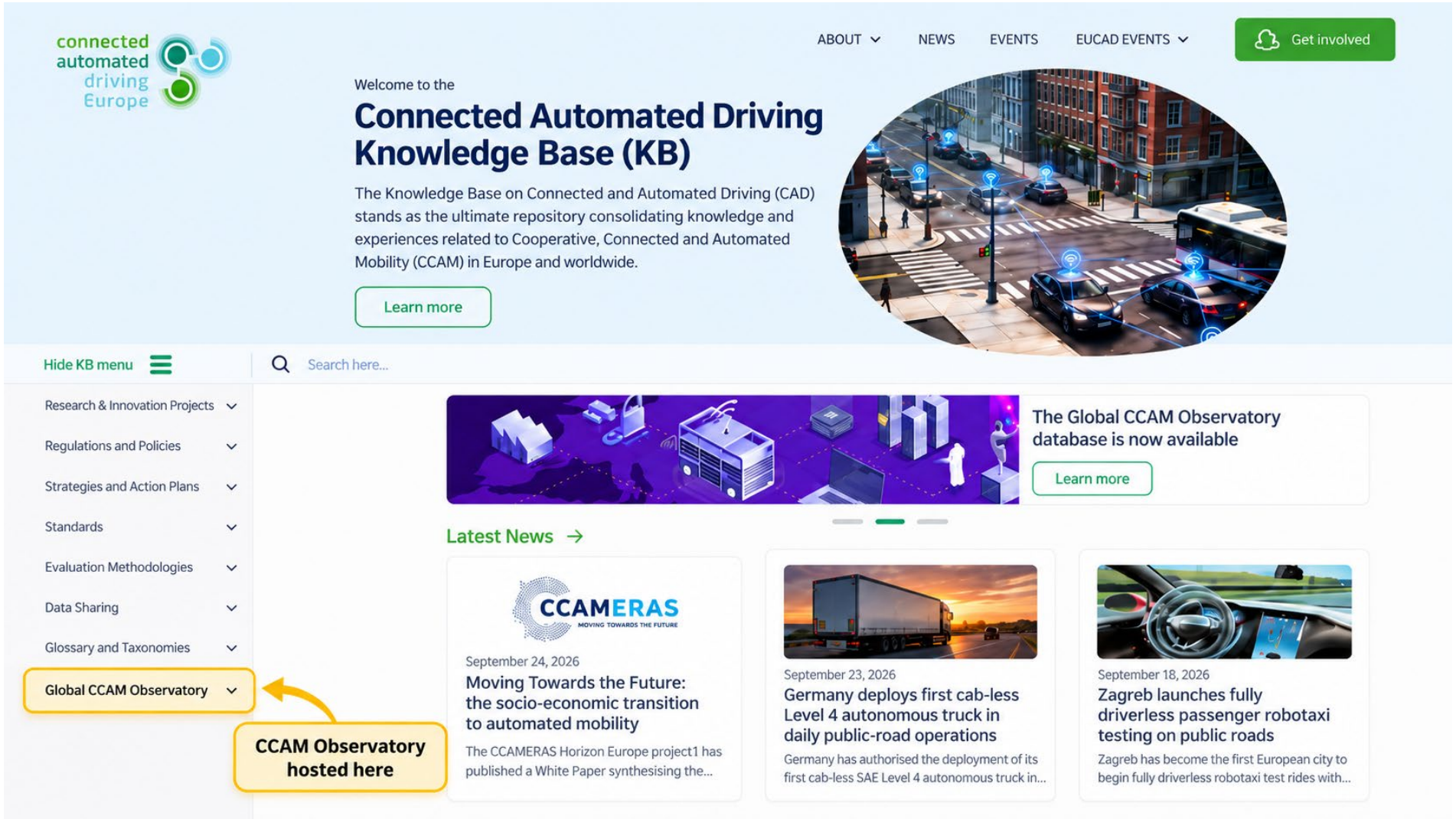
United States
A mix of closed full-stack developers and an active pure-software supplier market.

European Union
A more partnership-led pattern, with heavier reliance on Tier-1 and OEM alliances.

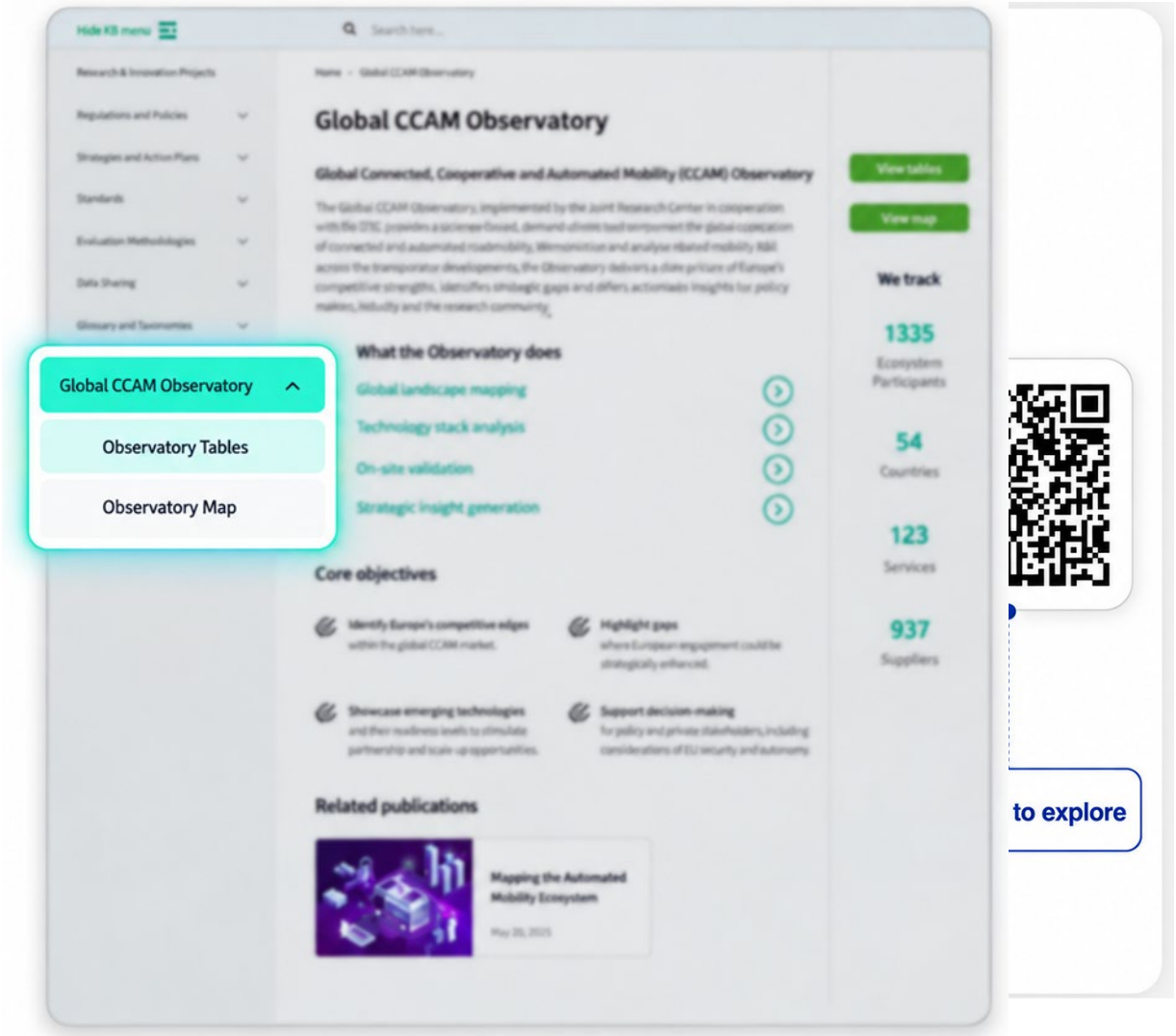
Japan
The most supplier-integrated pattern, anchored in long-standing Tier-1 relationships.



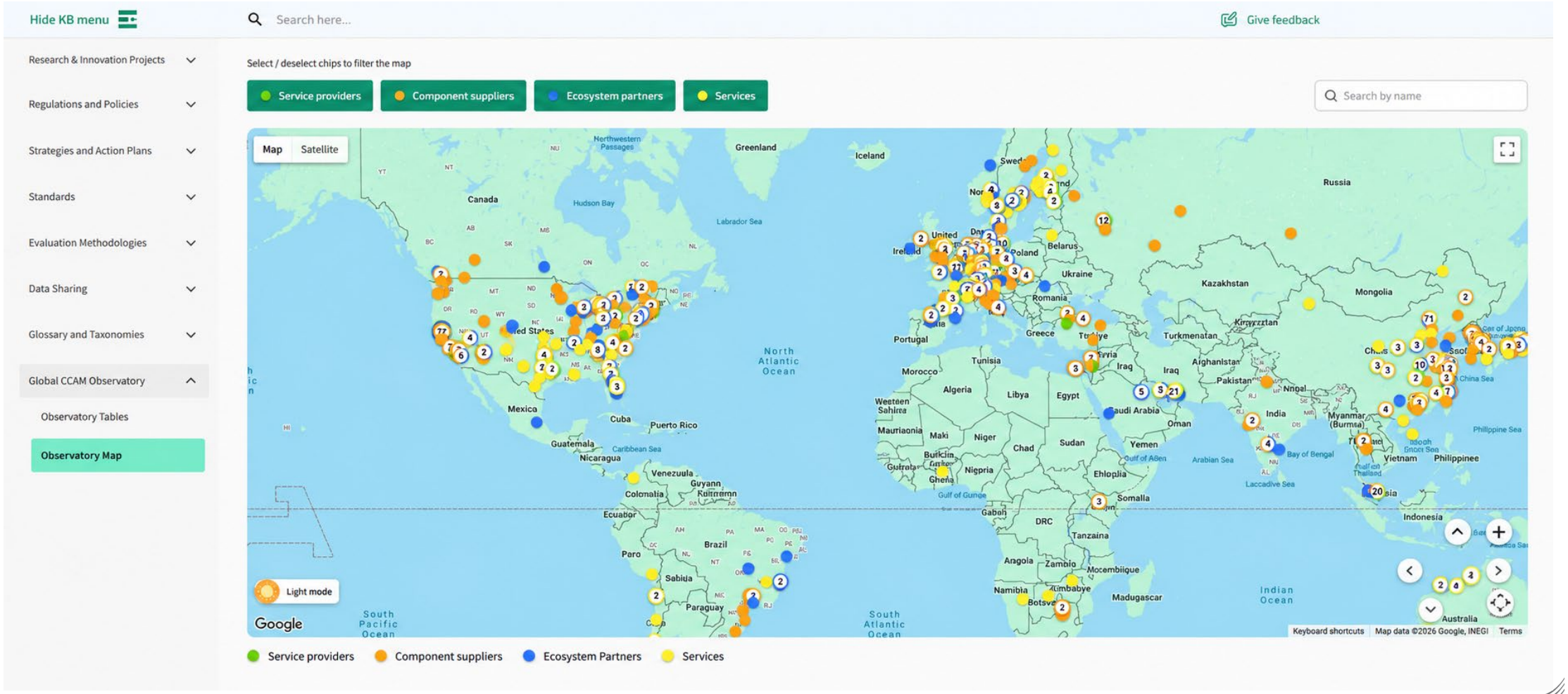
Where is it hosted?



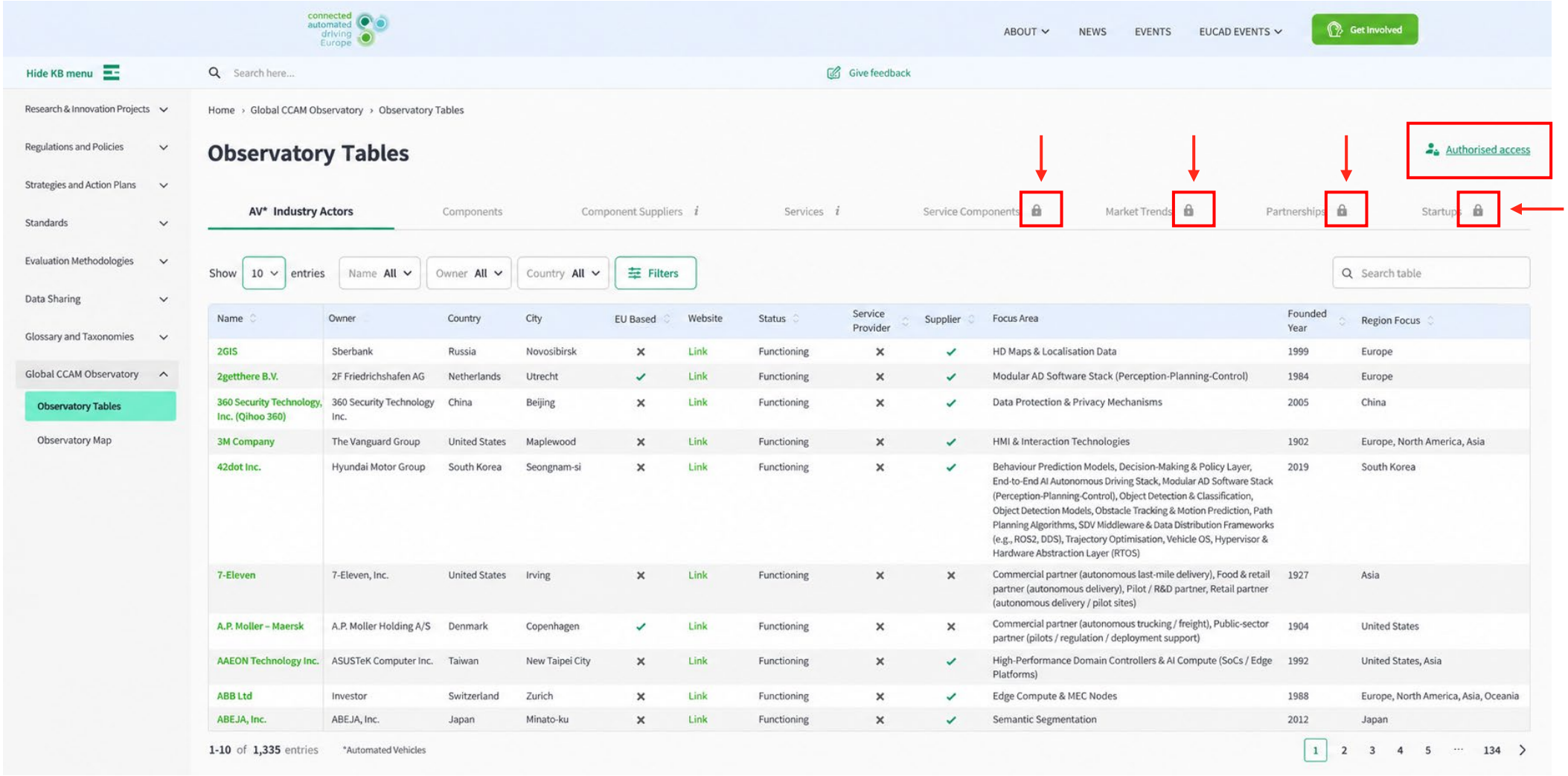
Observatory main page



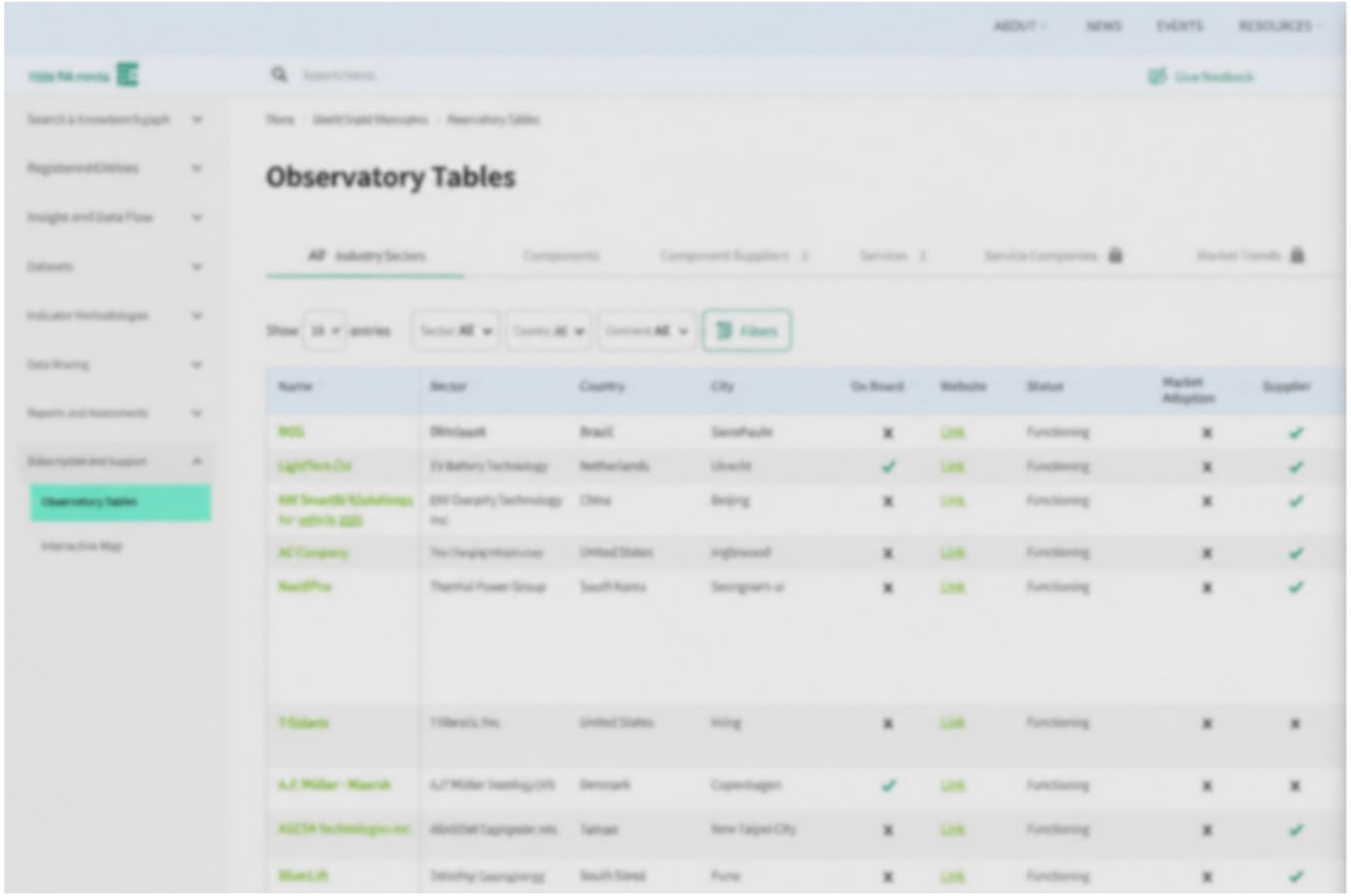
Observatory map

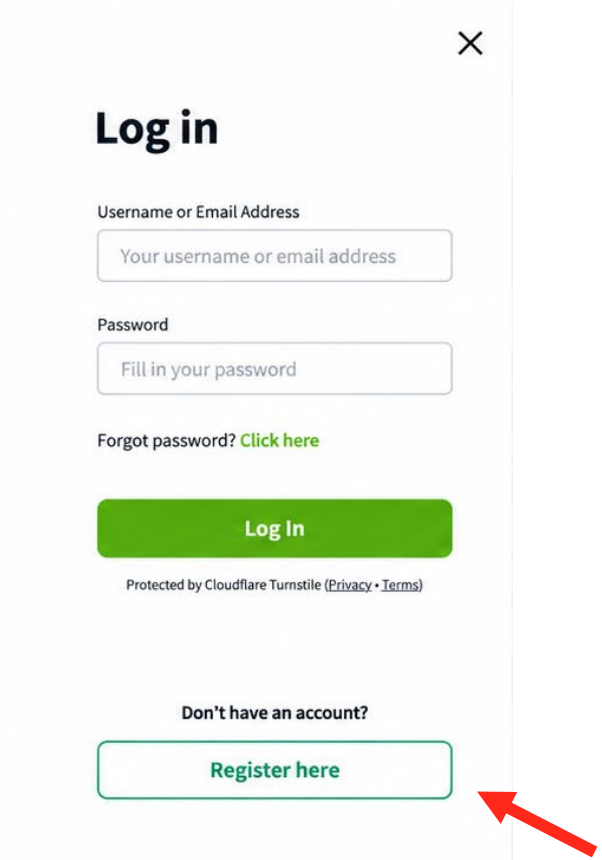


Observatory tables



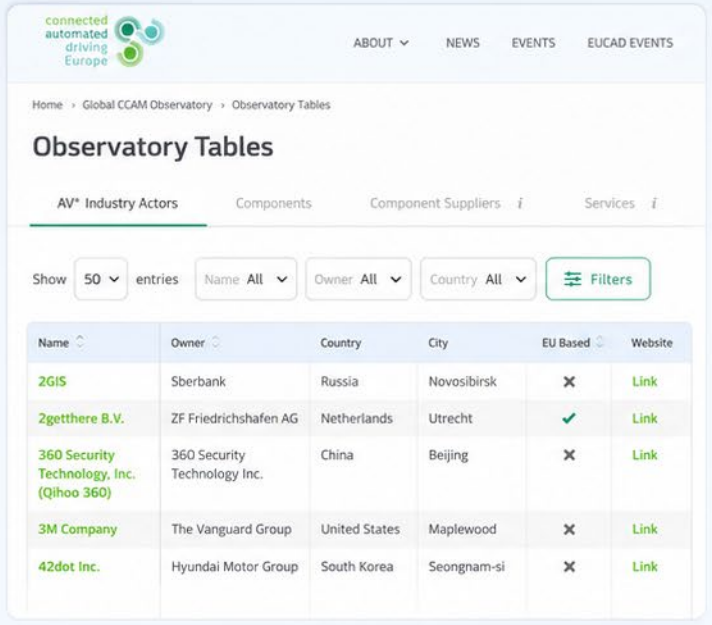
Restricted access





What users can find on the second level of access

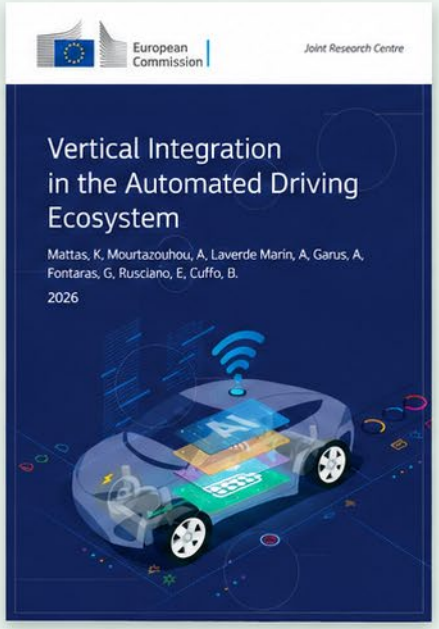
1 Observatory tables and data



Name	Owner	Country	City	EU Based	Website
2GIS	Sberbank	Russia	Novosibirsk	✗	Link
2getthere B.V.	ZF Friedrichshafen AG	Netherlands	Utrecht	✓	Link
360 Security Technology, Inc. (Qihoo 360)	360 Security Technology Inc.	China	Beijing	✗	Link
3M Company	The Vanguard Group	United States	Maplewood	✗	Link
42dot Inc.	Hyundai Motor Group	South Korea	Seongnam-si	✗	Link

Access to all the tables and the data gathered.

2 Focused publications



Publications dedicated to specific topics.

3 Site-visit reports



A series of reports from selected visits and deployments.

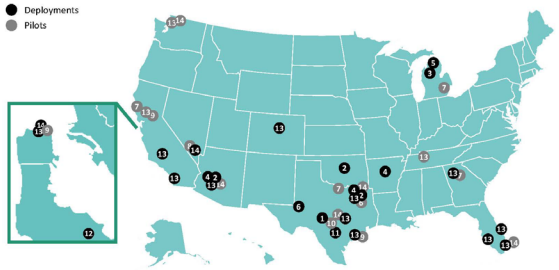
Link with CCAMbassador Country Factsheets



CCAM R&D&I Ecosystem in USA

The US CCAM ecosystem is mainly market-driven, with private industry leading technology development and early deployment, while public authorities focus on impact assessment, guidance and post-market safety oversight rather than pre-market type approval. Vehicle safety is regulated at federal level by NHTSA through a self-certification regime, whereas testing and deployment rules are largely determined at state level, resulting in a fragmented regulatory environment. Public CCAM R&D is coordinated mainly by USDOT through the ITS JPO, which manages cross-modal research on automated driving, human factors, simulation and connectivity. Unlike the EU or Japan, connectivity and V2X are not mandated for automated driving; automation-only approaches dominate. Since 2021, the Infrastructure Investment and Jobs Act has significantly reinforced federal investment in digital infrastructure, traffic operations, safety and connectivity pilots.

Main Stakeholders, Pilots & Deployments



POLICY

- NHTSA, Washington, DC
- FHWA, Washington, DC
- FTA, Washington, DC
- FMCSA, Washington, DC
- ITS JPO, Washington, DC

INDUSTRY

1. AVRIDE
2. Aurora
3. Ford
4. Gatik
5. GM
6. Jx
7. MAY
8. Motional
9. nuro
10. Plus
11. STARSHIP
12. Uber
13. WAYMO
14. ZOOX

National CCAM Timeline

1997	1999	2004 - 2007	2009	2012	2019	2020	2023	2023	2024	2024	2025	2025	2026
Automated highway Demo '97	FCC assigns spectrum for DSRC V2X	DARPA Grand Challenges	Google's development of self-driving technology	Nevada and California AV legislation	Aurora 1st heavy truck company with driverless testing permit	Waymo 1st driverless public ride Phoenix	Deployment permit SF Cruise / Waymo (aug)	Cruise's permit suspended (oct)	National Deployment plan V2X (aug)	FCC adopts C-V2X 5.9Ghz (nov)	AV-Framework in Innovation Agenda, NHTSA	Upscaling Waymo deployments	Gatik launches first driverless trucks at scale

Primary R&D Topics

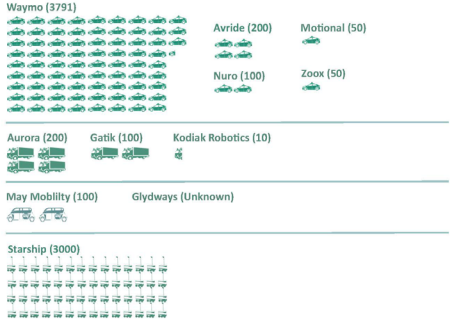
- Safety Validation (NHTSA)
- V2X / Connectivity (ITS- JPO)
- ADAS and ADS in bus and transit shuttles (FTA)
- Freight Automation (FMCSA)
- Cooperative driving automation with digital infrstructure (FHWA)

Building Block Index

Successful implementation of CCAM depends on a combination of regulatory, organisational, technical and societal conditions that enable automated mobility solutions to move beyond pilot projects and into everyday operation. Europe has identified the following key Deployment Building Blocks (DBBs) to support this transition: Vehicle (inside the vehicle), Person (users, citizens, workforce), Physical & Digital Infrastructure (communication, roadside, server), Business, Design and operations (operational challenges, lessons learnt, integration into public transport) and Regulation. A qualitative assessment by the CCAMbassador team to see to what extent these building blocks are addressed in the various regions around the world led to the following insights / relative ranking. In the US the most mature building blocks are Business, Vehicle, Design and operations and Regulation, followed by Physical & Digital Infrastructure and Person.

Relative Fleet Sizes

= 50



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This factsheet is based on publicly available information, input from CCAMbassador experts and relevant national stakeholders. Despite best efforts to ensure accuracy and completeness, it should not be considered authoritative or exhaustive. Suggestions or remarks? Contact info@connectedautomateddriving.eu

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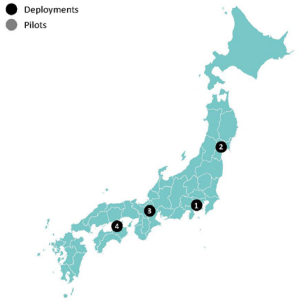
CCAM R&D&I ECOSYSTEM IN

United States of America

CCAM R&D&I Ecosystem in **Japan**

Japan's CCAM ecosystem is shaped by demographic pressures, strong state coordination, and long-term industry–academia collaboration. Automated mobility addresses aging-population mobility gaps through services such as rural shuttles and pilot deployments, and is embedded in the national Society 5.0 strategy issued by the Cabinet Office, emphasizing safety, resilience and digital infrastructure. Regulatory progress — through initiatives like RoAD to the L4 ww— focuses on Level 4 deployment, safety assurance, and ITS infrastructure development. Japan's shift toward system-level mobility innovation is supported by Mobility Innovation Alliance Japan, covering digital twins, data spaces, and smart infrastructure. The country remains heavily engaged in EU cooperation, especially on safety harmonization and mobility services.

Main Stakeholders, Pilots & Deployments



POLICY

- National Police Agency (NPA)
- Ministry of International Affairs and Communications (MIC)
- Ministry of Economy, Trade and Industry (METI)
- Ministry of Land, Infrastructure and Transport and Tourism (MLIT)
- Digital Agency
- Cabinet Office, Bureau of Science, Technology and Innovation

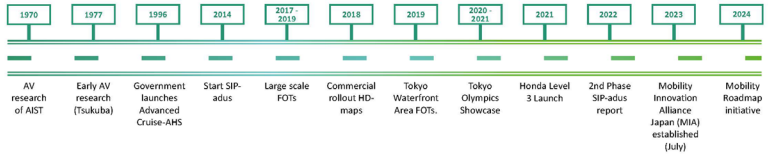
INDUSTRY

NISSAN, MITSUBISHI HEAVY INDUSTRIES, TOYOTA, HINO

DEPLOYMENT

1 BYD, 3 KYOTO, 2 HINO, 4 NAVYA

National CCAM Timeline



Primary R&D Topics

- Development & validation of automated driving systems through Field Operational Tests (FOTs).
- FOTs in real urban conditions, such as the Tokyo waterfront area.
- FOTs for social implementation of mobility and logistics services in local regions.
- Traffic Data & Safety Platforms
- Societal Mobility Use Cases
- Smart Infrastructure for CCAM
- Implementation & Commercialization Tools
- International collaborative R&D

Relative Fleet Sizes

= 50

Tier IV (100)

Honda (Cruise JV) (50)

Panasonic (20)

Building Block Index

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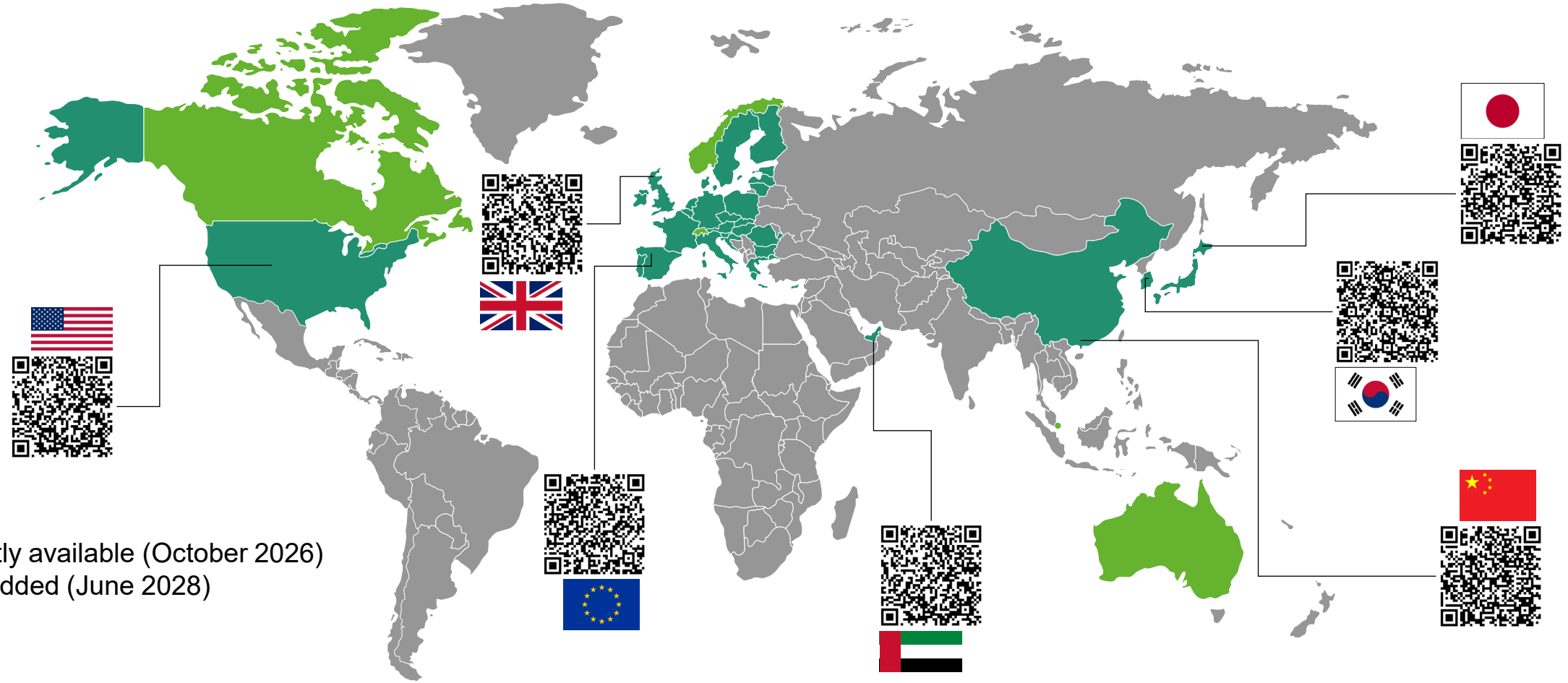
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CCAM R&D&I ECOSYSTEM IN

Japan

FACTSHEETS R&D&I CCAM ECOSYSTEM



- Currently available (October 2026)
- To be added (June 2028)

Access all factsheets

Thank you

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