

Digital Mobility Solutions Conference

11.10.23

Digitally enhanced driving

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busworld®

EUROPE BRUSSELS

7-12 OCT 2023 



Automated driving



Drones



Data exchange



Traffic management



Artificial Intelligence



Mobility as a Service



Mobility Apps



Transport and Logistics

ITS

Intelligent Transport Systems



Navigation



Intelligent Infrastructure



Safety



Multimodality



Payment Systems



V2X Communication



eMobility

From ADAS to driverless...



ASSISTED DRIVING

- The driver is at the wheel and must constantly supervise the vehicle and **intervene when necessary**.
- The system provides **steering, acceleration** and **braking** support.



AUTOMATED DRIVING

- The system is able to **cope with all dynamic driving tasks** within its operational design domain (ODD) without driver supervision.
- It will **transition to the driver**, offering sufficient lead time, when these conditions are not met.
- The driver may **perform non-driving related tasks**.
- The driver must be promptly **available for safe transition of control**.



AUTONOMOUS DRIVING

- The system drives the vehicle **under all conditions**.
- **No driver input is required**.
- All vehicle occupants are effectively passengers.

From ADAS to automation in the bus community -> challenges

Safety

- Complex active and passive safety systems
- Interpreting the physical infrastructure
- EU General Safety Regulation (in force 6th July 2022)
- Role of testing and validation
- Role of ISA, data recording, monitoring and incident reporting

Infrastructure

- Physical and digital infrastructure
- Road infrastructure accommodate and optimize the flow of automated buses efficiently
- Dedicated lanes, digital twins in the digital perception
- Cooperation between PTO, PTA, local communities

Public acceptance & trust

- Community awareness: role of public and private sector
- Skills
- Resilience
- Set the public example via tangible use cases

From ADAS to automation in the bus community -> challenges

Regulatory framework

- UN-ECE R155 (cyber), R156 (SW updates), R157 (ALKS)
- National type approval frameworks for L4 in UK, DE and FR
- New EU type approval for ADS (implementing regulation 2022/1426 on ADS), currently only for small series
- DSSAD and liability rules
- AI act
- Traffic rules (Vienna & Geneva conventions at UN level)
- Driving licence

Privacy and security

- Increased reliance on technology -> concerns about data privacy and cybersecurity
- Vast amounts of data:: geolocation, passenger information, many are personal data
- V2V, V2I, V2X : cyber resilience is key

New EU safety rules set framework for EU-wide type approval for AD

General Safety Regulation

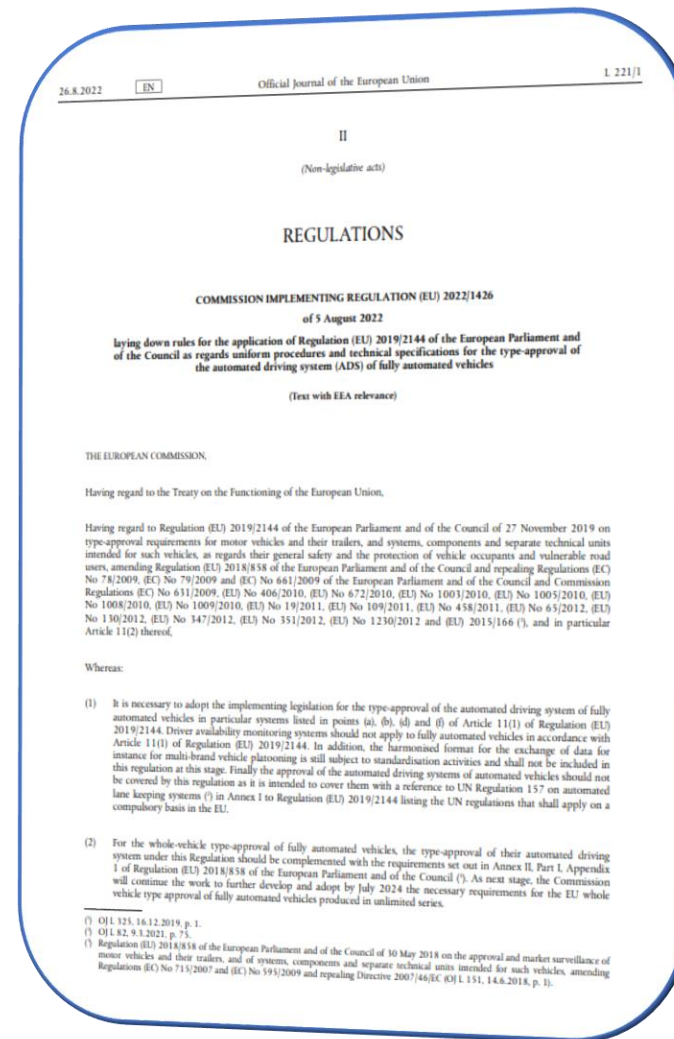
New rules on vehicle safety and automated mobility

6 JULY 2022



Implementing Regulation on Automated Driving Systems -> 5th August 2022

- ❑ EU type approval
- ❑ **Strict** rules based on UN-ECE and other
- ❑ **Compliance** assessments:
 - ODD/various traffic scenarios
 - Minimum risk maneuver
 - ADS safety concept & audit
 - Validation tests
 - Principles for creditability assessment
 - In-service monitoring & reporting
- ❑ Cybersecurity and software updates OTA
- ❑ EDR (recording of occurrences and data elements)
- ❑ Limited to **small series** (at this stage)



National type approval & updated traffic rules

Examples:

- United Kingdom:** legislative framework ready
- Germany:** legislative framework ready
- France:** legislative framework ready
- Sweden :** testing on public roads since 2017. “Vision Zero” strategy with focus on connected and automated vehicles
- Netherlands:** guidelines and legislation to allow the testing of autonomous vehicles, including buses, on public roads (also with dedicated testing facilities such as the Automotive Campus in Helmond/Eindhoven).
- ...

-> Very different regimes applicable in the USA. Cfr California new ruling (e.g. San Francisco robottaxi)

National type approval & updated traffic rules

UK : May 2023 Scotland rolled out five autonomous buses

- ❑ First registered bus service using full-sized autonomous buses in the UK (and Europe)
- ❑ Part of the £6.1 million fund by the UK Government's Centre for Connected and Autonomous Vehicles (CAV)
- ❑ The first phase, CAVForth I, is ongoing and will run until November 2023, collecting essential data on performance, passenger experience, and economic viability. The subsequent phase, CAVForth II will extend the route by five miles into Dunfermline city center, introducing more complex autonomous driving scenarios. This phase is scheduled to run until at least March 2025.

More: <https://www.cavforth.com/ambitious-and-complex-cavforth-autonomous-bus-service-launches-in-scotland-controlled-by-fusion-processings-automated-drive-system/>

FAME


Framework for coordination of Automated Mobility in Europe



European Commission funded
Research & Innovation Action

July 2022 – June 2025
23 partners from 12 States

Coordinated by ERTICO-ITS Europe



THE FAME PROJECT IS FUNDED BY THE
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R&I Projects

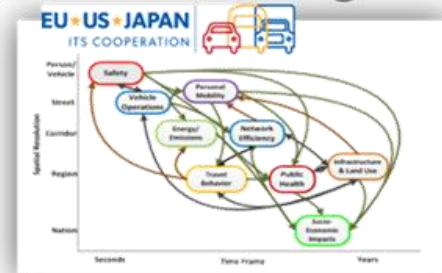


CCAM Knowledge Base

One-stop shop” for all CCAM related activities in Europe



Evaluation Methodologies



Policies & Regulations



Data Sharing Framework



Strategies & Action Plans



News & Events



EUCAD



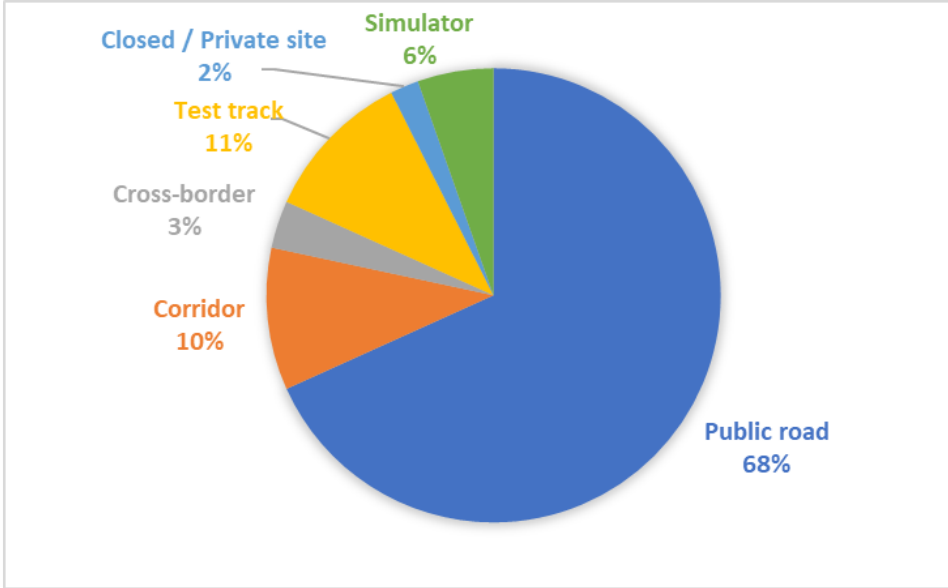
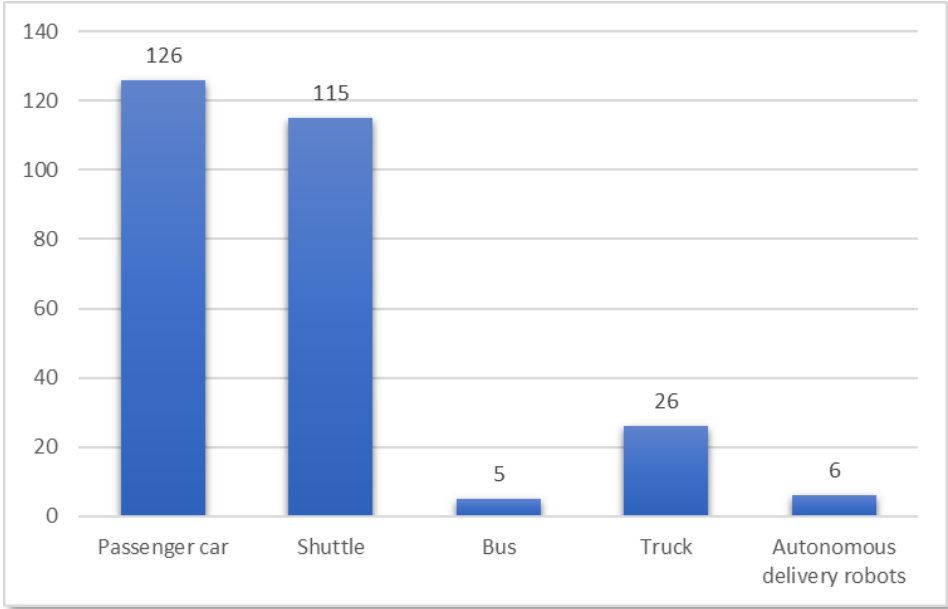
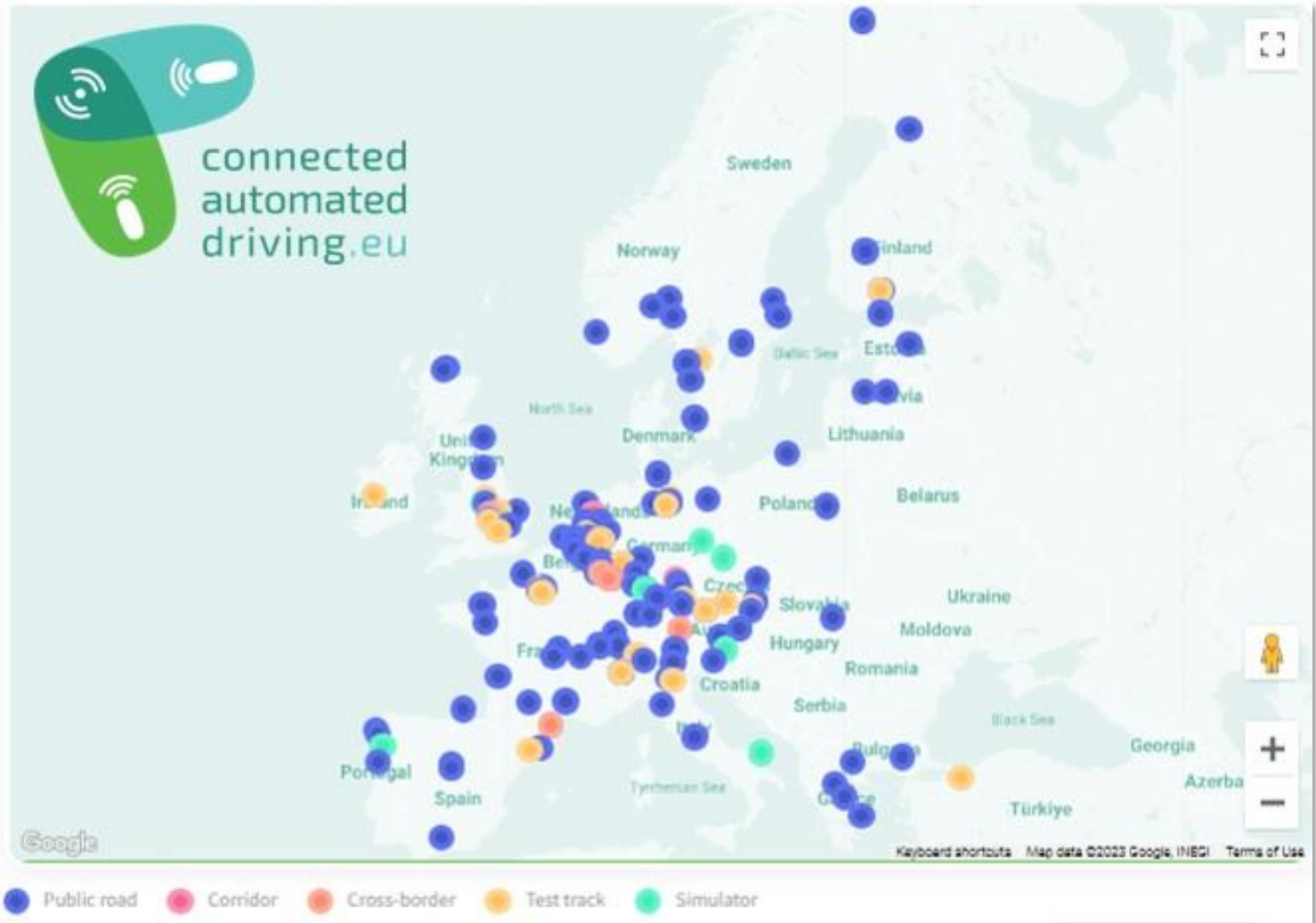
Standards

Standards Collection

Standard	Year	Status
EN 15253-1	2015	Standard
EN 15253-2	2015	Standard
EN 15253-3	2015	Standard
EN 15253-4	2015	Standard
EN 15253-5	2015	Standard
EN 15253-6	2015	Standard
EN 15253-7	2015	Standard
EN 15253-8	2015	Standard
EN 15253-9	2015	Standard
EN 15253-10	2015	Standard
EN 15253-11	2015	Standard
EN 15253-12	2015	Standard
EN 15253-13	2015	Standard
EN 15253-14	2015	Standard
EN 15253-15	2015	Standard
EN 15253-16	2015	Standard
EN 15253-17	2015	Standard
EN 15253-18	2015	Standard
EN 15253-19	2015	Standard
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EN 15253-21	2015	Standard
EN 15253-22	2015	Standard
EN 15253-23	2015	Standard
EN 15253-24	2015	Standard
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EN 15253-97	2015	Standard
EN 15253-98	2015	Standard
EN 15253-99	2015	Standard
EN 15253-100	2015	Standard

CCAM Tests and Demonstrations in EU

EU-wide Knowledge Base on CCAM 266 Test Sites



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**“Alone we can do so little,
together we can do so much”** Helen Keller

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