



Department
for Transport

Automated Driving Systems: An overview of the UN regulations

ITU Future Network Car Symposium 2026

9th July 2026

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What is an 'automated driving system'?

Driver assistance systems



Systems which *assist* the driver

- Driver assisted in longitudinal and/or lateral control.
- Conventional vehicle designs (pedals, steering wheel)
- Examples: lane keep assist, adaptive cruise control



Automated driving systems



Systems which *replace* the driver

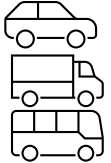
- Hardware and software designed to perform the dynamic driving task (i.e. designed for self-driving).
- Enables new vehicle designs (without driver controls).



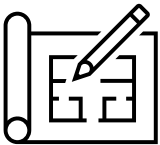
UN activity - Automated Driving Systems (ADS)



- Deliver a harmonised and mutually recognised approval regulation for *automated driving systems* by June 2026
- Deliver a Global Technical Regulation for *automated driving systems* by June 2026



Scope includes cars, vans, trucks, buses and quadricycles.
Enables wide range of use-cases, operational design domains and system designs.



Outcomes and performance-based regulation. Technology neutrality.



Agreed by 'contracting parties' (countries) to the 1958 and 1998 agreements, supported by industry.



Representatives from Canada, China, European Commission, France, Germany, Japan, Netherlands, South Korea, Sweden, UK, USA, industry, academia and other non-governmental organisations.

Conventional approach to regulating vehicle systems and components



- ✓ Works well for many vehicle systems and components
- ✓ Compliance is easily verifiable

Implicit assumption that performance in the prescribed test is representative of acceptable performance in real-world use

- A finite set of standardized tests is assumed sufficient to characterize the system performance.
- Behaviour is assumed consistent and transferrable from test conditions to operational use.

The (safety) case for a new approach...



ADS are complex systems (involving machine learning) and operate in a complex environment.



Challenging to regulate exhaustively through prescriptive tests which are abstract representations of real-world operating environments. Need to avoid a 'checklist' approach to safety assurance.



Safety isn't proven (or accepted) at a single point in time; it must be an ongoing endeavour.

Therefore, the ADS regulation safety assurance is structured around...

- A safety management system covering both ADS development and performance during use
- A safety case
- Performance reporting obligations

What is a safety case and a safety management system?



Safety Management Systems – systematic and structured approach to managing safety.



Safety cases – Structured approach to claiming and demonstrating safety:

- Claims that the ADS meets the requirements of the regulation
- Arguments for how those claims are met by the ADS
- Evidence to show those arguments are accurate

Technical requirements for the ADS



General requirements - The ADS shall be free of unreasonable risk and, as a general concept, be at least as safe as a 'careful and competent human driver'.



Performance of the Dynamic Driving Task (DDT) - The DDT requirements cover ADS control of the vehicle and safe operation in traffic. Requirements include compliance with traffic rules, avoiding collisions, and avoiding unreasonable disruption to the flow of traffic.



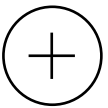
User Interactions - The user requirements cover the HMI, information to be provided to users, transitions between the ADS and Users, and measures to avoid mode confusion.



Data Storage System for Automated Driving (DSSAD) – Record ADS vehicle data when specified triggers occur (e.g. transfer of control from the ADS to a human user).



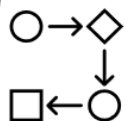
Cybersecurity and Software updating – Ensure ADS is cyber secure and updates are properly managed.



Other ADS requirements – facilitating vehicle inspections (including period technical inspections) and handling signals from other vehicle systems.



Manufacturer requirements



Minimum requirements for the manufacturer's safety management system

A Safety Management System (SMS) is a systematic approach to managing safety.

- Organisational safety policies, principles and culture
- Processes for risk management and ADS design and development
- Personnel competencies



Minimum requirements for credible testing environments

Ensure that the physical test environments and toolchains (e.g. virtual testing toolchains) are appropriate for their use.



Minimum requirements for providing a valid ADS safety case

Structured presentation of claims supported by SMS and testing outcomes that the ADS meets or exceeds the requirements of the regulation and is free from unreasonable risks to the ADS vehicle user(s) and other road users.



Minimum requirements for in-service monitoring and reporting

Establishes minimum requirements for capabilities to monitor the performance of ADS in use and establishes requirements for reporting on ADS safety performance.

Assessment requirements



Audit the Safety Management System

Verify compliance with SMS requirements.
A single SMS may cover multiple ADS.
Periodic certification anticipated



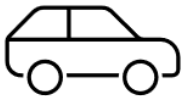
Assess test environment

Verify the credibility of the manufacturer's ADS testing organisation and management, including application of SMS outcomes to ensure effective testing of the ADS.



Assess safety case

Assess the safety case for completeness and robustness, and that each requirement of the regulation is addressed within the safety case. Assess that the ADS is free from unreasonable risk.



Perform confirmatory testing

Confirm that the evidence provided by the manufacturer accurately represents the ADS performance.

Concluding remarks

Safety in the real-world is what matters and cannot be reduced to a single test.

Safety is not a one-off judgement; it needs to be continually managed and assessed.

Safety is multi-faceted and needs to be supported by multiple layers of assurance.

The UN ADS regulation introduces a new approach to safety assurance for road vehicles:



Enables a wide range
of ADS use cases
and designs



Sets clear
real-world performance
expectations



**Requires a safety
management system**
to underpin and support
the ADS, including the need
to monitor in-service safety



Requires a safety case
to claim, supported by
a body of evidence,
that the system is safe



Covers safety across
a varied set of domains