















# ISO TS 5083 – SAFETY FOR AUTOMATED DRIVING SYSTEMS. PRINCIPALS.

## Groups of principals of safety and cybersecurity

PSC-01 Cybersecurity

PSC-02 Data Recording

PSC-03 Passive Safety

PSC-04 Safety Assessment

Automated Vehicle and  
Related Aspects

PSC-05 Safe Operation

PSC-06 Safety Layer

PSC-07 Behaviour in Traffic

PSC-08 Operational Design Domain

Automated Driving System

PSC-09 Role of User

PSC-10 Driver Initiated Takeover

PSC-11 Vehicle Initiated Takeover Request

PSC-12 Interdependency between Driver and Automated Driving System

Human Factors

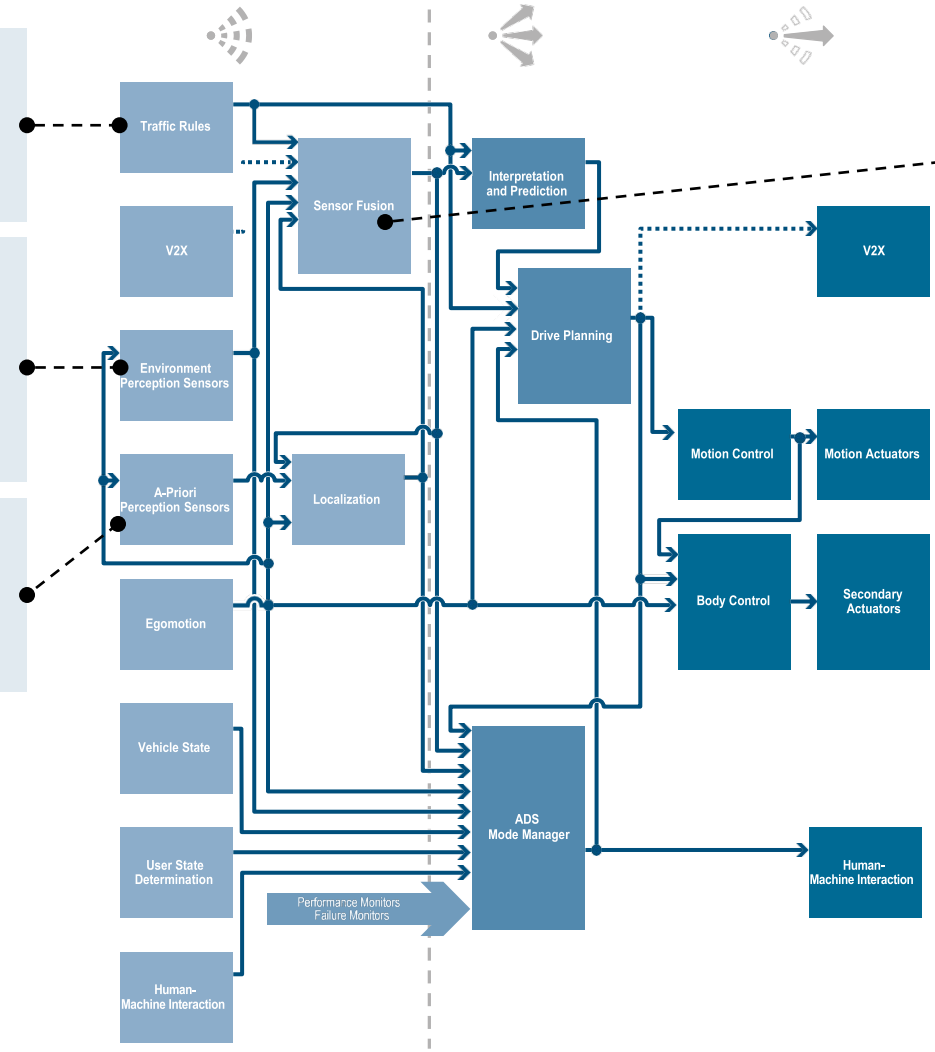


# ISO TS 5083 – SAFETY FOR AUTOMATED DRIVING SYSTEMS. GENERIC ARCHITECTURE.

**Traffic Rules:** Worldwide and locally different traffic rules need to be taken into account.

**Environment Perception Sensors:** Different physical principles.

**HD maps** have to offer reliable map attributes.



**Sensor Fusion:** Combination of at least three sensor technologies (e.g. camera, lidar, radar).

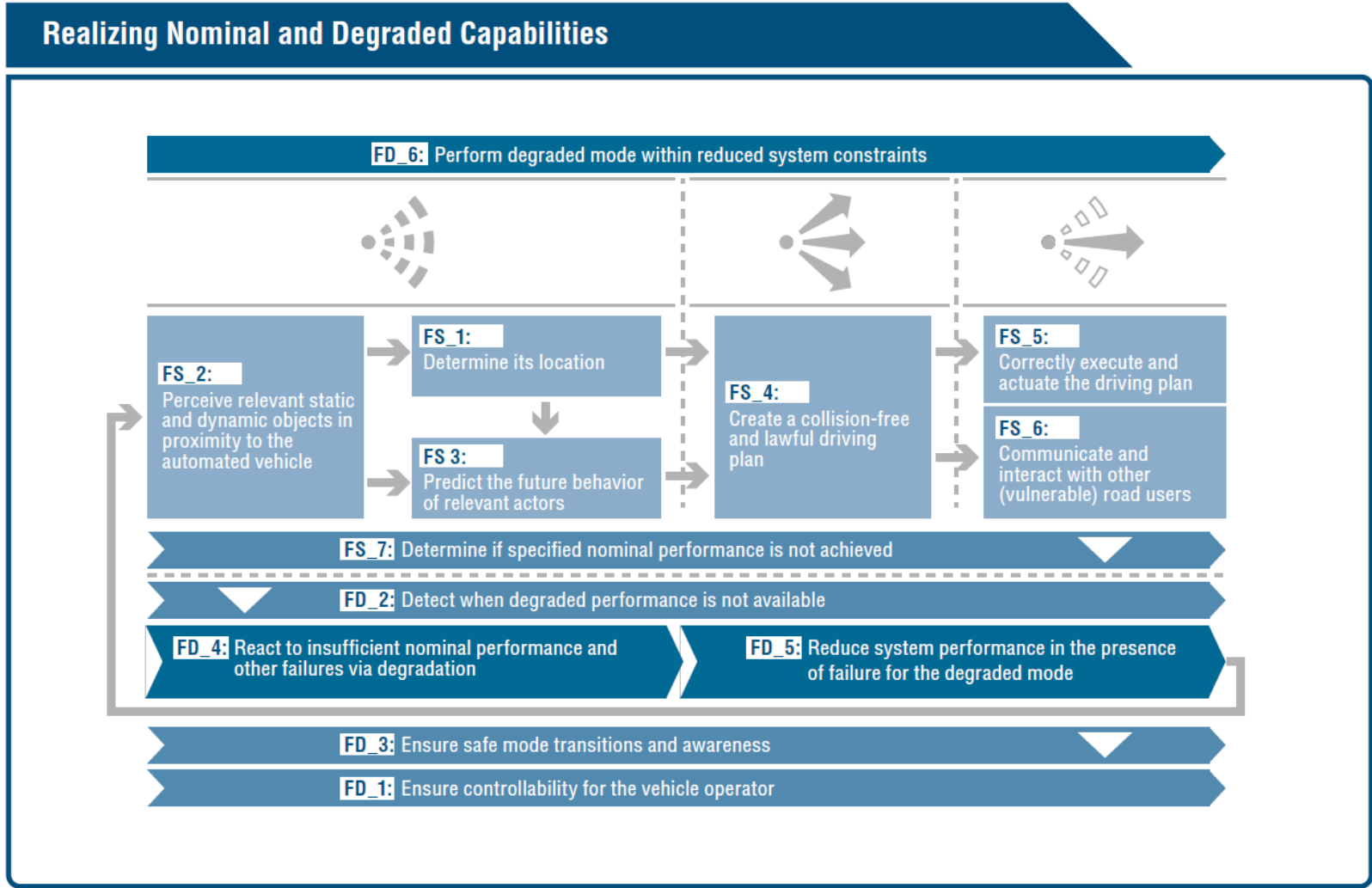
Safety measures for supervised offline trained DNNs.

Integrated circuits need to fulfill Functional Safety requirements.

Complement verification & validation approaches by field monitoring.

Implementation of redundant safety channel.

# ISO TS 5083 – SAFETY FOR AUTOMATED DRIVING SYSTEMS. SAFETY BY DESIGN.

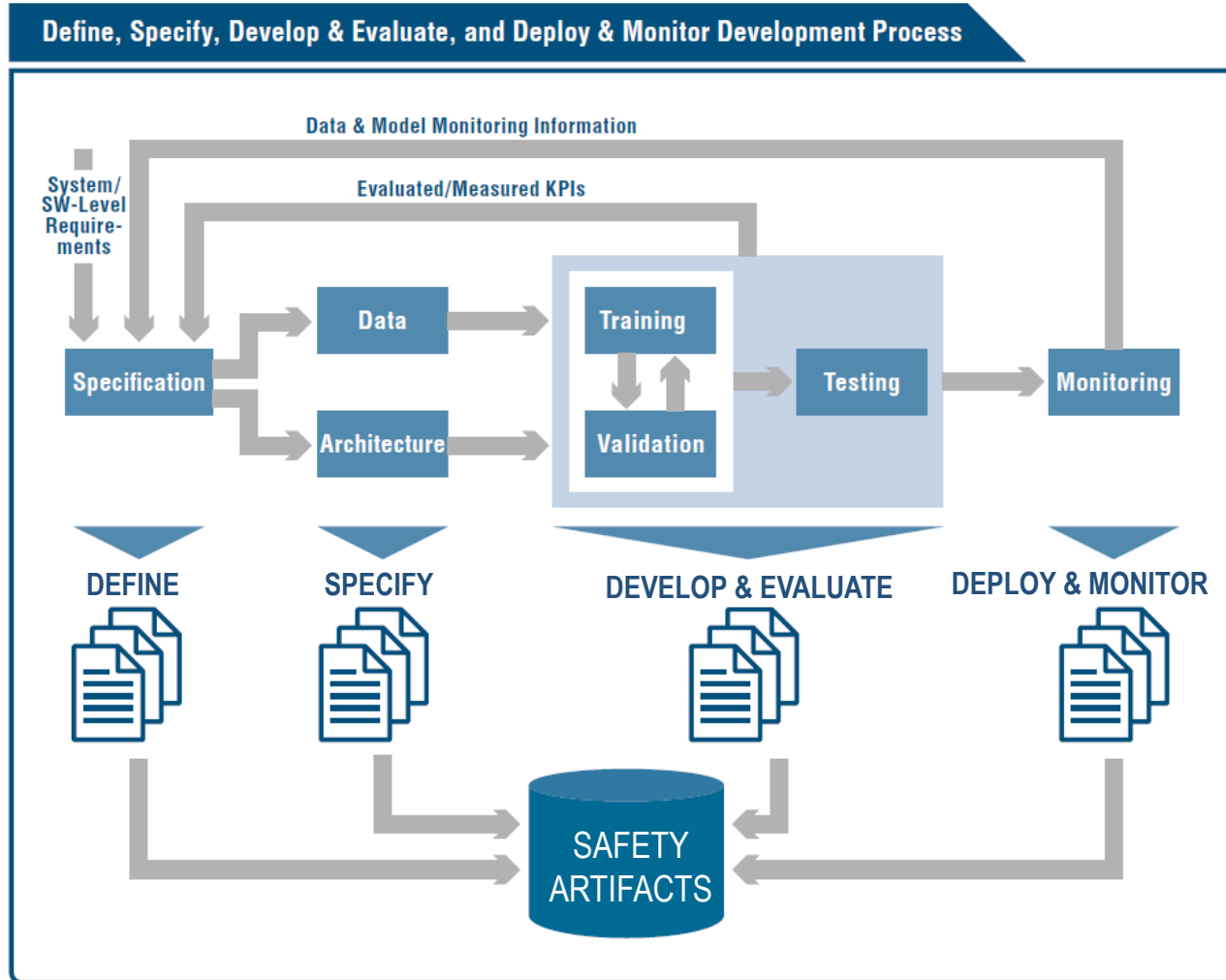


**Fail Safe (FS):**  
After failure the risk is small or covered by *Fail Degraded*



**Fail Degraded (FD):**  
Provide safe system for specific time until Minimal Risk Condition (MRC) is reached

# ISO TS 5083 – SAFETY FOR AUTOMATED DRIVING SYSTEMS. DEEP NEURAL NETWORKS.



Modular-based system architecture recommends that machine learning algorithms are treated as a software component.

**Development steps of deep neuronal networks**

**Each step should provide safety artifacts to support the safety case.**

# ISO TS 5083 – SAFETY FOR AUTOMATED DRIVING SYSTEMS. CURRENT AREAS OF WORK STRUCTURED BY CLUSTER AND TOPICS.

## G01 Overarching

C01 Scope

C23 Overarching

C03 Terms and definitions

C06 Principles

C02 Alignment with other related standards

C08 Reference safety life cycle

## G04 Safety by design

C10 Capabilities

C12 Elements

C21 Safety of connected vehicles

C11 MRM and MRC

C15 HD map

C04 Cybersecurity

C16 Architecture models

C22 Electrical architecture/ network design

## G03 Overall risk assessment and verification & validation

C05 Positive risk balance and avoidance of unreasonable risk

C07 Safety Case

C09 Generic structure of risk assessment

C18 Achievement of safety by fulfilled requirements

C13 Verification & validation

## G07 Development examples

C17 Development examples

C19 Busses and Trucks

C20 Different Level of AD systems

## G06 AI / ML

C14 Artificial intelligence / machine learning

# ISO TS 5083 – SAFETY FOR AUTOMATED DRIVING SYSTEMS. SUMMARY.

## ISO TS 5083 can support regulations on automated driving by

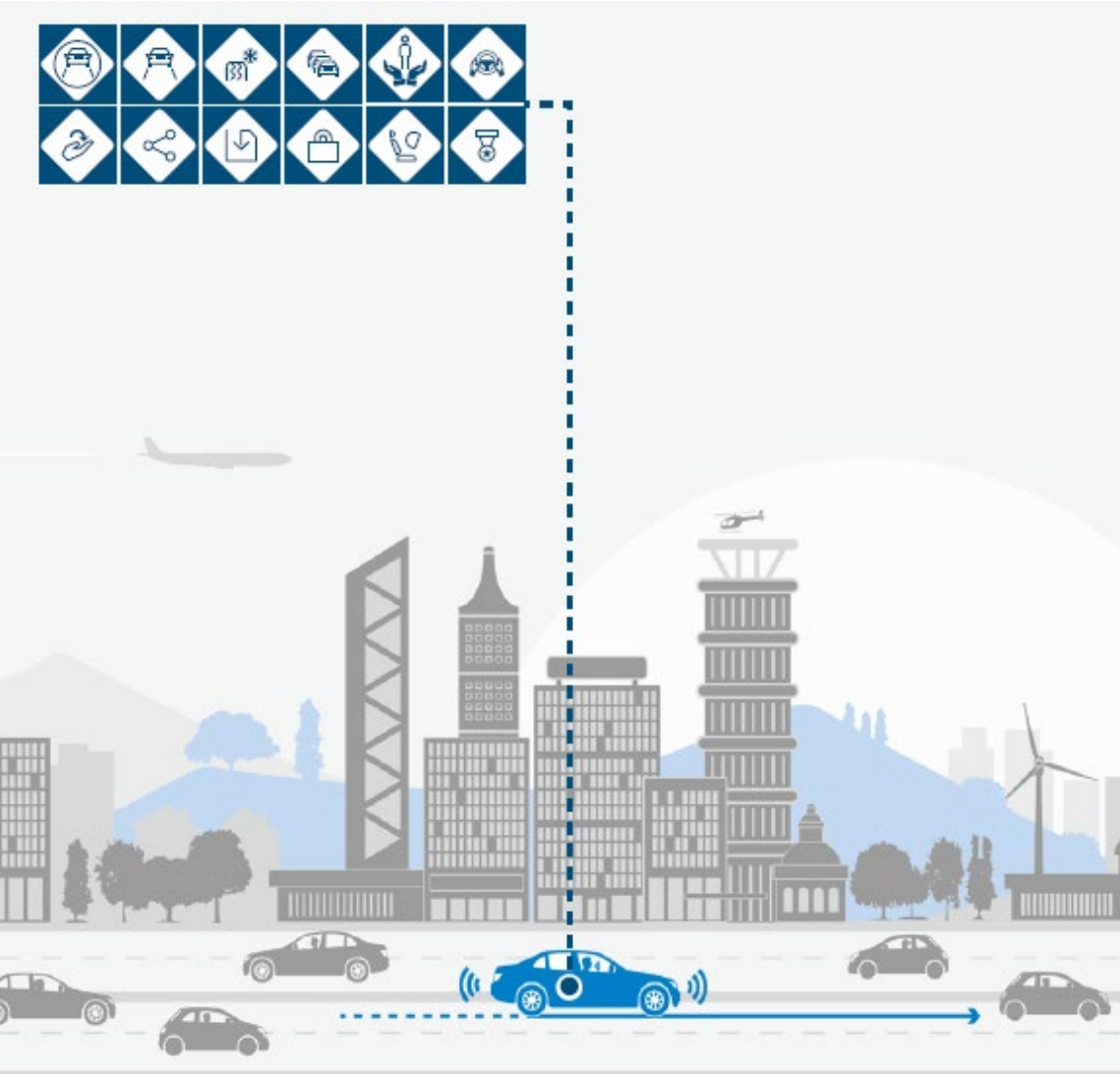
- Representing an worldwide industry consensus
- Being developed in short cycles to represent state-of-art of fast evolving field of automated vehicle
- Following an holistic safety approach for automated driving systems of SAE Level 3 and 4
- Introducing approach on safety targets
  - positive risk balance and
  - avoidance of unreasonable risk
- Being the overarching, application specific standard covering all aspects of automated driving systems
- Linking all standards addressing dedicated automated vehicle related topics.



# ISO TC22-SC32-WG13

## ISO TS 5083

**Thank you for your attention!**



**Road Vehicles – Safety for automated driving systems –  
Design, verification and validation**