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European Association of Automotive Suppliers

Intelligent Transport:
from "Assisting Drivers" to "Automated Vehicles"

Stefan Deix
CLEPA, Director R&I

Agenda

- Introduction
- Advanced Driver Assistant Systems and Automated Driving
- Key Challenges and Objectives

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INTRODUCTION

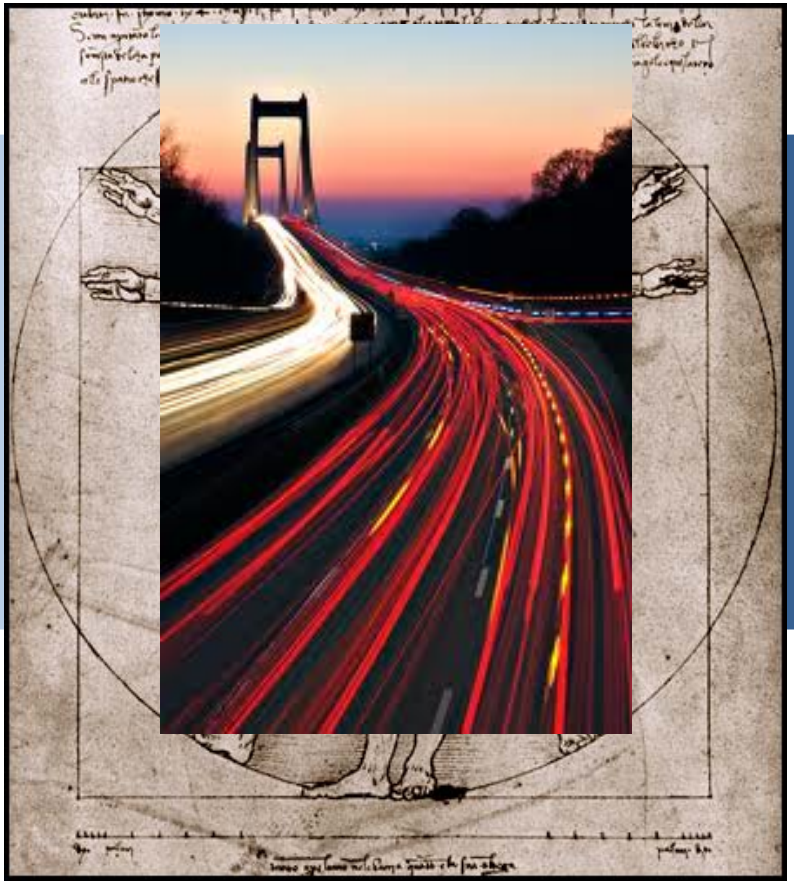
European Association of Automotive Suppliers

- ✓ Founded in 1959
- ✓ 110 corporate members of the world's most prominent suppliers for car parts, systems and modules
- ✓ 25 national trade and European sector associations
- ✓ Representing more than 3000 companies
- ✓ 5 million employees
- ✓ 600 billion € sales
- ✓ Partner of the EU and the UN

INTELLIGENT TRANSPORT SYSTEM

- Intelligence - How?

Sensing



STATE OF THE ART

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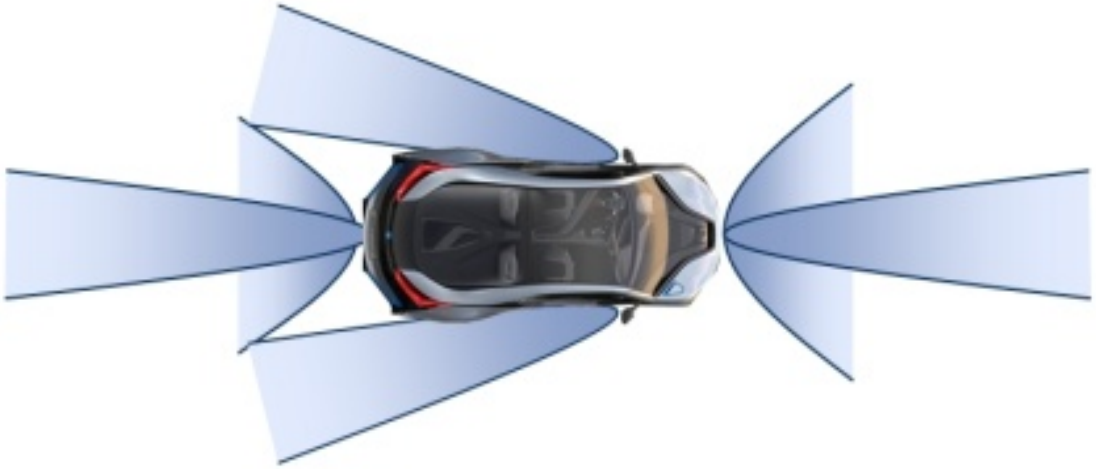
LDWS



Traffic Sign Recognition

Lane Change Assist Blind Spot Detection

Automated Parking Rear Cross Traffic Alert

AEBS

Traffic Jam Assist

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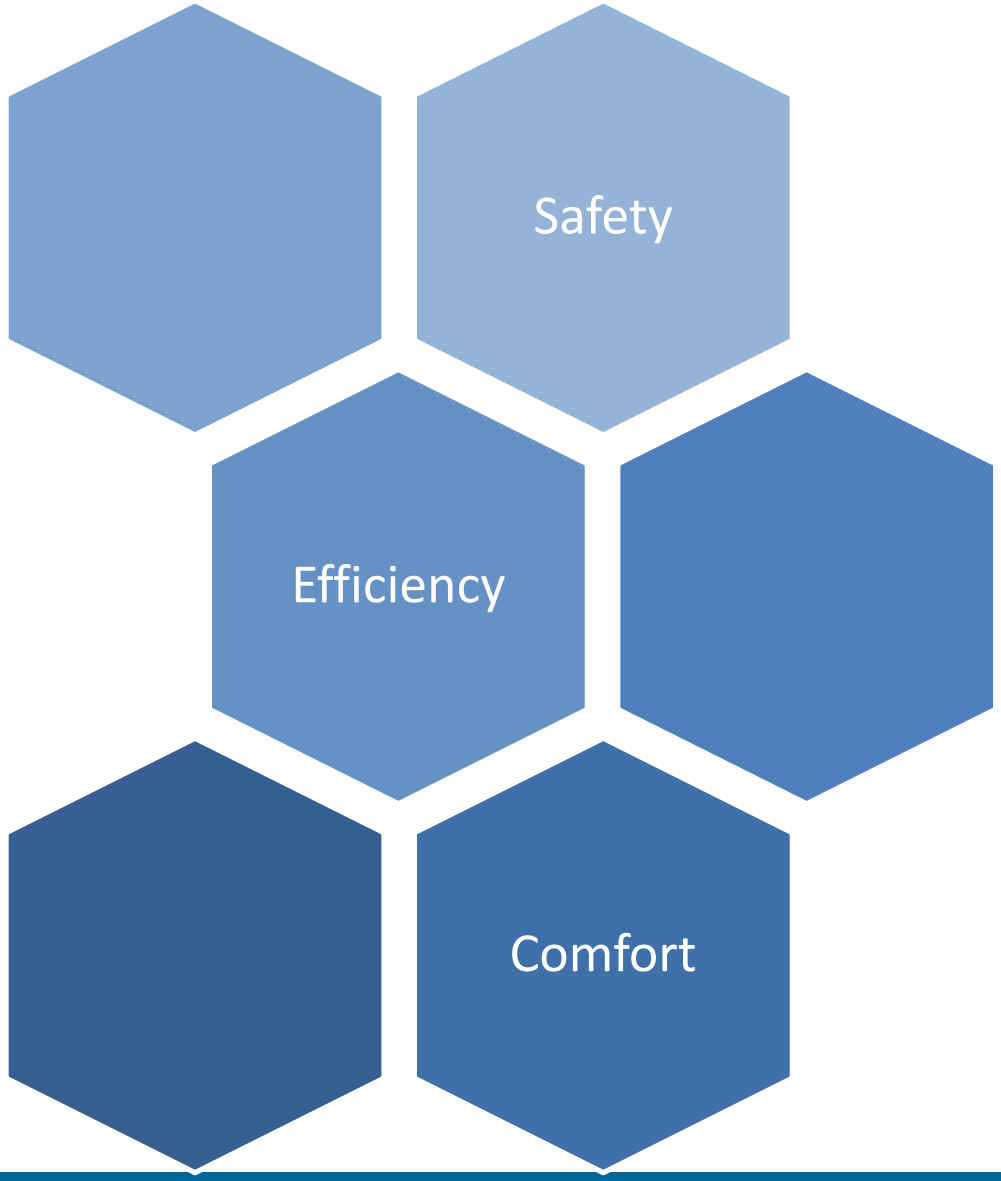
ADAS and Automated Driving

AUTOMATED DRIVING

- Why?



FROM ADAS TO AUTOMATED DRIVING

- **Revolution or Evolution?**

DEFINITIONS

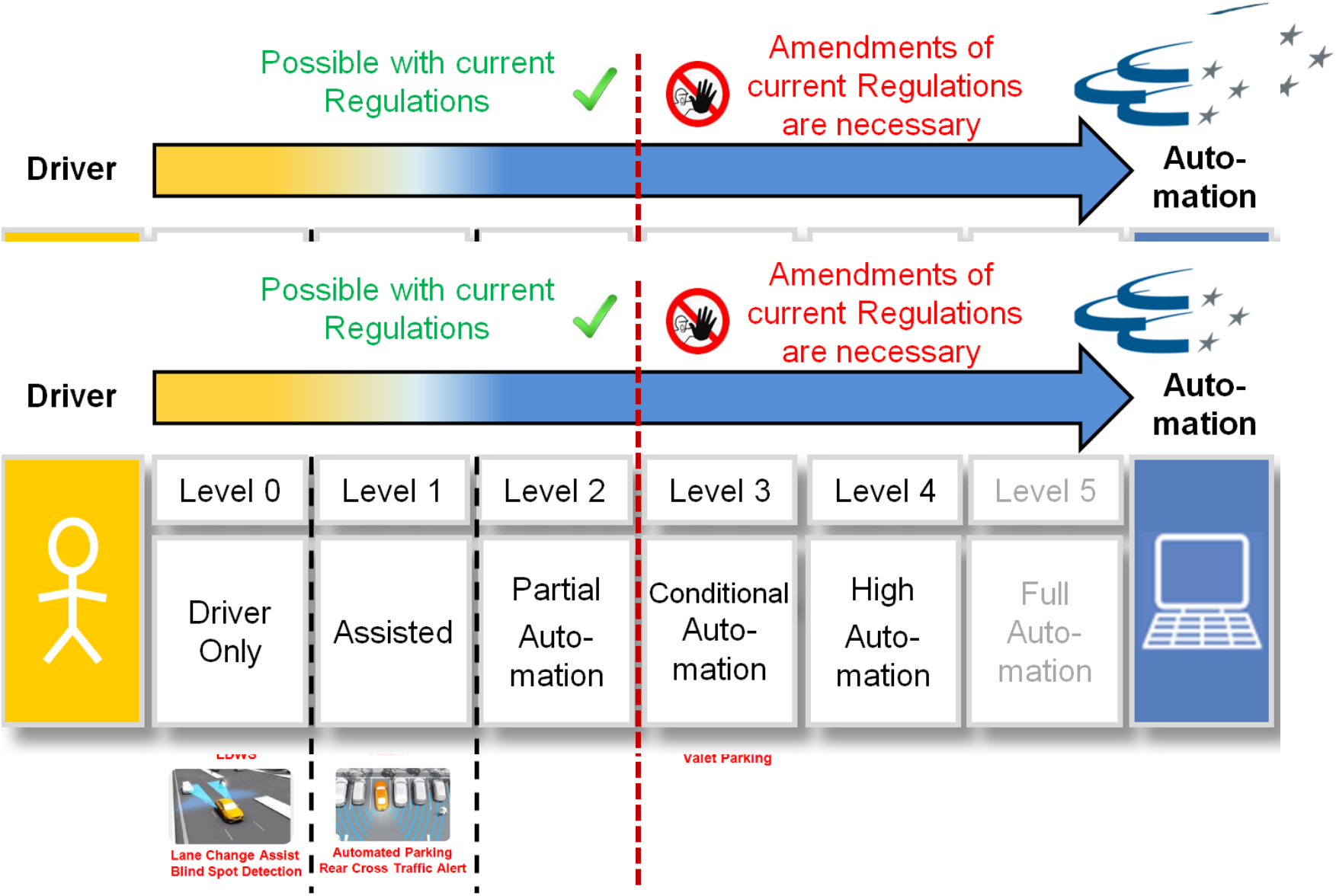
Summary of Levels of Driving Automation for On-Road Vehicles

This table summarizes SAE International's levels of *driving* automation for on-road vehicles. Information Report J3016 provides full definitions for these levels and for the italicized terms used therein. The levels are descriptive rather than normative and technical rather than legal. Elements indicate minimum rather than maximum capabilities for each level. "System" refers to the driver assistance system, combination of driver assistance systems, or *automated driving system*, as appropriate.

The table also shows how SAE's levels definitively correspond to those developed by the Germany Federal Highway Research Institute (BASt) and approximately correspond to those described by the US National Highway Traffic Safety Administration (NHTSA) in its "Preliminary Statement of Policy Concerning Automated Vehicles" of May 30, 2013.

Level	Name	Narrative definition	Execution of steering and acceleration/ deceleration	Monitoring of driving environment	Fallback performance of *dynamic driving task*	System capability (*driving modes*)	BASt level	NHTSA level
***Human driver* monitors the driving environment**								
0	**No Automation**	the full-time performance by the *human driver* of all aspects of the *dynamic driving task*, even when enhanced by warning or intervention systems	Human driver	Human driver	Human driver	n/a	Driver only	0
1	**Driver Assistance**	the *driving mode*-specific execution by a driver assistance system of either steering or acceleration/deceleration using information about the driving environment and with the expectation that the *human driver* perform all remaining aspects of the *dynamic driving task*	Human driver and system	Human driver	Human driver	Some driving modes	Assisted	1
2	**Partial Automation**	the *driving mode*-specific execution by one or more driver assistance systems of both steering and acceleration/deceleration using information about the driving environment and with the expectation that the *human driver* perform all remaining aspects of the *dynamic driving task*	**System**	Human driver	Human driver	Some driving modes	Partially automated	2
***Automated driving system* ("system") monitors the driving environment**								
3	**Conditional Automation**	the *driving mode*-specific performance by an *automated driving system* of all aspects of the *dynamic driving task* with the expectation that the *human driver* will respond appropriately to a *request to intervene*	System	**System**	Human driver	Some driving modes	Highly automated	3
4	**High Automation**	the *driving mode*-specific performance by an *automated driving system* of all aspects of the *dynamic driving task*, even if a *human driver* does not respond appropriately to a *request to intervene*	System	System	**System**	Some driving modes	Fully automated	3/4
5	**Full Automation**	the full-time performance by an *automated driving system* of all aspects of the *dynamic driving task* under all roadway and environmental conditions that can be managed by a *human driver*	System	System	System	**All driving modes**	-	

Figure 1. SAE Levels of Driving Automation for On-Road Vehicles [acc. Smith, B, W, Stanford Law School, (2013)]



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KEY CHALLENGES AND OBJECTIVES

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- What is a key challenge?

KEY CHALLENGES AND OBJECTIVES

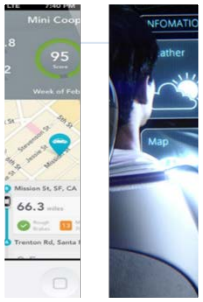
Environmental perception and detection

Driver attendance and involvement

Common validation model and testing requirements

Road system, connectivity and digital infrastructure

KEY CHALLENGES AND OBJECTIVES



User acceptance

Demonstrating reliability, safety and robustness of technology

Regulatory framework

IMPLEMENTATION

„Key position for automotive supply industry and systems providers in Automated Driving“

Thank you!

Stefan Deix, R&I Director