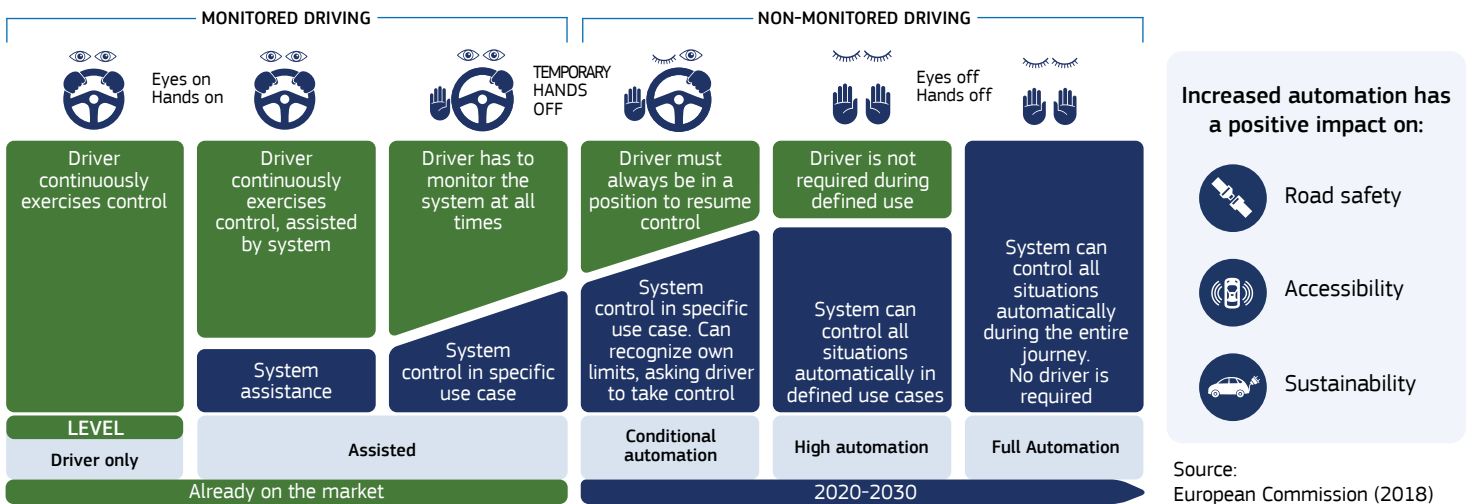# Internet of Things in connected and autonomous vehicles can support safer, more accessible and sustainable transportation

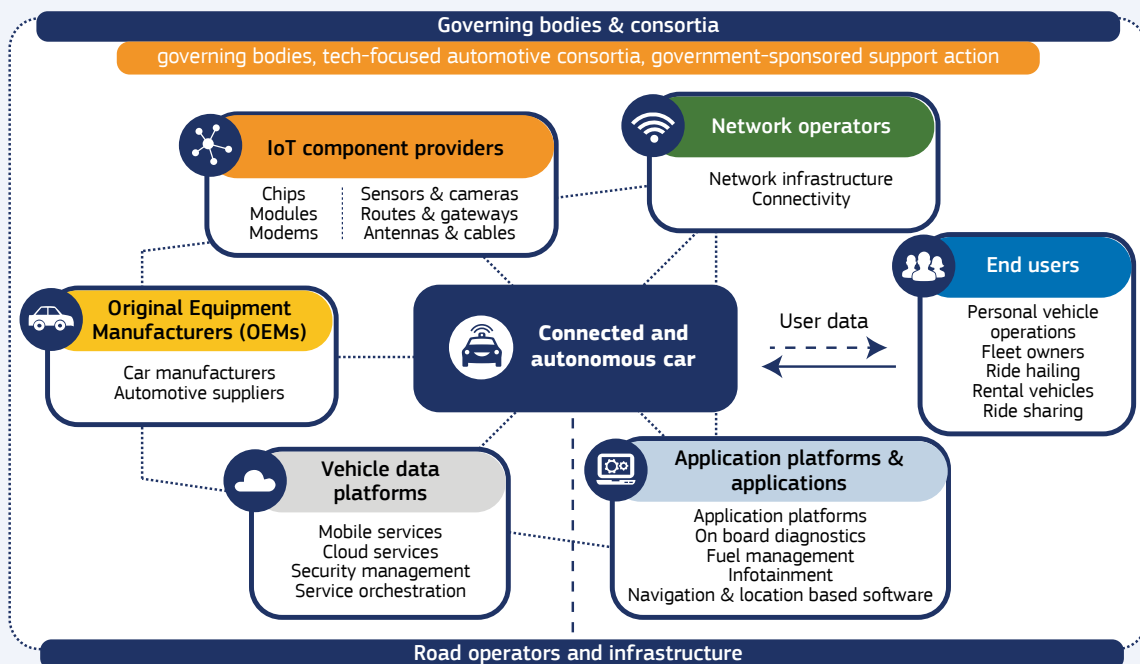## Product Watch: IoT Components in Connected and Autonomous Vehicles

The European automotive industry is facing a digital revolution in the 21st century in the form of the connected and autonomous vehicle. With the integration of **Internet of Things (IoT)** components into vehicles, they become part of a **network**, enabling them to communicate with each other, with the surrounding infrastructure and with other drivers.

Different levels of automation

MONITORED DRIVING

NON-MONITORED DRIVING

Eyes on Hands on

TEMPORARY HANDS OFF

Eyes off Hands off

Driver continuously exercises control	Driver continuously exercises control, assisted by system	Driver has to monitor the system at all times	Driver must always be in a position to resume control	Driver is not required during defined use	System can control all situations automatically during the entire journey. No driver is required
	System assistance	System control in specific use case	System control in specific use case. Can recognize own limits, asking driver to take control	System can control all situations automatically in defined use cases	

LEVEL

Driver only	Assisted	Conditional automation	High automation	Full Automation

Already on the market

2020-2030

Increased automation has a positive impact on:

- Road safety
- Accessibility
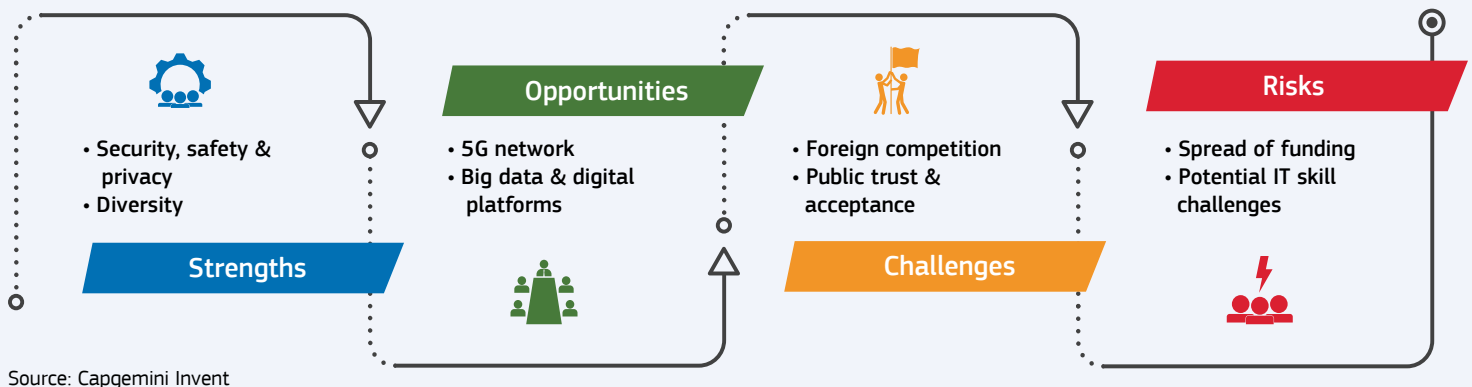- Sustainability

Source:
European Commission (2018)

Mapping the value chain for connected and autonomous vehicles showcases its importance in the European automotive industry

High-level connected and autonomous vehicle value chain for the EU

Governing bodies & consortia
governing bodies, tech-focused automotive consortia, government-sponsored support action

IoT component providers
Chips
Modules
Modems
Sensors & cameras
Routes & gateways
Antennas & cables

Network operators
Network infrastructure
Connectivity

Original Equipment Manufacturers (OEMs)
Car manufacturers
Automotive suppliers

Connected and autonomous car

User data

End users
Personal vehicle operations
Fleet owners
Ride hailing
Rental vehicles
Ride sharing

Vehicle data platforms
Mobile services
Cloud services
Security management
Service orchestration

Application platforms & applications
Application platforms
On board diagnostics
Fuel management
Infotainment
Navigation & location based software

Road operators and infrastructure

Source: Capgemini Invent

For more information, read the full Product Watch on IoT in connected and autonomous vehicles:
https://ati.ec.europa.eu/reports/product-watch/iot-components-connected-and-autonomous-vehicles

The EU's competitive position is particularly strong because of its focus on safety and diversity in its offerings

Strengths
- Security, safety & privacy
- Diversity

Opportunities
- 5G network
- Big data & digital platforms

Challenges
- Foreign competition
- Public trust & acceptance

Risks
- Spread of funding
- Potential IT skill challenges

Source: Capgemini Invent

The rise of connected and autonomous vehicles raises concerns to be addressed in the fields of security, reliability and environmental impact

Cybersecurity, liability, software and hardware reliability and data privacy

From a **safety** point of view, autonomous vehicles lack human abilities to pick up on subtle signs of other road users

To fairly measure the **environmental impact**, the complete lifecycle must be taken into account instead of solely fuel consumption

About the Advanced Technologies for Industry (ATI) project

The ATI project – funded by the European Commission – supports the **implementation** of Europe's new growth strategy with a systematic monitoring of **technological trends** and reliable, **up-to-date data** on advanced technologies.

Robotics · Artificial Intelligence · Connectivity · Photonics · Advanced Materials · Security · Advanced manufacturing Technology · Internet of Things · Industrial Biotechnology · Mobility · Blockchain · Cloud Computing · Micro- and Nanoelectronics · Big Data · Augmented and Virtual Reality · Nanotechnology

The **Product Watch** analyses novel products that are based on advanced technologies for the development of goods and services - enhancing their overall commercial and social value. It supports cluster organisations and S3 partnerships, providing intelligence on innovation areas where European regions could team up and invest together.

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