



JAMA-CLEPA  
BUSINESS SUMMIT

# JAMA-CLEPA Business Summit

## Venice, 27 & 28 October 2016

*European automotive suppliers meet  
Japanese vehicle manufacturers*





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htw saar  
Forschungsguppe  
Verkehrstelematik

# Connected and automated driving

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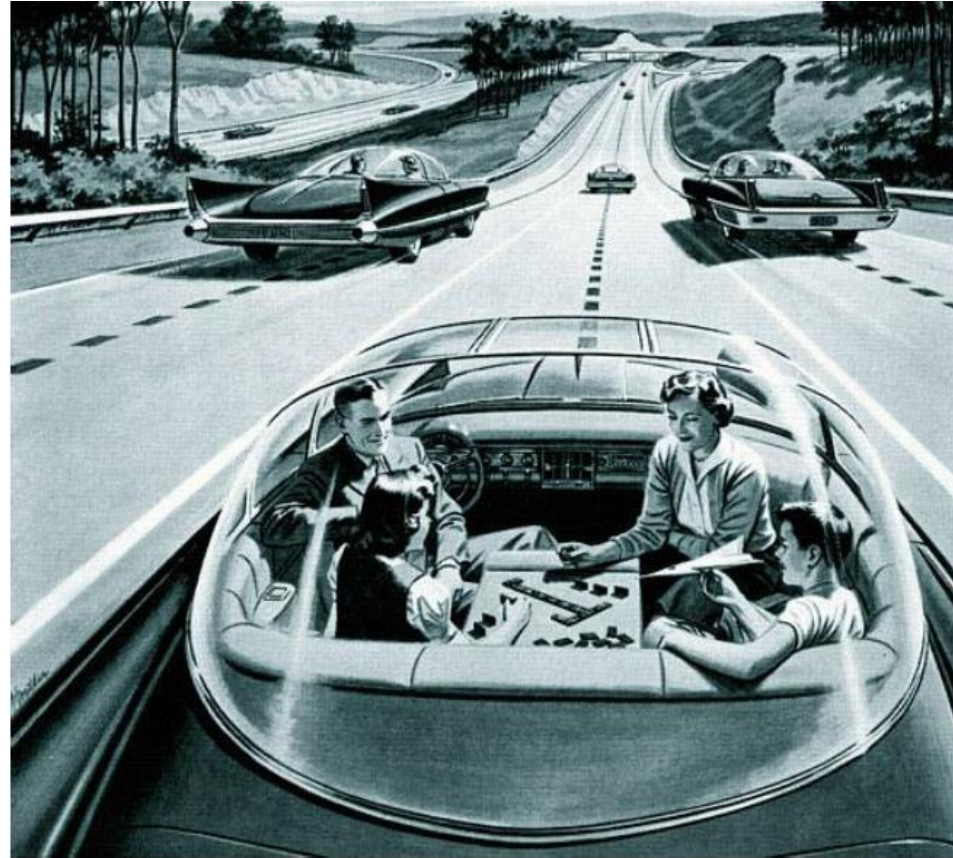
*European automotive suppliers meet  
Japanese vehicle manufacturers*



# The dream of the 1950s becomes reality...

*“ELECTRICITY MAY BE THE DRIVER. One day your car may speed along an electric super-highway, its speed and steering automatically controlled by electronic devices embedded in the road. Highways will be made safe – by electricity! No traffic jams ... no collisions ... no driver fatigue.”*

source: „Power companies build for your new electric living“.  
The Victoria Advocate. 24 March 1957.





# Overview of CAD in Europe



1. History and development

2. State of the art of connected and automated applications

3. European trends and initiatives

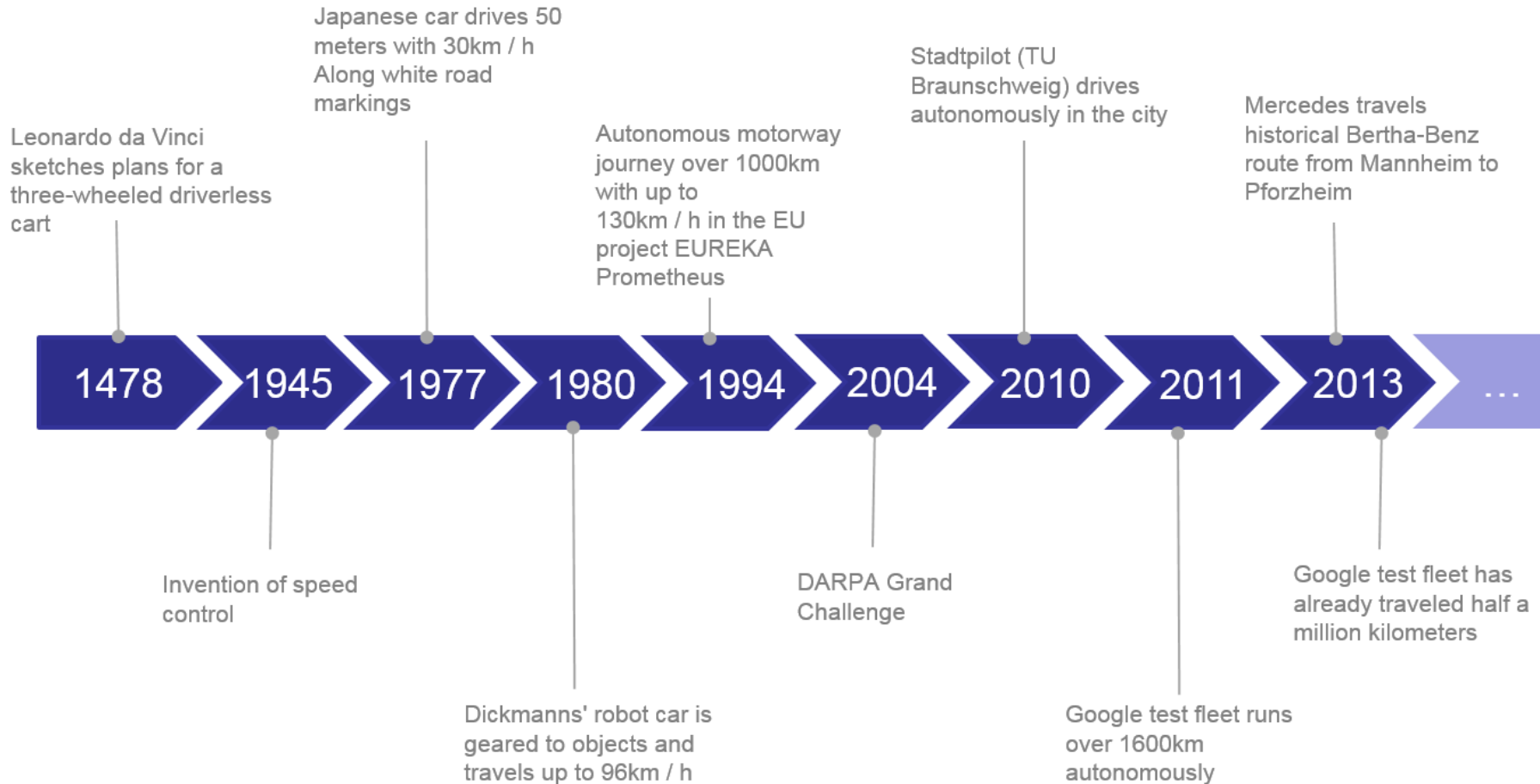
4. Outlook: potentials and challenges



- **Connected cars** are those that have access to the Internet and a variety of sensors, and that are thus able to send and receive signals, sense the physical environment around them, and interact with other vehicles or entities.
- **(Fully) automated vehicles** (also known as self-driving cars or robotic cars) are motor vehicles that operate without a human driver, which reduces the cost of transportation and improves convenience and (in most cases) safety.
- The car of the future will be **both**.



# History and development

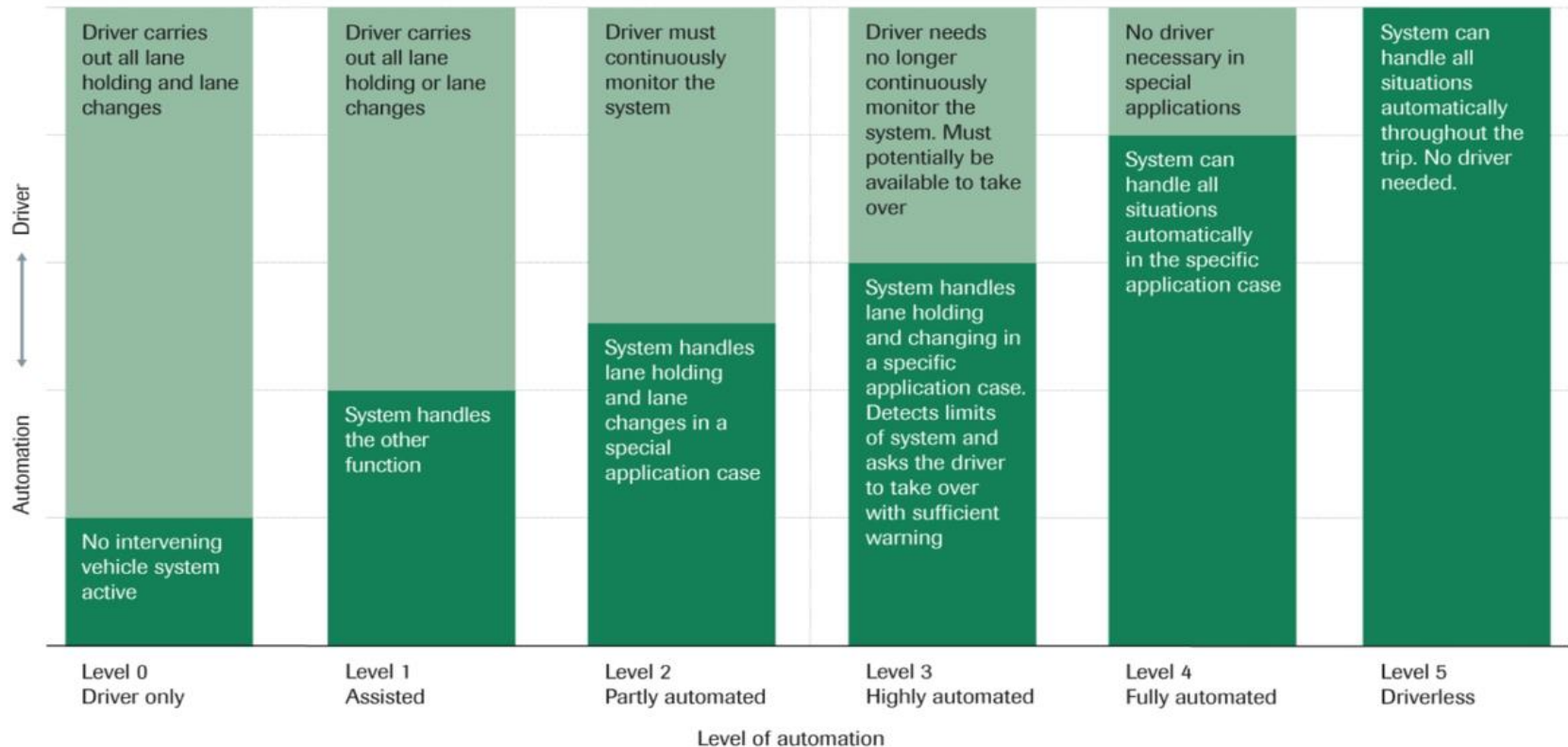


source:  
own figure



# History and development

## Levels of automated driving

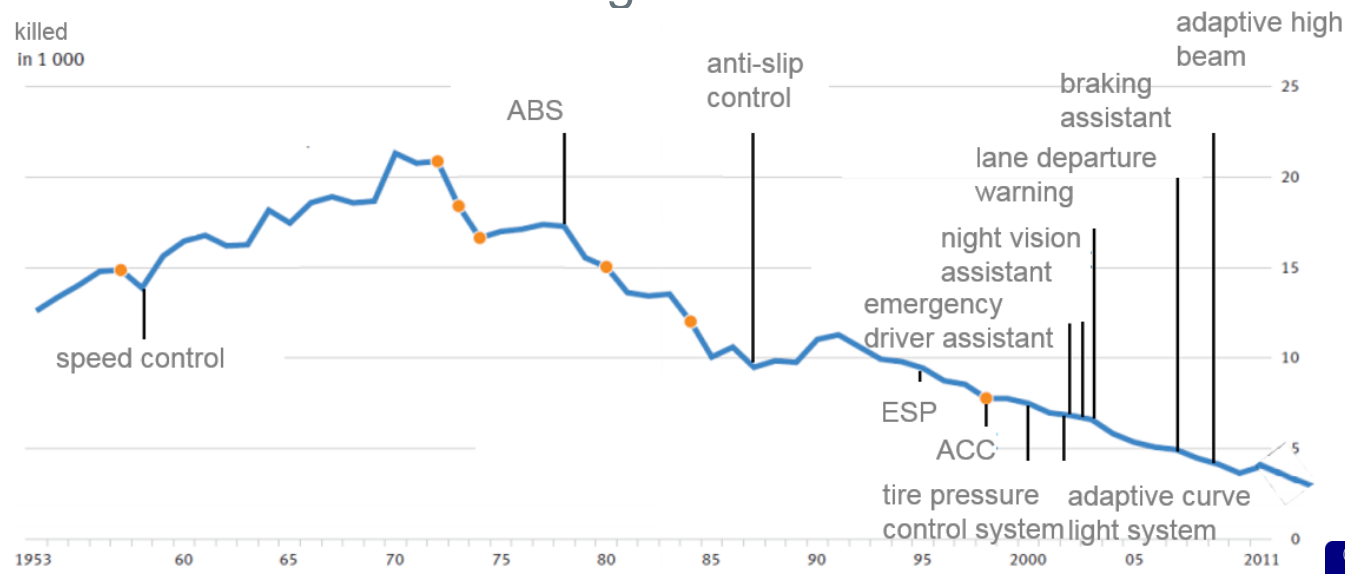


Source: VDA



# History and development

- 86% of accidents involving personal injury are caused by misbehavior of the vehicle drivers.
- Reasons:
  - danger not recognized
  - situations misjudged
  - reactions too slow or wrong



source:  
Acatech / Federal Statistical Office



# State of the art of connected and automated applications

**Advanced Driver Assistance Systems**, or ADAS, are systems to help the driver in the driving process. When designed with a safe Human-Machine Interface, they should increase car safety and more generally road safety.

adaptive cruise control (ACC)



collision avoidance system



lane departure warning system



source:  
DVR

blind spot monitor



parking assist system



lighting systems



night vision assistant



traffic sign recognition



ESP



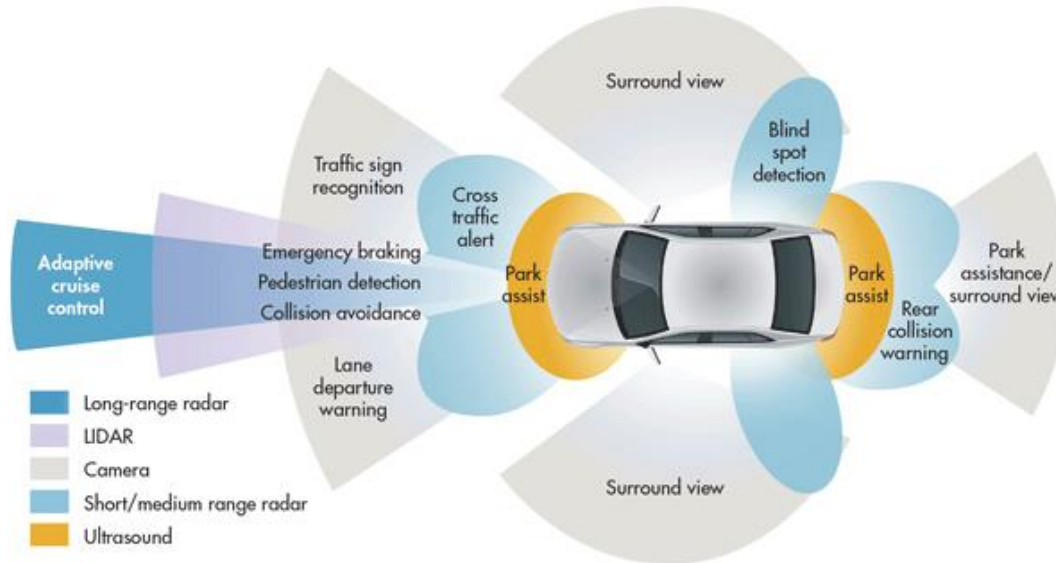


# State of the art of connected and automated applications

## Advanced Driver Assistance Systems:

- Inform
- Warn
- Support
- Intervene
- Recognize critical situations

→ But they do not drive alone!



source:  
<http://roboticsandautomationnews.com/wp-content/uploads/2016/09/adas-illustration.gif>



# State of the art of connected and automated applications

## Example Germany

Self-driving cars are particularly difficult in urban traffic. Six German cities want to set up test fields for autonomous driving.



- Streets are to be equipped with sensors.
- Computers are used to take over certain tasks, such as braking and tracking assistants, or systems where you can take your hand off the road for a while.
- By 2020, the federal government is providing 80 million euros as research funding.



# European trends and initiatives

## Scope and objectives



Automated and connected Driving is seen as one of the key technologies and major technological advancements influencing and shaping our future mobility and quality of life. The main drivers for higher levels of Automated Driving are:

- **Safety:** Reduce **accidents** caused by human errors.
- **Efficiency and environmental objectives:** Increase **transport system efficiency** and reduce time in congested traffic. Smoother traffic will help to decrease the energy consumption and emissions of the vehicles.
- **Comfort:** Enable user's **freedom** for other activities when automated systems are active.
- **Social inclusion:** Ensure **mobility** for all, including elderly and impaired users.
- **Accessibility:** Facilitate access to city centres.

→ Automated Driving must therefore be considered as a key aspect for the European Transport policy. Nations have to design a regulatory framework.



# European trends and initiatives

## Initial development



- Automated vehicles projects are currently underway in several countries worldwide. A number of European countries, including **UK, Germany, France, Sweden** and **Netherlands** are taking significant steps to be at the forefront of research in this sector.
- This research and development is partly driven by governmental stakeholders on various levels (e.g. Horizon2020, Strategy for automated and connected driving), partly by OEMs.
- **EU Directive 2007/46/EC** regulates how new vehicles should operate and be designed. More detailed technical provisions are contained within UNECE (WP.29) and can be found in the UNECE regulations to which the EU legislation refers.
- Within existing rules, barriers exist against the global market launch of automation Level 3, 4 and 5 and, in some cases, national provisions could also challenge the use of Level 2.
- Europe takes the evolutionary approach, rather than the revolutionary, known from the US (Google, Apple, Tesla).

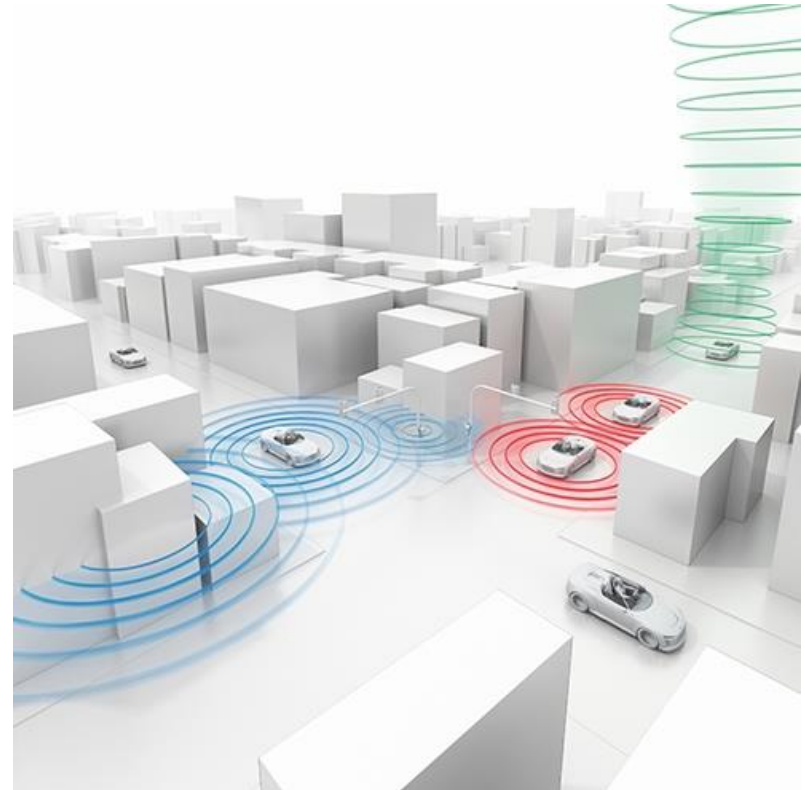




# European trends and initiatives

## 5 G Automotive Association

- AUDI AG, BMW Group, Daimler AG, Ericsson, Huawei, Intel, Nokia and Qualcomm Incorporated team up to evolve, test and promote communications solutions for connected mobility.
- Next generation mobile networks will help to address society's mobility and road safety needs with applications like connected infotainment features and connected automated driving.
- The association is open to further partners.

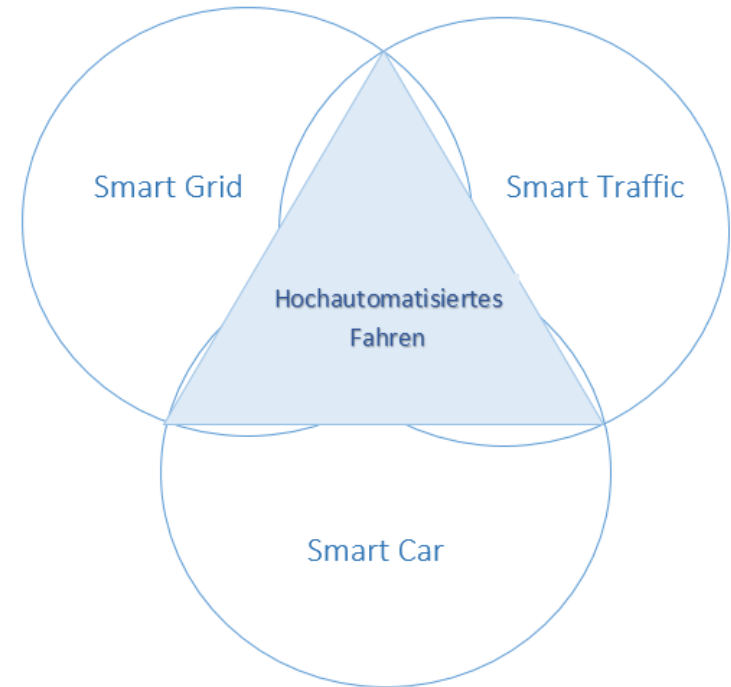




# Outlook: potentials and challenges

## Possibilities

- No longer think in products or content, but in effect.
  - Not car, but mobility.
  - Not product, but service.
- The future of connected and automated driving is based on situationally relevant IT-services.
  - DATA-TRACKING
  - DATA-MINING
  - DATABILITY
- Safe, efficient and comfortable transport
- Green and smart



source:  
own figure

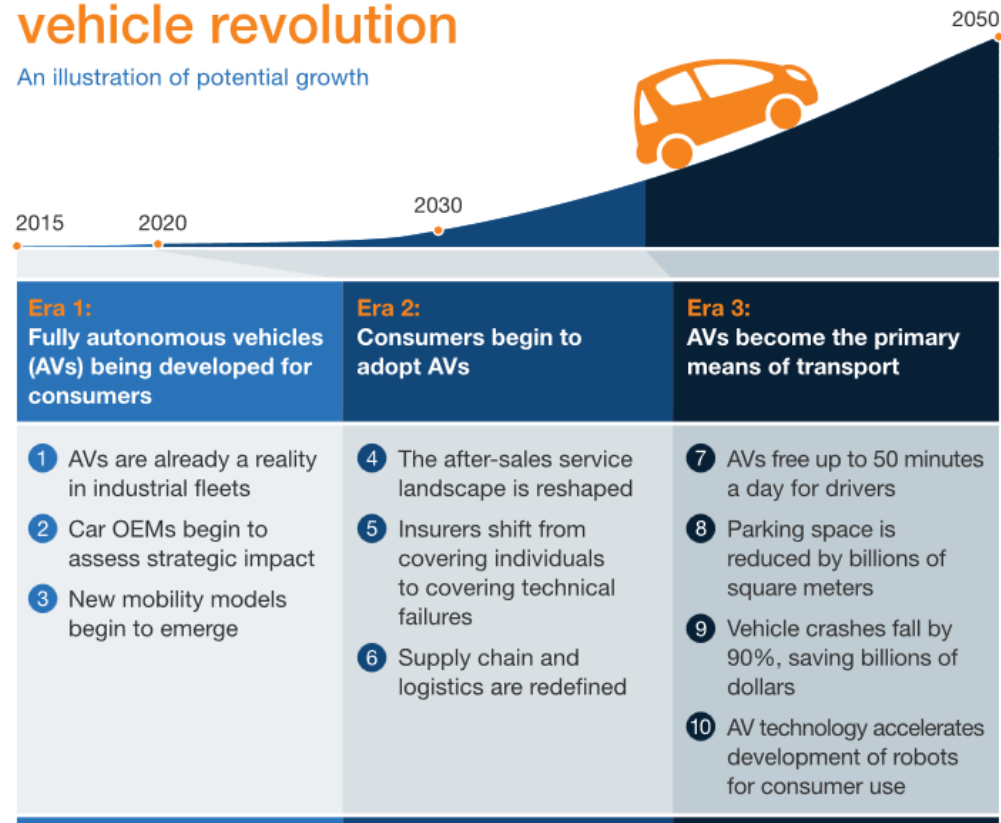


# Outlook: potentials and challenges

## Consumer potential

### The self-driving vehicle revolution

An illustration of potential growth

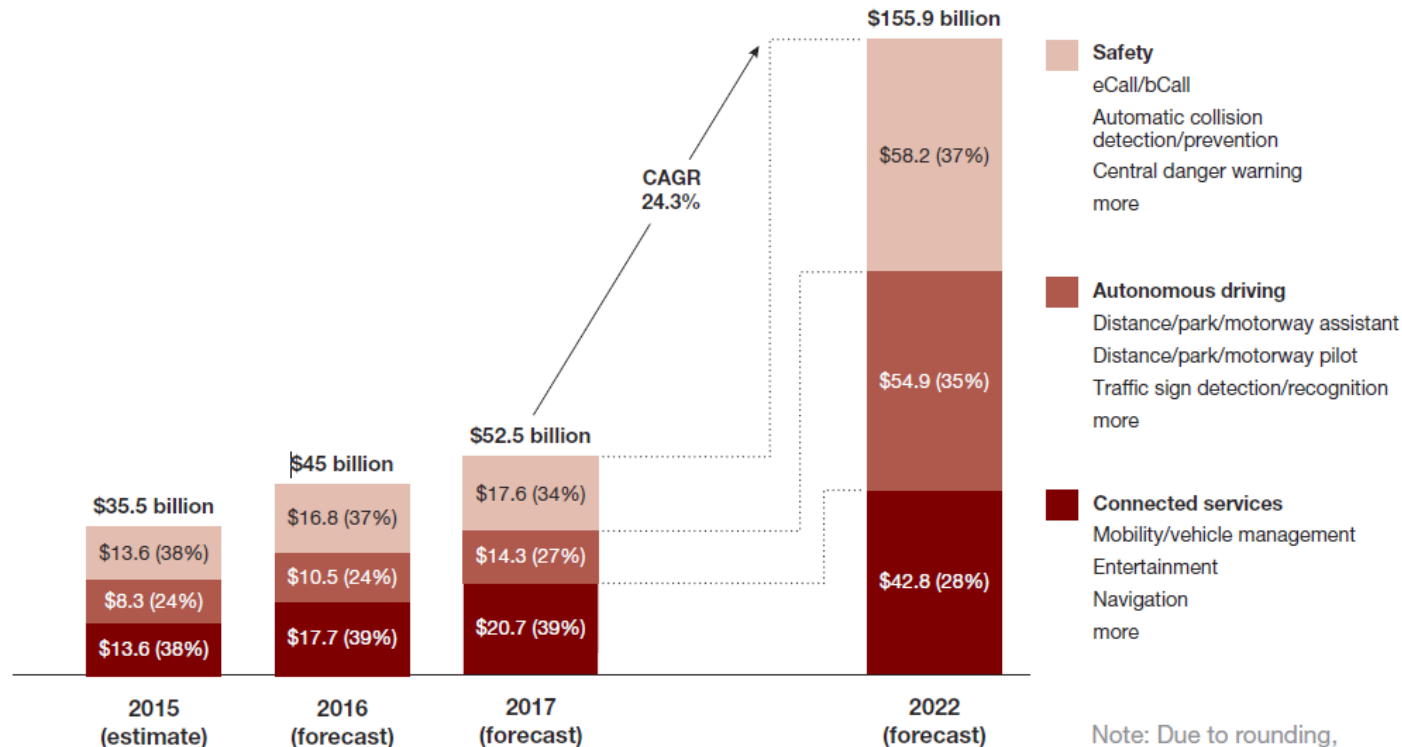


McKinsey&Company



# Outlook: potentials and challenges

## Market potential



source:  
McKinsey 2016

Note: Due to rounding,  
numbers shown here may  
not add up precisely to the  
totals provided.

Source: Strategy& analysis



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Forschungsgruppe  
Verkehrstelematik



# Outlook: potentials and challenges

## Development needs / unanswered questions

- Will the automated car need a drivers license?
- Liability (driver or OEM?) and traffic law
- Artificial intelligence for communication
- Cultural and social behaviour adaption
- Ethical dilemmas
- Which Infrastructure is needed?
- ....



source:  
DVR



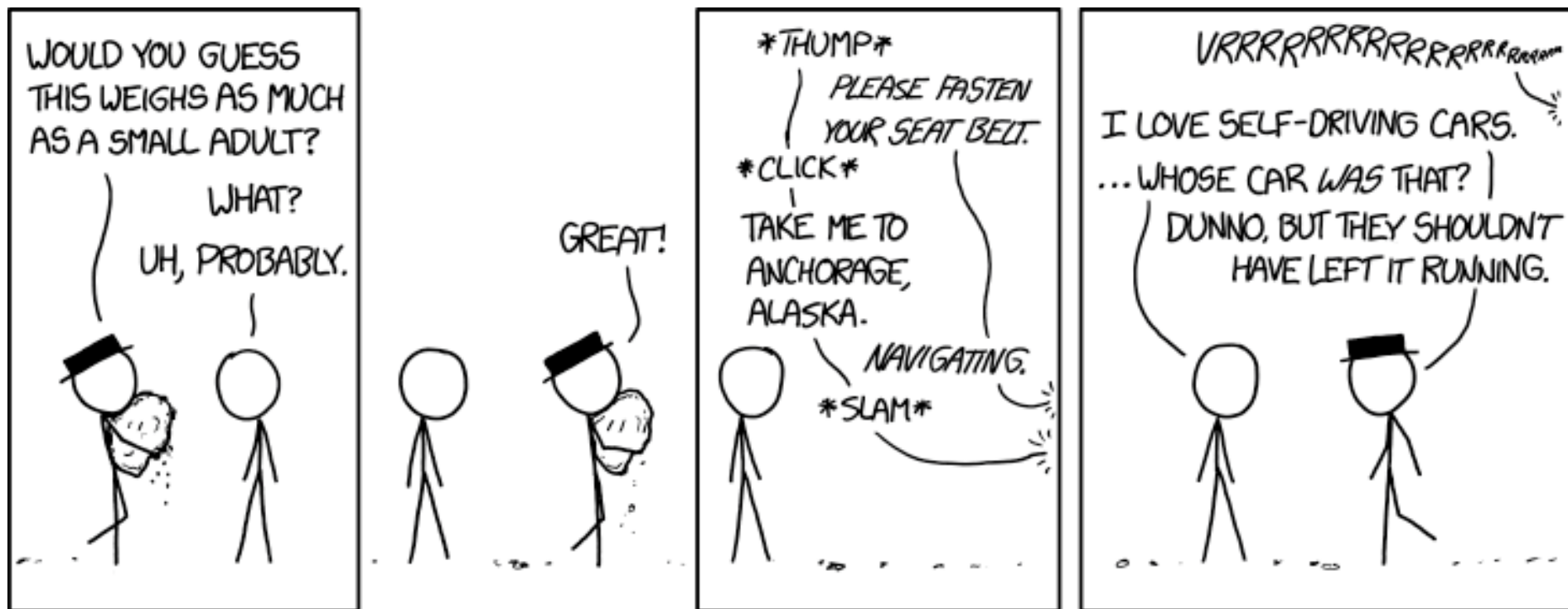
source:  
Automobil und Motorentechnik



source:  
radiatorbella.de



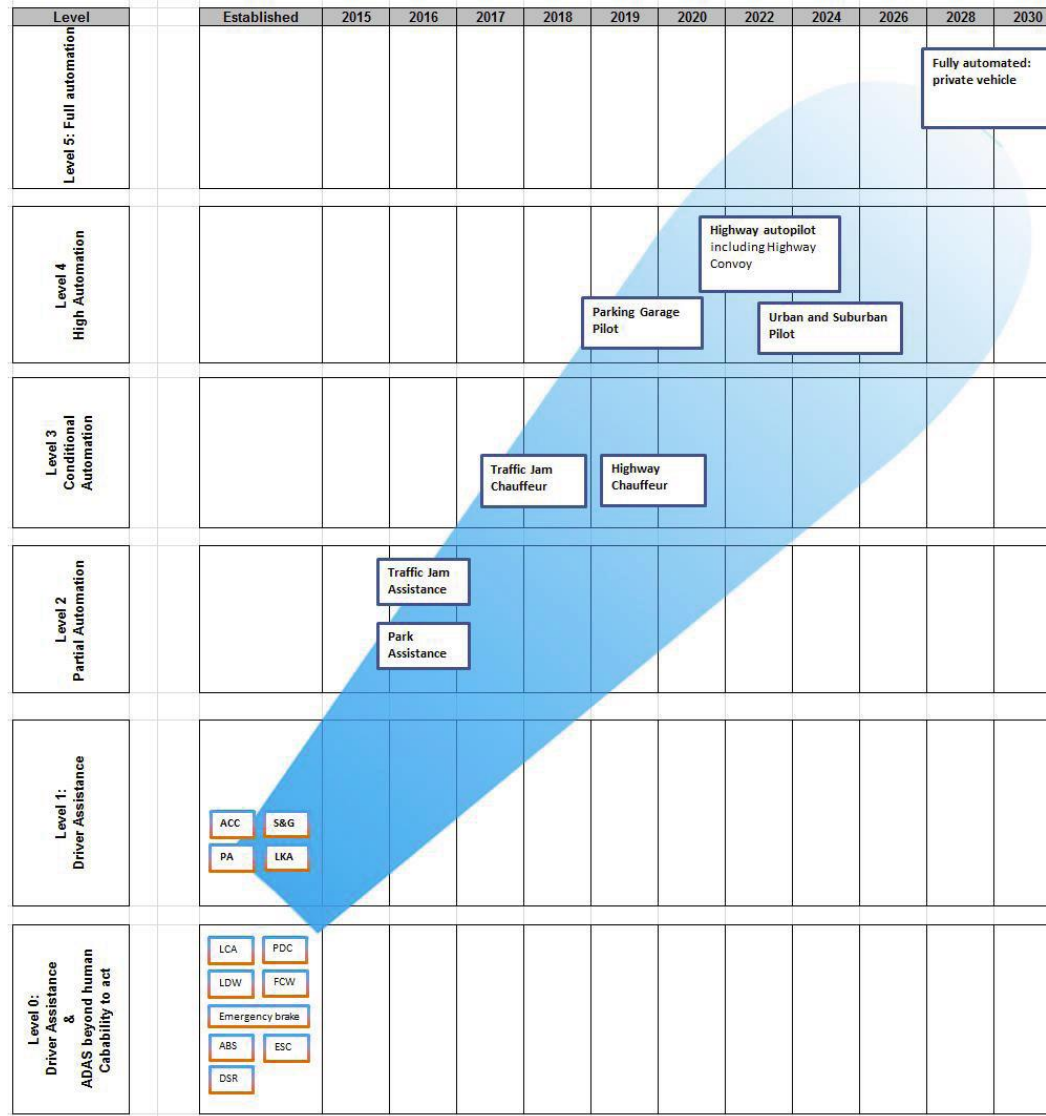
# Outlook: potential and challenges



source:  
explainxkcd.com



# The automated driving deployment path



source:  
ERTRAC





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Thank you for your attention!  
ご清聴ありがとうございました。  
Grazie per l'attenzione!

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Japanese vehicle manufacturers*