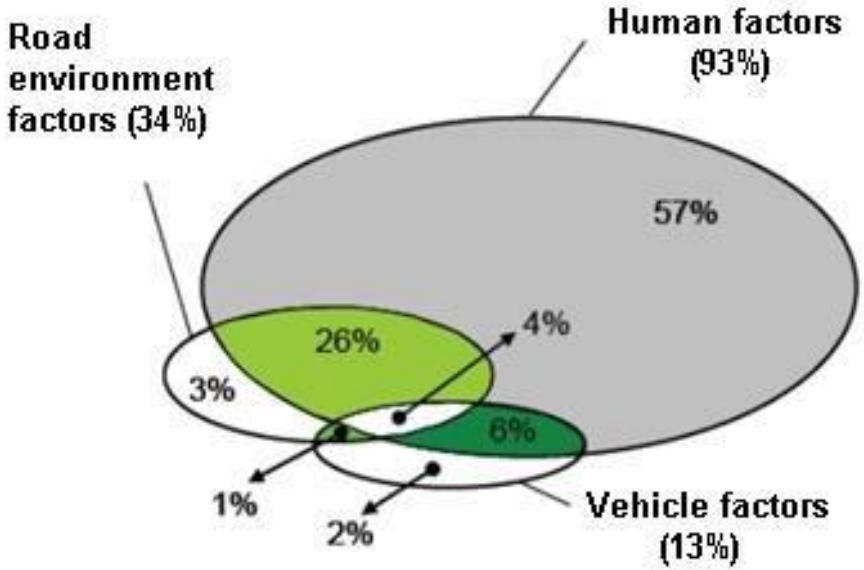
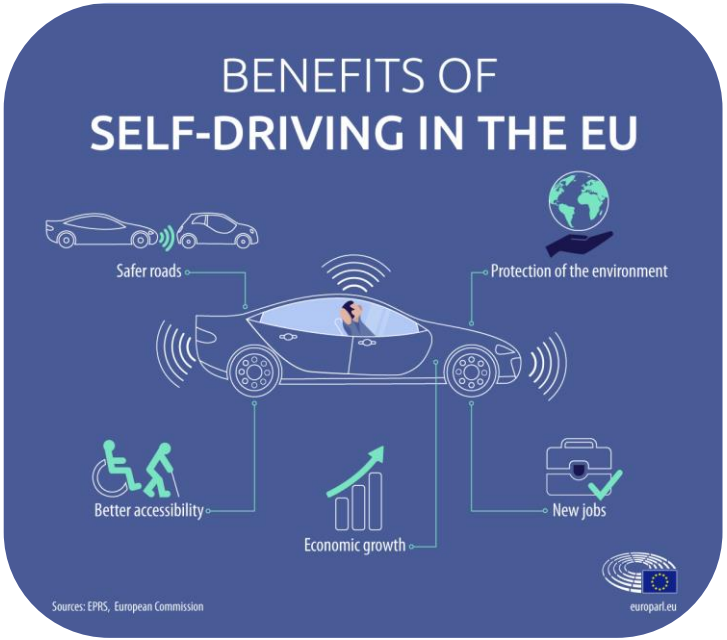
Belgisch Wegencongres
Congrès belge de la Route
LEUVEN · 4-7.04.2022

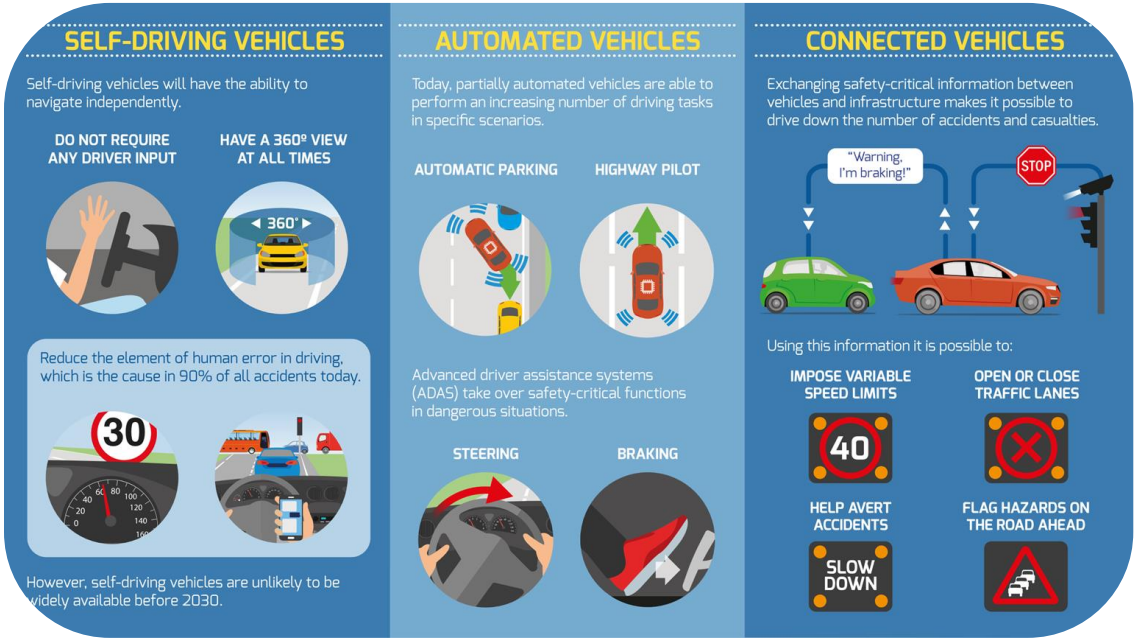
CAV et sécurité routière
-
Défis et potentiel


VITESSE MAX 70 KMH
561 FCF 92
920ENF 92



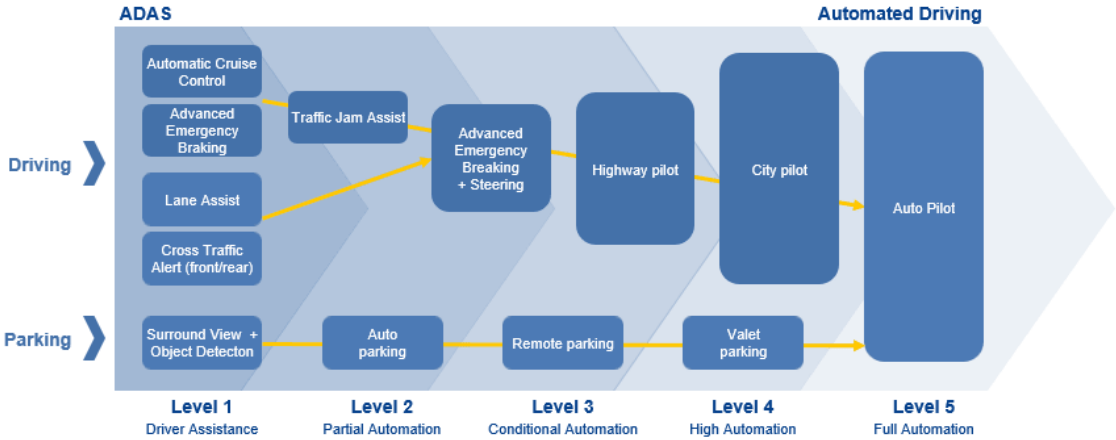
Traffic accidents as part of environmental assessment, Mariia Khrapova, CULS

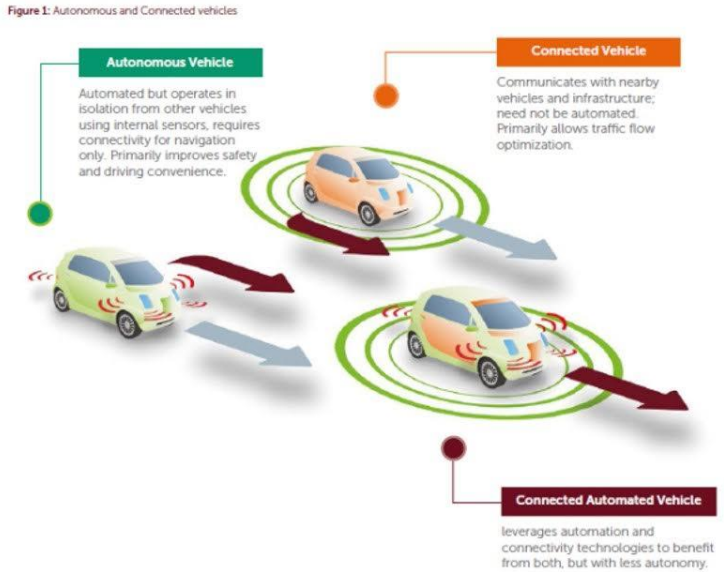




www.europarl.europa.eu

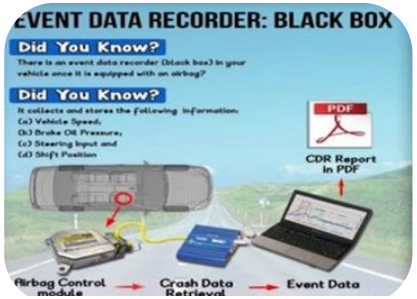
www.roadsafetyfacts.eu (ACEA)





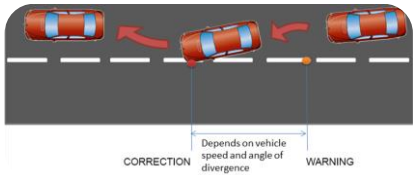
OEM guide to ADAS development (Renesas electronics)

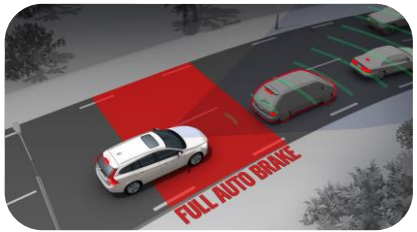
iCAVE2: instrument for Connected and Autonomous Vehicle Evaluation and Experimentation



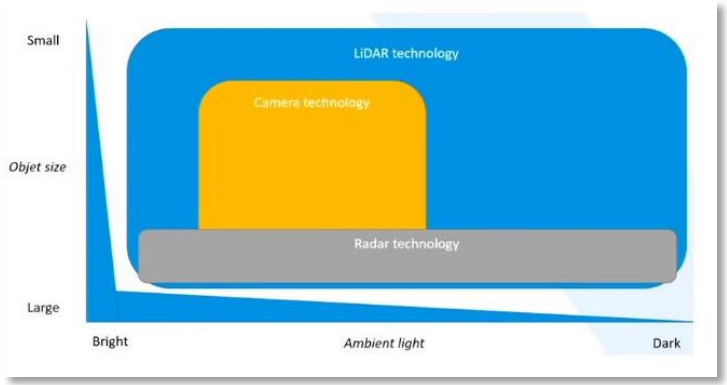
REGULATIONS

REGULATION (EU) 2019/2144 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of 27 November 2019
on type-approval requirements for motor vehicles and their trailers, and systems, components and separate technical units intended for such vehicles, as regards their general safety and the protection of vehicle occupants and vulnerable road users, amending Regulation (EU) 2018/858 of the European Parliament and of the Council and repealing Regulations (EC) No 78/2009, (EC) No 79/2009 and (EC) No 661/2009 of the European Parliament and of the Council and Commission Regulations (EC) No 631/2009, (EU) No 406/2010, (EU) No 672/2010, (EU) No 1003/2010, (EU) No 1005/2010, (EU) No 1008/2010, (EU) No 1009/2010, (EU) No 19/2011, (EU) No 109/2011, (EU) No 458/2011, (EU) No 65/2012, (EU) No 130/2012, (EU) No 347/2012, (EU) No 351/2012, (EU) No 1230/2012 and (EU) 2015/166





COMMISSION DELEGATED REGULATION (EU) 2015/962
of 18 December 2014
supplementing Directive 2010/40/EU of the European Parliament and of the Council with regard to the provision of EU-wide real-time traffic information services



Road Surveying business – new tools with upcoming autonomous vehicles, Calgary 2022, XenomatiX

Table 4: **Assessment of sensor performance across driving tasks**

Performance aspect	Human	Automated Vehicle			Connected vehicle	Connected, automated vehicle
	Eyes	Radar	Lidar	Camera	DSRC	Radar, Lidar, Camera and DSCRC
Object detection	Good	Good	Good	Fair	n/a	Good
Object classification	Good	Poor	Fair	Good	n/a	Good
Distance estimation	Fair	Good	Good	Fair	Good	Good
Edge detection	Good	Poor	Good	Good	n/a	Good
Lane tracking	Good	Poor	Poor	Good	n/a	Good
Visibility range	Good	Good	Fair	Fair	Good	Good
Poor weather performance	Fair	Good	Fair	Poor	Good	Good
Dark or low illumination performance	Poor	Good	Good	Fair	n/a	Good
Ability to communicate with other traffic or infrastructure	Poor	n/a	n/a	n/a	Good	Good

Source: (Shoettle, 2017)

Table 2: **Summary of Fitts List of strengths and weaknesses across various aspects of function allocation between humans and hardware/software systems**

Aspect	Human	Hardware/Software system
Speed	Relatively slow.	Fast.
Power output	Relatively weak, variable control.	High power, smooth and accurate control.
Consistency	Variable, fatigue plays a role, especially for highly repetitive and routine tasks.	Highly consistent and repeatable, especially for tasks requiring constant vigilance.
Information processing	Generally single channel.	Multichannel, simultaneous operations.
Memory	Best for recalling/understanding principles and strategies, with flexibility and creativity when needed, high long-term memory capacity.	Best for precise, formal information recall, and for information requiring restricted access, high short-term memory capacity, ability to erase information after use.
Reasoning	Inductive and handles ambiguity well, relatively easy to teach, slow but accurate results, with good error correction ability.	Deductive and does not handle ambiguity well, potentially difficult or slow to program, fast and accurate results, with poor error correction ability.
Sensing	Large, dynamic ranges for each sense, multifunction, able to apply judgement, especially to complex or ambiguous patterns.	Superior at measuring or quantifying signals, poor pattern recognition (especially for complex and/or ambiguous patterns), able to detect stimuli beyond human sensing abilities (e.g., infrared).
Perception	Better at handling high variability or alternative interpretations,3 vulnerable to effects of signal noise or clutter.	Worse at handling high variability or alternative interpretations,3 also vulnerable to effects of signal noise or clutter.

Source: (Schoettle, 2017) adapted from (Cummings, 2014; de Winter and Dodou, 2014)

Automated vehicle

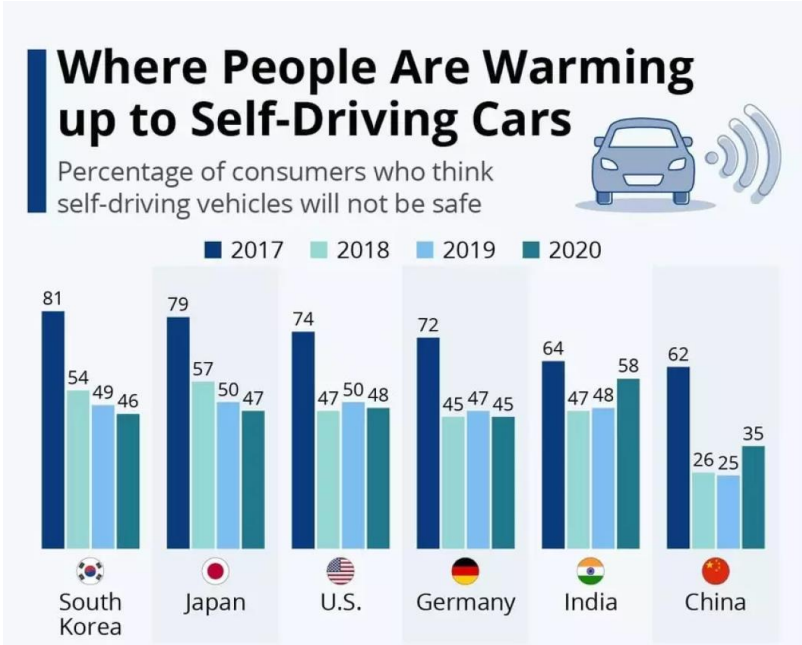
Human operator

Illustration: Bryan Christie Design

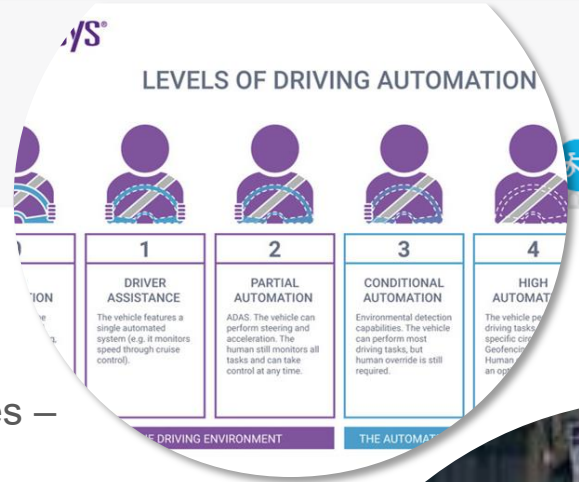
Reading Body Language

can a self-driving car tell what a human driver could take in at a glance?


TEMPE
DEADLY CRASH WITH SELF-DRIVING UBER
abc 15
ARIZONA


Where People Are Warming up to Self-Driving Cars
Percentage of consumers who think self-driving vehicles will not be safe
2017
2018
2019
2020
81
54
49
46
South Korea
79
57
50
47
Japan
74
47
50
48
U.S.
72
45
47
45
Germany
64
47
48
58
India
62
26
25
35
China

Deloitte

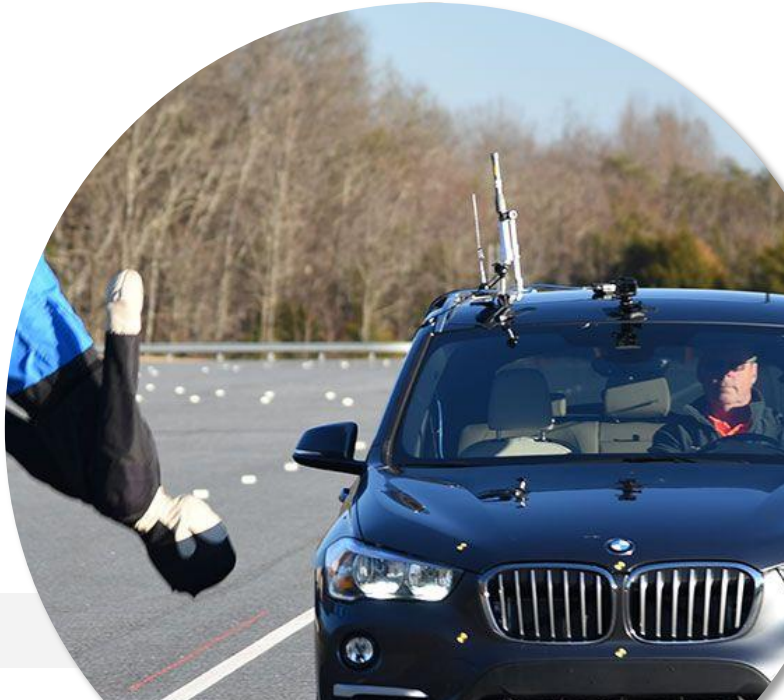


'nouveaux' défis

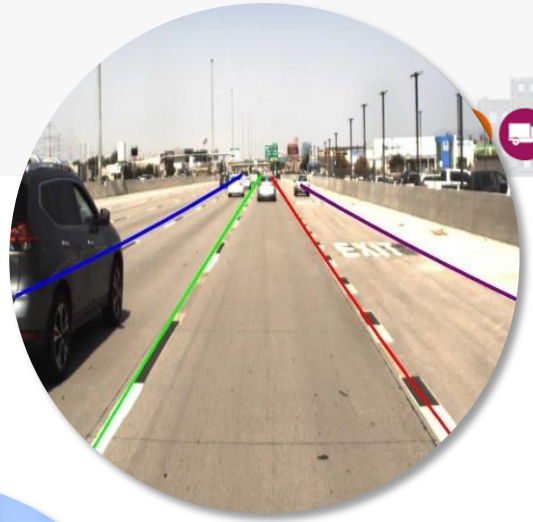
- autonomous vehicles ?
- jusqu'à SAE L3 : l'humain toujours nécessaires – hands on
- deskilling (automation addiction) & situational awareness (L3)
- période de transition et mix de véhicules / encore des décennies
- Interaction avec les autres usagers de la route (voitures, VRU, micro-mobilité, ..)
- Erreurs soft- et hardware
- cybersecurity

- Complexe
- Déclarations de sécurité basées sur des expériences limitées
- Gain de sécurité difficile à démontrer

California, US
... rapports d'accident et de désengagement
… AV plus impliqué dans les accidents
… accidents avec AV moins graves
... généralement causés par d'autres usagers de la route
... plus de collisions arrière
… moins d'accidents avec le PTW
… le nombre d'accidents diminue à mesure que la proportion de VA augmente

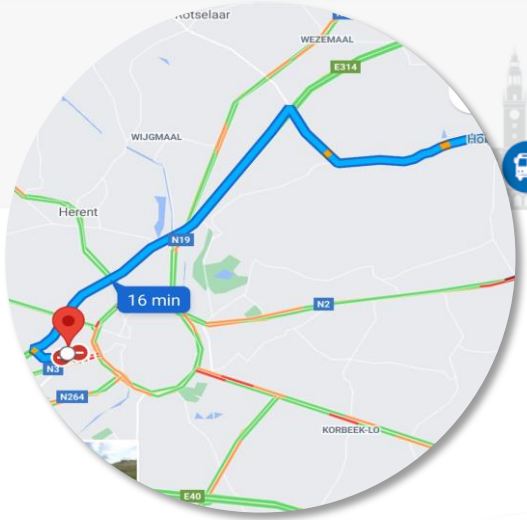


- Formation supplémentaire ?



Contribution de l’infrastructure ?

- marquages routiers (LDW)
  - contraste, rétroreflexion, alignement
- panneaux de signalisation (ISA)
  - harmonisation
  - visibilité
  - panneaux placés au-dessous des signaux routiers, messages implicites
  - langue



Contribution de l’infrastructure ?

- digital maps (ISA, SRTI, RTTI)
  - informations correctes
  - emplacement précis
  - à jour
- infrastructures de communication (ISA, SRTI, RTTI)
- qualité de la surface de la route (LDW, AEB)

également utile pour le conducteur humain

en attendant …

- des mesures classiques sont encore nécessaires

CAV & sécurité routière

Des inspections sécurité routière sur des trajets routiers pour les essais de voitures à conduite autonome
(Mark Broeckaert, VIAS)

***

Navette autonome de Louvain-la-Neuve et sécurité routière
(Sandra Martens, LLN & Simon Collet, TEC)

UNE ORGANISATION

ABR | Association Belge de la Route

AGENTSCHAP WEGEN & VERKEER

AVEC LE SOUTIEN DE

Centre de recherches routières

BRUXELLES MOBILITÉ
SERVICE PUBLIC RÉGIONAL DE BRUXELLES

Wallonie mobilité infrastructures SPW

FBEV
Fédération Belge des Entrepreneurs de Travaux de Voirie asbl

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