Voitures du Futur: Electriques, Partagées, Connectées, Autonomes

Michel Parent, AutoKAB

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Volvo Has a "Production-Viable" Autonomous Car, Will Put It on the Road by 2017

BI February 19, 2015 at 11:23 am by **Alexander Stoklosa**

Nissan to launch self-driving car in Japan in 2016, Ghosn says

KYODO

Some Teslas Will Be Able To Drive Themselves In Just 3 Months

The Huffington Post | By Alexander C. Kaufman

Posted: 03/19/2015 3:49 pm EDT | Updated: 03/19/2015 4:59 pm EDT

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TECHNOLOGY VEHICLE TECHNOLOGY

Watch: Audi's self-driving car in action

SAE WORLD CONGRESS

Driverless cars and the big conundrum

Cities

Cities in motion

End of the car age: how cities are outgrowing the automobile

BUSINESS DAY

Hands-Free Cars Take Wheel, and Law Isn't Stopping Them

By AARON M. KESSLER MAY 2, 2015

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Microsoft's first self-driving car hits the road with Cortana riding shotgun

Uber's First Self-Driving Fleet Arrives in Pittsburgh This Month

Otto, founded by ex-Googlers, is bringing self-driving technology to trucks

Inside the Self-Driving Tesla Fatal Accident

NXP

Dubai debuts driverless minibus

Sep 3, 2016 838 0

NXP Demonstrates Complete Autonomous Vehicle Platform

Why Remove the Driver?

- Better safety
- Better efficiency (space and energy)
- Better external control
- Better mobility
- Free time for the driver
- New businesses

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Market Segments

- Military vehicles
- Trucks/Buses
- Agriculture
- Mining
- People Movers
- Urban delivery
- Fleet vehicles
- Private vehicles

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Military Robots (1980's)

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Prometheus 1986-1994

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Pioneering Autonomous Driving

Prometheus culmination points in 1994

- 1758 km trip from Munich in Bavaria to Odense in Denmark and back.
- Longitudinal and lateral guidance performed autonomously by vision.
- On highways, the robot achieved speeds exceeding 175 km/h.
- Longest autonomously driven stretch reached 158 km.
- In total, 95% autonomous driving (by distance) was achieved.

AHS San Diego (1997)

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DARPA Grand Challenge 2004

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DARPA Grand Challenge 2004

DARPA Challenge II (2005)

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DARPA Urban Challenge 2007

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Google Car (2011)

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Daimler Autonomous Vehicles

"We want to be the first to launch autonomous functions in production vehicles. You can be sure: we will accomplish that in this decade," Thomas Weber, Daimler head of development said.

Autonomous Mannheim-Pforzheim trip in Sept. 2013

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Carlos Ghosn (Renault/Nissan). Oct. 2013

I am committing to be ready to introduce a new ground-breaking technology, Autonomous Drive by 2020, and we are on track to realize it

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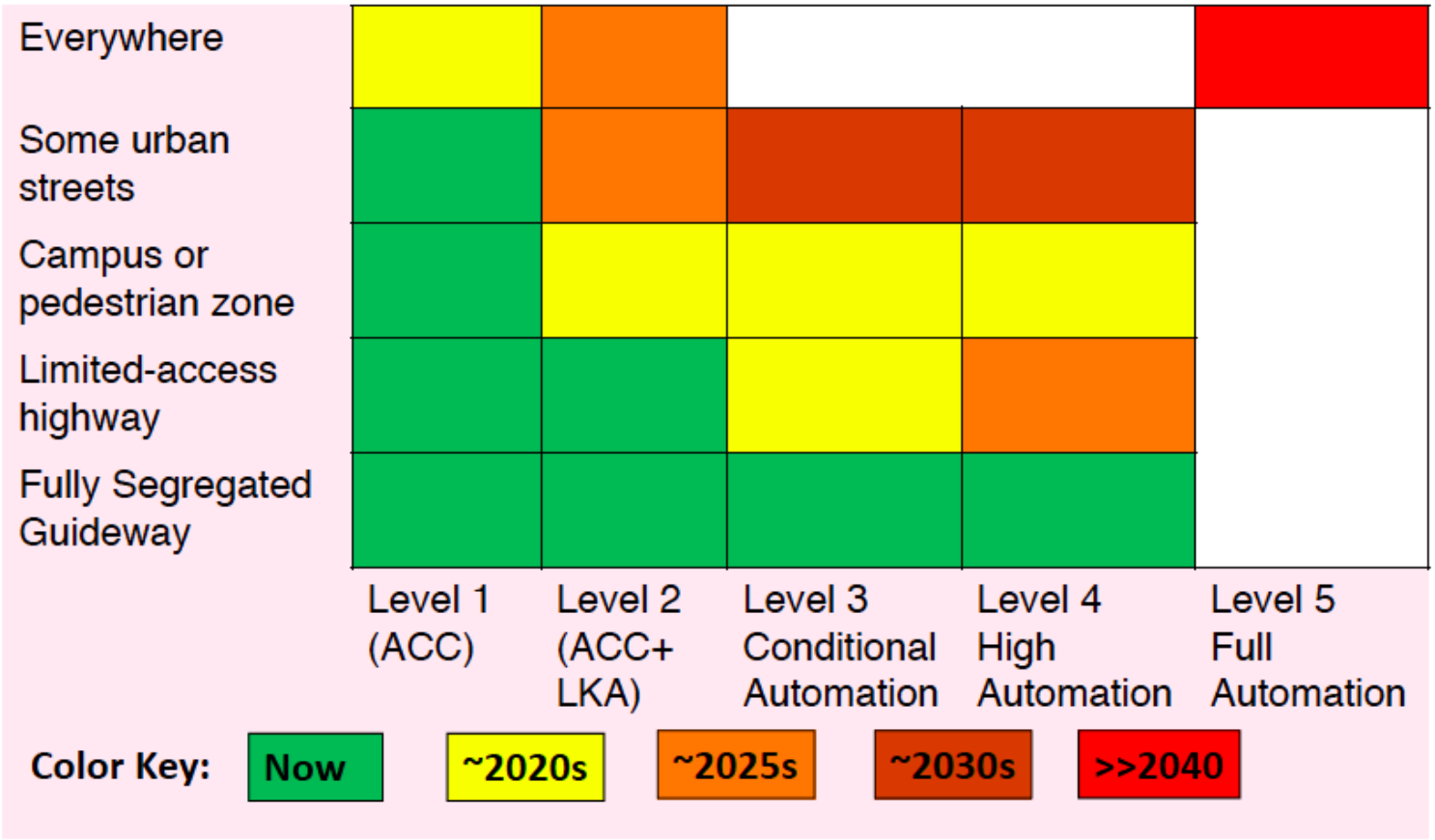
Deployment of SDC (seen by OEMs)



- **Trade-off between level of automation and level of segregation**
- **Focus on connectivity (V2V, V2I/I2V) to gain benefits**

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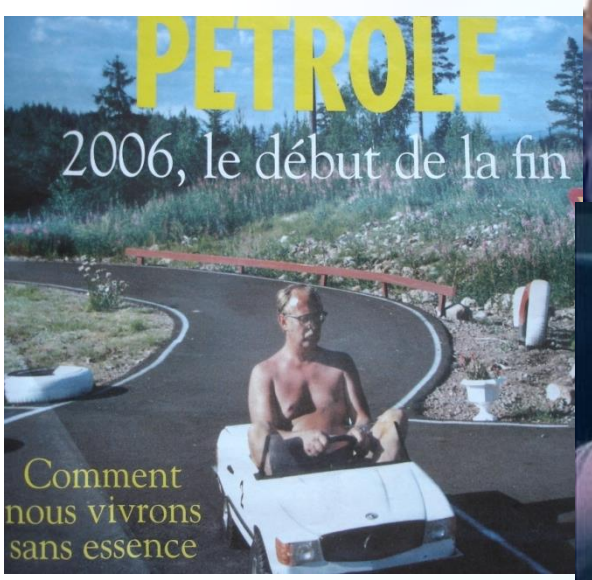
Problems of the automobile



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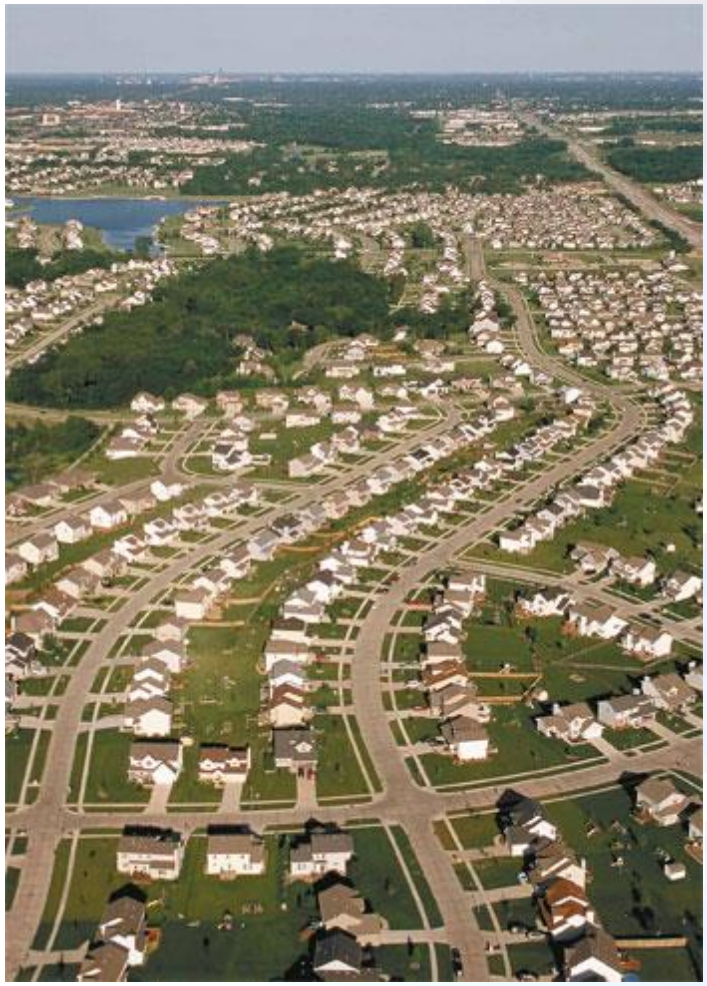
Urban Sprawl



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*Space*Time Expenditure*

- Moving (4 km) :
  - Pedestrian: 1 m2*h
  - Bicycle: 1 m2*h
  - Moped: 2.0 m2*h
  - Car: 9 m2*h
  - Bus (30p): 0.3 m2*h
  - Tram (200p): 0.1 m2*h
- Parking (8h) :
  - Pedestrian: 0
  - Bicycle: 8 m2*h
  - Moped: 12 m2*h
  - Car (street): 80 m2*h
  - Car (parking): 240 m2*h
  - Bus/Tram: 0

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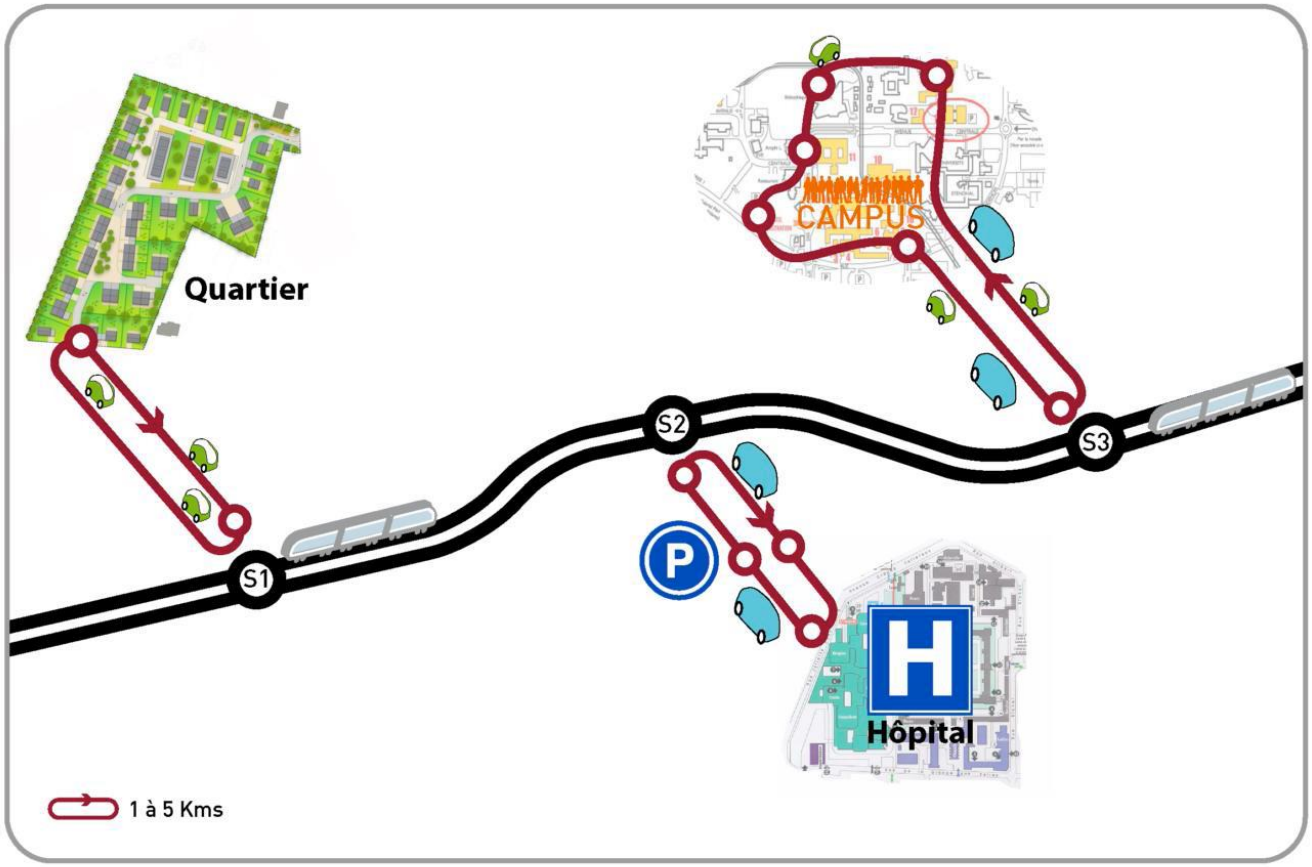
Multi-modality. Last Mile Link



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Bike Sharing

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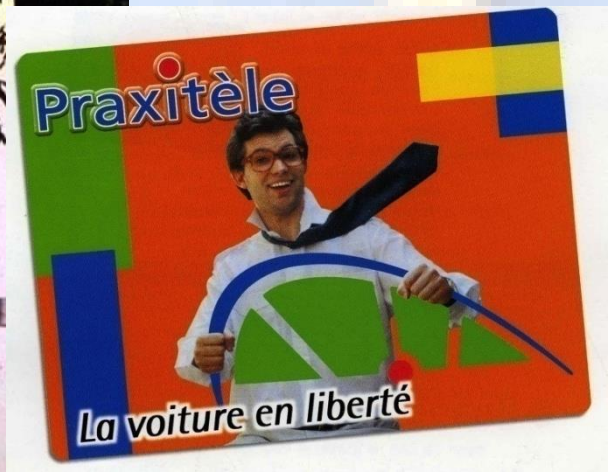
Praxitele (1993-1999)



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Car Sharing

CAR2GO IS COMING

autolib'

2 automation strategies

"something everywhere"

Improve the automated driving systems available in conventional vehicles so that human drivers can shift more of the dynamic driving task to these systems.

"everything somewhere"

Deploy vehicles without a human driver and gradually expand this operation to more contexts.

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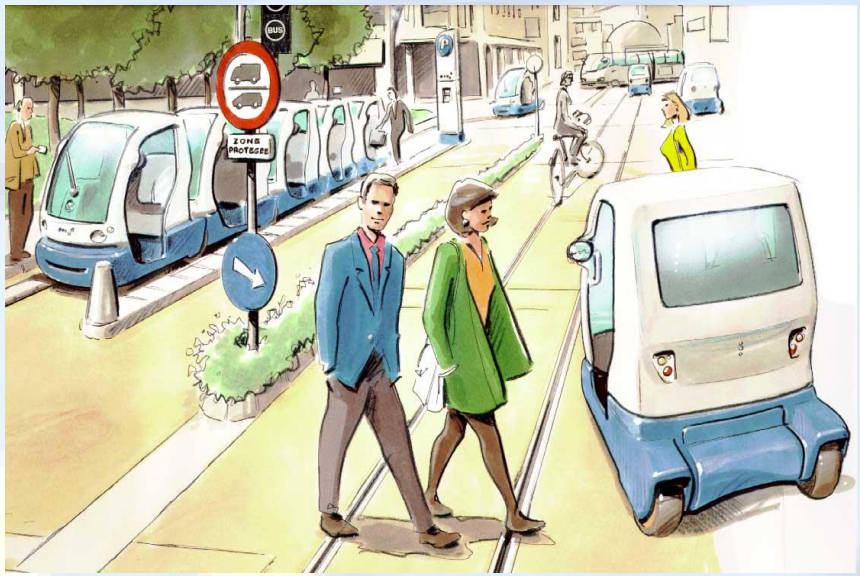
Concept INRIA/INRETS (1991)

- Small Public Urban Vehicles
- Assited driving
- Platooning
- Automated Parking
- Automated tracks
- Complement to other modes



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Platooning (INRIA-1994)

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INRIA CyCabs (1996)

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ParkShuttle-2 Rotterdam (2005)

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ParkShuttle II

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2GetThere – Masdar City (2010)

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ULTra in Heathrow (2010)

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CityMobil in La Rochelle (2011)

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Google Pod (2013)

Automated Shuttles Mainstream?

Major Difficulties Ahead

- Sensor suite (cameras, lidars, radars, fusion)
- Handling of unexpected situations
- Dynamic HD Maps and localisation
- Interaction with other vehicles and infrastructure
- Certification of systems
- Business models

Automation Kits for Autos and Buses

AutoKAB Founders

Michel Parent, Président
Working full time on the development of the society

Carlos Holguin, CEO in September?
Urbanist.10 yers of experience in the demonstration of automated shuttles. Development of the business

Fawzi Nashashibi, Advisor
In charge of technology development at INRIA. Will facilitate the transfer via personnel and licences

Adriano Alessandrini , Advisor
Expert in Innovative Urban Transport. Has worked with us since CyberCars (2000). Knows the transportation business

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Other Start-ups

- nuTonomy (http://nutonomy.com/)
- Jaybridge (http://www.jaybridge.com)
- Oxbotica (http://www.oxbotica.com/)
- Cruise (http://www.getcruise.com/)
- Peloton Technology (http://peloton-tech.com)
- Otto (http://www.otto.com)

Product description

Automation kit functions:

- Virtual rails: Absolute localization/mapping systems (GPS, SLAM) with risk-management integration
- Smart steering/acceleration-braking control
- Collision avoidance systems
- Bus-trains system
- V2V-V2I collaborative communication system

Sold in **3 kits + subscription** service to fit different needs

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Kit functions

Kit	Level 0	Level 1	Level 2	Level 3
Trajectory recording	X	X	X	X
Collision warning		X	X	X
Driving assistance			X	X
Driving automation				X

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Potential market

Bus operators fleets (examples):

- **Deutsche Bahn: ~20 000 buses**
- **RATP: 4500 buses (in Paris)**
- **Transdev: 60 000 buses (world)**

We target 250 equipped buses by 2020 with an annual fee of 3000€ per bus/year + 2000€ instal.

Break even at 300 kits installed

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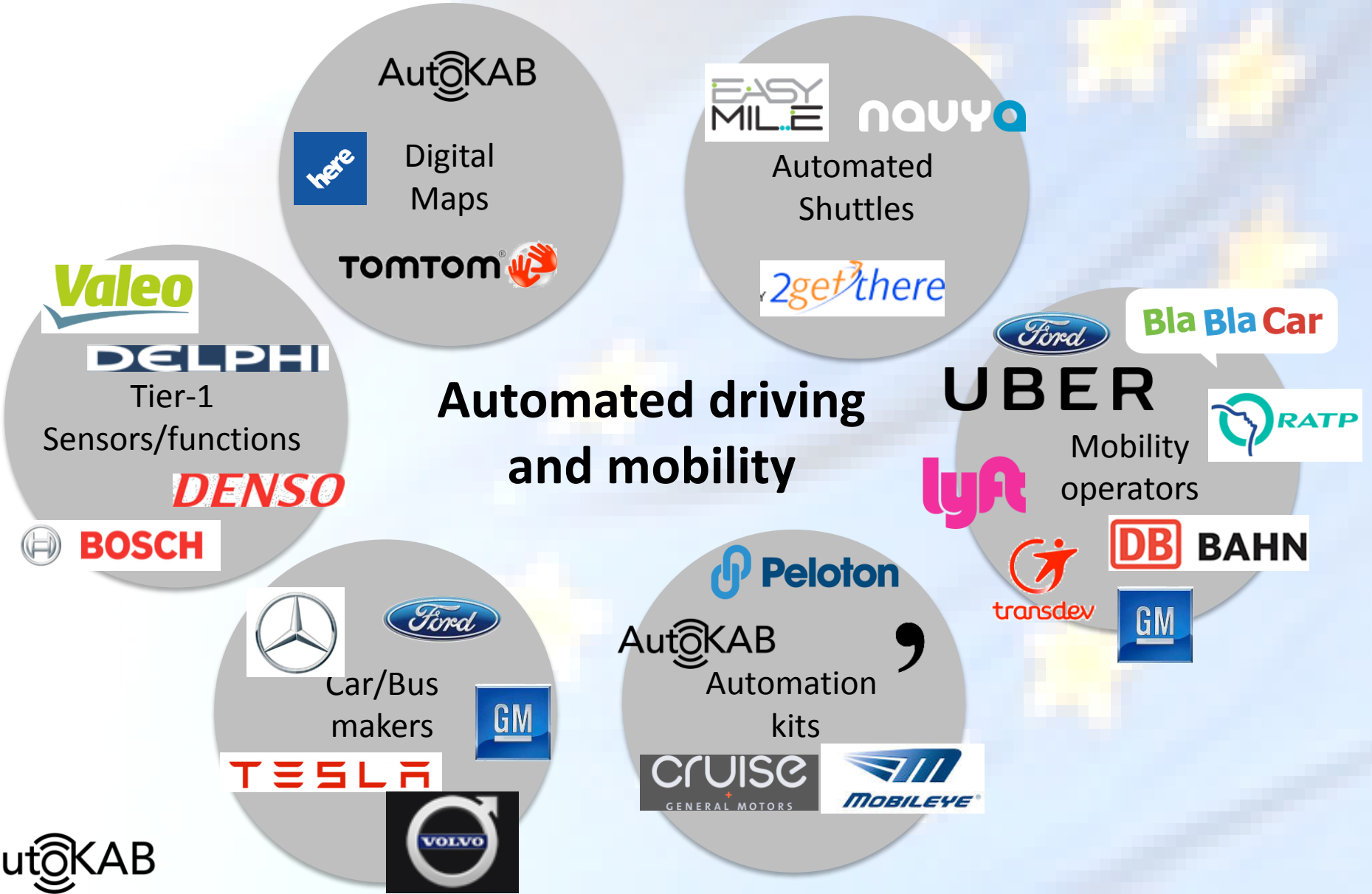
Vehicle Automation Competitive Landscape



Products forming the kits

- Mapping software using laser scanners
- Localisation software using laser scanners
- Localisation software using vision
- Obstacle detection and speed control with laser scanners + vision
- Platooning hardware/software
- Fleet management for automated vehicles
- Remote control of automated vehicles

First AutoKAB Kit

AutoKAB

Merci

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www.cybercars.fr

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