

# The perspective of European cities & regions

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# Some observations about vehicle automation developments

Much optimism bias about AVs yet many uncertainties about when it will arrive & in what form



# So why do we (cities/regions) need to act?

- To anticipate what is to come
- To build understanding of possible impacts at transportation & societal level
- To identify where automation can deliver positive outcomes for transport policy, where there are risks and how they can be mitigated
- To define measures (policy, financial, regulatory, etc) to maximise opportunities and minimise disbenefit





# Some possible impacts of AVs

## Travel behaviour

- Reduction in private car ownership in favour of shared mobility
- More motorised

## Spatial

- More public space put to other functions
- Urban sprawl

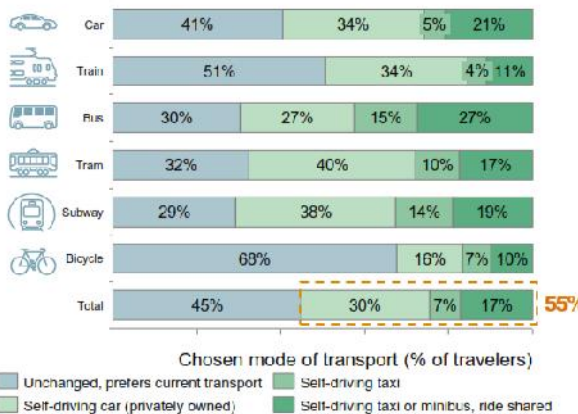
## Social

- Enhance transport by reducing congestion
- Increased social mobility by new mobility services (car/ride-sharing)

**Survey indicates that ~55% of all car, public transport and bicycle users prefer a form of SDV in scenario 3**

Question: Which mode of transport would you choose if self-driving vehicles were available today?

Current transport mode<sup>1</sup>



~55% of travelers already indicates that they would switch to a SDV

More than half of travelers indicate that they would switch to a form of self-driving vehicle

- Among car users, this figure is ~60%
- Among rail passengers, this figure is ~50%
- Among bus, tram and subway users, this figure is ~70%
- Among cyclists, this figure is ~30%

The preference of self-driving vehicles is about 50% for a privately owned self-driving car, and 50% for some form of vehicle-sharing or ride-sharing

These conversion rates are more probably an underestimate than an overestimate, because conversions to new technologies are often underestimated by consumers

- We took this into account when drafting the various scenarios



# Some possible impacts of AVs

## ➤ Road safety

- (i) driver distraction reduction; (ii) road rules compliance
- (i) Interaction with VRUs; (ii) technology infallibility

## ➤ Traffic management/efficiency

- C-ITS approach could enable (i) richer data for traffic and asset management; (ii) improved vehicle control
- Improved traffic efficiency leads to more vehicles on road
- “More pain than gain” in short-medium term due to co-existence and higher safety margins

## ➤ Infrastructure

- Investments depend on AV implementation path: autonomous, CCAV or systems-approach
- Where significant investments required, new business models must be found

# CoEXist in brief

## CoEXist CoEXist CoEXist Use Cases

### **CoEXist Approach**

- Automation-ready extension of existing transport models (passenger car/ bus)
- Automation-ready impact of CA demand and development (CAV-/CV-shared)
- Automation-ready use cases in four Milton Keynes and impacts on safety requirements (with hybrid infrastructure)



Long term



**Microscopic**

Impact of C



Signalized

- Mixed traffic
- V2I & V2V



**Microscopic**



Drop off / pick up / self parking



**Milton Keynes  
(University of Cambridge)**

Automated Freight Delivery



**Microscopic**



**Macroscopic**

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[www.h2020-coexist.eu](http://www.h2020-coexist.eu)



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# MAVEN in brief

*MAVEN*



## □ Main objectives

- ✓ Management reg
- ✓ Monitoring, supp
- guide vehicles at
- ✓ Further enhance

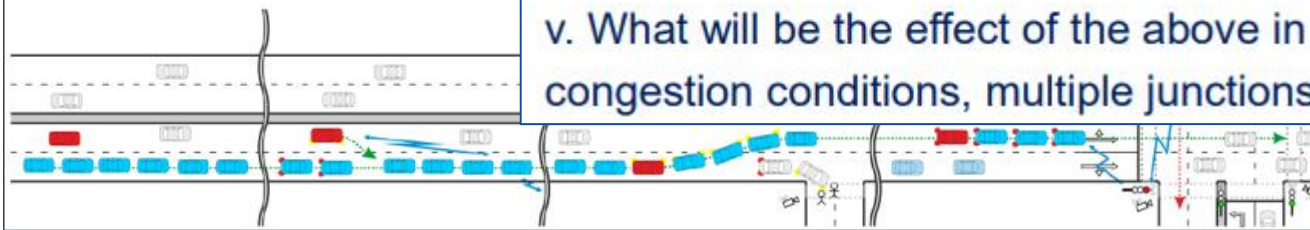
## □ MAVEN use cases

- ✓ VIC interactions
- ✓ traffic controllers
- management, qu
- ✓ platoon manager
- ✓ detection of non-coop

## b d. Operational

- i. i. How scalable is the MAVEN approach?
- ii. Interaction between AVs and non-AVs and VRUs?
- iii. What happens in case of system malfunction?
- iv. How can the functionality of the system be maintained over time (e.g. via periodic inspections at authorised centres or real-time plausibility checks mechanisms)
- v. What will be the effect of the above in different scenarios (e.g. congestion conditions, multiple junctions, presence of VRUs)

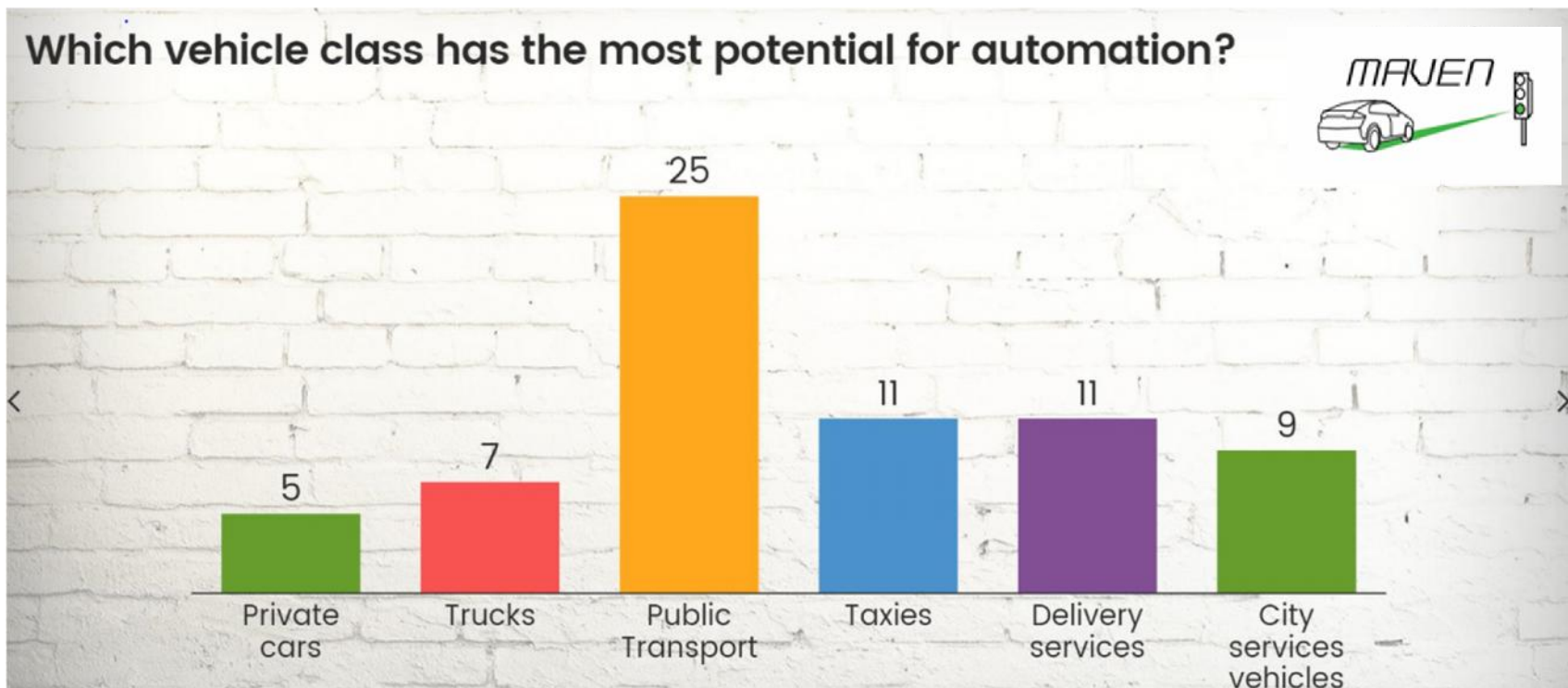
autonomous, connected/cooperative, partially automated and non-automated vehicles?



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# Automation and multimodal transport





# Automation and multimodal transport



CITIES DEMONSTRATING AUTOMATED ROAD PASSENGER TRANSPORT



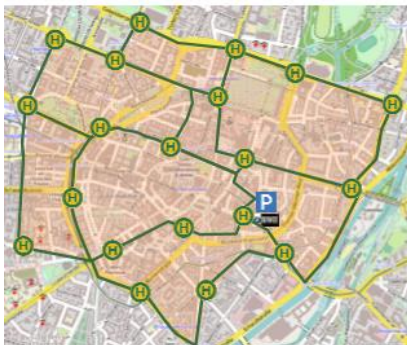
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# Automation and multimodal transport

## Will public transport as we know it today still be there in a fully automated future?

AUTONOMOUS DRIVING (L4/5-FAD): NEW MOBILITY SERVICES.

Phase 1



- FAD is only possible in specific areas and on approved routes.
- The access to the car is only possible on defined stop stations.

Phase 2



- FAD is available in a larger area in cities.
- The density of the stop stations and the number of approved routes rises.
- The routes enlarge for example the public transport system.

Phase 3



- FAD is available in the entire urban area.
- There are no more fixed stop stations.

Dr Fastenrath, BMW, Polis TE&M  
WG meeting, 9/10/17



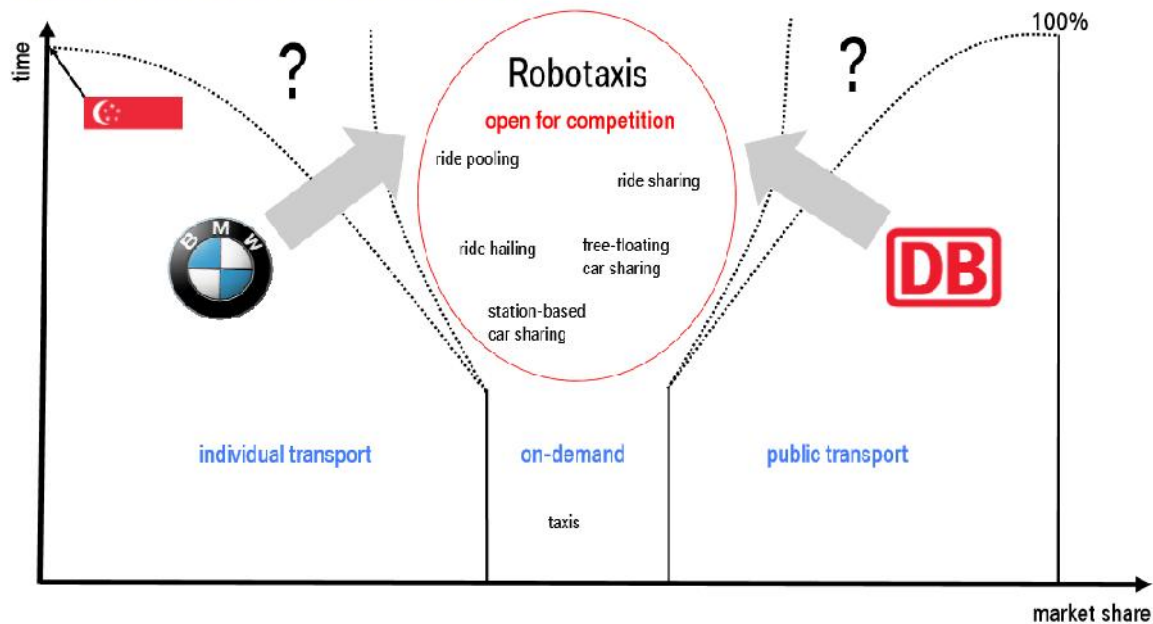
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# Automation and multimodal transport

Will public transport as we know it today still be there in a fully automated future?

THE WORLD OF MOBILITY IS CHANGING



Dr Fastenrath, BMW, Polis TE&M  
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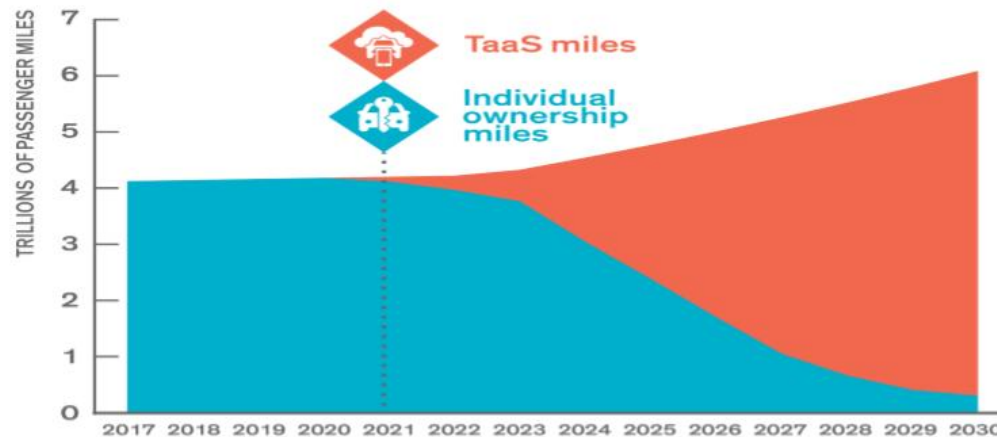


# Automation and multimodal transport



Will public transport as we know it today still be there in a fully automated future?

**95% of Passenger Miles TaaS (AEV) by 2030**



Tony Seba, economist & disruption expert, JRC workshop on connected & automated road transport, 17/6/17

# Automation and multimodal transport

## Can new mobility services take all?

- Requires massive modal shift: not easy given attachment to car for independent mobility
- Unlikely that shared cars can offer capacity of mass transit systems, even if all trips are shared
- In an open market, fleet managers will (i) drive for economic efficiency and (ii) want to operate in most profitable (dense) city areas only
- What about physical activity?



Citizens and mobility in Barcelona, Creafutur

# Automation and multimodal transport

Public transport coupled with new mobility services is most efficient



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# Automation and multimodal transport

## Transport authorities should be steering this

L.A. calls on Uber, Lyft, Chariot et al to create ambitious new MicroTransit plan for the city



The city of Los Angeles, arguably the spiritual home of both cars and congestion, is hoping to partner with mobility companies to lure drivers out of their vehicles.

L.A. is offering ride-hailing services such as Uber, Lyft and Ford's Chariot (plus any other interested parties) a chance to help design a "MicroTransit" system to complement existing bus and rail lines.

Starting from 25 October, the L.A. County Metropolitan Transportation Authority is accepting proposals for a pilot project in which vans circulate through different zones in the city (rather than operating on fixed routes) to pick up passengers within minutes of being summoned via a smartphone app. The goal is to transport multiple riders, especially in areas that aren't well served by existing bus lines or need better options to get to rail stations, according to Joshua Schank, Chief Innovation Officer for the transit agency.

# Some recommendations

- Keep **discussions grounded**
- Promote **engagement of transportation/road authorities** in AV discussions/developments to prepare for and steer their implementation
- Consider how the **role and responsibilities of the authority** may change with the advent of automation and new mobility services
- Ensure automation developments are not purely industrial policy driven, but also **support transport policy**
- Foster **partnership and dialogue**

