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Autonomous vehicles and socio-demographic change in Alpine region

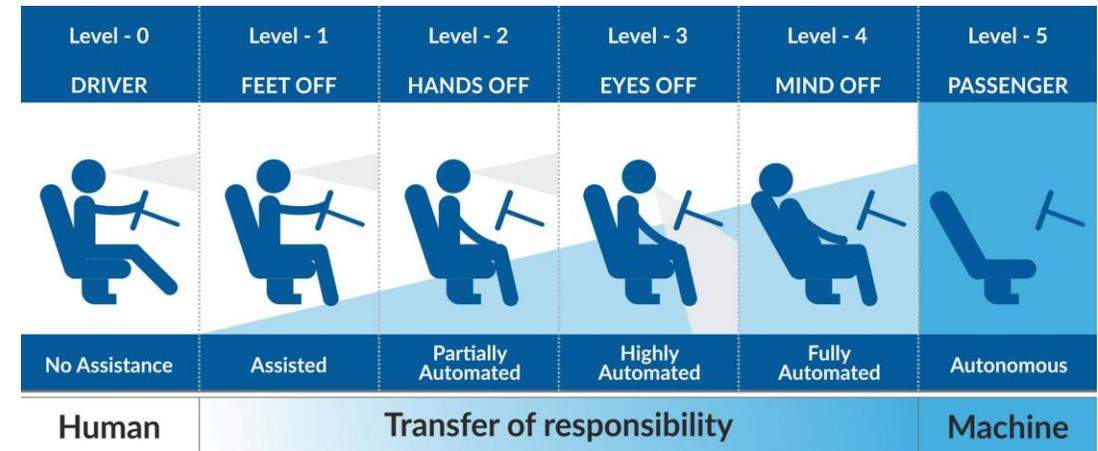
Autonomous Vehicles (AV's)

.... a vehicle that can guide itself without human conduction

Level of Automations:

In 2014, Society of Automotive Engineers (SAE), USA

- **Level – 0: No Automation**
- Level – 1: Drivers Assistance
- Level – 2: Partial Automation
- Level – 3: Conditional Automation
- Level – 4: High Automation
- **Level – 5: Full Automation**
-> *Full Autonomous Vehicle (FAV)*



Source: SAE International, 2014

AV's Development

The journey started almost a century back

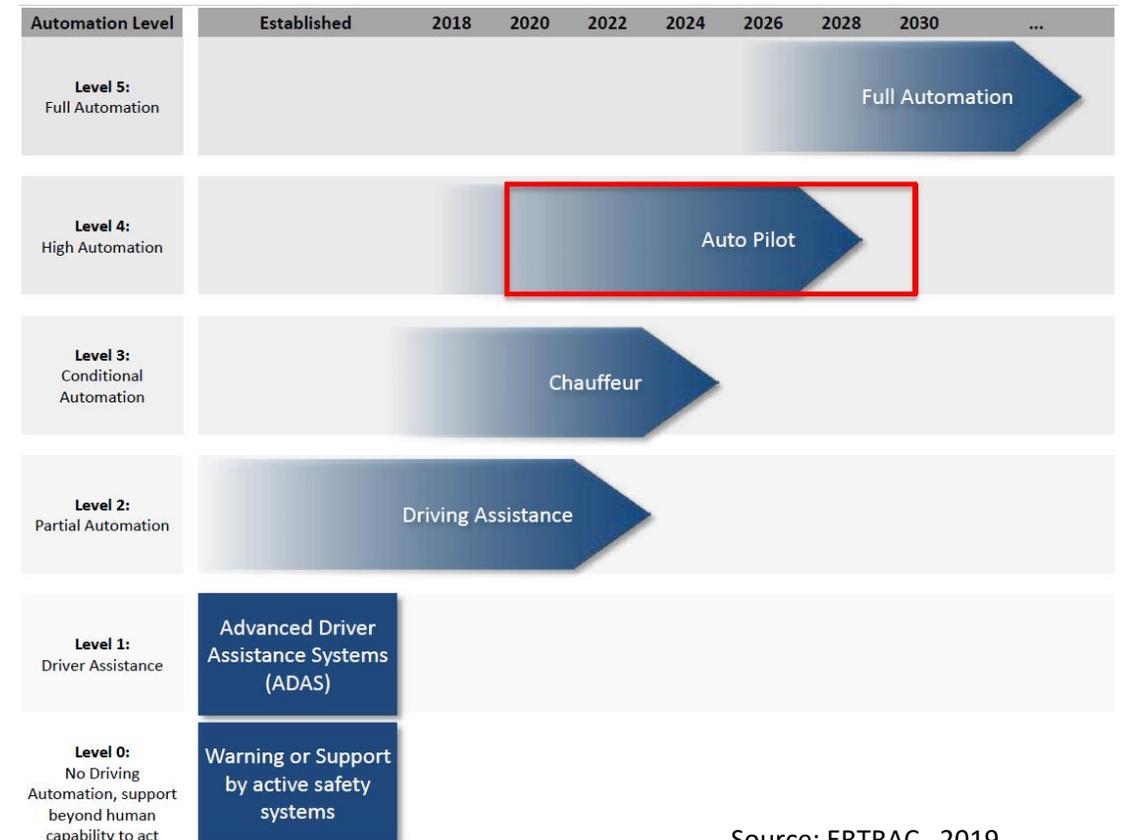
1925: with the radio controlled car

1955: RCA Labs built a car that was guided and controlled

1995: VaMP drove 2,000 km on a Paris three-lane highway

2009: Google's AV project kick-off

2018: Waymo drove 1.2 million AV miles



Source: ERTRAC , 2019

Demographic change in Austria

- According to Statistik Austria (2018) prognosis

In Austria:

2030: **23.1%** of total Population will be **65+**

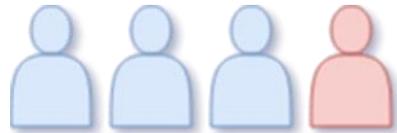
2040: which will be **26.1%** and in 2050: **27.3%**

In Tyrol:

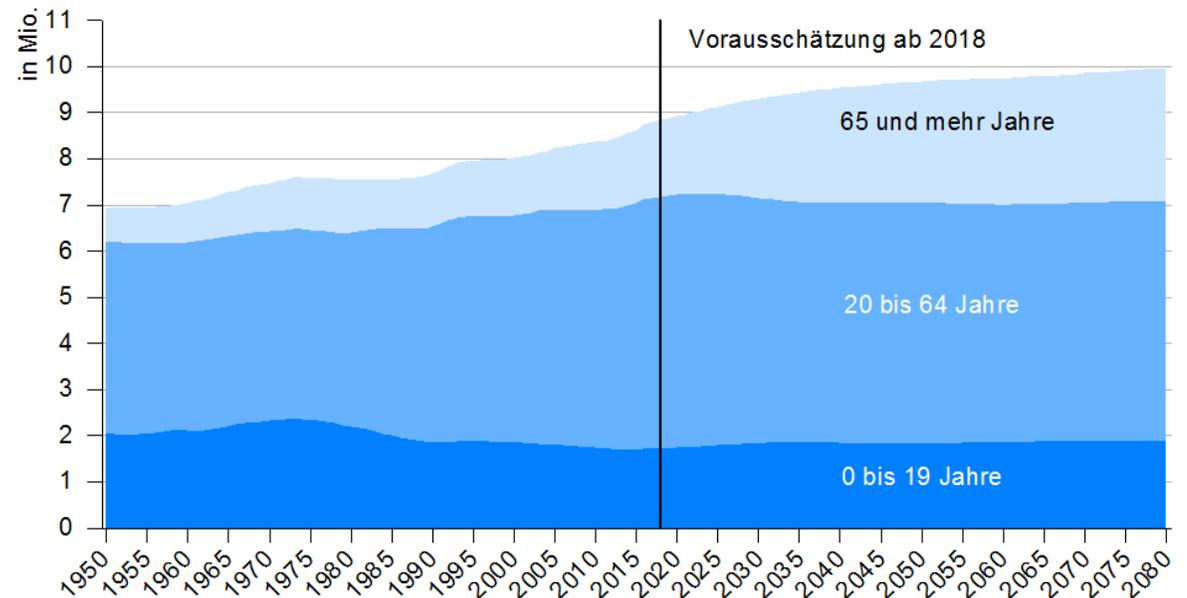
2030: **22.5%**

2040: **25.9%**

2050: **27.3%**



**Bevölkerung nach breiten Altersgruppen 1950 bis 2080
(mittlere Variante)**



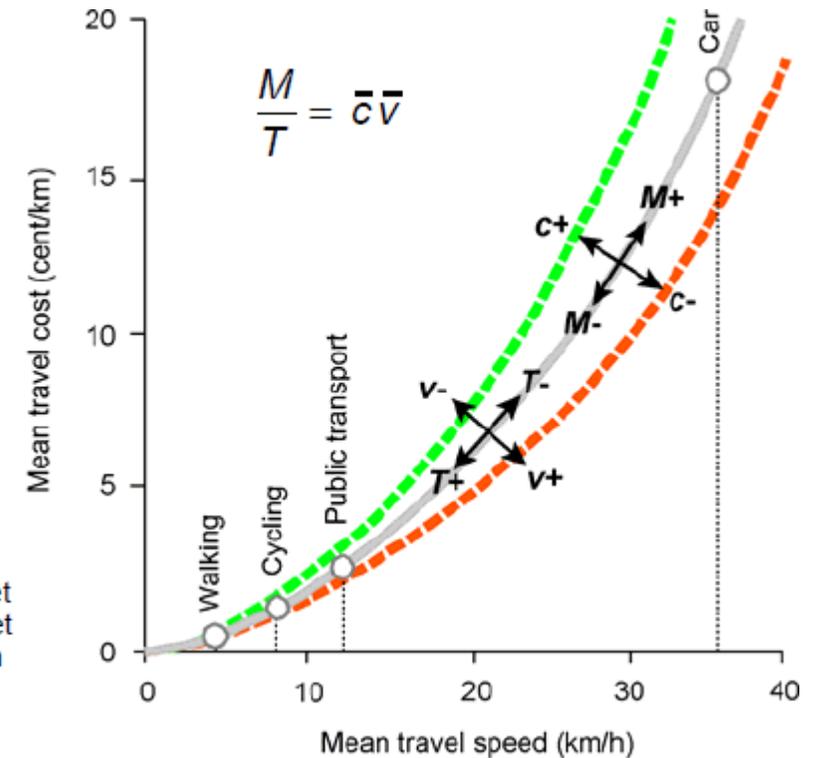
Source: Statistik Austria , 2018

Unified Mechanism of Travel (UMOT)

Based on travel data of more than 100 urban regions, *Zahavi (1981)* proposed the following hypotheses:

- (1) Households consider in their daily travel decisions *monetary* and *time budgets*.
- (2) Monetary and time budgets available for transport change only very *slowly*.
- (3) Within their monetary and time budgets households *maximise* spatial opportunities (i.e. travel distances).

M Travel cost budget
 T Travel time budget
 \bar{c} Mean cost per km
 \bar{v} Mean speed



Source: Wegener, 2008

Unified Mechanism of Travel (UMOT)

- This implies:
 - If travel becomes *faster* or *less expensive*, people will make *more* and *longer* trips.
 - If travel becomes faster or less expensive, people will choose *more distant* locations.
 - If people will get more *affluent*, they will make more and longer trips and choose more distant locations.
 - If people have to *work less*, they will make more and longer trips and choose more distant locations.
 - If *all this happens together*, people will make more and longer trips and choose more distant locations.

The Triangel

- Is there any relationship between: UMOT, 65+ Age Group and AV's?
 - 65+ citizen group *work less* as the are in Pension
 - This group is comparatively more *affluent*
 - AV's will make the travel *faster*
 - Shared AV's will make the travel *less expensive*



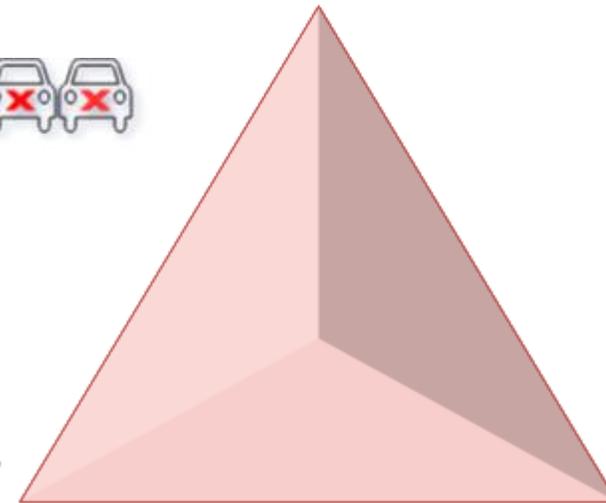
Source: insurance journal, 2015



1 / UMOT

2 / 65+ gr.

3 / AV's



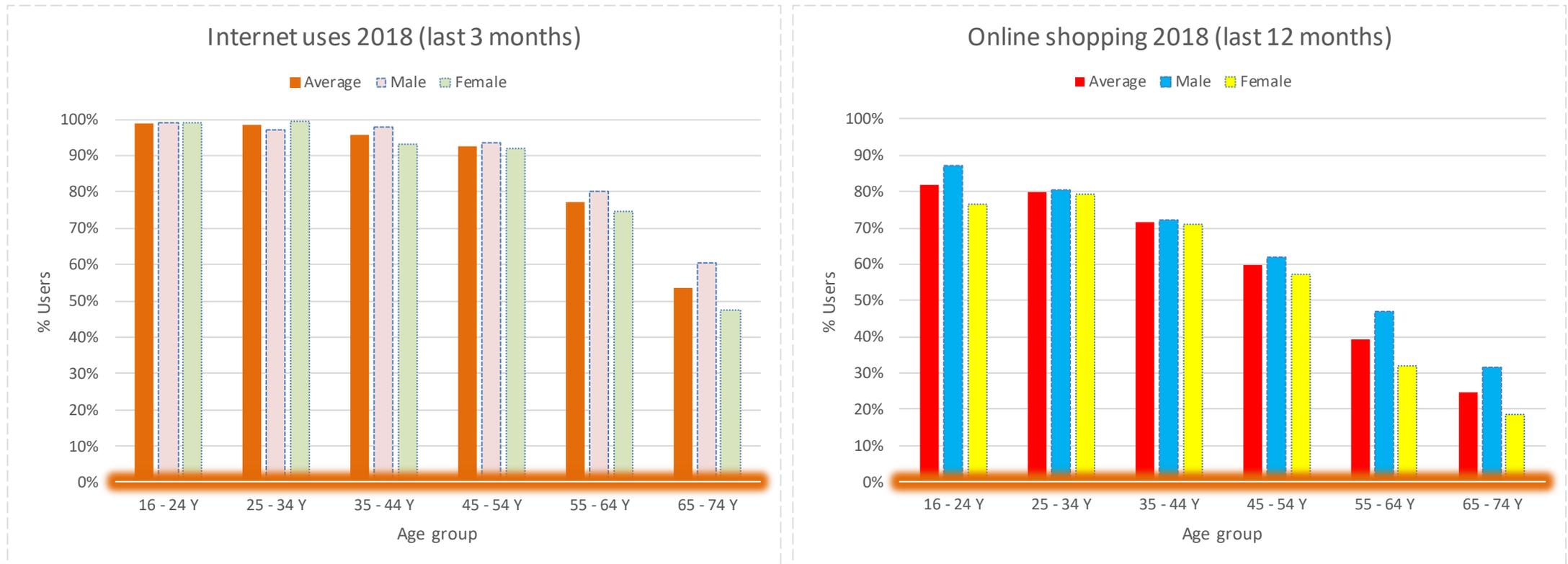
Consequences

- i. Do the Citizen Group 65+ travel more and cover longer distances in future?
- ii. Do they choose more distant locations for living?
- iii. Will that create urban sprawl?

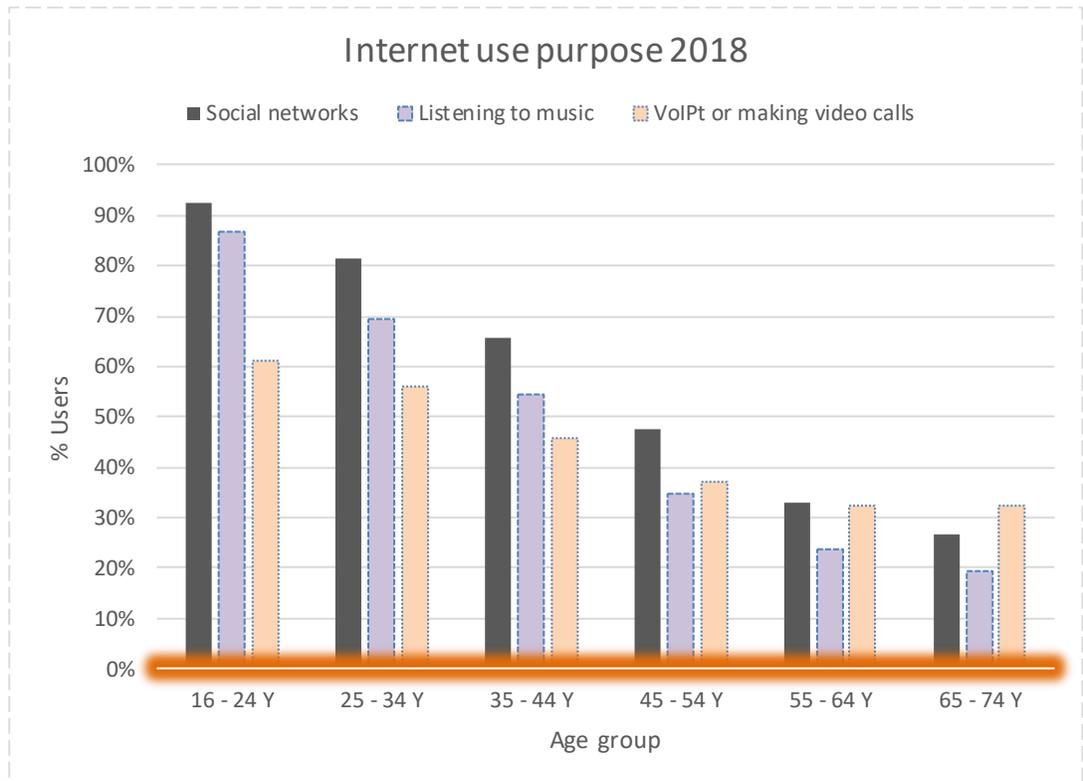
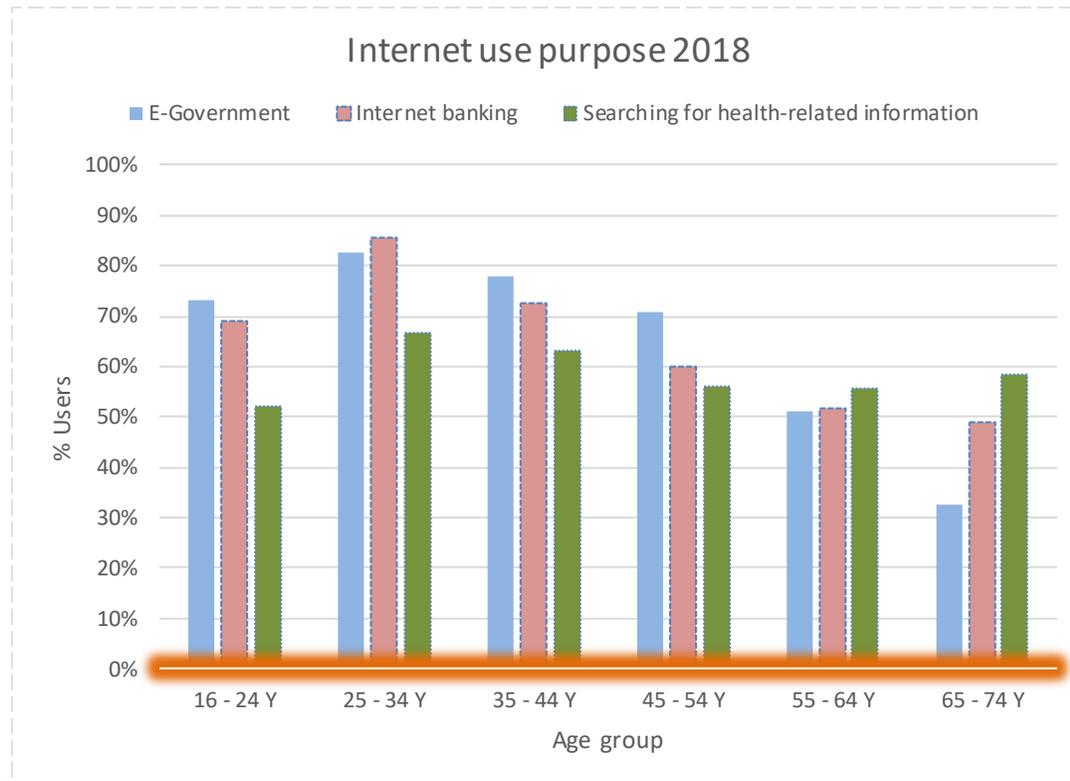
In Practise

- Citizen Group 65+ are less comfortable with new digital technologies
- They are also the late adopters of new digital technologies

Internet Use



Internet Use

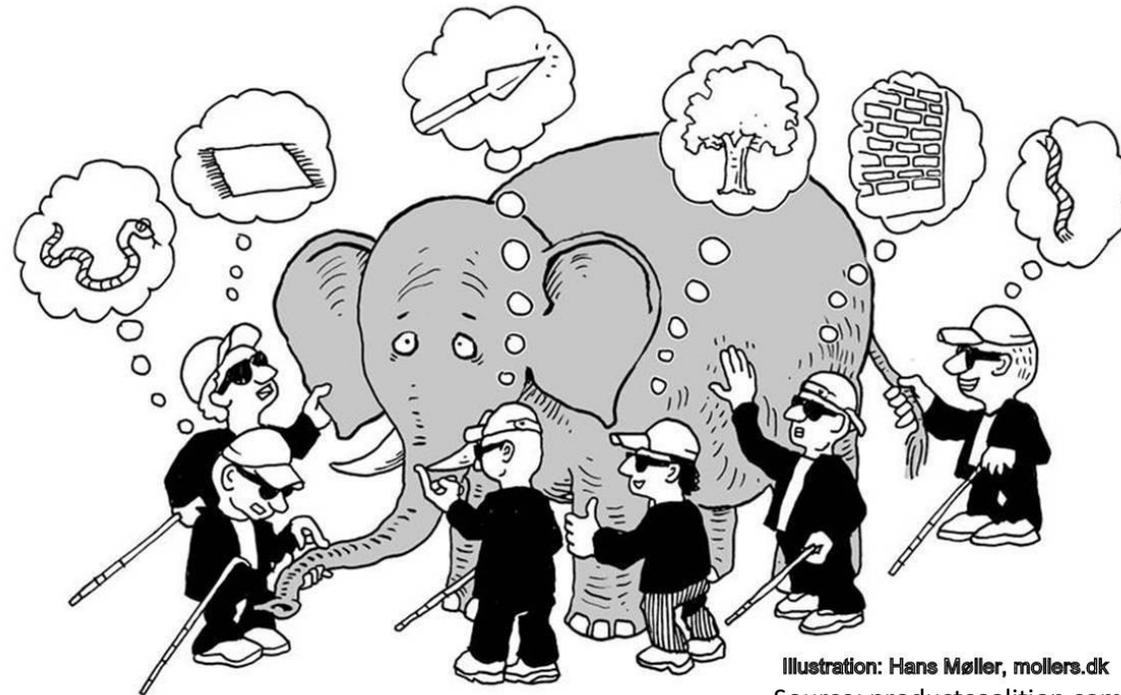


Questions for Discussion

- How can we measure the acceptance of AV's by the Citizen Group 65+?
 - Can we use Technology Acceptance Model by Davis (1989) or Theory of reasoned action by Ajzen (1967)?
- Which 65+ Citizen Group we will take into consideration?
 - Those who are 65+ now or will be 65+ in (2030, 2040 or 2050)?
- How can we identify the acceptance of Shared AV's by the Citizen Group 65+?

Finally

... AV's are not all about **Transportations!**
... how much we know about it?





Thank you for your attention !