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Autonomous driving in Ticino: a mirage or around the corner?

There is great uncertainty about the transition from human to autonomous driving vehicles, as well as about the extent and direction of their potential impacts on the urban shape and design. Predictions and scenarios have been developed, that adopt a global perspective, but lack in contextualization to local organization of the transport sector. Under the EVA project (www.evaproject.eu), aimed at optimizing regional infrastructures for the transition to electric and connected autonomous vehicles, we are developing predictions and future scenarios that are contextualised to the Ticino reality. How are autonomous vehicles perceived by the Ticino population? When will they diffuse and how will they be used? How will they impact on public transport and active mobility? We present preliminary findings from a survey targeting the Ticino population and a focus group with local practitioners and experts active in the field of mobility.

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Automation levels

The Society of Automotive Engineers (SAE) defined six levels of automated driving [1]:

Level 0 – *No Automation:* all aspects of driving being fully human and manually controlled

Level 1 – *Driver Assistance:* one single automated aspect (e.g. cruise control)

Level 2 – *Partial Automation:* automated steering and acceleration capabilities (e.g. helping vehicles to stay in lanes and self-parking features)

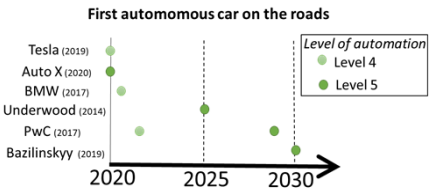
Level 3 – *Conditional Automation:* vehicles are able to detect the environment around them and make informed decisions for themselves (e.g. overtaking slower moving vehicles)

Level 4 – *High Automation:* human intervenes only in extreme cases (e.g. bad weather)

Level 5 – *Full Automation:* human driving is completely eliminated

Technological status

The technological path to reach fully automated driving seems well defined. Some car companies are already producing models with level 4 and 5 automation and several previsions suggest that fully autonomous vehicles will be on road by 2030.

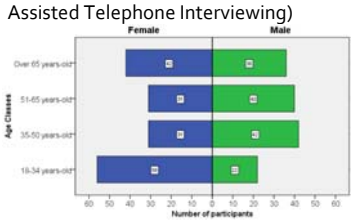


Vehicles with automation equal to or higher than level 3 require an authorisation for being tested on Swiss roads [2]. Today, five tests are active in Switzerland, running fully autonomous shuttle buses. None of them is operating in Ticino.

Methods

To investigate local perceptions and attitudes about the levels of autonomy and their expected diffusion in Ticino, we surveyed two groups:

- the population: 300 individuals living in Ticino were surveyed through CATI (Computer Assisted Telephone Interviewing)

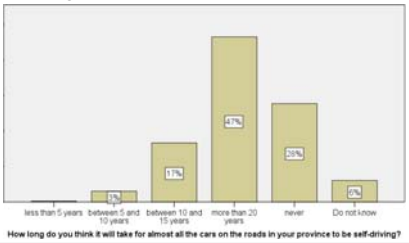


- local experts: 8 local practitioners and experts active in the transport sector (civil servants, academics, providers of car-pooling services, car driver associations and distribution system operators) were engaged in a focus group.

Population perspective

If a choice was given, today 67.7% of the respondents would prefer to use a vehicle with a human driver. Only 8% would choose a completely autonomous vehicle.

When asked about when the completely autonomous vehicles would dominate the car fleet circulating in Ticino, almost half of the respondents answered: "*in more than 20 years from now*". Yet 28% of them believes that this technology will never dominate the car offer.



Local experts perspective

All experts agree that fully autonomous cars (level 5) will eventually circulate in Ticino, just like the other countries of the world: "*Ticino has not the critical mass to influence the offer*". In their opinion, level 3 and 4 autonomous vehicles will enter the Ticino market somewhere between 2020 and 2035, once legislation is adapted to deal with them. They expected such vehicles will dominate the circulating car fleet between 2030 and 2050. With such automation levels, vehicles are expected to mostly remain privately owned. Level 5 autonomous vehicles will instead enter the market between 2028 and 2045, and become dominant between 2048 and 2060. Their diffusion will imply a radical change: they will "*most likely be shared*". However, experts predict that "pooling" options (ride-sharing) "*will only be chosen for monetary reasons*". Their diffusion will not affect demand for train and bicycle use.

Conclusions

According to both the perception by the population and predictions by transport experts, autonomous cars in Ticino are not a mirage - but they are not around the corner either.

Citizens and local experts agree that this technology will be available, but there is high uncertainty about when it will happen. This is not surprising and reflects the uncertainty in the scientific community about the time horizon of the adoption and diffusion of autonomous cars [3].

However, even though most of the experts were not aware of scientific literature on autonomous vehicles, their expectations are in line with scientific and commercial predictions [4, 5].

On the other hand, citizens tend to be skeptical about this technology and their large majority still prefers human driving: autonomous cars still need to go a long way, before they become mainstream.

References

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Project

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