Exploring plausible futures of automated vehicles in the Netherlands: results from a scenario analysis

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Introduction

- The introduction to the market, the development and the implications of automated driving are among the main uncertainties of the future transport system.
- The design of robust long-term transport policies and investments needs to take into account these uncertainties.
- Our study aimed to identify plausible future development paths of automated vehicles (AV) in the Netherlands and to estimate potential implications for traffic, travel behavior and transport planning on a time horizon up to 2030 and 2050.
- We conducted a scenario analysis that involved experts from various planning, technology, and research organizations in the Netherlands and was completed in three workshops.

Methods

- Identification of key factors and driving forces of development of automated vehicles
- Assessment of impact and uncertainty of driving forces
- Construction of the scenario matrix
- Estimation of penetration rates and potential implications of automated vehicles in each scenario
- Review of the scenarios and assessment of the likelihood and overall impact of each scenario

Results

Scenario Matrix

**AV ...in standby**

- High technological development
- AV ...in bloom

Restrictive AV policies

- Fully automated in 2045.
- Limited legislation for AV integration. No AV trials allowed.
- Recessionary economy, high unemployment.
- Negative customers’ attitude, almost no demand for AVs.
- Important environmental problems. Very slow transition to low-carbon economy.

Supportive AV policies

- Fully automated & cooperative vehicles (V2V) in 2030.
- Legislation inflexibility for AV. Transport policies restraining use of AV. High regulation of AV trials.
- Modest economic growth.
- “Wait and see…” customers’ attitude, mid-low demand for AVs.
- No major environmental problems, but still low penetration of electric vehicles.

**AV ...in doubt**

- Low technological development
- AV ...in demand

**AV in vehicles fleet (%) & AV VKT in total travel (%)**

**Value of time (% decrease)**

**Likelihood (0%-impossible … 100%-certain)**

*Each bar represents the average value of five experts’ (or for perception of likelihood) experts’ responses collected in three workshops and the error bar depicts standard deviation.

Conclusions

- Fully automated vehicles are expected to be commercially available between 2025 and 2045, and penetrate the market rapidly after their introduction.
- Complexity of urban environment and unexpected incidents may influence development path of automated vehicles.
- Certain implications on mobility are expected in all scenarios, although there is great variation on the impacts among the scenarios.
- It is expected that measures to curb growth of travel and subsequent externalities will be necessary in three out of the four scenarios.

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