AV meets PT: the future of automated vehicles in public transport

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Short abstract

This paper gives an overview of the projects and pilots with automated vehicles as public transport in the Netherlands as well as the remaining research questions and preliminary results of passenger related studies regarding expected ridership.

Abstract

The technology of automated vehicles is developing rapidly and the vehicles offer a lot of benefits. They claim to be safer, more environmentally friendly and they can provide transport for everyone, including people who currently don't have access to transportation. The focus seemed to be on the development of automated private vehicles, but the focus seems to shift from private transportation to automated public transportation.

The Netherlands has been pro-active in testing automated vehicles on public roads. This paper gives an overview of the projects and pilots with automated vehicles as public transport in the Netherlands as well as the remaining research questions. Also, preliminary results of passenger related studies regarding expected ridership and perception are discussed in this paper. Information was gathered by performing desk research and conducting interviews with twelve public transport authorities. During these interviews we spoke about threats and opportunities as well as feasibility, visions and knowledge gaps. Subsequently we spoke about what the future of public transport would look like and how we can anticipate on these upcoming technologies. Lastly we asked about (future) pilot locations with automated vehicles. These locations are included on a map of the Netherlands.

In general the interviewed parties agree that the public transport on trunk lines will remain the same. The parties expect more possibilities with automated vehicles as first/last mile solution to and from trunk lines. They stated that the main challenges for public transport is the accessibility of public transport, the aging society and declining population as well as keeping public transport

feasible. A study conducted by Scheltes et al. shows that automated vehicles can fulfill the last-mile gap by simulating door-to-door transport with automated vehicles near the Delft-Zuid train station, the Netherlands. The simulations show different operational scenarios with a reduced average total travel time of over six minutes (1). One of the risks mentioned during the interviews, is the risk of drawing people from active modes, such as cycling and walking, to the automated public transport system. A study conducted by Hezaveh et al. shows great opportunities for AV's to complement public transport, but also shows the possible impact on the network due to excessive demand and the risk of people moving from, for example, active modes to automated vehicles. Furthermore, automated public transport might remove mobility barriers for captive drivers which will increase the demand (2).

In many places in the Netherlands there is or has already been experiments with automated vehicles (3 – 4). These pilots, experiments or demonstrations are often focused on the technical aspects. However, the challenges regarding the deployment of an automated vehicle extends beyond the technical level. The interviewed parties indicate that it is important to focus, with the upcoming pilots, more on the traveller and the position of the vehicle within the existing public transport network. The interviewed parties stress that it is important to think about the long-term implementation.

The current public transport contracts as we know them, will likely change with the arrival of automated vehicles. Concessions are already becoming more flexible and space is created to experiment with new concepts such as automated vehicles. During a concession, it is possible to experiment alongside the established service and a transition path can be mapped out. Tendering an automated shuttle has not (yet) taken place in the Netherlands (5). The public transport authorities are clear about the future: automated vehicles in public transport do not come with a 'big bang' but will gradually find their way.

Literature
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