Helsinki

ACTION OVERVIEW

Autonomous Electric Bus Pilot

This action was implemented by Metropolia University of Applied Sciences. A full report (D4.15), written in English is available on https://mysmartlife.eu/publications-media/public-deliverables/

A European urban transition project towards more sustainable cities through innovative solutions, in the fields of mobility, energy and digitality.

Smart City

Global Project

Coordination: CARTIF
European grant: 18M €
30 partners, 6 countries

Period: Dec. 2016 - Nov. 2021
Demonstrators:
Hamburg, Helsinki, Nantes

@mysmartlife_EU
https://mysmartlife.eu

Helsinki Demonstrator Site

Coordination:
The City of Helsinki
European grant: 5,6M €
7 partners

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Mobility

Electric vehicles

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www.metropolia.fi/fi/tutkimus-kehitys-ja-innovaatiot/hankkeet/helsinki-robobusline

▶ OBJECTIVES

› To address urban last-mile mobility issues
› To define the overall maturity level of the available robot bus technology and suitability to the Finnish transport system
› To promote the transition to an electric and sustainable transport system

▶ IMPLEMENTATION

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CHALLENGE

Transport represents almost a quarter of Europe's greenhouse gas emissions. New technological solutions such as electric and autonomous vehicles are developed to help tackle mobility challenges. Robot buses have been seen to increase the modal share of public transport and lower the use of private cars while also having an electric drivetrain.

PROGRESS

Two automated bus pilots implemented in the Helsinki area lasting around 6 months each (In Kivikko, 2018, and in Kalasatama, 2019).

› 5185 passengers in total
› 4006 km driven
› Operator (responsible person/safety driver) still on board

Most of the passengers were trying out the bus - the journey was not part of the passengers' travel chain. Generally, they were happy about the ride. The biggest complaints were related to the speed of the bus as well as to harsh braking. The maximum operating speed of the bus was 18 km/h, thus it was not able to keep up with the traffic flow. Depending on the operational area, the risks increased while the bus was being passed by other vehicles.

Kalasatama was the more suitable operational area for the bus in use at this stage. The area speed limit - 30 km/h. It is the maximum recommended limit for testing similar automated buses in road traffic. However, the narrower streets with roadside parking created situations where the operator had to intervene and overtake obstacles (usually parked cars on the roadside) manually.

LESSONS LEARNT

During the pilots, our understanding of the challenges increased. An electric vehicle turned out not to be automatically sustainable: it depends on what kind of conditions the vehicle is operated in, how the used electricity is produced and how the vehicle is manufactured. Robot buses also need parking space, charging infrastructure and a service depot – at this stage also for the on-site personnel related to the operating. Challenges arise if first/last mile robot bus routes are located far from the existing maintenance services.

The robot buses would not replace any current bus lines with more sustainable technology, as they would only produce more CO2 if just replacing walking and cycling. The key is to reduce private car usage by making public transport more attractive and achievable.

Routes had to be chosen based on what the buses can do rather than where the real demand for mobility solutions is. Currently, automated buses would best serve disabled people since a short walking distance is already a challenge for them. This user group should be specifically considered when developing the vehicles and designing related services. However, it should be noted that a responsible person is not intended to be inside the vehicle to physically assist passengers.

FURTHER DEVELOPMENT

The potential usage cases and benefits of robot buses in the future could be shortly listed as follows:

›On demand-based automated robot buses should be able to complement the public transport offer and provide a service that specifically meets demand
›In areas of higher demand, robot buses could offer so-called last-mile journeys and complement the feeder transport.
›On demand-services could be radically more cost-effective to implement as a driverless service where one person could concurrently monitor the operation of several vehicles.
›Main focus in future projects should be in developing the technology itself, so that the responsible person can be removed from the vehicle and several vehicles can be remotely monitored by one person.

Overall, it was rewarding to see how the automated bus pilots gained a lot of positive attention both nationally and internationally. Despite the current challenges, the automated future looks bright and if cleverly arranged, it will improve the public transport's coverage and service as well as make the traffic system more sustainable.

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