



# AUTONOMOUS BUSES

## THE FUTURE OF TRANSPORT?

In December 2023, passengers in the GZM area could choose to take a ride on an autonomous bus. The bus, developed by a Gliwice-based company called Bleeps, is a level 4 autonomous vehicle according to the SAE classification. This means that it is equipped with technologies that enable autonomous navigation, but it still requires a person in the vehicle who is ready to take full control in case of an emergency. The bus was available at three locations: on the campus of the Silesian University of Technology in Gliwice, in the Valley of Three Ponds in Katowice, and in the Silesian Park in Chorzów. During the testing phase, Anita Pollak, PhD, Associate Professor, Łukasz Jach, PhD, Associate Professor, Anna Mucha, MA, from the Institute of Psychology of the University of Silesia in Katowice, and students Alicja Jurkowska, Ksenia Krotofil, Wiktor Łuniewski, Mateusz Mendrok, Janusz Pach, Ligia Skrzypczak carried out their study.

'Public transport in the city is one of the

areas of cooperation between humans and autonomous systems that has been developing rapidly in recent years. The introduction of autonomy into transport raises many questions, such as how to encourage people to accept such a solution, how to organise supervision of the driving process, and how to prepare people to use this type of solution,' states Anita Pollak.

In practice, these questions give rise to further questions: Who will be willing to pay for access to such solutions? Who – a person or a system – should decide whether to stop or continue driving? How can parents be persuaded to let their children travel to school on an autonomous bus?

During the course of the study, the psychologists performed a comprehensive analysis of the attitudes and beliefs regarding the tested vehicle. They looked at trust, level of interest in the technology, expectations regarding the effectiveness of the solution, as well as safety and comfort. In addition, they explored

previously under-researched issues related to staying alert during the journey and the emotions experienced by the passengers. At the same time, a survey was conducted among people travelling by traditional means of transport. The researchers also examined aspects related to the screen inside the vehicle displaying information about its operation, prepared with the aim of increasing passengers' sense of safety. Ultimately, the screen is intended to replace the on-board operator.

The study responds to the growing interest in analysing the social and psychological factors influencing the willingness to accept and use autonomous buses. The results of this study are interesting because they concern passengers of autonomous vehicles, for whom the absence of an active driver may favour a sharper awareness of stimuli, e.g. in terms of comfort.

The study involved 449 people who completed a survey after taking a ride on an autonomous bus and 159 passen-

Transport plays an important role in the Metropolis GZM. Travelling from one city to another for work or leisure is part of everyday life for many people in the GZM area who have to deal with heavy traffic, congested streets, and insufficient parking spaces and bus connections. Issues related to urban transport, logistics, and optimisation of movement within the metropolis are becoming increasingly important.



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gers who took a ride on a traditional bus. The participants' overall assessment of comfort and safety was positive. They also gave a favourable assessment of the necessity, legitimacy, and quality of the solution presented to them. The study did not reveal any differences in trust between the groups. This indicates that both users of the new and standard forms of transport felt that the vehicle would meet their requirements and keep them safe.

Participants who tested the autonomous bus were more interested in the technology and rated it higher compared to the ratings by users of traditional vehicles. The most positive responses came from people who often travel on foot, as well as younger and older drivers. Positive interest in the technology was associated with pleasant emotions (especially among men), while a negative assessment of the technology was associated with anxiety (among women) and boredom (among the entire group testing the autonomous

bus). According to the technology acceptance model, the above-mentioned correlations favour an increase in the willingness to use this solution.

Interesting results were found in relation to where respondents' attention was focused – outside or inside the vehicle in which they were travelling. Taking a ride on an autonomous bus, which is dependent on the reliability of the systems used, directs the respondents' attention to the external environment. They make an effort and monitor possible obstacles that could affect the bus – unlike people travelling on a standard bus, who admitted that they are more involved in monitoring the situation inside the bus which could involve dangerous situations caused by other passengers.

There are many concerns about autonomous buses, and they relate to a wide variety of issues. Firstly, whether the autonomous system will be able to make the right decision in an emergency, e.g. in the event of a pedestrian

crossing the road in front of the bus or a bird flying into the windscreen. Secondly, travellers are concerned that the remote operator may have difficulty taking control of the vehicle in the event of a malfunction, e.g. internet connection failure. Thirdly, there are doubts regarding legal liability for possible accidents. Fourthly, respondents also point out the issue of privacy and data security, as remote surveillance requires constant monitoring.

The survey data confirms that Poles are receptive to the idea of autonomous transport, which means that there may be less pushback against its introduction than is commonly believed. In addition to transparent legal regulations, it is important to clearly communicate the advantages and limitations of the technology and to gradually implement autonomous solutions in order to develop a sense of control among passengers and confidence that the system operates according to strictly verified safety standards.