

Milestone in the automated public transport: Passenger operation for self-driving shuttles on demand started in Karlsruhe

German premiere: first-time combination of autonomous and on-demand • Funding project „EVA-Shuttle“ starts passenger operation in Karlsruhe • Flexible App-booking via ioki platform

(Karlsruhe, April 21st, 2021) In the Weiherfeld-Dammerstock district of Karlsruhe, citizens can now experience a unique mobility concept: As part of the EVA-Shuttle research project, autonomously driving, emission-free minibuses will bring passengers comfortably from A to B as required. The special thing about this: the vehicles move freely in regular traffic, there they act independently and react to pedestrians, cyclists and motorised means of transport. The order is made on-demand via the app of ioki. In this constellation, this is so far unique in Germany. The three vehicles with the names "Ella", "Vera" and "Anna" are now open to the public traffic as part of EVA-Shuttle (EVA = in german words: elektrisch, vernetzt, automatisiert, which means electric, networked, automated) after an intensive testing period in the last project phase. Until the end of June, passengers can now test the new mobility concept – free of charge.

A consortium of five partners is involved in the EVA-Shuttle research project: in addition to the FZI Research Center for Computer Science, these are the Robert Bosch GmbH, Verkehrsbetriebe Karlsruhe GmbH, TÜV SÜD Auto Service GmbH and Deutsche Bahn subsidiary ioki GmbH.

"By funding this project, the federal government is making an important contribution to further developing urban mobility. We need such innovative projects in order to be able to take the lead internationally when it comes to driverless public transport," says Federal Minister of Transport Andreas Scheuer, adding: "With our new law on autonomous driving, we will be the first country in the world to bring self-driving vehicles from the research laboratories onto the road – and this in regular operation. Projects like this one here in Karlsruhe can then be implemented much more easily. I am sure: by making technology part of everyday life piece by piece, we can get people excited about autonomous driving."

Mayor Dr. Frank Mentrup is particularly proud that Karlsruhe is once again one step ahead when it comes to innovative public transport solutions: "26 years ago, we revolutionized local transport by rail with the "Karlsruhe model", now we are the first city to serve an entire district with automated shuttles." He expects valuable knowledge from the project for planning the mobility of the future. "Autonomous solutions for the first

and last mile could be a decisive step in attracting new user groups for public transport and thus making a valuable contribution to a green city," Mentrup emphasizes.

The Verkehrsbetriebe Karlsruhe take over the operation of the EVA shuttles as an experienced transport company. They embed the shuttles in the reporting chain of their central control center and can use the logistics of the car workshop in Karlsruhe's Rheinhafen at any time if maintenance is required. "Passenger operations are the heart of our joint project. We offer customers within the test area a smart and barrier-free solution to complement the existing public transport offer for the first and last mile. I hope that the citizens will be open to this project, which is supported by a highly motivated consortium, and I am very curious to see how the people from Karlsruhe will accept this offer," explains Dr. Alexander Pischon, Managing Director of the Verkehrsbetriebe Karlsruhe (VBK).

That the vehicles are able to move freely within the road boundaries and thus be able to react independently to different traffic situations in inner-city mixed operation, is possible because at the FZI Research Center for Computer Science completely new planning algorithms for decision making was developed. These built on the sensor technology, environmental detection and self-localization of the project partner Bosch. Professor J. Marius Zöllner, Director of the leading FZI Research Center for Computer Science, explains: "The vehicle travels on the basis of highly detailed maps from the test field Autonomous Driving Baden-Württemberg, which gives it the navigable area. Obstacles as well as other traffic participants are detected by the sensors of the vehicle. The vehicle aligns its route individually on the basis of the self-identified traffic situation. This is what makes the EVA-Shuttle project so special and is an important step for the automated mobility of tomorrow."

Digitalisation of public transport picks up speed

Passengers can order a vehicle via ioki's smartphone app and thus travel barrier-free from the Dammerstock light rail stop to the front door in the district or drive comfortably from home to the baker in the district center. Operating hours are daily until 30 April between 9 am and 4 pm, from 1 May to 30 June daily from 8 am to 5 pm.

The shuttles run without a fixed timetable (on-demand) only if they are requested via smartphone app. They operate virtual stops, to which they are routed by the app when they are asked to drive. Passengers with similar routes are bundled into ridepooling thanks to an intelligent algorithm. The DB subsidiary ioki presents its specially developed technical interface for the first time, which enables the combination of autonomous driving and on-demand booking, a Germany premiere. "Today we are climbing the next level of technology in autonomous driving: for the first time, we are combining autonomous and on-demand, and we are also interlinking the shuttles via app with bus and train. Our ioki platform enables exactly these links. As a result, the digitalization of public transport continues to gain momentum. In doing so, we are also strengthening the railways, thus accelerating the turnaround in mobility and climate protection. That is why

the importance of this research project extends far beyond Karlsruhe," says DB Passenger Transport Board Berthold-Huber.

Safety comes first: safety drivers always on board / Corona concept

Safety is paramount in passenger operations. The safety concept developed under the direction of TÜV SÜD ensures the safety of passengers and other road users. The three vehicles Ella, Vera and Anna have completed months of development and tests on the test field Autonomous Driving Baden-Württemberg both on a private test track and in the public target area. In order to start passenger operations, they were repeatedly tested by TÜV SÜD experts and approved by the Karlsruhe district for road traffic with a maximum speed of 20 km/h. "We are proud to be involved in this research project, which has incorporated our extensive knowledge gained in similar projects in Germany, Singapore and the USA," says Christian Gndt, Vice President Automated Driving at TÜV SÜD. "Everyday operations will also bring us many other valuable insights to effectively test the safety of increasingly automated vehicles," Gndt added.

Even if the minibus moves self-driving in the district, a trained safety driver of the Karlsruhe Transport Association (KVV) is always on board, who can intervene in an emergency and ensure the operation. At any time, the driver has the possibility to intervene in the driving process and make a correction, to bring the vehicle to a standstill or to switch to a manual operation mode. He is also available in driving breaks for all questions or can help passengers with reduced mobility to get in and out.

Where normally up to six passengers would be accommodated, whose travel requests can be intelligently collected via the so-called ridepooling, a maximum of three people will now be able to board for infection protection due to the Corona pandemic. In coordination with the Karlsruhe Health Office, the VBK have developed a hygiene concept. As with all public transport, the ride is only allowed with a medical mask. All surfaces are regularly disinfected by the safety drivers.

Autonomous shuttles use infrastructure of the test field Autonomous Driving Baden-Württemberg

The EVA shuttles run on the test field Autonomous Driving Baden-Württemberg. Baden-Württemberg Transport Minister Winfried Hermann emphasizes: "With the test field Autonomous Driving Baden-Württemberg, we have created an excellent basis for providing innovative projects on autonomous driving with a research environment with real conditions that is easily accessible to third parties. The test field has been in operation since 2018 with more than 200 kilometers of network length of all road types and is currently used by more than ten research projects. I am very pleased that the EVA-Shuttle-Project – funded by the federal government – is also benefiting from the advantages of the test field and from the strategy for automated and networked mobility in the country. It is particularly important to me that the project has the future-oriented use case of public transport as a part of it. I encourage all citizens to witness this testing of the new technologies and to use the minibuses.



About the EVA-Shuttle project

In the EVA-Shuttle project, the project consortium around the FZI is developing and testing mobility solutions for the first and last mile from the bus stop to the front door. Called by App, autonomous shuttles will pick up future passengers according to the principle of car pooling and bring them to their destinations. In addition to the FZI, the Robert Bosch GmbH, Verkehrsbetriebe Karlsruhe GmbH, TÜV SÜD Auto Service GmbH and Deutsche Bahn subsidiary ioki GmbH are involved in the development. INIT GmbH, the city of Karlsruhe and the Karlsruher Verkehrsverbund / Albtal-Verkehrs-Gesellschaft are accompanying the project as associated partners. The Federal Ministry of Transport and digital Infrastructure (BMVI) is funding the project as part of the research program Automated and Connected Driving with 2.52 million euros over a period of 33 months.

Press contact ioki

Carolin Frick

Head of Marketing & Communications

m: 0152 / 375 247 20

e: press@ioki.com

www.ioki.com