

**NRW expands expertise for autonomous driving
Mobility 4.0 in focus at XPONENTIAL Europe**

Autonomous and teleoperated driving systems are developing rapidly. In the US and China the first robotaxis are already operating on the roads. However, Germany is not affected by a ‘tailback’, say traffic experts. Here, live operations are being tested in Aldenhoven, to name but one city. The local Testing Center is one of the lighthouse projects in Europe and partners with XPONENTIAL Europe, the trade fair for uncrewed systems and robotics debuting in Düsseldorf from 18 to 20 February next year.

The car is safely doing it laps in Aldenhoven, a small community located in the outskirts of Aachen. But the driver’s seat is empty – because he is sitting somewhere in Tokyo, some 9,300 kilometres away steering the vehicle round the testing grounds in the “Jülicher Börde”, stopping at red lights, overtaking cyclists at a safe distance, waiting for pedestrians at the zebra crossing and not even straying from the “guiding line” on rain-soaked tracks – perfect and precise to the millimetre.

“This is where the road traffic of the future is being created,” says Micha Lesemann, Managing Director of Aldenhoven Testing Center GmbH. Where former colliery “Emil Mayrisch” once stood until 1992 is now a testing grounds rated among the top destinations for trialling forward-looking mobility systems across Europe. Many street vehicles and drones have already done their laps here. Nearly all renowned OEMs such as McLaren, Porsche, Smart and Skoda have run tests here. Systems and software providers such as MIRA are also regular guests at the 40-hectare site. More than 200 companies regularly run their tests here in live operations – on an oval track as a ring road surrounding a complete urban traffic environment in the centre. Even braking tracks and bad roads as well as ascending slopes, driving dynamics area and a handling course are available. Users even have direct access to a proper motorway track: “Here in Aldenhoven all autonomy levels of mobility are tested,” says Lesemann.



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The Aldenhoven Testing Center (ATC) is operated by the Düren district council and is a subsidiary of the nearby RWTH Aachen university. Its Institute for Automotive Engineering (ika), the Chair of Thermodynamics of Mobile Energy Conversion Systems (zme) and the Institute of Control Engineering (IRT) are directly involved. The test site was funded by the state of North Rhine-Westphalia, the German state and the European Union.

Leading radio spectrum and bandwidth in Europe

The digital backbone of the site is the network operated by Vodafone – because coverage makes and breaks today’s and tomorrow’s mobility. As early as 2019 the first 5G radio station operated in Germany went on air at the 5G Mobility Lab. The system whose central radio tower rises where the colliery winding tower used to stand, boasts one of Europe’s most state-of-the-art mobile radio development and test environments for the connected and autonomous traffic of the future. “The radio spectrum and bandwidth we cover here are unique all over Europe,” says Michael Bösing, Head of Vodafone’s Technology Innovation Development Division. The lab network operation was built and expanded under his direction. Now besides pre-defined standard configurations individual configurations can be made available. To this end, in addition to 5G there is also GSM, LTE and NB IoT available for life operation. In connection with customer-specific ICT components and solutions this makes it possible to generate the required eco-system for automotive and mobility applications and to control, monitor and evaluate them from the control centre. In all of this “safety first” takes top priority. This test philosophy of learning systems, he says, is also what distinguishes them from the real-life operations that have already started in the USA and China: “Apart from the regulatory framework many things will depend on us creating networks that are available for various modes of transport under one roof,” says a convinced Bösing.



Mobility 4.0 rather than coal is subsidised: North Rhine-Westphalia is a centre of mobile mobility systems



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The region between Aachen, Düsseldorf and Cologne has long developed into a nationwide centre for the research, development and trials of new mobility concepts. In Wegberg-Wildenrath, located some 35 kilometres from Aldenhoven, Siemens Mobility operates one of the world's biggest test and validation centres for rail transport. In Monheim, not too far from Cologne, the first buses with Autonomy Level 4 in Germany have been running since 2020. In Düsseldorf, MIRA, a subsidiary of Rheinmetall, is developing remotely operated vehicle systems, which have already successfully completed city and motorway trips in trial operation. For XPONENTIAL Europe this company will offer a teleoperated shuttle between the Exhibition Centre and Düsseldorf's city centre.

“North Rhine-Westphalia is developing into a lighthouse region for automated and connected mobility,” says professor Dr. Lutz Eckstein. He is the scientific director of ‘innocam.NRW’. The network initiated in 2020 by the Institute of Automotive Engineering (ika) of RWTH Aachen university and involving science, business and administration, aims to link all relevant players in automated and connected mobility across all modes of transport. The Ministry of Transport of the state of North Rhine-Westphalia provides funding for the project: “North Rhine-Westphalia offers the optimal prerequisites for establishing this multi-disciplinary network,” says Eckstein and adds: “Automated and connected mobility is already being developed by excellent research clusters in varied pilot projects, tested on unique test sites in NRW such as the Aldenhoven Testing Center (ATC), for example, and driven by mobility companies, start-ups, research institutions and local authorities today.”

Düsseldorf as ideal location for XPONENTIAL Europe

“The on-going research projects and developments show that North Rhine-Westphalia and the region located between the rivers Rhine, Ruhr and Weser play a leading role in Mobility 4.0. This is where the market is, where the innovation drivers are and where the expertise of Messe Düsseldorf as a global partner in the industry sector is located. This makes Düsseldorf the ideal location for XPONENTIAL Europe,” says Malte Seifert, Director Metals & Autonomous Technologies at Messe Düsseldorf. He is responsible for XPONENTIAL Europe, which



will celebrate its premiere in Düsseldorf next year. The focal topics of the trade fair are uncrewed systems and robotics.



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„Die laufenden Forschungsprojekte und Entwicklungen zeigen, dass Nordrhein-Westfalen und die Region zwischen Rhein, Ruhr und Weser eine führende Rolle bei der Mobilität 4.0 haben. Hier ist der Markt, hier sind die Innovationstreiber und hier ist die Kompetenz der Messe Düsseldorf als weltweit agierender Partner im Industriesektor. Deshalb ist Düsseldorf der ideale Standort für die XPONENTIAL Europe“, sagt Malte Seifert, Director Metals & Autonomous Technologies der Messe Düsseldorf. Er ist verantwortlich für die XPONENTIAL Europe, die im kommenden Jahr ihre Premiere in Düsseldorf feiert. Zentrale Themen der Messe sind autonome Systeme und Robotik.



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