AstaZero unveils the world's most advanced proving ground

Technology breakthrough hastens a new era in vehicle connectivity

- RISE (Research Institutes of Sweden) Proving Ground AstaZero unveils the first 6G, edge-computing facility to test the limits of traffic and vehicle communications.
- 99.999% connected vehicle system reliability achieved for the first time.
- Advanced AI powered systems to face world's most demanding tests in global race for connected vehicle supremacy.

Telecom providers, AI engineers and vehicle manufacturers around the world are working together to embrace an increasingly interconnected and complex vehicle ecosystem. As international 3G networks are decommissioned, traffic, business and mission-critical systems (i.e. police, ambulances, fire brigade) face the challenge of upgrading and adapting their systems to ensure seamless integration with 6G infrastructure and technologies. AstaZero is now launching a unique system enabling communication reliability between vehicles to reach 99.999%, thus marking the biggest breakthrough in vehicle testing for a generation.

Virtually every new car, truck and bus sold today is equipped with a host of sensors needed to support drivers (e.g. emergency braking, lane keeping, etc) and technology allowing drivers to receive information about, for example, road conditions or traffic. The next generation of critical communication (V2X) scenarios will unlock the full potential of this ecosystem and allow vehicles – both AI-enabled and non-AI-enabled – to interact within EDGE networks. These systems will need to reach a reliability of 99.999%, which requires that not only will tests on the individual sensor level be required, but also on integrated and collaborative systems, a task which have been impossible until now. This is a critical step forward in the journey for autonomous vehicles, industrial automation and connected societies, as it allows virtual objects and situations to be tested in scenarios limited solely by the engineer's imagination and vehicle technology.

In a future where highly automated traffic systems not only enhances safety but also enables vehicles and infrastructure to communicate seamlessly, the intelligent test network will help to optimize traffic flows, reduce congestion, minimizes emissions and ultimately transform urban mobility into a smoother, more efficient experience for all.

In live tests of complex traffic scenarios, the new system uses orchestration tools to manage and communicate critical data including exact positioning and control signalling to and between different objects during tests, including self-driving vehicles, cyclists, pedestrians, motorbikes and physical infrastructure, including traffic signals. The increased adoption of drone technology, particularly in urban settings, will also benefit from the ability and reliability to test a multitude of scenarios hitherto impossible.

AstaZero proving ground is the only open and neutral test location in Europe, if not the world, where transport tests with this level of advanced technology is made available to any brand, enabling unique and unbiased data testing for all.

"In the future, communication might not always originate from the sensors on the vehicle itself, but instead from sensors mounted on connected infrastructure or from the sensors of another vehicle. In these types of systems, three key factors are crucial: reliability, ultra-fast communication and intelligent decision-making.

However, the bitter truth is that without a global, harmonious and integrated testing approach, there is no guarantee that vehicles and infrastructure will have the capabilities to enable the highest level of safety with complete confidence within this connected ecosystem." said Peter Janevik, CEO, RISE AstaZero.

The primary reason for testing new vehicles and traffic technology is to increase safety and reliability. As vehicle manufacturers innovate to reduce accidents, the need to test new technology to its absolute limits is key if they are to become commercially viable.

A safer vehicle and pedestrian ecosystem will be a significant outcome of the technology tested at AstaZero. Studies show that accidents across European cities are on the rise, particularly involving commercial vehicles, pedestrians and cyclists. The decreasing number of road accidents in Europe has flattened out. From 2019, the decrease in fatalities plunged from a 10 percent to a 1 percent reduction in 2023. The test facility will directly address this by ultimately improving the communications whilst decreasing the latency between vehicles and the infrastructure ecosystem that underpins it.

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NOTES TO EDITOR

Example to illustrate the technology in action

- Imagine for example an ambulance rushing towards a congested motorway responding to a critical emergency. Through V2X connectivity, the ambulance shares its real-time location, speed, and intended route with surrounding infrastructure and vehicles. In intersections connected traffic lights automatically turn green for the ambulance and on the motorway, vehicles are instructed to make way for the ambulance well in advance of their drivers being able to see or hear the approaching ambulance. Similarly, connected road signs and traffic lights close to the motorway on ramps are adjusted in real-time to adjust the speed of approaching vehicles to avoid them entering the motorway before the ambulance has passed.

- For this future to become a reality focus needs to be broadened from the individual component of the ambulance, drone, car, network or traffic light. All the parts of the bigger system need to operate in harmony with each other. Which cars should reduce their speed? By how much and for how long? When can the speed be raised again? The systems need to work all the time, and not just most of the time. These types of mission critical applications need to have a reliance of 99.999%. How do we get to this future? The key is to include testing as an integral part of development.

RISE - Research Institutes of Sweden and the Proving Ground AstaZero - Background

- RISE Proving Ground AstaZero is the world's first full-scale independent test environment for the automated transport system and mobility connectivity. AstaZero is owned by RISE Research Institutes of Sweden. It is a neutral, and open environment and research organization for testing automated vehicle solutions and advanced safety systems. AstaZero provides end-to-end vehicle and infrastructure testing facilities. This includes component reliability tests in electromagnetic chambers to repeatable functionality tests at the AstaZero proving ground, where the full system can be tested in a safe realistic environment, including both simulated and real parts of the system.

- AstaZero is a member of Global Certification Forum (GCF) and contributes to the Mission Critical Services and the Automotive streams. AstaZero is also a GCF Recognized Test Organization (RTO). Within the automotive industry, AstaZero is an independent Euro NCAP accredited testbed.

- AstaZero is a member of Euro NCAP and one of the only certified test grounds to do Euro NCAP certification tests. They have actively participated in the development and decision-making process and requirements linked to vehicle critical connectivity and V2X information which are included in the 2026 – 2032 Euro NCAP certification. The criteria start with driver awareness information in 2026 and gradually increases by 2032 to include critical communication support for ADAS and AD vehicles.

EU ROAD ACCIDENTS TREND

- Out of all fatal city accidents involving commercial vehicles, 80 percent were unprotected road users.
- In 2023, 20,400 people lost their lives in road crashes across the EU, marking a 1% decrease from the previous year, with 46 road deaths per million inhabitants. While the long-term trend shows a 10% reduction compared to 2019, the current pace of decline falls short of the required 4.5% annual reduction needed to achieve the EU's goal of halving road deaths by 2030.
- Preliminary figures for the first six months of 2024 indicate the number of deaths on EU roads has remained the same, compared with the same period in 2023. Some Member States, including Austria, Lithuania and Slovenia have recorded notable falls of more than 25%. Other countries have seen a significant increase to date. Monthly fluctuations however make accurately predicting the entire year difficult.
- EU-wide, road deaths in 2023 fell by 1% on the previous year. While this represents around 2,360 fewer fatalities (-10%) compared with 2019, the downward trend has flatlined in several Member States.
- Since 2019, the number of road deaths has scarcely fallen in Spain, France and Italy, while it has risen in Ireland, Latvia, the Netherlands, Slovakia and Sweden. In contrast, over the last four years, Belgium, Czechia, Denmark, Hungary and Poland2 are on track to meet the 50% reduction target in road deaths and serious injuries by 2030 (It is important to note that this is based on preliminary and often partial data).

Source: European Commission Directorate-General for Mobility and Transport, 8 March, 2024 and 10 October 2024

https://transport.ec.europa.eu/news-events/news/2023-figures-show-stalling-progress-reducing-road-fatalities-too-many-countries-2024-03-08_en

https://transport.ec.europa.eu/news-events/news/20400-lives-lost-eu-road-crashes-last-year-2024-10-10_en