

InfraROB: Transforming road maintenance with robotics and automation

The InfraROB project is exploring automation and robotics to improve road infrastructure safety and efficiency across Europe

The Horizon 2020-funded InfraROB project, running from September 2021 to February 2025, is transforming the way road infrastructure is constructed, upgraded, and maintained. With a strong emphasis on automation, robotics, and modularisation, InfraROB aims to enhance worker safety, reduce costs, and improve the overall efficiency of Europe's transport network.

CHALLENGES

Road infrastructure is crucial for both economic development and social mobility in Europe. As road transport remains the dominant mode for passenger and freight movement across the EU, ensuring a reliable and safe road network is paramount. However, maintaining and upgrading this network presents several challenges, particularly concerning worker safety and operational efficiency.

Work zones are particularly hazardous, with approximately 4% of all road accidents occurring in these areas. Construction workers face

high exposure to live traffic and heavy machinery, while the repetitive nature of maintenance tasks presents an opportunity for robotic automation. Despite the growing adoption of robotics in various industries, its integration into road infrastructure management remains limited. InfraROB seeks to bridge this gap by introducing innovative solutions that enhance safety, efficiency, and sustainability.

INNOVATIONS & TECH

InfraROB focuses on roadbed and pavement maintenance, particularly on asphalt roads, which constitute 90% of all paved roads and highways in Europe. The project developed a suite of autonomous robotic systems and advanced technologies designed to streamline various aspects of road maintenance:

- Automated (re)paving systems to enhance efficiency in road resurfacing
- Robotic solutions for crack and pothole repair, reducing the need for manual labour in hazardous conditions
- Autonomous line-marking machines for improved road safety and durability
- Collaborative robotic safety systems, including robotized safety cones and Remotely Piloted Aircraft Systems (RPAS), to enhance worker and road user protection
- Modular precast concrete elements that serve as both roadside safety barriers and road construction components, promoting a more flexible and resilient infrastructure
- Upgraded traffic and

maintenance management systems, ensuring the safe deployment of automated maintenance technologies and improved network availability

As a key partner in the InfraROB project, CECE has played a pivotal role in communication and dissemination efforts, ensuring that project developments reach relevant industry stakeholders. Through strategic outreach and engagement, CECE has contributed to raising awareness about the benefits of automation and robotics in road infrastructure maintenance.

EVENT INSIGHTS

The project's final event, held on 16 January in Madrid, provided a platform for experts from across Europe to exchange insights and showcase innovative solutions for road infrastructure management. Organised in collaboration with EU-funded projects OMICRON and HERON, the event gathered key stakeholders from research, industry and government to discuss the project's outcomes and future applications.

Noemi Jiménez Redondo from CEMOSA opened the event, setting the stage for a series of thought-provoking discussions. Pedro Arias-Sánchez from the University of Vigo highlighted the transformative potential of technologies such as digital twins, drones and artificial intelligence, emphasising their role in reducing accidents, costs and disruptions while enhancing capacity and efficiency.

José Solís Hernández of OMICRON underscored the significance of European competitiveness in the global market. He advocated for streamlined regulations to facilitate the adoption of emerging technologies, enabling Europe to compete effectively with major players like China and the US.

THE FUTURE

InfraROB has set a new benchmark for innovation in road infrastructure management. By integrating automation, robotics and digital solutions, the project not only enhances worker safety and efficiency but also paves the way for a more resilient and sustainable transport network in Europe.

The insights gained and technologies developed through InfraROB will serve as a foundation for future advancements in smart infrastructure, reinforcing Europe's leadership in construction technology.

As the project concludes, the industry must now focus on translating these innovations into widespread implementation.

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