

SafeRoute-6G

Project ID: C2023/2/14
 Start Date: 1 November 2024
 Closure date: 30 April 2028

Partners:

Austria

Geodata Messtechnik GmbH

Canada

Micro Engineering Tech. Inc.
 Wedge Networks

Finland

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Aunoa Software S.L.

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Project Websites

www.celticnext.eu/project-saferoute-6g/
<https://saferoute6g.fmi.fi>

Road safety infrastructure and services evolution and enhancements towards 6G

Weather, safety and road maintenance services are of utmost importance to network vendors and solution providers as well as for commercial fleet operators and operators of automated vehicle fleets. Safe Route-6G with its international consortium is facing this challenge during the current climate change situations and provides ready to market solutions for the autonomous driving industry. The consortium consists of partners from Luxembourg, Finland, UK, Türkiye, Austria, Spain, Canada and Korea.

Main focus

Traffic automation will increase in the coming years, and challenging road weather conditions will become more frequent due to climate change. Vehicles need reliable communication and accurate information about the state of the road network. By utilising next-generation data networks (5G-Advanced and 6G, including satellite), combining different data sources and using artificial intelligence, road weather models and traffic situational awareness can be improved, which contributes to traffic safety and enables more efficient road maintenance.

The project work is conducted in use cases focusing on the project key issues. Collection, evaluation and distribution of

sensor information from vehicles, road weather stations and other sensors for safety services, is essential element of the project. Cyber threat detection and prevention using Digital Twin is another key issue. Furthermore, hybrid communication for teleoperation and remote monitoring of automated vehicles is found very important topic within our main concept. Finally, implementing cross-border exchange of C-ITS messages is also an essential element in order to validate our findings.

Approach

The SafeRoute-6G project improves road safety, optimizes logistics and road maintenance, and contributes to the future of autonomous driving by delivering novel, focused and time-critical services to vehicles, road users, and 3rd party organizations in a reliable, resilient and scalable manner in the participating SafeRoute-6G countries and sites. The overall goal can be broken down into more specific objectives. Studying and refining the novel 5G/6G-inspired use cases for the automotive vertical sector and analyse the resulting requirements and business models for connectivity and services both on national and international levels. Designing and developing dynamic connectivity and



secure data aggregation solutions for vehicles and analyse enhancements brought by 5G/6G as well as advanced road weather and safety services to vehicles, road users, and 3rd party organizations. Another objective is analysing the distribution of service architectures and data processing closer to the network edge and end users and develop the required edge applications. We perform technology evaluation using simulations, as well as piloting and testing of the developed solutions in 5G/6G and vehicular test environments. We are utilising the results and international cooperation in the project in extending or enhancing the product and research offerings of the research and industrial partners while offering and arranging the co-operation between test-sites. We are using Digital Twin for CAM Cybersecurity, considering Proactive and Predictive Defense, Real-time Verification, Continuous Oversight and Dynamic Response Mechanism and address the problem of mass movements in the vicinity of roads.

Main results

The main results include Road weather station (RWS) improved road weather model, integrating data from different sources, allowing improved road maintenance and improved road weather services, hybrid communications to improve the safety of automated vehicles, improved reliability and coverage of remote monitoring with rerouting assistance. Other results are cybersecurity solutions

detecting cyber-attacks, preventing threats and providing security event information including Digital Twin-based cybersecurity for 5G/6G/NTN.

Further results include Cross-border exchange of C-ITS messages, IoT sensors to provide advanced services of fuel consumption estimation, safe rest stop identification, traffic blackspot identificati-

The results will be piloted in real environments in the participating countries.

Impact

The general objective of the Safe-Route-6G project is to provide improved traffic weather and safety services, making use of mobile infrastructure and operative weather radar networks for impro-



on. Important is also early detection of mass movements threatening roads and in general improved situational awareness with vehicle and infrastructure sensor data. This includes the assessment of use of 6G as sensing tool by simulation and a vehicular edge computing platform, enabling advanced safety and navigation.

ved traffic safety. Obviously, the ultimate impact approached is less or zero fatalities in traffic, supported with targets of decreased material costs in traffic accidents, more fluent traffic and less pollution within the traffic entity.

A parallel goal is improved performance of remote driving and remote monitoring of automated vehicles through hybrid communications (5G/6G, V2X, satellite), improved positioning services, improved cybersecurity services and new solutions, service concepts and business models for road safety service provision. Together these goals are aiming to bring us towards better traffic entity with less dangers and more convenience and fluency.

About CELTIC-NEXT

CELTIC-NEXT is the EUREKA Cluster for next-generation communications enabling the digital society. CELTIC-NEXT stimulates and orchestrates international collaborative projects in the Information and Communications Technology (ICT) domain.

The CELTIC-NEXT programme includes a wide scope of ICT topics based on new high-performance communications networks supporting data-rich applications and advanced services, both in the ICT sector and across all vertical sectors.

CELTIC-NEXT is an industry-driven initiative, involving all the major ICT industry players as well as many SMEs, service providers, and research institutions. The CELTIC-NEXT activities are open to all organisations that share the CELTIC-NEXT vision

of an inclusive digital society and are willing to collaborate to their own benefit, aligned with their national priorities, to advance the development and uptake of advanced ICT solutions.

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