5G Corridor project fiche – 5G-ADRIA

5G-ADRIA: inception study for 5G cross-border deployment between Slovenia and Croatia on the Mediterranean corridor

The project in a nutshell

The 5G-ADRIA project will focus on defining what 5G infrastructure is needed to support future traffic-related services that will be used along TEN-T transport corridors in Slovenia and Croatia.

Additionally, the proposed corridor is connecting core TEN-T ports in the northern Adriatic region, namely in Koper and Rijeka.

The project will be carried out by Telemach Slovenija, sirokopasovne komunikacije, d.o.o., together with its partners Druzba za Avtoceste v Republiki Sloveniji D.D, Transmitters and Communications Ltd, and Univerza v Ljubljani.

Key facts

Length: 378 km

Corridor: Koper (Slovenia) - Rijeka (Croatia)

Total EU grant: €735,225.00

Project duration: 6 months (January 2024 – June 2024)

Transportation mode: Road

Spectrum bands: N28, N7 and N78

Standards: 5G-V2X, NR-V2X

QoS:

- Response Time: user response in the specific time frame
- Reliability: without unexpected failures
- Availability: accessibility to users whenever needed
- Scalability: to handle increasing loads and users without significant degradation
- Security: protection of sensitive data and resources

Service / Use cases:

- Scenario 1: Supporting Non-Critical Informational Services

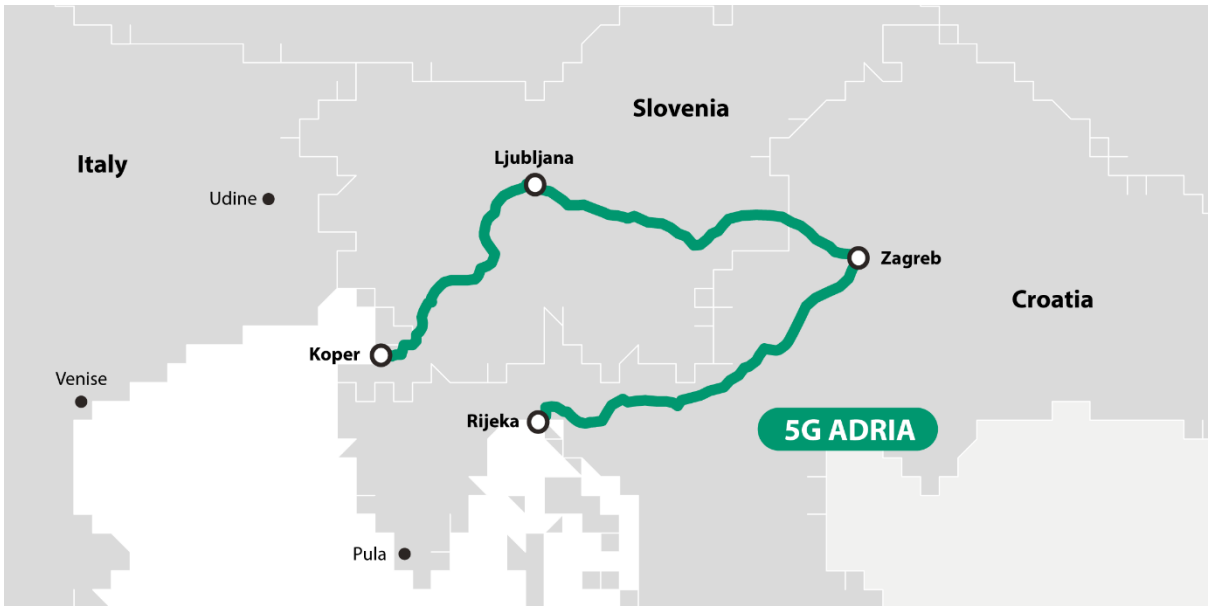
Typical services: Traffic event alerts (congestion, accidents, wrong-way driving, emergency vehicles, weather conditions), variable message sign transmission, coordinated traffic flow management, the transmission of basic enriched information to vehicles (animations, video display), multimedia content delivery (infotainment: web, streaming music and video), basic information support for V2V services, support for autonomous driving up to L2.

- Scenario 2: Supporting Basic Critical and Advanced Informational Services

Typical services: (in addition to Scenario 1): Accident warning through shared sensor data (vehicles, infrastructure), incorporation of surrounding data and knowledge of conditions around curves or at other branches of intersections, implementation of data processing algorithms and rapid alerts, richer set of transmitted sensor data (radar system, video), synergistic integration of V2V, V2N, V2I, and V2C services, support for autonomous driving up to L3.

- Scenario 3: Support for Advanced Services Towards Full Autonomous Driving

Typical services (in addition to Scenarios 1 and 2): Sharing of driving intent (future manoeuvres), coordination of driving between vehicles and between vehicles and infrastructure, full cooperative driving, incorporation of multiple traffic modalities (VRUs), support for profiles and requirements for autonomous driving L4 and beyond.



What will it provide?

The main objectives of the study are:

- Match the existing passive and active infrastructure along the corridor against current traffic information and management services. The study will represent the foundation for the evolution of future networks and services.
- Introduce initial standardized CAM services with improved traffic information and management, requiring improved 5G coverage with higher data demands and vehicle density.

- Introduce advanced CAM services with cooperative safety and real-time international traffic information exchange and traffic management, putting pressure on dense 5G coverage, high-data throughput, low-service latency and high-service reliability.
- Prepare the basis for next-generation networks with outstanding performances that might not be achievable in the near future, e.g., services requiring extremely high data throughput and low latencies.

How will the project unfold?

Consortium is planning both active and passive network to be upgraded, based on scenarios developed in the project study, where ITS-G5 and V2X co-exist.

Intelligent Transportation System G5 (ITS-G5) and Cellular Vehicle-to-Everything (C-V2X) are two different communication technologies designed to enable vehicles and roadside infrastructure to communicate with each other and with other road users for various purposes such as enhancing road safety, improving traffic efficiency, and enabling advanced vehicle applications. While both technologies aim to enable V2X communication for safer and more efficient transportation systems, they differ in terms of technology basis, latency, throughput, coverage, spectrum allocation, and standardization, making each more suitable for specific use cases and deployment scenarios. ITS-G5 is based on IEEE 802.11p standard, while C-V2X operates on the 4G/LTE and 5G cellular networks.

The coexistence of ITS-G5 and C-V2X involves ensuring that both technologies can operate simultaneously without significant interference or degradation in performance. There are several approaches to achieving this coexistence:

- Spectrum management: Regulators and industry stakeholders need to allocate and manage spectrum effectively to accommodate both technologies. This may involve spectrum sharing agreements and policies to minimize interference.
- Interference mitigation: Several techniques can be implemented to mitigate interference between the two technologies. This may include dynamic spectrum allocation, power control mechanisms, and signal processing algorithms.
- Hybrid solutions: In some cases, hybrid solutions that utilize both ITS-G5 and C-V2X technologies can be deployed to take advantage of the strengths of each technology in different scenarios. For example, C-V2X can provide extended range and coverage in areas with cellular network coverage, while ITS-G5 can offer low-latency communication in dedicated short-range communication (DSRC) environments.
- Collaboration and coordination: Collaboration among stakeholders, including automotive manufacturers, infrastructure operators, regulators, and technology providers, is essential for successful coexistence. Coordination efforts can help address technical challenges and regulatory issues.

ITS-G5 and C-V2X are both communication technologies designed for vehicle-to-everything (V2X) communication in the context of intelligent transportation systems (ITS), but they have five key differences.

How is it financed?

The project is funded by EU/CEF Digital Grant programme.

Total EU Contribution: €735,225.00

More information

5G Corridors Call 2: Selected Project Overviews | Shaping Europe's digital future (europa.eu)

About

The ambition of the GUIDE project is to bring together the relevant stakeholders from the ecosystem of 5G Corridors across the European Union (EU) and to help them get the maximum value from the CEF Digital programme, ensuring that future CEF Digital work programmes progressively address the actual needs of the stakeholder communities.

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https://guide.5gcorridors.eu/