Project Overview

5G PPP Webinar: 5G for Cooperative, Connected and Automated Mobility (CCAM)

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Project overview

5GMed will demonstrate advanced Cooperative Connected and Automated Mobility (CCAM) and Future Railway Mobile Communications System services (FRMCS) along the "Figueres – Perpignan" cross-border corridor between Spain and France.

Enabled by a multi-stakeholder compute and network infrastructure deployed by MNOs, neutral hosts, and road and rail operators, based on 5G and offering support for AI functions.

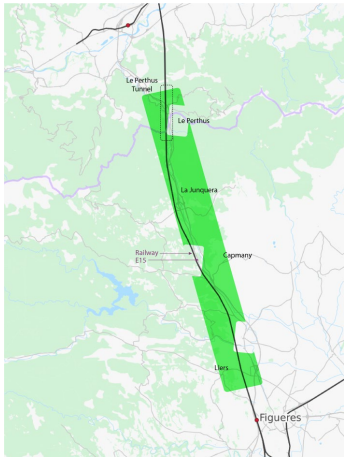The consortium coordinated by Cellnex Telecom includes 21 partners from 7 countries:
- Telecom Sector
- Transport and Mobility Sector
- Solution providers
- Consulting services providers
- Research institutions
- Outreach boosting organization

Project overview

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Description

– Border between Spain and France:
65 km between Perpignan and Figueras

– **Value proposition:**
High-speed rail track + highway run very close to each other = deploy a single infrastructure to be used by multi-stakeholder

– **Two** different **scenarios**:
- **Spain**: Single MNO + Sidelink.
- **France**: Mobility Private network and evolve to Neutral host infrastructure. (IaaS model for MNO & PaaS for other stakeholders).

– 3 different testbeds.
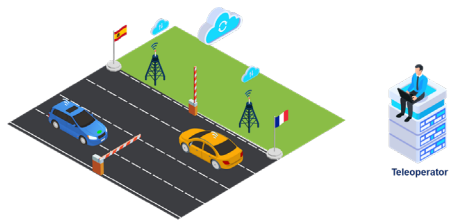– **Four Use Cases**

Topics

- Cross-operator service orchestration

- Innovations in multi-connectivity supporting high-speed vehicles and trains

- Self-sustainable 5G access network infrastructure that can be deployed when power and backhauling resources are scarce

- Enhancements to speed up roaming transitions across MNOs and neutral hosts

- Novel high-speed access network architectures for railways

- The ability to support AI enabled functions executing at the edge of the network
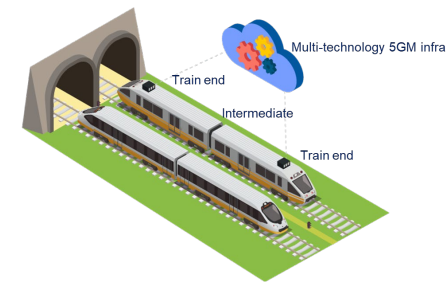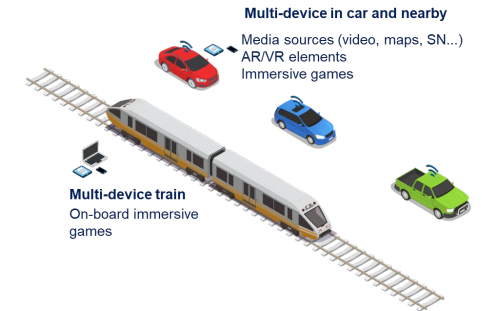
Four Use Cases

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UC1: Remote Driving

Objective
- **Assist an automated vehicle** out of its Operating Design Domain(ODD)
- **Maximize safety** for all road users (ex: limit emergency lane use)
- To take vehicle and passengers to a **safe location**

Scenarios
- **Automated** execution of the Minimum Risk Manoeuvre **(MRM)**
- **Request for remote assistance**
- **Teleoperation of the vehicle to reach a safe harbour**

UC2: Road infrastructure digitalization

Objective
- Bring road infrastructure closer to Level A of the ISAD classification.
- Enhanced road infrastructure elements with dynamic traffic control strategies.
- Improve the traffic flow and safety.

Scenarios
- Replication emergency message sent by vehicle to infrastructure (ECO booster)
- Automatic incident detection and local area traffic management.
- Dynamic aggregation and management of C-AV platoons
- Real time flow regulation by using a selected group of C-Avs
- Road infrastructure support enabling remote driving on highways.

UC3: Future Railway Mobile Communications

Objective
- **Increase railway telecom service experience.**
- Advanced applications in cross-border situations
- On-board seamless service continuity with multiple media types, service QoS requirements, handover between service orchestrators, and edge network transitions.

Scenarios
- Tunnel Service continuity
- Hight seed train
- Hybrid technology handover (Sidelink– 5G – mmW)

UC4: Follow-ME Infotainment

Objective
- The service will process and distribute high quality media contents, in an end-to-end fashion, from the involved sources to the end users while traveling in cars or train, optimizing the streaming distribution resulting in a high-quality reception synchronizing multiple streams in a smooth way, even in the cross-border scenario

Scenarios
- New Media – Watch movies/shows together. **Watch movies in sync**

Objectives. Technology

1. Specify and validate a scalable, cross-border and **multi-stakeholder 5G and AI-enabled system architecture supporting CCAM and FRMCS services** that can be replicated along European.

2. **Design and develop cross-operator service orchestration** that enables MNOs, neutral hosts and road/railways Infrastructure Operators to deliver service continuity to end-users.

3. Propose and **establish novel practices on how MNOs, neutral hosts, OEMs and road operators can cooperate** to deliver Remote Driving, Advanced Traffic Management and Infotainment use cases in cross-border scenarios.

4. Identify and establish MNOs and railways operators' cooperation priorities to deliver advanced FRMCS performance and business use cases across cross-border scenarios.

Objectives. Impact

1. **Contribute to standardization activities through key 5G, automotive and FRMCS SDOs including 3GPP, ETSI ITS and UIC**, while collaborating with relevant joint public-private platforms of industry and public authorities, building a harmonized voice towards the implementation of CCAM (likeC-Roads and EU EIP).

2. Perform a **cost/benefit analysis of the 5G infrastructure deployment** involving MNOs, neutral hosts and Infrastructure operators in the Figueras-Perpignan cross-border corridor, considering the impact on other business stakeholders.

3. **Define innovative business models for CCAM/FRMCS service provisioning**, involving MNO and road/railways infrastructure operators, while providing new market opportunities for third-parties beyond the automotive/railways sectors and positioning the role of Public Authorities.

4. **Promote a wide and sustainable impact of 5GMed** outcomes through:

    I. dissemination in relevant European and global cross-industry associations and joint public-private platforms,

    II. active engagement of industry, public authorities, government bodies towards operational deployment models, and

    III. communication campaigns for society awareness, facilitating the acceptance of CCAM technologies.

5. **Ensure the scalability and replication of 5GMed technical and policy outcomes**, accelerating and shaping the deployment of 5G cross-border corridors across Europe (with the envisioned support of CEF Digital or other relevant initiatives).

Milestones, Deliverables

Milestones defined to assess the overall progress and coherency of the project.
Based on relevant project deliverables produced before the respective milestone date.
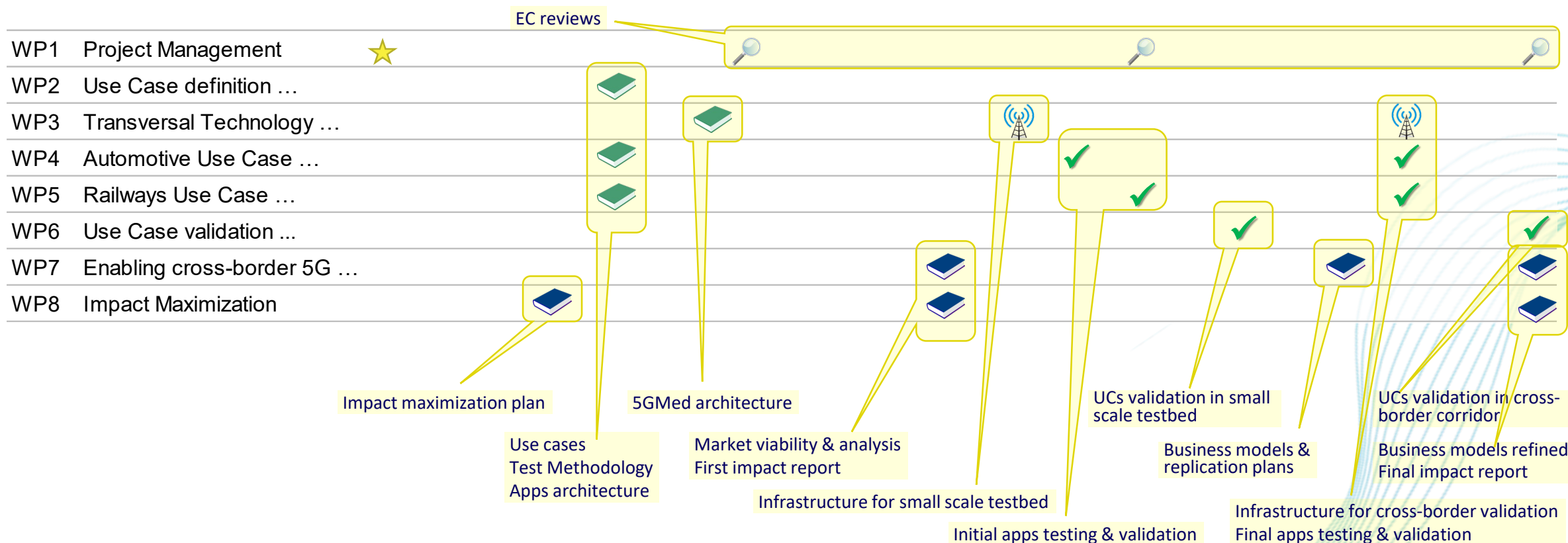
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Thank you!

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