S5LECT

SatCom & 5G Link, Edge & CybersecuriTy

NEWSLETTER

June 2025

INSIGHTS

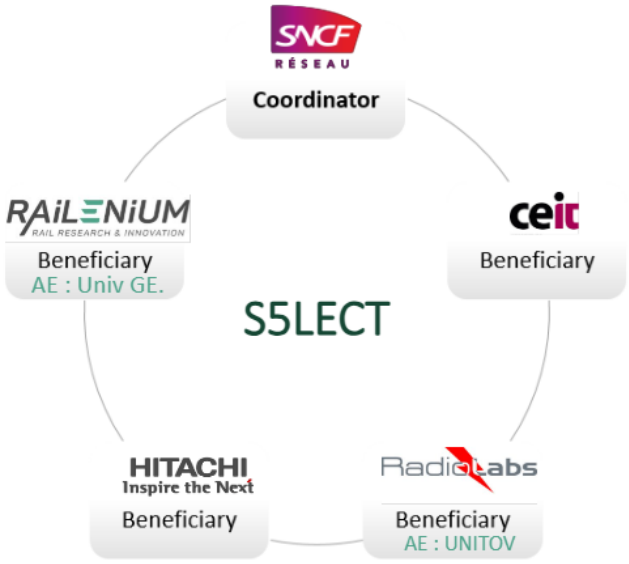
The project has officially kicked off. **S5LECT** project is a "kind of exceptional" project for EUSPA / EU, by combining emerging SatCom & rail technologies. It aims to create a **seamless handover between networks, check cybersecurity risks, propose new edge computing designs, and prove the concepts** in the **S5LECT Testing Laboratory**.

As such, partners are working together on a project that encompasses both technical and political dimensions: **research & innovation**, approaches developed in the project need to be spread as much as possible to other railway stakeholders, researchers & industrials across EU for putting SatCom for rail (and / or GOVSATCOM) on political agendas.

While EC / EUSPA are involved in several fields of space-related R&D&I initiatives, the notions of satellite data for operations (communication, train localisation, etc.) remain relatively open to developments – as long as these fits with international standards.

In other words, users' requirements on every aspect of **S5LECT** innovations should pave the way for technical developments and constitute the core of the project dissemination towards potential users, EU train operators and other EU / national projects related to these fields.

KEY INFORMATION



Objectives	Experimenting a solution for seamless handover between 5G terrestrial networks, satellite link and GSM-R communication system.
Budget	€ 1 938 382,50
Duration	30 months Starting date : 01/03/2024
TRL	Project start : 2 Expected by project end : 4

Newsletter to the Advisory Board of the S5LECT project.

This project is funded by European Union's Horizon Europe programme under grant agreement No 101129493

THE PROJECT

Objectives

Obj1: Definition of the applications requirements and specific railway scenarios for the use of a combination of satellite and terrestrial radio access technologies

Obj2: Design, implementation, and validation of innovative solution for seamless handover between 5G terrestrial network, Satellite link and GSM-R

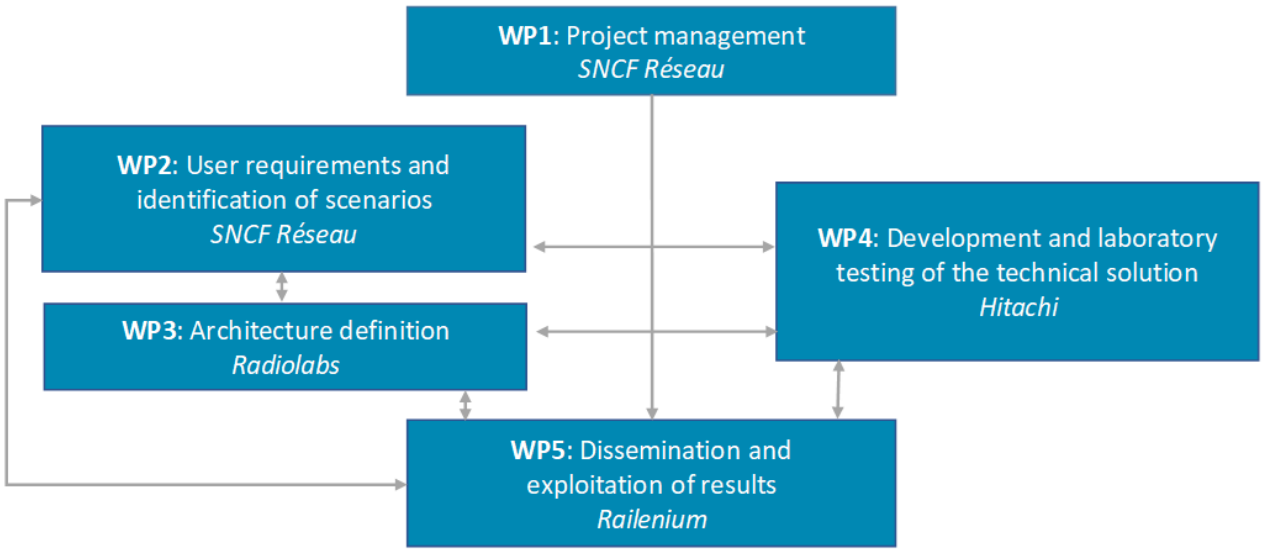
Obj3: Analysis of the cybersecurity risks associated to the use of satellite communications for critical and noncritical railway applications

Obj4: Design, implementation, and evaluation of Edge Computing technology for critical railway applications in the context of satellite communications

Obj5: Development and integration of the different bricks for the S5LECT Testing Lab

Obj6: Proof of concept of the technical solution in the S5LECT laboratory

Work packages



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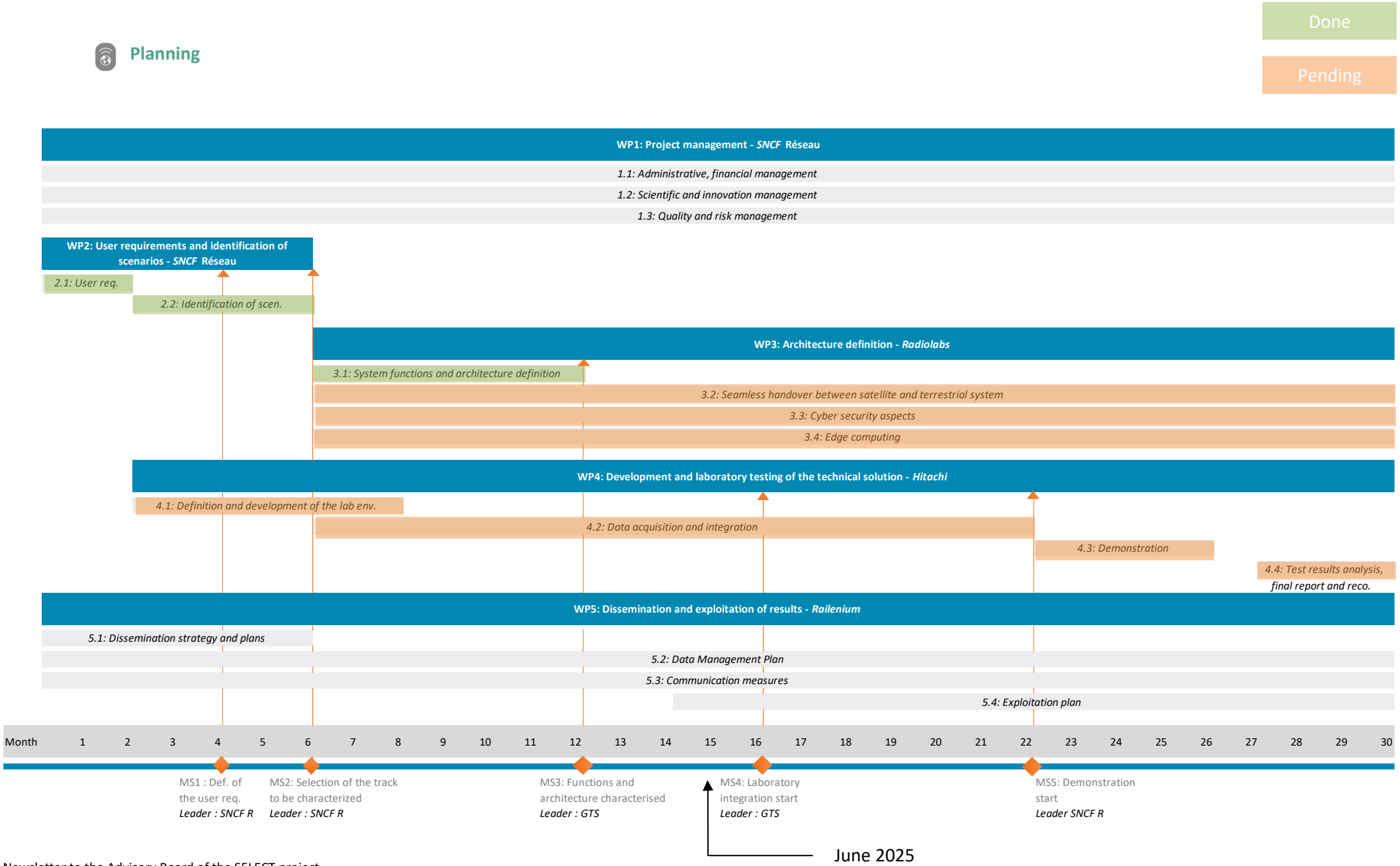
Planning



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MEETINGS

The **Kick-off meeting took** place on May 21st and 22nd 2024 in Paris with all the partners. It was an opportunity to go over the project's key issues but, more importantly, to meet each other.

Consortium meetings take place monthly, providing a great opportunity to showcase our progress by work package to the partners.

Workpackage meetings take place monthly, enabling to progress on the technical aspects at each work package.

EVENTS

Article Computer science, by University Gustave Eiffel

Special issue in railway transport journal : [2025: Rethinking the European Railway System - 2025: Rethinking the European Railway System], by University Gustave Eiffel and Hitachi

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SUMMARY OF TECHNICAL WORK PACKAGES

Work Package 2

WP2 objective is to describe and test at least one use case for railway critical communications including SatCom. As there is no standard for Railway critical communications on public network or on Satellite Network, S5LECT will get inspired by standardized applicative in term of network and radio performances. For architecture and cybersecurity aspect, S5LECT will rely on European standard and Shift2Rail known results. WP2 will define the user requirements and the use cases in term of functional and technical needs and test scenarios covering the use cases behavior and the S5LECT project technical enabler.

Work Package 3

The main objective of WP3 is focused on the definition of terrestrial-satellite emulation platform High Level Architecture (HLA), in accordance with the identified user requirements in WP2, that will result in the **S5LECT Testing Laboratory**. This includes the definition of the integration of terrestrial and satellite components, building blocks and interfaces including seamless handover, cyber security aspects and edge computing and the commands and procedures for emulating terrestrial-satellite communication networks.

Work Package 4

The aim of WP4 is the development, integration and validation of the different technological bricks defined in WP3 to create the **S5LECT Testing Laboratory**. For this the following activities are considered:

- characterization tools will develop and validated for the measurements
- capture and treatment of real environment data for emulation purposes
- development and integration of the S5LECT Testing Laboratory
- tests based on use-case scenarios

The final Proof of concept at TRL4 will consist in the integration and validation and testing (evaluation of KPIs) of the technical solutions in the **S5LECT Testing Laboratory.**