

Applicant: [LCA BALLAURI S.r.l.](#)

Project Partners:

- [Capetti Elettronica S.r.l.](#)
- [Movimatica S.r.l.](#)
- [ODR \(DIMEAS – Politecnico di Torino\)](#)

The context in which the activity of this project is developed for the intelligent, sustainable, and inclusive growth of Piedmont, is that of diagnostic monitoring systems, for the safety of rail freight vehicles.

The S.W.A.M.project Rail (operation financed pursuant to Annex 12 of Reg. (EU) No. 1303/2013 point 2.2.2) aims to create a system that allows to monitor the fundamental parameters, which govern the safety of the wagon, with the continuous speed-temperature-vibration parameters.

The self-feeding system exploits the wagon movement and produces enough energy to perform monitoring, surveillance, and information functions.

The project main activity is the replacement of the old lids of the train, with new sensorized, instrumented and self-powered lids, capable to detect the bearing's temperature increasing over the decayed axle with related vibrations.

Data collected, stored locally, are processed, and sent, in wireless mode, to a basestation and, after appropriate processing, are forwarded to locomotive as alarm signals, up on occurrence of exceeding "limit thresholds" set (example: high acceleration values caused by derailment), to have a prompt intervention of the tractionist.

Today, there is no type of communication between wagon and locomotive; the only driving conditions feedback comes to the driver, through information/signals from the train network operators, or through his sensitivity, in manoeuvring operations.

The creation of a communication and signalling network between the wagon and the locomotive will allow an efficient alert system so that potentially dangerous situations will be promptly recognized, and appropriate corrective measures implemented.

[Capetti Elettronica](#) participates in the project, as innovative PI, as a short-range wireless technology supplier, which allows communication between installed sensors on the axle bushings and the concentrator (Basestation), installed in the underbody of each railway wagon.

It is also responsible for developing specific communication modules, which consider the project requirements, in terms of operational environmental conditions, energy consumption and immunity to electromagnetic disturbances.

[Lca Ballauri](#), specialized in mechatronics, deals with axle bushing of the railway cover design and construction, which includes the sensorization, planned in the project.

[Movimatica srl](#), specialized in Wireless diagnostics and monitoring, realizes a coordinator able to manage the wireless communication of data coming from the various lids-bushing.

Thanks to [ODR Politecnico di Torino](#) research and development, it is possible to develop the system, to be integrated and engineered, for scale vehicle applications. As part of the collaboration, Politecnico stipulates, with the consortium of partner companies, an exclusive license option contract, relating to the patent.