

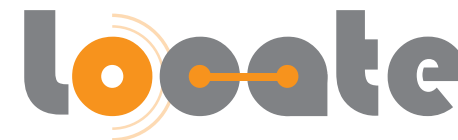
## Consortium



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## Locomotive bOgie Condition mAintENance

LOCATE is a 24-month Shift2Rail project which will contribute to the modal shift to rail freight by replacing the preventive or scheduled maintenance of locomotive bogies by predictive maintenance.

LOCATE will improve the competitiveness of freight rail transport by:

- increasing the freight reliability and availability;
- and replacing inspection activities to cost-effective remote defect localisation and monitoring solutions.

## Facts and figures

Acronym: LOCATE  
H2020-S2RJU-OC-2019  
Grant agreement n° 881805

EU contribution: 1.5 m€  
Project coordinator: EVOLEO Technologies  
Work programme S2R-OC-IP5-01-2019

Partners: 6 partners from 4 countries:  
Portugal, Spain, UK, France

Duration: 24 months  
Project start date: 01/11/2019  
Project end date: 31/10/2021

## Objectives

From preventive conditional or scheduled maintenance of bogies to predictive maintenance through digitalisation.

LOCATE will:

- develop optimised condition-based maintenance strategies using dynamic tools to:
  - . support maintenance scheduling,
  - . localise faulty components bogies,
  - . ensure appropriate inventory control of stocks and spare parts,
  - . and assign maintenance staff;
- set-up and validate an open architecture to carry asset management data on the locomotive bogie;
- develop a digital twin for the bogie system, based on vehicle dynamic simulations and post-processing;
- apply a cost-effective and reliability-based sensor installation to locate defects and monitor structural integrity of bogies.

## Contact

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<https://locate-project.eu>

## Description of work

**WP1 (Project Management)** will carry out the necessary management activities aiming at an effective coordination of the overall project work plan.

**WP2 (Requirements & Specifications)** aims to ensure that research and development of LOCATE is driven by the end user needs. In order to do so, this WP will assess requirements set and consider the current standards and regulation constraints. Moreover, a set of specifications will take place, regarding the functions to implement within the project, and the architecture and components needed to support those functions, always considering reliability and economical sound solutions.

**WP3 (Measured Behaviour)** will focus on obtaining data from the critical components to be monitored, to observe the measured behaviour. As such it will focus on the sensor selection and evaluation, as well as on the devices responsible to gather their signals and communicate the datasets for processing, along with interfaces with Onboard Units.

**WP4 (Reference Behaviour)** will focus on how the systems should behave along time, creating reference twins on which it will be

possible then to compare the measured data against the expected data and by that define a condition-based maintenance model. This will basically predict the expected degradation of components and need of maintenance.

**WP5 (Operational Behaviour)** will take the result of the previous work packages and define the rules for monitoring and thresholds which should be considered important for events. It will define the maintenance schedule procedures for the next generation of condition-based maintenance, ensuring that in all steps of the project and predictive maintenance implementation, safety is ensured.

**WP6 (Integration and Testing)** aims to build a demonstrator on which the projects results are going to be validated. This validation process will include and analyse project's performance, including the accuracy of the developed algorithms as well as the provided information.

**WP7 (Dissemination, Communication and Exploitation)** aims to communicate and disseminate the result toward project stakeholders and passengers, as well as foster the exploitation of project results.

Reliability of the locomotives permanently supervised by removing unnecessary manual controls

Reduced maintenance costs, continuously improve repairs by improving the management of spare parts and anticipating their removal

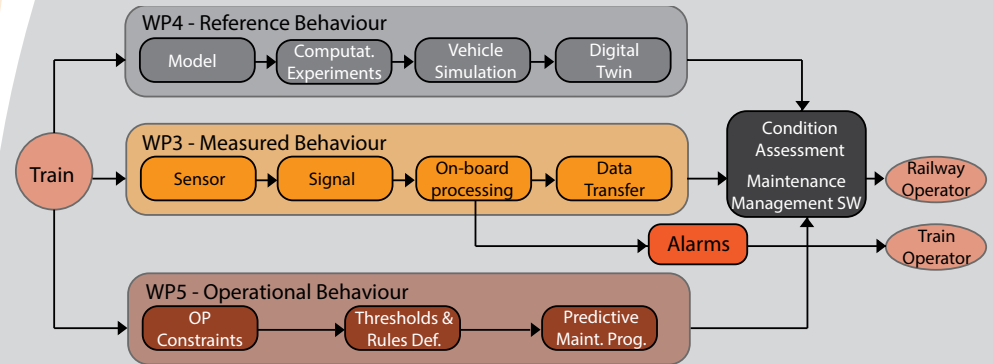


Reliability of the locomotives permanently supervised by assisting with the planning

Reduced maintenance costs, continuously improve repairs by removing unnecessary manual controls

**LOCATE will contribute to a more reliable and available rail freight transport system.**

## Project structure



## Project contribution to Shift2Rail vision

Asset Control Tower & Customer Communication	
Locomotive	GPS Localisation of the Locomotive
Locomotive	Asset Condition Monitoring
Locomotive	Raw data from sensors, can provide information on Locomotive Condition
Infrastructure	Raw data from sensors, can provide information on Rail Infrastructure Condition
Condition Monitoring for Predictive Maintenance	
Locomotive	Sensor for Condition Monitoring of the Bogie
Locomotive	Integration of Data with Onboard Computational and Communications Unit
Locomotive	Knowledge Extraction for New Locomotives and Retrofit of existing ones to reduce Life Cycle Cost
Infrastructure	Backbone of wireless communications on the train
Infrastructure	Dynamic Maintenance Planning on Maintenance Shops
Infrastructure	Communication with Suppliers for parts delivery
Infrastructure	Condition Based Maintenance Regime

## Added value

The added value provided by data gathered, transferred and processed by the LOCATE demonstrator, directly translates into improved asset management of both rolling stock and infrastructure. With this demonstrated innovation capability, rail freight becomes a more secure investment, helping achieve EU objective of 30% modal shift from road by 2030 and making rail freight corridors the backbone of the freight transport system. It makes rail freight more cost-effective in CAPEX (capital expenditure) and OPEX (operating expenditure).