

PROJECT

## STREAM

# Smart Tools for Railway work safety and performance Improvement

**Funding:** European (Horizon 2020)

**Duration:** Dec 2020 - May 2023

**Status:** Ongoing

**Total project cost:** €2,700,000

**EU contribution:** €2,700,000



**Call for proposal:** H2020-S2RJU-OC-2020

[CORDIS RCN : 232535](#)

### Objectives:

The rail industry is facing important challenges as the average age of the workforce keeps growing while less young workers are interested in the physically demanding work required. Smart technologies can help to reduce work demands, avoid incidents and accidents, and support workers during heavy activities. STREAM support LEAN execution of intelligent maintenance process by introducing technologies that cause negligible modification of current working procedures, yet strongly improve operation planning, safety and performance. STREAM will develop two smart technologies employing environment perception and human intention principles enabling prevention and risk mitigation.

First, STREAM will develop a control platform (OTA3M) adapted to existing rail excavators, by exploiting sensors, hydraulic actuators and software which will allow excavators to conduct multi-purpose autonomous operations enabling safe worker-machine collaboration. The OTA3M controls the excavator motion autonomously along tracks and introduces the autonomous capacity of manipulating heavy components relying on motion/force controls, obstacle detection and collision avoidance.

Second, STREAM will deploy a modular active exoskeleton (MMPE) to reduce the risk of injury by assisting workers in heavy activities. The MMPE is tailored to track workers to reduce the risk of injury at the lumbar area by reducing biomechanical loading for a vast variety of manual handlings. MMPE understands human intention by exploiting human-activity recognition, proprioceptive sensors, and control strategies, and reducing worker's efforts by applying specific forces, synchronized with the musculoskeletal system. The MMPE design emphasizes ergonomic aspects and PPEs integration to ensure comfort and usability making it suitable for workers. The consortium, assisted by an end-user board, will assess the devices from the perspectives of performance, ethics, and economic rationale to prepare further commercial exploitation

### Parent Programmes:

[H2020-EU.3.4. - Horizon 2020: Smart, Green and Integrated Transport](#)

**Institute type:** Public institution

**Institute name:** European Commission

**Funding type:** Public (EU)

**Other programmes:** S2R-OC-IP3-03-2020 Advanced tools and equipment: collaborative robots & wearable mobile machines (TD3.8)

### Lead Organisation:

**Fondazione Istituto Italiano Di Tecnologia**

**Address:**

VIA MOREGO 30  
16163 GENOVA  
Italy

**Organisation Website:**

<http://www.iit.it>

**EU Contribution:** €768,875

**Partner Organisations:****Novatron Oy****Address:**

JUVANKATU 6  
33710 TAMPERE  
Finland

**EU Contribution:** €301,375

**Union Des Industries Ferroviaires Europeennes - Unife****Address:**

AVENUE LOUISE 221  
1050 BRUXELLES  
Belgium

**Organisation Website:**

<http://www.unife.org>

**EU Contribution:** €132,813

**Sirti - Societa Per Azioni****Address:**

VIA STAMIRA ANCONA 9  
20127 MILANO  
Italy

**EU Contribution:** €203,000

**Comsa Sau****Address:**

Calle Viriato 47  
8014 Barcelona  
Spain

**EU Contribution:** €200,750

**Tampereen Korkeakoulusaatio Sr****Address:**

KALEVANTIE 4  
33100 TAMPERE  
Finland

**EU Contribution:** €675,625

**Etablissement D'enseignement Superieur Consulaire Grenoble Ecole De Management****Address:**

12 RUE PIERRE SEMARD  
38003 GRENOBLE  
France

**EU Contribution:** €123,250

**Stam Srl****Address:**

VIA PARETO 8 AR  
16129 GENOVA GE  
Italy

**Organisation Website:**

<http://www.stamtech.com>

**EU Contribution:** €294,313

**Technologies:**

Safety systems  
Autonomous system for train detection

**Development phase:** Validation

**STRIA Roadmaps:** Vehicle design and manufacturing

**Transport mode:** Rail transport

**Transport sectors:** Passenger transport, Freight transport  
Societal/Economic issues,

**Transport policies:** Safety/Security

**Geo-spatial type:** Other