Agenda

☑ ESA overview

☑ Space4Rail Downstream Applications in ARTES 4.0 - call for proposals (CfP)
  • Key Objectives
  • Why space is important to rail
  • Thematic domains and use cases
  • How to apply

☑ Q&A
Supporting the Development of Services on Earth that Involve Space
KEY OBJECTIVES:

- To support the exploitation of space-based assets in applications/services related to future control, command and signalling in the European Rail system

- To support the exploitation of space-based assets in innovative applications/services improving performance and attractiveness of the railway
Why space is important to rail

Source: UIC, High speed rail. Fast track to sustainable mobility 2010


It's not easy being green: Transport Focus surveys put it close to the bottom of passengers' priorities.

ECONOMY Average external costs per transport modes (Euros per 1,000 passenger-kilometres)

Share of rail based on total passenger transport activity globally in the New Core Scenarios, 2009-2030

https://www.iea.org/reports/rail
Why space is important to rail

Earth Observation
Providing an effective and frequent way to monitor land and resources, and can also facilitate change detection.
Facilitates applications related to the monitoring of railway assets, infrastructure and surrounding areas, or augmented reality applications enhancing the user experience.

Satellite Navigation
Enabling global positioning functions.
Supports applications such as enhanced train localisation for eco-driving & signalling, interactive mapping, surveying and predictive maintenance.
The use of sensors with satellite navigation may improve the position and velocity performances (relative and absolute).

Satellite Communications
Supporting 5G architectures, that is key to the Future Railway Mobile Communication System, superseding the current GSM-R infrastructure.
Providing ubiquitous coverage, enabling an extension of reliable and secure connectivity to complement terrestrial communications, including satellite-based Internet of Things for rail freight and cargo monitoring, and satellite broadband for enhanced on-board and in-station connectivity.

https://space4rail.esa.int/projects
Open Call for Proposals (CfP) for innovative and sustainable Applications/Services based on at least one space asset (e.g. SatEO, SatNav, SatCom)

Three Thematic Areas

- **Future CCS Applications in the European Rail System**
- **Improving the Performance of the Railway**
- **Improving the Attractiveness of the Railway**
Control-Command and Signalling (CCS) Applications

Targets activities that exploit space-based assets to improve the business case of ERTMS through increased operational performance and/or cost reduction

- Advanced Train Positioning
- Next generation communication system(s)
- Supporting ERTMS “Game changing” functionalities
- ERTMS Level 3
- ATO GoA4
Improving the performance of the Railway

01 SAFETY
Safety of the people involved

02 EFFICIENCY
Efficiency of the assets management

03 PERFORMANCE
Performance in operation and maintenance

04 SECURITY
Security: data, sites, stations
Improving the attractiveness of the Railway

PASSENGERS
Increase the user experience

FREIGHT USERS
Speed up the implementation of new services for cargo user and shipper

STATIONS
Promote the development of Smart Stations
Activity implementation

Users/Customers Needs

Feasibility Study (AO 11026)

Demonstration Project (AO 11026)

Operational Service

User Driven Business Opportunity

Consolidated Business Case

Validated Viable Service
Activity implementation

✓ Feasibility studies (FS): to investigate and assess the business opportunity and technical feasibility of the new applications/services in the railway domain
  ✓ Be user driven
  ✓ Benefit from the use of at least one space asset (SatNav, SatCom, Earth Observation)
  ✓ Aim to evolve the targeted applications and services to pre-operational roll out, potentially through a DP

✓ Demonstration projects (DP): to implement and validate pre-operational services in the railway domain
  ✓ Be user driven (including user involvement and contribution) and potential customer engagement
  ✓ Benefit from the use of at least one space asset (SatNav, SatCom, Earth Observation) proven in a pre-operational context
Funding scheme

<table>
<thead>
<tr>
<th>Activity Cost</th>
<th>Feasibility Study</th>
<th>Demonstration Project</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>max. 500’000 EUR (limited to acceptable cost)</td>
<td>case by case assessment (limited to acceptable cost)</td>
</tr>
<tr>
<td>ESA Co-Funding</td>
<td></td>
<td></td>
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<tr>
<td>Baseline</td>
<td>max. 50% of company’s cost</td>
<td>max. 50% of company’s cost</td>
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<td>Micro, Small and Medium-Enterprises⁵</td>
<td>max. 80%⁶ of enterprise’s cost</td>
<td>max. 80%⁶ of enterprise’s cost</td>
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<td>Universities and Research Institutes with no commercial interest in product/service</td>
<td>max. 100%⁶ of institute’s cost and max. 30% of activity cost</td>
<td>max. 80%⁶ of institute’s cost and max. 30% of activity cost</td>
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<tr>
<td>Industry Co-Funding</td>
<td>Remaining part of the cost to carry out the activity</td>
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- ESA will bear up to 50% (non SME) or 80% (SME) of the eligible cost **pending support from National Delegation**, and the remainder has to be financed by the tenderer and/or other partners.

- **IPRs** (Intellectual Property Rights) will **remain with the company**.
Generic Programme Line **BASS** – to support the development of pre-operational services - possibly in partnership - for a wide range of users through the combination of different systems.

Strategic Programme Line **4S** (Space Systems for Safety and Security) - to support and promote the development of innovative safety and security downstream services enabled by space technologies (SatCom but also other space assets) addressing institutional needs in the railway sector.

Strategic Programme Line **5G/6G** - to support space, terrestrial and railway vertical players to foster the design, development, implementation, validation, demonstration of Integrated 5G terrestrial and satellite solutions, technologies including downstream applications to the benefits of railway vertical sector.

....list of participating countries described in ESA Star AO 11026...
OUR OFFER

- Zero-Equity Funding
- Tailored Project Management Support (technical & business)
- Access to Our Network & Partners (incl. Investors)
- Brand Credibility & Outreach
Procurement process

- Incremental procurement approach: APQ is the starting point – max 8 pages document with a standard template to present WHAT, WHY, HOW
- standard templates for proposals and deliverables during activity implementation
- Ambassador Platform available to guide companies in the process (https://business.esa.int/ambassador-platforms)
ESA-Star and S4R website

- Space4Rail Downstream Applications in ARTES 4.0 Open Call for Proposal is permanently open and available on ESA-Star as AO-1-11026
  https://esastar-publication-ext.sso.esa.int/ESATenderActions/details/24185

- Space4rail website & Open Call:
  - news for this specific call for proposal,
  - customised templates for the Activity Pitch Questionnaire, Outline Proposal and Full Proposal as soon as the call is issued

  https://space4rail.esa.int/opportunities/ba-s4r/documents
Thank you

space4rail@esa.int
Enrico.Spinelli@esa.int
Elena.Razzano@ext.esa.int
Christian.Wullems@esa.int