|  |
| --- |
|  |

Outline Proposal Template for a Space4Rail Downstream Applications in ARTES 4.0 Feasibility Study

# INTRODUCTION

Downstream Applications in ARTES 4.0 are dedicated to develop pre-operational downstream applications and services using existing space technologies, integrated, when needed, with terrestrial solutions. The Space4Rail Downstream Applications in ARTES 4.0 Call for Proposals focuses on railway applications and services based on space assets, addressing one of the thematic domains reported in Annex 2 of the letter of invitation (AO11026).

An Outline Proposal is a means for the Tenderer to provide an initial iteration on the content and justification of the planned Space4Rail Downstream Applications in ARTES 4.0 activity.

The Tenderer is reminded that ARTES 4.0 is an optional programme of the European Space Agency, and as such every activity has to explicitly receive the financial authorisation by the National Delegation(s) of the relevant countries of the consortium. The Tenderer and its Subcontractor(s) shall therefore contact their National Delegation(s) before submitting their Outline Proposal[[1]](#footnote-2). Should the National Delegation(s) request access to the Outline Proposal, this shall be handled directly by the Tenderer and its Subcontractors and the National Delegation(s).

The Tenderer is required to submit an Outline Proposal containing the information described in this document before submitting a Full Proposal. On the basis of the information provided in the Outline Proposal, the eligibility of the proposed idea for Space4Rail Downstream Applications in ARTES 4.0 support will be assessed by relevant ESA experts and early feedback will be provided. Only once the Outline Proposal is found acceptable by ESA, the Full Proposal may be submitted.

Concerning the use of this template, please note the following:

1. Parts in red font in this template should be modified as appropriate for your proposed activity.
2. Text in blue and in a smaller font size *(example)* is for guidance and can be removed from the completed outline proposal document.
3. In case the Tenderer has produced an [Activity Pitch Questionnaire (APQ),](https://space4rail.esa.int/sites/default/files/APQ%20ProjectName_Space4Rail.docx) the specific section AP.X.Y of the APQ can be directly copied where identified as: [from AP.X.Y]. Whenever needed and/or relevant, the contributions coming from the APQ shall be updated in this Outline Proposal.

The [Terminology used in ARTES 4.0 Business Applications](https://business.esa.int/sites/business/files/TERMINOLOGY%20used%20in%20ESA%20Business%20Applications.docx) document provides an explanation of the relevant terminology and shall be used as a reference in preparation of the Outline Proposal.

**This outline proposal shall be sent to:** [**space4rail@esa.int**](mailto:space4rail@esa.int)

Please use this page as the cover page of the Outline Proposal and remove the previous two pages   
(Template Title page and Introduction)

Study Name

Outline Proposal for a Space4Rail Downstream Applications in ARTES 4.0 Feasibility Study

Date: ……

Reference: ……

ESA Template Ref. 1. 1 issued 26/01/2022

[INTRODUCTION 0](#_Toc94104360)

[1 PROJECT SUMMARY AND RATIONALE 2](#_Toc94104361)

[1.1 Background information 2](#_Toc94104362)

[1.2 Service Description and Rationale 2](#_Toc94104363)

[1.3 Space Asset(s) / Space Technology and Rationale 3](#_Toc94104364)

[2 Customers/users and their needs 4](#_Toc94104365)

[2.1 Business Model Overview 4](#_Toc94104366)

[2.2 Customer/User Segments 4](#_Toc94104367)

[2.3 Pains and Gains 4](#_Toc94104368)

[3 Application / Service Viability 6](#_Toc94104369)

[3.1 Market size and geographical reach 6](#_Toc94104370)

[3.2 Value Proposition 6](#_Toc94104371)

[3.3 Competitive Landscape 6](#_Toc94104372)

[3.4 Viability Success Factors 7](#_Toc94104373)

[3.5 Roadmap 7](#_Toc94104374)

[3.6 Environmental, Social and Governance Sustainability Aspects 8](#_Toc94104375)

[4 SYSTEM AND IMPLEMENTATION ASPECTS 9](#_Toc94104376)

[4.1 Project Team 9](#_Toc94104377)

[4.2 System/Service Architecture 10](#_Toc94104378)

[4.3 Implementation Approach 10](#_Toc94104379)

[4.4 Technical and Non-Technical Risks 12](#_Toc94104380)

[4.5 Financial, Management, Administrative (FMA) 12](#_Toc94104411)

# PROJECT SUMMARY AND RATIONALE

## Background information

Feasibility Study Name: [from AP.1.1]  
*(Provide a short catchy name or acronym as well as the full study name. Please avoid to pick a name of an activity that is already present in the ARTES 4.0 Downstream Applications family. This can be checked under: https://business.esa.int/projects . The project name should be the same used for the commercial branding of your product / service.)*

Company Proposing : [from AP.1.2]  
*(Provide details, i.e. address, country, website, contact point name, telephone and e-mail)*

Company background: [from AP.1.3]  
*(Provide a short description of the company background including year of creation, size, turnover, number of employees)*

Are you familiar with ARTES 4.0 Business Applications? [from AP.1.4]  
*(Indicate if you have worked with ESA before and how you discovered ESA Downstream Applications.)*

Are you applying as a consortium? *(Yes/No)*  
Who are the other entities? *(name, country, website)*  
[from Ap.1.5]

Does your team (company / consortium) have the right skills and experience? [from AP.1.6]  
*(Yes/No/Partial + comments  
Please indicate which skills/expertise you possess/miss with respect to the involved space assets like SatCom, SatNav, SatEO, Manned Space Flight, in the specific applications domain and in business development)*

Have you (or your partners) contacted your National Delegation or ARTES Applications Ambassadors (where available)? [from AP.1.7]  
*(Yes/No/Partial + comments  
Indicate if you have been in touch with your National Delegation. Also indicate if you have discussed this application with your ESA Business Applications Ambassadors, if applicable. If yes, please, present the status of discussion with them)*

## Service Description and Rationale

Description of the service that you intend to offer: [from AP.2.1]

In the case that the activity is proposed for the Strategic Programme Lines (5G or 4S), explain how your service makes use of 5G networks/secure space systems

5G SPL: Indicate the value of using space assets and data together with 5G technologies, indicate the level of 5G and other technology(ies) maturity, indicate the 5G actors (e.g. telecommunication operators) involved in the value chain and their level of engagement in the project

4S SPL: indicate if the service is specifically addressed to institutions or relates to public safety objectives, if there is a need to deploy/utilize secure satellite communications and which are the actors involved in the value chain related to 4S (e.g. institutional users, secure satcom providers, ..)

Thematic Domain and related rationale:

*Indicate the thematic domain for the product/service you propose, together with the rationale. The thematic domains are reported in Annex 2 of the invitation letter of the Call for Proposals for Space4Rail Downstream Applications in ARTES 4.0 .*

ONLY For thematic domain 1 (delete in case of thematic domain 2 or 3):

Assessment of the ERTMS (European Rail Traffic Management System) business opportunity:

*Include an assessment of the business opportunity of your proposed product/service for the European Rail Traffic Management System (ERTMS, e.g. in terms of costs reduction, improvement of efficiency).*

Complementarity to other activities launched at European level (e.g. within Shift2Rail or Horizon 2020):

*Describe whether and how your proposed product/service complements other activities launched at European Level (e.g. within Shift2Rail or Horizon2020).*

Innovation / unique selling point with respect to what is available in the market: [from AP.2.4]

The proposed product/service fits within our current business activities and your mid-/long-term strategy the following way: [from AP.3.3]

Time of commercial entry into the market: [from AP.3.5]

## Space Asset(s) / Space Technology and Rationale

Space asset(s) / space technology envisaged for integration: [from AP.2.5]

*(Provide either information on the concrete space asset(s) / satellites / sensors / technologies foreseen for integration and their basic features (e.g. Satellite Communications: narrowband/broadband, data rate, SatCom network operator. Earth Observation: optical/radar, spatial & temporal resolution, specific EO instruments, data provider. Satellite Navigation: accuracy. Manned Space Flight: technology/service),   
or present as minimum a shortlist of space assets / satellites / sensors/ technologies subject for investigation in the Feasibility Study.*

Rationale for integration of the space asset(s) / space technology: [from AP.2.5]

*Provide information why the space asset(s) / satellites / sensors / technologies are considered necessary for integration and what their expected added value in the proposed application / service above other technologies is.*

# Customers/users and their needs

## Business Model Overview

A first draft of the targeted Business Model is presented below including explanations.

*[Present a first draft version of the targeted business model utilising the ‘Business Model Canvas’ template available under:* [*http://www.businessmodelgeneration.com/canvas/bmc*](http://www.businessmodelgeneration.com/canvas/bmc) *(NB: in case of different targeted market segments at the same point of time, please, use either colour codes or separate forms per market segment)].*

## Customer/User Segments

The key customers/user segments of the final product/service: [from AP.2.2].  
*(Please note: users and customers can be different: users use the final product/ service but they do not necessarily pay for it; customers pay for the service, but they do not necessarily use it)*

The potential customer/user organisations that will be involved in the Feasibility Study are: [from AP.3.2]  
*(indicate who they are and what your level of engagement with them is)*

‘Letter(s) of Interest’ are available from the following organisations and are attached to this Outline Proposal: …

*(Letter(s) of interest from the customer(s)/user(s) to be involved in the Feasibility Study (Annex 1):*

*The letter(s) shall indicate in the own words of these customer(s)/user(s) why they are interested, how they intend to contribute to the study and to which tasks, and what their interest beyond the feasibility study is in case that the study shows satisfactory results. If such letters cannot be provided upfront, then the process and timescale for confirming their interest must be indicated. Such letters have to be provided at the latest at Full Proposal submission.)*

## Pains and Gains

The pains (e.g. problems) and gains (e.g. benefits) of these customers/users are: [from AP.2.3]  
*(please note: whenever users and customers are different, pains and gains can be different as well)*

*(A short description shall be provided of how the involved customer(s)/user(s) currently handle the issues that the proposed application/service would address. An overview of the shortcomings and challenges vis-à-vis the present situation shall be provided, as well as opportunities for improvements. This can be related to improvement of service, performance, quality, economic, commercial, legal or other factors.)*

The following table provides a summary overview of the customers to be involved in the feasibility study, the associated high level characterisation in relation to the target service and their representativeness for the targeted market segment.

Table 2.1 Key Customers/Users, their Problems/Needs, and their Representativeness for the targeted market segment

| **Key Customer / Customer Segment** | **Customer’s relevant Tasks/Jobs** | **Customer’s Pains (e.g. problems)** | **Customer’s Gains (e.g. benefits)** | **Rationale for Involvement** |
| --- | --- | --- | --- | --- |
| e.g. Infrastructure Manager | Manages national rail infrastructure | Cost of hazard monitoring is high (XX EUR per km) | Reduce cost by YY% | Key player in the market of ZZZ |
| ……… | ……… | ……… | ……… | ……… |
| ……… | ……… | ……… | ……… | ……… |
| ……… | ……… | ……… | ……… | ……… |

*(If the product/service is targeting a few important customers, each customer should be clearly identified. Add any supplementary text you feel is necessary to clarify the nature of your intended customers and to explain their main needs. Please note that the problems must be specific and show a clear understanding of the customer pain).*

# Application / Service Viability

## Market size and geographical reach

What is the related market size and its geographical reach? [from AP.3.1].

*(e.g. key quantitative financial figures of the market size, regional / national / international geographical reach. market position after 5 years.   
NB: do not confuse the potential financial market size of the targeted information service with the general market segment, e.g. when providing an information service to railway operators it is required to present the financial market size for this specific information service, but not for the total of the railway business.)*

The targeted position of our application/service in the market is summarised in the matrix below.

Table 3.1 Market positioning

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| MARKET | New | …… | …… | …… |
| Adjacent | …… | …… | …… |
| Existing | …… | …… | …… |
|  | | Existing | Incremental | New |
| PRODUCT / SERVICE | | |

*(For example, if the application/service tries to resolve a potential need not yet expressed by users, the market positioning will be New, and shall be indicated accordingly in the above table. If the intended project tries to improve (e.g. by increasing features, reducing costs) a, application/service, the product positioning will be existing. Possible combinations of Markets / Product / services shall be marked in the table (either with a “X”, or with the name of the product / service) as appropriate.)*

## Value Proposition

The table below identifies the specific characteristics of the application/service that will address the previously-identified customer problems/needs *(e.g. performance, cost, new features)*and define its value proposition towards its customers

Table 3.2 Key Product Characteristics

|  |  |  |
| --- | --- | --- |
| **Customer Problem/Need** | **Envisaged Product/Service Offer incl. Key Characteristics** | **Value Proposition** |
| Infrastructure Managers | Trackside hazard monitoring | More reliable identification of trackside hazards (AA % accuracy) |
| ……… | ……… | ……… |
| ……… | ……… | ……… |

*Add any supplementary text that you feel is necessary to fully explain your value proposition.*

## Competitive Landscape

Our key competitors and the nature of the competition are identified in the table below.

Table 3.3 Summary of the Competition

|  |  |  |
| --- | --- | --- |
| **Competitor** | **Nature of Competition / Characteristics** | **References** |
| ……… | ……… | ……… |
| ……… | ……… | ……… |
| ……… | ……… | ……… |

*(Indicate the nature of the competition for each of the identified competitors. For example, an existing or potential supplier of the same type of product, an established supplier of similar products, a new entrant to the market, an entity known or suspected to have plans to develop the same type of product, a market incumbent. Quantify the nature of the competition as far as possible (e.g. provide estimates of their market share, competitiveness in terms of pricing, etc.). Provide references to substantiate your assessment of the competition (e.g. web links, references to market analyses, data sheets, etc.).*

*Please note that statements such as “There is no such product on the market, ergo there is no competition” are not considered acceptable, because the number one competition stems always from the existing way the problem is solved currently by the users/customers. The number two competition typically disregarded is from other solutions the customers might be able to take up (substitutes which do not require space assets).)*

## Viability Success Factors

The most important issues influencing the viability of the service(s) / the critical success factors towards implementing of a sustainable service are:

Table 3.4 Summary of issues / critical success factors

|  |  |
| --- | --- |
| **Issue / success factor** | **Description** |
| ……… | ……… |
| ……… | ……… |
| ……… | ……… |

*The issues and success factors can cover a variety of aspects, i.e. consortium internal / external such as partnerships, IP, investments, commercial, technological, regulatory, etc.*

## Roadmap

The major milestones (timeline, technical, commercial, others) towards the successful implementation of an operational service (roll-out in the market) are the following:

Table 3.5 Roadmap Milestones

|  |  |
| --- | --- |
| **Timeline** | **Subject of Roadmap Milestone** |
| ……… | ……… |
| ……… | ……… |
| mm/yyyy | Entry into Market |

*Provide information on the subject of the milestone (e.g. completion of feasibility study, partnership agreements, first customer contract, entry into market) and an estimation of the related timeline [mm/yyyy].*

## Environmental, Social and Governance Sustainability Aspects

The proposed project and the resulting services will contribute to address the aspects in terms of Environmental, Social and Governance (ESG) Sustainability as indicated in the Table below.

Table 1. Environmental, Social, Governance (ESG) Metrics

|  |  |
| --- | --- |
| **Metric** | **Justification wrt project / proposed service** |
| **Environmental** | |
| Waste and pollution | … |
| Greenhouse gas emissions | … |
| … | … |
| **Social** | |
| Health and safety | ... |
| Gender diversity | … |
| … | … |
| **Governance** | |
| Ethics and anti-corruption | … |
| Data privacy | … |
| … | … |

[Note: The above entries are just examples. Please populate as relevant.]

# SYSTEM AND IMPLEMENTATION ASPECTS

## Project Team

The following diagram describes the team composition and their role in the study in view of future service provision.

Figure 4.1 Project Team Composition and Roles in view of future service provision

EXAMPLE

*(Provide a diagram which illustrates the interactions among customers, users, project team (including the service provider) and other key stakeholders (e.g. regulators) relevant to evolve the application/service within this study and beyond.)*

The following table provides an overview of the positioning of the Tenderer and its Subcontractor(s) as well as of the involved external key actors together with their position in respect to the feasibility study and the targeted commercial exploitation.

Table 4.1 Partners’ Positioning

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Partner** | **Background and Experience** | **Role in  the Feasibility Study** | **Role in a potential Demonstration Project** | **Role in  commercial exploitation** |
| ……… | ……… | ……… | ……… | ……… |
| ……… | ……… | ……… | ……… | ……… |
| ……… | ……… | ……… | ……… | ……… |

## System/Service Architecture

A high level block diagram of the system/service showing the key attributes and key building blocks and the main interfaces is provided in the figure below.

Figure 4.2 System/Service Architecture



EXAMPLE

The individual building blocks and their main features as well as the interfaces between the building blocks are the following:

Building block “aaa”: …

Building block “bbb”: …

*(Provide information on the main features of each building block presented in the System/Service Architecture diagram and how they interface with each other.)*

## Implementation Approach

a) The starting point for our project is: [from AP.4.1]

*(e.g., idea, prototype, existing product, existing service, results from other activities, discussions with potential users)*

b) The expected goals / outputs at the end of the feasibility study and the way they will contribute to an informed decision for the next steps / further investments (e.g. in form of an Space4Rail Downstream Applications in ARTES 4.0 Demonstration Project) are: [from AP.4.3]

c) Study Logic:



*[In case that different tasks are proposed for Technical Phase 1 or in case that a study logic differing from the study logic as shown above and as introduced in Section 2.2 of the Management Requirements "MR" for Feasibility Studies is proposed, this needs to be duly justified.*

*If you have already all information related to a specific task, this task does not have to be repeated, but relevant proof has to be provided to the Agency.]*

d) The key activities proposed to be executed are: [from AP.4.2]

Table 4.2 Key tasks and high level information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **WP Identifier**  *(e.g. WP0000, WP1000, WP2000, …)* | **WP Title** *(e.g. Management, Customer Engagement,**Technical Feasibility, …)* | **Key activities** | **Responsible Entity** | **Schedule** |
| ……… | ……… | ……… | Prime/Subco | KO-KO+xx m |
| ……… | ……… | ……… | Prime/Subco. | KO-KO+yy m |
| ……… | ……… | ……… | Prime/Subco | KO-KO+zz m |

*(The table provides a high level description of the key activities (e.g. first level Work Packages) to be performed including the time planning information.)*

e) For each of the tasks, the most critical and important issues to be addressed during the study shall be presented.

Table 4.3 Study tasks – major activities & critical / important issues addressed

|  |  |
| --- | --- |
| **Study Task** | **Critical / Important Issues to be addressed** |
| ……… |  |
| ……… |  |
| ……… |  |

*(The issues and success factors can cover a variety of aspects, i.e. consortium internal / external such as partnerships, IP, investments, commercial, technological, regulatory, etc.)*

## Technical and Non-Technical Risks

The major technical, operational and business related risks associated with the proposed activity and the associated mitigation plans are: [from AP.4.7]

These risks are summarised in the following table.

*(Complete the following table as appropriate)*

Table 4.4 Overview of the Major Risks and the proposed Risk Mitigation Actions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Risk Identifier** | **Description** | **Likelihood** | **Severity** | **Mitigation Actions** |
| ……… | ……… | low/medium/high | low/medium/high | ……… |
| ……… | ……… | low/medium/high | low/medium/high | ……… |
| ……… | ……… | low/medium/high | low/medium/high | ……… |

## Financial, Management, Administrative (FMA)

1. The table below provides a high level description of the proposed team, including the internal source of co-funding.

Table 4.5 Main project participants

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Company Name** | **Main figures**  *(e.g. year of creation, size, turnover, number of employees)* | **Relevant Experience** | **Budget (cost) kEUR** | **Source of co-funding[[2]](#footnote-3)** |
| ……… | ……… | ……… | ……… | ……… |
| ……… | ……… | ……… | ……… | ……… |
| ……… | ……… | ……… | ……… | ……… |

1. The table below provides the breakdown of costing and pricing per contractor.

Table 4.6 Breakdown cost and price for prime and subcontractor(s)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Company/ Organisation** | **Status (e.g. University, SME)** | **Country** | **Cost (kEUR)** | **Price (kEUR) (requested from ESA)** | **% Funding from ESA[[3]](#footnote-4)** | **National Delegation Support[[4]](#footnote-5)** |
| Prime | ……… | ……… | ……… | ……… | ……… | yes/no/under discussion |
| Subcontractor 1 |  | ……… | ……… | ……… | ……… | yes/no/under discussion |
| Subcontractor 2 |  | ……… | ……… | ……… | ……… | yes/no/under discussion |

1. The table below provides an initial overview of the planned manpower distribution over the various Work Packages.

Table 4.7 Planned manpower distribution over work packages

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | WPxxx | WPxxx | WPxxx | WPxxx | WPxxx | WPxxx | Total |
|  | [%] | [%] | [%] | [%] | [%] | [%] | [%] |
| Manpower distribution |  |  |  |  |  |  |  |

1. The table below provides information and reference of other projects/activities carried out as precursor activities to the proposed study or on related subjects.

Table 4.8 Related projects/activities

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Linked Activity Name** | **Activity description and relevant links with what is proposed in this Outline Proposal** | **Cost of the Linked Activity**  **kEUR** | **Funds received by public sources**  **kEUR** | **Timeframe** | **Related programme / funding agency**  *EU H2020, FP7, ESA XXX, national programmes* |
| ……… | ……… | ……… | ……… | ……… | ……… |
| ……… | ……… | ……… | ……… | ……… | ……… |
| ……… | ……… | ……… | ……… | ……… | ……… |

1. Other help/support expected from ESA: [from AP.4.6]  
   *(e.g. networking, coaching, branding, technical/business advice)*

1. Points of contact of the National Delegations can be found at: <https://business.esa.int/national-delegations>   
   For Italian companies, it is NOT required to contact the National Delegation (ASI), because ESA has been delegated by ASI to interface with the Tenderer in the whole stage of the bidding process. [↑](#footnote-ref-2)
2. The source of co-funding needs to be indicated. Co-funding can be provided by industry, institutions and users participating in the activity. In case of third party funding, the status of the availability of this funding, and actions to arrive at a formal agreement for this need to be presented. [↑](#footnote-ref-3)
3. Please, note that work carried out by SMEs involved as contractors or subcontractors may be funded up to 80%   
   by the Agency. The decision of the applicable funding level is with the related national delegation. [↑](#footnote-ref-4)
4. yes = The National Delegation has been contacted and is in favour of the proposed activity.  
    no = The National Delegation has not yet been contacted.  
    under discussion = The National Delegation has been contacted and discussions are ongoing. [↑](#footnote-ref-5)