



CALL FOR IDEAS

**SPACE TRANSPORTATION
OPPORTUNITIES**

IDEAS: BUSINESS

#MORSPACEFORBUSINESS



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1 INTRODUCTION

The space sector is evolving into a new era, Space 4.0, and space transportation has a key role to play. Unprecedented changes are marking the space (transportation) sector:

- On one hand there is increased interest in commercial investment driven by potential business cases, thus leading economic operators to propose new services and innovative applications focused on downstream markets;
- On the other hand, the sector is confronted by a number of uncertainties as to the future evolution of the offer and demand, increased competition, and pricing pressure.

This calls for new thinking in Europe, specifically on space transportation capabilities to match upcoming needs while creating new opportunities. Maximising the use of space requires increasing accessibility of transport to, from and in space. One step is reducing the cost of access to space, another is completing the offer of transportation, not just to space but also to various orbits, between various orbits and back to Earth, as well as related ancillary services. Providing new, affordable transportation services will open up new business opportunities that will also provide a benefit to the public sector for institutional missions, stimulate employment, and benefit the global economy.

Europe shall seize on and boost the prospect of private operators taking action to develop new markets, accept risk and reduce costs, with a business-friendly outlook on more flexible and faster paced activities. To that end, in addition to ensuring guaranteed access to space for Europe through on-going programmes either in exploitation or in development - mainly relying on European launchers (Ariane, Vega) and activities like the modernisation of Europe's spaceport and development of a re-entry vehicle - the ESA Directorate of Space Transportation is taking action to improve growth and competitiveness through fostering the opening of new markets by European industry in the space transportation sector. The ESA Directorate of Space Transportation wants to ensure that promising ideas for new privately funded European space transportation services are identified and supported to realise their potential.

This call for ideas is a first step toward identifying promising ideas within Europe for new, privately funded, customer-oriented, commercial space transportation services. This will help ESA prepare the support such ideas require in order to become fully operational and commercially successful systems, including within the frame of Member States decisions at the occasion of the ESA Council meeting at ministerial level in 2019. For information about the latest relevant decisions on space transportation, please click [here](#).

Businesses big and small, research institutes, academia, and non-profit organisations are all invited to tell us about their ideas for new space transportation services and how the European Space Agency can help them to develop their idea into a fully operational space transportation service for commercial use.

This is YOUR CHANCE to tell us how we can help to get YOUR IDEA off the ground!

2 ACRONYMS AND ABBREVIATIONS

CEST	Central European Summer Time
CFI	Call For Ideas
ESA	European Space Agency
IPR	Intellectual Property Rights
LEO	Low Earth Orbit
SWOT	Strengths-Weaknesses-Opportunities-Threats analysis
TRL	Technology Readiness Level

3 DEFINITIONS

Technology Readiness Level The Technology Readiness Level (TRL) scale is used to describe the maturity of a Technology. The scale goes from Level 1 through Level 9, as shown below:

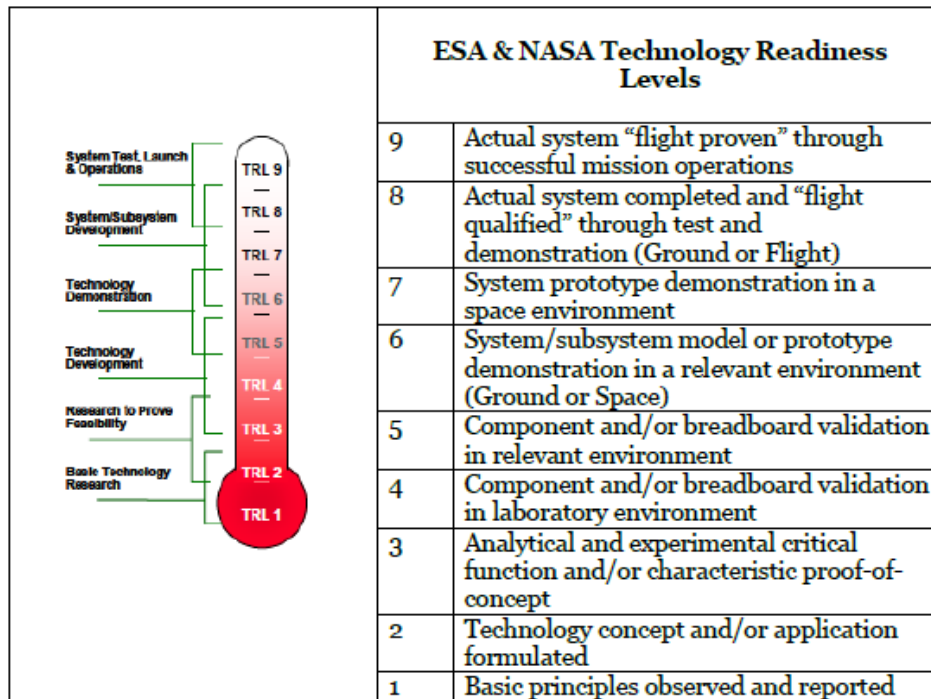


Figure 1 Technology Readiness Level Definition

ESA Merit Stamp/Cachet: Within the future New Space Transportation Services Initiative, something like an “ESA Stamp” or “Cachet” could be created. This would be awarded to commercial space transportation ideas that have been submitted to and assessed by ESA and that have been found to be based on solid market analysis and feasible technology/system maturation plans. This stamp/cachet would be a gauge of the quality and value of the idea, specifically when public funding would not be available.

Note: Such a Stamp/Cachet does not exist yet



4 GOAL OF THE CALL FOR IDEAS

To maximise the use of space, flexibility and availability of transport to, from and in space must increase. Orienting new affordable transportation services to, from and in space towards private customers will open up new business opportunities.

With this call for ideas, the Directorate of Space Transportation of the European Space Agency wants not only to gather valuable input and identify promising ideas within Europe for new privately-funded space transportation services but also to help ESA establish the support such ideas need in order to become fully operational and commercially successful systems. Ongoing studies for launch services based on micro-launchers, where private investment is required to set up the business, are one of the first examples of such potential support. See [here](#) and [here](#) for more information.

Please note that this call for ideas is not part of a formal selection process for placement of contracts or funding. The outcome of this call for ideas will inform the preparation of upcoming Member States decisions and may lead to the implementation of a focused initiative targeted at maturing promising new European space transportation services under a commercial lead, with ESA contributing through financial instruments or in-kind.

The main objectives of such an initiative would be:

- Enlargement of European presence in global markets through the development of new services relying on space capabilities.
- Improvement of European space industry competitiveness, by promoting innovation, developing highly qualified technical expertise, and creating business opportunities.
- Accompanying private economic operators in setting up their business and encourage high-risk/high-potential initiatives.
- Achieving advances in products and services/distribution.

The Agency does not commit to placing any contract at the end of this CFI process. However, we do reserve the right to contact respondents after reception of their proposal to discuss their idea further, including potential next steps – see chapter 4.1 “What is in it for you?” below. The award of contract, if any at a future step, will be dealt with under a separate process in compliance with ESA Procurement Regulations (ESA/REG/001, rev. 4) - see “Administrative Documents” under “Reference Documentation” [here](#).

4.1 What is in it for you?

At this stage, this is an open call for ideas with no associated funding or contracts, so why should you take the time to provide us with your idea?

- I. All submitted ideas will be assessed by a team of ESA experts, who will provide constructive feedback on your idea.



- II. We want to be ready to support initiation/initial progress of high potential ideas; to do this we need to ensure we have understood your needs. We are here to support a competitive European Space industry, including assisting in areas such as:
- Financing instruments (funding, risk sharing...) including through facilitating innovative schemes (e.g. loan guarantees).
 - “ESA Merit Stamp/Cachet”.
 - Coaching/mentoring.
 - Technical Expertise.
 - Use of publicly operated test facilities.
 - Please suggest anything else in your response!
- III. All submissions will be stored and as we move forward, they will be our first port of call when looking for promising ideas to develop. Please be aware therefore that by submitting an idea you agree to us contacting you after the closure of the call for ideas. If we can already identify support that we can provide then this would be part of our discussion with you.
- IV. The information provided will be used by ESA to help develop new commercial space transportation initiatives, as such the information provided to us will be treated as commercially sensitive - communicated within ESA only on a “need to know” basis and not communicated outside of ESA without explicit agreement of the respondent.
- V. Finally – prizes! As judged by the panel of experts, up to three ideas will be selected as “Outstanding ideas” to be presented in a press release on the results of the CFI. In addition these entries will win a trip to the Guiana Space Centre in French Guiana for up to three people to visit the facilities and attend a launch event.



5 CALL FOR IDEAS

5.1 Entry requirements

In line with the goal of this call for ideas, idea submissions of new European space transportation services complying with the following conditions are encouraged:

- a) The proposed new space transportation service shall be:
 - I. For exclusively peaceful purposes.
 - II. Based on a private funding scheme.
 - III. Complementary to existing ESA space transportation programmes and activities in order to expand the space business.
See [here](#), [here](#), [here](#), [here](#) and [here](#) for information on current European Space Transportation systems and programmes.
 - IV. With the objective of commercial viability, oriented toward private sector customers, without public funding in the operational phase and with a long-term vision of service provision.
- b) Any proposed new space transportation service can be (i) To space; (ii) In space; and/or (iii) From space.
- c) Any new proposed commercial space transportation service could respond to one or more current areas of interest, focusing on the space transportation aspect:
 1. In-Earth orbit transportation and services, e.g.:
 - Capabilities enabling potential future exploration missions and/or earth-moon services.
 - In orbit propulsive platforms.
 2. Return from orbit services, e.g.:
 - Debris removal (complementing on-going initiatives within ESA, see [here](#)).
 - Space experiments retrieval.
 3. Low cost access to space for light satellites (up to 200kg) e.g.:
 - Development of new low cost commercial services to Low Earth Orbit (LEO).
 - Standardisation of elements for cost reduction.

A new space transportation service not fitting into one or more of the categories laid out above but complying with all other conditions laid out in a) and b) can also be proposed.

5.2 Conditions for participating to the Call for Ideas

Any kind of entity (company, person, academic institute, ...) may respond to this CFI. Please note that contracts and/or agreements, if any, will be placed only with entities considered to belong to one of the ESA Member States or Canada (in accordance with Article II.3 of Annex 5 of the ESA Convention – see [here](#)), and duly registered in esa-star.



Entities willing to be registered in esa-star are requested to complete the on-line dedicated questionnaire (see: <https://esastar.sso.esa.int/>). The latest information on the registration process is found in the ESA Industry Portal [here](#).

5.3 Submission

Anyone interested in this Call for Ideas are invited to submit their idea using the attached form in **Annex 1**. Any submitted idea is not legally binding.

In order to submit their ideas, interested parties should:

- Check that their idea complies with the entry requirements for this Call For Ideas as laid out in chapter 5.1.
- Complete the submission form given in **Annex 1**, taking care to fill in all required fields and considering the evaluation criteria as laid out in chapter 5.6 that shall be used to assess each idea.
- Prepare their submission in electronic format AS ONE SINGLE FILE (Microsoft Word (.doc) or Adobe Acrobat (.pdf)) and have a maximum length of 10 pages. To facilitate transmission of the file, the total file size should be no more than 15 MB (including pictures).
- Submit their idea via email to the following address:

ST_ideas@esa.int

Reception of the submitted idea will be acknowledged within 10 working days of submission.

If a submission is not complete, that is to say if all required fields have not been filled in, the submitter will be informed via email and invited to submit a complete idea if the submission deadline has not passed. A non-complete submission will not be assessed.

There is no limit to the number of ideas that an interested party can submit, however for each separate idea the submission form laid out in **Annex 1** must be completed. It should also be noted that as per the evaluation criteria laid out in chapter 5.6, a single space transportation system that can provide multiple different services would be considered as having a stronger business case and therefore generally would be evaluated more positively than a system that can only provide one service.

Please try to fill in all the boxes of the submission template, however we do understand that not all elements may be ready; in this case explain; e.g. write “Not available yet”. We would recommend however trying to provide at least first principles of all the elements requested.

5.4 Submission deadline

The submission deadline is the **14/09/2018 23.59 CEST**

Ideas submitted after this deadline will not be acknowledged or assessed.



5.5 Proceeding of the Call for Ideas

1. The CFI and any additional communications pertaining to the CFI are published on the EMITS platform under “News” - see [here](#).
2. Respondents may ask questions in relation to the CFI. Questions must be sent by email to ST_ideas@esa.int, not less than 10 working days before the submission deadline stated above. The Agency will publish on EMITS all questions raised in an anonymous manner, together with the Agency’s answers.
3. Ideas provided in answer to the CFI shall comply with the submission requirements laid out in chapter 5.3. The non-compliance to these requirements will result in the non-evaluation of the idea.
4. Expenses incurred in the preparation and dispatch of the responses to this CFI will not be reimbursed.
5. The Agency reserves the right at any time to suspend or cancel the CFI process. Such suspension or cancellation may not give rise to any claims by the responders to the call.
6. During activities linked to this CFI, ESA will:
 - i. Communicate ideas submitted in answer to this CFI within ESA on a “need to know” basis.
 - ii. Not communicate the submitted ideas to other entities outside of ESA, unless explicitly agreed by the respondent, e.g. for a press release.
 - iii. Ensure a transparent and fair evaluation process.
7. The Agency will maintain a record of the CFI proceeding (subject, procedure, correspondences, ideas, responses, evaluations) in electronic format.
8. Title to documents and dissemination principles:
 - a) Title to all documents and information supplied by respondents in the CFI process shall remain vested in the concerned respondent.
 - b) No Intellectual Property Rights (IPR) shall be included in the answer to the CFI.
 - c) No elements submitted to export control shall be included in the answer to the CFI.
 - d) The answer to the CFI shall be free from any plagiarism. When use is made of quotations or citations from existing public literature, such use shall be clearly indicated and due reference indications (source and author) shall be provided.
 - e) Responses to the CFI shall be stored in a secure manner for two years or until the information is no longer needed (whichever is sooner). Responses shall then be destroyed.



- f) The obligation of the Agency not to disclose documents and/or information contained in the response shall not apply to documents and information:
- (i) In the public domain.
 - (ii) Which come into the public domain by publication or otherwise through no fault of ESA.
 - (iii) Where proof can be provided that the documents and/or information were already legitimately in ESA's possession at the moment the document/information concerned was provided by the respondent.
- g) The above provisions shall continue to apply after the completion of this CFI process for a period of time to be determined by the respondent. Until the response is destroyed as per 5.5.8.e) above, a respondent is entitled at any time after the termination of this CFI process to request that documents made available to ESA shall be either destroyed or returned.

5.6 Evaluation criteria

All submitted ideas will be assessed by a team of ESA experts using the following evaluation criteria. These criteria should be kept in mind when preparing a submission.

Eligibility criteria:

- a) The completeness of the submission – all required fields have been filled in and clearly described. We do understand that not all elements for your idea may be ready, however we would recommend however trying to provide at least the first principles of all the elements requested. If such principles are not yet available for your idea, you may explain; e.g. write “Not available yet”. If a submission is judged to not be complete it will not be assessed further.
- b) Compliance to the entry requirements as laid out in chapter 5.1. If the submission is judged to be not compliant it will not be assessed further.

Eligible submissions, i.e. those satisfying a) and b) above, will be assessed according to the following criteria, in descending order of importance:

1. **Commercial viability:** Potential for return on investment and associated time to market. Expected Private financial backing and funding.
Proposed activities must have the potential to ultimately lead to the introduction of a new commercial service, and most will require subsequent financial investment from the private sector to bring the idea to market. There must be a reasonable expectation that investors can recover their development costs from future exploitation of the service. The soundness of the business elements provided will enable the necessary level of confidence of the expected commercial viability. Evidence of industry, investor and customer support for an idea enhances its credibility, as does a plan for further development or enlargement of the service.
2. **Technical feasibility** of the idea and relevance of the proposed implementation approach.



The proposed concept shall be technically credible and its description sufficiently complete. It shall clearly identify the main technical elements to be developed, the main technologies that are required and the approach for the implementation of the activities and for mitigating the risks. The feasibility for implementing the concept within the schedule and financial budget shall be substantiated, taking into account the proposed set-up for the team and necessary expertise.

3. Potential for impact in contributing to the development of the European commercial space transportation services and the competitiveness of the sector.
In describing a proposed new service, you should highlight benefits for the European Space Transportation industry as well as direct and indirect benefits expected at higher levels for the Space Sector, downstream industry and European economy.

5.7 Feedback to respondents

Reception of the submitted idea will be acknowledged within 10 working days of submission.

All submitted ideas considered as eligible will be assessed by a team of ESA experts, who will provide feedback on your idea in the form of an email within three months of the closure of the call for ideas.

Please note that this call for ideas is not part of a formal selection process for the placement of contracts or funding, however we reserve the right to contact you after the closure of the call for ideas to discuss your submission.

5.8 Contact

For questions related to this Call for Ideas, please contact:

ST_ideas@esa.int



6 ANNEX 1 – SUBMISSION TEMPLATE

Field	Content
1	Title of idea
2	Category of idea (see CFI 6.1 c)
3	<p>Short Description of the idea - including a graphic that easily identifies the idea/proposal (maximum two pages)</p> <p><i>In this section, the proposer is expected to present/identify, with the relevant level of detail, the idea for a new service, highlighting:</i></p> <ul style="list-style-type: none"> • <i>The type of service intended to be provided (and eventual options if any)</i> • <i>The matching of the service with one of the areas identified in § 5.1 (or if it is a new service not falling within those areas).</i> • <i>The frequency expected for the service to take place, on a yearly basis.</i> • <i>The intended availability of the service.</i> • <i>The complementarity with existing European Space Transportation services.</i> • <i>The main technical elements and system architecture elements needed for implementation of the service.</i> • <i>The type of infrastructure needed to develop and operate the service and the level of dependency on this infrastructure.</i> • <i>The possible locations for operating the service.</i> <p><i>Other useful information for understanding the proposed concept.</i></p>
4	<p>Preliminary business case elements:</p> <ul style="list-style-type: none"> - Target market. - Estimated project cost up to commercialisation. - Estimation Return on Investment and associated timeline. - Financing plan; expected methods to raise necessary funding. - SWOT (maximum two pages). - <p><i>In this section, the proposer is expected to provide sufficient elements in order to understand the assumptions of the business case on which he intends to provide the service.</i></p> <p><i>The elements provided shall allow the understanding of the expected customer base and the intended market segment to be covered.</i></p> <p><i>The level of information provided shall clearly identify the timing for the start of commercial exploitation, the expected income from exploitation of the service, the foreseeable associated exploitation costs and the return of investment necessary to recover the private funding required to develop, qualify and set-up the commercial exploitation of the service.</i></p> <p><i>The expected approach for funding the project shall be developed with the indication of the private investment portion and identification of possible private investors.</i></p> <p><i>A SWOT analysis and support from potential customers will also help to assess the commercial viability of the service.</i></p>

Field	Content
5	<p>Expected benefits for the European Space Transportation sector:</p> <ul style="list-style-type: none"> - Market opportunities for private sector. - Broader social-economic benefits. <p>(1/2 page)</p> <p><i>In this section, the proposer is expected to provide an assessment of the foreseen benefits for the European Space Transportation sector as well as more widely in terms of social- economic benefit that will be developed by the activity and the effect on the economy (e.g. Highly qualified employment, education needs, economic growth, etc....)</i></p>
6	<p>Duration of the project Description of main phases up to commercialisation: (1/2 page)</p> <p><i>In this section, the proposer is expected to clearly identify the various steps and their durations foreseen in the implementation of the service up to full operational capability. They shall in particular identify the main stages of the development phase and their duration and the transition to commercial exploitation.</i></p> <p><i>The duration of the relevant steps shall consider the time needed for reaching the necessary level of maturity for the technology intended to be used (as per section 7).</i></p> <p><i>They shall also identify any test/demonstration step of the service (if any) before its commercialisation, and the eventual ramp-up (if any) in the level of provision of the service.</i></p>
7	<p>Outline of the identified required technologies (1 page)</p> <p><i>In this section, the proposer shall identify the required technologies that will be needed for the development and exploitation of the service in relation with the technical elements presented in section 3. They shall provide indications (if available) on the level of maturity of the technologies required and the approach for maturing them when the required level is not sufficient. If there are several technology options possible, the most likely option shall be highlighted.</i></p>
8	<p>Information on the proposing entity</p> <ol style="list-style-type: none"> 1) Key competences/Relevant experience. 2) Size (number of people). 3) Address & Location. <p>(1 page)</p>



Field	Content
<p>9</p>	<p>How advanced is the entity that will implement the idea (industrial teams, partners, investors, supporters)? How advanced is the implementation of the idea? (1 page)</p> <p><i>In order to support the assessment of the credibility of the plans for the service, the proposer shall identify the expertise needed to bring the service up to commercial use and how the proposer intends to obtain such expertise. They shall also provide information (if available) about possible partnerships envisaged and indicate identified supporters of the idea and possible investors that would be ready to fund partly or fully the implementation phase. In case the implementation of the idea has already started, the proposer shall identify when it started and which step it has reached so far.</i></p>
<p>10</p>	<p>Expected support from ESA</p> <ol style="list-style-type: none"> 1) Financing. 2) Fund-raising support e.g. via “ESA Merit Stamp/Cachet”. 3) Loan guarantees. 4) Coaching/mentoring. 5) Technical Expertise. 6) “ESA Merit Stamp/Cachet”. 7) Test Facilities. 8) Any other. <p>(1 page)</p> <p><i>In this section, the proposer shall clearly identify the support that ESA could provide in order to best help the implementation of the new service proposed and the development of the new business. Due to the large range of possible support that could be envisaged in some areas (technical, test facilities, coaching), the proposer is invited to give as far as possible precise indications on the type of support that would be most beneficial for them (e.g. system engineering, mechanical, thermal, etc....)</i></p>
<p>11</p>	<p>AOB to be reported (1/2 page)</p> <p><i>This section is left free to the proposer to provide any useful information that is not contained in any of the previous sections, but would be useful in the assessment of the idea by the expert panel.</i></p>



7 ANNEX 2 – SCHEDULE FOR EVALUATION AND NEXT STEPS

