

**Small Business Innovation Research (SBIR) and  
Small Business Technology Transfer (STTR)  
Opportunity Announcement  
HR001121S0007-05  
Portable Personal Air Mobility System**

**Which program will fund this topic?**

SBIR

**What type of proposals will be accepted?**

Both Phase I and Direct to Phase II (DP2)

**Technology Area(s):** Air Platform, Ground/Sea Vehicles

**DARPA Program:** ROCIE-1; ROCIE-2; SPIRALLS; STARK

**I. INTRODUCTION**

The Defense Advanced Research Projects Agency (DARPA) Small Business Programs Office (SBPO) is issuing an SBIR/STTR Opportunity (SBO) inviting submissions of innovative research concepts in the technical domain(s) of Air Platform, Ground/Sea Vehicles. In particular, DARPA is interested in understanding the feasibility of Portable Personal Air Mobility System.

This SBO is issued under the Broad Agency Announcement (BAA) for SBIR/STTR, HR001121S0007. All proposals in response to the technical area(s) described herein will be submitted in accordance with the instructions provided under HR001121S0007, found here: <https://beta.sam.gov/opp/d0cde4fb668d40b1982da8296d5349c0/view>.

**a. Eligibility**

The eligibility requirements for the SBIR/STTR programs are unique and do not correspond to those of other small business programs. Please refer to Section 3.1, Eligible Applicants, of HR001121S0007 as amended for full eligibility requirements.

**b. Anticipated Structure/Award Information**

Please refer to Section 1, Funding Opportunity Description provided in HR001121S0007 for detailed information regarding SBIR/STTR phase structure and flexibility.

If a proposer can provide adequate documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications, the Direct to Phase II (DP2) authority allows the Department of Defense (DoD) to make an award to a small business concern under Phase II of the SBIR program without regard to whether the small business concern was provided an award under Phase I of an SBIR program. This SBO is accepting DP2 proposal submissions.

For this SBO, DARPA will accept Phase I proposals for cost of up to \$225,000 for a 6-month period of performance. All Phase I awardees will be eligible to submit a Phase II proposal at the appropriate time during the Phase I period of performance. They will be

contacted by the DARPA Small Business Programs Office via the SBIR/STTR Information Portal (SSIP) and provided with proposal submission instructions and the submission deadline. Phase II proposals will be evaluated in accordance with the applicable DoD or DARPA SBIR/STTR BAA. Phase II selection(s) are at the sole discretion of the government and are subject to funding availability and Phase I performance.

DARPA will accept DP2 proposals for cost of up to \$1,500,000. This includes a 12-month base period not to exceed a cost of \$500,000 and a 12-month option period not to exceed a cost of \$1,000,000.

SBIR Phase II awardees pursuant to this BAA will not be eligible to participate in the DARPA Embedded Entrepreneur Initiative (EEI) during the Phase II Period of Performance. Refer to Section 2.6, DARPA Embedded Entrepreneur Initiative (EEI), of BAA for detailed information on EEI.

Proposers should refer to Section 4.1. Proposal Preparation Instructions, HR001121S0007 for detailed proposal preparation instructions. Proposals that do not comply with the requirements detailed in HR001121S0007 and the research objectives of this SBO are considered non-conforming and therefore are not evaluated nor considered for award.

Phase I proposals shall not exceed 20 pages. Phase I commercialization strategy shall not exceed 5 pages. This should be the last section of the Technical Volume and will not count against the 20-page limit. Please refer to Appendix A of HR001121S0007 for detailed instructions on Phase I proposal preparation.

DP2 Feasibility Documentation shall not exceed 20 pages. DP2 Technical Proposal shall not exceed 40 pages. Phase II commercialization strategy shall not exceed 5 pages. It should be the last section of the Technical Volume and will not count against the 40-page limit. Please refer to Appendix B of HR001121S0007 for detailed instructions on DP2 proposal preparation.

**c. Evaluation of Proposals**

Section 5, Evaluation of Proposals, in HR001121S0007 provides detailed information on proposal evaluation and the selection process for this SBO.

**d. Due Date/Time**

Full proposal packages (Proposal Cover Sheet, Technical Volume, Price/Cost Volume inclusive of supporting documentation, and Company Commercialization Report) must be submitted via the DoD SBIR/STTR Proposal Submission website per the instructions outlined in HR001121S0007 no later than **12:00 p.m. ET, April 20, 2021**.

**II. TOPIC OVERVIEW**

**a. Objective**

The DARPA TTO office is interested in receiving proposals to develop and demonstrate novel or unique approaches to personal battlefield mobility for operators in a man portable low-cost package.

**b. Description**

This platform system or system of systems could incorporate entirely new designs, or modifications to existing systems. These platforms could serve a variety of military missions, enabling cost effective mission utility and agility in areas such as personnel logistics, urban augmented combat, CSAR, Maritime interdiction and SOF Infil/Exfil. Systems may be air deployed to allow for Infil to hostile territory, or ground deployed to allow for greater off-road mobility without the use of existing Vertical Takeoff & Landing aircraft such as helicopters and CV-22. The platforms may be one-time use or reusable with minimal repacking/re-deployment actions such that they properly support the envisioned use cases.

Unlike the ongoing AFWERX Agility Prime program, TTO is interested in proposals for systems which are man portable/storable in 1 (or a few) man portable containers/mobility bags.<sup>1,2</sup> When deployed, the systems allow mobility for a range of at least 5 km for a single operator, likely at low to medium altitudes. Systems should be designed such that assembly and deployment can occur in less than 10 minutes using only simple tools or no tools at all. The platforms must not require assistance from external equipment or other unique environmental factors (e.g. wind, elevation, etc.) for launch/recovery. Some examples of technologies of interest include jetpacks, powered gliders, powered wingsuits, and powered parafoils which could leverage emerging electric propulsion technologies, hydrogen fuel cells or conventional heavy fuel propulsion systems.

Of particular interest are systems which display low signature qualities inherent to their design, such as low auditory signature and low IR signature.

When deployed, the platform will be designed with simplified operations in mind, so that someone unfamiliar with the platform could be educated in its safe and effective use with relatively little training. It is anticipated that computer assisted control functions and intuitive interfaces will enable an effective operational system in addition to an overall system design that permits fast, equipment-free set-up.

**c. Phase I**

The Phase I feasibility study should focus on identifying the critical enabling technologies for the proposed system and conclude with sufficient bench testing and/or analytical efforts to demonstrate a viable path to a Phase II demonstration. The work performed in this Phase should focus on defining the trade space of the proposed system and identify one or more operational concepts with anticipated performance objectives. The final Phase I deliverable should clearly describe the system, its anticipated performance capabilities, the technical maturation roadmap necessary to reach a demonstration system, and detailed descriptions of one or more relevant use cases.

Phase I should include commercialization opportunity exploration and DOD end user interaction.

**i. Schedule/Milestones/Deliverables**

- Period of performance will be proposal dependent: from 3-9 months.
- Deliverables/Milestones to include:
  - a. Kickoff briefing
  - b. DOD customer Outreach Report
  - c. System Design Space Trade Study
  - d. Technology Feasibility Study
  - e. Technology Demonstration Roadmap
  - f. Monthly Status Reports

**d. Phase II**

Phase II will focus on maturing the relevant technologies via analysis and test campaigns that will culminate in a ground and/or flight test effort that establishes the viability of an operational version of the proposed system. The work in this Phase should build upon the Phase I efforts and follow the technical maturation roadmap to refine the anticipated performance capabilities and system characteristics. Phase II will culminate in a detailed design of the system prototype and identify the remaining steps necessary to mature the technologies into a viable operational system. The conclusion of Phase II will provide a system that is able to be transitioned to another DARPA program or another military service for continued testing and development.

**i. Schedule/Milestones/Deliverables**

- Period of performance will be 1-2 years with options
- Deliverables/Milestones to Include:
  - a. Kickoff
  - b. Preliminary Design Review
  - c. Quarterly TIMs
  - d. As-Built Report
  - e. Test Readiness Review
  - f. Technology Demonstration
  - g. Technology Report
  - h. Technology maturation summary
  - i. Transition Roadmap
  - j. Monthly Status Reports

**e. Dual Use Applications (Phase III)**

The operational system developed during the first two phases will be designed to provide a demonstration system that establishes the viability of the operational system. Depending on success of previous phases a Phase III effort may continue technology maturation and completion of a prototype system capable of being utilized in field trials

and other relevant demonstration and test events for the military use cases identified in the first two phases.

Depending on the system created in previous phases, a variety of DOD missions and users may be interested in transitioning the technology to an operational capacity including a variety of Special Forces units. Within the private sector, a large market for personal mobility systems exists for emergency first responders including Police, search and rescue, and particularly time critical ambulance response. Depending on the system, a wide variety of less critical use cases may emerge for commercialization including urban mobility or recreation.

**f. References**

1. Agility Prime Innovative Capabilities Opening (ICO) Transformative Vertical Flight. FA8625-20-R-2028. Available at <https://www.afwerx.af.mil/resources/Agility-Prime-ICO.pdf>
2. Agility Prime Area of Interest One (AOI#1) Air Race to Certification. Available at <https://www.afwerx.af.mil/resources/Agility-Prime-AOI.pdf>

**g. Keywords**

*Air Vehicles; Personnel Mobility; Logistics; Aerospace; Aircraft Design; Hybrid vehicles; Electric vehicle; Low cost; Attritable*

**III. SUBMISSION OF QUESTIONS**

DARPA intends to use electronic mail for all correspondence regarding this SBO. Questions related to the technical aspect of the research objectives and awards specifically related to this SBO should be emailed to [HR001121S0007@darpa.mil](mailto:HR001121S0007@darpa.mil). Please reference BAA TTO\_HR001121S0007-05 in the subject line. All questions must be in English and must include the name, email address, and the telephone number of a point of contact.

DARPA will attempt to answer questions in a timely manner; however, questions submitted within seven (7) calendar days of the proposal due date listed herein may not be answered. DARPA will post a consolidated Frequently Asked Questions (FAQ) document. To access the posting please visit: <http://www.darpa.mil/work-with-us/opportunities>. Under the HR001121S0007-05 summary, there will be a link to the FAQ. The FAQ will be updated on an ongoing basis until one week prior to the proposal due date.

In addition to the FAQ specific to this SBO, proposers should also review the SBIR/STTR General FAQ list at: <http://www.darpa.mil/work-with-us/opportunities>. Under the HR001121S0007 summary, there is a link to the general FAQ.

Technical support for the Defense SBIR/STTR Innovation Portal (DSIP) is available Monday through Friday, 9:00 a.m. – 5:00 p.m. ET. Requests for technical support must be emailed to [DoDSBIRSupport@reisystems.com](mailto:DoDSBIRSupport@reisystems.com) with a copy to [HR001121S0007@darpa.mil](mailto:HR001121S0007@darpa.mil).