

DEPARTMENT OF THE ARMY
DoD 23.4 Small Business Innovation Research (SBIR) Annual BAA
Release 16
Proposal Submission Instructions

INTRODUCTION

Where big ideas come to life, the Army SBIR and STTR programs align innovative small businesses with critical U.S. Army priorities to turnover game-changing solutions to our most critical customer – the soldier.

Proposers responding to a topic in this BAA must follow all general instructions provided in the Department of Defense (DoD) SBIR 23.4 Program BAA. The DoD 23.4 SBIR Program BAA can be found here: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>. Army requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below.

Specific questions pertaining to the administration of the Army SBIR Program and these proposal preparation instructions should be directed to: Dr. Zach Harrell at zach.harrell.civ@aal.army

June 13, 2023: Topic issued for pre-release

July 6, 2023: Army begins accepting proposals via DSIP

July 20, 2023: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET

August 1, 2023: Deadline for receipt of proposals no later than 12:00 p.m. ET

From **June 13, 2023 to July 6, 2023**, this topic is issued for Pre-Release with the names of the topic authors. During the pre-release period, proposing firms have an opportunity to contact topic authors through <https://calendly.com/zach-harrell-aal/heavy-vtol-tpoc-call> to schedule a time to ask technical questions about the topic. Questions should be limited to specific information related to improving the understanding of the topic's requirements. Proposing firms may not ask for advice or guidance on solution approach and you may not submit additional material to the topic author. If information provided during an exchange with the topic author is deemed necessary for proposal preparation, that information will be made available to all parties through the DSIP Topic Q&A module.

Once the Army begins accepting proposals on **July 6, 2023**, no further direct contact between proposers and topic authors is allowed unless the Topic Author is responding to a question submitted during the pre-release period. However, proposers may submit written questions through the DSIP Topic Q&A module at <https://www.dodsbirsttr.mil/submissions/login>. The DSIP Topic Q&A for this topic opens on **July 6, 2023**, and closes to new questions on **July 20, 2023 at 12:00PM ET**. Once the BAA closes to proposal submission, no communication of any kind with the topic author or through Topic Q&A regarding your submitted proposal is allowed.

Deadline for Receipt: Proposals must be **completely** submitted no later than **12:00 p.m.** ET, on **August 1, 2023**. Proposals submitted after 12:00 p.m. ET will not be evaluated. The final proposal submission includes successful completion of all firm level forms, all required volumes, and electronic corporate official certification.

PROPOSAL GUIDELINES

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers are required to submit proposals via DSIP; proposals submitted by any other

means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Content of the Technical Volume

Phase II and Direct to Phase 2 (DP2) proposals should follow the following format:

<https://aal.army/assets/files/pdf/sbir-direct-phase-2-template.pdf>.

Technical Volume (Volume 2)

The technical volume is not to exceed 15 pages and must follow the formatting requirements provided in the DoD SBIR Program BAA. Any pages submitted in excess of these limits will not be considered in proposal evaluations.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will not be considered during proposal evaluations.

Supporting Documents (Volume 5)

All proposing small business concerns are REQUIRED to submit the following documents to Volume 5:

1. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment
2. Disclosures of Foreign Affiliations or Relationships to Foreign Countries
3. Disclosure of Funding Sources

Please refer to the DoD Program BAA for more information.

Proposers can submit an optional slide deck of 10 slides in Volume 5: Supporting Documents. The slide deck can contain information on the technical approach, the team, commercialization plans, or relevant technology/research the proposers have developed, and it should contain additional/complementary information to the technical volume. If a proposer elects to submit a slide deck, its information will be used in the evaluation process. A sample Slide Deck template is located here: <http://aal.army/assets/files/pdf/sbir-optional-slide-template.pdf>.

EVALUATION AND SELECTION

The Army will conduct an evaluation of each responsive, timely, eligible proposal in accordance with the evaluation criteria listed in the DoD Program BAA. It is the policy of the Army to ensure equitable and comprehensive proposal evaluations based on the evaluation criteria and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals.

As previously stated herein, timeliness, responsiveness, and eligibility will be assessed upon initial screening, during evaluation, and after selection. Proposals that do not comply with the instructions and requirements detailed in this document, the DoD Program BAA, or the corresponding Topic posting (including the research objective(s)), will be considered ineligible, nonresponsive, untimely, or non-conforming and therefore will not be evaluated or considered for award.

Using the evaluation criteria, the Government will evaluate each responsive, timely, eligible proposal in its entirety, documenting the strengths and weaknesses relative to each evaluation criterion. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own

individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding opportunity.

Selected proposals are those determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD Program BAA, the component-specific instructions herein, the corresponding Topic posting, and availability of funding.

Proposing firms will be notified via email of selection or non-selection status for a Phase I or direct to Phase II award within 90 days of the closing date of the Topic. The notification will be sent to the Corporate Official listed on the proposal cover sheet from the Army SBIR Program Office mailbox. The Army promotes transparency regarding the technical evaluation for all Army SBIR proposals. The Army will provide a technical evaluation narrative to the proposer in accordance with the SBA Policy Directive, Appendix I, paragraph 4. The selection decision notice contains instructions for retrieving the technical evaluation narrative.

Proposers must not regard the notification email (selection decision notice) as an authorization to commit or expend funds. After the Army SBIR Office has recommended a proposal for award, a Government Contracting Officer may contact the proposer in order to discuss and request additional information required for award. This may include representations and certifications, certified or other than certified cost data, subcontracting plan for small businesses, and/or other information as applicable to the proposed award. Proposers must not regard these communications as an authorization to commit or expend funds. Unless a Government Contracting Officer signs the award document (i.e. contract), no obligations to provide funding are made. The Government may reject the proposal or cancel the contract action at any time.

If signed by the Government Contracting Officer, the award document is the official and authorizing instrument (i.e. contract). The anticipated period of performance start date will be determined at time of award. The Contracting Officer will email the signed, authorizing award instrument to the principal investigator (PI) and/or an authorized organization representative.

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.

AWARD AND CONTRACT INFORMATION

Please refer to the DoD Program BAA for detailed information regarding SBIR/STTR phase structure and flexibility.

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Release 16

A234-022 Heavy Lift Vertical Take-off and Landing; Heavy VTOL

A234-022 Heavy Lift Vertical Take-off and Landing; Heavy VTOL

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Trusted AI/Autonomy; Sustainment & Logistics

OBJECTIVE:

Design, Develop and Demonstrate Heavy-lift Vertical Takeoff and Landing (HVTOL) Systems to enhance the U.S. Army's resupply capability.

DESCRIPTION:

Heavy Vertical Takeoff and Landing (HVTOL) Systems will provide unique capabilities over currently planned VTOL systems in that they will provide upward of 10X the lift capability. This ability is vital for future Army combat operations. Successful advancement of Heavy-Lift Vertical Takeoff and Landing (HVTOL) Systems would enhance U.S. Army modernization priorities by increasing the amount of equipment that can be carried by a single platform at one time. This will reduce the number of flights it takes to resupply a forward unit, allow for heavier modular mission payloads to be carried and ultimately take Soldiers out of harm's way by utilizing an uncrewed platform.

Currently there are no uncrewed systems being fielded to US Army units. The Joint Tactical Autonomous Aerial Resupply System (JTAARS) is only requiring a lift capability of 125 lbs payload capability while other efforts are crewed cargo lift platforms at or above 3000lbs, on autonomous conversions utilizing full-sized helicopter platforms. Primary obstacles to overcome for successful operation of Heavy-Lift Vertical Takeoff and Landing (HVTOL) Systems is the balance of lift capability versus the distance a platform can fly to resupply units while displaying to Army units the time and effort saved by utilizing these platforms.

The goals of this effort are the design, development, and demonstration of Heavy Vertical Takeoff and Landing (HVTOL) Systems that can lift a threshold or minimum of 800lbs and goal of 1400lbs while having the ability to fly 100 miles threshold/minimum and a goal of greater than 100 miles.

These designs should be able to be loaded and unloaded in the field either by soldiers or autonomously, be able to fly autonomously or with human takeover, assist and fly routes while avoiding obstacles, select multiple routes, have an override system that allows soldiers to divert or modify resupply locations, autonomously select safe landing zones, have an override for human landing zone selection. Systems should be able to utilize or integrate modular mission payloads moving forward and common attachment systems are of benefit.

PHASE I:

This topic is accepting Direct to Phase II proposals only. Feasibility documentation should describe a design for a new or improved existing VTOL craft to achieve threshold or minimum of 800lbs and goal of 1400lbs payload capacity, while having the ability to fly 100 miles threshold/minimum and a goal of greater than 100 miles. The resulting design should include any relevant features or modifications to include air frame, propulsion, fuel/power systems, control, autonomy, navigation, hazardous cargo handling, and safety/loss of signal.

PHASE II:

In this Direct to Phase II solicitation, companies should be able to clearly indicate progress beyond the goals outlined in phase I in their proposals. For Direct to Phase II, companies will Develop and Demonstrate Heavy-Lift Vertical Takeoff and Landing (HVTOL) Systems. The system should include navigation controls, obstacle avoidance, override systems, loading and unloading controls, instructions, and training and safety instructions. Required Phase 2 deliverables include all necessary components (hardware and software) to control the platform, attach payload to the platform (TBD), ability to select navigation route, route override, landing or delivery zone selection, zone selection override, lost link

control, system safety, remote payload controls, ammo safe capability, soldier safety capable, a final report, and monthly progress reports. The system will be demonstrated in future Army experimentation or test events to evaluate performance.

Phase II evaluation goals will include:

- Demonstrated lift capability at test ranges, with a stage-gate lift of 500lbs at an Army experimentation or test event in early-mid 2024, prior to completion of the period of performance (PoP). Success is required to become eligible for a sequential phase II.
- Full systems, plans, designs, or other documentation that clearly shows how this technology will progress to a demonstrated lift in the 800-1400lb range during a potential phase II sequential award. Companies that do not include these detailed plans will not be eligible for full technical consideration.

Phase II duration is not to exceed 12 months and a cost of \$3 million.

This topic is planning for an immediate sequential phase II award to demonstrate lift/transport progress from the 500lb milestone to a demonstrated lift of 800 – 1400 lbs following the conclusion of the original PoP. Further requirements to be addressed in the sequential award will include ability to integrate with DoD's Modular Open Systems Architecture (MOSA), control systems, spectrum management, hardening/security, etc.

- Preferred integration with an externally supplied autonomous payload (selected vendors will be informed following contracting)
- Final performance demonstration of minimum 800lb lift at an Army experimentation or test event in spring 2025, with external autonomous payload integration.
- Test reports detailing solution performance.
- Product documentation detailing operation of prototype.
- Monthly progress reports describing all technical challenges, technical risk, and progress against the schedule.
- Final technical report, to specifically include system cost.

Sequential Phase II duration is not to exceed 12 months and a cost of \$3 million.

In accordance with the Small Business Act (15 U.S.C. §638, subsection (aa)(1)), no Federal agency may issue an award under the SBIR program or the STTR program if the size of the award exceeds the award guidelines established under this section by more than 50 percent without a waiver from the SBA. SBA shall adjust the maximum dollar amount every year for inflation. As of October 2022, agencies may issue a Phase I award (including modifications) up to \$295,924 and a Phase II award (including modifications) up to \$1,972,828 without seeking SBA approval. Any award above those levels will require a waiver. *Any award resulting from this solicitation that exceeds these amounts is subject to the SBA's prior approval of such waiver as a pre-requisite to funds availability; this solicitation does not guarantee any award.*

Army Applications Laboratory has secured a waiver to exceed the maximum phase II award amount for this solicitation as well as the follow-on sequential award.

PHASE III:

The objective of Phase III, where appropriate, is for the small business to pursue commercialization objectives through the effort. Companies may develop a manufacturing-ready product design, capable

of integration with the existing or future system, and demonstrate technology integration. Low-rate production will occur as required. Companies will engage in laboratory or operational testing as required. Phase III deliverables include system-level integration technical data package, installation documentation, and system-level prototype for demonstration and government-sponsored testing.

Additionally, Phase III goals will include:

- Additional capability developments
- Performance measurement in a variety of different operational test environments
- Test reports detailing solution performance.
- Operationally relevant demonstration of lift system integration with payload system
- Working toward further technology improvements, additional testing/modifications, and integration with Army stakeholders toward large scale adoption and commercialization.

KEYWORDS:

VTOL; Heavy UAS; Cargo UAS; Contested Logistics; Resupply; Autonomous UAS;

REFERENCES:

1. https://www.army.mil/article/219887/jtaars_concept_presented_to_industry
2. https://www.army.mil/article/265428/army_focuses_on_contested_logistics_a_threat_to_enemy
3. <https://www.forbes.com/sites/davidhambling/2021/03/16/us-army-pushes-ahead-with-battlefield-resupply-drones/?sh=b67f5796b94f>
4. <https://www.sciencedirect.com/science/article/abs/pii/S1570870522000178> (The introduction section gives good information on potential mission types and needs; the inclusion of this reference is not intended to endorse any of the article's methods or conclusions)
5. <https://warontherocks.com/2022/05/flying-dirty-unmanned-casualty-evacuation-on-the-contaminated-battlefield/>