

BAA Call N00014-22-S-C002
Special Program Announcement for Office of Naval Research
Research Opportunity:
DoD Explosive Ordnance Disposal S&T Large Area Clearance Experiment (LACEx)

I. INTRODUCTION

This announcement describes a proposal opportunity for the DoD Explosive Ordnance Disposal (EOD) S&T Program under Ocean Engineering and Marine Systems (ONR Code 32, <https://www.onr.navy.mil/Science-Technology/Departments/Code-32/all-programs/ocean-engineering-marine-systems>). Participation in this opportunity is available under the N00014-22-S-B001, Long Range Broad Agency Announcement for Navy and Marine Corps Science and Technology which can be found at <https://www.onr.navy.mil/work-with-us/funding-opportunities/announcements>. The submission of white papers, proposals, their evaluation(s), and the placement of research contracts will be carried out as described in the above Long Range Broad Agency Announcement.

The purpose of this announcement is to focus attention of the scientific community on (1) the technology area to be studied, and (2) the planned timetable for the submission of white papers and full proposals.

II. TOPIC DESCRIPTION

The Large Area Clearance Experiment (LACEx) is an ONR applied research and advanced technology development effort for the DoD Explosive Ordnance Disposal S&T program. The proposed topic will support research efforts to improve the effectiveness and speed of EOD clearance operations for surface and subsurface ordnance. EOD technicians are asked to: 1) Clear airfields of unexploded ordnance, including submunitions and penetrators, consistent with required operational timelines and in remote and austere environments; 2) Enable convoy maneuver along key ground lines of communication threatened by area denial munitions, improvised explosives, or other hazards and 3) Clear expeditionary advanced bases, ports, and beach landing zones to support the establishment of infrastructure and basing.

LACEx is planned as a 3 year build & experimentation program. The focus of this BAA Call is on high risk, high payoff research and development proposals that advance state of the art capabilities (from TRL1-4 to TRL6/7) in the described topic areas. **ONR intends to fund up to 8 awards valued at 200K-750K per year with either 6.2 or 6.3 funding which is dependent on the proposal and technology readiness level.**

BACKGROUND:

Operational Description: Explosive Ordnance Disposal (EOD) technicians are required to rapidly clear large areas in a variety of terrains, weather conditions and environments. EOD technicians use lightweight, small sized, up to 2-person portable capabilities and tools to conduct surface and buried munitions clearance operations, often in austere environments. The current clearance process is time and touch labor intensive. It involves repetitive work, uses handheld devices with no standoff and high cognitive load on the operator.

Below are Operational Scenarios Parameters to consider when developing ideas and writing proposals:

- Rapid is characterized as decreased operational timelines from current baseline (risk heavy) EOD operations, such as 1 hour to detect and assess an attacked/damaged airfield, or 3 hours to clear multiple threats within an Airfield Minimum Operating Strip (MOS). These characterization times do not reflect the hard requirements as mission timelines are typically variable. The first operational environment that LACEx will address is runways.
- Large area is defined as 5000 acres for the purpose of experimentation. The first operational area of study will include a runway (approximately 150 ft x 10,000 ft).
- Clearance is characterized as either the remote elimination or neutralization of a threat (or the threats ability to function as designed), or the remote rendering of the threat safe to move, and/or removing safely from the Area of Concern (AOC). Given the sensitive nature of the AOCs and the potential for close proximity multiple threats, it is preferred that clearance action(s) do not initiate high order detonations or sympathetic detonations.
- Environments
 - Day and Night time conditions
 - Concrete or asphalt surfaces
 - Various soil and terrain
 - Sand Density (Beach or High Density Desert)
 - Forested Areas with Foliage and Ground Cover
 - Weather Impact Conditions as Snow
- Threat Types with varying size, type, materials and configuration:
 - UXO & submunitions (from 1x2 inch cylinder sized to large general purpose bomb sized, various materials and shapes)
 - IEDs (from wire size to modified ordnance sized, various materials)
 - Penetrators of variable size and type

Research Objectives: The objective of the program is to develop TRL6/7 capabilities for EOD technicians and provide rapid, standoff large area clearance capabilities that are up to 2-person portable, including power sources. LACEx will also provide an understanding of phenomenology, performance and research publications where practicable.

Approach (LACEx Science Teams & Test Events): Funded Principal Investigators (PIs) will work on their individual research efforts and then team via LACEx collaborative field tests which will allow PIs to collect data, experiment and receive user feedback throughout the research and development process. Government facilities will be arranged during reasonable test milestones and paid for by the government for major LACEx team experiments. Bench testing and preparatory field work will be included in the proposals institution and carried out at PI facilities. PIs will work together as a science team throughout LACEx within all of the requirements of their government awards and contracts. Weekly team virtual meetings will be organized by the government

PERIOD OF PERFORMANCE & AWARDS

Performance periods should be a maximum of three years and should map to TRL levels. Up to eight awards between \$200K and \$750K per year are intended to be awarded for the LACEx effort.

TOPIC DESCRIPTIONS

Proposing PIs will provide only one proposal for each topic area. If multiple approaches or ideas are supplied, separate the ideas by section and clearly identify that multiple ideas and separately costed/schedule efforts provided in the proposal. ONR is seeking new ideas, approaches and methods that are suitable for 6.2 and 6.3 funding. ONR is not looking to fund incremental development or 6.4 efforts.

1. Topic 1: Rapid, Standoff Surface Munition Clearance

This topic requests innovative proposals for rapid clearance of surface munitions at standoff distances (50 feet minimum). Clearance is described in the Operational Description section above. Elimination and/or Neutralization approaches can be provided. Unmanned Ground Vehicle (UGV) or Unmanned Aircraft System payload development should include demonstration on small UGVs (up to an equivalent size of EOD TALON® or Packbot® platform) and sUAS should be equivalent to a small person portable platform (such as group 1). Remote mechanical clearance ideas should include a description of autonomy, manipulation and path planning development, if applicable. Consumable or attritable system ideas will be considered. Non-detonative or low order neutralization ideas are preferred if they are rapid and high precision (aimspot of a US dime) capabilities. Please describe the TRL of the payload, all platform details, including maturity of autonomy that would be required to enable an unmanned system capability. Provide specific evidence to support TRL determinations (tests, results, etc).

2. Topic 2: Standoff Render Safe Surface Munitions

This topic involves new approaches and technologies for the interruption of function or separation of components to render a surface munition safe, along with a process to visually verify the procedure. Proposals that apply multiple approaches (such as standoff physical/mechanical separation or other energy sources) should be provided as a single proposal. Surface munitions include scatterable submunitions as well as larger UXO such as 155mm artillery projectiles that feature conventional (TNT, Comp B) and insensitive explosive fills (IMX-101) .

3. Topic 3 Advanced Airborne Sensors for Shallow and Deeply Buried Munitions Detection (small, Group 1 sUAS)

This topic requests proposals for innovative airborne sensors for rapid detection of shallow (down to 12 inches) and deeply buried munitions (down to 25 feet). Provide a description of the advanced sensor and the phenomenology/characterization steps that will take place for airborne sensing. Provide the expected performance and concept of employment for the sensor and platform. This would include area of coverage rate, penetration depths, and range resolution as a function of environmental constraints.

4. Topic 4: Robotic Platforms to support LACEX

a. Fast Ground Robots for Open Source Sensor Integration

This topic requests a fast, small, unmanned ground robot with open source sensor integration capabilities that can support experimentation for Large Area Clearance missions. The small robot/UGV platform should be fast (survey speed greater than 6mph) in environments that would initially include sand, high grass and concrete/runways. Above/below grade obstacles (debris, crater) may be present in these environments. The PI would develop behaviors and operate the fast robot during field tests. The robot requires the capability to be tasked by other robots to quickly interrogate and sense areas of interest within large areas defined in the background section. Please provide the robot specifications, autonomy/interface and description of sensor integration capabilities.

b. Non-Magnetic or Low Mu Small Unmanned Ground Vehicle Development for Magnetometer payloads

This topic requests a non-magnetic or low mu, small UGV that can carry magnetometer payloads in the environments described above (sand, grass, concrete are priorities). If such a platform is not readily available, please propose a design concept study to enable an integrated capability for deep detection of buried munitions. The magnetometer shall be supplied by the government. The goal of this UGV is so that it can carry an integrated magnetometer on the robot and not on a trailer or with spacers within the robot body.

The capability or concept study should assume a payload weighing 15 lbs and having a cross-body footprint of at least 20 inches. The total weight of the UGV should be 2-person portable per MIL-STD 1472D. The study should outline the proposed magnetic noise minimizing procedures such as higher voltage, lower current operation, twisted pair shielded cabling, nonmagnetic material construction (preferably nonconductive). It will also carefully evaluate the impact of permanent magnets in motors and actuators. Other useful magnetic noise mitigation strategies should also be evaluated, including placing noise-generating components away from the payload section and manipulating the noise spectrum of sources such that the predominant noise is above 20 Hz. Additionally, mu-metal shielding should be evaluated as a means of managing noise from components that cannot be made magnetically quiet using other strategies. The study will also propose measurements to show that the shielding minimizes unwanted flux leakage in the sensor payload section without adversely impacting magnetic anomaly detection.

III. DISTRIBUTION OF GOVERNMENT FURNISHED INFORMATION WORKSHOP - INDUSTRY DAY

ONR does not plan to hold workshops, industry days, or webinars, etc, in support of this announcement.

IV. WHITE PAPER SUBMISSION

Although not required, white papers are strongly encouraged for all Offerors seeking funding. Each white paper will be evaluated by the Government to determine whether the technology advancement proposed appears to be of particular value to the Department of the Navy. Initial Government evaluations and feedback will be issued via e-mail notification from the Technical Point of Contact. The initial white paper appraisal is intended to give entities a sense of whether their concepts are likely to be funded.

Detailed Full Proposal (Technical and Cost volumes) will be subsequently encouraged from those Offerors whose proposed technologies have been identified through the above referenced e-mail as being of “particular value” to the Government. However, any such encouragement does not assure a subsequent award. Full Proposals may also be submitted by any Offeror whose white paper was not identified as being of particular value to the Government or any Offeror who did not submit a white paper.

For white papers that propose efforts that are considered of particular value to the Navy but either exceed available budgets or contain certain tasks or applications that are not desired by the

Navy, ONR may suggest a full proposal with reduced effort to fit within expected available budgets or an effort that refocuses the tasks or application of the technology to maximize the benefit to the Navy.

White papers must be submitted in accordance with Section II, Subsection D. of ONR BAA N00014-22-S-B001.

To ensure full, timely consideration for funding, white papers should be submitted no later than 14 January 2022 at 5 PM Eastern Standard Time (EST). White papers received after that date will be considered as time and availability of funding permit.

The planned date for completing the review of white papers is 21 January 2022.

V. FULL PROPOSAL SUBMISSION AND AWARD INFORMATION

Full proposals should be submitted under N00014-22-S-B001 by 4 March 2022 at 5PM Eastern Standard Time (EST). Full Proposals received after that date will be considered as time and availability of funding permit.

ONR anticipates contracts or grants will be issued for this effort.

Full proposals for contracts should be submitted in accordance with Section II, Subsection D. of ONR BAA N00014-22-S-B001.

Although ONR expects the above described program plan to be executed, ONR reserves the right to make changes.

Funding decisions should be made by 15 March 2022 Selected projects will have an estimated award date of 1 August 2022.

VI. SIGNIFICANT DATES AND TIMES

Event	Date	Time
White Paper Submission	14 January 2022	5pm EST
Notification of White Paper	21 January 2022	5pm EST
Full Proposal Submission	4 March 2022	5pm EST
Notification of Selection: Full Proposals*	15 March 2022	5pm EST
Awards*	1 August 2022	5pm EST

Note: *These are approximate dates.

VII. Small Business Subcontracting

As indicated in ONR Broad Agency Announcements large businesses and non-profit organizations must submit a subcontracting plan along with their research proposal. While large businesses and non-profits are responsible for making these subcontracting arrangements, ONR will help facilitate prime contractor/small business contracting connections by posting to the ONR external website contact information of small businesses that have indicated their subcontracting interests and technological niche for prime contractor consideration for this program. This is not an endorsement, but an effort by ONR to help bring these parties together to provide superior solutions.

If you are a small business, and your company is interested in subcontracting activities with large businesses and/or non-profits considering your technology for this program, please provide the following information by email, to the ONR Small Business Director at ellen.simonoff@navy.mil with the subject line, “BAA Call N00014-22-S-C002”. Provide this information:

- 1) Company Name and Website
- 2) Individual (POC) name and contact information (email and/or telephone number)
- 3) Brief Technology Description (no more than 3 sentences)
- 4) Technology Key Words (no more than 10 words)

Note: Do not include ANY proprietary information. This information will be posted on the ONR website under this BAA call and will available to the public.

VIII. POINTS OF CONTACT

In addition to the points of contact listed in N00014-22-S-B001 the specific points of contact for this announcement are listed below:

Technical Point of Contact:
Jean McGovern

Program Officer, Ocean Battlespace and Expeditionary Access, ONR Code 322
jean.mcgovern@navy.mil

Business Point of Contact/Contracting Officer:
Surlean Darby
Contracting Officer, Branch 252
surlean.d.darby@navy.mil

IX. Submission of Questions

Any questions regarding this announcement must be provided to the Technical Points of Contact listed above. All questions shall be submitted in writing by electronic mail.

Answers to questions submitted in response to this BAA Call will be addressed in the form of an Amendment and will be posted to the following web pages:

- Beta.sam.gov Webpage –Contract Opportunities – <https://beta.sam.gov/>

□ ONR BAA Call Webpage - <http://www.onr.navy.mil/Contracts-Grants/Funding-Opportunities/Special-Notices.aspx>

Questions regarding **White Papers or Full Proposals** should be submitted NLT two weeks before the dates recommended for receipt of White Papers and/or Full Proposals. Questions after those dates may not be answered.