

Program Solicitation
Biological Technologies Office (BTO)

Firefox
DARPA-PS-26-137
Amendment 1
Nov 05, 2026

This Program Solicitation (PS) constitutes a public notice of a competitive funding opportunity issued under the authority of 10 U.S.C. § 4022. Any resultant negotiations and/or awards will follow all laws and regulations applicable to the specific award instrument(s) available under this PS.

The purpose of Amendment 1 to DARPA-PA-26-137, the Firefox Program Solicitation (PS), is to update the deadlines for OPP submissions and presentations. Changes are highlighted below.

PROGRAM SOLICITATION OVERVIEW INFORMATION

- **Federal Agency Name** – Defense Advanced Research Projects Agency (DARPA), Biological Technologies Office (BTO)
- **Funding Opportunity Title** – Firefox
- **Announcement Type** – Initial Announcement
- **Funding Opportunity Number** – DARPA-PS-26-137
- **Dates**
  - Posting Date: September 16, 2026
  - Proposers Day: September 21, 2026
  - Questions Due Date: October 13, 2026, by 4:00pm Eastern Time (ET)
  - Abstracts Due Date and Time: October 19, 2026, by 3:00pm ET
  - Oral Presentation Proposal (OPP) Package Due Date and Time: November 30, 2026, by 3:00pm ET (anticipated)
  - Oral Presentations: By Government request, estimated one (1) week after OPP submission around the week of December 7th
- The Defense Advanced Research Projects Agency (DARPA) is soliciting innovative approaches to address overcome key technological hurdles in the following technical areas: 1) development of components enabling dynamic rastering/scanning of the incoming coherent optical signal to target multiple regions of interest and 2) development of new data processing architectures beyond the digital domain to handle the high data rates and computational burden inherent to scaling the amount of neural data recorded by the optical system. The ultimate goal of the Firefox program is to use these innovations to develop a 100-channel, non-invasive BCI with 50-micron spatial and 100-microsecond temporal resolution.
- **Total Funding** – Multiple awards are anticipated between $4,000,000 and $7,000,000 across all Phases 1 – 3 of the program described below.
- **Types of instruments that may be awarded** – Other Transaction for Prototype
- **Technical Point of Contact** – Dr. Pedro Irazoqui, Program Manager
- **Agency Contact**

  The Solicitation Coordinator for this effort can be reached at:
  Firefox@darpa.mil
  DARPA/BTO
  ATTN: DARPA-PS-137
  675 North Randolph Street
  Arlington, VA 22203-2114
- **Attachments**
  - A. Abstract Summary Slide Template
  - B. Abstract Template
  - C. Model Other Transaction (OT) for Prototype
  - D. Cost Spreadsheet
  - E. Schedule of Milestones and Payments
  - F. OPP Guidelines
  - G. Risk Matrix

PROGRAM SOLICITATION
Defense Advanced Research Projects Agency (DARPA)
Firefox

1. PROGRAM INFORMATION

1.1. Background

For over five decades, the scientific community has sought chronic, high-channel-count neural recording to enable advanced brain-computer interfaces; however, no reliable, non-surgical human interface achieves near single-unit spatiotemporal resolutions of 50 μm and 100 μs. High-resolution invasive arrays (e.g., Utah arrays, Neuropixels, Neuralink) require surgical penetration into the brain, subjecting the electrode interface to foreign-body responses like gliosis, which leads to significant signal degradation within a few weeks. Conversely, current non-invasive modalities such as functional magnetic resonance imaging (fMRI), functional ultrasound (fUS), and diffuse optical tomography (DOT), either rely on slow hemodynamic proxies for neural activity rather than direct electrical firing or have a spatial resolution that is fundamentally restricted to millimeter scales. No current effort towards an operational brain-computer interface approaches single-neuron (which we define as 50 μm voxel) resolution, direct firing-rate temporal resolution (i.e., 100 μs), cortical depth from the scalp (12-15 mm), noninvasiveness, and scalability higher than 100s of simultaneous channels.
In DARPA's Next-Generation Nonsurgical Neurotechnology (N3) program, approaches towards using coherent optical sensing to extract motion, velocity, and sub-wavelength displacements of micron-scale targets, such as firing neural populations, were developed. This methodology was able to leverage the use of quasi-ballistic photons rather than just ballistic photons – allowing for extraction of neuron membrane motion information correlated with the ion currents that take place in each action potential in the cortical targets of interest. Recent internal technological improvements in this technology have led to sensing of aggregate (down to nearly 50 μm voxel size) neural activity noninvasively at tissue depths of up to 12.5 mm in humans, recovered at a fidelity previously achievable only by placing electrodes on or in the head. While this result represents a critical leap in non-invasive neural recording, the technology is single channel and data intensive. DARPA's goal is to scale the current system's single optical sensing beam, dynamically rastering it to address multiple independent regions across a wide field of view, and to process the resulting multi-channel data in the analog domain.

1.2. Program Description/Scope

Firefox will achieve this goal through two technical areas (TAs) focused on developing two separate technologies for use in a pre-existing coherent optical sensing system:

Technical Area 1 seeks to develop prototype scalable components, or system of components that can dynamically steer/raster coherent light across an operationally relevant sensing volume. It involves scaling the current capability of the optical system to sense from a single point of neural tissue to a rastered field of view covering a solid angle of 1 steradian across a desired 100 channels. Predicted approaches may include but are not limited to the use of spatial light modulators, mechanical (e.g., micro-electromechanical system (MEMS), Risley-prism) scanning, or optical

phased array.
Technical Area 2 involves developing scalable prototype architectures capable of processing the optical speckle data from each time sample of each rastered channel in the analog (for example, but not limited to, optical) domain. The objective of TA2 lies in achieving order-of-magnitude gains in throughput over digital processing by reducing data rates and quantization noise to practical levels. Predicted prototype approaches may include but are not limited to the use of all-optical photonic, in-sensor, or neuromorphic-photonic approaches.

The prototype components and architectures generated by the performers in this program are anticipated to inform the Government-mediated integration and generation of a novel, scalable, and non-invasive brain-computer interface. To this end, performers under both TAs will produce and deliver functional, testable outputs (e.g., components, software models, hardware as prototype) at specified checkpoints within each program Phase. These deliverables will undergo staged validation, testing, and benchmarking by the government's designated Independent Verification and Validation (IV&V) partner. Performance during these checkpoints will coincide with scheduled site-visit demonstrations and design reviews, which will look ahead towards future Phase goals. These evaluations will serve as the primary gateway for eligibility to transition into subsequent Phases of the program. The technical activities of this 36-month program are structured into three (3) Phases.

Firefox Phase 1, 2, and 3 program execution will include regular collaborative meetings and teleconferences to inform the Firefox program team and IV&V teams of development status. The anticipated meeting schedule is outlined below:

- 6-Week Performer Status Review Meetings (Virtual - 30 minutes) - It is anticipated that status review will be conducted every 6 weeks virtually. The technical status report is required and will detail technical progress to date and report on all problems, technical issues, major developments to include a list of all developing intellectual properties (IPs) or enhancement of existing IPs, and the status of external collaborations during the reporting period.
- Phase Site Visits (In-Person) to include demonstrations and design reviews for future Phase work with specific performer team, Government team, and IV&V teams.
- Program Reviews (In-Person Kickoff and Annual In-Person Reviews) with all performers, Government team, and IV&V teams

1.3. Acquisition Strategy

Firefox is using a modified acquisition approach to lower the administrative burden of entry, reduce program risk, foster competition, and have performing teams get to work quickly. This Firefox Program Solicitation (PS) solicits independent proposal submissions for one and/or two Technical Areas (TAs) for Phases 1, 2, and 3. Following a decisional abstract review, selected proposers will be invited to submit an Oral Presentation Proposal (OPP) Package to present their program proposals to the DARPA Firefox program team. The Government will review all oral presentations, and selected proposers may be awarded an Other Transaction (OT) for Prototype Agreement.

Proposer teams may submit proposals in response to TA1 or TA2, described in detail in Section 1.5 below. If a proposer team wishes to respond to both TA1 and TA2, they should do so via

separate proposals, with each proposal addressing only one TA.

This PS encourages solutions from all responsible sources capable of satisfying the Government's needs, including large and small businesses, nontraditional defense contractors as defined in 10 U.S.C. § 3014, universities, and research institutions.

1.4. Coherent Optical Sensing Context and Reference Architecture

To provide general context for prospective proposers, this section outlines some of the key underlying physics and parameters of the optical system with which components and models will be integrated:

The current coherent optical system operates at 1310 nm and focuses light from a single-mode optical fiber at a depth of ~12mm from the scalp surface (or top millimeter of the cortex). The light backscattered from this region is then collected and passed through a multi-mode fiber where it is imaged onto a focal plane array. This backscattered light is highly speckled due to both the back-reflection from the sensing volume and propagation through the tissue.

This speckle image is coherently mixed with a reference beam, allowing for the optical phase to be accurately recorded. As each of these speckles has a random phase offset, they must be phase aligned and then combined to allow for the processing of a tissue velocity. This phase alignment and combining is currently achieved through processing after the digitization of the coherently mixed speckle field. It has been shown that neuronal firings result in correlated tissue motion that results in nanometer-scale displacements. Processing of these displacements permits high spatiotemporal recordings of neural activity.

The focus of the two technical areas is then to:

1. (TA1) Increase the area and volume over which neural activity can be recorded at depth
2. (TA2) Increase the efficiency or phase accuracy of the speckle field processing (data phase alignment and combining)

Table 1. Current Coherent Optical System – Incoming Optical Signal Parameters

Parameter Category	Specific Parameter	Value/Characteristic
Beam Profile and Quality	Beam Quality Factor (M^2)	< 2
	Beam diameter	> 2 mm
	Focal Length	25 mm
Polarization	Illumination (Tx) Polarization	Linear
Transmitter (Tx) Fiber Coupling	Fiber Type	Single Mode Fiber (SMF)
	Free-Space Coupler Clear Aperture	1.8 mm
	Free-Space Coupler Divergence Angle	< 0.25◦
Receiver (Rx) Fiber Coupling	Fiber Type	Multi-Mode Fiber (MMF)

	Free-Space Coupler Clear Aperture	1.8 mm
	MMF Core Diameter	62 µm
	Numerical Aperture	0.275

The above table outlines the critical parameters of the current coherent optical system. As performers' final deliverables will be integrated into this central, government-retained optical system for Independent Verification and Validation (IV&V) and human subjects research, all proposed TA1 and TA2 research products must align with and accommodate these incoming optical signal characteristics.

Specific Context for TA1

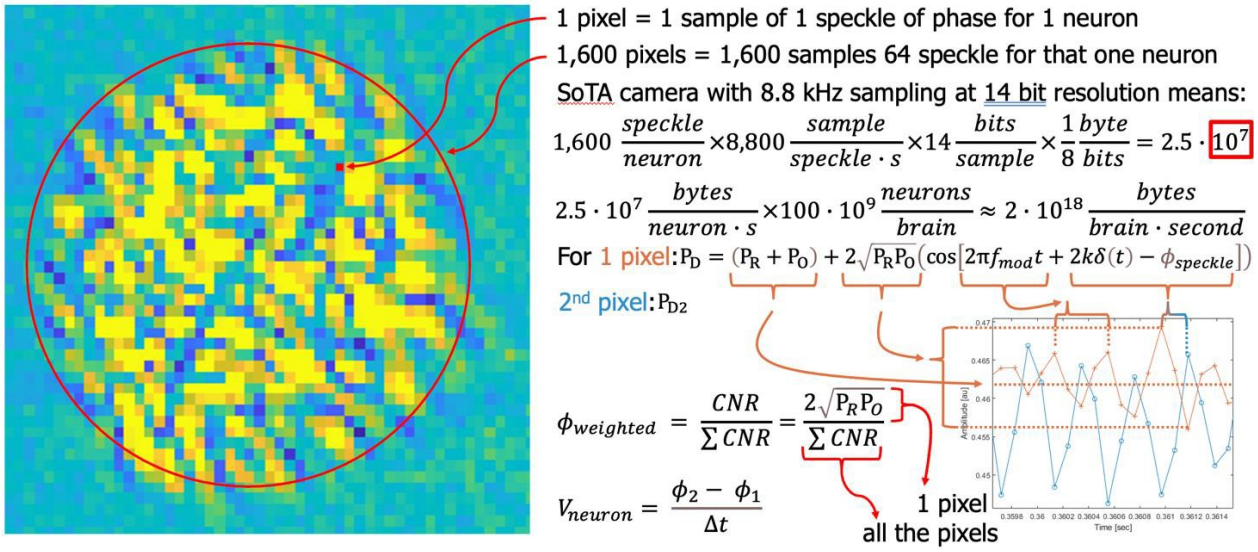
TA1 responders must design their dynamic steering/rastering componentry to receive an incoming coherent optical signal centered at a wavelength of 1310 nm. This componentry must maintain the coherency of the incoming optical signal. The primary goal encompasses designing rastering/scanning componentry for a focused beam of light and then collection of that scattered (speckled) light that can then be passed to TA2 for phase alignment and combining.

Specific Context for TA2

The current processing of this optical data involves the following:
For any single pixel (or 1 speckle, a sample of phase for 1 neuron) on the coherent receiver array, the time-varying detector power is mathematically modeled as:

$$P_D = (P_R + P_O) + 2\sqrt{P_R P_O}(\cos[2\pi f_{mod} t + 2k\delta(t) - \phi_{speckle}])$$

Where P_R is the reference beam power, P_O is the signal (object) beam power, f_{mod} is the heterodyne modulation frequency, k is the wave number, δ is the phase difference, and ϕ is the phase of that individual speckle. The following figure shows current processing in the digital domain. Performers are encouraged (but not required) to develop improved approaches, and required to implement processing in the analog domain so as to reduce the 10^7 data rate to a subsequent photodetector:



The phase accuracy of each returning speckle scales inversely with its Carrier-to-Noise Ratio (CNR) and the reference system images the resulting speckle field onto a multi-pixel focal-plane array (1,600 speckles representing 1,600 phase samples for a single neuron). To reconstruct the neural signal with high fidelity, the phase information from each pixel is combined via a nonlinear weighting function driven by each pixel's real-time CNR:

$$\phi_{weighted} = \frac{CNR}{\sum CNR} = \frac{2\sqrt{P_R P_O}}{\sum CNR}$$

Once this is extracted, the physical membrane velocity can be computed as:

$$V_{neuron} = \frac{\phi_2 - \phi_1}{\Delta t}$$

TA2 responders must address the challenge of moving this mathematical processing from the digital domain to the analog domain, or propose another novel processing domain– a requirement that becomes clear when analyzing the downstream digital data rates. For a single neuron, utilizing a state-of-the-art camera running at an 8.8 kHz sampling rate with 14-bit resolution generates:

$$1{,}600\ \frac{speckle}{neuron} \times 8{,}800\ \frac{sample}{speckle \cdot s} \times 14\ \frac{bits}{sample} \times \frac{1}{8}\frac{byte}{bits} = 2.5 \cdot 10^7\ \frac{bytes}{neuron \cdot s}$$

Extrapolating this single-neuron data rate to the brain yields an astronomical bandwidth requirement:

$$2.5 \cdot 10^7\ \frac{bytes}{neuron \cdot s} \times 100 \cdot 10^9\ \frac{neurons}{brain} \approx 2 \cdot 10^{18}\ \frac{bytes}{brain \cdot second}$$

For this reason, TA2 responders must address moving a large portion of the mathematical processing into the pre-digitization analog domain in order to significantly collapse these data streams prior to digitization, reducing system latency to operational levels.

While the reference architecture and mathematical context provided in this solicitation outline a specific approach to multi-speckle phase combining, DARPA is highly receptive to novel, out-of-the-box, and creative methodologies to achieve TA2 goals. Proposers are not strictly bound to DARPA's mathematical model of conceptualized processing pathways. DARPA strongly encourages innovative architectures to solve the data volume bottleneck – whether leveraging advanced all-optical components, novel microelectronics, in-sensor computation, neuromorphic-photonic computing, or other emerging paradigms. The architectural constraints consist of the following: data compression, phase alignment, and speckle processing, which must occur entirely in the analog or optical domain prior to digitization.

Approaches that rely on passing raw, uncompressed, or high-bandwidth optical signals into the digital domain for processing do not meet the goals of the Firefox program and will not be considered.

1.5. Program Structure

The Firefox program is comprised of three (3) Phases over 36 months (Phase 1: 12 months; Phase 2: 12 months; Phase 3: 12 months). Firefox has two Technical Areas (TAs) with 1) TA1 tasked to develop prototypes of dynamic, steerable rastering components or systems of components for coherent optical sensing and 2) TA2 focused on developing novel prototypes of analog data processing architectures allowing for scalable optical channel throughput. Throughout all Phases of the program, TA1 and TA2 teams will work separately to demonstrate each of their component technologies, ultimately producing prototypes, which the IV&V teams will test and integrate so that the ensuing optical system can be benchmarked against fMRI in human subjects. ***Notes: Proposer teams may submit proposals in response to TA1 or TA2, as described in detail in Section 1.6 below. If a proposer team wishes to respond to both TA1 and TA2, they should do so via separate proposals, with each proposal addressing only one TA. If there is a potential OCI, a mitigation plan will need to be included in the OPP package.***

Site visits to each selected performer team will be conducted two (2) months prior to the end of each Phase and will include members of the DARPA program team as well as the IV&V teams. This site visit will serve as a demonstration of progress on Phase metrics and will also include designated time to conduct a design review of the performer team's plans to fulfill the ultimate goals of the program.

1.6. Program Goals/Metrics by TA

Program goals and metrics for each TA by Phase are included below and summarized in Tables 1, 2 and 3.

Table 2. Phase-specific goals of Firefox

Phase (Duration)	TA1	TA2
Phase 1 (12 months)	Develop a rastering architecture capable of scanning a focused laser across 10 points within 100 ms across a 0.5 steradian field of view (FOV) and meeting further metrics described in Table 3.	Develop analog data processing architecture capable of phase aligning and combining 16 speckle in each sample at a detection equivalent bit depth of 24 bits in less than 10 ms. Further metrics can be found in Table 4.
Phase 2 (12 months)	Increase the rastering scan rate to 50 points within 5 ms across a 0.75 steradian FOV, and in a wearable form factor.	Enhance analog data processing hardware capable of phase aligning and combining 32 speckle at a detection equivalent bit depth of 24 bits in less than 100 µs per sample.
Phase 3 (12 months)	Deliver rastering **prototype componentry (or system of components)** with scan rate to 100 points within a FOV of 1 steradian within 100 µs, using approaches compatible with scaling to larger	Scale and deliver **prototype analog data processing hardware and architectures** to phase align and combine 100 speckle at a detection equivalent bit depth of 24 bits in less than 1 µs per sample, in a manner compatible with scaling to thousands,

	FOVs and/or channel count/resolution in future efforts.	millions, or billions of neural channels in future efforts.

1.6.1. TA1: Develop scalable prototype components or system of components that can dynamically steer/raster coherent light across an operationally relevant sensing volume

The goal of TA1 is to scale coherent optical sensing from a static, single-sensing point of light to a dynamic, steerable, rastered sensing volume. Responders to TA1 must propose how they will design and fabricate prototype components allowing this volume to expand, going from an initial solid angle of 0.5 steradians in Phase 1 to an eventual 1 steradian in Phase 3. Proposers may include, but are not limited to, approaches leveraging spatial light modulators (SLM), mechanical micro-opto-electromechanical systems (MEMS), Risley-prism high-speed scanning assemblies, or optical phased arrays for illumination. Based on predicted outcomes of the proposed rastering/steering designs, TA1 Proposers must describe key challenges and risks presented by the proposed approaches, as well as carefully reasoned risk-mitigation strategies to be articulated in the abstract and proposal.

Proposed systems must allow undistorted passage of 1310 nm coherent light to maximize ballistic and quasi-ballistic photon penetration through human scalp and skull while strictly adhering to ANSI laser safety limits for skin/tissue exposure. Due to the program goal of rastering across 100 discrete points (i.e., channels) over the 1 steradian FOV within time scales compatible with obtaining neural information (i.e., 100 μs sampling interval for each channel), responders to TA1 must also detail approaches to reaching a high scan rate across all desired channels. Starting with a minimum 10-ms scan rate in Phase 1 and eventually reaching a scan rate less than 1 μs in Phase 3. Proposers must also include approaches to miniaturization of the developed technologies such that by program end, TA1 technology meets a head-mountable form factor. It is expected that significant progress will be made on miniaturization of the technologies by the end of Phase 2, which will require TA1 componentry to operate in a fiber-tethered prototype configuration.

In order to remain compatible with the existing coherent optical system for integration purposes, proposers must describe approaches to maintain optical signal coherence properties, a bi-static angle of 3-10 degrees in the transmitter/receiver system, and allow an optical power transmission of minimum 10 mW average power, reaching 100 mW in Phase 2. In addition, proposers should include approaches towards ensuring maximum system efficiency and must provide justification for proposed approaches and methodology towards analyzing this metric. As program goals include enabling a portable and compact system, proposers must describe approaches to enabling fiber-tethered operation of their dynamic steering/rastering system, as this forms part of a critical milestone within Phase 2.

To bridge the translation gap between TA component development and testing/validation with the IV&V teams, performers will describe benchtop experimental validation approaches demonstrating hardware performance to metrics at each phase of the program. **At the end of the program, TA1 performers must produce prototypes of their beam steering componentry or systems.** This is not anticipated to require in vitro or in vivo work.

1.6.2. TA2: Develop a scalable, high-bandwidth and low power optical speckle processing prototype architecture.

The single-point optical coherent system that forms the basis for this program generates approximately 24 Mb/s of raw data for a single channel. Scaling this architecture to a volumetric, 100-channel (or larger) interface would create a massive data-rate bottleneck, generating several gigabytes per second and driving power requirements far beyond the bounds of wearable, field-deployable form factors. The goal of TA2 is to process, combine, and compress these massive optical streams in the analog domain prior to digital conversion. Responders to TA2 must propose how they will develop a scalable processing prototype architecture that combines a high density (10x10 in Phase 3) of optical speckle channels (from coherent light at 1310 nm), while collapsing the quantization-noise floor, and reducing downstream data processing by several orders of magnitude.

Proposals including processing using digitization rather than innovative analog processing will be considered non-responsive.

Proposals may include, but are not limited to, approaches leveraging analog-optical processing networks, in-sensor computational arrays, or neuromorphic-photonic processing units. The focus must be on executing multi-speckle phase accuracy weighting and phase combining in the optical or analog domain **prior to** digitization (see section 1.4 for more information on specific calculations that DARPA recommends for analog processing). Proposers must also include approaches to miniaturization of the developed technologies by program end.

Proposers must address the challenge of demonstrating processing response times faster than the native decorrelation time of biological tissue (speckle decorrelation time < 1ms) to ensure real-time coherence-gate modulation and signal recovery. While the program emphasizes pre-digitization analog processing to collapse raw data transfer bottlenecks, substantial computational post-processing will likely still be necessary during technological development. Proposers to TA2 must estimate and justify computational requirements to achieve program metrics and, ultimately, program goals.

At the end of the program, TA2 performers must produce prototypes of their analog processing architectures, including any hardware or software necessary to process the optical speckle data.

Table 3. Firefox TA1 Metrics
*

Phase	Metric ID	Parameter	Value/Target
Phase 1	TA1-1.1	Field of View (FOV)	Minimum 0.5 sr
	TA1-1.2	Scan Rate	< 100 ms full volume scan
	TA1-1.3	Optical transmit power and beam quality	10 mW (average power) at $M^2 < 2$ with a beam waist at aperture of > 2mm

	TA1-1.4	Optical system performance	Focus length of 15-25mm (in air)
	TA1-1.5	Bi-static angle (separation between illuminator and receiver field-of-views)	3-10 degrees
	TA1-1.6	Wavelength class	Passthrough of 1310 nm without affecting coherence
	TA1-1.7	Target points within FOV	20 independent coordinate points
Phase 2	TA1-2.1	FOV	> 0.5 sr
	TA1-2.2	Scan rate	< 10 ms full volume scan
	TA1-2.3	Optical transmit power	100 mW (average power, ANSI-compliant)
	TA1-2.4	System integration	Tethered optical head form factor – 50-micron core multi-mode fiber for receiver and single-mode fiber for transmitter
Phase 3	TA1-3.1	FOV	> 1.0 sr
	TA1-3.2	Scan rate	< 100 μs full volume scan
	TA1-3.3	Target points within FOV	100 independent coordinate points

*Performers must meet or exceed these metrics at the conclusion of each Phase.

Table 4. Firefox TA2 Metrics

Phase	Metric ID	Parameter	Value/Target
Phase 1	TA2-1.1	Speckle density	16 individual speckles per sample per channel
	TA2-1.2	Detection bit depth	24-bit dynamic range
	TA2-1.3	Phase alignment rate	Phase align 16 speckle within 10 ms
	TA2-1.4	Optical collection efficiency (light into the TA2 hardware vs. light coming out of TA1)	> 10%
Phase 2	TA2-2.1	Speckle density	32 speckle per sample per channel
	TA2-2.2	Phase alignment rate	Phase align 32 speckle

			within 100 µs
	TA2-2.3	Optical collection efficiency	> 20%
Phase 3	TA2-3.1	Speckle density	100 individual speckles
	TA2-3.2	Phase alignment rate	Phase align 100 speckle within 1 µs
	TA2-3.3	Optical collection efficiency	> 50%

*Performers must meet or exceed these metrics at the conclusion of each Phase.

1.7. Program Milestones and Deliverables

A detailed breakdown of tasks, deliverables, and reporting requirements are presented in Tables 4 and 5 below. See Schedule of Milestones and Payments (Attachment E) for metric details. Responders may propose additional, payable milestones with justification.

Table 5. TA1 Schedule of Milestones and Deliverables

Phase	Target Month	Task Category	Milestone	Deliverable/ Reporting Requirements
Phase 1	M1	TA1	(MS1) Project Kickoff	**Technical Report** ➢ Detailed slide package ➢ **Lead time list for predicted components, if applicable**
	M3	TA1	(MS2) Optical/processing Architecture Design	**Technical Report** ➢ Submit technical report detailing baseline optical configurations
	M6	TA1	(MS3) Initial scanning verification	**Technical Report** ➢ Report demonstrating initial scan rate and FOV over phantom
	M9	TA1	(MS4) Site Visit	**Demonstration** ➢ Initial demonstration of early-stage optical scanning assemblies and metric fulfillment on standard scattering phantoms **Design Review** ➢ Demonstration of plans/progress towards final program metrics
	M11	TA1	(MS5) Phase 1 Handoff to IV&V	**Deliverable** ➢ Deliver scanning/rastering componentry to IV&V teams
	M12	TA1	(MS6) Phase 1 Final Report	**Technical Report** ➢ Detailed report on methodologies, experiments, and successes/failures encountered in Phase 1 as well as progress against final program goals. Should include data and figures to support. Phase 1 metrics must be met.
Phase 2	M15	TA1	(MS8) Tethered Head Design	**Technical Report** ➢ Design review package and report for

				initial tethered scanning/rastering componentry including SWaP parameters
	M20	TA1	(MS9) Intermediate scanning verification	**Technical Report** ➢ Report demonstrating adherence to 10 ms full volume scan rate across > 0.5 sr
	M21	TA1	(MS10) Site Visit	**Demonstration** ➢ Demonstration of tethered scanning/rastering componentry on sample volume showing metric fulfillment- near completion of FOV and scan rate goals for Phase 2. See Schedule of Milestones and Payments for metrics.
	M22	TA1	(MS11) Phase 2 Handoff to IV&V	**Deliverable** ➢ Deliver scanning/rastering componentry to IV&V teams
	M24	TA1	(MS12) Phase 2 Final Report	**Technical Report** ➢ Detailed report on methodologies, experiments, and successes/failures encountered in Phase 2 as well as progress against final program goals. Should include data and figures to support ➢ Data to support fulfillment of all Phase 2 metrics
Phase 3	M28	TA1	(MS13) Steering checkpoint	**Technical Report** ➢ Data demonstrating progress against 100 dynamic steering/rastering coordinates over target FOV approaching Phase 3 final metrics
	M32	TA1	(MS14) Site Visit	**Demonstration** ➢ Demonstration of scan rate and FOV improvements at nearly 100 dynamic, steerable/rasterable coordinates covering FOV
	M33	TA1	(MS15) Final Metric Alignment	**Technical Report** ➢ Report demonstrating final adherence to FOV, scan rate, and target points within FOV
	M34	TA1	(MS16) Final Handoff to IV&V (Prototype)	**Deliverable** ➢ Deliver of the prototype: final scanning/rastering componentry to IV&V teams
	M36	TA1	(MS17) Phase 3 Final Report	**Technical Report** ➢ Detailed report on methodologies, experiments, and successes/failures encountered in Phase 3. Should include data and figures to support

				➢ Data to support fulfillment of final program goals and metrics for TA1.

Table 6. TA2 Schedule of Milestones and Deliverables

Phase	Target Month	Task Category	Milestone	Deliverable/ Reporting Requirements
Phase 1	M1	Admin	(MS1) Project Kickoff	**Technical Report** ➢ Detailed slide package ➢ **Lead time list for predicted components, if applicable**
	M3	TA2	(MS2) Processing Architecture Design	**Technical Report** ➢ Submit technical report detailing baseline data compression path
	M6	TA2	(MS3) 16-speckle alignment simulation	**Deliverable** ➢ Submission of software execution model showing phase alignment of a 16-speckle field
	M9	TA2	(MS4) Site Visit	**Demonstration** ➢ Initial demonstration of early-stage speckle field processing on sample dataset. meeting speckle density and alignment rate metrics **Design Review** ➢ Demonstration of plans/progress towards final program metrics
	M11	TA2	(MS5) Phase 1 Handoff to IV&V	**Deliverable** ➢ Deliver software models/processing software to IV&V
	M12	TA2	(MS6) Phase 1 Final Report	**Technical Report** ➢ Detailed report on methodologies, experiments, and successes/failures encountered in Phase 1 as well as progress against final program goals. Should include data and figures to support. Phase 1 metrics must be met.
Phase 2	M18	TA2	(MS7) Speckle Alignment Demonstration	**Deliverable** ➢ Submission of test data proving successful phase combining across 32 speckle
	M21	TA2	(MS8) Site Visit	**Demonstration** ➢ Demonstration of mid-stage speckle field processing showing adherence to speckle density, alignment rate, and optical collection efficiency
	M22	TA2	(MS9) Phase 2 Handoff to IV&V (Deliver Prototype)	**Deliverable** ➢ Deliver of the software models/processing hardware to IV&V
	M24	TA2	(MS10) Phase 2 Final Report	**Technical Report** ➢ Detailed report on methodologies, experiments, and successes/failures

				encountered in Phase 2 as well as progress against final program goals. Should include data and figures to support ➢ Data to support fulfillment of all Phase 2 metrics
Phase 3	M28	TA2	(MS11) Speckle Alignment Demonstration	**Deliverable** ➢ Submission of test data proving successful phase alignment across a 100 speckle array.
	M32	TA2	(MS12) Site Visit	**Demonstration** ➢ Demonstration of successful phase combining of 100 speckle within 1 µs processing latency
	M33	TA2	(MS13) Final Metric Alignment	**Technical Report** ➢ Report demonstrating final adherence to phase alignment density, rate, and optical collection efficiency goals
	M34	TA2	(MS14) Final Handoff to IV&V (Deliver Prototype)	**Deliverable** ➢ Delivery of prototype: final software models/processing hardware to IV&V
	M36	TA2	(MS15) Phase 3 Final Report	**Technical Report** ➢ Detailed report on methodologies, experiments, and successes/failures encountered in Phase 3. Should include data and figures to support ➢ Data to support fulfillment of final program goals and metrics

2. PROGRAM SOLICITATION AUTHORITY

This PS may result in the award of an OT for Prototype Agreement, which can include not only commercially available technologies fueled by commercial or strategic investment but also concept demonstrations, and development activities that can significantly improve commercial technologies, existing Government-owned capabilities, and/or concepts for broad defense and/or public application(s). The Government reserves the right to award an OT for Prototype Agreement under 10 U.S.C. § 4022, or make no award at all. In all cases, the Government Agreements Officer shall have sole discretion to select the award agreement type, regardless of agreement type proposed, and to negotiate all agreement terms and conditions with selected proposers. The OT agreement will not require cost sharing unless the proposer is a traditional defense contractor who is not working with a non-traditional defense contractor to a significant extent.

2.1. PS Procedure

In response to this solicitation, and after verifying eligibility, proposers are asked to submit a 7-page abstract as described in Section 4.2. This process allows DARPA to ascertain (1) whether the proposers understand the key challenges of the Firefox program and (2) whether they are capable of executing their proposed concept. Specific evaluation criteria used by DARPA to

make the assessment can be found in Section 4.3. If DARPA finds that both of these conditions are met, it may invite the proposer to submit an Oral Presentation Proposal (OPP) as described in Section 4.4 and participate in an oral presentation to DARPA, where the proposed technical solution will be evaluated. After the oral presentations, DARPA will decide which proposers will be selected to participate in the program. Specific evaluation criteria used to make the assessment can be found in Section 4.5. The Government will not pay proposers responding to this PS for the costs associated with abstract submissions, OPP preparation, or oral presentations.

DARPA will use the following process to facilitate the Firefox source selection:

a. **Proposers Day (Optional):** The Program Manager will hold a Proposers Day where he will briefly describe the program and its goals and solicit questions from the audience in real time. Where possible, the Government will provide answers in real time, and a comprehensive list of questions and answers will be provided afterward via a Frequently Asked Questions (FAQ) document. Participation in the Proposers Day is optional and is not a requirement for proposers seeking to submit an abstract. Additional details about the Proposers Day will be provided in Special Notice SN-26-112, separate from this PS.

b. **Frequently Asked Questions (FAQ) (Informational Only):** DARPA will host a question and answer (Q&A) session during the Firefox Proposers Day and will post a consolidated Frequently Asked Questions (FAQ) document. The FAQ document will be available online at http://www.darpa.mil/work-with-us/opportunitieshttps://www.darpa.mil/research/programs/firefox. Following Proposers Day, questions can be sent to Firefox@darpa.mil. DARPA will respond to any relevant and/or PS clarification question(s) prior to the final abstract due date and post consolidated FAQs at the DARPA Opportunities page (https://www.darpa.mil/research/programs/firefox)http://www.darpa.mil/work-withus/opportunities.

c. **Abstracts (Required)**: Abstracts shall be submitted as specified in Section 4.2 of this PS. The Government will review all submitted abstracts for Technical Comprehension and Technical Ability, and Budget (see Section 4.3). Selected abstracts will be invited to provide an OPP and participate in an oral presentation (see Section 4.4) to the Government. Note that all proposers must submit an abstract(s) in response to this solicitation to be considered for participation in the Firefox program. Proposers will not be invited to submit an OPP, provide an oral presentation, or be included in any further progression of the program without participating in the abstract phase of the solicitation.

d. **Oral Presentation Proposal (OPP)/Oral Presentation (Required if selected)**: Oral presentations are anticipated to take place approximately one (1) week after OPP submission. OPP content and format are detailed in Attachment F: OPP Guidelines for planning purposes; the evaluation criteria for the OPP will not change from what has been documented in this PS. However, the final requirements, to include templates, submittal instructions for OPPs, and proposed presentation dates for oral presentations, will be provided in the invitation to Submit an OPP and participate in an oral presentation. The Government will review all OPPs (see Section 4.5), which will not be made public or provided to other proposers. For Phases 1-3, proposers must propose an OT for Prototype with fixed payable milestones (Schedule of Milestones and Payments). Table 5 and Table 6 provide these key payable milestones for Firefox's TA1 and TA2. *Proposers may*

propose additional critical milestones as payable milestones, but DARPA reserves the rights to review and accept/reject these recommendations. (Note – Milestones represent a completed event. Milestone schedule is based on key observable events in the critical path to accomplish program objectives. Payments are triggered by successful performance of observable technical events documented on the Schedule of Milestones and Payments. Fixed payable milestones are payments based on successful completion of the milestone accomplishments agreed to in the milestone plan. A Schedule of Milestones and Payments is included as Attachment E.)

e. **Awards (if selected):** DARPA will review OPPs and oral presentations to determine which proposed solutions sufficiently meet the evaluation criteria stated in Section 4.5. Upon favorable review, and subject to the availability of funds, the Government may award an OT for Prototype agreement for Phase 1 under 10 U.S.C. § 4022 with fixed, payable milestones for selectees. The award will be to develop either components enabling scalable, rastering of coherent holographic light (TA1), or scalable, analog optical speckle processing architectures (TA2), with an initial 12-month period-of-performance for Phase 1 with Phase 2 and Phase 3 structured as Option Periods.

2.2. Program Length

Firefox is a 36-month, three (3) phase program, where each phase is 12 months. Phase 1 is 12 months, Phase 2 is 12 months, and Phase 3 is 12 months.

3. ELIGIBILITY INFORMATION

3.1. Eligible Applicants

3.1.1 Federally Funded Research and Development Centers(FFRDCs), UARCs and Government Entities

3.1.1.1 FFRDCs and UARCs

FFRDCs & UARCs are subject to applicable direct competition limitations and cannot propose to this PS in any capacity unless they meet the following conditions: (1) FFRDCs & UARCs must clearly demonstrate, with specific details, that the proposed work, expertise, and facilities are not otherwise available from the private sector, and (2) FFRDCs & UARCs must provide a letter on official letterhead from their sponsoring organization citing the specific authority establishing their eligibility to propose to Government solicitations and compete with industry, and their compliance with the associated FFRDC/UARC sponsor agreement's terms and conditions. This information is required for FFRDCs/UARCs proposing to be awardees or subawardees. FFRDC/UARC proposals that do not include these elements may be deemed non-conforming and removed from consideration.

3.1.1.2 Government Entities

Government Entities (e.g., Government/National laboratories, military educational institutions, etc.) are subject to applicable direct competition limitations. Government entities must clearly demonstrate that the work is not otherwise available from the private sector and provide written

documentation citing the specific statutory authority and contractual authority, if relevant, establishing their ability to propose to Government solicitations, and compete with industry. This information is required for Government Entities invited to submit OPPs as either awardees or subawardees.

3.1.1.3 Submission as Prime

For this solicitation, if selected, DARPA will not establish new contractual agreements for their participation but will only fund these entities through their existing sponsor contracts. Entities interested in this program as a prime must ensure the abovementioned requirements are included in their OPP packages. Since DARPA will leverage existing sponsoring contracts for these entities, proposed prime under this category cannot have industry partners as part of their teaming arrangement, and their efforts/works/findings may be required to share with other Firefox performers.

3.1.1.4 Submission as Sub-Performer

Proposals that include a UARC, FFRDC, Government entities, or National Laboratory as a subcontractor/subperformer must identify the following: (1) their role is clearly defined in the technical proposal with a point of contact, and (2) a rough order of magnitude cost is provided in the technical proposal only—cost proposals must exclude their funding, as DARPA will not fund them through the prime, as they will be funded through existing agreement with the Government. It is important to note that if funded, DARPA will contact these entities directly to discuss proposed activities, and these organizations may be required to share their work and findings with other performers also supporting the same program.

3.1.1.5 Authority and Eligibility

At the present time, DARPA does not consider 15 U.S.C. § 3710a to be sufficient legal authority to show eligibility. While 10 U.S.C. § 4892 (formerly 10 U.S.C. § 2539b) may be the appropriate statutory starting point for some entities, specific supporting regulatory guidance, together with evidence of agency approval, will still be required to fully establish eligibility. DARPA will consider FFRDC and Government entity eligibility submissions on a case-by-case basis; however, the burden to prove eligibility for all team members rests solely with the proposer.

3.1.2 Other Applicants

Non-U.S. organizations and/or individuals may participate to the extent that such participants comply with any necessary non-disclosure agreements, security regulations, export control laws, and other governing statutes applicable under the circumstances.

3.2. Organizational Conflicts of Interest (OCI)

Without prior approval or a waiver from the DARPA Deputy Director, a contractor cannot simultaneously provide scientific, engineering, technical assistance (SETA), advisory and assistance services (A&AS), or similar support and also be a technical performer. As part of the OPP, all members of the proposed team (including any potential subawardees or consultants) must affirm whether they (their organizations and individual team members) are providing

SETA or similar support to any DARPA office(s) through an active award or subaward. All facts relevant to the existence or potential existence of Organizational Conflicts of Interest (OCI) must be disclosed in the Administrative and National Policy Requirements document, should the proposer be invited to submit an OPP.

If SETA, A&AS, or similar support is being or was provided to any DARPA office(s), the OPP must include in the Administrative and National Policy Requirements document:

- The name of the DARPA office receiving the support;
- The prime contract number;
- Identification of proposed team member (subawardee, consultant) providing the support; and
- An OCI mitigation plan.

Under this section of the OPP, the proposer is responsible for providing this disclosure with each OPP submitted. The disclosure must include the proposer's, and as applicable, proposed team member's OCI mitigation plan. The OCI mitigation plan must include a description of the actions the proposer has taken, or intends to take, to avoid, neutralize, or mitigate such conflict, prevent the existence of conflicting roles that might bias the proposer's judgment, and prevent the proposer from having unfair competitive advantage. Prior to the start of OPP evaluations, the Government will assess potential conflicts of interest based on the OPPs submitted. DARPA will promptly notify the proposer if any appear to exist. The Government assessment does NOT affect, offset, or mitigate the proposer's responsibility to give full notice and planned mitigation for all potential organizational conflicts.

If, in the sole opinion of the Government after full consideration of the circumstances, a proposal fails to fully disclose potential conflicts of interest and/or any identified conflict situation cannot be effectively mitigated, the OPP will be rejected without technical evaluation and withdrawn from further consideration for award.

If a prospective proposer believes a conflict of interest exists or may exist (whether organizational or otherwise) or has questions on what constitutes a conflict of interest, the proposer should send his/her contact information and a summary of the potential conflict via the specific email address identified in this PS before time and effort are expended in preparing an OPP and mitigation plan.

4. GUIDELINES FOR ABSTRACTS, ORAL PRESENTATION PROPOSAL (OPP) PACKAGE, AND ORAL PRESENTATIONS

4.1. General Guidelines

a. Do not include elaborate brochures; only include information relevant to the submission requirements or evaluation criteria.

b. Use of a diagram(s) or figure(s) to depict the essence of the proposed solution is permitted.

c. All abstracts and oral presentations shall be unclassified.

d. Proposers are responsible for clearly identifying proprietary information. Submissions containing proprietary information must have the cover page and each

page containing such information clearly marked with a label such as "Proprietary" or "Company Proprietary." NOTE: "Confidential" is a classification marking used to control the dissemination of U.S. Government National Security Information as dictated in Executive Order 13526 and should not be used to identify proprietary business information.

e. Questions regarding abstracts can be sent to Firefox@darpa.mil by October 13, 2026, at 3:00 PM (ET).

f. All abstracts are required to be submitted via DARPA's Broad Agency Announcement Tool (BAAT) by October 19, 2026 3:00 PM (ET). Files containing Controlled Unclassified Information (CUI) must be appropriately marked and must be encrypted when sending over the Internet. Please visit Proposer Instructions and General Terms and Conditions (https://www.darpa.mil/about/offices/contracts-management/proposer-general-terms) for instructions on how to submit your abstract through DARPA's BAAT. It is important to note that the terms and conditions on the remainder of the Proposer Instructions and General Terms and Conditions link above do not apply to this solicitation. The purpose of referencing the website is for you to obtain instructions for DARPA's BAAT.

g. Submissions sent through other mediums, channels, or after the prescribed Program Solicitation deadline will not be considered, reviewed, or evaluated.

h. Proposers providing abstracts that are not invited to an oral presentation will be notified in writing as soon as practical.

4.2. Abstract Content

Proposers must submit an abstract to be considered for invitation to oral presentation. A conforming abstract package must include both Attachment A: Abstract Summary and Attachment B: Abstract Template.

Abstracts (Attachment B: Abstract Template) should not exceed seven (7) single-sided written pages using 12-point Times New Roman font with 1" margins all around. **Embedded text in figures and tables may be no smaller than 10pt font.** Abstracts that do not conform to these requirements may not be evaluated. The submitted abstract must consist of the following information:

a. ***Abstract Summary Slide:*** See Attachment A: Abstract Summary Slide Template. This summary slide does not count against the seven (7) written page limit.

b. ***Title page:*** Proposer Name, Title, Date, Point of Contact (POC) Name, E-Mail Address, Phone, and Address. The proposer shall also include a statement on the title page that no person on the proposer's team works for DARPA as SETA, A&AS, or similar support services, as DARPA has a policy prohibiting such people from working as technical performers. The title page does not count against the seven (7) written page limit.

c. ***Executive Summary*:** Provide a summary of the technical problem the Firefox program seeks to solve. This summary shall be stated in the proposer's own words without any "copy and paste" of this solicitation. The goal is for the proposer to demonstrate a clear and quantitative

understanding of Firefox's purpose and goals. The Executive Summary shall be no more than one (1) page and is included in the seven (7) written page limit.

d. ***Proposed Approach*:** Provide a summary of the proposed technical approach to achieve Firefox's goals and metrics. Methods to address the challenges in each Phase must be provided. Highlight the novelty and uniqueness of the proposed work with respect to prior efforts. The Proposed Approach shall be no more than four (4) pages and is included in the seven (7) written page limit.

e. ***Technology Challenges*:** Identify specific challenges associated with this proposed approach. The proposer should include its view of the primary risks to successful development of the Firefox program. In other words, what are the critical challenges related to the proposed approach? The Technology Challenges summary shall be no more than one (1) page and is included in the seven (7) written page limit.

f. ***Technical Ability*:** Detail why the proposer believes their team has the ability to be successful at achieving the goals, if selected to participate in Firefox. The proposer may include past experience, organizational capabilities, team members' qualifications, or anything else that demonstrates competence in designing and demonstrating desired Firefox outcomes. The Technical Ability summary is included in the seven (7) written page limit.

g. ***Rough Order of Magnitude (ROM)/Budget:*** Include the estimated total labor, estimated materials, and Other Direct Costs, (i.e. equipment, materials, travel) for all three Phases. This may be presented as no more than half a page narrative or table, and is included in the seven (7) written page limit.

h. ***References:*** Provide a list of citations, references, or endnotes. References <u>are not</u> included in the seven (7) written page limit.

4.3. Abstracts – Process and Basis of Evaluation

Abstracts will be evaluated by DARPA using the evaluation criteria listed below in descending order of importance, and not against other abstracts submitted in response to this PS. As stated above, proposers are required to submit an abstract for evaluation by DARPA to be considered for oral presentation. DARPA will respond to the 7-page abstract with a statement as to whether or not DARPA requests submission of an OPP package. Upon review of abstracts, the Government may elect to invite all, some, or none of the proposers to submit an OPP and participate in oral presentations. ***Note: Only abstract proposers invited by DARPA to submit an OPP and participate in oral presentations are eligible to provide one.***

- ***Technical Comprehension:*** The proposed technical understanding is accurate, proposed approach is clearly described, and key technical challenges and risks are identified. Technical approaches to challenges are supported by brief calculations or physical estimates where possible.
- ***Technical Ability:*** The proposer's team and organization demonstrate the ability to achieve the goals of the program.
- ***Budget:*** The estimated costs are realistic for the proposed solution and accurately reflect the technical goals and objectives of the PS.

Non-Conforming/Non-Responsive Submissions: Abstracts and submission packages may be deemed non-conforming and removed from further consideration if they fail to meet the requirements of this Program Solicitation. Examples of non-conforming submissions include, but are not limited to:

- Abstracts that address multiple TAs without separate submission packages
- TA2 submissions that propose primarily digital signal processing approaches
- Submission packages that are not submitted using the BAAT tool
- Submission packages that simply reiterate the justifications or background information provided in the Program Solicitation
- Submissions that reflect cost strategies intended to artificially enhance competitiveness – such as minimizing technical risk, limiting innovation, or relying primarily on junior personnel.

DARPA's policy is to ensure impartial, equitable, and comprehensive proposal evaluations based on the evaluation criteria listed above and to select the source (or sources) whose abstract meets DARPA's technical, policy, and programmatic goals. DARPA will conduct a review of each conforming abstract, and all evaluations will be based solely on the evaluation criteria in this section.

For the purposes of this abstract evaluation process, DARPA defines a "selectable" abstract as follows:

- ***Selectable:*** *A selectable abstract is one that the Government has evaluated against the evaluation criteria listed in the PS, and the positive aspects outweigh the negative aspects.*

For the purposes of this abstract evaluation process, DARPA defines a "non-selectable" abstract as follows:

- ***Non-Selectable:*** *An abstract is considered non-selectable when the Government has evaluated it against the evaluation criteria listed in the PS, and the positive aspects do not outweigh the negative aspects*

4.4. OPP Package Instructions & Process

If DARPA requests an Oral Presentation Proposal (OPP) Package, the proposers will be asked to provide further details on their proposed solution. Attachment F: OPP Guidelines provides additional information regarding the OPP process for planning purposes. However, the evaluation criteria for the OPP is included in Attachment F of this PS and will not change in the official invitation to submit an OPP. As mentioned previously, the official OPP content and format (to include templates, submittal instructions for OPPs, evaluation criteria, and proposed presentation dates for oral presentations) will be provided in the invitation to submit an OPP to those being selected for oral presentation.

- Oral presentations are expected/anticipated to be held in-person over the course of 1-2 days in December in the Washington, DC metro area, and will be organized by TA. Travel costs for oral presentation will not be reimbursed by the Government. Each oral presentation will be scheduled for 40 minutes, allowing for a strictly limited 20-minute

presentation time, and up to 20 minutes of questions and answers following. Further details will be provided within the invitation to submit an OPP. Attachment F: Firefox OPP Guidelines highlights the instructions and processes for OPP and is provided for planning purposes only.

- The dates for OPP submission (November 30, 2026) and oral presentation (December 7-8, 2026) are provided for planning purposes. The actual dates will be provided within the Invitation to Submit an OPP.

5. AWARDS

5.1. General Guidelines

Upon favorable review of the proposal and subject to the availability of funds, the Government may choose to negotiate an OT for Prototype Agreement award.

The Government Agreements Officer reserves the right to negotiate directly with the proposer on the terms and conditions prior to execution of the resulting OT agreement, including payment terms, and will execute the agreement on behalf of the Government. Be advised, only a Government Agreements Officer has the authority to enter into, or modify, a binding agreement on behalf of the United States Government.

In order to receive an award:

a. Proposers must have a Unique Entity Identifier (UEI) number and must register in the System forAward Management (SAM). Proposers are advised to commence SAM registration upon notification of entry to Phase 1 of the competition.

b. Awardees will be required to submit invoices for payment electronically via the Wide Area Work Flow (WAWF) module in the Procurement Integrated Enterprise Environment at https://piee.eb.mil/, unless an exception applies. Registration in PIEE is required prior to any award under this PS. DARPA Contracts Management Office (CMO) personnel will assist those proposers from whom a proposal is requested.

c. Proposers must be determined to be responsible by the Agreements Officer and must not be suspended or debarred from award by the Federal Government nor be prohibited by Presidential Executive Order and/or law from receiving an award.

d. Being asked to submit a proposal does not guarantee that a proposer will receive an award. The Government reserves the right not to make an award.

5.2. Competition Sensitive Information

DARPA policy is to treat all submissions as competition sensitive and to disclose their contents only for the purpose of evaluation. Restrictive notices notwithstanding, during the evaluation process, submissions may be handled by support contractors for administrative purposes and/or to assist with technical evaluation. All DARPA support contractors performing this role are expressly prohibited from performing DARPA-sponsored technical research and are bound by appropriate non-disclosure agreements. Input on technical aspects of the proposals may be solicited by DARPA from non-Government consultants/experts who are strictly bound by the appropriate non-disclosure requirements.

5.3. Program Intellectual Property / Data Rights

The Firefox program seeks to develop foundational technology that will be disruptive to existing approaches for recording neural activity non-invasively. The Firefox technology is anticipated to greatly accelerate research and development in neuroscience applications. However, outside of its use as a research tool, DARPA expects the possibility of intellectual property developed on Firefox to transition to commercial applications, some of which will have dual-use capability for the military.

For this effort, DARPA will retain government purpose rights under the program Subject Data, which are foreground data and IPs being generated from Firefox program.

Additionally, DARPA is requesting for the performer to propose a structure via unique license for the Government to retain Unlimited Rights for the entire TA1 or TA2 technologies, to include background and foreground IPs. This will be centered on a principle where the performer does not intend to commercialize or pursue the technology in a future state. The Government will be provided a Right of First Refusal (ROFR) for the purposes of commercialization, where the Government must obtain a ROFR from the IP owner before the Government may sublicense the IP to a third party that aims to commercialize it. Critically, should the IP owner sell the IP to another party, in accordance with Foreign Access to Technology article, DARPA would still be bound to seek a ROFR from the new owner before sublicensing the IP for the purpose of commercialization.

Proposers are directed to review the specific language included in the Model Other Transaction Agreement attached to this Program Solicitation's OPP Guidelines (Attachment F).

5.4. Procurement Integrity Act (PIA)

All awards under this PS shall be treated as Federal Agency procurements for purpose of 41 U.S.C. Chapter 21. Accordingly, the PS competitive solicitation process and awards made thereof must adhere to the ethical standards required by the Procurement Integrity Act.

5.5. Fundamental Research and FRRBS

5.5.1. Fundamental Research

Proposers should indicate in their proposal whether they believe the scope of the research is fundamental or not. While proposers should clearly explain the intended results of their research, the Government shall have sole discretion to determine whether the proposed research shall be considered fundamental and to select the award instrument type. Appropriate language will be included in resultant awards for non-fundamental research to prescribe publication requirements and other restrictions, as appropriate. Please see - https://www.darpa.mil/work-with-us/communities/academia/fundamental-research

It is DoW policy that the publication of products of fundamental research will remain unrestricted to the maximum extent possible. National Security Decision Directive (NSDD) 189 defines fundamental research as follows:

'Fundamental research' means basic and applied research in science and engineering, the results of which ordinarily are published and shared broadly within the scientific community, as distinguished from proprietary research and from **industrial development, design, production, and product utilization, the results of which ordinarily are restricted for proprietary or national security reasons.**

For certain research projects, it may be possible that although the research to be performed by a potential awardee is non-fundamental research, its proposed sub-awardee's effort may be fundamental research. It is also possible that the research performed by a potential awardee is fundamental research, while its proposed sub-awardee's effort may be non-fundamental research. In all cases, it is the potential awardee's responsibility to explain in its proposal which proposed efforts are fundamental research and why the proposed efforts should be considered fundamental research Fundamental Research & Fundamental Research Risk-Based Security Review Program (FRRBS)

5.5.2. Fundamental Research & Fundamental Research Risk-Based Security Review Program (FRRBS)

DARPA's Fundamental Research Risk-Based Security Review Process (formerly CFIP, now FRR-BS a.k.a. "FRRBS") is an adaptive risk management security program designed to help protect the critical technology and performer intellectual property associated with DARPA's research projects by identifying the possible vectors of undue foreign influence. DARPA will create risk assessments of all proposed senior/key personnel selected for negotiation of a fundamental research award. The DARPA risk assessment process will be conducted separately from the DARPA scientific review process and adjudicated prior to final award. For additional information on this process and submission requirements, please visit Proposer Instructions: Other Transactions (https://www.darpa.mil/about/offices/contracts-management/proposer-transactions).

All submissions proposing to this solicitation must complete the Common Disclosure Forms, biosketch, and current/pending support forms. Forms can be found using the above link and submitted in BAAT:

- Certified Biographical Sketches (https://www.nsf.gov/policies/nspm-33/common-form-biosketch)
- Current and Pending Support (https://www.nsf.gov/policies/nspm-33/common-form-cps)

5.6. Cybersecurity Maturity Model Certification (CMMC) Requirements

As codified in 32 C.F.R. Part 170, the Cybersecurity Maturity Model Certification (CMMC) Program is designed to ensure Department of War (DoW) performers are properly safeguarding Federal Contract Information (FCI) and Controlled Unclassified Information (CUI) that is processed, stored, or transmitted on performer information systems. FCI and CUI must be protected to meet evolving threats and safeguard nonpublic, unclassified information that supports and enables the warfighter. The CMMC Program provides a consistent methodology to assess a defense contractor's implementation of required cybersecurity requirements. Proposers are encouraged to visit the DoW Chief Information Officer CMMC Resources & Documentation site for more information on CMMC: https://dodcio.defense.gov/cmmc/Resources-Documentation/.

This provision outlines the CMMC requirements pertaining to this solicitation, including the required CMMC level and the corresponding proposal requirements. All DARPA efforts, including those involving Fundamental Research, at a minimum require prime performers and subcontractors to demonstrate compliance with CMMC Level 1, which focuses on the protection of FCI and consists of the security requirements that correspond to the 15 basic safeguarding requirements specified in 48 C.F.R. 52.204-21.

5.6.1. Required CMMC Level

The required CMMC level for this solicitation is CMMC Level 1 (Self-Assessment). CMMC Level 1 (Self-Assessment) focuses on the protection of FCI and consists of the security requirement that correspond to the 15 basic safeguarding requirements specified in 48 C.F.R. 52.204-21.

5.6.2. Eligibility for Award

To be eligible for award under this solicitation, the CMMC Unique Identifier (UID) associated with the prime proposer must reflect a current CMMC status (representing either Final or Conditional status) posted in the Supplier Performance Risk System (SPRS), indicating compliance at the required level above prior to award. Additionally, the proposer must have a current annual CMMC affirmation, submitted by an authorized Affirming Official, posted in SPRS. Further, as some entities may have multiple business segments, multiple CAGE codes, etc., DARPA must reasonably be able to relate the CMMC UID in SPRS to the proposing entity. *(Note: SPRS is housed within the Procurement Integrated Enterprise Environment https://piee.eb.mil; an additional resource on SPRS is located here: https://dodcio.defense.gov/Portals/0/Documents/CMMC/CMMC-SPRS.pdf)*

5.6.3. Subcontractor Flow-Down

Prime proposers are responsible for verifying subcontractor compliance. In the proposal, the prime proposer must attest that all subcontractors who will process, store, or transmit FCI or CUI under a resultant award will meet the applicable CMMC level required by 32 C.F.R. § 170.23. The proposal must also describe the verification method the prime proposer will use to ensure subcontractors have the required CMMC status in SPRS prior to subcontract award.

6. PS DEFINITIONS

"Data" refers to recorded information, regardless of form or method of recording, which includes but is not limited to, technical data, software, mask works, and trade secrets. The term does not include financial, administrative, cost, pricing, or management information and does not include inventions.

"Nontraditional Defense Contractor" is defined in 10 U.S.C. § 3014 as an entity that is not currently performing and has not performed, for at least the one-year period preceding the solicitation of sources by the DoD for the procurement or transaction, any contract or subcontract for the DoD that is subject to full coverage under the cost accounting standards prescribed pursuant to 41 U.S.C. § 1502 and the regulations implementing such section. This includes all small business concerns under the criteria and size standards in 15 U.S.C. 632 and 13 C.F.R. Part 121.

"Other Transaction" refers to the type of OT that may be awarded as a result of this PS. This type of OT is authorized by 10 U.S.C. § 4022 for prototype projects directly relevant to enhancing the mission effectiveness of military personnel and the supporting platforms, systems, components, or materials proposed to be acquired or developed by the DoD, or for the improvement of platforms, systems, components, or materials in use by the armed forces.

"Prototype Project" is described in the DoD Other Transactions Guide (Version 1, Nov. 2018) issued by the Office of the Under Secretary of Defense for Acquisition and Sustainment: https://www.dau.edu/pdfviewer/Source/Guidebooks/Other-Transactions-(OT)-Guide.pdf.

"Small Business Concerns" is defined in the Small Business Act (15 USC § 632).

"**Unlimited rights**" means rights to use, duplicate, release, or disclose, Data in whole or in part, in any manner and for any purposes whatsoever, and to have or permit others to do so.

7. ACRONYMS

A&AS: Advisory and Assistance Services
BCI: Brain-Computer Interface
BTO: Biological Technologies Office
C.F.R.: Code of Federal Regulations
cm: centimeter
CMO: DARPA Contracts Management Office
CMOS: Complementary Metal-Oxide-Semiconductor
DARPA: Defense Advanced Research Projects Agency
dB: decibels
DoD: Department of Defense
DOT: Diffuse Optical Tomography
FAQ: Frequently Asked Questions
FFRDC: Federally Funded Research and Development Centers
fMRI: Functional Magnetic Resonance Imaging
fUS: Functional Ultrasound
FOV: Field of View
GPR: Government Purpose Rights
HSR: Human Subjects Research
IP: Intellectual Property
IV&V: Independent Verification and Validation
MEA: Micro-electrode Array
MEMS: Micro-Opto-Electro-Mechanical Systems
NIR: Near-Infrared
OCI: Organizational Conflicts of Interest
OPP: Oral Presentation Proposal
OT: Other Transaction for Prototype agreement
PIA: Procurement Integrity Act
PS: Program Solicitation
SAM: System for Award Management
SETA: Scientific Engineering Technical Assistance

SLM: Spatial Light Modulator
SME: Subject Matter Expert
SWaP: Size, Weight, and Power
SWIR: Short-Wave Infrared
TA: Technical Area
UEI: Unique Entity Identifier
USAMRDC: United States Army Medical Research and Development Command
U.S.C.: United States Code
WAWF: Wide Area Work Flow