Request for Information (RFI)
DARPA-SN-26-42
Rapid Reconstitution of Space Capabilities
Responses Accepted: Until 5:00 PM (ET) on July 08, 2026
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BACKGROUND

The United States leverages space assets and the services they provide for economic prosperity, weather forecasting, scientific discovery, critical infrastructure, and national security. Conversely, other nations seek to position themselves as leading space powers while undermining the stability and tranquility that allows space to benefit all nations.[1] Some U.S. competitors are implementing a sustained effort to develop a broad range of offensive counterspace capabilities through a variety of anti-satellite (ASAT) weapons, including direct attacks on satellites, jamming and spoofing of signals, and continued cyberattacks on satellite and ground infrastructure.[2] Use of these weapons could have serious consequences for all nations that benefit from space-based systems.[3] Space is an increasingly contested environment, presenting a multitude of threats to U.S. space assets. Adversarial attacks could impact strategic capabilities such as those that support communications, position navigation and timing (PNT), and intelligence, surveillance, and reconnaissance (ISR). Therefore, there is a strategic need to be able to quickly respond to disrupted assets and reconstitute degraded space capabilities.

To address this dynamic threat environment, the U.S. Space Force and the Department of War (DoW) have sought the ability to rapidly deploy and operate space-based assets in response to immediate, urgent, and often unforeseen tactical needs. In a milestone toward achieving tactically responsive space (TacRS), the 2023 Victus Nox mission launched its space vehicle a mere 27 hours after the order came, beating the previous record for responsive space launch by more than two weeks.[4] Likewise, Space Systems Command's (SSC) Commercial Augmentation Space Reserve (CASR) is augmenting space-based capacity during a crisis or conflict by establishing contracts with commercial space companies.[5] CASR is one of multiple ways the DoW is ensuring that the web of satellites it can draw upon is so great, that attacking or disrupting them would be a wasted and escalatory effort.

REQUESTED INFORMATION

Rapid space capability reconstitution is a complex task requiring a multi-faceted approach and presents numerous technical, logistical, contractual, and regulatory challenges, many of which are still ripe for novel solutions and methodologies. The Defense Advanced Research Projects Agency (DARPA) Strategic Technology Office (STO) seeks information supporting technical solutions

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[1] Space Threat Fact Sheet, https://www.spaceforce.mil/About-Us/Fact-Sheets/Fact-Sheet-Display/Article/4297159/space-threat-fact-sheet/
[2] Space Force Doctrine Document – 1 (SFDD-1), The Space Force Space Training and Readiness Command (STARCOM) OPR: STARCOM Delta 10, 3 April 2025
[3] Economic Benefits of the Global Positioning System (GPS) RTI, O'Connor, A.C. et al., Report Number 0215471, Sponsored by the National Institute of Standards and Technology, Research Triangle Park, NC: RTI International, June 2019.
[4] U.S. Space Force successfully concludes VICTUS NOX Tactically Responsive Space mission, Space Systems Command Space Safari, 2024, https://www.ssc.spaceforce.mil/Newsroom/Article-Display/Article/3679056/us-space-force-successfully-concludes-victus-nox-tactically-responsive-space-mi
[5] Commercial Augmentation Space Reserve (CASR) hits major milestone, 2025, https://www.ssc.spaceforce.mil/newsroom/article/4156107/commercial-augmentation-space-reserve-hits-major-milestone-with-first-wargaming

and operational concepts and strategies to enable rapid, responsive, cost-effective reconstitution of any lost or degraded space capabilities resulting from attacks. The end goal is to develop and deploy effective response mechanisms to rapidly restore critical services to minimum levels or higher, on tactical timelines of hours to weeks, in response to demand surge needs, lost assets resulting from potential adversaries' ASAT engagements, or orbital debris collisions. The fixed capacity of launch vehicles and the relatively limited frequency of launches across multiple launch providers drive the need for greater functionality, resiliency, and flexibility in space assets. This requires minimizing spacecraft assembly, launch, and deployment time while maximizing the capabilities they provide. Reconstitution solutions must consider existing architecture integration. Possible solutions could be realized with reconfigurable, software-defined, multifunctional, and multi-mission payloads, as well as proliferated/mesh architectures and rapid on-orbit deployment concepts.

Responses should address one or more of the following general areas: space vehicle (SV) satellite bus and payload, launch vehicle (LV), SV-LV integration, and Concept of Operations (CONOPS). Topics of interest in the context of reconstitution include but are not limited to:

- Spacecraft modularity and scalability
- Plug-and-play components and interoperability
- Rapid satellite manufacturing and assembly, both ground-based and on-orbit
- Reconfigurable / software-defined satellites / virtualization
- Multifunctional/multirole satellites
- Radiation-hardened electronics and systems
- Technologies for operation in very low earth orbit (VLEO)
- Spacecraft survivability and resiliency
- Bus and payload components and technologies enabling rapid reconstitution
- Metamaterial electronically steered arrays
- Cost-effective spacecraft to enable large-scale constellations
- Operational concepts and strategies
- Alternative PNT
- Payload sensors
- Coherently distributed apertures
- Launch vehicle payload integration
- Design considerations and relevant trade spaces for rapid and flexible production
- Supply chain optimization for launch and space vehicle production
- Bottlenecks impacting reconstitution of satellite busses, payloads, launch vehicles, and integration components
- Priorities for reconstitution of space and launch vehicles (system type and quantity)

As an illustrative example for responders, a white space chart from the DARPA Compact Front-End Filters at the Element-Level (COFFEE) program is provided below. <u>Responders to this RFI are requested to create their own white space chart with relevant parameters for the proposed technology, comparing it with existing solutions. This will help identify promising research opportunities</u>. The chart shows various existing commercial radio frequency (RF) filters grouped by technology type (electromagnetic, acoustic, etc.) along two important filter parameters of interest: filter area and insertion loss. A clear tradeoff is evident between these two parameters. As

shown in the white space of the chart's upper right quadrant, the goal of the program is to develop filters that are both compact and low loss.

Figure 1: Example white space chart from the COFFEE program

SUBMISSION FORMAT

Respondents to this RFI are encouraged to be as succinct as possible while also providing actionable insight. Format specifications for responses include 12-point font, single-spaced, 8.5 by 11-inch paper, with 1-inch margins in Microsoft Word or Adobe PDF format. The maximum page count is 8 pages, including the cover sheet, technical description and bibliography.

A. Cover Sheet (1 page): Provide the following information
   a. Response title,
   b. Technical point of contact, organization, telephone number, and email address,
   c. Names, organizations and email addresses of anticipated collaborators.
   d. List whether the respondent is a U.S. citizen, U.S. person (Green card holder; please list other citizenship), or foreign national (not a U.S. person, please list other citizenship).
B. Technical Description (not to exceed 5 pages): Containing white space chart. (unclassified and classified)
C. Bibliography (not to exceed 2 pages): All references must be cited in the Technical Description.

Industry leaders who employ best practices that may be outside the traditional DoW industrial base are encouraged to respond to this request. For those new to DARPA or national security, the agency offers comprehensive, free resources on how to do business with DARPA via DARPAConnect. Register for access via https://www.darpaconnect.us/home.

This notice is not a request for solicitation, and awards will not be made through this notice. This information is subject to change in content, relative importance, or other meaningful ways without further notification.

If proprietary information is included, respondents are responsible for clearly identifying such

information. Responses containing proprietary information must have each page containing such information clearly marked with a label such as "Proprietary" or "Company Proprietary."

Security: DARPA STO will regard and handle all responses as Controlled Unclassified Information (CUI). Because the submission of classified national security information (CNSI) requires specific handling procedures, if you intend to include CNSI in your response, please carefully review the "Submission Instructions" section to ensure proper security measures are followed.

SUBMISSION INSTRUCTIONS

All responses to this RFI must be submitted via appropriate channels in accordance with the instructions outlined below. Responses will be accepted at any time from the publication of this RFI until the response date stated on Page 1. Early responses are highly encouraged. All technical and administrative correspondence and questions regarding this RFI should also be sent to the same email address. Emails sent directly to the program manager may result in delayed or no response. If the file size with references exceeds 10 MB, email DARPA-SN-26-42@darpa.mil to request a link to submit files up to 1 GB in size.

Classified research applications, if any, are also of interest. DO NOT INCLUDE ANY CLASSIFIED INFORMATION IN THE RFI RESPONSE. Send an email to DARPA-SN-26-42@darpa.mil indicating an intent to submit a classified response; DARPA will respond with follow-up instructions.

ELIGIBILITY

DARPA invites participation from all those engaged in related research activities and appreciates responses from all capable and qualified sources including, but not limited to, universities, university-affiliated research centers (UARCs), Federally-Funded Research and Development Centers (FFRDCs), private or public companies and Government research laboratories.

DISCLAIMERS AND IMPORTANT NOTES

- This is an RFI issued solely for information and new program planning purposes; it does not constitute a formal solicitation for proposals.
- Responses do not bind DARPA to any further actions related to this topic including requesting follow-on proposals from respondents to this RFI.
- Submission is voluntary and is not required to propose to a subsequent Broad Agency Announcement (BAA) (if any) or other research solicitation (if any) on this topic.
- DARPA will not provide reimbursement for costs incurred in responding to this RFI.
- Respondents are advised that DARPA is under no obligation to acknowledge receipt of the information received or provide feedback to respondents with respect to any information submitted under this RFI.
- DARPA will disclose submission contents only for the purpose of review. Submissions may be reviewed by the government (DARPA and partners) and scientific, engineering and technical assistance (SETA) support contractors.