Expedient Basing Challenge Focus Areas 1-3
#expedientbasing

BLUF

The United States Air Force (USAF) is seeking modern capabilities to establish distributed operations in austere environments around the world where it must rapidly respond to humanitarian crises, natural disasters, and/or military activity.

By uncovering and advancing solutions that are lean, versatile, scalable, sustainable, resilient, and interoperable between forces, the Expedient Basing Challenge aims to significantly reduce USAF response times from weeks or months to just hours or days.

OVERVIEW

The United States Air Force (USAF) is seeking modern capabilities to rapidly establish distributed operations in hostile environments around the world. This effort addresses an important aspect of Agile Combat Employment (ACE), a scheme of maneuver that shifts operations from centralized, physical infrastructures to a network of smaller, dispersed locations, providing flexibility for friendly forces and complicating circumstances for adversaries. **Before proceeding further, watch this video to learn more about the ACE concept and how it relates to Expedient Basing**.

The USAF recognizes that future USAF operating locations will need to be lean, versatile, scalable, sustainable, and resilient. The Expedient Basing challenge aims to significantly reduce base setup response times from weeks or months to just hours or days without degradation of operational capacity to swiftly execute missions.

We encourage participants in this Challenge to offer technological and innovative solutions for experimentation and/or feasibility study, as well as developed solutions. In either case, we're interested in understanding all underlying technologies upon which a solution relies.

FOCUS AREAS

- Site & Logistics Optimization
- Training Modernization
- Force Sustainment

OBJECTIVES

The objectives of the **Expedient Basing Challenge** are twofold:

1. The **primary objective** is to demonstrate the viability of solutions that streamline and expedite the planning and setup of operating locations in austere locations.

2. The **secondary objective** is to accelerate technology development that could lead to operational adoption of advanced capabilities by the U.S. Government.

CONTEXT

The USAF's ability to efficiently and effectively operate at the edge of a battle area is essential to our superiority. Forward Operating Bases and Contingency Locations, also known as FOBs and CLs, respectively, are located at or near the edge and act as non-enduring locations to sustain operations conducted for the protection of national interests.

For this Challenge, we're seeking net-new solutions, enhancements to existing solutions, and the development of multi-capable solutions. Within each focus area, the USAF has identified a set of desired capabilities. Please note that these are not requirements but are offered to clarify USAF intent. Additionally, the list of desirable capabilities provided here should not be considered comprehensive. While participants may submit one or more solutions for each focus area, the same solution may not be submitted in multiple focus areas.

FOCUS AREA DESCRIPTIONS

Based on internal knowledge and market research conducted across the DoD, industry, and academia, **the USAF has identified three focus areas** to bring structure to the crowdsourcing process for this Challenge, as follows:

Focus Area 1
Site & Logistics Optimization

This focus area plays a crucial role in the USAF's efforts to establish distributed operations in hostile environments and implement the ACE concept. To achieve ACE, the USAF must be able to rapidly establish and operate from remote locations. This capability involves identifying suitable locations for operations, assessing the infrastructure and resources needed, and rapidly deploying personnel, equipment, and supplies to those locations.

Core to site and logistics optimization is the design, building, and pre-positioning of transportable and modular infrastructure that can be quickly assembled and disassembled, as well as the development of supply chains that can rapidly deliver necessary resources for storage or immediate use to remote locations. Site optimization includes the identification and selection of prime operating locations, considering factors such as accessibility, terrain, environment, and security.

ACE also requires the use of expeditionary operations that are often conducted in partnership with other services and coalition partners. This involves effective logistics coordination and integration to ensure all necessary resources are available when and where they're needed.

Additionally, the ACE scheme of maneuver emphasizes the importance of technology and innovation. This includes developing new technologies and capabilities to enhance situational awareness, improve communication and data sharing, and increase the efficiency and effectiveness of logistics operations.

Capabilities and/or technologies of interest, including but not limited to:

- **Site Assessment & Planning**:
    - Joint force coordination and utilization of host nation resources
    - Deep learning tools for data-driven assessments
    - Predictive modeling for rapid, scenario-specific deployment. Digital twins of operating locations for planning and ongoing management
    - Unmanned aircraft system (UAS) swarms for rapid data collection in all environments

- **Asset Deployment Logistics**:
    - Expansion of multi-capable training, cross-training, and joint training for real-world scenarios
    - Improved data insights and collection
    - Improved workflows, coordination, and common-operating-picture (COP)
    - Augmented forces and locations with autonomous units
    - Artificial intelligence and machine learning leveraged for decision support

- **Asset Maintenance & Management**:
    - Real-time visibility of assets (knowing what we have, where it is, its condition, etc.)
    - Multi-channel, redundant communications that are real-time and buffered to ensure asset visibility
    - Workflow management systems to track the lifecycle of assets and their

environmental condition, automated to prescribe preventative maintenance
  - Joint services visibility provided by a standardized system
  - Access to knowledge management at the edge—a minimum viable set of data (operations, maintenance, repair, etc.) stored electronically with the assets

- **Asset Storage & Protection**:
  - Innovations in storage methods, durable packaging, temperature and humidity control, pest management, and remote monitoring
  - Easy to set up and tear down, deployable storage options that meet seismic and wind resistance standards
  - Decoy pre-positioning targets and Camouflage, Concealment, and Deception (CCD) technologies to complicate adversary identification for pre-position asset locations

- **Command & Control Decision Support**:
  - Real-time networking with multi-service data on a single system to provide trusted, actionable intelligence
  - Artificial intelligence, automation, and neural networks provide a higher level of understanding of the operational environment during the decision making process
  - Open architecture and commercial off-the-shelf solutions, reducing update times and patches

- **Data Collection**:
  - Sensors and/or sensing capabilities to actively collect data
  - Importance of accessing and providing automated, real-time data
  - Data transport validated in contested environments
  - Interoperability of information
  - Seamless, real-time control of autonomous systems

- **Operations Management**:
  - Fractionalized supply chain to reduce overall risk
  - Predictive maintenance integration of multi-service and allied assets (an ally is any nation with which the U.S. is engaged in a common military effort or has entered into a common defensive military alliance)
  - Provision of real-time data and visibility into supply chain and pro-positioned assets

Focus Area 2
Training Modernization

The USAF recognizes that the modernization of training is critical to meeting the ACE scheme of maneuver. The USAF needs to be agile and flexible in the face of evolving threats, with the ability to rapidly deploy and operate in austere and contested environments. To meet these requirements, the USAF must modernize its training approach to better prepare personnel.

One way the USAF is modernizing its training is using simulation and virtual training environments. This allows personnel to train in realistic scenarios that simulate ACE challenges and complexities. Deploying modern training tools helps personnel develop the skills and competencies needed to operate effectively in these environments.

As an example, the USAF is exploring the use of artificial intelligence and machine learning to enhance training programs and improve decision-making in real-time. Additionally, the USAF is investing in advanced communication and networking technologies to improve the coordination and integration of training activities across various locations.

The USAF is also expanding its partnerships with other services and coalition partners to provide more opportunities for joint and multinational training. This approach helps Airmen develop the skills and competencies needed to work effectively in joint and multinational operations, which are critical to achieving ACE.

Capabilities and/or technologies of interest, including but not limited to:

- **Culture of Learning**:
    - Internal design of incentive programs
    - Implementation of effective augmented and virtual reality training programs

- **Team-Based Learning**:
    - Standardization of training requirements for increased proficiencies
    - Development of crew training interoperability to develop special capabilities within teams
    - Development of intuitive and gamified training to reduce certification timelines for multi-capable Airmen
    - Student-led training to increase engagement and buy-in
    - Training visibility to improve crew member selection

- **Joint Force Training**:
    - Joint intelligence training (JIT) between military services, on demand and at the contested edge
    - Organized pre-positioning of supplies and equipment in multiple locations to improve access and supply chain resiliency
    - Augmentation of human/machine joint training on systems
    - Secure, localized command and control
    - Assisted “decision support” at the active edge

- **Human Performance Optimization**:
    - Real-time knowledge via a performance dashboard of factors:
        - Logistics and accessibility to training and tools
        - Scheduling to balance work and rest, and to optimize recovery and wellbeing
        - Software-enabled training
        - Nutritional resources and recommendations

- **Talent Identification & Management**:
    - Systemic methods to identify, track, and manage personnel skills
    - Automation technology to build teams based on skills and job requirements

- **Training Equipment & Technology**:
    - Joint intelligence training delivery of knowledge
    - Immersive extended reality (XR), represented by several different but related technologies, including but not limited to augmented and virtual reality
    - Realtime advisor reach back
    - Knowledge attachment to objects, i.e., quick response (QR) codes, booklets, and images
    - Multimodal training package
    - Integration of AR/VR into tool/robotic platforms as a direct control interface

Focus Area 3
Force Sustainment

The USAF provides force sustainment through a variety of means, including life support and mission generation support. These two pathways are critical to ensuring the USAF can maintain readiness and execute its missions effectively.

In expeditionary situations with an ACE scheme of maneuver, traditional logistical footprints likely aren't feasible because they require more manpower and infrastructure, and therefore a larger sustainment support. Environmental factors also play a significant role in the footprint generated by force sustainment. Cleaner technologies will help the USAF become more agile by minimizing hazard waste management, transportation, and processing.

In terms of life support, the USAF provides a range of services to ensure its personnel can operate in a safe and healthy environment. This includes lodging, food provisioning, and access to utilities, such as power, water, and waste management. Additionally, the USAF provides education and training to its personnel to help them stay healthy and fit for duty.

Mission generation support refers to the broad processes and systems the USAF uses to ensure its aircraft are maintained, serviced, and prepared for mission operations. This generally includes operations, communications, maintenance, and equipment expeditionary facilities. However, there's more to mission generation that directly supports aircraft and flight, such as: the storage and distribution of fuel and munitions, hazardous and industrial waste disposal, fire protection services, and explosive ordnance disposal.

The ACE concept is a key element of the USAF's doctrine for force sustainment. Because mission durations, force sizes, and environments can vary considerably, the USAF focuses on developing lightweight, mobile, scalable, and flexible equipment and systems that can be rapidly deployed and operated.

Capabilities and/or technologies of interest, including but not limited to:

- **Life Support Systems & Technologies** to address improved mobility, reduced weight, equipment efficiencies, simplified logistics, transportability, and ease of setup/preparation:

- **Shelters:**
    - Durable while in pre-positioned storage and while deployed
    - Earthquake, weather (typhoon-level), and environmental (corrosion) resistant materials and structures
    - Easy and quick to install
    - Lightweight

- **Food:**
    - Food technologies to provide high-quality and nutritious food for quick preparation while minimizing the footprint and need for kitchen facilities
    - Efficient and portable cold storage
    - Space- and energy-efficient kitchens to provide hot meal options

- **Hygiene:**
    - Sanitation capabilities to limit water use and reduce waste
    - Scalable options to meet a range of operational timelines
    - Smaller and lighter options

- **Utilities:**
    - Options that are durable and protect from the environment
    - Power generation systems, including solar, hydro-electrical power generation, etc.
    - Lightweight and fast-charging energy storage options
    - Clean water generation and purification technologies
    - Environmentally friendly waste management (i.e., waste-to-energy technologies—incinerating trash to produce electrical power, etc.)
    - Alternative fuel options for less reliance on diesel/combustion motors (i.e., hydrogen production to a fuel cell, electrolysis of water, etc.)

- **Mission Generation Support** to reduce risk concerns through improved cybersecurity, ease of setup/installation, and greater durability:

    - **Operations:**
        - Agile deployment of equipment
        - Disposable materials
        - Attritible systems
        - Remote survey
        - Autonomous systems

    - Multi-fuel (petroleum-based, battery, etc.) compatible heavy equipment and vehicles

- **Communications:**
    - Rapid response via autonomous systems
    - Ability to operate in zero communication/denied environments
    - Ability to conduct secure, constant communication

- **Maintenance & Equipment Storage:**
    - Ability to quickly accommodate the launch and recovery of highly complex and sensitive 5th generation aircraft
    - Cross-platform and multi-functional aerospace ground equipment (AGE) designed to withstand expeditionary service in austere environments
    - Innovative and robust landing, runway, and taxiway construction capabilities, including the use of indigenous materials
    - Early warning systems for chemical, biological, radiological, nuclear, and explosive (CBRNE) detection and alerting
    - Decoy pre-positioning targets and Camouflage, Concealment, and Deception (CCD) technologies to complicate adversary targeting
    - Easy to set up and tear down, deployable hangars that meet seismic and wind resistance standards
    - Customized shops and mixed office use—supply, weapons, and aerospace ground equipment (AGE)

WHO SHOULD PARTICIPATE

The USAF welcomes involvement from individuals or teams in industry, academia, investing, and government. We encourage working with partners or teams to meet or exceed the evaluation criteria.

What you stand to gain:

- Potential to receive funding for concept development and/or rapid prototyping and prospective further development of your solution within the USAF
- Potential long-term contract or agreement and continuing business relationships with the USAF and other government agencies
- Chance to inform and shape our nation’s elite warfighting capability, positively impacting our Airmen and creating a more resilient and mission-ready military force
- Opportunity for teaming and technology development

- Potential invitation to attend the Challenge showcase event and network with peers, the USAF and DoD, customers, and other investors
- Official recognition for you and your organization, if selected, through publication on internal and external USAF communication channels

PROCEDURES

The submission and evaluation process evolves over three spirals.

1. Spiral 1: Offerors submit the web form and optional supplemental document. The Government will evaluate solution submissions against the criteria within this Call. Selected offerors will be invited to Spiral 2.
2. Spiral 2: Selected offerors will be invited to provide additional information to elaborate on and discuss their proposed concept/technology/solution. The Government will evaluate oral demonstrations against the criteria within this Call. Selected offerors will be invited to submit proposals in Spiral 3.
3. Spiral 3: Offerors whose solution submission and oral demonstration are evaluated and determined to hold sufficient technical merit will be invited to submit a full written proposal. Instructions and evaluation criteria will be provided in the Spiral 3 Request for Commercial Solution Proposal.

SUBMISSION OF SOLUTION FOR SPIRAL 1:

1. Participation in this challenge requires a completed submission using the afwerxchallenge.com website located at the following link:

   The form includes the following fields:
   - **Solution title**: Provide the concise name of your solution.
   - **Executive summary**: Explain your solution in 500 characters or less.
   - **Solution description**: Explain in detail how your solution tackles the stated problem.
   - **Value proposition**: Describe how your solution can benefit the USAF.
   - **Inputs and outputs:** List the inputs and outputs that your solution needs and produces (if applicable) so an integration effort can more easily be defined.
   - **Solution maturity**: Indicate the development stage of your proposed solution, e.g., idea, prototype/experiment, complete application (has been tested and is ready for launch), or commercially available.
   - **Proof of concept:** Can you provide a test or proof of concept (PoC) for your solution, prior to potential implementation at scale? If yes, provide the timeline required to complete the test or PoC.

- **Implementation**: Provide the timeline required to implement your solution, including potential lead time for parts order/shipment.
- **Keywords**: Specify any descriptive keywords that may be useful for a search related to your solution.

Note:

- It's possible to create a private draft during the submission period by selecting "Save As Draft." You can edit and then launch the public submission when you're ready.
- Public submissions can be edited until the submission deadline.
- Participants can attach private files that are only made visible to the evaluation team.

2. Solution submissions shall contain the following:
   a. ***Offeror Information****:* Provide point of contact name, email address, phone, and address. (This <u>does not</u> count against the five-page limit.)

   b. ***Executive Summary***: Provide an executive summary of the technology. (This <u>*does*</u> count against the five-page limit.)

   c. ***Technology Concept:*** Show and/or describe how your proposed solution or potential new capabilities fulfill requirements, close capability gaps, or provide potential technological advancements in support of the Challenge mission focus area to provide capabilities that aid in the observation, orientation, decision, and action across all domains. Describe the unique aspects of your technology and the proposed work as it relates to the applicable Challenge mission focus area, including key attributes such as data sources, automation, user experience, cyber security, and ability to integrate with other systems. Identify whether the effort includes the pilot or demonstration of existing commercial technology (identified as commercially ready and viable technology), or the further development of commercial technology for potential defense application.

   d. ***Feasibility & Scalability:*** If development or adaptation is proposed, identify a suggested path to mature the technology. Identify aspects of your proposal, to include data and software, which may be considered proprietary. Identify the ability of the solution to scale rapidly across USAF and other agencies, and whether the proposed solution can provide a reasonable management approach for technical delivery, schedule, and cost.

e. ***Warfighter impact:*** Provide an assessment of how the solution brings value to the warfighter.

f. ***Offeror Responsibility & Solution Viability:*** Provide a brief overview of the offeror—a summary of current experience, qualifications, and resources or ability to obtain them in accordance with FAR Part Subpart 9.4, e.g., summary of the top line (gross sales/revenues) and balance sheet. Provide a summary of product development, manufacturing (if relevant), and logistics strategy to the best extent possible.

g. Does your proposed solution or potential new capabilities currently have an authority to operate (ATO)?

h. Data Rights Assertions for Commercial Items (if applicable).

i. Identify any Intellectual Property (IP) in the technology, all relevant owners and licensors, and associated restrictions on Government use.

j. The Due Date for Spiral 1 submissions is **07/21/2023**.

EVALUATION CRITERIA FOR SPIRAL 1:

A designated team of Government personnel will evaluate Challenge submissions to determine which solutions should advance to Spiral 2. The Government will use the following evaluation criteria, giving each item equal importance:

- **Relevance:** Demonstrates alignment with the Challenge purpose and focus areas.
- **Technical merit:** Product/technology solution works as stated in support of mission objectives and demonstrates feasibility.
- **Innovation:** Demonstrates a novel, unique, or previously underutilized approach when considered against the Government application.
- **Integration potential:** Functionality as part of a system.
- **Technical readiness speed:** Reasonable timeline for solution to be delivered by 2026.
- **Scalability:** Meets or exceeds the needs of mission profiles for broad impact across the USAF.
- **Impact:** Expected benefits to the USAF and Airmen.

ORAL DEMONSTRATION CONTENT FOR SPIRAL 2:

Offerors invited to participate in Spiral 2 shall address the following:

a. Expanded details of the potential solution that was provided in the Spiral 1 solution submission.
b. A live demonstration of the potential solution utilizing relevant and/or analogous data.
c. Should the solution require assistance with testing, validation, and/or capacity for scaling within the USAF, identification of the magnitude, type, and scale of assistance required for follow-on activities.
d. Rough Order of Magnitude (i.e., bottom-line estimated price) of the solution provided in Spiral 1.
e. The solution submission will identify all Intellectual Property (IP) in the technology, all owners and licensors thereof, and associated restrictions on the Government's use of that IP.
f. The Oral Brief should be able to address detailed Q&A from DoD stakeholders, including both technical and operational subject matter experts.
g. The purpose of the showcase is to provide networking opportunities with Government/non-Government communities interested in solutions. Information presented will only impact evaluations if content at the showcase is not consistent with content of solutions submission and oral demonstrations.

Each offeror will be allowed a specified amount of time for their oral demonstration. The timeframe will include time for Q&A.

EVALUATION CRITERIA FOR SPIRAL 2:

Oral Presentation evaluation criteria is listed below, with each item of equal importance.

a. Responsiveness of the solution in addressing the Challenge mission focus areas.
b. The Technical Merit of the proposed solution adequately addresses the Challenge mission focus area and demonstrates feasibility for the Government to pursue the proposed solution.
c. The Rough Order of Magnitude will be considered for affordability determinations only.

NOTE: Spiral 2 demonstrations may be recorded for Government evaluation purposes.

COMMERCIAL SOLUTION PROPOSAL (CSP) CONTENT AND EVALUATION FOR SPIRAL 3:

Offerors invited to participate in Spiral 3 will be provided a CSP, which will detail instructions to offerors and explain the basis for evaluation.

WHAT'S NEXT

The submission period opens on 05/26/2023 and ends on **07/21/2023** at 4:59 PM Pacific Time.

- Submissions shall be made at afwerxchallenge.com, and all required fields must be completed in order to be accepted.
- Communication to all successful and unsuccessful Challenge participants will be sent via email.
- The showcase will take place as an online or in-person event. Offerors selected to participate will receive notification via email. The showcase is an excellent opportunity to meet individuals, teams, and enterprises selected to attend. Another evaluation will be completed at the showcase via private pitches and public discussions with evaluators on the virtual showcase website.
- All dates are subject to change. We'll communicate any changes via sam.gov and afwerxchallenge.com.

GOVERNMENT CONTRACTING TERMS & CONDITIONS

Future contracting opportunities related to the **Expedient Basing Challenge** will be posted to any/all Government points of entry such as sam.gov, sbir.gov, afwerxchallenge.com, etc.

- This Call falls under Commercial Solutions Opening (CSO) FA2280-23-S-C001. A copy of the CSO can be obtained by searching for the FA2280-23-S-C001 at sam.gov. This Call and subsequent awards shall comply with all requirements of the CSO.
- In the event of a conflict between information contained on afwerxchallenge.com and the USAF solicitation on sam.gov, the CSO on sam.gov shall control.
- The announcement of AFWERX events, considered to possess high potential for further efforts, may be made at afwerxchallenge.com. FAR-based contracting instruments, Other Transaction (OT) for Prototype Projects

10 USC 4022, to include follow-on production OTs, and Prize Competitions 15 USC 4025 may support the accomplishment of these events.

- All announcements made at both sam.gov (formerly fbo.gov) and afwerxchallenge.com website(s) are considered to satisfy the reasonable effort to obtain competition per 15 USC 3719 (e) and 10 USC 4022 (b)(2).
- Possibilities exist to work with existing prime contractors on USAF contracts through submissions provided in response to this Challenge.
- All FAR-based actions will follow post-award synopsis procedures per FAR subpart 5.3 accordingly.
- Subject Matter Experts advising the Government team may include firms contracted by other participating DoD branches (U.S. Army, U.S. Marine Corps, U.S. Navy, and U.S. Coast Guard). These firms are contracted to provide advisory and assistance services to USAF or other DoD branches. These firms are an important supporting element in ongoing efforts; however, they may be asked to provide limited advice on potential solutions. It is the responsibility of participating firms to protect their intellectual property or other proprietary information as necessary.
- Notice to Offeror(s): The Government reserves the right to cancel this open call, either before or after the closing date. If the Government cancels this open call, the Government has no obligation to reimburse an offeror for any costs.
- The submission deadline is noted in the section labeled “What’s Next.” The submission deadline is controlled by the AFWERX Challenge server time and is not dictated by local participant computer time. AFWERX Challenge shall not be held responsible for discrepancies in computer times, delays due to internet connectivity, server performance due to large numbers of participants utilizing the software simultaneously, or other factors outside of AFWERX Challenge’s control. No exceptions will be made for late submissions regardless of the reason. It is advisable to complete submissions well in advance of the submission deadline.
- This Call may result in the award of prototype projects, which include not only commercially available technologies fueled by commercial or strategic investment, but also concept demonstrations, pilots, and agile development activities that can incrementally 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 a FAR Part 12 procurement contract or an Other Transaction (OT) under 10 USC 4022 agreement, including prototype and follow-on production, or no contract instrument at all, as a result of this Call. Consistent with 10 USC 4022, awards of follow-on production contracts must be made through the use of competitive

procedures unless the award of an initial OT provides for a follow-on production contract and the OT participant successfully completed the prototype project.

- In accordance with Section 5.8 of the CSO, non-Government advisors may participate as non-scoring members during evaluations. For this Call, non-Government advisors include Collaboration.Ai LLC and theDifference.
- Foreign-Owned businesses may independently submit a solution or do so as part of a teaming arrangement with one or more U.S.-owned businesses. Foreign participation is subject to small business and domestic sourcing restrictions and incentives in this CSO, or as may be imposed in the future by the President pursuant to the Defense Production Act, 50 U.S.C. 50 U.S.C. 4501, et. seq., or the Department of the Air Force. The ability of foreign-owned businesses to obtain a contract award or OTA based upon a submission may depend upon the ability of the foreign-owned business to obtain necessary clearances and approvals to obtain proscribed information, and the ability to comply with U.S. laws, regulations, and contractual terms.

- Agency-level protests submitted under Spiral 1 or Spiral 2 shall be submitted to Sandi Brubaker, Contracting Officer, at sandi.brubaker@afwerx.af.mil. Agency-level protests submitted in response to Spiral 3 solicitations shall be submitted to the Contracting Officer soliciting and executing the award.