



U.S. Army Space and Missile Defense Command | 2024-2025
Needs for Academia and Industry Partners

Introduction

Academia and Industry Partners

Developing optimal capabilities for Army space integration and interdiction, missile defense, and high altitude requires a deliberate, collaborative effort between the U.S. Army Space and Missile Defense Command and partners in academia and industry. This partnership focuses on innovative technologies that address modernization efforts across the command's mission areas. USASMDC's partners in academia and industry provide the command with awareness and access to new and emerging technologies while creating timely opportunities to accelerate the transition and fielding of new capabilities to Army forces.

Purpose

This pamphlet informs USASMDC's academia and industry partners of the focus areas for modernization across its mission areas. It creates the foundation for identifying advanced and emerging space interdiction, space integration, high altitude, and missile defense science and technology, and enabling technologies relevant to the needs expressed in this document.

About the Command

USASMDC is the Army's force modernization proponent and operational integrator for global space, missile defense, and high-altitude capabilities. It occupies strategic key terrain at the nexus of integrated deterrence between three combatant commands: the U.S. Space Command, the U.S. Strategic Command, and the U.S. Northern Command. It has a unique perspective on the convergence of space interdiction, space integration, missile defense in multidomain operations, and its role in integrated deterrence.

MISSION

USASMDC develops and provides current and future global space, missile defense, and high-altitude capabilities to the Army, joint force, allies and partners, to enable multidomain combat effects; enhance deterrence, assurance, and detection of strategic attacks; and protect the nation.

COMMANDER'S VISION

Our vision is "ONE TEAM!" that achieves our shared objectives via collaboration, feedback, assessment, and smart adaptation to continue demonstrating value to warfighters, our Army, our joint interservice and interagency teammates, our nation, and to our allies and partners.

COMMAND PRIORITIES

1. Accomplish our mission as a People First team of empowered, innovative, ready, and resilient professionals.
2. Provide trained and ready forces for space, missile defense, and high-altitude missions.
3. Conduct integrated planning and synchronized operations in the execution of our space and missile defense missions.
4. Prepare for future conflict.

The command provides trained and ready space and missile defense forces and capabilities to the warfighter and nation. It develops future space integration and interdiction and missile defense forces for tomorrow by researching, testing, and integrating space, missile defense, cyber, directed energy, hypersonic, and related technologies for the future.

Army space integration and interdiction is land-centric, providing scalable and mobile, expeditionary and forward-postured forces in contested and austere environments capable of keeping pace with maneuver forces supporting multidomain operations.



Defending the nation and its allies link USASMDC's 2,300 Soldiers and civilians stretching across 13 time zones and 19 worldwide locations.

Role of USASMDC in Army's Force Modernization

Modernizing Army Space, High-Altitude and Missile Defense Capabilities and Forces

USASMDC has existed since 1957, providing critical space and missile defense capabilities to the U.S. Army and joint forces. The Army designates the USASMDC commander as the force modernization proponent for Army space (interdiction), high-altitude, and missile defense capabilities. These capabilities play a vital role in the success of U.S. armed forces today. The demand for Army space integration and interdiction, high-altitude, and missile defense capabilities will likely continue to increase into the future. The command's capability development

supports the Army's Continuous Transformation framework across the three concurrent time horizons: Transform in Contact, Deliberate Transformation, and Concept-Driven Development to deliver lethal and survivable land power capability to the joint force on the rapidly evolving, sensor-rich, contested battlefield.

Questions for Academia and Industry Partners

The following questions highlight the command's modernization areas of interest and provide insight into where academia and industry partners can contribute:

1. Do partners have capabilities or concepts that support multidomain operations training that incorporate impacts on offensive and defensive space operations?
2. Do partners have test target capabilities on orbit (high altitude or low earth orbit at a minimum) or test target concepts that could support the Army and joint training?
3. Do partners have capabilities, concepts or innovation that support:
 - a. High-altitude platforms
 - b. Counter-surveillance reconnaissance capabilities
 - c. Alternative navigation systems overhead persistent infrared
 - d. Artificial intelligence/machine learning
4. Do partners have capabilities or enabling technologies that will empower the Multidomain Task Force or the Multidomain Effects Battalion in providing offensive and defensive capabilities that can keep up with a multidomain force?
5. Do partners have capabilities or enabling technologies in the following disciplines that will support missile defeat operations by integrating and synchronizing operations left of launch to the threat?

Needs for Academia and Industry Focus: Capabilities and Technologies

Space Support to the Warfighter

1. Space in depth:
 - a. Design enhanced cybersecurity capabilities for satellite intra- and inter-communications.
 - b. Improve means to degrade an adversary's ability to collect intelligence against Army forces from space.
 - c. Continue to enhance space domain awareness capabilities; preserve Army freedom of maneuver in all phases of conflict.
2. Close space support capabilities:
 - a. Continue to improve Space-Special Operations Forces-Cyber Triad concepts, integration and capabilities.
 - b. Identify emerging joint space capabilities that show potential to enhance Army land operations.
 - c. Identify means to increase the efficiency of the operational Army forces requests for space support.
3. Space domain awareness:
 - a. Develop improved data analytic capabilities to enhance space objective positioning information for Army forces operational employment.
 - b. Explore a means to enhance the prediction, detection, tracking and targeting of space objects for desired effects.
 - c. Boost directed energy capability accuracy while lowering power consumption.
 - d. Upgrade information-sharing programs/protocols between government, industry and academia.
4. Synchronize command and control of Army capabilities:
 - a. Improve and enhance organizational structures to increase decision-making efficiency.
 - b. Integrate operational-level planning and execution forces with improved space-enabled communications.
 - c. Devise improved senior leader education opportunities to enhance understanding of space capability employment.
5. Appropriate level of authority at echelon:
 - a. Evaluate and enhance decision-making to execution timelines.
 - b. Identify current roadblocks for employing new and emerging Army space interdiction capabilities.
 - c. Design new organizational structures centered on executing Army and joint space capabilities.
6. Navigation warfare:
 - a. Capabilities to characterize the GPS signal environment accurately and incrementally in three dimensions over time, including electromagnetic spectrum and physical environment influences to develop a shared common operating picture with Army mission command information systems.
 - b. Self-contained stimulation of GPS and other relevant global navigation satellite system-reliant systems from federated constructive models and simulation tools organic to Army mission command information systems for operating in a degraded GPS environment.
 - c. Decision and risk-management tools organic to Army mission command information systems for operating in a degraded GPS environment.
 - d. A "non-propagation" method of representing relevant global navigation satellite system systems in federated constructive modeling and simulations, calculating position and relative position time stamps of satellites only when the simulation needs them.
 - e. Capabilities approach for planning and risk management of the deployment of kinetic and non-kinetic capabilities, in conjunction with other Army mission command information systems in support of maintaining positioning, navigation and timing services.
 - f. Improve L-band beam antenna directivity and minimize beam intercept outside the intended focus area for high-altitude payloads (60-100K above mean sea level).
 - g. Live, virtual, constructive-integrating architecture for a "navigational war range" supporting Soldier, leader, and collective training needs.
7. Assured positioning, navigation and timing:
 - a. Automated, system-integrated alternatives to the global navigation satellite system-provided timing for expeditionary network time protocol information networks, ensuring accurate clock synchronization between computer systems over packet-switched, variable-latency data networks.
8. Offensive and defensive space operations:
 - a. Develop new, novel capabilities to enable the Army space interdiction forces to engage adversary capabilities while on the move.
 - b. Continue to enhance means to defend and protect data transfer capabilities.
 - c. Design improved capabilities to enable assured Army positioning, navigation and timing in any environment.



9. Counter-Intelligence, Surveillance and Reconnaissance:
 - a. New and emerging capabilities that address CSR in support of Army/multidomain operations.
 - b. How is the technology and capability integration into current and future multidomain operations?
 - c. Can this technology/capability be demonstrated in a live or virtual training environment for exercise and experimentation without using white cards for simulation?
 - d. Are training aids, devices (trainers) or lesson plans available? Individual and crew trainers?
 - e. Is the technology ready for Soldier touchpoint to further provide input to the operation and use of this technology?
10. Early warning (missiles and space):
 - a. Continued oversight of and engagement with the U.S. Space Force to ensure Joint Requirements Oversight Council-validated Army overhead persistent infrared requirements are incorporated and included in USSF requirements documents and capabilities.
 - b. Employ the Army Navy/Transportable Radar Surveillance and Control Model 2 (AN/TPY-2) forward-based mode radar to bolster the early warning mission.
11. Terrestrial and space environment monitoring:
 - a. Improve integration and data fusion from information sources to enhance specific Army training events and operations.
 - b. Develop new capabilities and further enhance existing systems to improve overall situational and operational awareness for combat operations.

Enabling Capabilities for the Space, Cyber and Special Operations Forces Triad

1. Incorporate Triad tenets in the missile defeat white paper/concept currently under development in the Space and Missile Defense Center of Excellence's Concept and Doctrine Division.

Space Training

1. The ability to provide technical space superiority weapon system training to a globally distributed population of students in real time.
2. Enhanced and expanded capacity to create a virtualized environment for distributed training.
3. Improve communication lines with expanded capacity, speed and security at a lower operating cost.
4. Enlarge technical data replication in training scenarios to make training as realistic as possible.



Space and Missile Defense Training and Leader Development

1. Virtual training capability that replicates the electromagnetic spectrum with positioning, navigation and timing effects felt by the training audience.
2. Virtual training capability to replicate satellite communications networks and links at all echelons. Virtual training capabilities must include the ability to replicate adversary impacts to satellite communications links with effects-based impacts.
3. Virtual training capability to replicate impacts of degraded or denied positioning, navigation and timing to precision-guided munitions.
4. Virtual training capability to replicate high-altitude platforms with different onboard capabilities (i.e., intelligence, surveillance and reconnaissance; command and control; etc.)

Training Range, Targeting, Deconfliction with Other Non-Kinetic Fires

1. Link emerging fire capabilities with current range design; a new methodology would provide participants with a fully integrated training/exercise experience.
2. Craft a new joint command and control system to link and deconflict fires elements and enhance the overall effectiveness of compounded and deconflicted fires elements.
3. Utilize artificial intelligence/machine learning to correlate data points and streamline intensive manual processes.

High Altitude and Its Platform Support to the Warfighter (Persistent High-Altitude Capabilities)

1. Continuing coordination with the high-altitude community of interest for increased maturation of high altitude across the doctrine, organization, training, materiel, leadership and education, personnel, facilities and policy spectrum through





joint exercises and experimentation attendance. Bring back data from these events to address the learning demands focused on requirement refinement, leading to the establishment of a high-altitude program of record.

2. Continue to assess various vendor command and control, planning, mission operations systems. The objective is to integrate the appropriate capability into an existing Army program to gain training, operations and support efficiencies.
 - a. Where possible, directly observe and assess Soldier high-altitude touchpoints. Work with the community of interest and the Army unit to collect answers to the high-altitude learning demands for all other events to continue refining DOTMLPF-P.

Missile Defense and Hypersonic

1. Missile defeat across the kill chain including hypersonic:
 - a. Missile defeat adopts a “whole of government” approach, involving various government branches, agencies and international partners to effectively address the threat’s overmatch capability.
 - b. Missile defeat combines transregional integrated air and missile defense with left-of-launch activities

to deny, delay, disrupt and degrade an adversary’s missile strike capabilities.

- c. It includes diplomatic efforts to deter adversaries, economic sanctions to limit their resources, and intelligence operations to gather information on their missile programs.
2. Cradle-to-grave tracking of hypersonic missile threats by integrating legacy platforms and developing new space and terrestrial platforms:
 - a. Missile defeat and missile defense include defense against hypersonic maneuvering threats.
 - b. Successful engagement of ballistic or hypersonic maneuvering threats requires dynamic tracking from launch until successful interception.
 - c. Cradle-to-grave tracking methodology is required for all current and future terrestrial- and space-based systems across the services.
 - d. Given a move toward a global defense design, new and/or improved shot doctrine may be required to incorporate the unique battle plans of each regional area of operation to retain localized command and control and defeat evolving threats.

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