A Compendium to the *2024 Annual Estimate of the Strategic Security Environment*

This list of strategic issues offers insight into the particularized matters impacting defense organizations. Senior leaders across the highest echelons of US Army and Department of Defense (DoD) organizations provided input. This list and the narrative found in the Strategic Studies Institute's (SSI) *2024 Annual Estimate of the Strategic Security Environment* will help focus the research community on topics important to the Army.

CHIEF OF STAFF OF THE ARMY

1. Fighting Echelons (War Fighting)

Examines the operational concept of organizing and engaging combat forces at different echelons. This concept includes the tactics, strategies, and organizational structures employed by Army units to conduct operations effectively across various echelons, from small-unit engagements to large-scale multidomain operations. Explores the command and control, logistical support, and communication aspects vital for successful combat operations at different echelons. This research topic aims to investigate the dynamic nature of modern warfare, emphasizing the need for adaptable and agile military forces capable of operating effectively at various echelons. It seeks to understand the complexities involved in coordinating and synchronizing operations across different levels, highlighting the implications for force structure, training, and interoperability.

- Emphasis on the evolution of tactical operations and the impact on force employment given what we are seeing in Ukraine and Gaza
- Analysis of technological advancements and their influence on echelon-based warfare
- Consideration of historical case studies and contemporary scenarios to draw insights into effective echelon operations
- Examination of the role of Joint and multinational operations in echelon-based warfare
- Examination of the role of enablers and the appropriate echelon for their employment

2. Contested Airspace Involving Unmanned Systems in Combat: A Comparative Analysis (War Fighting)

This research analyzes and compares the challenges associated with contested airspace involving unmanned systems in combat scenarios. It will examine the complexities, legal implications, and operational hurdles of using unmanned systems in combat situations within contested airspace. The comparative analysis will provide valuable insights into the evolving landscape of unmanned aerial vehicles and their impact on contested airspace dynamics in combat environments.

- Legal and regulatory frameworks for operating unmanned systems in contested airspace during combat and in training environments
- Ethical considerations and implications of unmanned systems in military and civilian airspace during combat operations
- Technological advancements and their impact on contested airspace management in combat scenarios
- Comparative case studies of contested airspace incidents involving unmanned systems in combat situations, including the challenges of preventing blue-on-blue destruction of unmanned systems

3. Partnering across the Total Army (War Fighting, Delivering Ready Combat Formations)

This group project with officers from all three components (COMPO) delves into the strategic importance and operational dynamics of fostering effective partnerships and collaborations across the Total Army, encompassing the active-duty, reserve, and National Guard components. It seeks to explore the integration of efforts, resources, and capabilities to enhance readiness, interoperability, and mission effectiveness in both domestic and international operations.

- Examination of best practices for cross-COMPO training and exercises to enhance cohesion and interoperability
- Analysis of Joint personnel management and talent utilization across the Total Army, to include cross-COMPO permeability
- Exploration of communication and coordination strategies for seamless integration and collaboration among the active-duty, reserve, and National Guard components
- Consideration of case studies and lessons learned from Joint operations to identify successful partnership models and areas for improvement
- Examination of the optimal force structure across all three components to employ the Total Army in competition, crisis, and conflict

4. Russian Reconstitution after Ukraine (Delivering Ready Combat Formations)

Regardless of the outcome of the Russia-Ukraine War, Russia will take time to rebuild its forces to pre-Ukraine full-scale invasion levels. What are the opportunities and threats for the Army from a significantly weakened Russia? How will Russia's rebuilt Army differ from its Army today, and what are the implications of this new force structure for the United States Army? How long will it take before Russia can significantly threaten Europe again?

- Consider what the security environment in Europe would look like if Russia is defeated and Ukraine reverts to its 2014 or 2022 borders, what it would look like if Ukraine is completely defeated and the Zelensky regime collapses, and what it would look like if it ends in a "frozen conflict" or negotiated settlement that sees Russia controlling the four regions it illegally annexed in September 2022.
- Exploration of the global consequences of any of the three scenarios above, particularly as it impacts the decision calculus of the emergent "axis of upheaval" of the People's Republic of China, Iran, and the Democratic People's Republic of Korea

5. Army Health, Fitness, and Wellness (Delivering Ready Combat Formations)

This research topic examines the multifaceted aspects of promoting and sustaining optimal health, fitness, and wellness among Army personnel. It encompasses the study of physical fitness programs, mental health initiatives, nutritional strategies, and overall wellness frameworks designed to enhance the readiness, resilience, and well-being of the Army.

- Examination of the impact of physical fitness on operational effectiveness and injury prevention
- Analysis of mental health and resilience programs tailored to the unique demands of military service
- Exploration of nutritional guidelines and wellness initiatives to support the holistic health of soldiers
- Consideration of innovative approaches, technologies, and best practices for promoting a culture of health and resilience within the Army

6. Adapting the Army for Modern Combat (Delivering Ready Combat Formations, Continuous Transformation)

This project should consider whether the Army should tailor forces toward a specific threat or remain focused on a range of contingencies. Following the Yom Kippur War, the newly established TRADOC drew lessons as the Army oriented toward battle in central Europe. More recently, the Marine Corps reoriented toward fighting the People's Republic of China in the Indo-Pacific.

- What are the benefits and drawbacks of orienting on a specific threat for war fighting, modernization, combat-ready formations, and Army professionalism?

- What theater should the Army focus on if focusing on a specific threat?
- What are the implications for an Army focused on a specific threat?

7. Continuous Army Transformation

This research topic revolves around the ongoing evolution and adaptation of the Army's organizational structure, doctrine, capabilities, and operational concepts to meet emerging security challenges and technological advancements. It encompasses the study of continuous improvement initiatives, force modernization efforts, and the strategic agility crucial for sustaining the Army's relevance and effectiveness in a dynamic global security environment.

- Examination of the role of emerging technologies, such as artificial intelligence and autonomous systems, in shaping continuous Army transformation
- Analysis of the implications of geopolitical shifts, hybrid warfare, and irregular threats on the necessity for continuous transformation
- Exploration of organizational change management, leadership strategies, and stakeholder engagement essential for driving continuous transformation initiatives
- Consideration of lessons learned from previous transformation efforts and their applicability to the contemporary and future operational environment

8. The Impact of Emerging Technologies on Modern Warfare: Opportunities, Challenges, and Ethical Considerations (Continuous Transformation)

This topic explores the influence of emerging technologies on the landscape of modern warfare. It delves into the opportunities, challenges, and ethical considerations posed by the integration of advanced technologies in military strategy and conflict resolution.

1. Opportunities:
   - Enhanced situational awareness through advanced surveillance and reconnaissance technologies
   - Improved effectiveness and precision in targeting through developments in weaponry and defense systems.
   - Integration of artificial intelligence and machine learning for strategic decision making.
2. Challenges:
   - Ethical dilemmas regarding the use of autonomous weapons and unmanned systems
   - Potential risks associated with cyber warfare and the vulnerabilities of interconnected defense systems
   - The need for continuous adaptation and training to keep pace with rapidly evolving technologies

3. Ethical Considerations:
   - Moral implications of deploying advanced technologies in warfare and their impact on civilian populations
   - Accountability and transparency in the use of autonomous systems and lethal technologies
   - The need for international regulations and ethical frameworks to govern the responsible use of emerging technologies in warfare

9. Foundations of the Army Profession (Strengthening the Profession of Arms)

Considers how well those in the Army understand their profession and ways to reinforce professionalism in the Army. Right now, the Army publishes *The Army*, Army Doctrine Publication 1; *Army Leadership and the Profession*, Field Manual 6-22; and *Army Profession and Leadership Policy*, Army Regulation 600-100. In the past, other models have described the profession and the roles of professionals.

- Does the changing operating environment have implications for how the Army trains and certifies professionals?
- How do our regulations and doctrine reinforce military professionalism?
- How should the Army publish professionalism doctrine?
- How should the Army teach professionals about their roles in the profession?

10. Impacts of Abusing Inspector General and Equal Opportunity Complaint Systems (Strengthening the Profession of Arms)

This project should explore how abuses of legitimate complaint systems lead to perceptions of a so-called "investigative culture" that adversely impacts trust and cohesion. This project should consider whether the Army should adopt "toxic leader" and "toxic follower" as official Army terms and determine whether those ideas are related to an "investigative culture," where leaders are apprehensive about enforcing the standards and discipline needed to establish cohesive teams and a culture of war fighting.

- Does the Army need to develop a followership doctrine to teach the importance of their contributions?
- How can the Army empower and demonstrate trust in leaders?
- How can the Army overcome the perception of treating leaders as guilty until proven innocent?

11. Reconsidering Officer Personnel Management System (OPMS) XXI (Strengthening the Profession of Arms)

In 1997, Chief of Staff of the Army General Dennis J. Reimer created the modern functional area system. The change was based on a perception that the old system required "field-grade officers to do too many things today for them to excel at any one of them." The old system tended to punish officers that served in their functional areas with lower promotion rates. Some argue, however, that OMPS XXI created a system of rigid stovepipes that inhibit a broader development of the officer corps, for both basic branch and functional area officers. This project considers whether OPMS XXI is the right model for officer development today.

- What alternate models could the Army consider? What are comparative strengths, weaknesses, opportunities, and threats of each? Consider flexible career time lines for critical jobs if officers served in both their basic branches and functional areas.
- See *Reconnecting Athens and Sparta: A Review of OPMS XXI at 20 Years* published as Association of the US Army Land Warfare Paper #114 in October 2017 for a starting point.

12. Understanding the Evolving Role of the Army Profession in Contemporary Conflict Environments (Strengthening the Profession of Arms)

The evolving role of the Army profession in contemporary conflict environments is a critical area of study that explores the changing nature of warfare and the challenges faced by the military in modern times. This topic delves into the complex relationship between the Army and contemporary conflict environments, including the impact of technology, evolving tactics, and the changing nature of threats.

- Impact of Technology: Discuss how advancements in technology have influenced the Army's role in contemporary conflict environments, such as the use of drones, cyber warfare, and precision-guided munitions.
- Hybrid Warfare: Explore the concept of hybrid warfare and its implications for the Army profession, including the blurring of traditional boundaries between conventional and unconventional warfare.
- Humanitarian Assistance and Peacekeeping: Examine the Army's involvement in humanitarian assistance and peacekeeping operations in contemporary conflict environments, highlighting the challenges and opportunities in such missions.
- Professional Ethics and Conduct: Consider the evolving ethical dilemmas faced by Army professionals in contemporary conflict environments, including issues related to civilian protection, rules of engagement, and moral decision making.
- Adaptation and Resilience: Discuss the Army's ability to adapt to evolving conflict environments, emphasizing the importance of resilience, flexibility, and innovation in facing new challenges.

13. Empowering Command Teams (Strengthening the Profession of Arms)

This research topic revolves around the strategies and frameworks aimed at empowering and enabling Army command teams to lead, manage, and inspire their units effectively. It delves into the various aspects of leadership, decision making, communication, and resource management essential for creating high-performing and adaptable command teams capable of meeting the dynamic challenges of modern warfare.

- Exploration of leadership development programs tailored for Army command teams
- Examination of decision-making processes and the psychological factors influencing command team dynamics
- Analysis of communication strategies and technologies for enhancing situational awareness and decision making in high-pressure environments
- Consideration of best practices for talent management, succession planning, and team building within Army command structures

14. Army Recruiting and Retention

This research topic focuses on the strategies, challenges, and outcomes related to the recruitment and retention of personnel within the Army. It delves into the analysis of effective recruitment tactics, talent acquisition methodologies, and the development of initiatives to boost retention rates and sustain a capable, motivated, and resilient force.

- Examination of the impact of socioeconomic, cultural, and generational factors on recruitment and retention efforts
- Analysis of innovative recruitment techniques and targeted messaging to attract diverse talent pools
- Exploration of retention incentives, career development programs, and initiatives to enhance job satisfaction and overall well-being among servicemembers (both enlisted and officer)
- Consideration of the long-term implications of recruitment and retention strategies on force readiness and organizational effectiveness

15. Telling the Army Story: "Branding"

This research topic focuses on the strategic communication and branding efforts aimed at effectively communicating the Army's narrative, values, and mission to internal and external stakeholders. It seeks to explore the role of branding, storytelling, and digital media in shaping public perceptions, building trust, and fostering a strong and authentic identity for the Army.

- Examination of the integration of brand messaging across traditional and digital media platforms

- Analysis of the impact of storytelling and personal narratives in conveying the Army's values and experiences
- Exploration of the use of branding to attract and retain talent, engage with diverse audiences, and foster a positive organizational culture
- Consideration of best practices and case studies from the military and corporate sectors to identify effective branding strategies for the Army's storytelling efforts

HEADQUARTERS, DEPARTMENT OF THE ARMY (HQDA) G-3/5/7

1. How Does US Involvement in UN Peacekeeping Preserve the Rules-based World Order within the Gray Zone of Strategic Competition?

In today's rapidly evolving global security landscape, the concept of the gray zone has gained prominence, representing actions and strategies that fall short of traditional physical hostilities but are aimed at gaining strategic advantages such as influence and economic dependence. Within this context, where strategic competition with Russia and China is escalating, the United Nations plays a crucial role in addressing these challenges. Therefore, there is a need to examine how US involvement in UN peacekeeping effectively preserves the rules-based world order within the gray zone of strategic competition below the level of armed conflict.

Recommendations from this study should help the United States adapt its strategies to address challenges within the gray zone of strategic competition with Russia and China effectively, ensuring the continued preservation of the rules-based world order. This study will serve as a valuable resource for policymakers, scholars, and practitioners seeking to address the critical challenges posed by America's strategic competitors as they operate in the gray zone, enhance US participation in UN peacekeeping, and maintain the current rules-based world order in the twenty-first century and beyond.

Research sponsor is HQDA G-3/5/7 US Military Observer Group (USMOG).

2. Biothreat Resilience of Institutional and Operational Forces

A review of current doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy (DOTMLPF-P) to identify near-term mitigation Courses of Action (COAs) that will increase the Army's institutional and operational ability to fight, win, and survive in biologically contaminated environments.

Recommended COAs should provide near-term solutions for mitigating the impacts of biothreats to the current Army and inform on the state of the Army's current war-fighting concepts.

Research sponsor is HQDA G-3/5/7 US Army Nuclear and Countering WMD Agency (USANCA).

3. Combatant Command and Army Service Component Command Exercise Costs

Examine and identify cost drivers of Combatant Command (CCMD) and Army Service Component Command (ASCC) exercises. Propose options to reduce costs.

By far the largest expense is transportation, followed by travel. A holistic look at exercise costs, costing models, and ways to reduce costs will inform on training, the Total Army, and readiness.

Research sponsor is HQDA G-3/5/7 Training Division (DAMO-TR).

4. The Impact of the Western Hemisphere Institute for Security Cooperation on Foreign Militaries

An examination and assessment of the education and training provided by the Western Hemisphere Institute for Security Cooperation (WHINSEC) for partner nations.

This study could inform on the investment and validity of Army training for foreign militaries in US Southern Command (SOUTHCOM) and potentially serve as a model for educational programs for partners in other regions/theaters.

Research sponsor is HQDA G-3/5/7 Strategy Division (DAMO-SSP).

5. Adversary Targeting with Proliferated Low Earth Orbit Intelligence, Surveillance, and Reconnaissance

Examine the adversary's ability to track and target friendly forces with proliferated low Earth orbit (pLEO) intelligence, surveillance, and reconnaissance (ISR) capabilities. Establish the ability to deny the adversary freedom of action in space to enable theater-level multidomain operations (MDO) and protect friendly forces.

This study informs on war-fighting concepts / emerging technologies.

Research sponsor is HQDA G-3/5/7 Space Operations Division (DAMO-SOS).

6. Space Targeting and Fires Synchronization System

Research and examine global and theater Army space control deconfliction requirements, including policies and resources, and make recommendations to the Space Operations Division (DAMO-SOS) regarding changes to the Department of Defense (DoD), US Space Command (USSPACECOM), Army policy and procedures, Space Situational Awareness, and command-and-control (C2) equipment requirements that would better enable Army space control units to conduct deliberate and dynamic space fires deconflicted in real time or near real time from USSPACECOM and other geographic combatant commands' space fires.

Provides actionable resourcing and policy requirements to enable real-time or near-real-time deconfliction of space fires increasing Army space control units' ability to support multidomain convergence while enabling centralized clearance of space fires into USSPACECOM's area of operations. A deconfliction capability for space fires that functions similarly to the Advanced Field Artillery Tactical Data System (AFATDS) would enable oversight of global space fires by USSPACECOM, allowing for the creation of more clearly defined space fires policies and procedures and ultimately allowing Army space control systems to serve as a Joint and multinational enabler for multidomain convergence in support of maneuver objectives. Access to a national database of vetted space targets and signals by this deconfliction system would further enhance the speed of Army support to Joint and multinational multidomain convergence.

Research sponsor is HQDA G-3/5/7 DAMO-SOS.

7. Army Space Marksmanship Range

Research and examine Army space control live-fire proficiency and training progression to inform requirements, including training, policies, and resources, and make recommendations to the Space Operations Division (DAMO-SOS) regarding changes to space control live-fire training progression, and identification of both internal and external resourcing, budgeting, and policy requirements that would better enable the function of Army space control live-fire proficiency gates.

Provides actionable resourcing and policy requirements to support Army space control live-fire proficiency gates to increase training value for space control units accessing the National Space Test and Training Center (NSTTC) during Joint and multinational exercises. An Army Space Marksmanship Range would enable greater integration of space control with combined arms maneuver exercises with US and multinational allies and partners, increasing interoperability when conducting multidomain convergence through the execution of command and control (C2) while synchronizing kinetic and non-kinetic fires with maneuver.

Research sponsor is HQDA G-3/5/7 DAMO-SOS.

8. Future of the US Army's Command and Control

Research how the US Army needs to change command and control (C2) (processes, organizations, and systems) or mission command philosophy to enable the application of capabilities to achieve convergence. Possible subtopics include: 1) values/limitations of artificial intelligence (AI) employment; 2) possible adversary war-fighting concepts, including how to contest friendly C2; 3) possible friendly Combined/Joint war-fighting concepts; and 4) methods for successful implementation of the proposed C2.

This research increases the Army profession's insights vis-à-vis future C2 of the Army.

Research sponsor is HQDA G-3/5/7 Strategy, Plans, and Policy Division (DAMO-SSP).

9. New/Expanding Roles for the 2040 US Army Enabled/Required by Technological/Geopolitical Trends

Research what new/expanding roles the US Army will play in 2040, which are enabled/required by technological/geopolitical trends. Possible subtopics include: 1) technological trends affecting relative utility/cost-effectiveness of ground-based assets/activities compared to corresponding space-, air-, or sea-based assets/activities with similar effects/purposes; 2) geopolitical trends affecting future Army roles; and 3) the implications for the future Army force structure.

This research increases the Army profession's insights vis-à-vis possible Army roles in 2040.

Research sponsor is HQDA G-3/5/7 Strategy, Concepts, and Doctrine Division (DAMO-SSP).

10. Sub-unified Command in US Indo-Pacific Command

This section includes research on the advantages/disadvantages of establishing a new sub-unified command to counter China in the Indo-Pacific. Possible subtopics include: 1) history of US command and control (C2) structure in the Indo-Pacific; 2) US options for C2 structure in the region; and 3) notable operational considerations in the region.

This research increases the Army profession's insights vis-à-vis possible US C2 structure in the Indo-Pacific.

Research sponsor is HQDA G-3/5/7 Strategy, Concepts, and Doctrine Division (DAMO-SSP).

11. Army Roles as a Foundational Joint Enabler in Protracted Conflict

Research what roles the Army, as a foundational Joint enabler, can/should play in a possible protracted conflict with China. Possible subtopics include: 1) history of US Army's roles in World War II; and 2) necessary changes to Army operations, activities, and investments (OAIs) to fulfill the identified roles.

This research increases the Army profession's insights vis-à-vis possible Army roles as foundational joint enabler in a possible protracted conflict.

Research sponsor is HQDA G-3/5/7 Strategy, Concepts, and Doctrine Division (DAMO-SSP).

US FORCES COMMAND (FORSCOM)

1. Great-Power Conflict

If the United States were to enter a major war in 3–10 years against an uncertain adversary in an agnostic area of responsibility (AOR), what lessons from recent or ongoing conflicts will have prepared America to fight and win? What if the foe were China or Russia? What if the battlefield were regional or global? How can the Army best balance addressing the People's Republic of China (PRC) as the pacing challenge and meeting its global responsibilities?

Research sponsor is FORSCOM.

2. Lessons Learned from Non-US Conflicts

How are the Ukraine, Gaza, and Nagorno-Karabakh conflicts different? Similar? What lessons can US military forces learn from these conflicts?

Research sponsor is FORSCOM.

3. The Character of Future War

Is the character of war changing? How will the changing character impact the war-fighting functions? How can the Joint Force conduct distributed command and control (C2) well on the future battlefield?

Research sponsor is FORSCOM.

4. Technology and Warfare

What technology is the most important for success on the future battlefield? What role will mission command, massing unmanned systems, electronic warfare, and quantum computing play on the battlefield in the next 5–15 years?

Research sponsor is FORSCOM.

US ARMY PACIFIC COMMAND (USARPAC)

1. Strategic Messaging and Shaping through Training

Combined exercises—from small-unit to operational formations—clearly message resolve while enhancing war-fighting competencies. Executed at both the Joint Multinational Readiness Center (JMRC) in US European Command (EUCOM) and the Joint Pacific Multinational Readiness Center (JPMRC) in INDOPACOM, Army Corps– and division-level command post exercises paired

with brigade-level ground maneuver exercises are critical to exercising tactical decision making and enhancing interoperability between multinational war-fighting formations. How are high-tactical exercises, such as those conducted at JMRC and JPMRC and regionally focused Warfighter exercises through the Mission Command Training Program (MCTP), facilitating and shaping strategy in campaigning? How can large-scale exercises—conducted in either US training areas or in host nations—tangibly enhance alliances and partnerships in the information sphere? What metrics define tangible enhancement of military alliances and partnerships in the Indo-Pacific?

Research sponsor is USARPAC G5.

2. Contested Sustainment at Range

Adversary anti-access / area denial (A2/AD) capability bubbles continue to expand and extend. American operational reach and endurance will continue to be challenged by adversaries who will generally enjoy interior lines in the areas most likely for large-scale combat operations (LSCO). How can the US Joint Force generate new options to overcome the challenges of sustainment in a renewed era of diplomatic and economic coercion for critical partners? How does posture evolve to permit consistency while avoiding targetability? How do Landpower forces prioritize efforts or determine thresholds to maximize readiness while distributing nodes to avoid overconcentration?

Research sponsor is USARPAC G5.

3. Preparing for Protraction

In large-scale combat operations (LSCO), the Joint Force commander must consider the enemy's ability to achieve local overmatch, challenging our ability to impose our military will and return to competition under advantageous conditions. While protracted conflict incurs significant strategic risk for US policymakers, protraction may be more politically or socially untenable for our adversary. In certain conditions, land forces can endure longer than other Joint forces. How can land forces generate options for policymakers in conflict that expand the battlefield without escalating strategic response? What preparations—active and/or passive—can be executed in campaigning oriented on protraction in conflict? How does strategic deception and information management shape protraction options?

Research sponsor is USARPAC G5.

EIGHTH ARMY

1. The Democratic People's Republic of Korea as an Emerging Global Actor

Research and examine if the Democratic People's Republic of Korea (DPRK) is becoming a global, rather than regional, actor through its relationships with Russia, the People's Republic of China (PRC), and Iran and its changing engagements across the Global South. Examine how these relationships have changed over time and how the DPRK is leveraging the Russia-Ukraine War and the Israel-Hamas War to achieve its strategic objectives.

Provide historical context to contrast with the current situation. Is the DPRK's support to Russia providing it with a platform to increase its export of weapons, munitions, and technology globally? How are the DPRK and Iran partnering to achieve their strategic objectives?

Research sponsor is Eighth Army G2.

2. Noncombatant Evacuation Operations in Korea

Research and examine "[t]he optimal military force structure for a [noncombatant evacuation operations] NEO operation in Korea given current units on the peninsula." Examine how this operation would compare with historic NEO missions (in Africa, Afghanistan, and Vietnam), and how critical diplomatic and strategic issues, including the evacuation of Russian and People's Republic of China (PRC) noncombatants, will impact a US-led NEO in Korea.

Provide metrics and historical context so that Army senior leaders have a holistic view of the magnitude of this operation. How should the need for supporting forces from outside Korea be balanced with avoiding conflict escalation? Multiple countries will request support for this NEO, to include United Nations Command (UNC) Member states, NATO members, and US Indo-Pacific Command (INDOPACOM) partners.

Research sponsor is Eighth Army G35 NEO.

STRATEGIC STUDIES INSTITUTE
US ARMY WAR COLLEGE

US ARMY EUROPE AND AFRICA (USAREUR-AF)

1. Reconstitution during Large-Scale Combat Operations

As the speed, range, and accuracy of weapon systems makes the battlefield more lethal, the need for the US Army to reconstitute units during large-scale combat operations (LSCO) is more necessary now than in the last 20 years of counterinsurgency (COIN). Russian capabilities (like hypersonic weapons), rhetoric (to use nonstrategic nuclear weapons), and will (to protract conflict) make it necessary that the Army plan how to reorganize, regenerate, and redistribute. How can reconstitution happen at the speed and scale necessary to fight and win against peer adversaries?

US Army Europe-Africa has 7th Army Training Command to provide ready, trained, and equipped forces in theater. 1st Army provides mobilization, readiness, and training to reserve component forces. US Forces Command (FORSCOM) trains and prepares deployable US Army forces. What organization is responsible for developing plans and training for reconstitution from fort to assembly area? Some activities may take place in the continental United States (CONUS), while other activities may take place in theater. Informs requirements for a Headquarters, Department of the Army (HQDA) "Service Support Plan" to an Army Service Component Command's (ASCC's) "Component Support Plan" to a Combatant Command's (CCMD's) "Contingency Plan."

2. Span of Control

What are the limitations of assigning more responsibilities to the same commander and command during competition, crisis, and conflict? Do the benefits of having one commander responsible for two different combatant commands outweigh the costs? Do the benefits of having one person command a US command and a NATO command outweigh the costs? Is this relationship optimal in competition? Will this relationship be suboptimal during the transition to crisis and conflict?

Currently, the commanding general (CG) of USAREUR-AF is dual hatted as the NATO – Commander Allied Land Command (LANDCOM). In competition, that means one commander is the Army Service Component Command (ASCC) to US European Command (EUCOM) and US Africa Command (AFRICOM) while also being the Land Component commander to Supreme Headquarters Allied Powers Europe (SHAPE). In crisis and conflict, that same commander also must generate two "field armies" to command and control two sets of multi-corps. In total, one commander (two staffs, US and NATO) must perform five different and unique mission sets. While this command relationship worked for the Global War on Terror (GWOT), did this command relationship work for General Douglas MacArthur during the Korean War as the commander of United Nations Command (UNC) while retaining his position as commander in chief of Far East Command (FECOM)?

3. Prospects for the Offense in Large-Scale Combat Operations on Land

Research and examine trends and developments in Ukraine to inform the search to develop the capability/capacity to achieve tactical and operational success in offensive large-scale combat operations (LSCO). Identify sources of relative advantage in future offensive operations.

The current state of play in Ukraine favors the defense. Preparing for successful offensive operations, especially in a counteroffensive context, is vital to Ukraine, the United States, NATO, and allies worldwide in maintaining credible deterrence. Inform updates to: the *Army Future Operating Concept*; *Operations*, Army Doctrine Publication 3-0; and *Operations*, Army Field Manual 3-0.

4. Allied Military Assessments

Research and examine a way to analyze allied and partner military capabilities in a holistic way that is easily accessible to Army operational planners.

Provide a new methodology to inform allied and partner running estimates in Europe and the Pacific as priority theaters. These estimates can inform plans, war games, security cooperation, and senior leader engagement. This resource should inform exercises like the Warfighter series and be widely available.

Research sponsor is USAREUR-AF G5.

5. Modeling Air-to-Ground Combat Power Effects in the Generation 5 Era

Research and develop useful models for how the air domain can assist ground forces with close air support (CAS) and aerial interdiction (AI) to help understand the Air Force's new structure and for allies (mixed Generation 4 and Generation 5 airframes). Detailed analysis using historical data and simulations of new capabilities should be used to forecast possible future effects.

Following the end of AirLand Battle doctrine and the fall of the Soviet Union, threat/adversary air defense capabilities and the munitions, airframes, and doctrine of allied forces have changed. A new mathematical model could assist Joint and service planners understand requirements (for example, sustainment), understand the effects on the Correlation of Forces and Means (COFM), and help inform acquisitions.

Research sponsor is USAREUR-AF G5.

6. Modeling Multidomain Operations Effects

Research and develop useful models for how to abstract the effects of new multidomain operations (MDO) capabilities (such as machine learning, sensor fusion, and hypersonics) and traditional non-kinetic effects (such as information, deception, and cyberattacks) to inform large-scale combat operations (LSCO).

The current understanding of MDO effects is limited across the Joint Force and often compartmentalized into silos of excellence. Developing a means to estimate and account for possible effects can help planners make informed decisions, plan defense activities against adversary actions, and inform Army force structure/basing decisions.

Research sponsor is USAREUR-AF G5.

US ARMY NORTH (ARNORTH)

1. Evolving Threats to the Homeland

Emerging technologies are being developed and employed across multiple domains. Artificial intelligence (AI), biotechnology, robotics, cyber and space attacks, and similar technological advances are projected to play a part in future conflicts. These technologies will be employed against the American public, critical infrastructure, and the Joint Force's ability to project force from the homeland to other theaters, and in ways that we do not yet anticipate. How will emerging technologies impact defense of the homeland? Desired objectives: 1) identify new vulnerabilities emerging technologies will exploit, prioritized by the impact on the homeland; 2) recommend operations, activities, and investments (OAIs) that will enable the land force to mitigate the impact of the most significant threats from emerging technologies; and 3) assess whether emerging technologies requires a paradigm shift within the land force.

Research sponsor is ARNORTH.

2. Force Structure in Homeland Defense

In the event the Army mobilizes, there is a need to mobilize quickly, but a significant number of key enablers reside in the Army National Guard (COMPO 2) and Army Reserve (COMPO 3). These enablers are critical to both projecting forces forward and defending the homeland.

- How should Army North structure forces to ensure timely response and mission success?
- Consider overall force structure, as well as component (COMPO) balance.
- For further consideration, how does the current recruiting crisis impact force structure, and how can that be mitigated?

Research sponsor is ARNORTH.

3. Defense of Critical Infrastructure

This question focuses on how the Department of Defense (DoD) can ensure the protection of infrastructure critical to military operations and domestic resilience. Assess current and emerging US adversary capabilities, to include violent extremist organizations (VEOs), transnational criminal organizations, and domestic threats that pose a threat to defense critical infrastructure within the US homeland. Make recommendations on investments that can harden DoD critical infrastructure and policy and authorties changes that can enable the protection of non-DoD critical infrastructure.

Research sponsor is ARNORTH.

US ARMY SOUTH (ARSOUTH)

1. Instability

How might near-peer competitors create or exploit instability in Central/South America and the Caribbean to threaten the homeland due to its proximity? What measures can the Department of Defense take to reduce or eliminate these threats?

Research sponsor is ARSOUTH.

2. Posture Limitations

How should US Southern Command (SOUTHCOM) advocate for a change to its posture, in terms of forces, footprints, and agreements, to balance between posture limitations imposed by strategic guidance and growing investment/influence by near-peer adversaries? Analyze the current posture and recommend proposed changes, consolidation, and/or expansions by 2040.

Research sponsor is ARSOUTH.

3. Themes and Messages

How can Army commands incorporate themes and messages into the operations process to synchronize engagements that are mutually supportive at multiple levels of influence?

Research sponsor is ARSOUTH.

4. Antarctic Strategy

Learn lessons from developing the Artic strategy with its challenges of adjudicating roles and responsibilities within the Department of Defense (DoD) and three combatant commands, devise a framework for an Antarctic strategy that resolves the increasing security and military implications from a region where resources, location, and potential military uses draw interest from near-peer adversaries.

Research sponsor is ARSOUTH.

5. Diverging Interests

How do theater armies reconcile the difference between partner nations' objectives (counterdrug and counter transnational criminal organizations [CTCOs]) with those of DoD requirements (large-scale combat operations [LSCO], all-domain warfare, modernization)?

Research sponsor is ARSOUTH.

US ARMY CYBER COMMAND (ARCYBER)

1. The Potential Conflict of Department of Defense Cyber-centric Operational Plans and Unexpected National Demands Responding to a Massive Cyberattack against US Whole of Society

US Cyber Command (USCYBERCOM) and its cyber service components conduct deliberate Operation Plan (OPLAN) development in support of prioritized combatant commands' requirements. If the United States suddenly suffered a large-scale domestic cyberattack affecting the national economic base or compromising the safety and security of the US population at scale, what is the predicted impact upon limited DoD cyber capabilities and associated planning for crisis and conflict?

This project should consider the possibility of a rapid, dramatic re-prioritization of limited DoD cyber forces for whole-of-society (WoS) support and the subsequent impact upon Army Service Component Command's (ASCC's) deliberate operational planning. While allowing for possible attack scenarios, this project is not focused on "what happened" but on "what is the impact to deliberate cyber-centric crisis and conflict planning," especially for an ARCYBER OPLAN and contingency planning.

Research sponsor is ARCYBER.

2. How Can We Optimize and Standardize Cyber Capability Assessments of Partner Nations and Use the Assessments to Build Partner Capacity and Partner-Nations' Cyber Resilience?

Research who conducts the assessments, how they are conducted, and the resulting products. Recommend follow-on steps and tactics, techniques, and procedures (TTPs) to inform the combatant commanders responsible for cyberspace security cooperation activities how they can improve Building Partner Capacity (BPC), especially for cyber security. Also, explore the utility of Security Cooperation Cyber Roadmaps and the roadmaps' ability to influence resourcing, increase interoperability with partner nations (PNs), and contribute to US strategic interests.

With limited resources, ARCYBER builds cyber-centric partner capacity on a global scale in support of US geographic combatant commands and USCYBERCOM. Ultimately, US Army War College–sponsored research is useful if it helps our command prioritize limited capacity in support of strategically important PNs.

Research sponsor is ARCYBER.

3. The Diminishing Value of Geographically Aligned Combatant Commands

Research and examine "Have geographically aligned combatant commands outlived their utility as transregional capabilities and risks continue grow?" This research project should assess if the founding tenets and assumptions made in the creation of geographically aligned combatant commands remain valid in the modern era where key functional warfare capabilities like cyber, space, Special Operations Forces (SOF), and transportation have been segregated and the range of fires has extended beyond geographic boundaries.

This research project should specifically explore if threat- or adversay-aligned Joint Task Forces (JTFs), per *Joint Operations*, Joint Publication 3-0, would be a more efficient way to manage the full spectrum of capabilities in multidomain operations (MDOs). Additionally, this project should assess the value of establishing and maintaining standing threat focused JTFs and/or standing responsive JTFs. Specifically, the research should be designed to highlight how we can gain advantage and reduce any advantage wielded by adversaries or malicious actors.

Research sponsor is ARCYBER.

4. The Cost of Not Separating Sensitive but Unclassified from Non-secure Internet Protocol Routing (NIRP) Networks in Major Combat Operations

Research and examine "[t]he operational tactical costs of not splitting [Non-secure Internet Protocol Routing] NIPR into a [sensitive but unclassified] SBU and Open Traffic network" in major combat operations with a near-peer adversary. This research project will inform requirements, resources, policies,

programming, and/or budgeting to improve unclassified cyber capabilities and services in multidomain operations (MDOs).

This research will explore various employment schemata to provide war fighters a resilient and survivable SBU capability in major combat operations against a near-peer adversary. This project should not solely focus on how not separating the information across networks could be accomplished but, rather, explore how different options would perform in a contested environment during major combat operations with a near-peer adversary. Specifically, the research should highlight how the United States can gain advantage and reduce any advantage wielded by adversaries or malicious actors.

Research sponsor is ARCYBER.

5. Secure Computing during the Quantum Dawn

Research and examine "[r]isks and advantages of quantum computing to National Security Systems (NSS), Weapon Systems, and Defense Critical Infrastructure (DCI)" to determine causal factors to inform requirements, including the need for resources and make a recommendation on required changes to policies, programming, and/or budget.

This research will examine the role of quantum computing in information and information system (IS) security while data are at rest or in transit or during processing from a friendly and adversary perspective. This project should explore asymmetrical means to quantum harden legacy systems rapidly in response to a technological leap in adversary capabilities. Specifically, the research should highlight how we can gain advantage and reduce any advantage wielded by adversaries or malicious actors.

Research sponsor is ARCYBER.

6. Zero Trust against the Advanced Persistent Threat

Research and examine "[t]he risks and advantages of Zero Trust architecture against the Advanced Persistent Threat [APT]" to inform policies, requirements, resources, and procedures quantitatively.

This research project will examine the methodology required to ensure APTs are removed and prevented access to critical Identity, Credential, and Access Management / Identity and Access Management (ICAM/IdAM) elements inherent to role-based access in Zero Trust Architectures (ZTAs). Additionally, this research should explore opportunities, techniques, and policies required to ensure ZTAs are developed, procured, operated, and defended in a manner in which malicious cyber actors can be detected and contained. Specifically, the research should highlight how we can gain advantage and reduce any advantage wielded by adversaries or malicious actors.

Research sponsor is ARCYBER.

7. Artificial Intelligence (AI): Ethical Dilemma of AI-Informed or AI-Driven Effects

Research and examine "[t]he ethical dilemma of employing AI-informed or AI-driven effects" to determine causal factors to inform requirements, and resources required to shape policies and procedures to inform design and procurement of AI-informed or AI-delivered effects.

This research project will examine the ethical factors in using AI in the development and/or delivery of kinetic and non-kinetic effects. This project should provide recommendations on changes to ensure the ethical use of AI, to include changes in procedures and policies like rules of engagement (ROE) and the Office of the Director of Operational Test and Evaluation (DOT&E) certifications. Specifically, the research should highlight how we can gain advantage and reduce any advantage wielded by adversaries or malicious actors.

Research sponsor is ARCYBER.

8. Artificial Intelligence: Leveraging Automation in Network Defense

Research and examine "the employment of artificial intelligence (AI) informed automation in the defense of our networks to counter AI improved adversary agility and capability."

This research will examine the use of AI in the automation of network defenses and its associated risks and benefits. This project should explore risks associated with counter-AI capabilities and challenges/requirements to US force structure to maximize the utility of AI-informed automation. Specifically, the research should highlight how we can gain advantage and reduce any advantage wielded by adversaries or malicious actors.

Research sponsor is ARCYBER.

9. Cyber Warfare in the Tactical Environment

Research and examine "which elements of cyber have a tactical advantage in the forward battlespace" to inform requirements, resources, policies, programming, and/or budgeting to improve cyber capabilities in multidomain operations (MDOs).

This research will explore various employment schemata to provide war fighters tactical cyber capabilities and determine which elements of the cyber forces would benefit from being moved forward in the battlespace. This project should look at all aspects of cyber, to include cyber and electromagnetic activities (CEMA). Specifically, the research should highlight how we can gain advantage and reduce any advantage wielded by adversaries or malicious actors.

Research sponsor is ARCYBER.

10. The Signal Force at Echelon in a Contested Combat Environment

Research and examine "which elements and skills of Signal Force are required to deliver the Joint Force the required tactical advantage in the contested forward battlespace" to inform requirements, resources, force structure, training, programming, and budgeting to deliver signal capabilities in contested multidomain operations (MDOs).

This research project will explore various employment schemata to provide war fighters tactical signal capabilities and determine which elements of the signal force are required at echelon in the contested forward battlespace. This project should look at all aspects of signal, to include terrestrial and satellite communications, network capabilities, and spectrum management in Joint and coalition environments. Specifically, the research should be designed to highlight how we can gain advantage and reduce any advantage wielded by adversaries or malicious actors.

Research sponsor is ARCYBER.

11. Coalition Operations in Cyberspace: How Does the United States Bring Coalition and Allied Capability to Bear in Cyberspace across the Competition Continuum?

Research and examine "Coalition Operations in Cyberspace" to inform requirements, resources, training, programming, and budgeting to deliver cyber capabilities and services in coalition multidomain operations (MDOs).

This research will explore cyber operations in combined operations with one or more coalition partner. This project will address challenges in information sharing, information security, and integrating disparate cyber capabilities. In addition to interoperability with US forces, this project should explore interoperability between partners as it relates to combined operations. The research should highlight how we can gain advantage and reduce any advantage wielded by adversaries or malicious actors.

Research sponsor is ARCYBER.

12. Cyber and Electronic Warfare (EW) Training Objectives at the Combat Training Centers: How Do We Optimally Integrate Cyber and EW Training Objectives into Major Exercises to Simulate a Denied, Degraded, Intermittent, and Limited (DDIL) Environment without Impacting Other Maneuver/Fires Training Objectives?

Research and examine "Cyber and EW Training" to inform requirements, resources, training, programming, and budgeting to deliver cyber capabilities and services in coalition multidomain operations (MDOs).

This research will explore how we optimally integrate cyber and EW training objectives into major exercises. Additionally, this project should explore how the DDIL environment can be simulated without impacting other maneuver/fires training objectives. This project should consider challenges of performing cyber and spectrum operation in the United States and likely operational environments and how differences in regulatory controls impacts readiness to drive executable recommendations. Specifically, the research should highlight how we can gain advantage and reduce any advantage wielded by adversaries or malicious actors.

Research sponsor is ARCYBER.

13. Major Combat Operations in the Transparent Battlefield: Emissions and Signature Controls

Research and examine "emissions and signature control on transparent battlefield" to inform tactics, techniques, and procedures (TTPs), requirements, resources, and training to hinder adversary use of the Internet of Things (IoT) and electromagnetic compromise of friendly force maneuvers.

This research project will explore operations in transparent battlefield of modern interconnected sensors. Specifically, this project will explore means to emissions and signature controls in the IoT and electromagnetic sensor battlespace. The researcher shall explore tenets of operations security (OPSEC) and military deception (MILDEC) as they apply to the modern urban warfare in an ever-increasingly sensor-laden battlespace in which every camera, phone, and antenna can be used to compromise friendly force maneuvers. Specifically, the research should highlight how we can gain advantage and reduce any advantage wielded by adversaries or malicious actors.

Research sponsor is ARCYBER.

14. Building the Army's Operational Technology with Security Baked In: Monitoring and Securing the Army Operational Technology

Research and examine Army Operational Technology (OT) to inform requirements, resources, training, programming, and budgeting to deliver capabilities and services that are monitorable, resilient, and secure.

This research project will explore how the Army will procure, modernize, and field operational technology (OT) in its weapon systems, facility-related control systems, platform control systems, and civil works to provide war fighters the visibility, security, and resiliency required for modern multidomain operations (MDOs). This project should explore how the Department of the Army (DA) should ensure all procurements, across all levels (that is, Joint-, DA-, service-, and unit-level procurements), bake in the capability to provide OT visibility and security with their programs. Additionally, researchers should provide recommendations on how the Army should manage, mandate,

and monitor its OT capability and authority. Specifically, the research should highlight how we can gain advantage and reduce any advantage wielded by adversaries or malicious actors.

Research sponsor is ARCYBER.

US ARMY RESERVE (USAR)

1. Innovative Recruiting of Reserve Soldiers

Analyze the impact and effectiveness of current USAR recruiting initiatives. Think of how modern attitudes toward military service and work-life balance challenge our ability to recruit talent. Suggest innovative ideas to change public attitudes and perceptions about the military, update our recruiting incentive structure, and refine our value proposition to appeal to new generations.

Research sponsor is the Office of the Chief of Army Reserve.

2. Integrating Reserve Soldier Civilian Skills and Talents

How can the US Army Reserve leverage and integrate the wealth of civilian skills and talents in its force to enhance our fighting readiness? Explore how the Army can integrate emergent civilian skills and technology into the force as we look to warfare in 2030/2040. Among others, specialty areas of consideration are cyber, space, artificial intelligence (AI), data science, and unmanned aircraft systems / counter-unmanned aircraft systems (UAS/cUAS). Discuss policy reforms and adaptations needed to enable integration.

Research sponsor is the Office of the Chief of Army Reserve.

3. An Enhanced Reserve Service Model

Our current reserve models date to a different era of strategic challenges and technological developments. Ponder whether our reserve structure and service model maximize our available talent, technology, financial, and materiel resources. Study different reserve service models implemented by our international partners and suggest ideas that, if enacted, could make the Army Reserve more efficient and combat ready. Consider the feasibility, acceptability, and suitability of ideas from both policy and Department of Defense (DoD) perspectives.

Research sponsor is the Office of the Chief of Army Reserve.

4. Adapting the Army Force Mix to the Challenges of the Twenty-First Century

The 1993 Active Component–Reserve Component Offsite Agreement has outlined the Total Army force mix for the last 31 years. Today's global strategic environment has evolved from the early 1990s. Faced with strategic competition on several fronts, the Army has refocused on preparations for large-scale

contingency operations. Accordingly, the Army should consider a review of a component (COMPO) force mix to ensure feasible execution of operational plans Time-Phased Force Deployment Data (TPFDD) capabilities. Consider all stakeholders, develop a plan of action and milestones, and recommend a more effective and resilient force mix to support today's strategic environment.

Research sponsor is the Office of the Chief of Army Reserve.

5. Rethinking the USAR Equipment Management Process

The USAR equips and sustains more than 1,900 units at more than 800 locations across the continental United States (CONUS) with limited full-time support personnel. This dispersed and lightly manned construct creates unique challenges in the equipment management process. Explore avenues to make the process more efficient and effective.

Research sponsor is the Office of the Chief of Army Reserve. Research should examine the fielding and distribution of new equipment, maintenance of on-hand equipment, and the redistribution and turn-in of excess equipment.

6. Transforming in Contact: Shaping the Army Reserve for 2040 and Beyond

The Army designed itself to go to war with all three components, resulting in the Total Army possessing limited strategic depth for protracted conflict. From manpower to capabilities, the Army Reserve has been optimized for limited duration contingency operations and faces challenges across doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy (DOTMLPF-P) for the demands of large-scale combat and mobilization operations. To meet future requirements and adapt to the changing character of the war, what force structure and resourcing decisions should the Army Reserve (in conjunction with the Army) make now, and, if not made, what are the associated risks? How will those risks impact the Army Reserve's ability shape itself for Army 2040 and beyond? Research should also consider how to transform the Army Reserve in contact (balancing readiness and modernization), must integrate recommendations as part of a Total Army solution (considering multidomain operation [MDO] challenges), and explore how current reserve component authorities (such as Title 10, mobilization, and the National Defense Authorization Act [NDAA]) direct requirements or create limits that impact adapting the Army Reserve's roles, responsibilities, and capabilities for the future

The Army Reserve has evolved over the past three decades from a strategic to operational reserve, becoming increasingly functional (combat support / combat service support) and, therefore, indispensable for the Total Army to function. Its structure, personnel, equipment, and training remain rooted in legacy doctrinal concepts, however, and are not being modernized sufficiently to meet anticipated demands of multidomain operations in a contested environment. Further, force structure and risk tradeoff decisions have placed the preponderance of critical

sustainment capabilities (for example, petroleum, theater opening, and ammunition handling) almost entirely in the Army Reserve, and current force generation and deployment challenges mean it is unlikely the Army Reserve can meet planned force employment time lines.

7. Positioning and Manning the Army Reserve for the Future

Research and examine the correlation between unit location and manning to determine how it impacts Army Reserve readiness. Aside from moving units, or changing unit type, how can the Army Reserve improve its manning policy and stationing process to increase recruiting/retention and contribute to improved unit level readiness? Research should consider how moving locations and/or reassigning USAR soldiers to fill critical positions could impact readiness and potentially mitigate recruiting/retention competition with components (COMPO) 1/2.

Army Reserve units typically lack a full complement of deployable, organic soldiers, requiring aggregation to meet mission requirements. Additionally, Army Reserve units commonly possess such low manning that they are not capable of collective training, and a large-scale combat operation / large-scale mobilization operation (LSCO/LSMO) event may force the acceptance of undertrained units moving forward—creating risk to the force and mission.

8. Army Reserve Sustainment Force Design Optimization

With the incorporation of automation and technological innovations, can Army Reserve sustainment units undergo a force design optimization effort that consolidates potentially excess headquarters and reduces unit manning without sacrificing sufficient capacity and capability to accomplish missions? Examine how the Army's transition to focus on large-scale combat operations (LSCO) impacts Army Reserve sustainment capabilities, capacity, processes, and procedures. Research should also consider the modernization of technology and equipment and how the integration of new capabilities has reduced manning impact maintenance and training requirements.

The Marines began the Infantry Battalion Experiment (IBX) in 2020 to see if they could rework infantry battalions to be smaller but trained to use a variety of weapons in a distributed environment. The US military continues to shrink, and there are significant challenges in recruiting and retention that could lead to the need for modernizing military units to undergo a reduction in personnel with a corresponding loss in capability/capacity. Similarly, research could consider how the IBX model applies to other units/capabilities across the war-fighting functions.

9. Army Reserve Integration in Joint Campaigning

As the Army transitions to prepare for large-scale combat operations (LSCO), how can the Army Reserve support better integration of its capabilities into combatant command and Army service

component command campaigning efforts? How can the Army Reserve prepare (train, man, and equip) for this integration? What will it take to prepare Army Reserve forces to support Joint posture, exercises, operations, and, if training in the theater, provide forces capable of rapidly transitioning to multidomain operations (MDOs) during a crisis/contingency? Research should consider the tradeoffs required and risks to mission and force from the perspective of both increasing and decreasing reliance on Army Reserve participation in campaigning efforts.

Each combatant command has a small Army Reserve element, and remnants of Joint Forces Command (JFCOM) exist as either the Joint Enabling Capabilities Command or the Joint Training Reserve Unit. These elements are not always "assigned forces," nor are Joint Force commanders confident enough in how to employ these assets in campaigning (beyond staff augmentation for large command post exercises). Additionally, many unique skills gained through civilian employment/education in science, technology, engineering, and mathematics (STEM), cyber, space, communications, and industrial logistics industries remain untapped in an increasingly connected landscape.

US SPACE COMMAND (USSPACECOM)

1. Emergent Space Conflict Theory and Policy

How should USSPACECOM prepare to fight a future space war? What changes are needed in existing Department of Defense (DoD) policy, strategy, doctrine, theories, and organizational form/function?

Research sponsor is USSPACECOM.

2. The Trinity of Multidomain Conflict

Explore the idea that future conflict may center on space, cyberspace, and special operations forces. How would such a conflict function? What changes are needed for US and allied security organizations to shift to this context?

Research sponsor is USSPACECOM.

3. Strategic Design of USSPACECOM

While well on its way to being stood up, the fluidity of the organizational design of USSPACECOM offers a once-in-a-century opportunity. This study would examine whether the United States is making the most of this unique era and proposes subtle and radical organizational changes, to improve the effectiveness of space war fighting.

Research sponsor is USSPACECOM.

4. Adapting to Advance Missile Warning Threats

Due to the changes and adaptability of new adversary threats, our detection, tracking, and display systems/capabilities (satellites, radars, and common operating picture [COP]) must be able to address our adversaries' abilities.

Research sponsor is USSPACECOM.

5. First Strike Instability in Space and Escalation Control

Because of the unstable nature of first-strike instability, there is a pressure to escalate to kinetic activity in the space domain during the competition-conflict transition. Current escalation frameworks do not account for space domain instability in the broader geopolitical context.

Research sponsor is USSPACECOM.

6. The Role of Novel Orbits in Generation-after-Next War Fighting

US military systems have been largely confined to operating in low Earth and geosynchronous orbits. This study would examine how a range of alternative orbits (including cislunar and heliocentric) might impact providing space services and space control both positively and negatively.

Research sponsor is USSPACECOM

7. Hostile Intent and Hostile Act

Examine how lessons from other domains can inform determining hostile intent and hostile act for space engagements. Examine how hostile intent is determined for other domains and what systems and processes might be changed to improve the accuracy and timeliness of determining hostile intent for space operations.

Research sponsor is USSPACECOM.

8. Megaconstellations

The use of megaconstellations comprised of small satellites is on the rise, commercially and internationally. These constellations impact the space area of operations and challenge our ability to maintain space domain awareness.

Research sponsor is USSPACECOM.

9. Proliferation of Commercial, Civil, and Military Space Systems

Understand what it would mean to have 10,000, 100,000, or 1,000,000 satellites in orbit from a military perspective. Include aspects such as fog of war (how does SDA change), command and control (C2), autonomy, and impact to terrestrial services.

Research sponsor is USSPACECOM.

10. The Road to Norms of Behavior for Space

How is space the same/different, and can we get to stability faster than other domains? Examine how norms of behavior developed in other domains and how this information might aid in developing norms for space.

Research sponsor is USSPACECOM.

11. Alternative Futures for the Extraterrestrial Battlespace

Examine the future of space warfare through the lenses of technology, policy, and evolving space applications. Alternative futures (for example, mining the asteroids/moon, a competitor passes us, and avenues of technological surprise) would be examined to see where the United States would find the most military advantages and disadvantages.

Research sponsor is USSPACECOM.

12. Terrestrial Response Options for Space Aggressions

Determine how to deter space aggressions using terrestrial actions. It is typically difficult to apply diplomatic, informational, military, and economic (DIME) deterrence actions to transgressions in the space domain.

Research sponsor is USSPACECOM.

13. Space Deterrence Theory

Examine the similarities and differences for how aggression is deterred in other domains as compared to space. Key differences might be that there is rarely a direct loss of life and greater difficulty collecting international interest in deterring space aggression.

Research sponsor is USSPACECOM.

14. The Global Proliferation of Positioning, Navigation, and Timing

Alternatives to GPS are proliferating, offering the United States and its adversaries new opportunities and challenges in the positioning, navigation, and timing (PNT) battlespace of the future. This study would plumb the depths of how this proliferation of PNT affects the future of warfare.

Research sponsor is USSPACECOM.

15. Replacing GPS for US Positioning, Navigation, and Timing Requirements

Study alternatives to replacing GPS technologically, sociologically, commercially, and militarily. Even if technology does not exist, extrapolate how "if" statements might impact dimensions of the positioning, navigation, and timing (PNT) user community, particularly the military community.

Research sponsor is USSPACECOM.

16. Informational Silos from Classified Programs

The rate of technological convergence and information availability has transformed commercial industry. US reliance on classification to provide strategic advantage has always been seen as a strength, but with the rate of change increasing, it is possible that the siloing of information may prove a strategic disadvantage. This study will seek to expose disadvantages to slowing information flow caused by classification or other barriers.

Research sponsor is USSPACECOM.

17. Terrestrial Response Options for Space Aggressions

Operationalizing space deterrence: what is an effective strategy for deterrence? How should the United States enable integrated deterrence in the space domain? How should space deterrence properly nest within national objectives, policy, and deterrence as a whole? What considerations are senior leaders not considering that would complement current trajectories?

Research sponsor is USSPACECOM.

18. Enabling Commercial Integration

How should the Departmet of Defense adapt its business model to the rapid life cycle of innovation and emerging technology? Balancing capability, time, and control, how can the Department of Defense mitigate bureaucratic impediments that delay modernization plans? How is space different from the terrestrial domains regarding commercial integration? How does

the DoD go beyond materiel solutions in partnerships with the private sector to leverage and strengthen the National Security Innovation Base effectively?

Research sponsor is USSPACECOM.

19. Civil Enterprise Assumption of Space Situational Awareness

The transition for Space Situational Awareness to be monitored by civil entities is taking too long. What impact does situational awareness have on Department of Defense members in cost and manpower? What are the major hurdles institutionally, organizationally, legally, and internationally? What are the consequences if this transition takes too long for USSPACECOM, the Department of Defense, and other stakeholders? How might this problem be resolved or a faster solution implemented outside existing or traditional approaches?

Research sponsor is USSPACECOM.

20. Commercialization

What are the pros and cons of commercialization of space from a military perspective? Starlink provided critical support to Ukraine during the Russia-Ukaine War, but it was later restricted by the company. Commercial imagery provides timeliness and high-resolution imagery, but it is expensive. Department of Defense use of commercial imagery ebbs and flows, to the great frustration of the commercial satellite communications industry. Can the Department of Defense rely on commercial capabilities? Should the Department of Defense rely on commercial space? If so, which capabilities or services? If not, why not? Does the Department of Defense need new standards or procedures for the use of commercial space such as, but not limited to, mandatory radiation hardening? Development of turn-key ground systems? Spare satellites or lift? How do we manage or leverage escalation by using commercial capacity during conflict?

Research sponsor is USSPACECOM.

21. Arctic Conflict and Space

What would conflict in the Arctic look like from a space perspective? What should the Department of Defense, civil authorities, and US Space Command do to prepare for conflict in the Arctic? Northern latitudes provide advantages and disadvantages for space operations. How do we exploit the advantages and mitigate the disadvantages of latitude, extreme weather, and limited infrastructure? What alternatives to space should the Department of Defense consider for Arctic operations?

Research sponsor is USSPACECOM.

22. Non-state Actors versus the United States, et al.

In the spirit of the British East India Company and the Dutch West India Company, how should the United States combat a hostile non-state actor in space? What would the threat look like? What might trigger a conflict? Would it necessarily be the United States versus the company? What military and nonmilitary options exist?

Research sponsor is USSPACECOM.

23. Quantum Theory and Warfare for the Space Domain

Quantum computing, encryption, and other more exotic possible applications are rapidly moving from the hypothetical into the theoretical and small-scale validation on a range of quantum applications in defense and national security. Space will play an important role in future quantum applications. How should USSPACECOM and the Department of Defense prepare changes in strategy, doctrine, operations, procurement, and other areas for how quantum will transform future conflict environments?

Research sponsor is USSPACECOM.

24. Human-Machine Teaming, AI in Sophisticated Narrow and (Theoretical) General Configurations for Space Applications

Artificial intelligence is a profound and disruptive field impacting virtually all aspects of societies. The accelerated yet still ill-defined future for human-machine relationships, teaming in security applications, and the long-term strategic, ethical, legal, and moral impacts of sophisticated AI (narrow, but potentially even general) posit new questions for the space domain. How does space present particular challenges with respect to AI and human security activities?

Research sponsor is USSPACECOM.

25. Autonomous Weapon Systems in the Space Domain

Autonomous weapons systems (AWS) in the space domain presents new and challenging problems for how USSPACECOM, commercial enterprises, and other actors may seek to safeguard or defend space activities, commerce, and societies using ever-increasingly sophisticated AI and human-machine teams. The space domain is unique in the vast scale and celestial conditions that differ from terrestrial contexts. How will AWS employment by friendly, adversarial, and commercial entities occur in space, and how should USSPACECOM implement new designs now to prepare for these considerations?

Research sponsor is USSPACECOM.

26. Radical Space Technology

Considering the space elevator and how it might impact future security contexts in space: The space elevator has been prophesized for decades, yet despite most of the components for such a device now being demonstrated as theoretically viable on a small-scale and in simulations, no major government or investment group has committed fully to building one. China, Japan, and US private industry have declared intents, and new advances in nano-carbon and other technologies suggest a space elevator could be created in the coming decades. How would such a device impact society, and how would USSPACECOM cooperate in Joint and partnered configurations to secure and protect such a system? What would be the new authorities, changes in combatant command (CCMD) roles/responsibilities, and what might be broad security considerations for such a radical, disruptive development be?

Research sponsor is USSPACECOM.

27. The Future of Space Medicine in the Department of Defense

With the stand-up of United States Space Force (USSF) and with USSPACECOM as the Department of Defense (DoD) Manager for Human Space Flight Support, the future of space medicine will significantly impact the Department of Defense. How might the Department of Defense further establish medical education and training to ensure medical professionals are prepared to support these missions? If the future includes DoD astronauts, should training and medical review be the responsibility of NASA or the Department of Defense?

Research sponsor is USSPACECOM.

28. Space Debris as a National Security Issue

Anti-satellite weapons (ASATs) are devastating weapons with the capability to destroy a satellite and create large debris clouds. Megaconstellations rob ASATs of their first-order effect, but what can the United States do to solve the second-order effects of debris clouds? Specifically, what policies and technologies need to be pursued to make active debris removal missions a viable capability that deters our enemies through denial?

Research sponsor is USSPACECOM.

29. Building a Space Alliance

How can the US Department of Defense Space Enterprise better integrate allies and partners into space organizations, training, equipping, and operations by design, that is, incorporating allies and partners in US concepts and plans for executing space operations from the beginning rather than at later stages? Focus on key allies—FVEYs (Australia, Canada, New Zealand, the United Kingdom, and the United States) plus France, Germany, and Japan—and actions the United States can take in the next 2–5 years.

Research sponsor is USSPACECOM.