Military Review

July-August 2025

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By Order of the Secretary of the Army:

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A CH-47 Chinook helicopter assigned to Task Force Nighthawk, 101st Combat Aviation Brigade (CAB), 101st Airborne Division (Air Assault), flies over the mountains near Erbil Air Base, Iraq, during a sunset mission 26 May 2025. The 101st CAB delivers rapid, reliable air mobility across diverse terrain to support coalition operations. (Photo by Sgt. Brianna Badder, U.S. Army)

Letter from the Editor

Col. Andrew Morgado, U.S. Army
Director, Army University Press

On 30 April of this year, the secretary of defense issued new guidance to the Department of Defense "to implement a comprehensive transformation strategy" to make the necessary changes to produce a more capable and ready force.[1] On the following day, the secretary of the Army and chief of staff of the Army issued joint guidance to the Army that outlined significant organizational and materiel changes that will begin to emerge in the months ahead.[2] This guidance heralds significant changes to how the Army will organize to carry out its roles and the weapons and equipment it will employ to do so.

Our modern Army is no stranger to transformation. According to the Congressional Research Service, this is the fifth major transformation undertaken by the Army since 2003.[3] In each instance, Army leaders sought to adapt the force to the new realities either experienced on current battlefields or forecasted for future ones. Also common to each period of change was disagreement and debate, some of which played out in the pages of *Military Review*.[4] The professional exchange on the pages of this journal and in other forums proved essential in identifying emergent conditions, shaping the direction of changes, and reporting on their progress. This latest round of change offers another opportunity for this fruitful discussion, and we hope our readers and fellow professionals will take up this challenge.

This issue helps begin the discussion by introducing several key issues. Six of our fourteen articles address and intersect on the topics of command posts, artificial intelligence, and unmanned aerial vehicles—all topics specifically addressed in the Army's initial guidance.[5] But what may be more significant, this issue highlights potential blind spots in our transformation. At the top of the list is combat casualty care. The treatment, evacuation, and care of our soldiers on the battlefield will be enduring imperatives. How might organizational changes and technological advancements enhance our ability to care for our soldiers? We are fortunate that very senior members of our Army and joint medical community chose *Military Review* to bring both this knowledge and discussion into the larger operational force. The ball is now in our collective, military professional court.

Where the Army will ultimately go and how it will get to its transformational ends are open ended and unknown. We, as military professionals, can shape both the destination and means of transformation by engaging in the debate. Whether it is on the pages of *Military Review* or some other journal, we encourage you to think and write about the issues facing our Army. It is our responsibility as stewards of the profession of arms. ■

Notes

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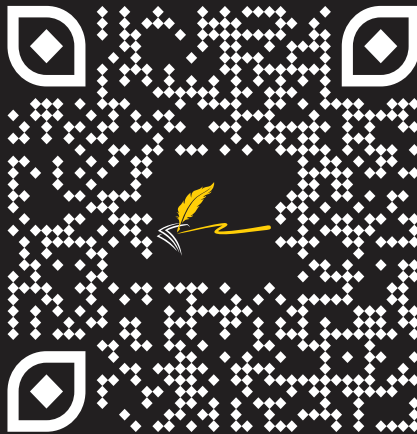
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An image on the live stream screen of a night vision drone operating circa 2025 near Pokrovsk, Ukraine, shows individual heat signatures of Russian soldiers and equipment congregated at a single location that were targeted for attack. (Photo by Anton Shtuka for NPR)

Distributed Combined Arms Rehearsals

Say Goodbye to Giant Terrain Models

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The era of in-person combined arms rehearsals (CAR) with hundreds of people stacked up around a terrain model straining to hear the commander is over—there, we said it.

Among the vital lessons learned from the Russo-Ukrainian conflict is that the dominant prevalence of unmanned aircraft systems (UAS) and modern long-range precision fires in the changed operational environment of modern battlefields makes unnecessary mass gatherings unacceptably risky. Moreover, each movement from a covered and concealed position is now a high-risk proposition that demands much greater risk-versus-reward calculation. Given these risks, how can we provide commanders an opportunity to communicate the necessary intent together with facilitating the synchronization of combat operations through rehearsals while also ensuring survivability? The answer is *distributed CARs.*

To accomplish this, our doctrine and policy must change to stipulate that CARs in the future must be distributed to protect the force because of the vulnerability of mass gatherings during large-scale combat operations (LSCO), and combat training centers must mandate the use of distributed CARs during training rotations. We expect resistance to this assertion from many experienced operators because their past experiences with distributed CARs may have been adversely colored by suboptimal software, clunky and unreliable communications equipment, or a preference for human interaction. However, if we consider the large scale of a brigade CAR during a National Training Center (NTC) rotation in the context of the Ukraine war influenced by a pervasive UAS threat, there is clearly a problem with the way we currently do business.

While there is real value in face-to-face conversations with the commander, the modern LSCO fight will only get more dangerous and the weapons more lethal. Imagine a battlefield with thousands of unmanned aircraft buzzing around in the skies. Would we really send our commanders and staffs to a centralized location in that scenario? We think not. The war in Ukraine shows us that we must consider distributed communications first before we expose our people to autonomous loitering munitions to preserve the force and minimize the impact of a key enemy capability.

What Is to Be Done?

The Army already has tools that can facilitate such virtual rehearsals, and initiatives stemming from the Army's transformation-in-contact concept are further modernizing the communications architecture to facilitate improved upper tactical internet (TI) across the force.[1] While this article focuses on CARs, it also obliquely highlights the pressing need to conduct a thorough DOTMLPF-P (doctrine, organization, training, materiel, leadership and education, personnel, and facilities) review where we are unafraid to evaluate with a critical eye even what are regarded by many as our most tried-and-true practices. Transformation in contact is delivering critical materiel to the force, and it is now time for our training, doctrine, and practices to catch up with the modernization taking place in the Army.

Vulnerability of Command-and-Control Nodes in LSCO

The Russo-Ukrainian conflict provides a stark reminder that our command-and-control (C2) structures must be light and agile to survive on the modern battlefield. Targeting adversary C2 nodes is not a new concept, but the war in Ukraine has highlighted the increased vulnerability of large tent-based headquarters due to modern precision long-range fires and drones. Lt. Gen. Milford H. Beagle Jr. and then–Brig. Gen. Jason C. Slider draw comparisons between Russian corps and division command posts (CP) and U.S. Army CPs in the article "The Graveyard of Command Posts."[2] The article highlights how the Russian defense of Kherson collapsed in early 2022 after a "relentless assault on command and control characterized by a systematic attack on Russian command posts at scale."[3] During the eight months leading up to the collapse of the Russian front at Kherson, the Armed Forces of Ukraine successfully struck Russian division, corps, and army-group headquarters on twenty-two separate occasions, severely degrading C2 capability and killing the commander of the 49th Combined Arms Army.[4]

UASs have become a pervasive threat on the battlefield in Ukraine and in those parts of Russia's Kursk Oblast where conflict is also raging. Not only do they provide the surveillance and target acquisition

Top: A screen capture of Ukraine drone imagery identifying the heat signature of a Russian command post on 16 May 2022. *Bottom:* A second screen capture shows the first in a series of explosions created by bombs dropped from a Ukrainian drone that destroyed the command post. (Screenshots from YouTube)

capability for long-range precision fires, but rapid "while in contact" innovation has also led to a wide array of different kinds of UAS that now provide a range of previously unknown capabilities to both sides.[5] One important development has been the use of commercially available first-person-view UASs modified into kamikaze drones by the addition of small payloads that have become so commonplace that they are now described as the "Ukrainian Army's principle anti-tank weapon."[6] They are everywhere on the battlefields of Ukraine. Countless examples of battlefield reports and widely advertised visual imagery on the internet provided by Ukrainian and Russian outlets depict the effectiveness of first-person-view drones chasing and destroying moving tanks, being navigated into confined spaces such as trenches or inside buildings to strike targets, and being used in a large-scale effort to hunt down and kill individual soldiers attempting to find shelter against such UAS attacks.[7]

The UAS revolution has had such an impact on the tactics employed by both sides of the Russo-Ukrainian war that some argue that it may have

"fundamentally altered the nature of tactics and warfare" itself.[8] Yet despite the pervasive threat of UAS observed in Ukraine and elsewhere, both in terms of constant surveillance and direct strikes, U.S. doctrine remains largely unchanged.[9] UAS expansion into multiple ubiquitous roles in support of both Ukrainian and Russian forces should compel an immediate clear-eyed reassessment of our doctrine and practices to ensure the success of our operations.

Relevance of Real-Time, Real-World Lessons from Ukraine

The U.S. Army's effort to reduce CP size is not solely a result of the Russo-Ukrainian war; CP survivability has been a consideration since the Army began to refocus on the fundamentals of LSCO.[10] Yet, while efforts are being made to reduce the size of CPs and make them more mobile and survivable, our doctrine and training persists in driving us to conduct full-up CARs although it should be obvious that such large gatherings are simply not compatible with LSCO.

Additionally, the problem is not just the mass gathering of commanders and staff for the CAR itself but also the movement of those commanders across the battlefield to a reach a CAR. Movement draws the eye, and with the proliferation of UAS on the battlefield, such movements place the commanders at greatly increased risk as compared to previous operational environments free of UAS. Worse yet, they provide opportunities for the enemy to track movement back to a CAR site or higher headquarters location and queue up a devastating strike against our C2.

Combined Arms Rehearsals

CARs are not immune to the threat posed to CPs or large gatherings in LSCO. However, while in-person CARs are becoming more dangerous, commanders still need a venue to be able to synchronize their plans in time and space with their staffs and their subordinate commanders.

"A rehearsal is a session in which the commander and staff or unit practices expected actions to improve performance during execution."[11] At present, training publications lead us to assume our rehearsals should be conducted in person around large terrain models.[12] Current doctrine further reinforces this assumption by listing techniques on a sliding scale of effectiveness with digital, map, and network rehearsals listed among the least effective (see the figure).[13] So ingrained is the assumption that during course of action analysis, we instinctively break out the terrain model kit and go into arts-and-crafts mode on an unsuspecting piece of ground to build a terrain model.[14] However,

(Figure from Field Manual 6-0, *Commander and Staff Organization and Operations*)

Figure. Rehearsal Techniques

the observable current operational environment has now rendered this doctrinal diagram obsolete. It was formulated during a time when network rehearsals were conducted over FM voice radio with analogue maps in hand. In contrast, modern networks using new technologies like Starshield (proliferated low earth orbit, or pLEO, satellites) empower commanders and staff to take part in rehearsals digitally that include moving unit icons across a map in real time for all participants to see. Consequently, commanders are now able to participate in dispersed rehearsals without leaving their CP, or even while mobile in a vehicle. The upshot is that we have the required technology. We only need the foresight and commitment to use and to develop it further by exploiting and expanding on its potential, and to do so quickly.

Furthermore, practical experience among many has debunked the notion that the network CAR is less effective than the in-person CAR. We assert that this view is outdated. Feedback from commanders within the 1st Cavalry Division (1CD) has been overwhelmingly positive as they were better able to understand the plan and better able to engage in dialogue and synchronization efforts no less than during an in-person CAR. Additionally, staff members reported having clearer situational awareness and being better able to follow

the commander's dialogue than is usually possible at an in-person CAR, where they are often relegated to the periphery and struggle to see the map and hear the dialogue. Unlike in-person CARs, virtual CARs grant all participants front-row seats.

It is understandable that there will be a natural preference for in-person CARs based on habits and tradition; some resistance to change is to be expected. But the situation has changed, both on the battlefield and in technological development, and we must be willing to change with it. Our challenge to doctrine on the conduct of CARs is therefore based on two factors. First, as we have established, dispersion is essential on the modern battlefield, and large gatherings must be avoided. Second, with the software that now exists, virtual CARs can now be more effective than in-person CARs in generating a detailed understanding of the plan.

Virtual CAR

1CD experimented in conducting virtual CARs during Avenger Triad 24, a multicorps NATO exercise involving ten partner nations and the first NATO exercise of its kind since the early 1990s.[15] The division's forces were spread over a large front in eastern Europe during the exercise, which meant an in-person

rehearsal was not possible, yet the complexity of the operation demanded careful synchronization—meaning a CAR was vital.

Division planners considered different virtual CAR methods before selecting Virtual Joint Operating Center (VJOC) in late August 2024, which proved effective at allowing the staff to establish a common understanding of the plan and facilitating commander dialogue. VJOC is a collaborative tool often used for briefings. A series of map boards were constructed on VJOC for the CAR along with moveable unit icons that, when combined with the drawing tool, allowed commanders to articulate their part in the plan. With these straightforward, easy-to-use tools at his disposal, the commander was allowed to inject contingencies, highlight his own concerns, and rapidly propose his own changes to things like the scheme of maneuver in a way that allowed the entire staff to follow along.

1CD is not the first formation to run rehearsals over VJOC. III Armored Corps used it to conduct distributed CARs while executing the 1st Armor Division's NTC rotation in January 2024. It conducted virtual CARs as a matter of necessity due to the dispersal of forces, with not all participants being physically located at the NTC. III Armored Corps realized the potential of executing distributed CARs in this manner and quickly discerned that this was the way of the future. During the rotation, no face-to-face corps or division rehearsals were conducted.

However, while VJOC can facilitate effective rehearsals, it was not purpose-built for virtual CARs. We found it to be a laborious process to snip Command Post Computing Environment

(CPCE) map images, create and import unit icons, and test that outstations could move the icons across the maps image. There were bandwidth issues that precluded using the VJOC voice capability. However, concurrently using CMS AudioVisual or Ventrillo audio during the rehearsal solved this problem. In short, VJOC is the best system we currently have for virtual CARs, but there is scope for improvement.

Not every division and corps headquarters in the Army has VJOC. Using CPCE by itself is an alternative, and the 3rd Infantry Division were able to use it to good effect during their deployment to the European Command area of operations.[16] Its method was to create a "dirty" CPCE layer with moveable icons, similar to the map boards we created on VJOC.[17] However, from our experience, VJOC is

(Photo by Staff Sgt. Noshoba Davis, U.S. Army National Guard)

The Risk of Large Gatherings

This photograph of a brigade combined arms rehearsal during a major NATO exercise in central Europe demonstrates the significant risk of gathering unit leadership during large-scale combat operations. Based on what we are seeing in Ukraine, such a gathering would certainly come quickly to the attention of an adversary due to ubiquitous loitering UAS intelligence collection over operational areas. Subsequently, it would be targeted by fires either coordinated or actually executed by UAS. Consider the impact that would have on the brigade's command and control if its collection of senior leaders and key staff were attacked in such a manner. Is that a risk we should be taking? Is it a standard procedure we should continue encouraging in doctrine and practice?

Maj. Ryan Hamilton (*center*), a field artillery officer with 1st Cavalry Division Artillery, works closely with Polish officers during Avenger Triad 24 on 11 September 2024 in Bolesławiec, Poland. Avenger Triad 24 was a U.S. Army Europe and Africa command post exercise with U.S. Army, NATO, and multinational organizations held 9–19 September 2024 in multiple locations in Europe. Incorporating lessons learned from Austere Challenge 24, this exercise implemented operational concepts, doctrine and procedures to increase readiness, enhance interoperability, employ new concepts, and inform regional planning. (Photo by Staff Sgt. Jasmine McCarthy, U.S. Army)

more user-friendly, allowing multiple map boards to be constructed and, through its "bring users to me" function, one user is able to steer the CAR by controlling what the other users can see.

Conversely, CPCE requires users to pull up the right layers and to manipulate their own map to the correct location for the discussion. Regardless of whether VJOC or CPCE is used, moveable icons are essential; the virtual CAR cannot just become a rolling presentation moving from slide to slide, or layer to layer on the CPCE. Such an approach turns the CAR into a backbrief rather than a dynamic rehearsal.

We assert that to embrace the virtual CAR, the Army cannot rely solely on CPCE and must field VJOC or a similar system across the force, supported by training and doctrine. Until that occurs, there will be no uniform way to conduct virtual CARs. Identifying the right software solution is an issue that could be addressed during a DOTMLPF-P review.

Electronic Signature

One counterargument to distributed CARs is that it would create an electronic signature that could give away the location of participants, exposing them to the risk of being targeted by enemy fires. This concern is rational, as we use electronic warfare to identify and target enemy command nodes, and surely the enemy would do the same. However, while this may be true of such communication types as HF and VHF radios, the emissions given off by pLEO satellite systems like Starshield are harder to detect. Such pLEO systems transmit in a common commercial bandwidth, which makes them hard to detect amidst the ambiance of most modern countries. This is one of the reasons that Starlink is being used so effectively in Ukraine.[18] Also worth noting, the electronic signature of such
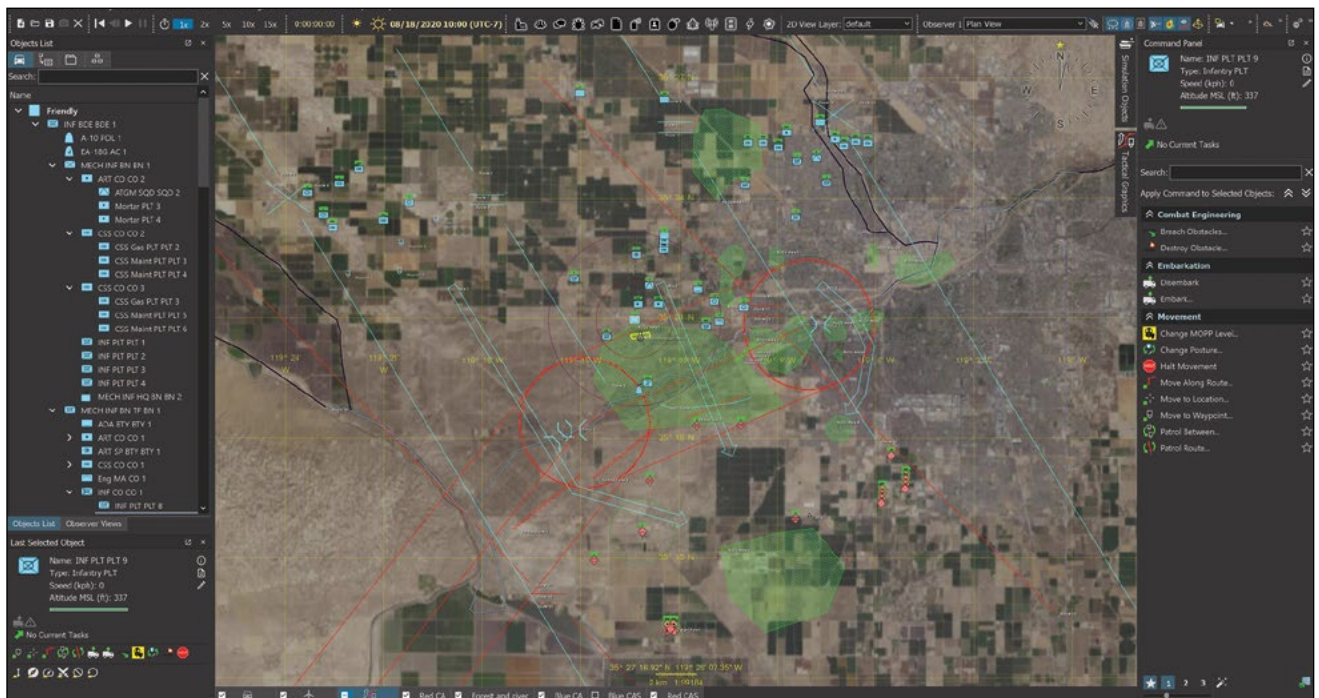
This screen capture from a VR-Forces simulation is similar to the interactive screen images that were employed 9–19 September 2024 during Avenger Triad 24, a combined, multinational exercise in Poland that included combined arms rehearsals by the 1st Cavalry Division and international partners via computer networks. The VR-Forces synthetic environment supports multidomain, multiechelon, and multiresolution simulation, including both entity- and aggregate-level modeling within a common tool suite. (Graphic courtesy of MAK Technologies' VR-Forces)

systems does not grow in strength as the number of users increases, therefore running a distributed CAR over upper TI using Starshield will not create emission spikes for enemy targeting.

Yet, while the risk of detection is reduced using pLEO systems, we cannot discount it entirely; the enemy will always look at innovative ways to detect our communications. So, what is the solution? Should we simply go radio silent and give up trying to communicate across our force? Of course not. That is not how the Army synchronizes its efforts and exercises C2. Instead, we should seek to minimize the risk of detection through all means available to us, including masking our signals and using decoys. Ultimately, the choice of whether to conduct a full-dress CAR or a virtual CAR is made through a risk assessment, but we argue that the risk of bringing leaders and staff together for an in-person CAR significantly outweighs the risk of doing it

over distributed means using discrete pLEO satellite communications like Starshield.

Another counterargument to distributed rehearsals is the belief that the Army's C2 Fix initiative is removing upper TI communications at brigade and below, which would make it impossible for them to conduct virtual rehearsals.[19] This is a misconception. C2 Fix aims to increase mobility and survivability for echelons at brigade and below by elevating network and server complexity to the division level. Upper TI is still required at brigade and below to access information critical to the commander's decision-making process. For this reason, the proliferation of pLEO is key to removing the network complexity at brigade and below, which is why Starshield is a critical part of modernization efforts. 3rd Brigade, 10th Mountain Division's recent combat training center rotation, where they were the first transformation-in-contact unit to participate in Combined Resolve 25-01 in Germany, showcased the brigade's innovative use of Starshield down to the battalion level, enabling excellent upper TI communications throughout the brigade and ultimately to the division headquarters.[20]

Recommendations and a Way Ahead

The Russo-Ukrainian conflict must be a cognitive wakeup call across the U.S. Army and specifically

for the armored force. We cannot fight and win the way we wanted to five years ago. The proliferation of UAS (armed and unarmed) and electronic warfare throughout the battlefield has rendered some of our most important capabilities extremely vulnerable. The chief of staff of the Army's transformation-in-contact initiative is critical to our success on the future battlefields. But we cannot think that materiel solutions alone will bring in the change that we need to dominate future wars.

The fact that in-person CARs still exist in our training events and doctrine in the face of numerous examples of Russian catastrophic failures is an indicator that we have an opportunity to look not only at our materiel shortfalls (which transformation in contact looks to address) but also across the spectrum of DOTMLPF-P. What sacred cows exist that might need a facelift? Or better yet, a complete and total rewrite? The CAR should be our canary in the coal mine. Also, what other things are we doing that might have been relevant twenty years ago but now just don't make as much sense given the fundamental shift in warfare? A future study could consider those questions and examine such issues as the following:

- Integrated weapons training strategy
- Gunnery table progression and training
- Electronic warfare/counter-UAS policies on home-station training (spectrum management)
- Home-station training area capabilities (dragon's teeth, antitank minefields)

Conclusion

We continue to observe a rapidly evolving tactical situation during LSCO in the Russo-Ukrainian war characterized by the proliferation of UAS. Concurrent to this, the U.S. Army is being transformed through modernization, and this includes the rolling out of state-of-the-art communications equipment that will deliver high-speed upper TI to the field army. Yet despite the lessons from the battlefields of Ukraine and our own technological advances, our training and doctrine remains largely stagnant. *This needs to change.*

We are not the first to make the case for a shift to distributed CARs. U.S. European Command and 3rd Infantry Division have experimented with and now advocate fully digitized rehearsals. In a 2024 article, Maj. Gen. Christopher Norrie et al. state that "fully distributed mission command replicate[s] how subordinate commanders will fight in large-scale combat operations where they will likely be separated by geography to increase dispersion for protection."[21] Consonant

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Lt. Col. Jay A. Ireland, U.S. Army, is an armor officer and the 1st Cavalry Division assistant chief of staff for operations, G-3. He holds a BS from the U.S. Military Academy and an MA in geography from the University of Hawaii, Manoa. He previously served as the commander of the 1st Battalion, 8th Cavalry Regiment, with earlier assignments in the 1st Armored Division, the 4th Infantry Division, and the 1st Cavalry Division.

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with his and other observations by senior leaders on the future of CARs—if we accept that we will not conduct large-scale, in-person CARs during times of war, then why are we doing it in training?

The CAR is a glaring example of how our practices are not compatible with the modern battlefield and are failing to embrace our technological capabilities. Virtual CARs should be implemented in doctrine and practice to mitigate risk; the tools exist in our formations. However, while this article has focused on the CAR, that is just one example of how our processes need to catch up with the transformation taking place in the Army. A full DOTMLPF-P review needs to be conducted to ensure that our doctrine and training evolve to keep pace with the materiel changes being delivered to the force by transformation in contact.

To emphasize the importance of the issue to the Army at large, as a practical matter, the next time a brigade at the NTC forms up for a full-dress CAR in range of enemy long-range fires, the observer-coach/ trainers should inform them they have just been struck by indirect fire and start handing out casualty cards. This would fairly make the vital point in a direct but appropriate way. ■

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The Modern Light Infantry Battalion Command Post

Modular, Minimalist, and Mobile

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The modern battlefield presents the commander with a seemingly inflexible problem. On the one hand, the standard of lethal, sensor-driven fires to lower echelons seems to demand a main command post (MCP) be able to tap the avalanche of real-time information at their fingertips while synchronizing effects across every warfighting function and domain. On the other hand, the technological trends that make this first vision of a robust MCP so attractive also spell its doom in the high-pitched sound of an enemy's quadcopter. The war in Ukraine provides ample evidence of the threat to the modern, tent-based MCP. Ever-present unmanned aircraft systems and a variety of precision fires options—from the long-range ballistic missile to the loitering munition—are real and lethal threats to command posts. The Ukrainians have pursued a "programmatic approach" to targeting Russian command-and-control nodes, so much so that some authors have dubbed Ukraine the "graveyard of command posts."[1] This unstable and complex battlefield is the environment in which the battalion MCP must operate and thrive. How does the commander then balance these competing priorities, design an effective command post, and win on the modern battlefield?

Though much studied, the answer to this question rarely produces concrete, actionable proposals. In May 2024, 1st Battalion, 87th Infantry Regiment's rotation to the Joint Readiness Training Center (JRTC) was our laboratory to seek an answer. While there is still much to practice, this article outlines a proposal for a lightweight, modular MCP and to support that recommendation with specific solutions achievable by any light infantry battalion. The MCP of the near-peer conflict must be vehicle-centric because it allows the commander different designs with three guiding principles: modularity, minimalism, and mobility, all with the goal of increasing the survivability of the command post.

The main command post in the "TOC Heavy" configuration during operations on 6 May 2024 at the Joint Readiness Training Center, Fort Johnson, Louisiana. (Photo by William A. McNutt)

The Concept

Before we jump into why we think this redesign is imperative, we must illustrate our idea and variations. This MCP redesign centers on the M1097 HMMWV equipped with a tarp and bows (the proverbial "high back HMMWV"). This vehicle offers a blank, self-contained palette for command post design. At its heart, the proposition is simple: mount all key systems in vehicles; anything that leaves a vehicle is a liability, and its utility to the commander's ability to visualize and fight his/her battalion must outweigh their cost in mobility.

Once vehicle-mounted, the design of the remainder of the tactical operations center (TOC) must be kept simple and modular. The Modular Command Post System, Small (MCPS) is a ready-made solution (a.k.a. the SICPS). It is light, easy to erect, and infinitely expansible. Most importantly, this concept easily accommodates vehicles with the addition of a boot wall, creating an enclosed space from the elements and

allowing for noise and light discipline. The modularity of the MCP enables the commander to control the scope of his command post with minimal additions to the load plan. The three stages of MCP design—unimaginatively dubbed TOC Heavy, TOC Light, and TOC Ultralight—allow the commander and staff to expand or contract the size of the TOC to meet mission requirements.

TOC Heavy: Modularity defined. The core design consists of three M1097 high backs outfitted with vehicle-mounted, battery-powered communications mated to a single central MCPS, serving as the hub of the current operations (CUOPS) fight. Even in a TOC Heavy configuration, field testing during collective training and JRTC reveals the MCP can effectively displace in under thirty minutes in daylight, so long as the staff remains ruthlessly disciplined in refusing to allow extraneous equipment to leave the confines of a vehicle. The operations sergeant major and TOC noncommissioned

The main command post in the "TOC Ultralight" configuration during operations on 6 May 2024 at the Joint Readiness Training Center, Fort Johnson, Louisiana. (Photo by William A. McNutt)

officer (NCO) must especially monitor the work/rest cycle, ensuring that all staff members keep rucksacks affixed to vehicles save for the bare minimum required for protection from the elements.

TOC Light: A seminomadic option. In the TOC Light, the basic configuration of three M1097 HMMWVs with vehicle-mounted communications remains identical to the TOC Heavy; however, rather than halt and establish tentage (SICPS), the TOC Light remains largely on the move. The most helpful aspect of this MCP concept is its ability to remain seminomadic, emplacing and displacing frequently. It may halt for hours at a time to facilitate planning and battle tracking, but the staff remains mounted or near their vehicles, forming a loose semicircle among the three key vehicles. At night, ponchos and plenty of camo netting assist the staff in maintaining light discipline without tentage.

The TOC Light lends itself especially to rapid emplacement in an urban setting, a key feature of the modern battlefield.[2] The vehicle-mounted communications systems, carefully designed to allow speakers and push-to-talk microphones to separate from their radio mounts, enables staff to enter a hardened structure and seek shelter in the physical and electromagnetic noise of an urban area. This method avoids the time-consuming process of transporting tough boxes of communications equipment from a vehicle to reassemble in a structure.

TOC Ultralight: A large-scale combat operation necessity and the TOC's quartering party. Finally, the MCP is designed to operate from a single vehicle when necessary. While not part of the MCP establishment during normal operations, the TOC Ultralight forms the core of the concept, as it enables a critical segment of the TOC and key leaders to immediately displace all lower tactical infrastructure capabilities *in extremis*. In the case of unexpected enemy unmanned aircraft systems overflight, the TOC Ultralight immediately disconnects from the MCP and relocates, serving as the

quartering party for the remainder of the TOC. This method proved successful at JRTC with the ever-present enemy quadcopters roaming the battlefield; the key to this is always having identified jump locations for the MCP—black and gold plans. The key members of the TOC Ultralight at JRTC were the commander, S-3 (operations), fire support officer, S-2 (intelligence), battle NCO (serving as the driver), and a TC (truck commander) usually a battle lieutenant. This configuration allowed for continued battle tracking of operations while simultaneously preparing to receive the remaining vehicles of the MCP at the new location. The remainder of the TOC may be destroyed by enemy fires, but the critical core of the MCP will survive and continue to control the fight.

Redundancy in configuration and uniformity in the construction of command-and-control vehicles means that each can operate independently without a significant degradation in capability. Early testing of a no-notice field jump indicates that a single vehicle—the "Ultralight" configuration—can displace from the MCP in approximately eight to fifteen minutes with full lower tactical infrastructure capabilities. Now that we have explained our three command mediums, let's move over to the tenants that drive them, starting with modularity.

Modularity

Mobility stresses modular construction. Modularity equates to the command post's ability to assimilate in any environment without additional equipment, not losing function due to form, and the ability to execute mission command on-the-move and at a standstill with minimal degradation to capability.

The TOC Heavy configuration is the epitome of the modular necessity for the new MCP. The modular feature of our proposed MCP is the most luxurious, which in our profession usually means the least likely to happen. Nonetheless, having the ability to expand our command post in times of lesser danger is an opportunity that is necessary in the ever-changing nuances of war. While Spartan and simple, the TOC Heavy remains easily expandable. In a permissive environment, the modularity of a second or even third MCPS tent to the CUOPs hub provides a tented planning annex for extended sessions of the military decision-making process. Aside from the construction

of vehicle-mounted communications systems, covered in detail in the annex, no special tools are required. On emplacement, the primary HMMWV, equipped with slide-out table and a balanced communications suite, sets the apex of the MCP. The staff erects the lightweight tent around this vehicle as the remaining HMMWVs maneuver into position, and the staff clips in their still attached boot walls. An S-6 Tactical Communication Node–Light establishes approximately fifty meters from the remainder of the TOC Heavy, deploys a series of Mi-Fi pucks for encrypted Secret Internet Protocol Router service, and provides alternating current power to the CUOPS hub. The plans section, when the commander opts to colocate it with the MCP, locates at least one hundred meters from the MCP and works primarily from the back of a self-contained Lightweight Medium Tactical Vehicle outfitted with tables, chairs, map boards, and printing capabilities. Modularity creates the commander's ability to scale the MCP based on the situation, but he or she must also consider the necessity of minimalism and how that relates to command and control, and mobility.

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Minimalism

Mobility also demands minimalism. Minimalism equates to fewer people, less equipment, mission-essential rolling stock, and a lower electromagnetic signature or we will be detected, targeted, and destroyed.

At its most minimalist, the modern MCP is not a workspace for anything beyond the CUOPS fight. The MCP features no chairs, tables, or other luxuries often found in a larger tent-based system. All of these must be housed in each HMMWV and accessed from the center of the tent. This arrangement yields several important benefits. First, it means the TOC can easily transition form factor to meet the tactical situation without significant change to its makeup or the training required of the staff. At its lightest, this package most closely resembles a traditional three-vehicle tactical command post than it does a large TOC complete with tentage. In fact, hard-mounting communication systems means the MCP can operate on the move in the same manner as a traditional tactical command post.

The appropriate mix of staff required inside the MCP must be adjusted throughout operations. Certain members of the battalion staff, including the S-1 (personnel), S-4 (logistics), and S-6 (signal), would not always reside inside the MCP at JRTC; they would be present for specific battle rhythm events or would remain in the vicinity of the command post and enter as required by the commander. The S-2 maintained a presence in the MCP and was best positioned near the commander and the S-3/ fire support officer. This

ultimately reduced targeting time and allowed for better situational awareness of the fight.

Displacing in all configurations was found to be most effective if the CUOPS team ensured that they could transition immediately to the TOC Ultralight configuration. Throughout the JRTC rotation, the common operational picture and battle tracking systems were adjusted to maximize the information for the commander while maintaining operations during a MCP jump. This resulted in the TOC Ultralight configuration being able to displace within fifteen minutes while the remaining personnel and vehicles prepared to move to the next location. Minimalism ensures the mobility of the MCP. Without minimalism, the commander and his or her necessary staff could expect a much higher chance of enemy disruption.

Mobility

Mobility ensures survivability. Mission command systems must be vehicle-mounted to ensure rapid displacement and movement to a new location. This also ensures the MCP can operate on the move or stationary with minimal setup. In operation, NCOs guarantee this mobility. The TOC NCO—an experienced, decisive NCO with knowledge of all key systems—must immediately begin displacement rehearsal, focusing primarily on vehicle egress routes, and ensure the staff remains disciplined and ready to move at any time.

Early testing indicates that two key constraints severely limit the MCP's ability to displace: trailers and traffic jams in restricted terrain. Trailers invariably require backing, ground guiding, and complex maneuvers in the tight confines of any suitable TOC location. Second, a good location will situate the TOC in dense terrain with thick overhead cover. This necessity tends to restrict easy access to

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turnaround points or trails to the nearest high-speed avenue of approach. If not carefully planned and rehearsed, a single vehicle can snarl the momentum of the entire displacement. At a minimum, the key leaders of the TOC—battalion executive officer, operations sergeant major, and the TOC NCO—must ensure the Ultralight vehicle maintains immediate access to the most accessible path away from a compromised MCP, ensuring it can displace even as the staff breaks down tents and antenna masts around it.

It is important to note that everything revolves around mobility. Modularity is a luxury, and minimalism is necessary to create mobility, which lies at the center of the redesigned MCP concept. These three tenets create the best environment for a functioning MCP in the large-scale combat operations environment.

The Modern Light MCP in Conclusion

A commander must have a vehicle-centric command post guided by three principles: modularity, minimalism, and, most importantly, mobility. The modern battlefield presents a complex challenge for commanders seeking to establish effective MCPs capable of navigating the ever-evolving threats while maximizing operational efficiency. This article outlined a proposal for a lightweight, modular MCP tailored to the needs of an infantry brigade combat team.

By focusing on vehicle-mounted communication systems, such as with the M1097 HMMWV, and utilizing ready-made solutions like the MCPS, the proposed MCP concept offers flexibility and adaptability to varying tactical situations. The TOC Heavy, TOC Light, and TOC Ultralight configurations provide options for scaling the command post based on mission requirements while leveraging existing equipment within the light infantry battalion's inventory.

Field testing and operational simulations like those conducted at JRTC have provided valuable insights into the feasibility and effectiveness of the proposed MCP design. After further testing at JRTC, the modular and light MCP proved effective at maintaining command and control across the battlefield.

Ultimately, this article is a starting point for a broader conversation on modern MCP design and operational concepts. It acknowledges the need for further field testing and refinement, recognizing that practical solutions must be informed by real-world experience rather than theoretical conjecture. By continuing to iterate and improve upon the proposed MCP concept, commanders can better position themselves to succeed on the modern battlefield, balancing the imperative of information dominance with the realities of a dynamic and contested operational environment. ■

Notes

1. See, for example, Milford Beagle, Jason C. Slider, and Matthew R. Arrol, "The Graveyard of Command Posts: What Chornobaivka Should Teach Us About Command and Control in Large-Scale Combat Operations," *Military Review* 103, no. 3 (May-June 2023): 10–24, https://www.armyupress.army.mil/Journals/Military-Review/English-Edition-Archives/May-June-2023/Graveyard-of-Command-Posts/. This recent, much-lauded piece contains a host of prescient observations about the future of the main command post in large-scale combat but provides few concrete recommendations for what units should do with the equipment they have.

2. Craig Broyles and Charlotte Richter, "Concrete Command: Why Combat Training Centers Should Prioritize Training on Urban Command Posts," *Military Review* 103, no. 4 (July-August 2023): 12–19, https://www.armyupress.army.mil/Journals/Military-Review/English-Edition-Archives/July-August-2023/Concrete-Command/.

Senior leaders observe a joint combined arms rehearsal on 5 June 2024 on the eve of Ivy Mass 24 at Fort Carson, Colorado. (Photo courtesy of the 4th Infantry Division Public Affairs Office)

Becoming Multidomain Practitioners

Tactical Training for Multidomain Operations at Echelon

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Col. Charles M. Knoll, U.S. Army

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In 2020, the XVIII Airborne Corps initiated a series of joint exercises named Scarlet Dragon. The commanding general at the time, Lt. Gen. Erik Kurilla, recognized that despite the near-constant discussion of the need for artificial intelligence and machine learning to aid decision-making and full integration of joint and multidomain effects in the next war, there was almost no practical integration of these tools into tactical exercises. Project Maven, the Department of Defense's initial effort to use machine learning algorithms to assist intelligence analysts, had existed for several years and even seen some success in joint special operations targeting efforts in Afghanistan. However, the units that would be decisive in large-scale combat operations (LSCO)—corps, divisions, and brigades—had little to show for the early efforts. The implementation of these critical technologies and the practice of layering multidomain effects was long overdue, and thus, XVIII Airborne Corps created Scarlet Dragon.

With multidomain operations (MDO) moving beyond future concepts and into our doctrine with the update to Field Manual 3-0, *Operations*, we must determine what the practice of MDO means for units at echelon and for our tactical headquarters. We must find cost-effective, high-payoff methods to develop best practices iteratively, inform refinements to nascent doctrine, and identify gaps in capability development efforts.[1] It is time to become multidomain *practitioners*. Corps, division, and brigade commanders are ideally positioned in experience, resources, and staff proficiency to take on echelon-appropriate components of this task. To be clear, there is no shortage of talent and initiative across the force. Fort Bragg is not the only installation where leaders are striving to push beyond the status quo.

At Fort Carson, in June 2024, the 4th Infantry Division completed its second iteration of "Ivy Mass," a biennial joint, multidomain fire support coordination exercise. This article uses the observations and lessons from Ivy Mass 2024 to propose clearly defined roles for each tactical echelon as they train for MDO; propose enterprise-level opportunities for investing in innovation at the corps, division, and brigade levels; and share the challenges experienced in building and executing a division exercise of this scope and scale.

Clarity of Purpose at Echelon

As we engage our junior and midlevel leaders, there is still a lack of clarity as to what *exactly* they do as part of MDO. Even among senior leaders, this is a frequent topic of discussion. Perhaps, in our effort to solidify MDO's acceptance among the joint force and our allies, the constant drum beat of "big changes needed now" left many young leaders in our ranks uncertain of their role in that change.[2] Furthermore, the ongoing evolution of the concept into doctrine is generating healthy dialogue that is keeping pace with the speed at which forces are transforming or experimenting with new technologies.[3] We cannot afford to have our formations listless in either confusion or cynicism. If we are going to make real headway in developing leaders and headquarters as expert MDO practitioners, we need to capture the attention of our people and orient their creativity and innovation on echelon-appropriate problems.

"*What* do we do in MDO?" is the wrong question. Each formation exists for a tactical purpose well-defined by their mission essential tasks. The "what" does not change in MDO. The correct question is, "*How* does the multidomain battlefield change how we do what we do?" The answer is a simple one: *Warfighting remains all about combined arms maneuver.* The Army

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Forward observers from Q Battery, 5th Battalion, 14th Marine Regiment, spot targets on 9 June 2024 during a live-fire portion of Ivy Mass 24. (Photo courtesy of the 4th Infantry Division Public Affairs Office)

has been clear on this point from the start. The centrality of combined arms maneuver as the "how" by which the U.S. Army will fight in future conflicts was clear in the unveiling of the MDO concept.[4] The umbrella of MDO was inherently a joint, multinational vision of a future battlefield that would "demand that the Joint Force apply the proven principles of combined arms maneuver and massing of effects at decisive spaces."[5] The doctrinal definition of MDO is "combined arms employment of joint and Army capabilities to create and exploit relative advantages."[6]

Fortunately, we assess that there is a simple way of visualizing the unique roles and responsibilities of each echelon in LSCO on the MDO battlefield. At Fort Carson, these are known as "The Ivy Way of MDO." However, the authors do not claim the core ideas in this proposal as their own. Many of these thoughts emerged through group dialogue in multiple venues, and special credit must go to Maj. Gen. James Isenhower, former commanding general of 1st Armored Division, who was a notable voice in most of these discussions.

The corps, synchronizer of convergence. Absent a scale of conflict that resurrects the field army, the corps is the senior tactical headquarters that executes combined arms maneuver. The corps synchronizes convergence through the joint task force and has two clear responsibilities in battle: to prioritize and allocate tools and effects to divisions, and to shape the deep area.

The division, unit of action. The division delivers land power at the time and place of convergence and has two unique responsibilities: to plan, synchronize, and request multidomain effects; and to shape the close area. It is important to note that while the division is capable of visualizing and employing multidomain assets, they do not own them. This is unlikely to change much in the foreseeable future.

The brigade, agility at the edge. The brigade is the primary executor of their respective element of combat power—fires, maneuver, sustainment, etc. They receive assets, employ them for specified durations, and coordinate laterally. The brigade also has two distinct responsibilities: to plan and synchronize all forms of support for subordinate units, and to manage terrain by sequencing action in time and space.

The battalion, focused fighters. The battalion is the lowest echelon capable of synchronizing combined arms effects. They must do two things well on the

multidomain battlefield: organize the battalion task force for directed tactical tasks and fight the combined arms fight.

The company and platoon, tip of the bayonet. The company and platoon are ultimately the formations that will seize terrain or defeat an adversary at the decisive point of battle. They should be experts at their craft, but they are extremely vulnerable without the protection of higher-echelon shaping. On the multidomain battlefield, the company and platoon have two critical responsibilities: to *stay alive* by staying out of contact until directed otherwise, and to stay ready to move and arrive to the assigned objective *on time*.

Isenhower explained that corps and divisions can be "multidomain headquarters" while brigade and below headquarters are often "multiple domain" headquarters.[7] Thinking of roles and responsibilities in terms of the implications imposed by the friendly and enemy effects on the multidomain battlefield provide clarity for the problems that each echelon must solve through iterative capability integration and practice. Each echelon can shape their unit-level training around the core challenges facing their formations. This does not mean that each echelon is alone in the effort. As we have observed in both Ukraine and Nagorno-Karabakh, evolving drone technology will make staying out of contact a challenging task for our lowest echelons.[8] In fact, the problems facing lower echelons are perhaps the most difficult to solve as smaller formations will require coordinated assistance from higher echelons and enterprise-wide materiel solutions. However, the best answers in emerging tactics will come from the echelons in the field that must fight that fight, not from a simulation in a battle lab.

Building and Growing a Division Exercise

In 2021, then–Maj. Gen. David Hodne, the previous commanding general of the 4th Infantry Division, conceived of Ivy Mass as a means of tackling two initiatives. The first requirement was to build an iterative framework to practice with the multidomain tools that the division would use in battle. The second requirement was to find a way to keep the division staff sharp on warfighting tasks in the years between Warfighter exercises. In this way, the division staff, despite the very high annual turnover rate among field grade officers and senior noncommissioned officers, experiences a reliable tactical training progression every year while in garrison.

The inaugural Ivy Mass in 2022 took the form of a fire support coordination exercise employing the division's organic cannon artillery with supporting fixed wing close air support. Intentionally, Ivy Mass focused on synchronizing targeting and kinetic fires in the close area—the basic building blocks of the division's fight in LSCO. At its core, the exercise prioritizes lethality, but the design was intended to be scalable and train additional Army and joint capabilities that may support the division's maneuver in future battles. The second iteration retained the original focus on lethality while taking the division a step forward into truly multidomain operations.

In the autumn of 2023, the 4th Infantry Division staff began detailed planning for Ivy Mass 24. The division used the same planning model that the XVIII Airborne Corps employed in building Scarlet Dragon. The model is a slightly modified joint exercise life cycle framework often employed by the 75th Ranger Regiment and other joint special operations forces elements that plan and execute multilateral and task force training events.[9] These units need live joint capability integration to meet their training objectives but typically lack the time to officially resource support through the various service tasking channels like the Army Synchronization and Resourcing Conference.[10] Simply put, find friends who will bring their toys and come play with you.

The two primary adjustments to the doctrinal joint exercise life cycle are (1) limiting early concept development to goal-setting for types of units to recruit to meet the planning headquarters' training objectives by aligning with a participating unit's desired learning objectives, and in this case, Marine Corps tasks; and (2) shifting the burden of exercise design later in the planning process until the planning headquarters establishes a sufficiently complete list of participants. In part, the initial planning conference becomes a sales pitch where the planning headquarters says, "We want you to participate; the scenario is flexible; tell us what you need to train, and we can make it happen." This slower approach to concept development affords greater opportunity to build a robust team of players, but it places increased stress on the planning staff by truncating

Maj. Gen. David S. Doyle, commanding general of the 4th Infantry Division and Fort Carson, Colorado, answers a service member's question about innovation during the 4th Infantry Division's inaugural Multi-Domain Operations Symposium on 23 January 2025 at McMahon Auditorium on Fort Carson. Doyle highlighted the need for forward-thinking strategies, cutting-edge solutions, and seamless integration across all domains to maintain the division's operational edge, enhance interoperability with allied forces, and ensure mission success in modern warfare's increasingly complex and evolving landscape. (Photo by Spc. Doniel Kennedy, U.S. Army)

available time for detailed planning and constructing scenario depth.

In the end, just like Scarlet Dragon, the process worked. With roughly nine months of planning and preparation, Ivy Mass 24 brought together forty-five units with representatives from every service, including all three components, to conduct a fully synchronized live-virtual-constructive exercise across eleven installations (see figure). The division replicated seven "convergence windows" with live land, air, space, and cyber effects to conduct forty-one separate tactical tasks involving live Army and joint fires. All of this

was synchronized with live special operations forces direct-action activities and virtual maneuver from a Stryker brigade combat team and a division sustainment brigade conducting full command post exercises. We walked away from the experience with a far greater understanding of the frictions we will encounter under a similar task organization in combat. Additionally, we walked away with three groups of observations: opportunities for acceleration at the Army enterprise level, lessons for division-level staffs, and unit-level education to best train for MDO.

Observations: Army Enterprise-Level Investment

Two clear observations from Ivy Mass suggest that increased Army investment may accelerate MDO proficiency. The first concerns a known problem: modernizing the Army and joint Mission Command Network. The second is an opportunity to apportion resources to corps- and division-level exercises like Ivy Mass.

Network modernization and mission command. In most formations, the current division-level mission
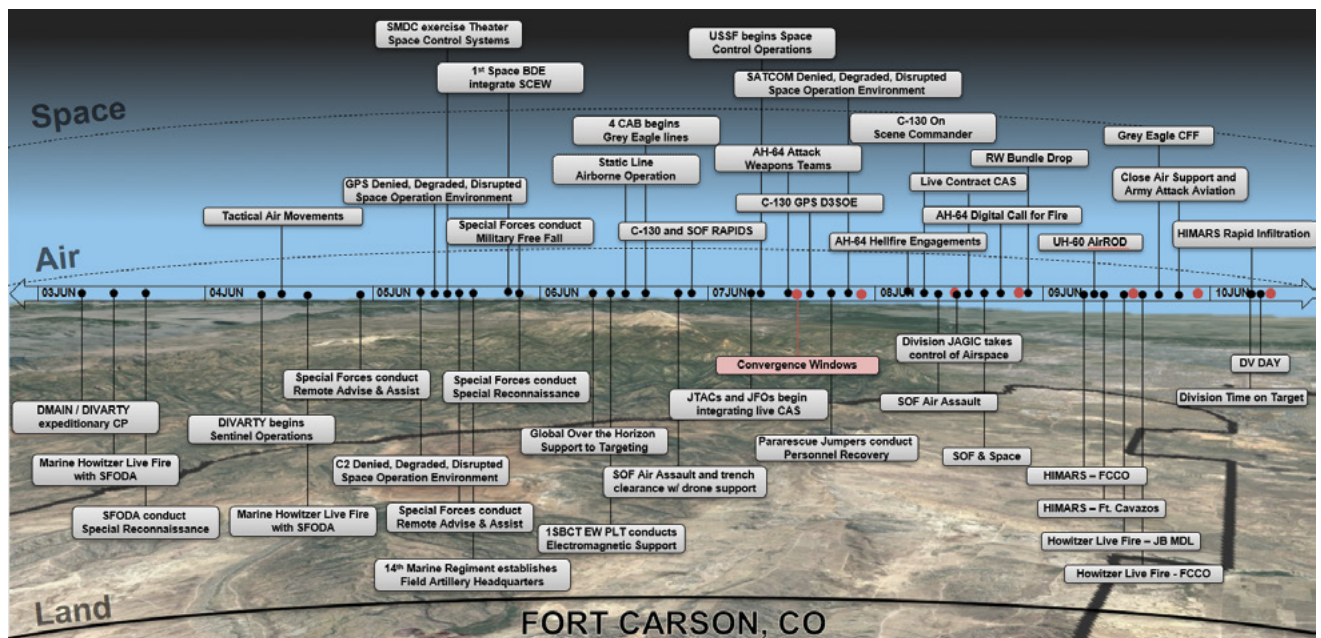
(Figure by 4th Infantry Division Artillery)

Figure. Joint, Multidomain "Players" and Activity Synchronization during Ivy Mass 24

command networks do not enable the speed demanded within LSCO and MDO. At one point in Ivy Mass, we recorded nineteen steps to execute a single integrated joint surface artillery fire mission. The wide range of communications equipment and tactics used across Army National Guard, Marine Corps, Space Command, and even our organic Army aviation assets were enough to challenge any tactical headquarters in maintaining a disciplined communications plan. Additionally, the digital call-for-fire integration with our AH-64 fleets continues to be fraught with technical issues that make executing without external field service support highly impractical. The Army is aggressively addressing this issue, and further detailed discussion lies beyond the scope of this article. The chief of staff of the Army is answering this demand from the field as he makes this effort the top priority for transformation.[11]

Formal investment in exercises designed by tactical headquarters. The Army has an opportunity to accelerate the practical application of MDO by assigning a "thought leader"—or more accurately, a "lead practitioner"—responsible to corps, division, and brigade commanders and providing dedicated fiscal resources

for these organizations to design and execute training beyond standard training pathways. The Strategic Studies Institute's integrated research project on lessons from Ukraine concluded that the U.S. Army must "reassess the roles and responsibilities of headquarters at echelon to account for MDO" and develop "innovative options for executing multi-echelon training on how to synchronize the concept of convergence and combined arms."[12] It is unrealistic to think that our combat training centers and the focused experimentation under Project Convergence can meet this goal alone.

At the corps level, this is already happening through the initiative of commanders, but it would be an easy step for the Army to formalize the existing lines of effort. The I Corps is deeply involved in overcoming the challenges of distributed mission command and sustainment under U.S. Army Pacific's Pacific Pathways exercise series.[13] The III Armored Corps is working on convergence and penetration tactics through their Remagen Ready gap crossing exercise.[14] The V Corps is routinely invested in multinational interoperability across the range of NATO and U.S. European Command training events.[15] The XVIII Airborne Corps has already taken on the decision dominance

A C-130 aircraft from the 731st Airlift Squadron departs a field landing strip on 10 June 2024 at Fort Carson, Colorado, after conducting a HIRAIN (High Mobility Artillery Rocket System Rapid Infiltration) rehearsal. The squadron also supported special operations forces airborne infiltration, forward resupply, and intratheater medical evacuation training objectives. (Photo courtesy of the 4th Infantry Division Public Affairs Office)

problem set through Scarlet Dragon and supported innovation efforts.[16]

For divisions, the Army can select and assign discrete problems for that headquarters to solve through division-led exercise design. The transformation-in-contact initiative is doing this with tactical communications with the 101st Airborne and 25th Infantry Divisions in exercises like Lethal Eagle at Fort Campbell and the multidomain task force integration at the Joint Pacific Multinational Readiness Center.[17] At the 4th Infantry Division, multidomain synchronization at the division level is the obvious task for our focus.

With neighbors like U.S. Space Operations Command and multiple space deltas at Peterson and Schiever Space Forces Bases, the U.S. Air Force Academy, the U.S. Army Space and Missile Defense Command, the Army's 1st Space Brigade collocated in the Colorado Springs basing cluster, in addition to the 10th Special Forces Group on Fort Carson,

the proximity to and natural relationships with theater-level capability providers make joint, multidomain integration relatively easy for the 4th Infantry Division. More importantly, the coordination and integration are relatively inexpensive. With so many local participants and all others traveling "pay to play," Ivy Mass 24 cost only $1.3 million above the already funded training plans for 4th Infantry Division units. Aligning tasks to divisions based on their proximity to relevant academic, industry, or joint military partners, these division-led initiatives can become very cost effective for the resulting readiness and innovation gains. Even allowing for a $3 million biennial allocation per division, the Army would spend less than $40 million every two years across the Regular Army. To frame perspective, that is roughly the cost of one light infantry brigade rotation at the Joint Readiness Training Center. Division headquarters need this training opportunity between the U.S. Forces Command scheduled "division in the dirt" exercises at combat training centers.

Observations: Division Lessons Learned

For division staffs integrating multidomain capabilities in training or combat, our experience in Ivy Mass 24 provided recommendations for planning horizons and integrating joint enablers. We learned specific

lessons that apply to the LSCO battlefield through the planning and development of Ivy Mass 24.

Expanded battlefields require expanded planning horizons. In future LSCO fights, nearly all combined arms maneuver will require joint theater-controlled capabilities to ensure success. As the echelon of control rises to the joint task force or beyond, the division must think further out. In combat, it is critical for division G-2s (intelligence officers) to identify high-value and high-priority targets out to a ninety-six-hour horizon. Requesting assets against specific enemy communications networks, electronic warfare capabilities, or signals of interest will increase both the odds of getting asset priority and eventual success in shaping. The feedback we received from Army and joint space assets during Ivy Mass 24 was that vague support requests are all too often the norm, and they are also only "vaguely effective." Training to think and plan further out in our G-2 and G-5 (plans) sections can reverse this trend.

Additionally, the same rule applies as divisions seek to secure space asset support for their home-station training. Appropriate lead time is key. The 4th Infantry Division secured robust support for Ivy Mass 24 in nine months only because our proximity allowed us to "cheat." After working closely with Space and Missile Defense Command on this topic, we recommend a minimum of fifteen months of planning time for live space integration. Consider concurrent coordination with the Intelligence Center of Excellence as you plan for space-based effect integration. Their "MDO in a Box" capability provides live electromagnetic stimulus that can stress your targeting kill chain.

Integrating joint elements with suboptimal command-and-control networks. While the Army and joint force address the network challenges mentioned earlier, divisions still need to prepare to integrate joint fires elements. The reality of global force management and time-phased deployments is that fighting a multicomponent, joint task organization is highly likely in any real-world contingency plan. The experience in Ivy Mass 24 highlighted two best practices. First, rapidly integrating liaison officers from direct support units into the joint air-ground integration cell is essential. Second, organizations must dedicate a small, talent-laden team from the G-6 (signal) section to understand and troubleshoot interservice communications integration.

Observations: Unit-Level Education

As we implement innovative training to learn and practice for MDO, the greatest barrier to success is our collective lack of knowledge about the specific friendly and threat capabilities on the battlefield. Educating our leaders is a nonnegotiable requirement. The security classification surrounding programs employed by both friend and foe has left many of our younger leaders unaware of these capabilities and the true implications for our formations. Not only does this ignorance pose an immediate roadblock to innovation and readiness, but it also slows the long-term development of leader cohorts who must build intuitive expertise in multidomain thinking. Divisions can remedy this challenge with minor changes to existing leader development programs. The Army could follow by introducing additional material to officer, noncommissioned officer, and warrant officer professional military education.

The division commander has staff leaders who have detailed knowledge and access to the full spectrum of multidomain tools. These leaders can translate enough information at the "secret" level to ensure that our staff field grade officers and company commanders are sufficiently aware of even our most highly classified tools. Division commanders must selectively expand their leader development programs—traditionally focused on battalion and brigade command teams—to include focused education for majors and captains to learn about multidomain battlefield effects and threat assessments.

Conclusion: Moving Forward

Within the 4th Infantry Division, we are already setting conditions for the next iteration of Ivy Mass. In 2026, the exercise will add new layers, extend the depth of the battlefield, and synchronize live brigade-level maneuver. Our vision of being the Army's marquee multidomain division has nothing to do with equipment modernization. Rather, we focus on developing a forward-thinking mindset and cultivating the unique team of joint, multidomain thinkers and doers in Colorado Springs. We believe we are postured to advance the MDO capability of the division, the Army, and the joint force through better integration at the unit of action.

For the broader force, future success in MDO demands that we orient on expertise in combined arms

maneuver while clearly defining roles and responsibilities relative to the multidomain battlefield. This action will drive unit-level refinement of doctrine and materiel solutions. Furthermore, the Army can accelerate the practical application of MDO by prioritizing network transformation and making modest resource investments that allow corps-, division-, and brigade-level commanders to use their initiative and creativity to iterate on Army-wide problems. Finally, with minor adjustments to common programs and practices, divisions can effectively train and fight with live multidomain assets and educate the next generation of multidomain leaders.

The core truth of transforming in contact is that the future is already here. "Legacy" and "modernized" are useless terms. When war comes, we fight it with the soldiers and equipment we have today. The time to become MDO practitioners is now. ∎

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A portrait of a futuristic soldier showcases a blend of human strength and technological prowess. (AI image from Adobe Stock)

Achieved Overmatch

A Potential Future for AI in the Army

Maj. Thomas Haydock, U.S. Army

It's very clear that AI is going to impact every industry. I think that every nation needs to make sure that AI is a part of their national strategy. Every country will be impacted.
—Jensen Huang, Nvidia CEO

Eastern Europe, 2045

Observing an artificial intelligence (AI)-enhanced wet-gap crossing (WGX) was like watching a colony of bees at work. The V Corps' master AI system effortlessly controlled everything from the initial reconnaissance, the planning, 3D printing the bridging segments and driving them to the water, and even linking the segments into a complete bridge. The AI even controlled the vehicle movement across the modular bridge. Because of the sensors that continuously measured the current, torsion between bridge sections, weight of each vehicle, and other factors, crossing was amazingly rapid. The abundance of sensor data meant the AI could comfortably cross many vehicles at once, all at higher speeds. But the master AI did far

more, from planning to preparation, through execution and assessment.

In planning, it created the nucleus of the plan for the staff, generated and then answered information requirements and synchronized the plans vertically and horizontally across echelons. In seconds, it performed the work of a hundred human minds by analyzing the terrain and weather, including accessing information from historical records and live imagery. It rapidly created courses of action (COA) that accounted for the enemy's doctrine and recent observations, capabilities, composition, and disposition. As instructed, it integrated deception into each COA, arranging large and small actions to build an image of a very different reality.

With COAs built, the AI segregated the friendly plan into one persona and war-gamed the COAs against a separate persona that played the enemy. Through hundreds of war-game iterations, which combined took only seconds, the master AI improved the three requested COAs and lowered risk. Further, it seamlessly integrated the often-neglected aspects of traffic control, nonlethal fires, command post jumps, and more, all while building the right signals and noise for the deception plan. The generation of all these staff planning products, which combined military decision-making process steps 2 to 5, took the commander and operations officer about seven minutes and a few prompts to the AI.[1]

The master AI's output included the collection plan for tasking human and autonomous systems to answer information requirements. With a few minutes of human review, that collection plan was approved, and the crossing plan was ready for continued refinement as new information was fed into the COAs and their war games.

Within five hours, the minimum information required for decision-making was available. The commander and staff donned their virtual reality goggles as the master AI presented each COA in an immersive movie-like format. Interacting with each other and the AI in the simulated world, the plan was adjusted and approved. V Corps' master AI seamlessly coordinated with similar AI enterprises from sister services, subordinate divisions, and allies/partners. Within twenty-four hours, the orders process was complete across all echelons, and plans were synchronized and rehearsed vertically and horizontally across echelons. Rehearsals mimicked the COA briefs, with formations rehearsing on the virtual version of the actual terrain.

AI had a similarly transformative impact on execution. For the actual crossing, the master AI synchronized efforts, reduced inefficiency, and directed autonomous systems. Following the plan it helped develop and disseminate, it positioned maneuver, protection, sustainment, and more. For example, with human help, the industrial 3D printers in the rear printed the autonomous bridging sections that drove themselves onto trailers for trucking to the crossing site. Once delivered, the sections drove off the trucks, swam into the water, and linked themselves, with humans verifying connections.

All around, a cornucopia of manned and unmanned, autonomous and remote controlled, and expendable and treasured systems combined as individual tiles into a mosaic. In the mosaic, 3D-printed modular systems scanned the electromagnetic spectrum (EMS) for enemy usage and dynamically adjusted jamming, overwatched the crossing or looked further out, or retransmitted friendly communications. In the river, modular swimming drones, scaled-down versions of the bridging type, monitored current, looked for mines, and waited for enemy boats or swimmers. On the ground, soldiers marked positions for autonomous excavators to converge on and swiftly produce vehicle fighting positions. A few kilometers down and a few hours before, a brigade, augmented by all-terrain vehicles with 3D-printed slip-on covers to mimic supply trucks and mortar carriers, performed a demonstration that mimicked a division. The demonstration was complete with human-impersonating AI chatbots running a dynamic conversation on the EMS to add realism. The master AI harmonized efforts and delegated as much as it could to lower-level platform AI when it could, still embracing the philosophy of mission command. From overhead to below surface, each warfighting function (WfF) was enhanced for the better, producing overmatch for the U.S. Army.

The master AI's effect on protection was particularly remarkable. By integrating a plethora of cameras and other sensors around the crossing and empowering them with machine vision, defensive weapons truly became a layered protection

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Concept-required capabilities

| 24 | 1 | 26 | 2 | 30 | 3 | 35 | 40 |

Transformation in contact

Capabilities in formations in less than 24 months

Deliberate transformation

POM 26 - 30
POM 27 - 31
TAA 26 - 30
TAA 27 - 31

Concept-driven transformation

DEVELOP   FIELD
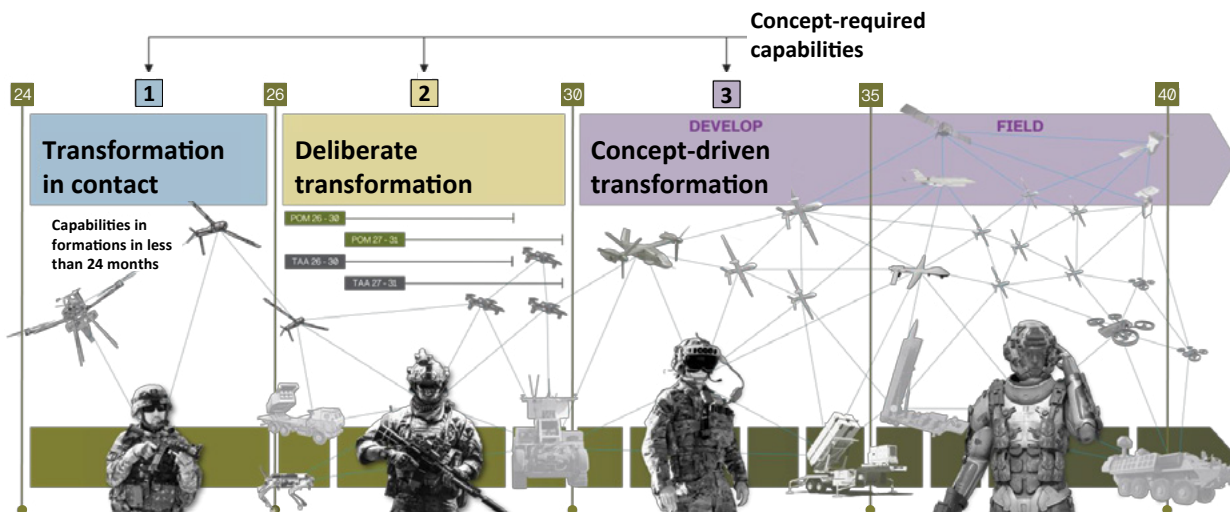
(Figure by Army Futures Command)

Figure 1. Continuous Transformation, the Army's Forthcoming Warfighting Concept

system. *Machine guns, microwave emitters, defensive drones, acoustic weapons, lasers, missile launchers, and decoys were seamlessly integrated. Simultaneously, various sensors recorded every engagement, allowing the masterAI to furiously determine enemy locations and strength. Using that information, the masterAI recommended options and supporting taskings to decision-makers to deal with problems.*

AI similarly transformed the final step in the operations process, assessment. Assessment was transformed by the combination of machine analysis, near instantaneous conversion of observations into lessons, and easing of human friction. For instance, recording engagements allowed the masterAI to better analyze each success and failure of protection. When bridging sections had issues properly connecting due to bad 3D printing, the problem was noted and a remedy instantly implemented. Human friction, including not sharing lessons with adjacent units, became a relic of previous generations, as each echelon's AI ceaselessly interacted vertically and horizontally. The entire operations process, from planning to preparation, execution, and assessment, was still conceptually the same but now heightened by machine speed.

AI systems like masterAI were revolutionary, but each step of the revolution was itself a small evolution rather than a giant break with the past. It was the aggregate of years of development, the proliferation of sensors, and the integration of AI with other systems like 3D printing that was revolutionary compared to the generation prior.

How to Think About AI

The U.S. Army Futures Command is currently producing the forthcoming Army warfighting concept, *continuous transformation* (CT). As so far laid out by Gen. James Rainey in a *Military Review* article, CT looks across three time horizons (see figure 1).[2] This article explores how we in the U.S. Army can use AI to gain battlefield advantages across all three horizons. Specifically, we will examine how harnessing current trends in the first two horizons can build evolutionary advantages, generating overmatch against all adversaries in the third horizon. An overmatch representing a revolution compared to militaries that have not harnessed AI. In that light, the vignette above is a preview of our concept-driven future: an AI-boosted U.S. Army that acts faster, makes superior decisions, is more lethal, and better protects the force than every adversary. This article also discusses expected challenges, potential mitigations, and why the Army needs to integrate this approach as part of a national strategy for AI superiority in national defense.

Transformation in Contact

Transformation in contact (TiC) looks forward two years to enable "solving problems and seizing opportunities today."[3] With that short horizon, TiC revolves around using capabilities that are already

Artificial Narrow Intelligence (ANI)

- Trained on specific tasks
- Little-to-no reasoning ability
- Attempts to apply lessons between tasks often fail due to limited reasoning ability

Human-like abilities

Machine learning and speed

Artificial General Intelligence (AGI)

- Able to perform a variety of tasks, like humans, but at machine speed
- Has human-like reasoning ability
- Can apply lessons between tasks and use reasoning to evaluate its work

Unification

- The combination of multiple ANI functions
- Instead of designing specialised AI systems for narrowly defined tasks (like chatbots for conversation or algorithms for image recognition), the goal is to integrate these systems into a unified framework capable of functioning cohesively.

(Figure by author; AI image generated with Google Gemini)

Figure 2. The Spectrum of AI

or imminently available. The tension for TiC is how AI can create advantages in the existing force while incorporating evolutionary change to build up revolutionary overmatch in the later *concept-driven transformation* (CDT) horizon. Resolving that tension requires understanding the current and impending state of AI.

Currently, AI is highly narrow (known as artificial narrow intelligence, or ANI), with available products offering very-limited-use cases. Anyone that has used large language model (LLM) chatbots like ChatGPT knows they excel at understanding text. Indeed, they provide great responses to prompts like, "Tell me about the use of operational art in the American Revolution," or "Summarize this attached article." Experiences vary between products and how the prompt is worded, but the responses can typically illustrate a very good understanding of nuance (which operational art has much of), facts, and more. Other well-known forms of AI include self-driving vehicles like Alphabet's Waymo and facial recognition systems. But those applications are very narrow, performing a particular task quite well, at machine speed: text-based interaction, driving, or identifying criminals in our examples.

Humans, then, are a form of *general intelligence* because we can do all these tasks, apply lessons between different types of tasks, and at least make reasonable attempts at things we have not been trained to do (see figure 2).[4] In short, while we are slower, we know how to adapt for things we have not specifically trained for, like unusual traffic situations. Given this state of narrow AIs, what then does evolutionary advantage in the TiC horizon look like?

It looks like a variety of artificial narrow intelligence systems performing limited functions that humans are capable of but at machine speed to generate advantages. Figure 3 illustrates examples of evolutionary change that AI can bring to the Army. Two areas particularly ripe for AI advantages are active protection systems (APS) for vehicles (included in figure 3), and orders production (not included in figure 3), which primarily align with the protection and command-and-control WfFs.[5]

APS can build on concepts already in place in hundreds of thousands of self-driving vehicles. Those vehicles take inputs from sensors like cameras, radar, sonar, and Global Position System signals and feed it into a dedicated AI inside the platform (see figure 4). That platform AI makes decisions about how to react

Protection		Command and Control		Fires	
Example: Active protection systems (APS) that learn		Example: Automated reporting		Example: AI-aided weaponeering	
How Active protection systems are designed to defeat threats like antitank guided missiles. Enterprise level-AI can be trained on the growing myriad of drone and other threats and learn how to defeat them, then pass lessons to less-robust platform AI that manage individual APS. Each engagement recorded by platforms and sent to the enterprise in turn enhances the APS in a learning cycle.	**Implication** Continually learning APS that can help restore freedom of movement and maneuver to infantry, armor, reconnaissance, engineer, and other close combat forces; this problem is clearly acute in the Russia-Ukraine War. APS can also be trained to recognize and not engage friendly systems, enabling things like friendly defensive drone swarms.	**How** AI handles routine reports like personnel status, communication checks, etc. Transmissions do not suffer from human issues of poor radio etiquette, mispronunciation, etc.	**Implication** Fewer and shorter emissions through AI chat bots communicating with each other with 100% accuracy in burst transmissions.	**How** Observers send images of targets to fires cells, and the fires AI system analyzes the pictures to count the enemy platforms (by type), dismounts, bunkers, etc., and determine fires platform, type and quantity of round or effect, etc., while accounting for ammo stockages and target priorities.	**Implication** Superior weaponeering and effects. Errors in observer reporting eliminated, and fires cell understanding enhanced. Accuracy increased and munitions usage decreased.

COP: Common operational picture
HF: High frequency
UHF, VHF: Ultra or very HF
TI: Tactical internet (digital data)

Protection diagram:
Enterprise-AI trained on threats → Defeat techniques passed to platform APS AI systems → Platform AI systems report new engagements to enterprise-AI

Platform APS AI integrates
- Kinetic weapons
- Electronic warfare
- Countermeasures
- Movement to cover

APS

Command and Control diagram:
Burst transmission between AI chat bots
Populates messages for human approval / Humans have preapproved message list
HF VHF UHF Upper TI → AI access to databases and COP → Subordinate units, Adjacent units, Higher headquarters or allies/partners/interagency

Fires diagram:
Fire cells AI-aided weaponeering

Fires cell AI system
1. Analyzes imagery: type, quantity, activity of targets
2. Compares to available ammo (by type), approved target lists and attack guidance, available platforms
3. Recommends action to human decision-maker (or sends fire mission if humans have already delegated decision-making)

Sustainment		Intelligence		Movement and Maneuver	
Example: (1) Predictive commodity management and (2) distribution optimization		Example: Information rapidly converted into intelligence		Example: Rapidly produced, integrated schemes of maneuver, fires, intelligence, etc.	
How (1) AI maintains real-time inventory across echelons, and predicts and proactively orders based on historical data, analysis of potential future operations, etc. (2) Routes and platform type/quantity optimized against priorities, conditions of routes, distance, competing usages of routes (e.g., civilian refugees, maneuver forces), etc.	**Implication** (1) Lethality enhanced through maintaining momentum and reducing chance of supply culmination (2) Faster delivery to units, with less fuel consumption and less platform usage via optimized routes Note: examples (1) and (2) are both included due to their interrelationship.	**How** Near instantaneous determination of implications from each report. Combing observations, enemy doctrine, and recent trends, with known and suspected composition, disposition, strength, and terrain/weather, will turn information into intelligence. Further, AI can continuously update enemy courses of action, decision templates, etc.	**Implication** Faster and more comprehensive ability to turn information into intelligence. AI can avoid human pitfalls of forgetfulness, quality disparity between analysts, lost information in shift changes, and other drawbacks.	**How** AI can digest and synchronize a scheme of maneuver with supporting functions (e.g., fires) to identify and remove friction. Further, if directed, it can do the same for decision points, injects like loss of key breaching assets, and branch and sequel plans. AI can perform this automatically for AI generated courses of action, or as an aid for human generated plans.	**Implication** More robust plans, that integrate WfFs together, rather than stitching together plans produced in isolation. Plans that can account for factors and contingencies that humans rarely have time for.

Sustainment diagram:
Classes of supply: Casualties, Blood, Prisoners, Recovery vehicles, Replacements → **AI enhanced:** Inventory management, Predictive ordering → Route and platform optimization, Convoy planning, including protection assets managed against threats and available resources

Intelligence diagram:
Reported enemy battalion, Obstacle report, Observed ammo dump, Reconned fording site → Intelligence from information, Refined enemy COAs, Decision support template

Movement and Maneuver diagram:
Recurring Planning Problems "Independent silos bumping into each other"
Maneuver, Intelligence, Fires, Sustainment, Intelligence, Protection
Plans Integrated by AI "Cooperatively focused on the enemy"

(Figure by author)

Figure 3. AI's Potential Across Warfighting Functions During Transformation in Contact

Sensors (inputs)

LiDAR

GPS

Cameras

Radar

Ultrasonic

Artificial Narrow Intelligence (outputs)

ANI can process thousands of inputs per second to deal with other vehicles, pedestrians, road conditions like ice and debris, traffic signals and roads signs. Enterprise-level AI has been trained on millions of traffic situations and continuously learns from fleets of autonomous vehicles on roads. The enterprise-level AI powers development of updates for ANI in each platform.

(Figure by author; AI image generated with Google Gemini)

Figure 4. Model of Current Self-Driving Car Systems

to road hazards, other vehicles, icy roads, and more, all while keeping the vehicle on route. These platform systems are updated as higher-level enterprise AI is trained in new scenarios. APS on armored vehicles can follow a similar model.

Like self-driving vehicles, APS can integrate a variety of sensors, be taught new threats, and make decisions about threats (or at least enable human decision-makers). APS sensors can include passive sensors like cameras and acoustic sensors, and emitters like LiDAR (Light Detection and Ranging) or radar. AI-powered APS can learn about new situations, like how to recognize and then defeat new types of enemy missiles or drones. Importantly, they can also be taught to ignore friendly systems to prevent fratricide. If allowed, they can also be empowered to defeat those threats with defensive weapons, countermeasures, maneuvering, etc.

Further, recorded engagements, with supporting sensor data and possible hypothetical situations, can enable AI systems to create and disseminate lessons learned throughout the force, as in our vignette. Imagine the Maneuver Center of Excellence with an

enterprise-level AI system that continuously analyzes successful and failed APS engagements and learns how to defeat a spectrum of threats. Perhaps the defeat for a particular situation is a tank using organic defenses (probably TiC horizon) and another involves the tank platoon collaboratively defeating the threat (deliberate transformation horizon). A powerful AI system running countless iterations and learning to win and then disseminating new techniques to less robust vehicle-mounted AI systems would be an incredible protection advantage. Looking at warfare now in Ukraine, where drones, mines, and missiles have severely reduced the freedom of movement and maneuver by both sides, and a transformation of APS is called for.

Orders production as a command-and-control function is similarly fertile ground for AI empowerment. Analyzing orders and annexes, imagery, friendly and enemy situations and capabilities, etc., are human tasks that machines can perform now. Simplistic tasks like reading an order and pulling out specified and implied tasks can be done by AI in seconds. More complex tasks like digesting enemy doctrine, equipment capabilities, and analyzing terrain and weather to create

possible enemy courses of action, devour hundreds of staff labor hours. AI can produce the same output in almost no time. This capability can be built now with our thousands of real-world and training operations orders as training data. Admittedly, using AI in orders production has an opportunity cost (as all decisions do): putting human staffs through the orders process creates a deep understanding to guide decision-making. But imagine a staff that can complete mission analysis, generate an information collection plan, initiate it, and find and then target its opponent's command post that is still highlighting their order and formatting slides! Which side would you choose?

In all these examples, the technology is either currently available or can be adapted from existing systems. However, the challenge for the TiC horizon is harnessing or creating *unified AI systems*, or combining narrow AI systems that can handle an entire process without having to involve other AI for sub-tasks. For instance, we do not want to use an LLM to analyze written orders and produce some outputs for orders production while using a different AI to analyze military graphics, maps, and imagery. AI in the TiC window will perform tasks that humans are capable of, but it will perform them much more efficiently and effectively. But central to harnessing that advantage is employing unified AI system. The *deliberate transformation* (DT) horizon will expand the unification of systems and the progression from narrow to general AI, generating cumulative advantage.

Deliberate Transformation
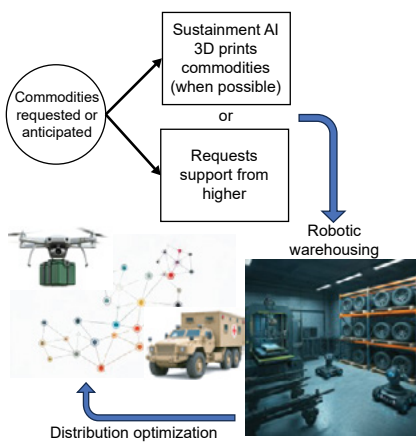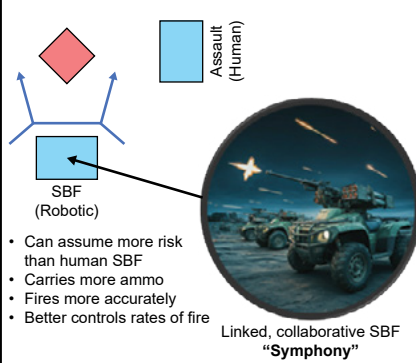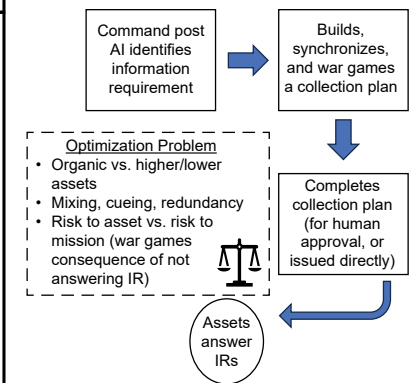
Where TiC is about "solving problems and seizing opportunities today," DT is "efforts managed through Army-level processes to deliver the Army we need within the time horizon for defense programming."[6] Building on advancements during TiC, AI in the DT period will become increasingly unified while approaching, but possibly short of, general AI (see figure 5). Crucially for our Army, this will include the transition from tasks humans can do (but faster) into the initial emergence of tasks that humans cannot. Importantly, AI's evolution will intersect with other burgeoning technologies like 3D printing and autonomous vehicles (which need AI). Deliberately managing the integration of these related technologies will enable the later emergence of revolutionary advantages.
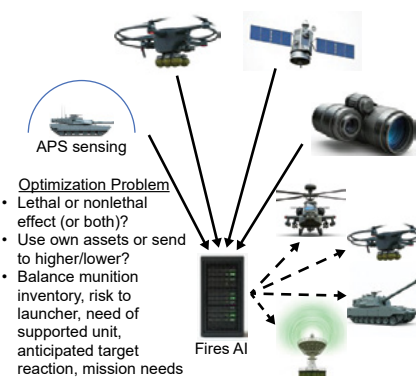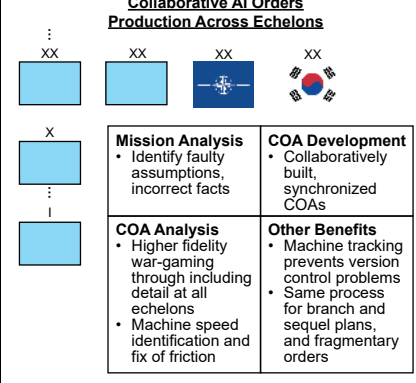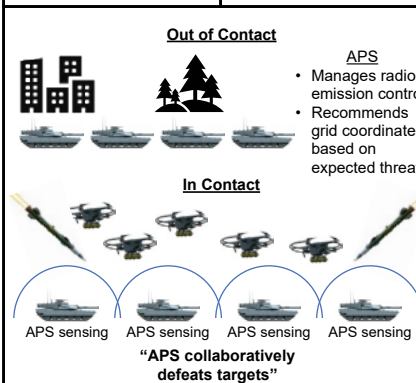
The example of printing bridging sections in the opening vignette previewed how narrow AI systems will become more unified and provide potential advantages from integrating emerging trends. Printing material as large and complicated as bridging sections may realistically belong in the CDT horizon, but its earlier version will emerge during DT. In this horizon, AI's ability to provide route and platform optimization will merge with the ability to manage 3D printers and robotic warehousing duties (figure 5). This will look like sustainment AI receiving an inventory alert for network cables or lug nuts and executing a decision-making process. That process will be another optimization problem to determine whether the AI prints the items itself or resources from elsewhere. Included in the distribution assets may well be autonomous vehicles. In short, AI in sustainment will grow increasingly unified, expanding from narrow uses like inventory management and route/platform optimization into management and optimization of entire supply chains.

Figure 5 highlights additional changes to expect during the DT horizon. Among those, the fires WfF offers a superb illustration of the evolution that will incorporate more systems and processes into unified AI. For example, fires will build on the TiC advantages to grow more robust counterfire (sensing and strike) capabilities and integrate more strike assets and effects.

AI enabled by sensors will change counterfire sensing by spreading the capability across the battlefield while introducing passive sensors that do not have to reveal themselves. Counterfire sensing is the ability to detect munitions and predict the launcher's point of origin using ballistic calculations; it currently relies on specialty radar emitters. However, APS, which will already be using cameras and other sensors to scan for drones and antitank weapons, can serve as counterfire sensing nodes for mortars, rockets, and ballistic missiles. These platforms can either predict the launcher's location or send raw data for fires cell action. Additionally, passive sensing (not emitting signals) like cameras avoids the dilemma of current counterfire radars announcing themselves as high payoff targets when turned on. In short, AI-enabled APS will proliferate counterfire sensing across the battlefield with the potential for passive sensing.

Concurrently, AI fires decision-making will evolve from TiC to unify lethal and nonlethal effects, from

Sustainment

Example: Supply chain management and optimization

How
AI builds on prior predictive commodity management and distribution optimization capabilities and adds control of 3D printers and robotic warehousing functions into a more unified sustainment AI.

Implication
Unification of these capabilities allows sustainment AI to manage and optimize an entire supply chain.

Movement and Maneuver

Example: Autonomous, robotic support by fire (SBF)

How
AI empowered autonomous vehicles with weapons, a capability demonstrated in Ukraine. However, this evolves to safely work in support of human assault elements. Robotic SBF platforms also linked to be a mutually supportive symphony, rather than separate systems obliviously providing the same service.

Implication
Lethality enhanced as robotic SBF assumes risk we do not with humans. Robot SBF can also carry more ammo, more precisely account for ballistics (wind, range, etc.), and better control rates of fire.

Intelligence

Example: AI manages information collection

How
During TiC, AI developed the abilities to rapidly turn information into intelligence and also to produce orders. In DT, these evolve and unify into AI producing information requirements (IRs), synchronized plans to collect that information, and management of autonomous assets.

Implication
AI will be able to ask questions about the enemy and operational environment and act to answer those questions. Humans and AI will complement each other by asking different questions. More efficient use of assets as AI synchronizes information requirements in an organization.

Fires

Example: (1) Robust counterfires and
(2) Integration of more strike assets and effects

How
(1) APS systems serve as counterfire sensing nodes.
(2) Unification of more lethal & nonlethal effects, across echelons into fires AI.

Implication
(1) Marked advantage in counterfire sensing. Profusion of passive sensors, like cameras, solves dilemma of exposing radar systems.
(2) Superior matching of systems and effects to need while balancing inventory, risk to launcher, need of supported unit, etc.

Command and Control

Example: Plans synchronized across echelons

How
Builds on AI enhanced orders production from TiC that supported separate echelons. Evolves into more holistic orders production where AI from different echelons collaborate to synchronizes plans between higher and lower echelons, adjacent units, allies and partners.

Implication
Enables the much sought after collaborative and concurrent planning between echelons. Can include AI systems war-gaming COAs across echelons, simultaneously. Identifies and solves friction points at machine speed.

Protection

Example: Active protection systems synchronized across formations, and with passive protection

How
APS AI grows to include synchronized protection for entire formations. Platforms collaborate to defeat threats, allocate targets, and minimize signature. APS expands to include passive measures like radio emission control management, evaluating terrain for protection against expected threats.

Implication
APS AI in formations able to defeat increasingly complex threats due to collaboration. Overall protection also enhanced by APS actively managing passive protection.

(Figure by author; AI images generated with Google Gemini)

Figure 5. AI's Potential Across Warfighting Functions During Deliberate Transformation

1	Enemy operates on one or more portions of the EMS.
2	Friendly platforms collaborate to scan different portions of the EMS across the battlefield and report all detection to AI.
3	Once an emitter is identified, friendly scanners locate the emitter.
4	Friendly AI aids decision-making on (A) attacking the emitter (if possible), (B) jamming it, or (C) allowing it to transmit for collection or other purposes.
5	The enemy can change frequency to avoid jamming, but the cycle repeats in adaptive jamming which chases the enemy across the EMS. The alternatives are: (A) stop transmitting, (B) keep transmitting but risk kinetic attack, (C) move away to avoid jamming but lose battlefield relevance. With AI, friendly systems can study enemy frequency hopping and potentially anticipate hops, reducing the windows available for enemy EMS use, making this cycle more efficient.

(Figure by author; AI images generated from Google Gemini and electromagnetic spectrum image from NASA)

Figure 6. Dynamic Jamming

mortars and drones to electronic warfare and obscuration, and across echelons. In TiC, images will enable fires AI at a given echelon, say division, to weaponeer for its rockets, artillery, and mortars. In DT, data like target images (including thermal and infrared), detection of jamming sources, and APS counterfire sensing will grow the optimization provided by fires AI. Optimization will include near-instantaneous decisions on potentially sending targets for lower echelon prosecution or if a strike by loitering drones or cannon artillery (or multiple effects together) is better. Nonlethal optimization can include AI overseeing frequency scanning and the dynamic adjustment to jammers to match the speed of enemy transition (see figure 6). These enhancements will be part of the evolution of fires AI as additional systems and capabilities are unified into the enterprise.

In the DT horizon, the combination of increasingly unified AI systems in each WfF and their intersection with other emerging trends will generate advantages by beginning to do what humans cannot. In our sustainment example, AI expanded into managing and optimizing an entire supply chain and did so in a dynamic operational environment. That type of task, precisely managing inventory and determining optimal delivery to customers, is something that massive companies like Amazon can do now but only in a static environment. For Amazon, the consequences of failure are low compared to large-scale combat operations, and its optimization is the product of years in a world where no enemy is attempting to destroy delivery assets, warehouses, headquarters, or bridges. Presently, in military sustainment, we willingly sacrifice utility (providing as much sustainment as possible to every customer possible), for simplicity. We designate priority of support because it makes planning and execution simple but not optimized. This unification of AI, that increasingly does what humans cannot, will build the revolutionary advantages to come from CDT.

Concept-Driven Transformation

CDT "is the longer-term vision described in the Army's emerging warfighting concept."[7] Returning to figure 1, CDT focuses on seven-to-fifteen years out; our goal for the CDT horizon is achieving overmatch against all adversaries, an overmatch that represents a revolutionary advantage in decision-making speed and quality, protection, and lethality over ground forces

that have not unlocked AI's potential (like our Army was around 2020). Figure 7 illustrates a version of that overmatch, following examples in the opening vignette.

I believe AI's greatest value for our Army will be realizing the potential of *mosaic warfare* (MW). MW focuses on creating "adaptability and flexibility for U.S. forces and complexity or uncertainty for an enemy through the rapid composition and recomposition of more disaggregated U.S. forces using human command and machine control."[8] MW is form of combined arms that envisions fitting different pieces (tiles) together to create a coherent friendly system (the mosaic); figure 7 provides additional insight. The contrast is a puzzle, in which there is only one arrangement of the pieces, and alternatives produce failure.

The central advantage MW seeks is presenting a greater variety of dilemmas to adversaries through tailored force packages that couple robust and exquisite platforms with many small, highly specific partners that may be autonomous and/or expendable. Essentially, it means supplementing a few large, powerful mosaic pieces with a variety of small tiles. Mosaics and puzzles can produce the same system, but one is robust and the other is fragile. Consider the following examples:

> A frigate and several unmanned surface vessels could replace a surface action group of three destroyers, or a section of strike-fighters could be replaced by a strike-fighter acting as a C4ISR [command, control, communications, computers, intelligence, surveillance, reconnaissance] platform for a group of standoff missiles and sensor- and EW-equipped [electronic warfare] UAVs [unmanned aerial systems]. In a ground force, rather than relying on large formations, smaller units and subunits could be augmented with small and medium-sized UGVs [unmanned ground vehicles] and/or UAVs to improve their self-defense, ISR, and logistics capability.[9]

The opening vignette's WGX is a model for MW synergistically combined with AI and 3D printing. The bridge was printed in segments that moved to the river and assembled autonomously. In the air, drones retransmitted friendly communication, provided observation and attack, and located and chased the

enemy across the EMS with jamming. In the water, drones measured current and scanned for mines. On the ground, autonomous excavators massed to rapidly prepare survivability positions for far-side security. Decoys made the demonstration force of a brigade look like a real division, mimicking tanks, ambulances, and more, including details like chatbot-run EMS activity to impersonate friendly patterns. This is the potential of MW with AI harmonizing the tiles, assisting human staffs and commanders envision new arrangements of the tiles that enhance our capabilities while creating dilemmas for adversaries.

In the CDT horizon, we can also harmonize deception, intelligence, and operations, a feat that today is a herculean mental effort and cannot be done quickly. The point of deception is to cause enemy action or inaction that provides advantages for friendly forces. As history has proved repeatedly, deception can be decisive, as in a handful of Greek troops hidden inside a wooden horse infiltrating inside Troy to enable the victory that years of siege could not. But deception requires meticulously synchronizing real and false activities with observations of the enemy. Deception is not thought of as a mosaic, but it could be; the right arrangement of tiles into a lenticular image to create one mosaic from a friendly perspective and a different mosaic from the enemy's, but while watching the enemy to see if they interpret the image as friendly forces want them to. However, deception is about providing the right breadcrumbs (or tiles) to create a believable story.

In the WGX scenario, synchronizing deception, intelligence, and operations might look like painting the picture (or arranging the tiles) that the decoy is the real crossing while the real crossing is in fact a demonstration. In other words, arranging events and monitoring enemy activity to see if they believe the fake is real and the real is fake. With the thousands of friendly actions, how can we orchestrate this lie? The U.S. Army has done this masterfully in instances such as the 1944 Normandy landings and the 1991 Gulf War, but it takes months of practice to properly arrange the tiles without giving away the truth.[10] With AI, this can become drastically easier as synchronizing efforts and resources among deception, intelligence, and operations can be addressed as an optimization problem, and then war-gamed at machine speed as described in figure 7.

Movement and Maneuver	Intelligence	Fires
Example: Mosaic warfare	Example: Synchronization of intelligence, operations, and deception	Example: Unification across services

Movement and Maneuver

Example: Mosaic warfare

How
Force package mixes of manned and unmanned systems, and their capabilities are tailored for the threat and operational environment. The tailoring is designed to arrange discrete friendly strengths across domains and dimensions, to create and exploit opportunities.

Implication
Creation of perpetually new dilemmas for enemies. Knowing the existence of the capabilities (tiles) does not give the enemy insight into their arrangement. The loss of some capabilities (tiles) either does not prevent the formation of the overall effect (image) or prompts the formation of a new image.

Manned or Unmanned | Kinetic or Nonkinetic | Space Cyber Air Maritime | Land

Dimensions: Human, Information, Physical | WfFs: Maneuver, Fires, Protection, C2, Sustainment, Intel

Satellites Naval Aviation, Cruise Missiles Infantry, Air Defense, Guerillas, Signals Intelligence

Tiles on a mosaic create a specific outcome or can be rearranged for different outcomes; subsets of tiles can create multiple smaller outcomes. There is no single way the tiles must be arranged to produce the same bigger picture.

Intelligence

Example: Synchronization of intelligence, operations, and deception

How
Deception plans rely on the enemy observing false friendly actions and not observing actions that would reveal the deception (part of the real operation). AI grows to unify capabilities to synchronize information collection (IC) and counterintelligence (CI) with deception.

Implication
Deception can become dramatically easier and more feasible over short time horizons. With machine power building and synchronizing efforts, individual events in the wider deception plan can be effortlessly incorporated into operations, all with the alignment of IC and CI.

Current state problem: Deception requires long trail of breadcrumbs

Optimization problem: optimize assets to
• Participate in deception
• Observe enemy reaction
• Protect friendly information
• Blind enemy sensors that would discover deception

Desired future state: Deception seamlessly aligned with ops and intel

Operations
• What is our operation's end state?

Deception
• What advantage do we want from deception?
• What action do we want the enemy to take?

Intelligence
• What does the enemy want?
• How does the enemy perform IC? What sources do they trust most?
• How do we feed deception breadcrumbs to enemy intel?
• How will we know the enemy has seen the breadcrumbs and how will we know if they believe the deception?
• How will we know if the enemy has discovered the deception? How do we deny them the ability to see the truth (CI)?

Fires

Example: Unification across services

How
The evolving unification of fires AI during DT grows to include joint fires and effects. Fires AI systems between services are either built to be natively compatible or are taught to build their own compatibility and bridge gaps.

Implication
Synchronization of more fires platforms and effects adds tremendous flexibility to friendly forces and presents more dilemmas for adversaries. This unification compliments mosaic warfare approaches in movement and maneuver.

Available Joint Fires and Effects

Fires AI

Targets

Sustainment	Command and Control	Protection
Example: Robotic maintenance and repair	Example: Rehearsals in virtual reality	Example: Autonomous robotic digging

Sustainment

Example: Robotic maintenance and repair

How
AI taught standardized routine maintenance/repair. Machine vision teaches maintenance AI via repeated observation of humans performing sequential tasks, like oil changes, weapons gauging, and optics calibration. Additional sensors in equipment guides robotic maintainers to correctly identify faults and apply learned maintenance algorithms.

Implication
Maintenance AI supplements human maintainers, allowing them to focus on complicated repairs. Tremendously increases maintainer capacity. As maintenance AI learns more tasks, this advantage grows and can increasingly be applied to more austere conditions, such as brigade maintenance points in the field.

AI taught routine maintenance via machine vision + Equipment increasingly gains self-diagnostic sensors → Equipment sensors guide robotic maintainers to grow more capable and enable decision-making

Sensor report	Decision-making process
Fault 1	If faults 1, 2, 3 exist, then possible underlying problems are x, y. Given problems x, y, perform repair A.
Fault 2	
Fault 3	

Command and Control

Example: Rehearsals in virtual reality

How
AI combines planning products, information on enemy forces and the operational environment, and friendly force status and operational plans for immersive virtual reality (VR) rehearsals.

Implication
Superior ability to synchronize friendly efforts in time, space, and purpose and model factors that cannot be replicated by maps and terrain models.

Protection

Example: Autonomous robotic digging

How
Robotic digging equipment like excavators already exists, and when paired with trained AI, it can autonomously dig survivability positions for vehicles and command posts. Using learned algorithms, AI can learn the requirements for different position types and modify them based on different possible threats and friendly needs.

Implication
Potential to massively increase survivability through fielding assets that do not need sleep or breaks. When combined with 3D printing, assets can be made in the field. More assets can also aid deception since with enough diggers, commanders will not face the dilemma of building real or decoy positions but can dig both.

Mission requires digging → Assigning existing autonomous diggers or 3D printing autonomous diggers → Autonomous digger

Soldiers provide requirements and identify positions

(Figure by author; Abrams tank image by Staff Sgt. Steven Colvin)

Figure 7. AI's Potential Across Warfighting Functions
Concept-Driven Transformation Horizon

Table. Recent Significant Federal Policies on AI

Title	Date	Purpose
Exec. Order No. 14179, "Removing Barriers to American Leadership in Artificial Intelligence"	23 January 2025	"Develop AI systems that are free from ideological bias or engineered social agendas" and also revoke "certain existing AI policies and directives that act as barriers to American AI innovation."
OMB Memorandum M-25-21, "Accelerating Federal Use of AI through Innovation, Governance, and Public Trust"	3 April 2025	"Agencies must remove barriers to innovation and provide the best value for the taxpayer … empower AI leaders to accelerate responsible AI adoption … [and] ensure their use of AI works for the American people."
OMB Memorandum M-25-22, "Driving Efficient Acquisition of Artificial Intelligence in Government"	3 April 2025	"Ensuring the government and the public benefit from a competitive American AI marketplace," "safeguarding taxpayer dollars by tracking AI performance and managing risk," and "promoting effective AI acquisition with cross-functional engagement."
U.S. Department of Energy release, "DOE Identifies 16 Federal Sites Across the Country for Data Center and AI Infrastructure Development"	3 April 2025	"Inform development, encourage private-public partnerships and enable the construction of AI infrastructure at select DOE sites with a target of commencing operation by the end of 2027."

(Table by author)

Conclusion and Future Steps

AI can produce overmatch for our Army, but the road to overmatch requires continual evolution and an accompanying national strategy for AI superiority. Overmatch will be the product of the continual evolution in AI that unifies more capabilities. During the TiC horizon, AI will be able to do many human tasks but at machine speed. However, the lack of artificial general intelligence (AGI) may mean a variety of specialized AI products, such as an LLM AI for digesting orders from higher with a machine-vision AI for understanding maps, imagery, and military graphics. The DT window will see increasingly unified AI, and perhaps even the emergence of true AGI. This includes a potential command post AI like our vignette's masterAI, performing a complete orders process, identifying information requirements, building and war-gaming a collection plan, and then supervising the collection via manned and unmanned systems. These evolutionary advances can build up to an overmatch in the CDT horizon.

Our potential CDT future is the vignette's WGX that harmonized human and autonomous efforts, producing overmatch in decision-making speed and quality, protection, and lethality over ground forces that have not unlocked AI's potential. The increasingly unified AI, if not full AGI, will enhance the speed of planning and synchronization, as in the example of the synchronization of deception, intelligence, and operations. Particularly important will be the leaps for protection as the APS of individual platforms unifies into collaboration between APS to protect entire formations. As seen in the Russia-Ukraine War, protection has not kept pace with threats, hence the abundant videos showing drones preying on platforms and forcing tanks to add homemade cages. Protection's advancement will not stop there. APS can grow into collaborating systems across sister services while also adding in passive measures like autonomous excavators and AI-managed emission control. Lethality will similarly advance as MW becomes a possibility and collaborative AI between sister services eases the burden of joint operations and fires. However, achieving this CDT future is far from certain.

We need a deliberate strategy to not only codify our ends, ways, and means but also to align the Army's efforts with the rest of government and industry while also creating dilemmas for adversaries through lawfare, export controls, and other measures. AI is clearly an extraordinary federal priority, as seen in the table, which samples just a few recent federal actions.[11] AI is also vividly important to industry, as seen in the stock price of chipmaker Nvidia, the world's third most valuable public company as of 28 April 2025.[12] How to create an Army strategy for AI that reaps synergistic effects from alignment with wider federal strategy and trends in industry will require its own research effort.
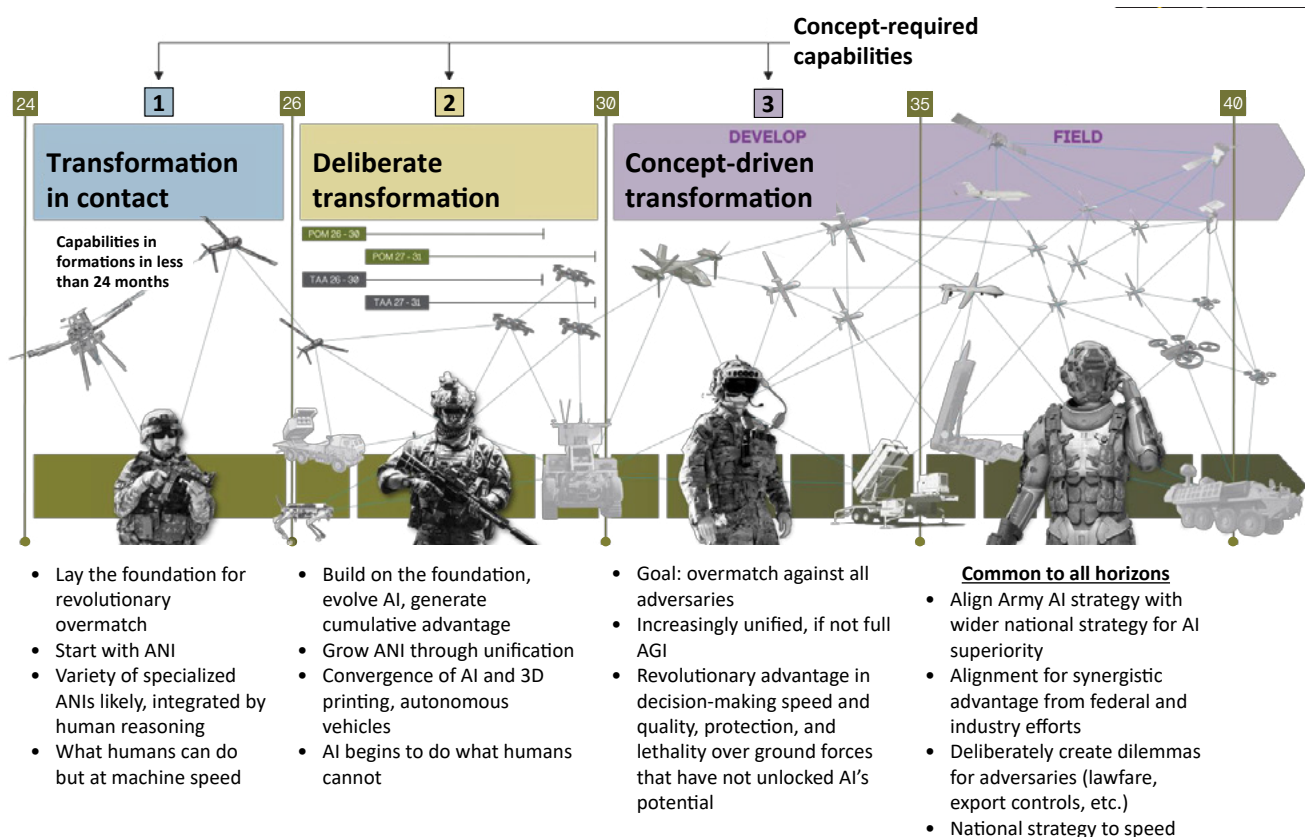
Figure by Army Futures Command, adapted by author)

Figure 8. The Army's Road to Achieving Overmatch

Part of this strategy must deliberately focus on creating dilemmas for adversaries: What capabilities do we want to delay or deny adversaries, and how can we align that disruption with federal strategy and industry desires? Creating dilemmas is essential since overmatch is a state of advantage, and advantage comes from both speeding ourselves up and slowing down adversaries.

Alignment of Army and federal AI strategies and industry efforts is also essential to solve the myriad technical, legal, and procedural issues. For instance, AI voraciously consumes power, produces tremendous heat and EMS emissions, and tends to be centralized in data centers (as opposed to edge computing at the end devices).[13] The Army cannot solve these problems, but industry can and already is, and federal strategy is essential to guiding industry to solve military problems. Similarly, there is a natural tendency for model creators to develop proprietary systems that do not seamlessly work with those of rivals. Lack of alignment with federal strategy and interaction with industry could see the

Army, Navy, and Air Force hitch themselves to incompatible providers, erasing our advantage over time to the cost of billions of dollars and years of wasted effort. Lastly, the examples and overall vision here for AI in the Army is quite optimistic for each time horizon. If we fight trends, we will certainly not afford future overmatch or achieve it in time; if we harness trends, it may speed up use cases, especially those with dual military and civilian application.

AI has recently reached an inflection point where it can provide real, if still limited, functional value; this value will rapidly change as AI unifies more capabilities and AGI becomes a reality. Across all the horizons of continuous transformation, AI can enhance our Army to provide evolutionary advantages. But the Army clearly cannot achieve this on its own, hence the need to build concepts now while creating and aligning an Army strategy for AI with federal strategy and industry efforts, simultaneously determining how to create dilemmas for adversary development so we grow our

advantage. An AI revolution is happening in society at large, and now is the time to plant the seeds of military revolution. A revolution that provides the Army overmatch in the ability to act faster, make superior decisions, be more lethal, and better protect the force, than every adversary (see figure 8). ∎

Notes

Epigraph. Jensen Huang, "Nvidia's Jensen Huang on the White House's AI Initiative," interview posted by Dean Takahashi, Venture Beat, 13 May 2018, https://venturebeat.com/ai/nvidias-jensen-huang-on-the-white-houses-ai-initiative/.

1. Field Manual 5-0, *Planning and Orders Production* (U.S. Government Publishing Office [GPO], 2024), 77. The steps to the military decision-making process are (1) receipt of mission; (2) mission analysis; (3) course of action (COA) development; (4) COA analysis; (5) COA comparison; (6) COA approval; and (7) orders production, dissemination, and transition.

2. James E. Rainey, "Continuous Transformation," *Military Review* 104, no. 5 (September-October 2024): 10–26, https://www.armyupress.army.mil/Journals/Military-Review/English-Edition-Archives/SO-24/SO-24-Continuous-Transformation/.

3. Rainey, "Continuous Transformation," 12.

4. Unification definition in figure 2 from "Unification in AI," accessed 15 January 2025, https://www.geeksforgeeks.org/unification-in-ai/.

5. Screenshots in fires pane from "HIMARS Accurately Hits a Convoy of Russian Military Vehicles," YouTube video, posted 29 September 2024 by My Global Issues, https://www.youtube.com/watch?v=dfReyUUESb0.

6. Rainey, "Continuous Transformation," 12.

7. Rainey, "Continuous Transformation," 12.

8. Bryan Clark, Dan Patt, and Harrison Schramm, *Mosaic Warfare: Exploiting Artificial Intelligence and Autonomous Systems to Implement Decision-Centric Operations* (Center for Strategic and Budgetary Assessments, 2020), 27, https://csbaonline.org/research/publications/mosaic-warfare-exploiting-artificial-intelligence-and-autonomous-systems-to-implement-decision-centric-operations.

9. Clark, Patt, and Schramm, *Mosaic Warfare*, 28.

10. Scott C. Farquhar, "Deceive, Divert, and Delay: Operation FORTITUDE in Support of D-Day," in *Weaving the Tangled Web: Military Deception in Large-Scale Combat Operations*, ed. Christopher M. Rein (Army University Press, 2018), 137–53; Donald P. Wright, "Deception in the Desert: Deceiving Iraq in Operation DESERT STORM," in Rein, *Weaving the Tangled Web*, 215–30.

11. Donald J. Trump, "Removing Barriers to American Leadership in Artificial Leadership," White House, 23 January 2025, https://www.whitehouse.gov/presidential-actions/2025/01/removing-barriers-to-american-leadership-in-artificial-intelligence/; Russell T. Vought, memorandum, "Accelerating Federal Use of AI through Innovation, Governance, and Public Trust," Office of Management and Budget, 3 April 2025, https://webdevelopmentgroup.us20.list-manage.com/track/click?u=6821469cd180710d53bfc94d1&id=70ff037017&e=f395826b19; Russell T. Vought, memorandum, "Driving Efficient Acquisition of Artificial Intelligence in Government," Office of Management and Budget, 3 April 2025, https://www.whitehouse.gov/wp-content/uploads/2025/02/M-25-22-Driving-Efficient-Acquisition-of-Artificial-Intelligence-in-Government.pdf; "DOE Identifies 16 Federal Sites Across the Country for Data Center and AI Infrastructure Development," U.S. Department of Energy, 3 April 2025, https://www.energy.gov/articles/doe-identifies-16-federal-sites-across-country-data-center-and-ai-infrastructure.

12. Measured by total market capitalization as of market closing 28 April 2025 from "Largest Companies by MarketCap," CompaniesMarketCap, accessed 28 April 2025, https://companiesmarketcap.com/.

13. Promising potential solutions to reduce AI's voracious appetite for power include photonic chips. See Jim Cramer, host, *Mad Money with Jim Cramer*, podcast, interview with Simona Jankowski, 18 November 2024. Information on impacts to the national power grid can vary widely. For an introduction, see Andrew Schwartz, host, *The Truth of the Matter with Andrew Schwartz*, podcast, interview with Joseph Majkut, 21 November 2024.

An artist's conception of a Chinese hacker launching an attack on Guam military bases. (AI illustration by Gerardo Mena, Army University Press)

Using CamoGPT AI to Build Scenario-Driven Change

The Example of Guam as a Hybrid Attack Target

Lt. Col. John Ringquist, PhD, U.S. Army, Retired

The experimental U.S. Army AI program CamoGPT debuted in 2024 as a program developed in-house by U.S. Army soldiers for members of the Department of Defense (DOD). When first offered, it provided users with the opportunity to explore potential scenarios in an unclassified setting. The resulting scenarios could provide context for multidomain operations planning, future force generation, and areas of potential civil-military collaboration that may otherwise go unnoticed in the data streams of daily operations. Artificial intelligence (AI) could also enable research into hypothetical scenarios that include hybrid or "gray-zone" warfare that could become a component of future conflicts. The risk of attacks against the U.S. domestic infrastructure are rising as Chinese and Russian gray-zone and hybrid warfare approaches demonstrate the capability for state-sponsored terrorists, criminals, and nonstate actors to destroy or degrade key infrastructure resulting in catastrophic impacts on security and the populace.

Cyber Attacks, Hybrid Warfare, and Volt Typhoon

The U.S. domestic infrastructure is exposed to attacks from domestic and foreign actors, through physical, cyber, and insider-threat means. The Cybersecurity and Infrastructure Security Agency (CISA) Advisory Committee warns that with limited exceptions, critical infrastructure and government agencies have not prepared for a contested environment as a result of nation-state conflict.[1] Despite attempts to improve physical protection for key infrastructure and efforts to develop resiliency against cyberattacks, numerous domestic infrastructure nodes remain vulnerable. Some of the most pernicious attacks occur over an extended period and in the background of existing systems, as back doors and malware work to undermine systems security.

China is the suspected or confirmed origin of many cyberattacks against the United States. The persistent attacks have generated discussion that questions if we are engaged in hybrid war with China. It is possible that we are being probed by Chinese state and nonstate actors in preparation for a larger conflict. In 2022, the People's Liberation Army discussed "Multi-Domain Precision Warfare" as a new way to leverage C5ISR by incorporating big data and AI to rapidly identify vulnerabilities in U.S. systems and then combine forces to

launch precision strikes against those vulnerabilities.[2] Cyberattacks used to indirectly determine weaknesses are preludes to a greater Chinese effort to destabilize U.S. alliances, degrade capabilities, and create weakness for later exploitation.[3] The Office of the Director of National Intelligence assesses that China would consider "aggressive cyber operations against U.S. critical infrastructure and military assets … to deter U.S. military action by impeding decisionmaking, inducing societal panic, and interfering with deployment of U.S. forces."[4] One of the most significant threats to the United States and its allies that was uncovered already embedded in numerous civilian utilities is the malware delivered by the Chinese hacker group Volt Typhoon. Despite repeated attempts to deny access and FBI successes against Volt Typhoon in early 2024, Volt Typhoon adapted, and its bots continue to exploit legacy systems through unprepared third parties in the United States.[5] The variety of threats to U.S. infrastructure from Volt Typhoon demonstrates the potential for malicious software to cause disruption of critical military systems and supporting civilian logistics networks.

Multiple Chinese hacking groups operate across the world, but Volt Typhoon characterizes an approach that seeks to attack the underprotected fringes of competing states. Volt Typhoon hackers have attacked energy, transportation, water, and wastewater systems in the United States and its territories.[6] One of the affected territories is Guam, the location of key U.S. forces expected to respond to Chinese aggression, especially in the case of an attempted invasion of Taiwan. Destroying or disabling military response capability through a hybrid attack that disables integrated civilian infrastructure, especially power and water, is one scenario

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that ChatGPT has indicated is likely in the lead up to a Chinese invasion of Taiwan. China is developing plans and capabilities to execute hybrid war that leverage emerging technologies and AI to determine the next war's strategies.

The Chinese army has invested heavily in new technologies as it upgrades its military capabilities. The People's Liberation Army has at least one AI model developed from Meta's Llama model that has been adjusted for military field missions.[7] This model, named ChatBIT, is another aspect of the changing nature of the hybrid battlefield that will be used to identify and exploit weaknesses in opposing forces' conventional forces and support systems. China's military already uses AI for training scenarios, and its joint civil-military programs keep the military intimately engaged in Chinese AI research and development programs. One outcome of the development of AI-enabled technology and dedicated AI models is the opportunity for the Chinese military to continually refine their plans and simulations.[8] The information obtained through multiple sources including nonstate actors, state-sponsored hackers, and espionage ensures data flows to Chinese servers to support AI decision-making for future scenarios. Combating Chinese cyberwarfare will be a major mission for the future but so will training that includes the effects and potential counters to Chinese cyberattacks.

Scenario Development with CamoGPT

Although the use of the AI programs CamoGPT and NIPRGPT were curtailed in early 2025, and the CamoGPT program was restricted by Presidential Executive Order 14271, new AI programs are being considered for the DOD.[9] When it debuted, CamoGPT was an overwhelming success. The enthusiasm for AI within the military is real. The initial promise from using an AI program like CamoGPT to analyze a potential Chinese hybrid warfare scenario against a single node revealed that a large language model (LLM) could select potential targets for the scenario and determine their value and vulnerability. In one example, CamoGPT identified Andersen Air Force Base on Guam as one of the most vulnerable U.S. military bases.[10] A slightly reworded inquiry confirmed Guam as one of the most important bases for a response to

a Chinese attack on Taiwan.[11] Further refining opening perimeters for the scenario that did not include a missile attack, CamoGPT AI defined some of the likely targets for a preemptive strike to be Andersen Air Force Base, Naval Base Guam, U.S. military communications and radar facilities, Apra Harbor, and Guam International Airport.[12] Therefore, for this scenario, Guam was separated as a discrete variable from the rest of U.S. Indo-Pacific Command to enable analysis of how a hybrid attack against Guam could affect its ability to support a military and civil response to a Chinese attack elsewhere in the region.

Utilizing CamoGPT for a training scenario that posits a hybrid attack on the island's infrastructure, AI quickly isolated a variety of variables that made Guam vulnerable to Chinese hybrid attacks.[13] CamoGPT selected Guam's critical vulnerabilities and included its remote location, dependence on a single internet provider, and an aging infrastructure including power grid and telecommunications systems vulnerable to distributed denial-of-service attack and ransomware attacks. However, it must be stressed that CamoGPT did make some mistakes, and when we checked the AI analysis, we learned that Guam could be a tougher target for physical infrastructure attacks. For example, Guam has not one but at least three internet providers, and eleven subsea systems and multiple landing stations.[14] The infrastructure analysis was proven valid.[15] The scenario assumed that civilian targets will be struck first across an array of vulnerable cyber and physical infrastructure, and military and government agencies would be targeted by malware. The next steps in the CamoGPT scenario creation and analysis were driven by the need to confirm CamoGPT AI's findings and potential holes in the scenario that could reduce its relevance. Each named vulnerability was assessed, and the CamoGPT scenario was refined by the assessment findings.

Civilian and military sectors in Guam have experienced cyberattacks and are addressing ways to harden Guam against future intrusions. The Guam National Guard has increased its cybersecurity posture and training and collaborates with other military organizations on the island. The Guam National Guard also conducts exercises with U.S. Space Force, and it hosted a cybersecurity summit in 2023.[16] The summit brought together military and civilian representatives to coordinate capabilities and identify solutions to Guam's

Source: CRS compiled the map based on publicly available information from sources that included the Homeland Infrastructure Foundation-Level Data (HIFLD) Open Portal website; U.S. Government Accountability Office reports, Naval Facilities and Engineering Command documents, the Guam Visitors Bureau, Marine Corps Base Camp Blaz website, and Google Maps.
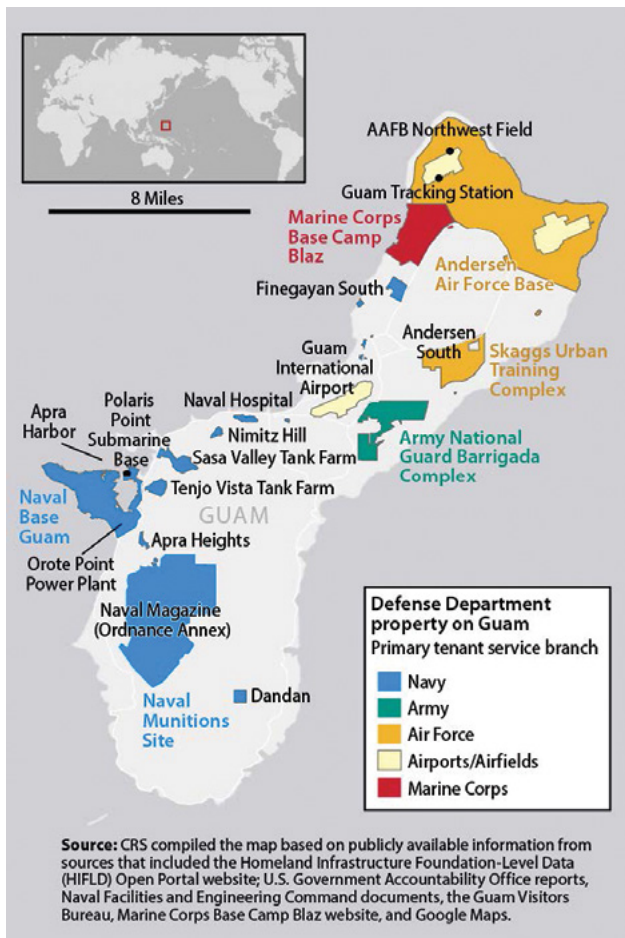
(Map by Congressional Research Service)

U.S. Military Installations on Guam

infrastructure issues in the wake of a typhoon that caused extensive damage to communications and other utilities, and the discovery of Chinese Volt Typhoon malware in Guam.[17] Before asking CamoGPT to outline a hypothetical cyberattack, we considered the following factors: solutions were in process, malware was already in the Guam ecosystem, any cyberattack would need to target people via phishing to introduce malware into military and civil systems, and it would require bots making continual efforts to ensure system defeat. This final variable was considered in light of another suspected Volt Typhoon generated series of attacks in 2025.[18] The CamoGPT scenario created via prompts considered these variables.[19] CamoGPT included physical and cyberattacks in its response.

The CamoGPT AI-generated hybrid attack scenario occurred across a multiweek period and

recommended several phases, including deception, espionage, and hacking to identify vulnerabilities. Specific steps and methods for an attack have been modified for this forum to prevent adversaries from emulating our findings. At this point we must stress that LLMs require checking, and their recommendations must be weighed against known information and capabilities.

The initial efforts in a hybrid attack could mirror known details of past Volt Typhoon and other similar hacking attacks by employing physical and digital reconnaissance to identify critical infrastructure including the power grid, water treatment plants, and military bases. The readily available Guam online utilities maps and the island's small size can reduce the time required for these options. Some hackers have followed up reconnaissance and networking probing with spear phishing campaigns to target key civil and military personnel. Malware like that used by Volt Typhoon could infect vulnerable systems through a spear phishing attack, then employ a distributed denial-of-service attack to overwhelm Guam's internet infrastructure. The follow-on effort could deploy social engineering messaging (e.g., cognitive warfare to spread disinformation and panic) with bots and human agents amplifying the message. The cyberattacks could then give way to physical attacks against critical infrastructure and military targets to degrade resiliency and destroy key capabilities.

Systems Vulnerabilities and Real-World Developments

The first area of vulnerability against Chinese attack are the computer systems that Volt Typhoon compromised with malware. CISA characterized the Volt Typhoon operations as positioning attempts to allow hackers to disrupt networks in the event of geopolitical tensions or military conflicts.[20] Discovery doesn't guarantee removal and requires continual vigilance. CISA observed that Volt Typhoon was persistent and relied on undiscovered presence in valid accounts. When combined with telecommunications hacks, the potential to compromise massive amounts of data and leave backdoors hidden within computer and telecommunications systems creates an atmosphere of uncertainty and risk. Chinese efforts to compromise U.S. systems continue unabated despite U.S. efforts to destroy networks and hacker groups. The insidious nature of

Several Navy vessels moor in Apra Harbor at U.S. Naval Base Guam on 5 March 2016. The harbor is an important element of the CamoGPT scenario due to its importance for naval operations and reliance on advanced technologies that could become a critical vulnerability if attacked. (Photo courtesy of the U.S. Navy)

the problem is complicated by state sponsorship and China's broad base of nongovernmental and state-sponsored hacking groups. Attacks have expanded to include additional sectors and people that are recognized as legitimate targets during hybrid warfare. Telecom executives, political leaders, and Washington, D.C., insiders have been hacked through similar methods, and as late as November 2024, a Chinese hack of unknown penetration depth and breadth was characterized as the worst telecom hack in U.S. history.[21] Combining a compromise of U.S. leaders' telecommunications systems with a pinpoint cyberattack against Guam would give China the advantage in command-and-control operations during the window of time between the attack and a concerted response from senior policymakers.

Creating a training scenario that can translate into a better appreciation of the vulnerabilities in civilian and military systems requires a way of building the scenario that ensures that the AI model is not the only input to scenario development. Working in an unclassified environment, it is possible to leverage the data that CamoGPT pulls from the internet with the caveat that the program will not provide information that could result in a formula for what exact nodes should be attacked in Guam to defeat the civil-military response. However, for training purposes, analysts can mitigate CamoGPT's shortcomings through research and by applying their own knowledge and experience to the scenario. For example, keeping this scenario within the realm of a short, sharp conflict, the most obvious targets would be military bases, materiel, and support logistics. However, additional targets for sabotage and physical attack are possible for a hybrid attack beyond power substations and water treatment plants. An example of targets that CamoGPT did not identify were the Guam undersea cable and onshoring facilities. The knowledge of follow-on Volt Typhoon attacks in 2025 informed the likelihood that attacks of a similar nature would feature in a future hybrid attack.

Also unidentified by AI, but vulnerable to assault is the Guam cable-management ecosystem connected to cloud architecture that could be attacked by hackers. Guam's communication cables enable Japan, Taiwan, the Philippines, Australia, the United States, and the

rest of Micronesia to enhance U.S. situational awareness in their respective areas and provide redundancy if land-based communications nodes were destroyed.[22] In the event of a cyberattack against the Guam cable management hubs, communications could be impaired for an indeterminate period. Absent a physical attack on the cables and data centers, the cyberattack scenario could provide China with the opportunity to launch a misinformation campaign or cause confusion sufficient to aid a hack on more sensitive systems. However, in this scenario, because CamoGPT did not identify the cables or onshore landing stations specifically, they would survive and play a potential response/resiliency role.[23] In reality, China and Russia have been named as prime threats to subsea communications cables, as recently as November 2024.[24] Undersea communications cables are attractive targets, but the most likely target for China is Guam's power infrastructure in the event of a hybrid warfare attack. CamoGPT identified it as one of the most likely targets for cyberattack.

Guam's aging power infrastructure is a major vulnerability for the U.S. military and the civilian populace in Guam. Despite increased funding to increase the electrical grid's resiliency, over 75 percent of Guam's citizens receive power through vulnerable and exposed aboveground lines.[25] This leaves the power grid open to weather effects and physical attack. Guam's transmission lines and substations also suffer from a lack of redundancy and legacy infrastructure in need of systemic replacement. Despite not providing specific means to destroy Guam's emergency response to a cyberattack, CamoGPT identified specific substations' transmission lines by name that could be vulnerable to physical attack. We did not name them in this article for security reasons. Although there was no single point of failure for the electrical grid, multiple points of vulnerability offer opportunities for physical attack. However, due to time constraints, a cyberattack could prove more destructive for Chinese hackers. They have proven that they can penetrate the network and can be expected to attempt to attack through undiscovered backdoors or new penetrations. Chinese hackers should be expected to employ a combination of attacks to breach networks through social engineering, phishing attacks, and exploitations of networked but less-anticipated routes of entry to utility and cloud systems such as law enforcement, civil authority, port management, and emergency response networks.

A query to CamoGPT for the solution on how to protect the electrical grid resulted in a recommendation for cyber vigilance and regular checks of systems for penetrations.[26] This may sound simplistic, but it may be the most effective way to deny Volt Typhoon access to key systems. Volt Typhoon has conducted attacks worldwide including hacks of electrical utilities in India like those in Guam with the identical goal of causing blackouts.[27] Further research into Volt Typhoon's attacks against electrical power grids and other logistics networks reveal a systematic attempt to create and maintain intrusions for the purpose of gathering intelligence and testing for weaknesses in interconnected networks. Examples from the news include attacks against communications, power, and emergency response networks. A parallel to Volt Typhoon's intrusions has been the work of Chinese state-sponsored hackers Salt Typhoon, whose hacking has been discovered in patched devices that were accessed using stolen credentials. Salt Typhoon has also taken advantage of zero-day vulnerabilities and unpatched systems.[28] Volt Typhoon, like Salt Typhoon, uses a persistent-access technique that can be expected to wait dormant until activated by the hacker group after exploring infected networks.[29]

Volt Typhoon has focused on infiltrating operational technology networks in critical infrastructure and has been found in multiple U.S. electrical utilities networks, geographic information system networks, satellite and telecommunications networks, and emergency response systems. Volt Typhoon has also been suspected of verging on compromising operational technology that could affect physical industrial control systems.[30] The ability to perform industrial control system attacks like the one generated by the Stuxnet computer worm could cause widespread damage to power generation networks.[31] This specific capability has the potential to cause significantly degraded operational capacity for U.S. military operations on Guam if the civilian electrical grid is attacked and power-generating industrial control systems are damaged or destroyed.[32] An industrial control system attack could cause systems to overheat, malfunction, or suffer catastrophic mechanical failure. Adding additional military facilities and increasing operations on the island will add to that

strain.[33] Volt Typhoon has compromised the Guam Power Authority in the past and should be expected to attempt multiple cyberattacks in the future.

Apra Harbor is an important element of the CamoGPT scenario because of its importance to U.S. naval forces and the anticipated arrival of additional forces. CamoGPT identified certain aspects of Apra Harbor's facilities and management as vulnerable to cyberattacks. The AI component of this port attack scenario is supported by the 2024 U.S. House of Representatives release of a report revealing that over 80 percent of ship-to-shore cranes at U.S. ports were manufactured by a China state-owned company, ZPMC.[34] The report specifically stated, "ZPMC could, if desired, serve as a Trojan horse capable of helping the CCP and the PRC military exploit and manipulate U.S. maritime equipment and technology at their request."[35] Guam was specifically identified as a point where Chinese hackers could exploit the ZPMC weaknesses because of the Port of Guam's acquisition of ZPMC gantry cranes and ship-to-shore cranes. Further, ZPMC was named a "Communist Chinese Military Company" by the DOD in August 2020.[36] The port infrastructure at Apra Harbor is at a crossroads while the geopolitical situation develops in the U.S. Indo-Pacific Command theater of operations. The port is simultaneously seeking to expand, accommodate increased Navy and Marine Corps mission requirements, and upgrade its existing technology. This confluence of factors creates an environment in which CamoGPT can help scenario developers plan through specific queries about port infrastructure, security systems, and communications.

The query "How could a cyberattack disable Apra Harbor?" led the AI to conclude that a cyberattack would occur through a combination of cyberattack techniques similar to those used by Salt Typhoon and Volt Typhoon in the past.[37] Although attacks against ships' navigation systems could create some confusion in the harbor, the greatest threat is to port logistics and power systems. Attacks on the port infrastructure would have wide-reaching and significant impacts on the military buildup currently underway in Guam. The current port cranes are antiquated and are considered a risk to port operations.[38] There are more vulnerabilities arising from plans to expand the Naval Base Guam infrastructure in Apra Harbor. The potential for a catastrophic cyberattack is not very clear in

the CamoGPT response, so a look at the new naval facilities helps with scenario building.[39]

Naval Base Guam is home to a variety of especially important units necessary for any response to Chinese aggression. China has undoubtedly monitored U.S. plans to expand the naval base and likely utilizes its own AI resources to analyze the base's capabilities. The expansion of Polaris Point Submarine Base to host a group of Los Angeles-class attack submarines, along with the addition of new maintenance repair facilities, makes this a target for cyber and infrastructure attacks. The potential for the Marine Corps adding Landing Ship Medium vessels to Guam increases naval base's value for a conventional attack to degrade or destroy base infrastructure, especially electrical power.[40] Although Guam's electrical grid is under extreme stress, if it should fail, the Navy has alternate power generating capabilities.[41] However, it too is vulnerable to an industrial controls attack. CamoGPT provided the basic parameters that identified Apra Harbor as a likely hybrid attack target, but including specific details for the Polaris Point Submarine Base, Navy Base Guam, and Marine Corps facilities helps develop the strategic value of the Navy facilities on Guam for any hybrid attack scenario. Compromising Global Positioning System, Automatic Identification System, and other ship navigation systems could create chaos in the harbor that would delay military responses and potentially damage military base infrastructure.

Conclusion: Why Use AI … and Its Shortcomings

CamoGPT, while experimental, was a useful AI tool for scenario development because it saved time and effort identifying general details that could be refined with subsequent queries. The example that was used for this article began with identifying the most vulnerable U.S. base, then narrowing the areas in which the Guam could be attacked through hybrid means. The overarching theme for many scenarios involving a Chinese attack against Guam includes missile and air attacks, but designing a scenario that focused on hybrid attack methods allowed for a teaching approach that emphasized a civil-military methods through existing means to achieve the desired end of a less vulnerable Guam infrastructure. Choosing not to include variables such as time for infrastructure replacement or capability reinforcement following a hybrid attack kept the scenario focused on a short, sharp attack that would involve existing identified unclassified vulnerabilities that CamoGPT picked out from the internet.

Unfortunately, until CamoGPT has been replaced by another program that is widely available and more funds are made available for training and resources, the remaining approved AI tools are sparse and have some limitations. Sage AI runs on tokens that must be purchased. NIPRGPT lost its approval. These temporary setbacks should not stop research into how we can incorporate AI into our DOD work. Commercial sources are available on civilian networks, and we can learn how to use ChatGPT or Perplexity (to name a few programs) to do AI work. The DOD needs an approved AI source for educators, students at PME institutions, and researchers looking into how we can become better and smarter with AI tools. Choosing to utilize a LLM like CamoGPT for planning or scenario development requires careful consideration of how to frame arguments and questions. The model will not respond to queries to provide information or guidance on illegal or harmful activities. However, it will provide consequences should systems be compromised. It cannot be stressed enough that LLMs can and do make mistakes, and that those people that employ such tools have an obligation to recognize this potential and fact check their results appropriately. The lesson for scenario developers is to approach a potential scenario with an eye to operational design as well as an appreciation for military strategy. China's approach to hybrid warfare will exploit the inherent weaknesses in civil-military relationships and capitalize on the potential for maximum disruption with the goal of creating opportunities to employ all elements of national power to defeat an enemy. ∎

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Staff Sgt. Stetson Manuel, a robotics and autonomous systems platoon sergeant from Alpha Company, 1st Battalion, 29th Infantry Regiment, 316th Cavalry Brigade, carries the Ghost-X Unmanned Aircraft System after its Project Convergence–Capstone 4 experimentation flight on 11 March 2024 at Fort Irwin, California. (Photo by Sgt. Charlie Duke, U.S. Army)

Unmanned Aircraft and the Revolution in Operational Warfare

Preparing the U.S. Army for the Age of Unmanned Systems

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According to Eliot Cohen's framework for understanding revolutions in military affairs, the widespread employment of unmanned aircraft systems (UAS) in the Russo-Ukrainian War represents a fundamental transformation in the conduct of operational warfare, as it demonstrates the confluence of new weapons, new organizations, and new ways of war (see the table).[1] This transformation manifests in fundamental changes to how forces plan and execute campaigns, integrate intelligence within operations, and approach command and control, with particularly significant implications at the operational level of war.[2]

As division and corps commanders must now account for persistent surveillance capabilities that eliminate traditional advantages of operational surprise while simultaneously leveraging new capabilities for deep strike and operational shaping, the experience of Ukrainian and Russian forces provides valuable lessons for how operational commanders must adapt to this new reality.[3] The widespread adoption of UASs has fundamentally altered the operational environment, creating conditions of near-persistent surveillance that challenge traditional concepts of military operations.[4]

Drawing on emerging evidence to demonstrate how these systems represent new weapons, organizations, and ways of war, this article examines the transformative impact of UASs on operational warfare through the lens of the Russo-Ukrainian War. It then explores the implications of this revolution for the U.S. Army at the operational level, offering specific recommendations for how the service must adapt its doctrine, organization, and leader development to succeed in future conflicts.

UASs as New Weapons: Transforming Operational Capabilities

The evolution of UAS employment. Demonstrating how UASs have transformed operational warfare, the Battle of Avdiivka in early 2024 saw Ukrainian corps-level commanders employing UASs weekly across the operational area, not merely as tactical assets but as integrated elements of operational design.[5] These systems enabled persistent surveillance across the entire operational depth, fundamentally changing how forces plan and execute operations. More

significantly, the integration of UASs with operational fires created new possibilities for deep strike and operational shaping, allowing commanders to affect the battlefield simultaneously across multiple domains and distances.[6]

Beyond traditional military applications, the operational impact extends further as Ukrainian forces have demonstrated remarkable innovation in adapting commercial UAS technology for military purposes. According to Stacie Pettyjohn, senior fellow and director of the defense program at the Center for a New American Security, Ukrainian forces routinely employ commercial drones modified with thermal imaging capabilities for night operations, enabling sustained twenty-four-hour surveillance and strike capabilities.[7] At the operational level, this adaptation has particular significance, as the ability to maintain continuous observation has transformed how commanders understand and shape the battlefield.[8]

Deep strike and operational shaping. Illustrating how UASs enable new approaches to operational shaping, Ukraine's April 2024 Belgorod raids saw Ukrainian forces employing over two hundred UASs in coordinated operations, demonstrating how unmanned systems allow operational commanders to create and exploit opportunities at unprecedented scale.[9] These operations integrated reconnaissance, electronic warfare, and strike missions in ways that fundamentally altered the relationship between operational planning and execution. The raids forced Russian operational commanders to commit significant resources to rear area defense, demonstrating how UASs enable smaller forces to achieve operational effects previously requiring much larger formations.[10]

Ukrainian forces have developed innovative ways of employing UASs for tactical strikes and battlefield shaping operations, particularly through the integration of first-person-view drones and loitering

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Table. Cohen's RMA Criteria Applied to UASs in the Russo-Ukrainian War

RMA Criterion	Evidence from the Russo-Ukrainian War
New Weapon	• Unprecedented proliferation and diversity of unmanned aircraft system (UAS) types • Rapid technological advancements (e.g., Bober heavy first-person-view bomber, Shahed-136) • Integration of AI and machine learning • Accessibility and cost-effectiveness ("Poor Man's Airforce") • Democratization of air power capabilities
New Organization	• Creation of Ukraine's Unmanned Systems Forces • Novel recruitment and training methods for UAS operators • Formation of specialized UAS teams (pilots, explosive ordnance disposal specialists, maintainers) • Integration of civilian education for drone operations • Russian proposals for "unmanned-centric" brigade concepts
New Way of War	• Expansion of battlefield vertically and horizontally • New tactics (e.g., UAS swarms, drone stacks) • Integration with conventional weapons systems • Changes in decision-making and command structures • Psychological impact on troops and public perception • Shift in economic calculus of warfare • Development of new counter-UAS strategies

(Table by author)

munitions. While these systems may not have the range typically associated with deep strike capabilities, they have proven highly effective against high-value targets within their operational reach. Ukrainian commanders have leveraged the relatively low cost and high accuracy of these systems to develop new tactical concepts, such as using first-person-view drones for real-time reconnaissance and target acquisition and employing loitering munitions for precision strikes against enemy armor, artillery, and command posts.[11]

The ability to conduct persistent, high-precision strikes at the tactical level has fundamentally changed how Ukrainian commanders approach battlefield preparation and exploitation. By using these systems to systematically degrade Russian combat power and disrupt their operations, Ukrainian forces have been able to create opportunities for decisive maneuver and counterattacks.[12] This tactical innovation has had operational-level impacts, enabling Ukrainian forces to seize the initiative during various phases of the war and shape the battlefield in their favor. However, it is important to note that these shorter-range systems are not a substitute for genuine deep strike capabilities such as long-range UASs like the Shahed or various other

systems, which can conduct strikes far behind enemy lines. Rather, they represent a complementary capability that enhances the overall effectiveness of Ukrainian operations at the tactical and operational levels.

Integration with Conventional Forces

Ukrainian commanders have developed sophisticated approaches to employing UASs in support of ground maneuver while simultaneously conducting independent deep operations, creating new operational synergy between UASs and conventional forces.[13] Extending beyond simple support relationships, this integration represents new ways of thinking about operational effects. By maintaining persistent surveillance while simultaneously conducting precision strikes, Ukrainian commanders have fundamentally altered how they approach battlefield preparation and exploitation.[14]

During the Battle of Kherson in late 2022, for example, Ukrainian forces employed swarms of small drones to identify Russian defensive positions and guide long-range fires, allowing them to rapidly degrade enemy combat power before launching a ground offensive.[15] This UAS-enabled targeting allowed Ukrainian

commanders to shape the battlefield at a tempo and scale previously impossible, setting conditions for a successful counterattack that liberated the city.[16]

David Hambling notes that the integration of UASs with artillery has been particularly transformative, as drones have made Ukrainian artillery "lethally accurate," allowing real-time adjustments of fire and immediate battle damage assessment.[17] This capability has changed the calculus of fire support, enabling commanders to employ artillery with unprecedented precision and responsiveness. Pairing drones with artillery has also allowed Ukrainian forces to engage targets across the operational depth, striking key Russian command posts, logistics hubs, and lines of communication.[18]

New Organizational Structures for Operational Success

Ukraine's Unmanned Systems Forces. Representing the most comprehensive organizational response to this operational revolution, Ukraine's establishment of the Unmanned Systems Forces (USF) in 2024 emphasizes operational-level integration and effects, unlike traditional military branches focused on tactical employment.[19] The structure maintains dedicated operational-level formations capable of supporting corps and division operations while simultaneously conducting independent deep operations. This organizational innovation demonstrates how unmanned systems require new concepts for force structure and command relationships at the operational level.[20] Aiming to support operations with "over a million indigenously developed first-person view unmanned aircraft systems," this new branch demonstrates Ukraine's commitment to reshaping its military structure around unmanned systems through massive investment in UAS technology and organization.[21] The appointment of Col. Vadym Sukharevskyi, described as "one of the first commanders in Ukraine to effectively deploy unmanned aerial vehicles (UAVs) in combat," as the first commander of the USF, underscores the emphasis on practical experience and expertise in unmanned operations at the highest levels of command.[22]

By creating a dedicated branch for unmanned systems, Ukraine's USF represents a fundamental shift in how militaries organize for operational success. This

allows for the rapid development and dissemination of new tactics, techniques, and procedures, fostering a culture of innovation and adaptation by institutionalizing the importance of these capabilities and ensuring their integration into all aspects of operational planning and execution.[23] Providing a model for how militaries can leverage tactical successes into operational advantages, the USF enables the rapid scaling of successful tactics and technologies across the entire force by consolidating expertise and resources at the operational level.[24] This ability to quickly translate tactical innovations into operational capabilities has been a key factor in Ukraine's ability to resist Russian aggression.

Transformation of operational headquarters. To integrate unmanned systems across all warfighting functions, Ukrainian corps and division staffs have evolved by adapting their processes to account for persistent surveillance capabilities and new strike options.[25] While intelligence sections developed new approaches to processing and analyzing the vast amounts of information available from UAS operations, operations sections created new planning processes that fully leverage unmanned capabilities.[26] For example, Ukrainian operational headquarters have established dedicated UAS cells responsible for integrating drone operations into overall campaign planning.[27] Working closely with intelligence and operations sections to ensure that UAS capabilities are fully leveraged in support of operational objectives, these cells also serve as conduits for rapidly disseminating new tactics and technologies across the force, ensuring that lessons learned are quickly applied at scale.[28] Ukrainian staffs have also developed new processes for managing the massive amounts of data generated by UAS operations, including the use of artificial intelligence and machine learning algorithms to process imagery, identify targets, and prioritize intelligence collection.[29] These technological innovations have allowed Ukrainian commanders to make sense of the operational environment and make decisions at a pace previously impossible.

Adopting a markedly different organizational approach at the operational level, Russian forces attempted to integrate UAS capabilities into existing headquarters structures while maintaining specialized drone units at higher echelons. This approach proved less effective, particularly in coordinating deep operations and managing the flow of intelligence.[30] The

The Textron Systems' MK 4.8 HQ Aerosonde unmanned aircraft system flies during testing at Redstone Arsenal, Alabama, on 20 December 2024. The MK 4.8 HQ Aerosonde was introduced into Army service in late 2024. (Photo by David Hylton, Program Executive Officer, Aviation)

contrast between Ukrainian and Russian approaches demonstrates the importance of organizational adaptation in leveraging new capabilities.[31] Highlighting the challenges of integrating disruptive technologies into existing organizational structures, the Russian experience underscores the importance of organizational change in adapting to revolutionary military technologies, as by attempting to fit UASs into legacy command-and-control systems, Russian forces limited their ability to fully leverage these capabilities at the operational level.[32]

A new way of operational warfare. Perhaps the most significant aspect of this revolution, the transformation of operational art through UAS integration represents a new understanding of how to conduct large-scale operations in the age of unmanned systems. Traditional concepts of operational maneuver based on massing forces at decisive points while achieving surprise require fundamental revision in an environment of persistent surveillance.[33] Developing new approaches emphasizing distributed operations, deception, and the ability to mass effects rather than forces, Ukrainian

operational commanders extend these changes beyond tactical adaptation.[34]

Transformation of operational decision-making. The operational decision cycle has undergone particular transformation in the age of unmanned systems. Division and corps commanders now operate in an environment where the time between detection and engagement has compressed dramatically, while they must simultaneously manage vast amounts of real-time intelligence.[35] Ukrainian forces developed new decision-making processes that push significant authority to lower echelons while maintaining operational coherence through mission command. This approach enables rapid exploitation of opportunities while ensuring subordinate units understand and operate within the commander's intent.[36]

Reshaping operational decision-making processes, the integration of artificial intelligence and machine learning with UASs is pointing toward a future where unmanned systems may operate with increasing autonomy, as Ukraine's efforts to develop drones with onboard AI for target recognition demonstrate.[37] While

raising important questions about human oversight and control, this development has significant implications for operational command and control, potentially allowing for faster decision cycles.[38] For example, Ukrainian commanders have experimented with AI-enabled UASs capable of independently identifying and engaging targets based on preset parameters.[39] While human operators remain in the loop for weapon release authority, these systems represent a significant step toward autonomous operations. The use of such systems has the potential to dramatically accelerate the pace of operations, allowing commanders to exploit fleeting opportunities and rapidly respond to changing battlefield conditions.

However, the increasing autonomy of unmanned systems also presents significant challenges for operational command and control. As these systems become more capable of independent action, commanders must develop new ways of ensuring human control and accountability.[40] This requires the development of robust command-and-control architectures, clear rules of engagement, and operator training.[41]

Evolution of operational reach. Through UAS employment, the concept of operational reach has evolved significantly, as Ukrainian forces demonstrated the ability to conduct deep strikes and shaping operations at distances previously requiring significant conventional force commitments.[42] More importantly, these operations demonstrated new approaches to operational synchronization, with unmanned systems enabling commanders to simultaneously affect multiple points across the battlefield. This capability requires new ways of operational design that account for both the opportunities and vulnerabilities created by unmanned systems.[43] Demonstrating how UASs have expanded operational reach, the April 2024 strike on targets in Russia's Tatarstan region, more than 1,300 kilometers from Ukraine's border, represents a significant shift in operational possibilities, allowing commanders to shape the battlefield at unprecedented depths with relatively limited resources.[44]

The expansion of operational reach through UASs has significant implications for the geographic scope of conflicts. As unmanned systems enable strikes at ever-increasing ranges, the distinction between front-line and rear areas becomes increasingly blurred.[45] This development challenges traditional notions of battlefield geometry and requires commanders to think more expansively about the operational environment. Moreover, the ability to conduct long-range strikes with UASs has the potential to escalate conflicts in unintended ways. As the boundaries of the battlefield expand, the risk of drawing in additional actors or provoking retaliation increases.[46] Commanders must carefully consider the strategic implications of UAS operations and ensure that they are fully integrated into overall campaign plans.

Implications for U.S. Army Operational Art

Doctrinal evolution. The transformation of operational warfare through unmanned systems demands fundamental changes in how the U.S. Army approaches operational art. Operational doctrine must evolve to account for new realities of persistent surveillance and precision strike capabilities.[47] Traditional concepts of operational security and surprise require revision when enemy forces can maintain constant observation across the operational depth. Updated doctrine must emphasize deception, electronic warfare, and the ability to operate effectively despite enemy surveillance.[48]

While acknowledging the importance of unmanned systems, the Army's current modernization strategy requires significant expansion to address the operational implications of this revolution.[49] Representing an important step, the Department of Defense's Replicator initiative, aimed at rapidly scaling autonomous capabilities, must be integrated into a broader transformation of operational doctrine and concepts.[50] For example, the Army must develop new doctrinal concepts for employing UASs in support of deep operations, to include intelligence collection, targeting, and strike missions. These concepts must address the unique challenges of operating unmanned systems at extended ranges and in contested environments, such as communications reliability, navigational accuracy, and survivability.[51]

Army doctrine must also evolve to account for the increasing use of AI and autonomous systems in operational warfare. This requires the development of clear ethical and legal frameworks for the employment of these systems and comprehensive operator training and certification standards.[52] Doctrine must also address the challenges of human-machine teaming at the operational

level, to include command-and-control arrangements, data management, and decision support systems.[53]

Leader development and education. Future corps and division commanders and staffs must understand both the opportunities and limitations of unmanned systems while developing new approaches to operational decision-making. The Ukrainian experience demonstrates that successful operational commanders in unmanned-intensive environments require a sophisticated understanding of technical capabilities while maintaining focus on operational art, making leader development a particular area of attention.[54]

Professional military education must evolve to prepare leaders for this new operational environment. The Army should revise curricula at intermediate and senior service colleges to emphasize updates to operational art that account for persistent surveillance and precision strike capabilities.[55] This education must go beyond technical understanding to develop leaders capable of integrating unmanned capabilities into sophisticated campaign designs. For example, the Army educational institutions should incorporate modules on unmanned systems into its core curriculum, with a particular emphasis on their operational implications. These modules should include case studies of UAS employment in recent conflicts, war games and simulations that replicate unmanned-intensive environments, and opportunities for students to develop and test new operational concepts.[56]

Leader development programs should place greater emphasis on cultivating the cognitive skills required to operate effectively in complex, data-rich environments, including training in critical thinking, adaptability, and rapid decision-making under conditions of uncertainty.[57] Leaders must also be comfortable with delegating authority to subordinates and operating in decentralized command structures.[58]

Organizational adaptation. To leverage unmanned capabilities effectively, the U.S. Army must consider significant organizational changes. While some, such as Lt. Col. Robert Solano, argue for the creation of a separate drone branch, similar to Ukraine's approach, the Army must carefully consider how best to integrate unmanned capabilities across all echelons while maintaining operational effectiveness.[59] As demonstrated in Ukraine, successful integration of unmanned capabilities requires new approaches to staff organization and processes, making the transformation of operational headquarters a particularly urgent requirement.[60] The Army must develop new models for operational headquarters that can effectively process and act upon the vast amounts of information provided by unmanned systems while maintaining the ability to conduct rapid decision-making and execution.[61] For example, the Army should consider establishing dedicated UAS cells within corps and division headquarters, similar to the Ukrainian model. These cells would be responsible for planning and integrating unmanned operations across the operational depth, in close coordination with intelligence, fires, and maneuver elements.[62]

The Army must also invest in the technical infrastructure required to support unmanned operations at scale, including robust communications networks, data management systems, and analytical tools capable of processing the massive amounts of information generated by UAS sensors.[63] Developing new systems that account for cybersecurity and electronic protection to ensure the integrity of unmanned systems in contested environments is also crucial.[64]

Recommendations for U.S. Army Adaptation

Structural changes. To prepare for this transformation in operational warfare, the U.S. Army must undertake several key initiatives. First, the Army should establish operational-level unmanned formations at corps and division levels, following the Ukrainian model of integrated unmanned capabilities.[65] These formations must maintain the ability to conduct both independent deep operations and support to conventional forces while developing new approaches to operational integration.[66]

Providing a framework for rapidly scaling autonomous capabilities, the Department of Defense's Replicator initiative requires the Army to develop specific organizational structures to effectively employ these systems.[67] This should include the creation of dedicated unmanned warfare centers at the operational level, similar to Ukraine's approach, to develop and implement new operational concepts.[68]

The Army should also consider establishing a dedicated Unmanned Systems Command, responsible for developing and overseeing the service's unmanned

Two Ukrainian soldiers from the Unmanned Systems Forces calibrate a Ukrainian "Vampire" unmanned aircraft. The hexacopter can carry fifteen kilograms of ammunition or other cargo. (Photo by Olena Khudiakova, Ukrinform)

capabilities. This command would serve as a focal point for unmanned systems doctrine, training, and materiel development, ensuring a cohesive and integrated approach across the force.[69]

Training and education reform. To prepare soldiers and leaders for the challenges of unmanned warfare, the Army must reform its training and education programs at all levels. This reform should include the development of specialized courses focused on the tactical employment of unmanned systems as well as the integration of unmanned scenarios into existing training exercises.[70] These programs should emphasize hands-on experience with UAS and counter-UAS systems, allowing soldiers to gain familiarity with their capabilities and limitations in realistic operational environments.[71]

Operational exercises should also evolve to include realistic unmanned threats and opportunities, enabling commanders and staffs to gain proficiency in the operational battlefield of the future. The Army should follow Ukraine's lead in developing specialized courses for drone operators and mission planners, establishing dedicated training programs for unmanned operations

that emphasize both technical proficiency and operational integration.[72] One example is creating a training program for corps and division staff officers centered on integrating unmanned systems into operational planning and execution. This program should feature classroom instruction on UAS capabilities and limitations, hands-on training with actual systems, and simulated exercises that mimic the complexity of unmanned-intensive environments.[73]

Furthermore, the Army should harness virtual and augmented reality technologies to design immersive training environments that accurately simulate the challenges of unmanned warfare. These environments should provide leaders with opportunities to practice decision-making and command and control in realistic, data-rich scenarios.[74]

Doctrinal development. Accelerating the development of new operational doctrine that reflects the realities of unmanned warfare is imperative for the Army. This doctrine should focus on several key areas, such as integrating unmanned systems into combined arms operations, command and control in unmanned-intensive

environments, counter-UAS operations at the operational level, and employing autonomous systems in deep operations.[75] The development of this doctrine should draw directly from Ukrainian experiences while considering unique U.S. Army requirements and capabilities. Particular attention should be given to the integration of artificial intelligence and autonomous systems, as these areas present both opportunities and risks that must be carefully evaluated.[76]

For instance, the Army should create an operational framework for employing unmanned systems in support of multidomain operations. This framework should outline how UASs can be integrated with space, cyber, and electronic warfare capabilities to generate synergistic effects across the operational depth.[77] Managing the massive amounts of data generated by unmanned operations is another critical aspect that the Army must address in its doctrine. Guidelines for data collection, processing, exploitation, and dissemination should be developed or refined, along with standards for interoperability and data sharing with joint and multinational partners.[78]

Technical integration. Developing new means to manage the vast amounts of data generated by unmanned systems is a key challenge for the Army. This includes creating AI-enabled systems for processing UAS intelligence, building robust and resilient communication networks, integrating unmanned systems with existing command-and-control structures, and implementing counter-UAS capabilities across all echelons.[79] The technical architecture supporting unmanned operations must be sophisticated enough to handle complex operations while remaining simple enough to maintain in combat conditions, which represents a crucial challenge for future force development.[80]

To illustrate, the Army should invest in advanced data analytics and machine-learning capabilities to automate the processing and exploitation of UAS sensor data. These capabilities should be scalable and deployable at the tactical level, allowing commanders to quickly make sense of complex operational environments.[81] Prioritizing the development of secure, jam-resistant communications networks capable of supporting unmanned operations in contested environments is another essential task for the Army. These networks must be able to operate in degraded conditions and ensure the integrity of command-and-control links.[82]

Conclusion

The revolution in operational warfare driven by unmanned systems demands a transformation of U.S. Army capabilities, organization, and doctrine. The evidence from Ukraine demonstrates that successful adaptation requires more than just technological solutions or tactical innovation; it demands fundamental changes in how operational commanders approach campaign design, staff organization, and decision-making. The cost of failing to adapt to these changes could prove catastrophic in future conflicts, as potential adversaries demonstrate increasingly sophisticated operational employment of unmanned systems.

Success in future conflicts will depend on the Army's ability to adapt operational art to the age of unmanned systems while maintaining proficiency in legacy military capabilities, as it stands at a critical juncture in its historical development. This transformation requires a careful balance between leveraging new technologies and maintaining focus on fundamental principles of operational art. It necessitates developing updates appropriate for American military requirements and strategic objectives, while the lessons from Ukraine provide valuable insights.

As Jacquelyn Schneider and Julia Macdonald argue, the key to successful military innovation lies not just in adopting new technologies but in developing new operational concepts that effectively integrate these capabilities into broader military operations.[83] The integration of unmanned systems into operational warfare represents more than just a tactical or technological challenge; it requires a fundamental rethinking of how modern armies fight at the operational level.

The U.S. military's ability to successfully navigate this transformation will play a crucial role in determining its effectiveness in future conflicts. By embracing the lessons of the Russo-Ukrainian War and committing to reform, the Army can position itself to lead the way in this new era of operational warfare. Ultimately, the Army must adapt its doctrine, organization, and training to fully leverage the potential of unmanned systems while mitigating the risks and challenges they present. Only through a holistic approach to innovation can the Army ensure its continued success on the battlefields of the future. ∎

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Sgt. 1st Class Vang Yang grades a candidate during the Army Combat Fitness Test portion of the Command Assessment Program at Fort Knox, Kentucky, on 29 October 2023. (Photo by Daniela Vestal, U.S. Army)

The Army's Command Assessment Program
The Doctrinal Foundation

Col. Andrew Morgado, U.S. Army

Bob O'Brien

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The Army's Command Assessment Program (CAP) facilitates the selection of battalion and brigade commanders, brigade command sergeants major, and medical service corps and acquisition corps professionals through its conduct of a ten-point, in-depth assessment process. There are several differences in the CAP programs tailored to the specific leader population assessed, so this article will focus on the Army competitive category officer population.[1] This multipoint assessment informs the Job Performance Panel (JPP) that incorporates CAP results in its review of an officer's performance file. The CAP scorecard allows the candidate-officer to put "points on the board" in five assessed areas that complement the officer's past performance as reflected in their evaluation reports and reviewed by the JPP.[2] The principal aim of CAP is to present a more holistic view of an officer's performance and potential as the Army selects commanders that will lead formations of hundreds and thousands of soldiers. CAP also serves to reinforce the application of Army leadership doctrine across all portions of the Army. The Army's leadership requirements model (see figure) and observed leadership behaviors, as stated in Army Doctrine Publication (ADP) 6-22, *Army Leadership and the Profession*, and Field Manual (FM) 6-22, *Developing Leaders,* are the doctrinal and practical foundations of CAP's assessments.[3] CAP also supports the warfighting and training doctrine across the Army. Though CAP currently focuses on the selection of commanders and key leaders, it also serves as the vanguard of a new approach in assessing Army leaders.

(Figure from Army Doctrine Publication 6-22, *Army Leadership and the Profession*)

Figure. Army Leadership Requirements Model

Origins of the Command Assessment Program

In the winter of 2019, then–Chief of Staff of the Army Gen. James C. McConville challenged Army leaders to develop a better way to screen and select Army battalion commanders. He remarked that the Centralized Selection List (CSL) board process relied on a file review of candidates' evaluation reports "lasting a matter of minutes" to render the decision on an officer's suitability for command.[4]

At face value, this rapid scrutiny, driven by the need to expeditiously review thousands of files, appears inadequate to make such a consequential decision that selects commanders to lead large, complex organizations. The materials reviewed by board members are also limited in scope and present a narrow view of an officer's performance and potential. Though assessed performance over a rating period (usually twelve months or more) is important and remains a significant portion of command selection, it is reliant on the perspective of two people, the rater and senior rater, and narrowly focuses on achievement as measures of performance and future potential. This focus on *achieves* as the principal basis of evaluation ignores an officer's longer-term impact on the organization and its people, specifically in *how* the officer achieves. CAP seeks to rectify these blind spots by examining an officer's knowledge, skills, and attributes from multiple perspectives.

Doctrinal Foundations

ADP 6-22 describes the Army leadership requirements model (ALRM). The model establishes "what a leader is (attributes—BE and KNOW) and what a leader does (competencies—DO)."[5] The attributes of a leader are character, presence, and intellect. The competencies are leads, develops, and achieves. The Officer Evaluation Report is an effective instrument to assess results and is a direct measure of "achieves" on the

Participants work together to negotiate one of several obstacles at the Alex Field Leader Reaction Course on day three of the Army's talent management initiative, the Battalion Commander Assessment Program, at Fort Knox, Kentucky, on 23 January 2020. (Photo by Eric Pilgrim, U.S. Army)

ALRM. The Officer Evaluation Report also provides insights and observations on an officer's "character," "presence," and "develops" competencies. It provides only a partial examination of an officer's "leads" competency and only indirectly evaluates the attribute of "intellect." This is where CAP comes in. The key, distinctive value of CAP is that it provides an objective assessment of the whole person vice solely a subjective evaluation on an officer's ability to achieve results. A 2021 article in *Military Review*, titled "Understanding Assessments and their Relevance to the Future Success of the U.S. Army," clarifies the distinction between assessments and evaluations:

> There are key differences between assessments and evaluations … Evaluations provide snapshots of performances that are mostly subjective, whereas assessments provide objective data on an officer's knowledge,

skills, and behaviors (KSBs). Assessments provide a standardized lens through which to compare individuals of the same rank across the Army; evaluations compare individuals within a constrained population dictated by the echelon and criteria of the senior rater.[6]

Through a comprehensive assessment process, CAP provides more and relevant insights into the attributes and competencies of future commanders. Specifically, CAP directly assesses an officer's "intellect" and observes components of leader attributes not necessarily visible to the rater and senior rater. It also provides indirect assessments of "character," "presence," "develops," and "achieves." Structured exercises, task-oriented events, and validated assessment tools allow for direct behavior observations. Structured interviews and candidate-professed actions allow for an indirect behavior observation. Together, these direct and indirect observations provide a multidimensional and comprehensive understanding of a candidate.

The Assessment Process

CAP conducts ten assessments over a five-day period that add up to 17.5 contact hours for each

Table. Command Assessment Program Assessments

Assessment	Type of Event	ALRM Assessed	Method
Observed Behavior Exercise	Informing	Intellect, Leads	Direct
Psychometric	Scored	All Attributes and Competencies	Direct
Verbal Communication	Scored	Presence	Direct
Written Communication	Scored	Intellect	Direct
Army Combat Fitness Test	Scored/Screen	Presence	Direct
Army Body Composition	Screen	Presence	Direct
Psychological Assessment	Inform	Character	Indirect
Peer Feedback*	Inform/Scored	Leads	Indirect
Subordinate Feedback*	Inform/Scored	Leads	Indirect
Army Comprehensive Talent Interview (ACTI)*	Scored/Screen	Leads, Develops, Achieves, Presence	Indirect
*Peer feedback, subordinate feedback, and ACTI assessments produce a composite leadership spectrum score.			

(Table by authors)

candidate. These assessments fall into one of three event categories: screening, informing, and scored. If an officer fails to meet the standard on a screening event, the officer receives a "Not Yet Certified for Command" determination and is unable to compete before the JPP for command selection. Informing events provide observations and data to members of the assessments team and the Army Comprehensive Talent Interview (ACTI) panel, which consists of general officers and sitting or former brigade commanders. Scored events provide objective performance data that compares candidate performance to historic populations and quantifies it in a series of percentile scores directly reflected in the CAP scorecard presented to the JPP. The table depicts the totality of CAP assessments, their categories, portion of the ALRM assessed, and method. CAP assessments, taken together with an officer's performance as reflected in evaluation reports and assessed in the JPP, help produce a comprehensive and complementary profile of the officer.

CAP's greatest contribution to the assessment process is identifying potentially "hidden" attributes by measuring intellect, behavior, and personality, as well as identifying counterproductive and ineffective leadership. The battery of psychometric assessments employs several different instruments to measure cognitive capacity, emotional intelligence, conscientiousness, self-awareness, and other behavioral traits. Day-to-day rater and senior rater observations of officers cannot measure the full depth of an individual officer's intelligence and mental capacity. Though not completely hidden, assessing intellect through casual observation is highly subjective and contextual.

Determining an individual leader's contributions is frequently difficult to parse out from the unit's performance. In fact, early CAP results indicate that mention of individual intellect (or intelligence) on a subjective evaluation is often not based on fact and is difficult to isolate based on singular observations. Similarly, evaluations measure leadership from the subjective perspective of the rater and senior rater and never directly from the led or peers. Augmenting psychometric assessments with work samples like peer and subordinate feedback and the CAP on-site, observed behavior exercises helps pull off the "mask" to provide greater insight on true leader identities.

The Lasting Impact of Leaders

Army leaders, and particularly members of command teams, have lasting impacts on their

organizations that go well beyond the two years of their command tenure. Their behaviors in command establish a climate and culture, either good or bad, that will continue to affect the organization and the soldiers within it for some time after their departure. Army doctrine acknowledges that leaders must employ a range of techniques that range between driving compliance and generating commitment. Based on the situation, mission, and readiness of the organization, leaders must vary their techniques.[7] Soldiers will respond to different techniques in varying ways. These soldiers and subordinate leaders have a vested interest in assessing these leaders and avoiding the deleterious effects of poor leadership and preventing it from infecting other organizations. Subordinates and peers experience the application of leadership; superiors usually only see and are concerned with results. Being "subjected to" rather than seeing the "results of" can be two very different perspectives in experiencing leadership. In organizations solely bent on achieving results, toxicity or counterproductive leadership is often invisible to those above the toxic leader. Peer and subordinate feedback are essential to "seeing" the whole person. Use of these metrics provided by subordinates and peers lead to the propagation of one of the greatest myths associated with the CAP process; namely, "getting CAP-ped."

Some officers invited to CAP believe the only way to attain positive subordinate and peer feedback is to perform one's duties as if competing in a popularity contest and avoid holding subordinates accountable. Failure to "win" this contest will lead to negative comments on provided peer and subordinate assessments. This is the "CAP-ped" myth. The facts do not substantiate this perception. Even the very best officers receive critical feedback on their peer and subordinate reports. Army doctrine is clear in asserting that leaders must balance compliance and commitment in motivating teams to accomplish the mission.[8] Every good leader knows they must accomplish the mission without breaking the organization and its people. In assessing this aspect of candidate performance, the ACTI panel members balance negative peer and subordinate feedback against the context of the action and the role played by the officer in each situation. The ACTI's principal orientation is rooting out counterproductive and ineffective leadership *trends*.

It is important for CAP candidates to understand that the ACTI panel knows a lot about each candidate's leadership style and history from the many assessment instruments that CAP administers to candidates. Before a candidate enters the interview room, panel members study a summary of *all* the assessment data. At the conclusion of the study period, the panel operational psychologist provides a verbal overview of the candidate that ties psychometric assessment data to the job sample data, including an overview of how the candidate performed on the observed behavior exercise, physical fitness test, written communication assessment, and peer and subordinate assessments. The psychologist points to converging or diverging data points to contextualize *how* the candidate leads and achieves results. The detailed process of providing context to a candidate's performance is intended to reduce bias and ensure the panel views the entire candidate and is not reliant on anonymous feedback. The panel, through the operational psychologist, develops questions designed to get the candidate to give context to times when they may have had leadership challenges. Candidates who can explain what they have learned from challenging leadership experiences often experience positive findings from the ACTI panel. It is important for candidates to understand that all the questions are designed for them to tell their leadership story and exhibit self-awareness of how they lead and achieve results. The panel assesses the leadership range of the candidate and how often he or she must rely on directive approaches.

Counterproductive leaders make it a habit of exhibiting abusive, self-serving, erratic, ineffective, incompetent and corrupt behaviors.[9] Though ineffective leadership is a subcategory of counterproductive leadership, the panel assesses ineffective leadership through the lens of FM 6-22, *Developing Leaders*, that highlights patterns of "needs indicators" across the ALRM.[10] CAP adheres to and applies Army doctrine. Panel members understand that every leader has challenging times when they must make hard decisions that many people may not like. Leaders who will not make hard decisions or enforce standards for fear of "getting CAP-ped" are at significant risk of being voted "Not Yet Certified for Command" for ineffective leadership.

Warfighting—"Wait! What? We Screen Out Patton and MacArthur?"

CAP not only supports leadership doctrine, but it also intrinsically supports Army warfighting doctrine and culture. Another persistent and unfounded myth about CAP is that its stringent focus on positive leadership dimensions screens out "tactical geniuses" who may be unconventional leaders. This position presupposes that the Army must endure abusive leaders if it hopes to succeed. This perspective is neither founded in historical experience nor rooted in doctrine. FM 3-0, *Operations*, identifies leadership as "the most essential dynamic of combat power … It is the multiplying and unifying dynamic of combat power, and it represents the qualitative difference between units."[11] Though CAP's assessments are not based on the tactical and technical components of warfighting, they undeniably reach to the foundations of creating combat ready units—namely, effective leadership skills. It all begins with the leader and his or her ability to display character, intellect, and presence, and effectively lead, achieve, and develop soldiers and units to mission accomplishment. CAP provides insights into all these elements and complements observations made by the chain of command; it reinforces the ability of the officer to acquire the requisite job-performance, domain knowledge through the Army's professional military education system. CAP

supports warfighters by providing a "deliberate investment in the abilities of individual leaders, teams, and units is foundational to prosecuting those operations successfully across the competition continuum."[12] Army leadership applies to all parts of the Army and must be adapted to meet the requirements of the mission and the needs of its people. Army leadership is designed to accomplish the mission as set by our senior leaders. In this light, CAP is foundational to meeting the Army's and Department of Defense's (DOD) priorities.

The enduring DOD and Army priorities center on warfighting capability and capacity and the efforts required to gain and maintain a position of relative advantage over potential adversaries. The DOD's and Army's focus will always be on deterring our Nation's adversaries and winning our Nation's wars. CAP's outcomes support these priorities and focus areas by assessing and developing the individual leaders to lead effectively under stress and great adversity. CAP psychometric assessments reveal an individual's mental capacity to identify and think through challenging problems. They also provide insights on emotional stability and aptitude to effectively interact with the people and groups around them. These are essential capabilities for a leader to possess in making sense of an increasingly complex and connected battlefield. CAP's observed behavior exercises and individualized assessments help reveal a leader's ability to think creatively in time-constrained situations, communicate effectively using multiple means, and build teams from diverse backgrounds and level of experience. Though not in a field environment or within a tactical scenario, CAP can observe and assess those skills required of leaders regardless of environment or situation.

Expertise is an attribute of "intellect" within the ALRM that describes Army leaders who acquire the technical, tactical, joint, cultural, and geopolitical knowledge that are essential elements of leading warfighting formations.[13] The leaders assessed at CAP arrive as products of the Army's larger educational and developmental system that relies on institutional (formal education), operational (on-the-job training) and self-development domains to inculcate the required domain knowledge based on that leader's branch or functional area. This is a tested and effective system that provides a "CAP certified" leader the technical skills to succeed, thus assessing technical and tactical expertise is not a focus area at CAP.

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Train as You Fight

Just as certified leaders serve as the foundation for combat effectiveness, they also lie at the heart of Army training. Certified leaders are essential to executing the Army's training methodology. The first two steps of the Army's eight-step training model, "plan the training event" and "train and certify leaders," focus on leader actions.[14] After identifying and allocating the right resources, Step 2 of the model directs,

> **Train and certify leaders.** Certification requirements are established and leaders and trainers are certified to lead and conduct the training. Certified personnel must have detailed knowledge of the training subject matter and have performed the task to standard themselves.[15]

ADP 7-0, *Training*, identifies unit commanders and senior leaders as critical to the process of ensuring effective training and they accomplish this through leadership, presence, and guidance.[16] Command Sgt. Maj. T. J. Holland, in a 2024 article titled "Decoding Lethality: Measuring What Matters," notes that Army formations are struggling to adapt to the increased cognitive demands of the modern battlefield. Holland identifies that physical and materiel measurements of unit performance are useful but inadequate. According to Holland, the Army must adapt its training approach to meet these new demands and legacy approaches may no longer suffice. He notes,

> Effective training is crucial for enhancing lethality. Training programs must be designed to develop not only physical skills but also psychological resilience, tactical acumen, and situational awareness. This requires a holistic approach that integrates traditional training methods with advanced technologies and support.[17]

As Army training starts with Army leadership, certifying leaders with the right capabilities is where any training program must begin. CAP's focus on the all-around perspective of Army leaders not only ensures Army battalions and brigades are led by leaders with the physical, intellectual, and emotional capacity to drive effective training, it also provides a model for reinvigorating Army training programs.

"World-Class, Fair and Consistent"

The CAP mantra is "world-class, fair, and consistent."[18] Establishing an assessment process firmly on the foundation of Army doctrine is an effective start to meeting all three criteria. Doctrine is a collection of accepted and effective best practices that establishes the lexicon for effective communication and the basis for shared understanding. It also sets the standard for soldiers and leaders to follow. Our Army's leadership doctrine is very clear on expectations and provides essential guidance on how to create effective organizations fixed on accomplishing the mission while protecting their people, our true combat power, to fight today, tonight, and tomorrow. Training and warfighting doctrine is inextricably linked to good leadership. Good leaders are essential to generating combat power and fielding competent and capable warfighting formations. A standard that is not enforced or properly modeled is not a true standard. The Army's Command Assessment Program not only validates the Army's leadership standard but also serves to inspire adherence to that standard for many years to come. ■

Notes

1. The Army competitive category officer population comprises most Command Assessment Program (CAP) candidates. The system for this population is the most advanced and mature. The other populations, specifically Army medical officer, acquisitions professionals, and command sergeants major, are moving toward this advanced model, but describing every nuance of each program can easily confuse the reader. In each population's entire Centralized Selection List system, the CAP portion and assessments remains the same. The systemic differences with other populations mostly encompass only invitation procedures and past performance scoring procedures.

2. CAP provides assessment scores in the areas of verbal communication, written communication, Army Combat Fitness Test, CAP Strategic Assessment score, and Leadership Strength Spectrum score. Candidates receive a tiered score based on decile ranking, comparing performance to scored performance of previous cohorts. The Job Performance Panel provides a performance score that considers an officer's full performance file of evaluations and other personnel records to round out the inputs to create a Centralized Selection List Order of Merit List. All scores are weighted. An officer's performance score is the most heavily weighted component in determining the Order of Merit List score.

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10. FM 6-22, *Developing Leaders*, 4-26.

11. FM 3-0, *Operations* (U.S. GPO, 2022), 2-4.

12. Ibid., 8-13.

13. ADP 6-22, *Army Leadership and the Profession*, 4-3–4-4.

14. FM 7-0, *Training* (U.S. GPO, 2021), 3-9.

15. Ibid.

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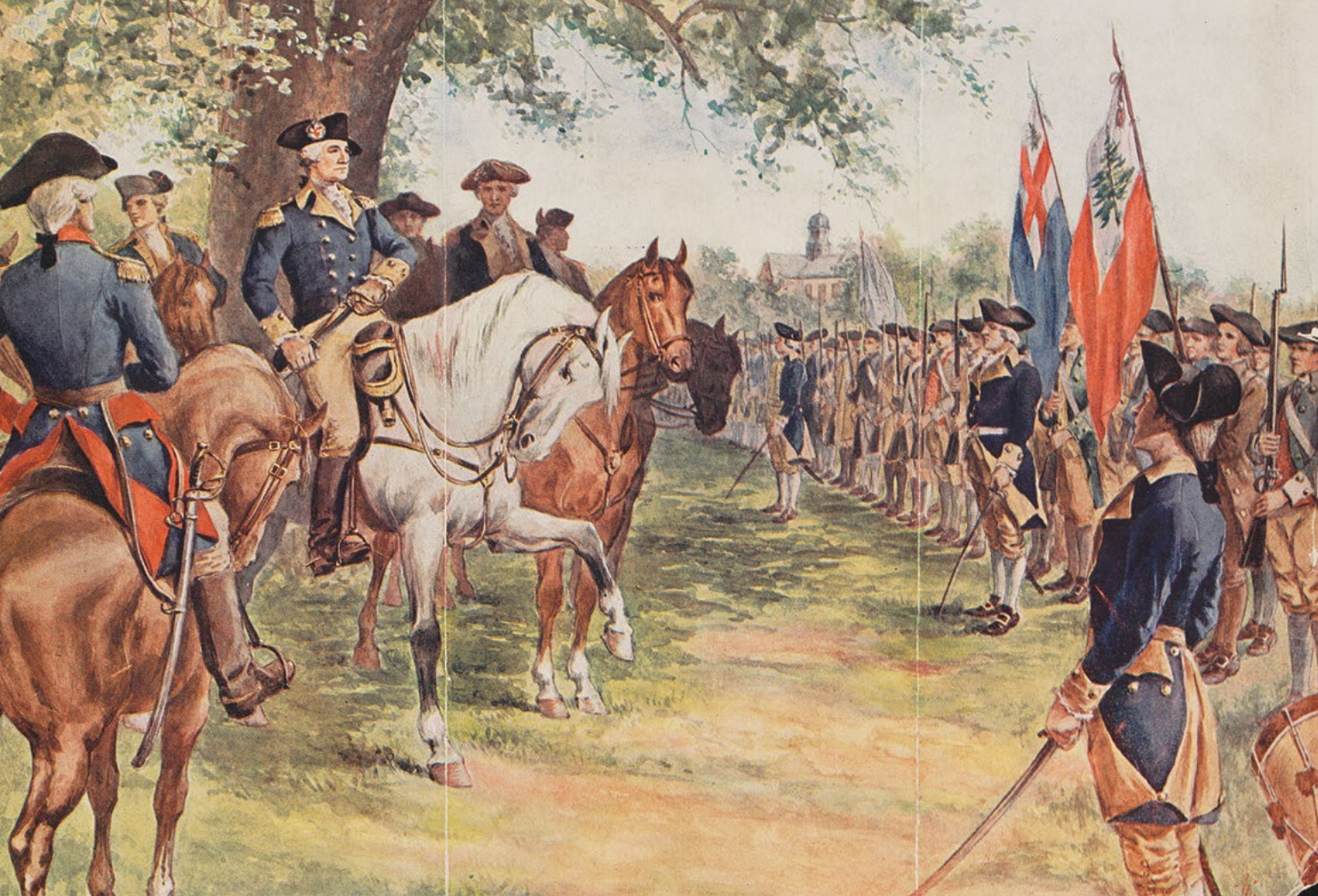
Washington Taking Command of the American Army Under the Old Elm at Cambridge, ca. 1908, photomechanical print, 21.3 x 29 cm. (Photo courtesy of the Library of Congress Prints and Photographs Division)

George Washington and the Foundations of Civilian Control of the Military

Robert F. Williams, PhD

W hen the American Revolution ended, George Washington was perhaps the most famous man in the world. In subsequent decades, he came to mean different things to different people but always as a paragon of virtue. He has been viewed as the American Cincinnatus, who went from farmer to commander in chief and back to farmer after playing a monumental role in delivering independence to the colonies.[1] While much of Washington's life has been mythologized, he established an important norm for new countries that persists to this day—civilian control of the military. Throughout the war, he devoted himself to reinforcing the political legitimacy of the fledgling Continental Congress. He came to embody the entire cause. He was the foremost American nationalist, and his entire military career is proof that war and politics are inextricably linked.[2]

At its core, politics is how groups of humans negotiate the distribution of power, make decisions, and allocate resources. The process by which these decisions are made is critical to the governance of a country. In that regard, militaries are integral to any political process. For Washington, this required direct communication with Congress, state governments, and the leaders of various regional military departments. He was often more of a "communicator in chief" or "explainer in chief," consistently explaining his army's condition to Congress and congressional action to his army, usually to great frustration. He was the consummate middleman, a diplomat between a weak Congress and thirteen regional governments.[3] In this complex political-military environment, he established norms and precedents that exist to this day. Washington's understanding of prevailing thoughts on standing armies, his adherence to political control through his dealings with Congress, and his symbolic transfer of power at the war's end serve as essential examples. Washington was a perceptive politician and commander who immersed himself in politics with a deft hand as needed and set an example for the modern military officer.

In May 1775, Washington arrived at the Second Continental Congress in style—wearing his blue and buff uniform of the Fairfax County militia to remind everyone of his background in the French and Indian War and signal his readiness for military action. His fellow lawmakers viewed him as one of them, a lawmaker with military experience.[4] He was chosen over his more experienced military contemporaries like Charles Lee and Horatio Gates because of his connections to the Continental Congress and political abilities. Unlike the other two, Washington was American-born and looked like a military leader.[5] Both were more experienced military men, but none had the combination of political, managerial, and military experience as Washington. He also represented an opportunity to connect the New England militias then at Boston with other forces from the southern colonies—a political calculation. In selecting Washington, Congress prioritized political acumen over long military experience. Regardless, Washington's election as "General and Commander in chief of the army of the United Colonies" began the American experiment in civilian control of its military.[6]

On 17 June, Congress granted George Washington "full power and authority to act as [he] shall think for the good and welfare of the service" while reminding him "punctually to observe and follow such orders and directions" as Congress delivered. Congress's end of the bargain was that they were to "maintain and assist him and adhere to him … with their lives and fortunes."[7] Congress was adamant that he follow all orders and directions "from this, or a future Congress of these United Colonies, or committee of Congress."[8] Congress wasted little time in establishing the rudimentary chain of command. In fact, despite appointing four major-generals, they were so concerned with the possibility of an American Cromwell wielding a standing army that they failed to work out the "intricacies of rank and

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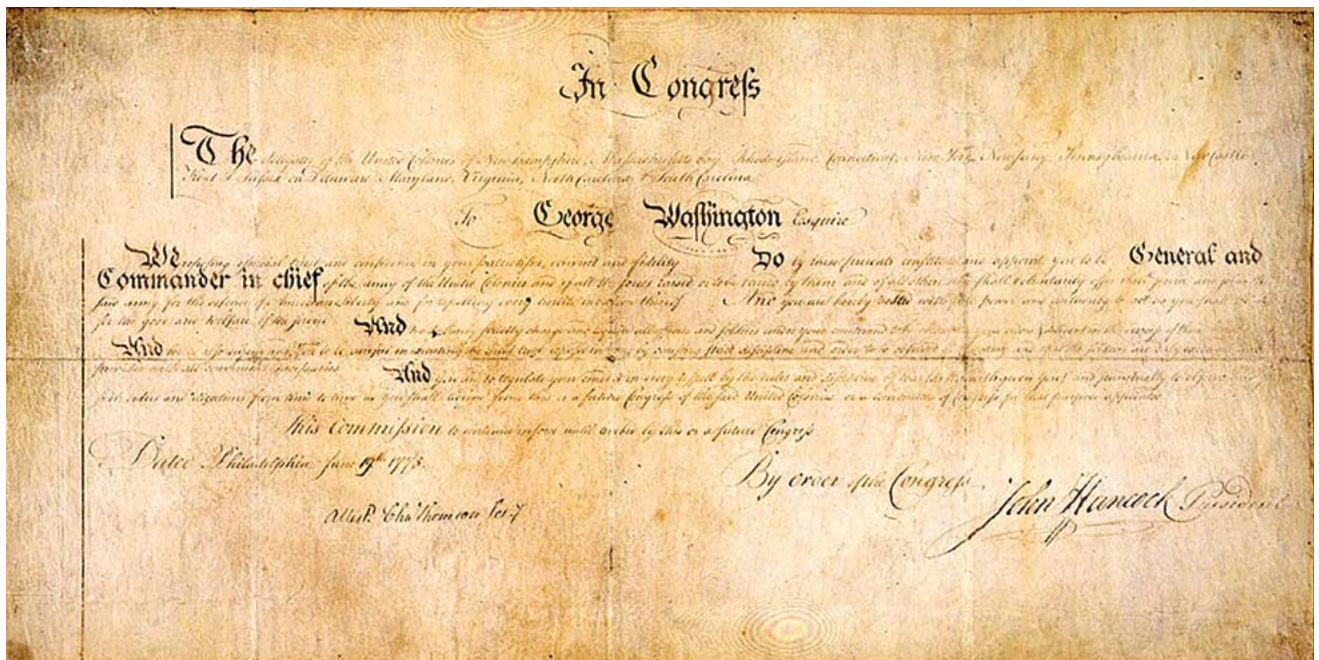
Two days after the Battle of Bunker Hill, the Continental Congress commissioned George Washington to lead the Continental Army on 19 June 1775. Congress unanimously voted on the measure, which read, in part, "We, reposing special trust and confidence in your patriotism, valor, conduct, and fidelity, do, by these presents, constitute and appoint you to be General and Commander in chief, of the army of the United Colonies, and of all the forces now raised, or to be raised, by them, and of all others who shall voluntarily offer their service, and join the said Army." (Scan courtesy of the George Washington Papers, Library of Congress Manuscript Division)

seniority" among those senior officers.[9] Nevertheless, his commission served as a reminder that his authority and legitimacy derived not from his military status but from Congress and the states—from the people's representatives, and therefore, from the people.[10]

While Washington was en route to Cambridge—he took command of the forces there on 3 July 1775—Congress issued sixty-nine "articles of war." These outlined his guidelines and provided the initial basis for a military justice system with which he could discipline and shape his forces.[11] Congress also formed a Board of War to which Washington was to report, but the larger body continued to weigh in on and decide most military matters. They instructed him to only act after consulting his "council of war," which referred to his other senior officers. Moreover, these articles of war outlined various disciplinary offenses and offered punishments. This gave Washington the legal backing to discipline his troops—particularly against the traditional excesses and plundering that accompany most military endeavors. Washington understood that he needed to retain the loyalty of the American people and took major steps to curtail unruly behavior with harsh punishments, including flogging and execution.[12]

Upon arrival, Washington maintained lines of communication with the Continental Congress and established them with local governors. This was critical for supplying his forces in the field, as much of the logistics system flowed from the states to their respective regiments. He specifically avoided confrontation with or irritating civilian leaders, especially New Englanders. The war was one between not just two armies but a struggle between two armies for the "hearts and minds" of the American people and the political legitimacy of the fledgling Continental government. Washington understood this "triangularity" of the struggle and took steps to keep his forces cognizant of that as well. This included making sure his men did not bathe nude within the eyesight of Massachusetts women to keep local politicians happy.[13] In the first nine months that Washington was in command outside Boston, he wrote fifty-one letters to John Hancock (then serving as the president of Congress) and more than double that number to Massachusetts, Connecticut, and Rhode Island leaders.[14] Communication was routinely directed to the

president of Congress throughout the war, but that was often not the most influential member of that body, nor did it remain the same. After Hancock's resignation in 1777, Congress went through seven different presidents during the remaining six years of the war.[15]

Politics also played an important role in many of Washington's tactical decisions. In 1775, he sought and received approval before dispatching Maj. Gen. Richard Montgomery to try to bring Canada into the fold. Further political considerations played a role in his thought process; he thought it militarily prudent to loosen the siege of Boston and withdraw his forces into the countryside, while his officers insisted that a retreat would not endear him to his soldiers nor Congress.[16] The pressure to defend Philadelphia and hold New York was also immense. The Continental's capital was in the former, and the latter's ports held strategic importance to British efforts. Washington was ambivalent about ideas for burning New York to prevent the British from using its ports until Congress resoundingly forbade it. He understood the city's importance yet juxtaposed that with how burning the city might lose him the support of the people.[17] Nevertheless, after withdrawing from Harlem Heights, Washington was disgruntled and nearly ready to resign. Foreshadowing things to come, he saw Congress as an ineffective and frustrating instrument that placed too much stock in patriotism rather than paying officers, as if a well-paid army might suddenly turn into an uncontrollable mercenary force.[18]

Washington's efforts to convince Congress of the plight of an army full of short-term enlistees paid off in the fall of 1776. As most Continental enlistments were set to expire on 31 December 1776, Washington was in a bind. Similar problems at the end of 1775 meant he was re-creating his force, retraining, and redisciplining it for the 1776 campaign season. In Washington's mind, the citizen-soldier ideal had led in part to the failure to secure Quebec, and Washington was faced with the prospect of not having an army for the next campaign season. He needed troops enlisted for the duration of the war that he could train and discipline into an effective fighting instrument to beat the British. As such, after weeks of deliberation by the Board of War, on 16 September, Congress approved a plan to provide cash bonuses and postwar land grants to entice men to enlist for the duration of the war. In

so doing, it authorized an army of eighty-eight battalions and upward of seventy-five thousand men. Congress continued to commission officers above colonel, while the states were still expected to commission colonels and below and provide arms and clothing for its regiments. Four days later, Congress amended its Articles of War from sixty-nine to seventy-six, giving Washington wider latitude to discipline his men as needed. The major change was an increase in the maximum number of lashes from thirty-nine to one hundred.[19] The collapse of enthusiasm for the cause and British victories in 1776 made Washington's case. This was the beginning of the Continental Congress's realization that it could not rely on militia alone and needed something more professional to supplement the militia tradition of the colonies.

Nevertheless, during the winter at Morristown, Washington decided on a "Fabian" strategy that sought to win the war by avoiding the main British army. This was derived from a classical understanding of Quintus Fabius Maximus's strategy that wore out his numerically superior Carthaginian opponent led by Hannibal in the Second Punic War. Fabian avoided giving Hannibal a pitched battle and chose instead to attack his supply lines and deny him the ability to convert more Italian provinces to defect through a decisive battle. Hannibal eventually left Italy after fifteen years of inconclusive campaigning.[20] Washington realized then that the way to win this war was not to lose. This included avoiding pitched battles and waging *la petite guerre*, or "unconventional warfare," in the triangular struggle with the British army for the support of the population.[21] This notion did not enthuse Congress, as it meant he would not defend the capital at Philadelphia.[22] He then lost consecutive battles at Brandywine Creek on 11 September 1777 and Germantown on 4 October—effectively clearing the way for the British to take Philadelphia. Meanwhile, the Continentals secured a great victory in the Hudson River Valley at Saratoga on 17 October 1777. John Burgoyne surrendered his army to Gen. Horatio Gates, and the French decided to join the war. Gates had been reinforced by Arnold and Daniel Morgan, and this continued to sour Washington's reputation.[23]

His Fabian strategy manifested his deep understanding of the political ends of military service.

Clausewitz reminds strategists that the destruction of the enemy's main force is, in fact, "only a means to an end, a secondary matter."[24] Washington sought to defeat the British by isolating them in their urban center, avoiding pitched battles, and wearing them down so that Parliament and the king might give up. Washington, like Fabian, sought battle when and where it made sense, and as a result, the Continental Army had only two major victories. At Saratoga, he was not involved, but it may have helped convince the French of the worthiness of the American cause. At Yorktown, the full defeat of Cornwallis's forces, with massive French support, was enough to end British attempts to subdue their subjects in North America. The key for Washington was to keep the army alive. The British could not win the war if he did that.[25]

Washington's navigation of twin crises during the winter of 1777 into 1778 was even more incredible than the winter of 1776. This manifested in two ways: his handling of the so-called Conway Cabal and his ability to convince Congress to allow him to rebuild his deteriorating army in his vision. The Conway Cabal was an alleged scheme to replace Washington as overall commander with Gates hatched by members of Congress.[26] Just as important, Washington convinced Congress to allow him to construct a disciplined and well-supplied national army during the winter encampment at Valley Forge.

As fall turned to winter, Gates looked like a hero, while Washington had just surrendered the capital, prompting speculation that a change might be in order.[27] Washington learned of the gossip network's half-baked scheme to replace him in an intercepted letter from Gen. Thomas Conway to Horatio Gates that supported Gates as commander in chief. The whole affair was nothing more than some correspondence between Conway and Gates. Still, it did serve as a major embarrassment for Washington and Congress, except for the retooling of the Board of War and the appointment of Conway as the inspector general.[28] Washington's former quartermaster general, Thomas Mifflin, was among the disgruntled officers. He described Washington as inept and surrounded by sycophants afraid to challenge him. He corresponded with Gates, telling the former to prepare for command as a "mighty torrent of public clamor and public vengeance" was brewing against Washington.[29]

Adding to the chaos, on 27 November 1777, Congress passed a resolution that appointed Gates to a new and reorganized Board of War that included Mifflin, former commissary general Joseph Trumbull, and Thomas Pickering, among others. This effectively made Gates superior to Washington. Gates had the authority to appoint officers, propose reforms, and supervise the quartermaster and commissary departments. Congress appointed an inspector general, Thomas Conway, to oversee Washington's forces. An outspoken critic of Washington, the Irish-born, French-trained Conway was appointed to that role on 13 December 1777. He was to report directly to Gates and Congress—independent of Washington's command—and he was not instructed to inform Washington.[30]

Washington revealed what he knew to the press to counter Gates and Conway's influence. Conway resigned in full, but Washington urged his supporters to duel with Gates and Conway. Gates refused to duel, apologized, and was reassigned. Washington's loyal subordinate, Gen. John Cadwalader, challenged Conway to a duel and shot him in the mouth. Conway was wounded but alive and fled to France to recover, where he issued an apology that Washington never returned.[31] With Conway out as inspector general, Washington appointed Friedrich Wilhelm August Heinrich Ferdinand von Steuben, also known as Baron von Steuben, to that post as a direct subordinate. Washington appointed his most trusted subordinate, Nathanael Greene, quartermaster general.[32] After this so-called cabal—where there is no evidence of a concerted effort to oust Washington—no further issues with civil-military relations sprang up until the war's end.[33]

The winter at Valley Forge is a seminal moment in U.S. Army history for several reasons, including how it informed civil-military relations. The choice of location was itself a political decision to placate civilian leaders. Washington seriously considered a winter campaign and an attack to retake Philadelphia but ultimately decided against it. Should a move like that fail, it would have ruined the army and the cause. Still, Congress did not want Washington to take his army into winter quarters. In early December, he sent a delegation to his headquarters only to find a demoralized and destitute army. According to Henry Laurens, this army had been on the move for the past six months and was "half in Rags & half of them without Blankets."[34] Washington
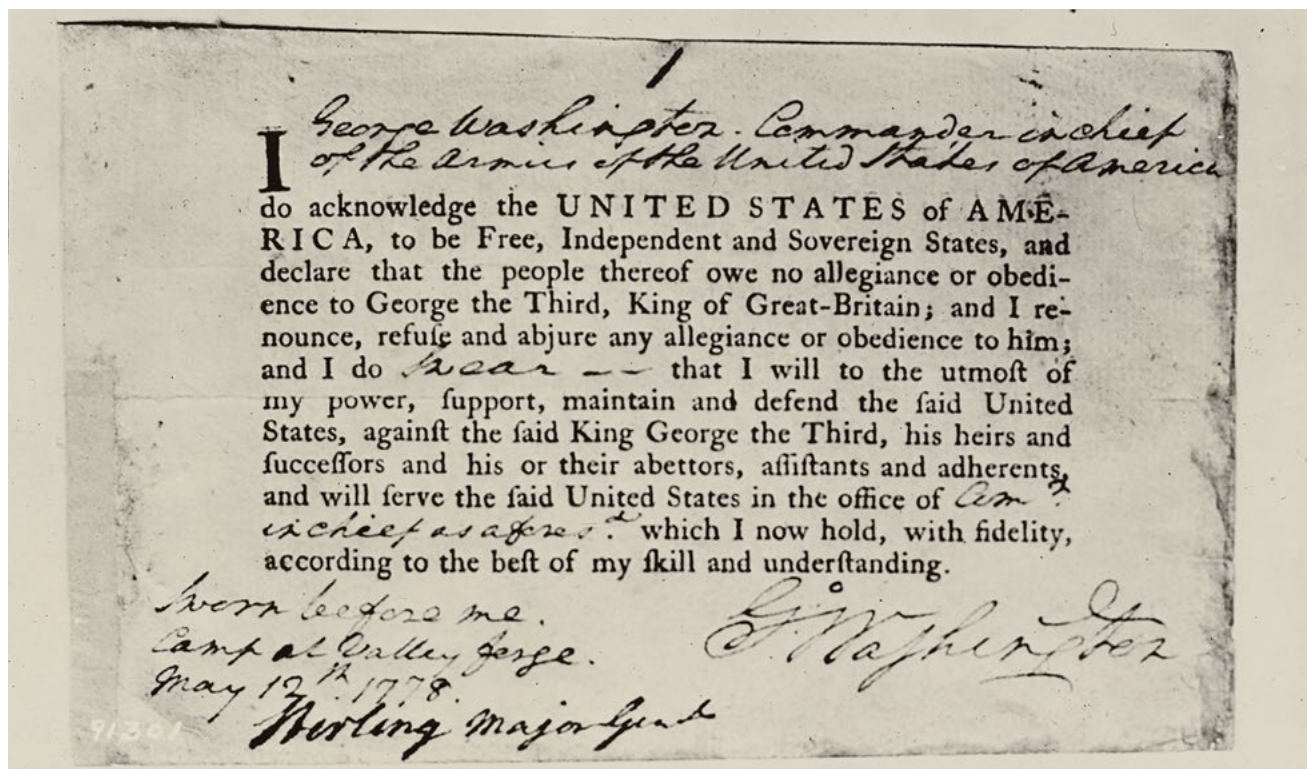
The Oath of Allegiance and Fidelity that was signed by Gen. George Washington while encamped and in command of the Continental Army at Valley Forge, Pennsylvania, on 12 May 1778. His oath was sworn before, and also signed by, Maj. Gen. William Alexander, Earl of Stirling. This affirmation came to be taken due to a Congressional Resolve dated 3 February 1778, which directed "every officer who holds or shall hereafter hold a commission or office from Congress" to take this oath. (Scan courtesy of the National Archives)

ultimately chose Valley Forge for his winter quarters due to a host of factors, but ultimately, the decision represented a compromise between military, political, and logistical needs. It was close enough to Philadelphia to monitor British forces but far enough away to be defensible. It contained natural defenses and quick access to major roads for resupply or movement. Most of all, Washington chose the location to balance Congress's wishes for a continued offensive with the beleaguered state of his forces.[35]

The winter at Valley Forge was most important for Washington's ability to re-create his army as he saw fit. Thanks to the efforts of Steuben—who arrived on 23 February 1778—to implement standard drills to train the Continental Army, the force that left camp in late spring 1778 was a far better-trained and led force than the one that entered.[36] Nevertheless, going into Valley Forge, the Continental Army was severely short on manpower, supplies, and funding—indicative of the strained relationship between Washington and Congress. To plead his case in the most direct manner possible, he hosted another congressional committee. This five-member delegation came to his headquarters on 10 January 1778 and stayed until March. Attendees included Francis Dana of Massachusetts, Nathaniel Folsom of New Hampshire, John Harvie of Virginia, Gouverneur Morris of New York, and Joseph Reed of Pennsylvania.[37] His previous experience in politics had prepared him well for this moment. Opponents in Congress had chastised him for overstating the army's situation, but this allowed him to demonstrate clearly to the delegates exactly what his army was enduring. The delegates, in turn, worked with Washington to attempt to resolve logistics and manpower issues; Washington called for a limited draft and civilian recruiting system, which Congress recommended to the states. Nothing would be completed before the campaign season, but the committee did adjust state quotas to better reflect their populations.[38]

Washington and his staff likewise penned a letter negotiating the army's needs against Congress's wants. Within, he outlined a Table of Organization for the

Mutiny of the Pennsylvania Line by Edmund A. Winham and James E. Taylor, 1881, woodcut, 11 x 12 cm. (Image courtesy of the New York Public Library Digital Collections)

army he needed to defeat the British. The letter called for increased pay to curb resignations, half-pay for life for his officers in retirement, an overhaul of the state-based regimental system so he could create a true national army, and the ability to levy promotions.[39] On 27 May 1778, Congress passed a resolution that created a new military establishment that reflected Washington's desires for the composition of regiments of infantry, artillery, and cavalry, as well as the structure of other noncombat departments. They also prescribed updated rates of pay and methods of promotion.[40] While this did not solve all of Washington's problems, it reflected his ability to persuade the political body and demonstrate the dynamic relationship between civilian and military leaders. They even approved half-pay pensions for officers in May 1778—restricted to seven years—and an eighty-dollar bonus for anyone who reenlisted for the duration.[41]

Throughout the war, Washington remained cognizant of prevailing aversion to a standing army. He endeavored to prove his republican credentials as a temporary military commander of citizens. Most of Congress eventually came to trust him. From the beginning, Washington and the Continental Army

took great pains to obey state laws and even provided receipts for items procured. Washington communicated directly with state-level governments because he understood that power lay at that level. In doing so, he endured problems with diffuse confederation-style governance that fueled his conviction that the country needed a strong national government—an opinion he began to express as early as 1780. To Washington, a failure to strengthen the federal government would lead to the forfeiture of hard-won gains in the war. The country would not consolidate its gains if it allowed the old, dispersed government to continue.[42]

During their stay at Valley Forge, soldiers noticed the refusal of so-called "patriots" to surrender food and goods to help the army survive—much less agree to any increased taxation. Accusations of war profiteering abounded, and the relationship between the army and the citizenry deteriorated despite congressional acquiescence to army demands.[43] As such, by early 1780, Washington warned Congress to address at least some of the army's grievances.[44] In January 1781, two minor mutinies served as precursors to the Newburgh Conspiracy. First, on 5 January, a group of one thousand disgruntled and unpaid soldiers from the Pennsylvania line marched on Congress with artillery. While en route, they shot two loyal officers and made sure to declare to everyone who would listen that they were "no Benedict Arnolds"; they were simply fed up with broken promises. Washington and his officers persuaded them to turn back. He also urged Congress to address their grievances and assured the lawmakers—and the states—that he and his fellow officers were committed to republican government.[45]

A second mutinous incident occurred three weeks later with troops from the New Jersey line. These men threatened to march on their state capitol at Trenton with intentions like the Pennsylvanians'. In this instance, Washington reversed course and chose to suppress this mutiny—to make an example. He dispatched Robert Howe and a six-hundred-man detachment to quell the mutiny, instructing him to compel their "unconditional submission," and that if he succeeded, he was to "instantly execute a few of the most active and most incendiary leaders."[46] Howe's men surrounded the rebels and then followed their orders, killing the two lead conspirators.[47] These two incidents were less of a problem in civil-military relations than the Conway Cabal or the Newburgh Conspiracy because they involved lower-ranked officers, the threat was minimal, and the attempts were quickly put down. Nevertheless, they had the potential to squander what support remained among the population.

Civil-military relations remained relatively calm until 1783. After the victory at Yorktown in the fall of 1781, Washington urged Congress to send him on the offensive, yet they declined. Dislodging British garrisons in New York or Charleston would be difficult at best and risked both civilian casualties and interrupting the ongoing peace process. It is important to note that Washington did not take his army on the march against the remaining pockets of British forces; rather, he adhered to the principle of civilian control by respecting Congress's wishes. However, he insisted on maintaining his army in a high state of readiness until a peace treaty was signed and moved to within striking distance of New York City.[48] His maintenance of a standing army during this time, while waiting for the signing of the Treaty of Paris, renewed fears of an American Caesar or Oliver Cromwell—the classic and recent examples of how republicanism ended in military dictatorship. Rumors about Washington wishing to prolong the war to extend his power—an accusation leveled at him before and something he addressed directly on multiple occasions, especially during his "Fabian" phase, where he deliberately avoided giving battle.[49] His most famous refutation of power and desire to return to Mount Vernon came in his 23 October 1782 letter to William Gordon. "I can say, with much truth, that there is not a Man in America that more fervently wishes for Peace, and a return to private life than I do." Washington wrote, "Nor will any Man go back to the rural & domestick enjoyments of it with more Heart felt pleasure than I shall."[50]

The war had reinforced what he had learned as a young officer in the Virginia militia, that successful generals *had* to immerse themselves in politics. He initially tried to remain above the fray of politics. Washington feared the impact he might have in influencing decisions in a political environment that feared a standing army and unchecked military power. However, he soon realized that, to have any army capable of taking on the British that was supplied and fed and to cooperate with Congress, he needed to be political. He needed to engage in the process of determining

George Washington by Charles Willson Peale, 1776, oil on canvas, 44 x 38 5/16 in. (111.7 x 97.3 cm). (Painting courtesy of the Brooklyn Museum, Dick S. Ramsay Fund)

how to allocate a finite number of resources to the young country. In so doing, he leaned on his experience as a politician to become an active and influential part of the political process. He specifically sought politically skilled officers to serve as his aides and corresponded with those politicians at all levels who might best influence events in favor of the army.[51]

The Newburgh Conspiracy is the closest the United States has come to a military coup d'etat or mutiny. It was a complex affair involving officers and members of Congress conspiring to strengthen the federal government and provide pay and benefits to war veterans. The origins of the crisis stemmed from the years of sacrifice made by the army for the cause. On top of that, officers were apprehensive about rejoining a civil society where their friends had grown rich from the opportunities that came during wartime while they suffered and sacrificed. Their pay had been in arrears for nearly four years—by some accounts, the cumulative total was over five million dollars. Congress was in debt to

six million dollars and could not tax; only the states could. In 1780, Congress granted a lifetime half-pay pension, which was halted in 1782 to save money. In a December 1782 memorandum, Continental Army officers asked Congress to maintain funding and allow them to receive their pensions in a lump sum payment with back pay rather than lifetime half-pay pensions. The officers included in that memorandum a threat that "any further experiments on their patience may have fatal effects."[52] On 6 January 1783, a congressional committee met to discuss the grievances but was ultimately fruitless.[53]

The petitioners had also ridden to Philadelphia and conferred with two young members of Congress—James Madison and Alexander Hamilton. They later met with Robert Morris, the congressional financier. Their timing was perfect. Virginia had just joined Rhode Island in vetoing a tax bill known as the Impost of 1781.[54] This would have provided funding to the federal government to fund veterans' programs, and favorable political winds had shifted to a faction of nationalists (pre-Federalists) who wanted to increase governmental authority. These congressmen then discussed the concerns of the delegation led by Maj. Gen. Alexander McDougall, urging them to cooperate. Hamilton thought that an officer revolt might help change the minds of other members of Congress. Morris and the rest also threatened that they would not refer their army claims to the various states if they did not participate. Their debate continued, each attempting to persuade the other, but in essence, a faction within Congress was attempting to use the army to threaten other members of Congress into bending to their will to increase the power of the federal government.[55] What is most striking is that these men later advocated on behalf of the Federalist Party.

As trouble brewed, Hamilton suggested that Washington not interfere; rather that he let the conspirators intimidate Congress. Hamilton also suggested that many within the ranks viewed him as too mindful of Congress and that he ignored the needs of soldiers. Hamilton's ideas were dangerous and would have set a terrible precedent in American civil-military relations. Washington did not respond to Hamilton's remarks for three weeks and even then, only to tell him that he decided not to join any schemes.[56] Washington wrote back to Hamilton on 4 March that "the sufferings of a

complaining Army on one hand, and the inability of Congress and tardiness of the States on the other, are the forebodings of evil."[57] One of their major grievances was the pension plan and its status as a political football. As these officers believed that they had sacrificed the most to the cause, they felt they deserved compensation for their time away from their families and livelihoods—a point Washington consistently reminded Congress about.[58] However, the situation intensified when, on 10 March 1783, an incendiary letter circulated the camp. This directive was more forceful. It referred to an ungrateful country and an indifferent Congress, suggesting that they did not disband until their grievances were redressed, or should war resume, they should step aside. Washington decided to act. He needed to extinguish the flames of dissent before the officers' plots ruined whatever gains they had just won in seven years of war.[59]

The plotters had originally planned for all officers, including Washington, to meet on 11 March. Washington foiled that and scheduled a new meeting for 16 March 1783. In that meeting, he delivered one of his most impassioned speeches. He reminded his officers that their ideas were anathema to the principles for which they had just fought. He urged them "not to take any measures, which, viewed in the calm light of reason, will lessen the dignity, & sully the glory you have hitherto maintained." He likewise viewed their intentions as an attack on his integrity and reputation: "As I have ever considered my own Military reputation as inseparably connected with that of the Army," he said.[60] And so, he had made himself synonymous with the cause, and his refusal to take part demonstrated the futility of their ideas as the officers knew they needed him.[61]

His speech included an unscripted moment where he pulled out his spectacles and put them on. The officers assembled did not realize he had begun to lose his sight. "Gentlemen," he apologized, "you will permit me to put on my spectacles, for I have not only grown gray but almost blind in the service of my country." While that statement does not appear in Washington's prepared remarks, it is attributed to him by an eyewitness, Henry Knox's aide-de-camp, Samuel Shaw.[62] He closed his remarks with a lesson in civil-military relations:

> And let me conjure you, in the name of our common Country—as you value your own sacred honor—as you respect the rights

of humanity, & as you regard the Military & national character of America, to express your utmost horror & detestation of the Man who wishes, under any specious pretences, to overturn the liberties of our Country, & who wickedly attempts to open the flood Gates of Civil discord, & deluge our rising Empire in Blood.[63]

This dramatic moment communicated to his officers that their wartime sacrifices were too great to soil their reputation and that of the American army on the altar of selfishness. It would have set a dangerous precedent at that moment if their grievances had been sent to Congress in the same fiery tone with which they were written to each other. As it was, Washington diffused the situation and continued to remind his officers of their role. Extinguishing such a fiery situation was difficult considering the widespread belief among the officer corps that they had a monopoly on what the cause meant and what it meant to be an American. How he handled Newburgh is the best example of Washington's understanding of the civil-military relationship and the principle of civilian control. He diffused the situation by maintaining clear and consistent communication with both parties. In talking to his army, he stressed that the delegates in Philadelphia were doing their best, albeit slowly. In turn, he stressed to Congress that his officers had made their requests respectfully, yet they deserved compensation for their sacrifice. As such, on 22 March, Congress offered a compromise of turning the half-pay-for-life pension into five years of full salaries through interest-bearing government securities. Washington immediately reproduced that legislative decision in his next general orders to his troops.[64]

The Newburgh Conspiracy, while as close as the United States has ever come to a military coup, was never going to replace the government with a military dictatorship. Washington consistently admonished his officers, Alexander Hamilton in particular, for playing politics with the army, noting that an army "is a dangerous instrument to play with."[65] It was, however, a case of the military attempting to exert immense outside pressure on the standard political process by force of arms. If Washington had not intervened, it would have been, in Richard Kohn's words, a "declaration of independence from the nation by the military" that would have created a major political crisis.[66]

> War and politics are inseparable. And despite his faults—of which there were many—Washington should be revered for his refusal to seek, seize, or otherwise hold power outside of legitimate means, for his consistent acknowledgment of how and where power is derived within the nascent United States and where the military *must* fit into that equation.

Washington's efforts to diffuse the situation and surrender his commission without incident are a testament to his leadership style, which was essential in the establishment of civil-military norms in the United States and his commitment to republican government.

The war officially ended with the signing of the Treaty of Paris on 3 September 1783. Despite this, British forces did not depart New York City until the end of November. During that time, Washington maintained his army in readiness, as he had since Newburgh, north along the Hudson River at West Point. On 2 November, he issued his final farewell remarks to his men. Thinking of civil-military relationships after the war, he urged his "virtuous fellow Citizens in the field" that they "should carry with them into civil Society the most conciliating dispositions; and that they should prove themselves not less virtuous and usefull as Citizens than they have been persevering and victorious as Soldiers."[67] The army began demobilizing, and British forces departed New York City at noon on 25 November. Washington was careful to let civilian authorities reclaim the city, not his army, although he rode in with the New York militia regiments alongside Governor Clinton.[68]

After securing New York City, Washington focused on returning to civil life. On 19 December 1783, he arrived in Annapolis, where the Continental Congress was operating, and on 23 December 1783—eight years, six months, and five days after Congress granted him command of the army in Philadelphia—he surrendered his commission in front of Congress in Annapolis.[69] In prepared remarks, Washington closed the loop on the civil-military relationship granted in his initial commission of June 1775. "The great events on which my resignation depended having at length taken place," he remarked, "I have now the honor of offering my sincere Congratulations to Congress & of presenting myself before them to surrender into their hands the trust committed to me, and to claim the indulgence of retiring from the Service of my Country."[70] He then returned to Mount Vernon just in time for Christmas.

At that moment, he rejected becoming an American Caesar and instead chose to embody Cincinnatus. Educated like most of his generation on popularizations of ancient history, Washington had patterned his behavior on his understanding of Roman heroes. Joseph Addison's 1713 play *Cato: A Tragedy* shaped Washington's conception of himself as he took steps to model his behavior from the Roman leader who exemplified public virtue and liberty. Fabian served as his example for victory and Cincinnatus for his postwar life. Cincinnatus is famous for having picked up the sword when called to save his country in 458 BCE and laying it down again to return to the plough and the life of a yeoman farmer. He embodied the citizen-soldier ideal that influenced Enlightenment thinking on the matter.[71]

Washington's experience provides ample material for students of civil-military relations. His experience, on the one hand, suggests that civilians and citizen-soldiers are effective, that expertise in arms was unnecessary in a republic, and that the need for a professional officer corps was moot. Despite Washington's argument for the contrary, his experience fueled advocates for a small military establishment. Throughout the nineteenth century, the United States continued to give high rank to amateur officers with militia backgrounds who used military service as a steppingstone to political office, including six presidents: Andrew Jackson, William Henry Harrison, Franklin Pierce, Rutherford B. Hayes, James A. Garfield, and Benjamin Harrison. On the other hand, Washington's struggles in being unprepared offered lessons to twentieth-century military officers such

as during the Korean War. His example then provided fuel for advocates of a larger standing military establishment prepared for any eventuality. Washington served as an example for both an amateur military establishment as well as a large professional cadre in arms.[72]

The "myth of Cincinnatus," that valiant citizens will defend the country when called has informed how Americans have mobilized and prepared for war since the revolution.[73] Washington understood that citizen-soldier militias were limited, which informed his desire to develop a well-paid, professional standing army. This tension, however, lay at the base of contemporary notions of civilian control of the military and was something with which Washington struggled throughout the conflict.[74] When the war began in 1775, Congress tried to administer the Continental Army in the same way they understood American politics—as diffuse as possible. Congress's stubbornness to maintain divided authority that relied on state-level governments was a direct side effect of Anglo-American fear of standing armies and the American localist worldview. Fighting a war, however, required centralized command and logistics. This focused combat power on the desired political end state and provided the necessary equipment and food to sustain an army in the field. If the defeats of 1775–1777 are indicative of anything, the nascent United States could not sustain an army. There existed, then, a fundamental struggle between the ideal and the real. Ideally, the fledgling United Colonies could throw off the yoke of British rule with motivated citizens. To achieve independence, a professional force was required. The Continentals won their independence despite, rather than because of, their political ideals. That Congress adapted over time is thanks to George Washington's ability to influence and adeptly navigate politics. Time and again, Washington made a concerted plea to his civilian leaders, and sometimes Congress listened, yet other times deferred to extant American political culture.[75]

War and politics are inseparable. And despite his faults—of which there were many—Washington should be revered for his refusal to seek, seize, or otherwise hold power outside of legitimate means, for his consistent acknowledgment of how and where power is derived within the nascent United States and where the military *must* fit into that equation.[76] Yet because they prefer separate political and operational spheres, American officers have not always allowed for tranquil civil-military relations. George McClellan, for example, was famously at odds with President Abraham Lincoln during the American Civil War. McClellan was raised on the teachings of Antoine-Henri de Jomini, who argued that after war began, civilian authorities should let the officers fight without interfering. Lincoln rejected this notion, as did President Harry S. Truman when he relieved Douglas MacArthur in 1951. Likewise, this occurred again when President Barack Obama's administration sacked Stanley McChrystal from his post in Afghanistan. Suppose these generals had followed Washington's example. In that case, they might have understood that the military, even in times of war, cannot be the only national priority, and that civilian leaders must manage all elements of national power in support of the broad political goal that the war is being waged to achieve, and that they must navigate contested political waters.[77] Throughout the nineteenth century, the military and politics became a consistent feature. The debate between standing armies and militias continued. Many officers ran for office while in uniform, while others foreswore their commission to take up arms against their country. ■

Notes

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14. Higginbotham, *George Washington and the American Military Tradition*, 64.

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The Army's Training Environment

Enabling Indo-Pacific Integrated Deterrence

Jennifer Dunn

For the better part of the last fifteen years, U.S. Army training and education has been immersed in a fictitious world. That world is known as the Decisive Action Training Environment (DATE) and is the Army's unclassified training environment, which has played a key role in ensuring operational readiness for soldiers since its inception.[1] Despite being fictitious, DATE is used throughout a soldier's career, starting with initial military training, for live, virtual, and constructive training and education events to provide *realistic* and *relevant* operational environment (OE) conditions.[2] The use of DATE across these venues enables the Army to train and understand diverse OEs in which it may find itself operating and future threats it may face.

In recent years, as part of broader Army transformation initiatives and to better prepare the U.S. Army for future conflict, the Army's training environment has substantively transformed to reflect the changing global environment and the security challenges that strain the defense enterprise. The *2022 National Defense Strategy* (*NDS*) identifies these challenges as shifts in global military capabilities, emerging technologies, new rival doctrines that threaten the U.S. homeland and global stability, increased coercive activities in the "gray zone," and transboundary challenges.[3] Specifically, the *NDS* highlights how U.S. competitors like the People's Republic of China (PRC) and Russia are exploiting these challenges to erode deterrence,

exert economic coercion, and endanger political autonomy.[4] It is crucial that Army training reflects these security realities, and DATE is the tool that provides the enabling environment.

The ability for trainers to create realistic security and intelligence informed training scenarios through DATE has led to an expansion of users. DATE, originally designed with the U.S. Army in mind, has expanded across the entire joint, interagency, intergovernmental, and multinational (JIIM) spectrum. This expansion has resulted in an unforeseen phenomenon: DATE has transformed from being a tool to enable Army operational readiness to a versatile training tool that ensures regional readiness, enhances partner capacity, and fosters interoperability across strategic theaters of concern for the United States.

This article presents an introduction to DATE and details elements of its development over the past decade, highlighting ongoing modernization efforts. Additionally, this article outlines the evolution of DATE, from a training tool to support collective unit training for Army brigades and below to a tool that continues to support not only Army unit training but also training and operational readiness across the JIIM spectrum. This article concludes with a discussion of how this expanded utilization of DATE has not only served to improve operational readiness for U.S. forces but has also enhanced partner capacity and interoperability, demonstrating its utility as an enabler in

The Decisive Action Training Environment (DATE) provides the U.S. Army training community with a detailed description of the operational environment characteristics and conditions found in multiple regions around the globe: Africa, Caucasus, Europe, the Indo-Pacific, and the Arctic and Antarctic polar regions. DATE provides trainers with a foundational narrative that can be used as is or adapted to fit the training needs of a specific scenario. (Graphic from OE Data Integration Network, TRADOC G-2)

supporting theater integrated deterrence efforts, most notably in the Indo-Pacific theater.

What Is DATE?

DATE is the U.S. Army's official mandated tool for scenario development that enables training for all essential tasks through a singular, unified, scalable training environment. DATE, while intelligence informed, is an unclassified foundation that resembles real-world OEs and threat militaries and is institutionalized across professional military education and training. It provides relevant and realistic conditions, and adaptive adversaries for the training community and supports the education continuum from the most junior to the most senior education venues.

DATE presents conditions across four geographic regions: Eurasia, Indo-Pacific, Africa, and the polar regions to support Army training requirements to counter and deter threats in any theater. DATE comprises twenty-four notional countries, all informed by real-world conditions and characteristics while complying with Army Regulation 350-2, *Operational Environment and Opposing Force Program*.[5] These real-world analog countries represent both threats and regional-security partner nations. They also include competitor nations, which allows Army training developers to create scenarios featuring pacing, acute, and persistent threats.

DATE depicts OEs using the framework of operational variables.[6] Real-world countries influence the variables and offer a diverse landscape that supports all variety of missions, from stability operations to irregular warfare and large-scale combat operations. These variables are regularly updated to stay relevant and support Army training objectives. For example, the Army's pivot to great-power competition and near-peer threats like China has increased the prioritization of chemical, biological, radiological, and nuclear defense training, triggering a DATE update.[7] DATE's physical environment replicates existing geographical features and man-made infrastructure, facilitating the use of existing maps and integrating with Army mission command information systems. However, due to altered country identities, political boundaries have shifted and

been renamed. Training audiences using DATE can further move boundaries and modify the operational variables to accommodate their training objectives.

Why DATE?

After 11 September 2001, the U.S. Department of Defense (DOD) prioritized antiterrorism and counterinsurgency mission support. For nearly a decade, Army training, once wholly focused against a near-peer Soviet threat, shifted to predominantly mission rehearsal exercises in advance of deployments to combat theaters where the Army was conducting large-scale counterinsurgency operations. However, *NDS* in 2008 the DOD shifted focus. While counterinsurgency operations continued, defense strategy identified the PRC as an "ascendant state with the potential for competing with the United States" and stated Russia's "retreat from openness and democracy could have significant security implications for the United States."[8] These watershed statements solidified what the Army had anticipated—large-scale counterinsurgency operations were ending, and the Army's training focus needed to shift from counterinsurgency to preparing to counter the growing threat represented by China and an increasingly belligerent Russia.

To prepare for these new threats, the Army published an updated training concept in 2010, describing the training requirements and capabilities needed to conduct full-spectrum operations (FSO) in a JIIM environment.[9] The Army training concept drove the development of the Army training strategy, creating synergies across the training domains to achieve the Army force generation objectives.[10]

The Army stressed the necessity to train simultaneously for combined arms maneuver and wide area security to balance combat power in tactical actions for offensive, defensive, and stability operations.[11] To support these initiatives, the Training and Doctrine Command (TRADOC) G-2 was tasked with developing a product to support FSO training environments across all combat training centers (CTC), thus, creating the Full Spectrum Training Environment (FSTE).[12] Although FSTE was a great step forward in supporting FSO training, it was clear the Army needed to do more to set the table for successful training events.

In 2011, the TRADOC G-2 improved upon FSTE and created what is now known as DATE. At the time, DATE consisted of one region and five countries, and it served as a single source for creating exercise scenarios. DATE was not intended to serve as a scenario but rather a detailed representation of multiple OEs with the necessary conditions and characteristics to enable trainers to develop scenarios that stimulate essential tasks in Army training. The 2011 DATE supported modern training concepts and Army force generation objectives, and enabled Army readiness for any operation.

Transformation and Modernization

From 2011 to 2013, DATE was primarily used for specific training requirements at CTCs. While it met the training requirements for those centers, it was not widely adopted across the Army in other soldier education venues. This limited usage was due to its restricted regional representation and its ineffective support to understanding real-world OEs and threats.

However, over time, TRADOC G-2 recognized the limitations and began expanding DATE, an expansion effort that was reinforced with guidance from the Army's chief of staff in 2018. The chief of staff recognized the need to broaden Army training to encompass more regions worldwide to better prepare for potential deployments to any theater of operation. This insight led to DATE's first major expansion, incorporating multiple global regions and establishing its role in supporting both Army training and education.

Today, DATE is a flexible and dynamic tool that provides an accurate representation of current OEs, emphasizing key conditions and potential threats. It has evolved to adapt to changing OEs, aligning with the DOD's overall strategy and the Army's training and modernization goals. To keep DATE up to date, TRADOC G-2 actively identifies, collects, and integrates recent observations of OEs, threats, and conflicts into the training environment.[13] The primary aim of this effort is to enhance understanding of threats and improve training for multidomain and large-scale combat operations. In a time of shifting geopolitical dynamics, threat-informed training is essential. National security and defense strategies identify specific countries that pose challenges for the DOD, and DATE aligns with this paradigm. DATE facilitates realistic, threat-informed training to prepare for these evolving security challenges.

An example of the DATE Indo-Pacific operational environment. DATE Indo-Pacific has a long history of political, military, and civilian instability and conflict, which includes ethnic, political, and religious factionalism. The region is centered on maritime concerns and is dominated by Olvana's military and economy. North Torbia threatens the entire region with nuclear ICBM ambitions. Himaldesh asserts itself as a global player and alternative to Olvana, while Sungzon serves as a foil to the latter's maritime dominance. The many, smaller nations seek international partnerships to advance their development and provide stability. Belesia, Gabal, Khorathidin, and Bagansait all vacillate between juntas and democracies. Complicating these regional dynamics are outside actors who grow increasingly involved in the economies. DATE Indo-Pacific thus represents an environment where highly localized conflict can spill over into widespread unrest or general war. (Map from OE Data Integration Network, TRADOC G-2)

Current initiatives to modernize DATE include updating OEs to accurately reflect the following conditions:

- a pacing challenge in the Indo-Pacific theater (Olvana);
- an acute challenge in the European theater (Donovia);
- persistent challenges in Pacific (North Torbia) and Central Asia (Ariana);
- adversaries with the capability and intent to challenge the U.S. homeland; and
- adversaries with the capability and intent to deploy chemical, biological, nuclear, and radiological weapons.

These modernization efforts have created a realistic, relevant, and intelligence-informed training environment that effectively supports training for multidomain and large-scale combat operations, all while remaining unclassified and publicly releasable. This feature has gained the attention of joint and multinational partners. Over the past two years, DATE's usage has expanded beyond the U.S. Army to include joint,

A screenshot from "ADF OBA Road to Crisis," a video used in the Australian Defence Force (ADF) DATE scenario titled Operation Bronze Achilles (OBA). This training scenario is designed to enable individual training in a joint environment utilizing DATE Indo-Pacific. The OBA scenario sees Australia operating as part of a U.S.-led multinational force against a near-peer adversary (North Torbia) fighting in South Torbia. The campaign plan provides enough detail to enable exercise designers and instructors to develop specific scenarios. (Screenshot from Battle Lab Training Adversary Cell, Australian Army)

multinational, and interagency partners, addressing their respective training needs.

DATE User Expansion

Because of the focused modernization efforts to ensure DATE can support training in all domains from sea, land, and air to space and cyberspace, DATE is now able to support training for joint all-domain operations. As a result, DATE is being used to support more training and education venues than ever before, serving as a vital tool in the training kit for not only Army soldiers but also marines, sailors, airmen, intelligence analysts, foreign service officers, and multinational partner militaries.

U.S. Army and Marine Corps. The original, intended users of DATE were the U.S. Army's CTCs, where unit training takes place. Over time, its use has expanded across the entire Army training and education community. Today, DATE not only supports collective training at the CTCs but also home station training

and individual training at the centers of excellence. Soldiers engage with DATE from the beginning of their careers in initial military training and throughout their educational experiences, including senior-level education aimed at developing general officers.

Beyond the Army, DATE is also being adopted by joint partners, notably the U.S. Marine Corps (USMC). While relatively new to DATE, USMC's usage is growing among various Marine organizations to enhance its training and education. The first USMC user was the Marine Corps Tactics and Operations Group, which provides advanced individual training for operations and intelligence personnel in the ground combat element of the Marine air-ground task force (MAGTF).

Recent modernization efforts have expanded DATE's capacity to support multidomain operations, facilitating the Marine Corps Tactics and Operations Group's implementation of the tool. A key application is from the Tactical Training and Exercise Control Group, which has begun to employ DATE for service-level training exercises. These exercises sustain and evolve live-fire and maneuver combined arms tactics, simulate combat conditions for improved decision-making, and integrate emerging capabilities to enhance the MAGTF's adaptability across various military operations.

Other USMC organizations, such as the Marine Corps University Command and Staff College and the Marine Corps Intelligence Schools, are also exploring

DATE for individual educational purposes. The Command and Staff College offers graduate-level education aimed at developing critical thinkers and ethical leaders for roles in the MAGTF and beyond, while the Marine Corps Intelligence Schools coordinate the training requirements for all USMC intelligence fields and promote intelligence language training and military occupational specialties. For both institutions, DATE will serve as the platform for scenario-driven practical exercises tied to their curricula.

ABCANZ Armies Program. DATE has long been used by international partners of the United States, most notably by the partners that make up the Army, British, Canadian, Australian, and New Zealand (ABCANZ) Armies Program, which have similar training requirements for their ground forces. In fact, ground forces from all ABCANZ partners were early adopters of DATE, and all countries have a formal memorandum of understanding (MOU) with TRADOC on the use of DATE, demonstrating DATE's utility as an enabler to ensure operational readiness for ground forces. ABCANZ has used DATE for either individual or collective training in some capacity since DATE's initial inception. However, in recent years, its application by these partners has expanded, in a similar way to its expansion in the U.S. Army and the USMC.

- The Australian use of DATE is more prolific than even the United States' use. This is because the Australian Defence Force (ADF) has formally directed that DATE will be used for training across all its services. As such, DATE is the foundation for individual and collective training across the ADF and is pervasive throughout its training community.
- New Zealand's application of DATE is like Australia's in that New Zealand Defense Force leadership would like DATE to support training across its entire force for individual and collective training; however, it is not yet as pervasive as in the ADF.
- Canada, one of the earliest adopters, extensively uses DATE in support of army training. While not pervasive across its joint forces, Canada's DATE use expands across collective and individual training for its ground forces.
- The United Kingdom, much like Canada, was one of the earliest adopters and extensively uses DATE across ground force collective training. While not

used by the joint services, DATE is expanding into individual training in the UK.

A new initiative among all ABCANZ members is to integrate staff college scenarios. To date, staff colleges from the U.S. Army, the USMC, Australia, and New Zealand are operating in one DATE-based environment, each addressing operations unique to the education objectives for each respective staff college but all part of the same theater-focused campaign.

The use of DATE by all ABCANZ partners for individual and collective training not only supports readiness individually for those forces but also enables training interoperability among all countries.

Japanese Ground Self-Defense Force. In 2024, the Japanese Ground Self-Defense Force (JGSDF) approached TRADOC about its interest in pursuing a formal MOU agreement for the use of DATE like the agreements TRADOC has with ABCANZ partners. While the JGSDF has not fully implemented DATE, JGSDF's Training-Evaluation, Education, Research and Development Command and TRADOC are refining the details of an MOU, which will cover JGSDF's use for individual and collective training. As the JGSDF implements DATE, it will no doubt support training interoperability in the same way it has with ABCANZ partners.

Interagency. DATE's versatility has extended beyond the military domain and now includes organizations from within the intelligence community and the Department of State (DOS), both leveraging DATE to meet their unique training objectives. As a member of the intelligence community, the Defense Intelligence Agency uses DATE as part of its Professional Analyst Career Education (PACE) Essentials curriculum. PACE Essentials is a training course designed to orient new intelligence analysts to core analytic tradecraft concepts and processes while giving them an opportunity to practice essential analytic skills. DATE is used to complement this curriculum by giving students a realistic, immersive, and interactive scenario in which analysts apply their skills to prepare them to support national security and intelligence missions.

Similar to the Defense Intelligence Agency, the DOS has begun using DATE to support training and education, but in this case, it is used with partners and also supports interoperability. In 2023, the DOS hosted the Quad Counter Terrorism Working Group, which

includes representatives from four regional partners—the United States, Australia, India, and Japan.[14] The Quad working group is designed to make tangible progress on pressing challenges within the Indo-Pacific theater. As part of this working group, those assembled conducted a DATE-based tabletop exercise to explore enhancing Quad cooperation in response to an overwhelming terrorist incident in the Indo-Pacific. The DATE-based event allowed participants to explore what capabilities and support the Quad could offer, and how the Quad might coordinate to support the existing capacities of Indo-Pacific countries.

Operational exercises. While expansion across the training and education communities is a compelling story on the utility of DATE as a capable training tool and intimates its utility for developing partner capacity and interoperability, it is applying DATE in support of major theater-level operational exercises that brings this story full circle. Three exercises demonstrate how DATE is not only developing partner capacity and interoperability but is also additionally contributing to greater U.S. DOD-integrated deterrence efforts.

Yama Sakura. Yama Sakura is an annual command-post exercise between the United States and Japan that is designed to strengthen readiness and hone planning capabilities between partners. In 2023, the exercise expanded to include Australia and became the largest iteration of the exercise in its history. The key focus of Yama Sakura is exercising interoperability between nations and for the first time in 2024, it leveraged a DATE-based scenario.

Talisman Sabre. Talisman Sabre is the largest bilateral joint exercise between the United States and Australia, and it includes multinational participation from over thirteen countries. For the first time in 2023, the exercise was DATE based and included more than thirty thousand participants deployed across the Australian continent.[15] With every iteration, the exercise increases in numbers and country participants, and it is described as the "Olympics of military exercises" as it presents an opportunity to execute dynamic activities across all domains.[16] Planning for the 2025 iteration is ongoing, and it has been determined that it will also be DATE based. According to the lead U.S. planner for Talisman Sabre 2025, "Our collective goal for Talisman Sabre 2025 is to build combined joint warfighting capabilities with Allies and partners" and to support theater integrated deterrence by contributing "toward maintaining a free and open Indo-Pacific."[17]

Rim of the Pacific. The Rim of the Pacific exercise is the world's largest multinational maritime exercise and involved twenty-nine nations and twenty-five thousand personnel in 2024.[18] While the 2024 exercise did not use DATE, current planning discussions for its next iteration are exploring the use of DATE. Themed "Partners: Integrated and Prepared," the purpose of Rim of the Pacific is to build relationships, enhance interoperability, and contribute to the peace and stability of the Indo-Pacific.[19] Leaders across the U.S. military have highlighted this exercise as a way to remind our allies and partners about the importance of sticking together and to demonstrate to the region the United States' commitment to Indo-Pacific deterrence.[20]

DATE: An Enabler for Indo-Pacific Theater-Integrated Deterrence

The *2022 NDS* defines integrated deterrence as "using every tool at the Department's disposal, in close collaboration with our counterparts across the U.S. Government and with allies and partners, to ensure that potential foes understand the folly of aggression. The Department will align policies, investments, and activities to sustain and strengthen deterrence—tailored to specific competitors and challenges and coordinated and synchronized inside and outside of the Department."[21]

In the Indo-Pacific theater, the importance of U.S. deterrence efforts is underscored by the region's complex security environment, which is characterized by rising military capabilities and

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challenges to the rules-based-order from countries like the PRC. The U.S. Army plays an essential role in achieving integrated deterrence in this theater because it is uniquely postured as a forward physical presence and is a key enabler in improving military readiness and interoperability among partner nations—supporting a key tenet of Defense Secretary Pete Hegseth's approach to the region.[22] Improving readiness and interoperability only happens through joint and combined training, which is increasingly supported with DATE.

DATE emerges as a key tool in the U.S. Army and the DOD by fostering training interoperability and building partner capacity. Furthermore, DATE exemplifies and supports integrated deterrence, bolstering the collective defense posture of the United States and its allies.

The exponential growth of the use of DATE heralds a paradigm shift in military training, characterized by improved threat and OE understanding, and driven by transformation in contact. As DATE continues to evolve and expand its reach, it underscores the U.S. Army's commitment to staying on the leading edge in delivering the OE in an ever-changing global security landscape, solving problems and seizing opportunities today for victories tomorrow. ∎

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Leveraging Flexible Partnerships and the Thucydides Dance

Rethinking U.S. Foreign Policy in the Indo-Pacific Command

Lt. Col. Patrick O. Boling, PhD, Louisiana National Guard
Paul R. Sanders, PhD

At dawn Sun Pin lured P'ang Chüan and half his army onto a narrow path along which Sun Pin had removed bark from a large tree. Sun Pin positioned his army in ambush along the trail with the instruction to fire when they saw a torch. General P'ang Chüan was summoned to the bare tree by his advanced guard. He lit a torch to examine the tree and discovered writing which stated "P'ang Chüan will die beneath this tree."

Sun Pin wrote the ending of his enemy by making his enemy's path appear obvious and easy, but it took P'ang Chüan's action to make that ending under the tree of destiny manifest. The challenge is that the path is not always the most obvious, direct, easy, or constant.

In the current global political climate marked by intricacy and interdependence, it is imperative to adopt a more sophisticated methodology when forging alliances. This proposed new strategy is characterized by adaptable relationships, collaborations centered around specific issues, and a shared set of values. This approach presents a practical and effective means for countries to navigate the complexities arising from China's growing influence without having to resort to rigid alliances or direct confrontations. It allows for a more nuanced and flexible approach that can adapt to the evolving geopolitical landscape.

Emerging global powers that aim to supplant the United States as a global power are rivals, rather than potential allies who are open to sharing power across multiple nations. These rivals are attempting to rewrite narratives and histories to sow internal conflict abroad and justify the annexation of sovereign lands. Confronting these rivals directly would only amplify their internal and external narratives of the United States as an aggressor or enemy. Instead, the authors propose an indirect path of developing strong alliances and avoiding the narrow path of requiring allies to perfectly align with U.S. foreign and domestic policy. The narrow path of homogenous alignment, which does not tolerate entanglements, leads to global polarization and allows rivals to form counteralliances among the alienated. Rather than trying to force countries to align perfectly with its policies, the authors argue that the United States should focus on building strong, adaptable relationships with other countries to avoid global polarization and counteralliances.

In their previous article, "Toward a Mutually Beneficial Partnership with India to Improve U.S. Strategy in the U.S. Indo-Pacific Command," the authors made the case for the United States to form a more robust partnership with India. This article introduced the concept of U.S. policy that seeks "to enter more equitable and willing partnerships rather than coalitions of the coerced."[1] Strategic positioning is a crucial yet demanding approach for the United States to maintain its global influence and foster a strong partnership with India. In his book *The Limits of Power: The End of American Exceptionalism,* Andrew Bacevich highlights the strain on American resources to maintain influence and security through strategic positioning, leading to strategic exhaustion.[2]

The United States recognizes the importance of establishing a mutually beneficial partnership with India to improve its strategy in the U.S. Indo-Pacific Command by integrating diplomacy, information, military, and economics in strategic planning.[3] This balanced approach ensures the United States does not rely solely on military might but also leverages diplomatic efforts, information sharing, and economic collaboration to achieve its objectives.

John Mearsheimer's *The Tragedy of Great Power Politics* highlights that true strength in international relations derives from military capability and strategic positioning.[4] This principle of peace through strength is not solely about raw power but rather about maintaining a relative position that maximizes strategic advantages. This balanced approach fosters stability and peace, recognizing that it is better to be a good player on a winning team than the best player on a losing team.

Previous page: Soldiers assigned to Company B, 1st Battalion, 5th Infantry Regiment, 1st Infantry Brigade Combat Team, 11th Airborne Division, train with Indian Army soldiers assigned to the 4/8 Gorkha Rifles Infantry Battalion, 91st Infantry Brigade, during Exercise Tiger Triumph near Visakhapatnam, India, on 4 April 2025. Tiger Triumph is a joint and combined U.S.-India exercise focusing on humanitarian assistance, disaster response readiness, and interoperability in the Indian Ocean region and beyond to support a free and open Indo-Pacific. (Photo courtesy of the Indian Army)

Strategic positioning allows for flexibility and the ability to leave relationships, when necessary, without the exhaustion and risk of unmet expectations and polarization. As Henry Kissinger discusses in *Diplomacy*, managing expectations and promoting fairness in foreign policies is essential to sustain partnerships and avoid the pitfalls of unmet expectations.[5] Strength is not defined by power alone but by the ability to maintain peace through a strong strategic position.

A practical example of strategic positioning is India's purchase of the S-400 missile system from Russia.[6] The acquisition strengthens India's military capabilities with no direct cost to the United States. This demonstrates how strategic positioning can enhance overall national security. However, promoting fairness and managing expectations is important in preventing unmet expectations that could strain the partnership between the United States and India.

To reiterate, strategic positioning is a necessary and sustainable approach for the United States to maintain its influence and foster a stronger adaptable partnership with India. By integrating the diplomacy, information, military, and economics framework and managing expectations, both nations can achieve peace through strength and ensure that strategic positioning remains a practical approach in their foreign policy arsenal.

Reasonable Expectations

Maintaining a strong adaptable relationship between India and the United States requires continuous effort and the setting of reasonable expectations. In international relations, the belief that a single treaty can resolve all issues without ongoing effort is unrealistic.[7] The dynamic nature of global politics necessitates that countries continuously engage with one another to address emerging challenges and opportunities.

The historical context of Sino-U.S. treaties underscores the importance of ongoing engagement. Initial agreements between the United States and China were often undermined by changes in China's policies and actions that the United States did not anticipate or respond to promptly.[8] The expectation of signing a treaty and walking away ignores the realities of an ever-changing environment.

Toward a Mutually Beneficial Partnership with India to Improve U.S. Strategy in the U.S. Indo-Pacific Command

Maj. Patrick O'Brien Boling, PhD, Louisiana National Guard
Dr. Paul Sanders

Chess has only two outcomes: draw and checkmate. The objective of the game ... is total victory or defeat—and the battle is conducted head-on, in the center of the board. The aim of Go is relative advantage; the game is played all over the board, and the objective is to increase one's options and reduce those of the adversary. The goal is less victory than persistent strategic progress.
—Dr. Henry Kissinger

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Published in the July-August 2023 edition of *Military Review* by Boling and Sanders, this article discusses an enduring and equitable partnership between India and the United States that could present opportunities for both nations to work together to contain China's influence in the Indo-Pacific region. To read this article online, visit https://www.armyupress.army.mil/Journals/Military-Review/English-Edition-Archives/July-August-2023/Mutually-Beneficial-Partnership/.

As China grew economically and militarily, it increasingly violated the terms of various agreements, exploiting the United States' lack of proactive monitoring and response.[9] Moreover, the United States often underestimated China's strategic ambitions, leading to treaty violations and strained relations.[10]

To maintain a robust and adaptable relationship with India, the United States should expect to continuously monitor and actively manage this relationship. This involves regular diplomatic engagements, addressing conflicts proactively, and adapting to changes in the geopolitical landscape to ensure that both nations can mutually benefit from their partnership. By understanding and implementing these principles, the United States can foster a more stable and enduring relationship with India.

Exclusivity Not Required

Expecting international partners to be exclusive to the United States and seek single sources is unrealistic. India, for instance, has learned from its historical relationship with Russia that relying on a single partner can lead to issues such as delays in supply, substandard quality, and maintenance difficulties.[11] As a result, India has shifted toward diversifying its defense procurements.[12]

The United States can leverage its technological superiority and robust defense infrastructure to provide tailored solutions that address India's specific needs and challenges. This approach mitigates the risks associated with single-source dependency and fosters long-term strategic partnerships based on trust and mutual benefit. By emphasizing the quality, reliability, and comprehensive maintenance support of U.S. defense equipment, the United States can strengthen its appeal to countries that are wary of overreliance on any single partner. Furthermore, by actively engaging in joint ventures, codevelopment projects, and technology transfers, the United States can enhance its collaborative footprint in the defense sector.[13]

This type of strategy addresses the concerns of countries seeking diversified procurement and positions the United States as a critical enabler of their defense modernization efforts. The United States has a unique opportunity to capitalize on the lessons learned by countries like India. By offering reliable, high-quality defense solutions and fostering adaptable partnerships, the United States can enhance its role as a preferred and trusted partner in the global defense market, strengthening its strategic alliances and expanding its influence.

Defense Cooperation

The notion of the United States and India fully integrating their military forces or "giving" military capabilities to one another is unrealistic and contrary to each nation's strategic imperatives. This notion is not supported by each country's distinct defense strategies, geopolitical goals, and historical analyses of their defense relations. Instead, both nations desire to retain strategic autonomy and avoid overdependence on any single partner.[14]

India's approach to military modernization involves leveraging multiple international partnerships to bolster its defense capabilities without compromising its sovereignty or becoming overly reliant on any single country.[15] David Brewster emphasizes India's strategic independence, highlighting that while India seeks to enhance its military capabilities through international partnerships, it maintains strict control over its military assets and decisions.[16]

The United States, on the other hand, has overestimated India's willingness to align closely with American strategic interests, particularly in countering China.[17] Although the defense trade between the two countries has grown substantially, it faces limitations due to India's modest defense budget, the high cost of U.S. defense systems, and its insistence on local production and technology transfer, which often makes deals commercially unattractive for American companies.

Therefore, the United States should adopt a more realistic and adaptable approach to its partnership with India, recognizing the limits of what New Delhi can and will do to support American strategic objectives. Both countries have deepened their defense cooperation, but their partnership is bounded by the desire of both nations to retain strategic autonomy and avoid overdependence on any single partner.

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Indian Army soldiers from the 4/8 Gorkha Rifles Infantry Battalion, 91st Infantry Brigade, conduct a large-scale amphibious landing drill 11 April 2025 as part of Exercise Tiger Triumph at Kakinada Beach, Andhra Pradesh, India. (Photo by Staff Sgt. Aaron Irvin, U.S. Air Force)

Polarization

Successful international cooperation relies on nations accommodating political and economic interests that are diverse. Embracing political diversity and respectfully tolerating entanglements among allies are crucial strategies for preventing alienation and polarization of outside nations. This more accepting approach fosters a more stable and cooperative international environment by acknowledging and managing the inherent differences in interests and policies among allied nations.

International orders are built through inclusive institutions that manage political diversity and conflicting interests among allies.[18] These institutions enable a stable and cooperative international system by creating frameworks in which diverse political interests can coexist and be managed constructively. Nations embracing political diversity and tolerating entanglements among states are essential for fostering diplomatic relationships and preventing the alienation of potential allies.[19]

Managing conflicting interests within alliances is crucial for maintaining unity and preventing polarization. Alliances are more effective and durable when they can accommodate and reconcile the diverse interests of their members, thereby enhancing collective security.[20] The European Union's success lies in embracing political diversity and managing conflicting interests among member states, which limits polarization and strengthens the union by allowing it to adapt to diverse political landscapes.[21]

Successful international cooperation relies on institutions that accommodate diverse political and economic interests. Embracing political diversity and tolerating entanglements among allies prevent alienation and polarization that can lead to further divisiveness and tensions among nations.

Strategic Flexibility

The swing state analogy, when applied to diplomacy, underscores the importance of strategic flexibility

and the ability to adapt to a shifting geopolitical landscape. In international affairs, viewing pluralism as pragmatism highlights the value of embracing diverse perspectives and alliances to achieve more stable and favorable outcomes.

In the context of U.S. presidential elections, swing states do not consistently vote for a single party and thus become crucial battlegrounds. This analogy can be applied to diplomacy, where countries must navigate a complex and fluid international environment, building and maintaining relationships with diverse partners to secure strategic advantages.

Mearsheimer's theory of offensive realism in *The Tragedy of Great Power Politics* emphasizes the need for flexibility and pragmatism in foreign policy, as rigid alliances can lead to strategic vulnerabilities.[22] Robert Keohane's *After Hegemony: Cooperation and Discord in the World Political Economy* further supports the idea that embracing pluralism is a pragmatic approach to achieving global stability and addressing common challenges.[23]

In *The Future of Power*, Joseph S. Nye discusses the concept of "smart power," which combines hard and soft power strategies to navigate the complexities of international relations. Nye's emphasis on the need for a pragmatic approach to diplomacy aligns with the idea of viewing pluralism as a practical and effective strategy in international affairs.[24] Kissinger's *World Order* further underscores the necessity of pluralism and pragmatism in diplomacy, arguing that a stable international order can only be achieved through a balance of power that respects the diversity of political systems and cultural values.[25] In conclusion, the swing state analogy and the view of pluralism as pragmatism in diplomacy highlight the importance of strategic flexibility, embracing diverse perspectives, and building alliances to achieve more stable and favorable outcomes in the complex and fluid international environment.

The Story About Horse Racing

Han Xin, a renowned Chinese strategist, employed a clever strategy to win a horse race against a rival general. He raced his slow horse against the rival's fast horse, his medium horse against the slow horse, and his fast horse against the medium horse, resulting in victory in two out of three races.[26] This story illustrates strategic principles, emphasizing the importance of leveraging one's strengths against an opponent's

weaknesses, echoing Sun Tzu's strategic thinking in *The Art of War*.[27]

Seek Favorable Outcomes

In strategic scenarios, adopting a pragmatic approach that aims for partial but significant success can reduce the risk of overwhelming loss. This "two out of three" success rate principle, reminiscent of Sun Tzu's wisdom, is particularly relevant in diplomacy, where minimizing risks and maximizing gains are crucial. Sun Tzu advises that understanding when to engage and avoid conflict is crucial to victory.[28]

Howard Raiffa's *Decision Analysis: Introductory Lectures on Choices Under Uncertainty* highlights the importance of decision-making strategies that maximize favorable outcomes while minimizing potential losses. Raiffa discusses the benefits of probabilistic decision-making, where aiming for a majority win can lead to more stable and sustainable results.[29] This concept is particularly applicable in diplomacy, where nations negotiate complexity with multiple interests at stake.

John von Neumann and Oskar Morgenstern's *Theory of Games and Economic Behavior* introduces mixed strategies in game theory, which involve making decisions that balance risks and rewards to maximize expected utility. In diplomacy, pursuing multiple avenues of negotiation and cooperation to achieve a majority of objectives reduces the likelihood of complete failure.[30]

In his work *Diplomacy*, Kissinger underscores the importance of balancing competing interests and achieving incremental gains in international relations. Successful diplomacy often involves compromise and the willingness to accept partial victories to maintain stability and avoid escalating conflicts.[31] By integrating these strategic insights, it becomes clear that adopting a "two out of three" approach in both horse racing and diplomacy can effectively minimize risks and enhance the likelihood of achieving consistent and favorable outcomes.

The Thucydides Dance

The concept of a "Thucydides dance" is a strategic approach to avoid the Thucydides trap, a situation where a rising power causes fear in an established power, leading to conflict. This strategy incorporates elements from various historical diplomatic efforts and alliances to manage and mitigate the risk of war through balanced power dynamics and strategic partnerships.

As President Donald J. Trump looks on, Prime Minister Narendra Modi of India signs the visitor's book at the White House on 13 February 2025. (Photo courtesy of the White House)

Graham Allison's *Destined for War: Can America and China Escape Thucydides's Trap?* explores how the rise of a new power such as China can lead to conflict with an existing dominant power like the United States.[32] To avoid this, the Thucydides dance concept suggests a complex interplay involving multiple powers to balance and manage these tensions.

Kissinger's principles of détente and his approach to opening diplomatic relations with China in the 1970s serve as foundational strategies for the Thucydides dance concept. Historically, détente with the Soviet Union and the opening to China were used to create a balance of power and reduce the risk of direct conflict among superpowers.[33]

The Thucydides dance involves forming strategic alliances similar to the Triple Entente of World War I, where France, Russia, and Britain partnered to counterbalance the power of the Central Powers. This historical precedent illustrates how alliances can form to counter a rising power and manage the potential for destabilization.[34]

Applying this to contemporary geopolitics, India can be viewed as a rising power that can play a crucial role in counterbalancing China's growing influence. India's strategic partnerships with the United States and other democratic nations can serve to mitigate the risks associated with China's rise.[35]

In summary, the Thucydides dance concept builds on the Thucydides trap, opening relations with China and détente to create a strategic approach for avoiding conflict among rising and established powers. By forming strategic alliances and balancing power dynamics, nations can mitigate the risks associated with a rising power and maintain stability in the international system.

Web Spinning

By accepting partners like India and allowing them to form additional partnerships with other nations such as Russia, we can enhance the complexity and stability of international diplomacy, even when interests conflict. This approach prevents the polarization of nations and reduces the likelihood of dragging more

countries into war. By spinning a web of international alliances, we can create a more nuanced and interconnected global community, avoiding the binary "us or them" mindset that historically led to catastrophic conflicts like World War I. Experts agree on the importance of maintaining flexible and diverse alliances to manage global stability.[36] The détente between the United States and Soviet Union during the Cold War and the U.S. opening relations with China in the 1970s exemplifies how engaging with diverse partners can prevent the rigid polarization that leads to conflict.[37]

The international community can foster cooperation and reduce tensions by tolerating different perspectives and interests. The domino effect that led to World War I illustrates the dangers of polarized alliances. According to Annika Mombauer, in *The Origins of the First World War: Controversies and Consensus*, the rigid alliance structures and binary thinking of that era contributed to the rapid escalation of conflict. The polarization of alliances, such as the Triple Alliance and the Triple Entente, left nations with little room for maneuvering, ultimately dragging them into war when conflicts erupted.[38] Robert Keohane's *After Hegemony: Cooperation and Discord in the World Political Economy* discusses how international institutions can manage cooperation among states with conflicting interests. Keohane argues that embracing pluralism in alliances rather than forcing binary choices helps maintain global stability and prevents unmet expectations that can arise from rigid, binary alliances.[39] In *How Enemies Become Friends: The Sources of Stable Peace*, Charles A. Kupchan emphasizes the importance of diplomatic flexibility and the ability to manage conflicting interests among allies. Kupchan's analysis supports the idea that tolerating differences and engaging in strategic partnerships with diverse nations can prevent polarization and reduce the risk of conflict.[40] Lastly, Nye advocates for building a web of alliances to enhance global stability. He argues that tolerating diverse interests and forming strategic partnerships with countries like India and Russia, despite their conflicting interests, can prevent the rigid polarization that often leads to war.[41]

To summarize, the concept of a Thucydides dance involves a strategic approach to avoid the Thucydides trap, where a rising power causes fear in an established power, leading to conflict. By forming strategic alliances and engaging in a complex interplay involving multiple powers, this strategy aims to balance and manage tensions, thereby dissuading adversaries from war or causing them to trigger their demise. This approach incorporates elements from historical diplomatic efforts and alliances, such as Kissinger's détente to manage the rise of potentially destabilizing powers like China.

Mimetic Theory

Mimetic theory, which posits that humans and their societies emulate each other's behaviors and desires, can be applied to India-U.S. diplomatic relations to understand the evolving dynamics of their partnership. René Girard's exploration of mimetic theory suggests that the United States and India are likely to adopt similar strategies and policies, enhancing their mutual interests without the constraints of formal alliances like NATO.[42] Unlike NATO, which has become polarized due to external conflicts such as the Ukraine crisis, the U.S.-India relationship benefits from flexibility and independent positioning. This flexibility provides a strategic advantage, allowing both nations to reposition rather than merely retreat if faced with a potential China-India conflict.

NATO's precrisis state was one of relative stability, but Russia's 2022 invasion of Ukraine, driven by fears of potential Ukrainian NATO membership, has disrupted this balance. This invasion has ironically strengthened NATO, as evidenced by the new member states that have joined since the conflict began.[43] However, NATO's involvement in Ukraine is nuanced; while supporting Ukraine, NATO itself has not directly entered the war, reflecting its defensive nature and adherence to nonaggressive principles.[44]

Considering the idea of India joining NATO is strategically inadvisable. India's current independence in foreign policy is beneficial as it prevents unnecessary provocations such as a potential China-Russia alliance. Though often messy, encouraging diplomacy through platforms like the UN remains a cornerstone of U.S. strategy, supporting global peace and cooperation.[45] The 2008 Mumbai terrorist attacks exemplify how shared challenges can strengthen U.S.-India relations, particularly in counterterrorism. This cooperation marked a significant convergence of interests, highlighting how crises can foster deep, resilient partnerships.[46]

The concept of True North is that navigational True North is fixed, while your metaphorical True North can evolve as you grow and change. True North, in this context, is about fostering commitment over compliance. The goal is to support organic, locally inspired governance solutions rather than imposing nation-building efforts that create proxies and further polarization. By inspiring people to shape their governments, the United States and India can build a partnership grounded in mutual respect and shared values, avoiding the pitfalls of enforced compliance and external manipulation.[47]

Recommendations

In an era of shifting geopolitical dynamics marked by China's growing assertiveness, the question of how to best safeguard a rules-based international order has become increasingly pressing. While the formation of a singular anti-China coalition presents significant risks, a more effective approach lies in cultivating a diverse network of partnerships. By focusing on shared interests and values, the United States and like-minded countries can create a more agile and adaptable strategy. The following recommendations outline a path toward building such a network, prioritizing cooperation, and constructive engagement over direct confrontation.

Regional alliances and partnerships. Rather than creating a single coalition, the United States and like-minded countries could strengthen existing regional alliances and partnerships. For example, the United States could deepen its engagement with ASEAN (Association of Southeast Asian Nations), work closely with the Quad (comprising the United States, Japan, India, and Australia), and support regional organizations in Asia to collectively address security and economic concerns.

Issue-based coalitions. Rather than forming a broad counter-China coalition, countries could come together on specific issues of mutual concern. This approach allows nations to collaborate on areas such as cybersecurity, maritime security, climate change, and public health without necessarily forming a comprehensive alliance.[48]

Flexible partnerships. Countries can engage in flexible partnerships where they cooperate on certain matters while maintaining their independence in others. This approach allows nations to pursue common goals without necessarily entering formal alliances.[49]

Norms and values coalition. A coalition could be formed around the promotion of democratic values, human rights, and the rule of law. Countries that share these principles can work together to defend them globally.[50]

It's important to recognize that any efforts to counterbalance China should be approached with caution and a focus on constructive engagement. The goal should not be to isolate or antagonize China but to promote a rules-based international order, peaceful resolution of disputes, and cooperation on global challenges. Building and maintaining such a coalition is a complex and long-term endeavor that requires skillful diplomacy and strategic thinking. ■

Notes

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To Conserve Fighting Strength in Large-Scale Combat Operations

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As the U.S. Army considers near-peer threats associated with multidomain operations (MDO) and large-scale combat operations (LSCO), it must assess medical implications on overall combat effectiveness and mission success. Estimates for LSCO suggest casualty rates the likes not seen since World War II, requiring the joint force and the Military Health System to reimagine triage, combat casualty care, medical evacuation, force health protection (FHP), and prolonged casualty care to minimize the risk to force. Additionally, if the U.S. military does not gain and maintain air superiority to readily evacuate casualties from the battlefield, the inability to resuscitate, rehabilitate, and reconstitute soldiers will increase risk to mission and to strategic victory. Ultimately mission success will be driven by Army medicine's ability to clear the battlefield for commander's freedom of movement and maximizing return to duty of high-performing service members to enhance lethality.

Over the last twenty years, lethality from battle injuries (BI) has reached historic lows that are not anticipated to be achievable during LSCO. During Operations Iraqi Freedom and Enduring Freedom

U.S. Army medical personnel administer a transfusion to a wounded comrade who survived when his landing craft went down off the coast of Normandy, France, in the early days of the Allied landing operations in June 1944. (Photo courtesy of the U.S. Army Signal Corps)

(OIF/OEF), 4,042 personnel were killed in action (KIA) from hostile actions and 1,270 died of wounds (DOW) from a total of 52,143 wounded; while in nonhostile actions, there were 876 deaths from accidents, 159 from illness/injury, 51 from homicide, and 334 from self-inflicted causes.[1] In contrast, Operations Desert Storm/Shield had 382 total deaths (147 battle deaths; 235 other deaths) and 467 nonmortal wounds.[2] Conversely, the Vietnam War recorded significantly higher casualties with 58,220 total deaths (47,434 battle deaths; 10,786 other deaths) and 150,341 receiving hospital care.[3] The battles of World War II resulted in 405,399 total U.S. deaths (291,557 battle deaths; 113,842 other deaths) and 670,846 nonmortal wounds.[4] Despite the remarkable advancements in combat casualty care over the decades, the lethality of operations projected for LSCO will require a new health systems support approach to minimize both the risk to mission and risk to force.

During casualty analysis, experimentation, and adaption, services often prioritize lethality from BI while underestimating the profound impact of disease and nonbattle injury (DNBI) on lost duty days and overall lethality. However, DNBI can significantly degrade combat readiness, as evidenced in the Vietnam War from 1967 to 1970 with lost duty days of 4,458,139 for DNBI and 7,065,350 for BI and wounds (see table 1).[5] In addition, DNBI consistently outpaced BI evacuations during the wars in Iraq and Afghanistan, even during spikes in larger-scale fighting, accounting for 80–85 percent of evacuations.[6] In LSCO, the ability to rapidly return service members to duty, regardless if they sustained BI or DNBI, becomes increasingly critical especially moving from small-unit operations of Iraq/Afghanistan to division-level operations (see the figure). However, the challenge extends

Table 1. Approximate Number of Man-Days Lost from Duty by Cause Among U.S. Army Personnel in Vietnam

Cause	1967	1968	1969	1970
Malaria	228,100	215,400	183,050	167,950
Acute respiratory infection	66,800	83,181	63,530	70,800
Skin diseases (including dermatophytosis)	66,400	64,832	50,790	80,140
Neuropsychiatric conditions	70,100	106,743	125,280	175,510
Viral hepatitis	80,700	116,981	86,460	85,840
Diarrheal diseases	55,500	60,132	48,980	45,100
Venereal disease (excluding CRO[1] cases)	7,500	6,840	3,130	3,700
Fever of undetermined origin	205,700	289,700	201,500	205,500
Disease total	780,800	943,809	762,720	834,540
Battle injury and wounds	1,505,200	2,522,820	1,992,580	1,044,750
Other injury	347,100	415,140	374,030	309,670

[1] CRO: Carded for record only
Preliminary estimates based on sample tabulations of individual medical records-carded for record only.

(Table from Spurgeon Neel, *Medical Support of the U.S. Army in Vietnam, 1965–1970*)

beyond the successful return to duty and reconstitution with a unit; it involves ensuring each individual reaches and maintains their full warfighting potential and optimal performance. If they are not optimized, both the individual and the collective ability to carry out an assigned task or mission are at risk. This could manifest as reduced accuracy with a weapon system or lead to longer mission times and associated increased logistical requirements. Without peak physical and mental performance, service members may lack the necessary stamina for prolonged, high-stress environments intrinsic to LSCO, ultimately impacting mission success.

This article addresses the impact of MDO and LSCO on BI and DNBI, drawing from historical information along with lessons learned from the war in Ukraine. The goal is to maximize U.S. Army capability in LSCO by addressing the full spectrum of soldier lethality and performance challenges related to BI and DNBI. To conserve fighting strength, commanders and medical leaders must emphasize FHP and prevention. Ultimately, military medicine's ability to strive for peak performance, maximize survival rates, and ensure the highest potential functional recovery underpins the trust service members, their families, and U.S. citizens place in the military healthcare system.

Battle Injury

The standard outcome measurements of BI lethality are a combination of KIA and DOW.[7] Historical data shows a steady decline in lethality over time: from World War II (30.8 percent KIA, 3.6 percent DOW) to the Korean War (23.7 percent KIA, 3.2 percent DOW) and from the Vietnam War (19.1 percent KIA, 3.2 percent DOW) to OIF/OEF (7.1 percent KIA, 2.5 percent DOW), with substantial variability at the beginning, middle, and end of the wars.[8] The unprecedented success in BI outcomes during OIF/OEF was driven by several factors. Casualty rates were relatively low with an incredibly infrequent high concentration of casualties in time and space. Medical evacuation (MEDEVAC) by medical personnel from the point of injury versus casualty evacuation (CASEVAC) by nonmedical personnel from the point of injury was the norm for maximizing initial and en route care. In addition, the military's ability to maintain air superiority resulted in rapid MEDEVAC within a combat zone from the point of injury to surgical intervention, typically bypassing roles of care, followed by rapid evacuation to Germany and the continental United States (CONUS) through the Air Force's aeromedical evacuation system. The presence of critical care air

Clinical Category	#	% of DNBI	Estimated evacuation rate / 1,000 per year[26]	Division / Combined Joint Task Force (PAR 25,000)[27]	Brigade Combat Team (PAR 5,000)	Battalion / Squadron (PAR 1,000)	Company / Battery / Troop (PAR 100)
Observed OIF & OND Evacuations, Jan 2003-Dec 2011[28]			# of projected evacuations by clinical category in future conflict, per year				
Battle Injury[29]	8,944	---	7.07	176.6	35.3	7.1	0.7
Musculoskeletal System	8,257	16.3	6.52	163.1	32.6	6.5	0.7
Non-battle injury / Poison	7,542	14.9	5.96	149.0	29.8	6.0	0.6
Behavioral Health	5,892	11.6	4.65	116.4	23.3	4.7	0.5
Ill-defined conditions	5,065	10.0	4.00	100.0	20.0	4.0	0.4
Nervous System	2,684	5.3	2.12	53.0	10.6	2.1	0.2
Digestive System	2;592	5.1	2.05	51.2	10.2	2.0	0.2
Genitourinary System	1,794	3.5	1.42	35.4	7.1	1.4	0.1
Circulatory System	1,512	3.0	1.19	29.9	6.0	1.2	0.1
Other Conditions	1,062	2.1	0.84	21.0	4.2	0.8	0.1
Neoplastic Conditions	1,006	2.0	0.79	19.9	4.0	0.8	0.1
Skin Conditions	980	1.9	0.77	19.4	3.9	0.8	0.1
Respiratory System	882	1.7	0.70	17.4	3.5	0.7	0.1
Infectious Diseases	753	1.5	0.59	14.9	3.0	0.6	0.1
Endocrine Systems	616	1.2	0.49	12.2	2.4	0.5	0.0
Breast Conditions	502	1.0	0.40	9.9	2.0	0.4	0.0
Pregnancy	268	0.5	0.21	5.3	1.1	0.2	0.0
Congenital Conditions	161	0.3	0.13	3.2	0.6	0.1	0.0
Hemotologic Conditions	122	0.2	0.10	2.4	0.5	0.1	0.0
Total	50,634	100.0	40.00	1,000.0	200.0	40.0	4.0

Legend

- >3.0 projected events
- 1.0 -- 3.0 projected events
- 0.5 -- 1.0 projected events
- <0.5 projected events

[26] Proportional evacuation estimate is based on expected all-cause evacuation rate of 0.04 events / 1,000 personnel. See Medical Surveillance Monthly Report, Vol 17, No 2, Feb 2010.
[27] PAR = Population at risk
[28] Medical Surveillance Monthly Reports, Vol 19, No 2, Feb 2012
[29] Battle injury evacuation rate is DIRECTLY related to level of combat intensity - the estimates reflected in this chart are drawn from OIF and OND. Future conflicts may/may not share the same level of combat intensity.

(Figure from Capability Development Integration Directorate, *Prolonged Care in Support of Conventional Military Forces: Capabilities Based Assessment* [U.S. Army Health Readiness Center of Excellence, 14 April 2017])

Figure. Summary of Battle Injury, Disease, and Nonbattle Injury Determination from Operation Iraqi Freedom and Operation New Dawn with Correlation to Personnel at Risk During LSCO

Fellow soldiers help a wounded Ukrainian defender at a first-aid station on 22 November 2022 in the city of Bakhmut in the Donetsk region. (Photo by Serhii Nuzhnenko, Radio Free Europe/Radio Liberty via war.ukraine.ua)

transport teams enabled the movement of the critically injured patients with exceptional clinical outcomes. These successes were bolstered by enhanced body armor and other insights gained through the Joint Trauma Analysis and Prevention of Injury in Combat.[9] The delivery of high-level medical care within seconds of injury including tourniquet use, lifesaving interventions like blood product support, and surgery within one hour of injury were all key medical interventions that positively impacted survival.[10] In addition, clinical practice underwent rigorous refinement through the Joint Trauma System by its Department of Defense Trauma Registry.[11] Despite a 44 percent decrease in BI mortality over OIF/OEF, the U.S. military healthcare system did not reach the goal of 0 percent preventable deaths from BI.

The war in Ukraine highlights key challenges MDO will impose on BI management in LSCO, which is further complicated by the ubiquitous presence of drones. Considering casualties at all roles of care in Ukraine, BI accounts for 35.7 percent of casualties, disease for 56.2 percent, and nonbattle injuries for 8.1 percent. Focusing on Role 1-2 care, DNBI accounts for 30 percent while BI makes up a full 70 percent.[12] Of note, these statistics reflect personnel losses who cannot return to duty on the day of their initial visit. Initially, military medical leaders in Ukraine implemented tactical combat casualty care standards that were initially established during OIF/OEF and adapted them to their operational environment.[13] Over time, however, the significant increase of casualties in local fighting exceeded 1,200 per day when coupled with the use of drones, extended evacuation times, insufficient blood product availability, and the targeting of medical assets that resulted in worse outcomes than observed in Iraq and Afghanistan.[14] A primary challenge to survivability is evacuation delays by CASEVAC and not MEDEVAC. Whereas evacuations in Iraq and Afghanistan typically occurred within one hour, evacuations times in Ukraine take an average of eight to twelve hours before reaching surgical intervention. This delay to definitive care

severely impacts survival rates. Limited blood product availability across the battlefield and prolonged tourniquet application (three to six hours) not only causes limb death necessitating an amputation but also results in elevated potassium levels and reperfusion injury from fluid shifts leading to shock.[15] A 2023 survey of the top three causes of death in Ukraine differs from OIF/OEF but parallels the etiologies observed in the Vietnam War: head injury, hemorrhage, and shock likely from infection, high potassium levels, and reperfusion syndrome.[16] Of note in the Vietnam War, if one survived the first twenty-four hours after injury, the top two causes of death were shock and pulmonary embolism.[17]

The war in Ukraine also highlights the importance of military medical intelligence. As an example, the movement of blood by the Russian military along with their medical infrastructure at the onset of the war was a major indicator of definitive combat operations versus an exercise, enabling the prediction of a window of time. As blood moved forward and there was an increase in blood collection drives, the likely window of onset of combat operations could be pinpointed based on the storage duration of packed red blood cells (forty-two days).[18]

Global health engagements are one strategy to close the knowledge gap, but it still requires analyzing and distributing that knowledge to be predictive and prescriptive. Army medicine has determined three major challenges to casualty care essential for supporting operational priorities: clearing the battlefield to enable commander's freedom of movement, maximizing return-to-duty rates, and overcoming congested logistics. One critical shift during LSCO will be the reliance on CASEVAC, the use of nonstandard casualty movement without dedicated medical personnel, versus traditional MEDEVAC for the movement of most casualties.[19] This will delay enhanced medical care at the point of injury and during en route care. The "golden hour" standard for reaching specialized care will be replaced by a triage-focused approach.[20] Additionally, the inability to rapidly move casualties to CONUS, in combination with the inability to rapidly move in theater, will require prolonged care at echelon. Although planners often approach problem sets as a math and physics problem, casualty management is dictated by the realities of anatomy and physiology.

The role of the frontline medic and nonmedical provider is paramount to the survival of a casualty in the initial moments following a battlefield injury. The nonmedical provider plays a crucial role in self and buddy aid, a practice with significant success during OIF/OEF. In Ukraine, tactical combat casualty care methods are employed; however, due to delayed evacuation, medics must now assess and manage interventions applied during care under fire and tactical field care to enhance survivability. This shift requires medics to have a deeper understanding of anatomy and physiology to deliver prolonged casualty care, including the administration of blood products and the execution of tourniquet takedown procedures. The challenges of contested logistics and prolonged evacuation times further highlights the need for frontline medics to make lifesaving decisions based on the operational environment.

Unique problems identified during the war in Ukraine also include the management of civilian trauma and patients with chronic medical conditions in an overlapping military and civilian healthcare system. Ukraine has moved civilian patients to other European countries to maximize service member care in Ukraine.[21] Agreements for care across Europe were required because of the volume of civilian and military casualties, especially those military casualties who were not going to return to combat quickly. This will be an issue not only for U.S. casualties overseas but will also be an issue with U.S. civilian facilities given the limited inpatient, ICU, and rehabilitative care available in U.S. military treatment facilities. Of note, most civilian hospitals including the VA function at 95 percent plus capacity without surplus rooms or staff. Very little data about detainee care is available from Ukraine, which underscores the requirements and challenges the United States will have with prisoner-of-war care. Coalition nations must plan clear medical rules of engagement to synchronize service member, civilian, and prisoner-of-war healthcare resourcing during conflict.

Another challenge the United States and allies will face became increasingly evident as Ukraine received medical supplies worldwide in support of their forces and civilian population. Currently, U.S. service members are unable to use non-Food and Drug Administration (FDA)-approved medication and non-FDA-cleared devices without legislative change. The validation of safe medication and devices will result in challenges using host-nation medical supplies, which becomes even more problematic considering the

Table 2. Predicted Mortality in a Hypothetical Population of 1,000 Untreated Combat Casualties

Location	0–1 Hour	1–6 Hours	6–24 Hours	1–7 Days
Head	70	11	15	27
Face	6	2	1	24
Neck	9	2	1	3
Thorax	48	11	8	33
Abdomen	28	17	16	31
Upper extremity	4	4	3	29
Lower extremity	15	12	10	67
Multiple	15	7	3	5
Total	195	66	57	219
Cumulative total		261	318	537

(Table adapted from Ronald F. Bellamy, "The Causes of Death in Conventional Land Warfare: Implications for Combat Casualty Care Research," *Military Medicine* 149, no. 2 [February 1984]: 55–62, https://doi.org/10.1093/milmed/149.2.55)

European Union's centralized approval of medications and devices when compared to the lack of a similar approval system across other regions of the world. Also, currently much Class VIII is sourced from potential adversaries, with a limited supply chain and widespread use of just-in-time inventory management.[22]

A unique challenge arising is the use of whole blood/walking blood bank products, which was initially illegal in Ukraine at the onset of the war, most likely due to their high hepatitis and HIV rates.[23] This required a policy change to enable the use of this lifesaving measure. Similar challenges exist across Europe and other global regions.

The necessity for terms of reference for key medical capabilities also became apparent as a combat medic in the U.S. Army has certain knowledge, skills, and behaviors, while a "medic" in Poland is equivalent to a U.S. Army physician assistant, and an emergency medicine-trained physician in France accompanies ambulances during emergency care. The role of medical mobility further complicates healthcare delivery in MDO as surgery, postsurgical care, and ICU-level care is not conducive to rapid movement. This becomes even more problematic if there is purposeful targeting of medical assets, necessitating enhanced protection, distributed formations, and novel positioning of medical assets including civilian buildings of opportunity and underground locations. While noncombatant evacuation operations of non-Ukraine civilian personnel did not overwhelm surrounding countries, there was a significant demand for medical training of Ukrainian personnel outside of the country to train the trainers within.

Historical data underscores the critical relationship between mortality and the time elapsed from injury to definitive treatment. During World War I, mortality rates increased from approximately 10 percent within the first three hours postinjury to approximately 35 percent in the next three hours, and then reaching 75 percent after eight hours.[24] This was validated during the Vietnam War with greater context to causes of death by the injury site and increased granularity of time with the highest predicted mortality of 0–1 hour for head, 1–6 hours for abdomen, 6–24 hours for abdomen, and 1–7 days for extremity (see table 2).[25] Death at 0–1 hours was due to hemorrhage followed by central nervous system trauma and finally shock.

As casualties survive the first few critical hours after injury, survival rates increasingly depend on access to advanced, intensive care-level support. In Ukraine, the presence of hyperkalemia (an elevated potassium level) and reperfusion syndrome (tissue damage caused by returning the flow of blood to previously blood-deprived parts of a body) harkens back to the challenges faced in World War II. In that war, acute kidney injury (AKI) affected 18 percent of the severely injured patients, a stark contrast to the Korean War, where the AKI

incidence dropped to 0.5 percent with the introduction of battlefield dialysis.[26] By the Vietnam War, only 0.17 percent of all casualties developed AKI. Dialysis was a standard capability in field hospitals until around 2014, when it was eliminated from the modified table of organization and equipment. The institutional training of Army dialysis technicians ceased around 2022 due to a reduced demand caused by rapid patient movement to initial surgical care with advanced ICU care followed by rapid movement to the CONUS.

Another major concern in Ukraine is the report that nearly 100 percent of casualties develop an infection with multidrug resistant (MDR) bacteria in which there are no available antimicrobials to treat the infections.[27] As noted during OIF/OEF, the presence of MDR bacteria complicates treatment, especially after the first five days of injury, leading to extended hospitalizations, more ICU days, increased surgical interventions, and poorer outcomes.[28] This portends a bigger concern than typically discussed, as U.S. casualties will likely be returning to CONUS civilian facilities to absorb the expected number of patients due to lack of sufficient bed capacity in military treatment facilities (MTF). This was not an issue during OIF/OEF but will become an additional threat to the homeland healthcare system as returning service members could expose civilian hospitals and patients to MDR bacterial infections from the battlefield.

Once casualties survive their initial BI, as shown in Ukraine, the role of rehabilitation can become increasingly complicated because of the numbers of amputations and lack of inpatient and rehabilitative care facilities within the country. The U.S. military could experience similar challenges of limited assets within theater and the challenges of evacuating patients to CONUS. To maximize return to duty, enhanced forward-care capabilities are essential—an approach not fully developed during OIF/OEF. The 60-to-120-day evacuation window to CONUS in the Europe and Pacific theater of operations during World War II show a potential way to maximize return to duty. Patients spent an average length of 80, 70, and 65 days after BI during World War II, the Korean War, and the Vietnam War, respectively.[29] Of the 194,716 wounded in Vietnam, 61,269 (31 percent) were treated and returned to duty.[30] Of those admitted to MTFs, the distribution for return to duty was 42.1 percent

in Republic of Vietnam, 7.6 percent in the U.S. Indo-Pacific Command, and 33.4 percent in the CONUS.[31] To replicate this approach to casualty care in a future LSCO environment would require maximizing rehabilitation in theater. Establishing Role 4 rehabilitation facilities equipped with physical therapists, occupational therapists, physical medicine and rehabilitation physicians, rheumatologists, and specialized technicians will be essential to enable in-theater recovery and return to duty.

The impact on risk to mission can be seen by comparing orthopedic injury data from Operations Desert Storm/Shield (ODS/S) and OIF/OEF. During ODS/S, the military healthcare system deployed limited rehabilitative resources. In a retrospective review of orthopedic injuries from ODS/S, authors Michael Travis and Michael Cosio noted that 45 percent of injuries evacuated from theater were orthopedic in nature and 45 percent of those with orthopedic injuries were able to return to duty without further treatment.[32] In LSCO, the MEDEVAC of soldiers who can be returned to duty represent a substantial risk to the mission. During OIF/OEF, Military Health System (MHS) leaders deployed additional rehabilitative experts such as physical therapists. In a retrospective review, Travis and Cosio found that physical therapy accounted for 45 percent of the workload in a combat support hospital's outpatient mission and that 96.1 percent of soldiers were returned to duty with either no restrictions or a temporary limited restriction easily accommodated by commanders in a deployed environment.[33] Additionally, an orthopedic surgeon who reviewed the cases estimated that 17.7 percent of these soldiers would have been evacuated to Germany or CONUS had the physical therapist capability not been available.[34]

Once patients are evacuated CONUS in LSCO, their care will likely be more reflective of events in World War II, the Korean War, and the Vietnam War. Then, service members received treatment across the civilian healthcare system and VA facilities. An adequate comprehensive organizational structure like warrior transition units or soldier recovery units—used over the past fifteen years during OIF/OEF—will be challenging to support the number of casualties returning CONUS during LSCO. A shift in the approach that leverages civilian capabilities will likely be required. Current efforts by U.S. Northern Command

seek to address these challenges through the National Disaster Medical System-Integrated CONUS Medical Operations Plan, but much work remains to ensure preparedness for future demands.[35] One consideration could be to include centers for military and civilian experts to layer in MTFs, VA facilities, and civilian large level 3 trauma and rehabilitation centers with graduate medical education and strong research centers to maximize the synergistic rehabilitative systems. Such examples include the University of Texas Health Sciences San Antonio/Fort Sam Houston, Texas; Colorado University/Fort Carson, Colorado; University of North Carolina/Fort Bragg, North Carolina; and Vanderbilt University/Fort Campbell, Kentucky.

Overall, models need to be refined for prolonged care in theater, along with unique requirements of rehabilitation in theater. The global demand on strategic platforms and inadequate staffing available for patient air movement will require policy updates to incorporate rehabilitation in theater to support optimization of return to duty as far forward as possible. Further investigation into sea evacuation and other multimodal evacuation approaches offers opportunities to drive the experimentation required to develop relevant doctrine, organizational structure, training, materiel solutions, leader development, personnel with unique expertise, facilities, and policies (DOTMLPF-P) (see table 3).

Disease

Disease complications like diarrhea and respiratory tract infections from infectious diseases (including tropical diseases), skin disorders, and behavioral health issues have historically been significant burdens across wars. However, the prevalence of diseases has decreased over time from 91 percent in World War II to 69 percent in the Vietnam War (see tables 4 and 5).[36] This decline likely reflects improved FHP infection prevention measures and shifting endemic tropical disease regions worldwide through eradication and vector control programs. During more recent conflicts, disease rates have continued to drop. The disease rate of 0.307/1,000 U.S. Army soldiers in ODS/S decreased to 0.166/1,000 for OIF and 0.227/1,000 for OEF.[37] The top five conditions resulting in hospital admission in OIF/OEF were respiratory symptoms, kidney stones, cellulitis/abscess, appendicitis, and generalized symptoms (alteration of consciousness).[38]

DNBI was responsible for approximately 50 percent of MEDEVACs, with leading causes being behavioral health conditions (~10 percent), ill-defined conditions (~9 percent), digestive (~6 percent), genitourinary (5 percent), and nervous system (~3.5 percent).[39] The lack of substantial infectious diseases including tropical disease in Iraq and Afghanistan is reflective of the low tropical disease threats within these regions. In contrast, rates of infectious diseases are expected to be significant in a conflict in Southeast Asia, Asia, Africa, or South/Central America. However, implementing and acting on disease surveillance during wartime remains difficult. Of note, disease data from Ukraine is limited, especially regarding behavioral health issues.

It is a challenge to provide detailed information from Ukraine on the impact of DNBI as Ukraine only reports a limited number of diseases that help provide insight into key infections.[40] However they do track key infections that would impact blood safety and walking blood like HIV, which is noted to have the second highest rate of HIV in Europe, only behind Russia.[41] There needs to be an establishment of a joint casualty system for BI and DNBI that must include a strong medical intelligence arm that can fully inform the threat and impact of infectious diseases. For example, an overall lack of emphasis on DNBI across the enterprise likely reflects the low rate of disease during OIF/OEF. Furthermore, a lack of understanding of the impact on the performance and lost duty days associated with a specific disease means that modeling the impact on personnel and missions to fully address DOTMLPF-P implications remain challenging.

Infectious disease. Historically, particularly up to World War I, death on the battlefield was predominantly caused by diseases such as smallpox, cholera, malaria, and typhus.[42] The ushering in of critical advancements during and after the war—including in sanitation, nutrition, germ theory, antimicrobial agents, vector control, prophylaxis, tracking, treatment, and personal protective measures like insect repellent and nets—resulted in a transition of dying from disease to dying from combat-related wounds. The death ratios from infection to trauma was 1.1:1 during World War II; and the ratio was 0.2:1 in the Korean War, Vietnam War, and OIF/OEF.[43]

Although DNBI has a limited impact on death on the battlefield today, its impact on lost duty days

Table 3. Proposed DOTMLPF-P Recommendations to Address LSCO Impact on Battle Injury, Disease, and Nonbattle Injury

Doctrine	Organization	Training	Materiel
Updates to Army key doctrine and programs of instructions —Army health services —Tactical combat casualty care (TCCC) + triage —Hospitalization —CASEVAC Update to biothreat and medical intelligence proponency Global health engagement and security cooperation updates addressing medical intelligence and agreements for in theater management especially for prolonged care, evacuation, rehabilitative care, and civilian care	Convalescent hospital for rehabilitation with Holistic Health and Fitness (H2F) Forward deployed H2F Intelligence analytics and informatics with AI for predictive and prescriptive outcomes Theater-level medical intelligence section for predictive and prescriptive outputs Joint Trauma System expands to joint casualty system to incorporate disease and nonbattle injury (DNBI) and modernizes to link with electronic deployable medical record with data analytics for predictive and prescriptive outputs Rapidly deployable special medical augmentation response teams (SMART)—vascular, infection prevention/control/tropical medicine, renal disease, medical informatics, research, CBRN, and virtual care Updated force health protection in LSCO environments Multimodal evacuation formations—ground, air, maritime, train, and river	Updated initial and sustainment training —Triage —CASEVAC —TCCC —Combat life saver —LSCO + multidomain operations Virtual, augmented and mixed reality (AR/VR/MR) training Medical Simulation Training Center–Next Generation (MSTC–NG) for point of injury, Role 1 and 2 care Models for battle injuries (BI) and DNBI incorporated into exercises that address evacuated personnel, mortuary affairs, and sustainment operations that also include lost duty days and impact on human performance Behavioral health training including moral injury Mobile training teams for U.S. military personnel and coalition partners across BI and DNBI	Novel therapy and infection prevention and control for multidrug-resistant bacteria AI process to be predictive and prescriptive of DNBI Methods to be predictive and prescriptive with moral injury, PTSD, and stress reaction Wearable technology with decision support tool for BI and DBNI Medical common operational picture that is predictive and prescriptive for commanders to enable risk-based disease assessment and impact on human performance Prophylaxis and prevention for DNBI Novel platforms that allow for surgery, postsurgical care, ward care, and ICUs to be mobile and protected

Leadership/Education	Personnel	Facilities	Policy
Mitigation strategies for DNBI especially commander emphasis and adherence on force health protection and behavioral health support iCOVER exposure CASEVAC and triage exposure CBRN impact exposure Moral injury exposure Cold weather exposure Updated AI and data analytics capabilities with established applicable data systems	Military medical intelligence experts Data analytics and informatics experts for DNBI H2F experts in operational rehabilitation and prevention Changing civilian graduate medical education will change personnel knowledge and skills impacting future capabilities necessitating a reassessment of doctrine, organization, and training (i.e., more specialized experts without generalized knowledge and skills)	Novel infection prevention and control infrastructure for multidrug resistant bacteria U.S. centers of collaboration-civilian, military, VA centers of operational, clinical, teaching, and research excellence MSTC–NG AR/VR/MR environments U.S. medical industrial base development and expansion	60–120-day evacuation policy National Disaster Medical System–Integrated CONUS Medical Operations Plan for United States receiving of casualties Modernized Soldier Readiness Program for movement from fort to port with congested logistic challenges reliant on civilian industrial base to include clear tracking system and redundancy Approval of non-FDA approved medication or cleared devices for use on U.S. military personnel Agreements with host nations for care of U.S. military casualties Noncombatant evacuation operations agreements Standardized terms of references across coalition and partners Updated doctrine and program of infrastructure processes for rapid development and implementation

(Table by authors)

Table 4. Selected Causes of Admission to Hospital and Quarters Among Active-Duty U.S. Army Personnel in Vietnam

Cause	1965	1966	1967	1968	1969	1970
Wounded in action	61.6	74.8	84.1	120.4	87.6	52.9
Injury (except wounded in action)	67.2	75.7	69.1	70.0	63.9	59.9
Malaria	48.5	39.0	30.7	24.7	20.8	22.1
Acute respiratory infections	47.1	32.5	33.4	34.0	31.0	38.8
Skin diseases (includes dermatophytosis)	33.1	28.4	28.3	23.2	18.9	32.9
Neuropsychiatric conditions	11.7	12.3	10.5	13.3	15.8	25.1
Viral hepatitis	5.7	4.0	7.0	8.6	6.4	7.2
Venereal disease (includes CRO)	277.4	281.5	240.5	195.8	199.5	222.9
Venereal disease (excludes CRO)	3.6	3.8	2.6	2.2	1.0	1.4
Fever of undetermined origin	42.8	57.2	56.2	56.7	57.7	72.3

CRO: Carded for record only
Rate expressed as number of admissions per annum per 1,000 average strength.

(Table from Spurgeon Neel, *Medical Support of the U.S. Army in Vietnam, 1965–1970*)

Table 5. Hospital Admissions for All Causes, U.S. Army During World War II, the Korean War, and the Vietnam War

War	Year	All Causes	Nonbattle Injury	Battle Injury and Wounds	Disease	Disease as Percent of All Causes
World War II						
China–Burma–India	1942–1945	1,037	85	8	944	91
Southwest Pacific	1942–1945	1,067	147	30	890	83
Korean War	1950–1952	1,005	165	229	611	67
Vietnam War	1965–1969	505	69	85.6	351	69.2

Average rate expressed as number of admissions per annum per 1,000 average strength.

(Table from Spurgeon Neel, *Medical Support of the U.S. Army in Vietnam, 1965–1970*)

remains significant. During the Vietnam War, up to 80 percent of lost duty days were attributed to infectious diseases (see table 1), and they also contributed to high rates of hospital admissions (see tables 4 and 5). However, some of the infectious diseases in the Vietnam War are less relevant today.

As an example, viral hepatitis is less of an issue due to availability of a vaccine with a 90 plus percent protection against hepatitis B. Although no hepatitis C vaccine exists, there is effective curative therapy available. Of note, both infections are spread through blood transfusions, which highlights the potential impact of the walking blood bank (and the sources of blood for the walking blood bank) on battlefields of the future. HIV did not exist in the Vietnam War, but Russia and China are experiencing increasing rates, which also impact walking blood banks. Also of note, the Philippines saw a 411 percent increase in daily incidence from 2012 to 2023. Drug-resistant tuberculosis rates are increasing in Russia, North Korea, the Philippines, and other countries across Asia.[44] Although improved malaria control with prophylaxis agents and personal protective measure will likely improve those numbers in future wars, personal protective measure adherence rates have historically been challenging despite command emphasis. Other vector-borne diseases like dengue, which is increasing

Soldiers carry a wounded comrade through a swampy area in Vietnam circa 1969. (Photo courtesy of the National Archives)

in Southeast Asia, can cause large outbreaks; others can be associated with prolonged syndromes that limit activity.[45] For example, Chikungunya—spread by the Aedes mosquito and present across South and Central America, Africa, southern Europe, and Asia—has an attack rate of approximately 30–50 percent with symptoms including fever that lasts seven to ten days and a 4–78 percent attack rate of arthritis of major joints that can impact performance and persist for three months or longer.[46] Although an FDA-approved vaccine is available, it is not currently part of deployment vaccine regimens. The potential for large outbreaks of infectious diseases persists. The 1918–1919 influenza pandemic, with fifty million worldwide deaths, was strongly linked with U.S. military training facilities and the worldwide transmission was augmented by military movements.

The challenges with diarrhea and respiratory tract infections substantially impacted lost duty days during OEF/OIF.[47] In a survey of 4,348 personnel deployed in OIF, 76 percent reported at least one diarrhea episode during their deployment and more than 50 percent reported multiple episodes. Diarrhea decreased job performance in 45 percent of personnel for a median of three days; 62 percent sought medical care at least once.[48] Disease burden included 31 percent who required intravenous rehydration. Of those cases, 17 percent were confined to a bed for a median of two days and the lost duty days was an estimated 3.7 days per 100 person-months.[49] Of particular concern is that nearly 10 percent of affected individual reported persistent diarrhea greater than fourteen days and 3 percent more than thirty days.[50] Norovirus, which causes severe vomiting and diarrhea, nearly closed a hospital in Basra, Iraq, at the beginning of the war and did close the airfields in Camp Arifjan, Kuwait.[51] On the one hand, tropical diseases in Iraq and Afghanistan had minimal impact in contrast to World War II where malaria was a major concern. On the other hand, leishmaniasis impacted both Afghanistan and Iraq for approximately two to three years, highlighting the impact diagnostic, treatment, personal protective measures, and environmental changes in living structure and field sanitation can have when fully implemented.[52]

An increased understanding of the impact of specific infectious diseases on service member performance is needed. As wars progress, the collapse or deterioration of local, regional, and national systems designed to mitigate disease through sanitation, vector control,

and personal interactions often lead to resurgence of endemic diseases or the introduction of new ones brought in by foreign military forces. To address this effectively, critical information about disease prevalence and impact must be incorporated into medical requirements models to better assess their effect on operational outcomes and commanders' decisions. In addition, there will be a need to adapt FHP policies, processes, and formation to meet the challenges of LSCO such as constant observation, drones, and long-range fires. Additionally, the Army must transition to predictive and prescriptive AI to enable operations. We can potentially add a simple concept that data should not be simply a way of telling a story and a presentation of facts for which a leader can draw their own conclusions for future efforts. Leveraging data for both predictive and prescriptive outcomes present leaders opportunities to direct action based on forward-looking analysis. An increased effort is needed to prevent, diagnose, and treat key pathogens as near to the point of need as possible to minimize lost duty days, enhance performance, and maximize return to duty.

Behavioral health. Behavioral health (BH) has significantly impacted warfighters throughout history, especially with posttraumatic stress disorders (PTSD) and acute stress responses. During the Vietnam War, BH-related lost duty days increased dramatically from 70,100 lost duty days in 1967 to 175,510 in 1970 (see table 1).[53] This equated to a rate increase from 11.7 per 1,000 soldiers in 1965 to 25.1 in 1970.[54] During OIF/OEF, BH diagnoses were the most common cause of evacuation for care, though rates varied over time; 334 deaths were attributed to self-inflicted causes.[55] Similarly, there were more deaths from self-inflicted causes (33) than KIA and DOW together (23) in Operation Inherent Resolve.[56] In the ongoing war in Ukraine, BH conditions have been associated with combat ineffectiveness in up to 50–60 percent of some regular Ukrainian armed forces units.[57] As a result, Ukraine has requested assistance from Walter Reed Army Institute of Research and Uniformed Services University to provide short-course training for their military personnel to mitigate the harmful psychological impacts of modern war. Reports of rotating time on the front and the rear at 1:3-week ratios are reminiscent of the trench warfare during World War I.[58] A major concern with LSCO, especially with the role of triage and prolonged care, is the impact

of moral injury on medical professions and first responders triaging large numbers of patients to expectant outcomes.[59] This challenge has not been well characterized in previous wars. The ubiquitous presence of drones on the modern battlefield creates a unique trigger for stress and trauma, unlike experience in previous conflicts. This requires further characterization and development of mitigation strategies.

An assessment of 7,023 psychiatric aeromedical evacuations from Iraq and Afghanistan revealed risk factors for evacuation from the battlefield included younger, female, white, divorced or widowed, and less-educated personnel, along with junior enlisted service members serving in combat arms military occupational specialties.[60] The primary BH diagnoses among evacuees include depressive disorders (25 percent), adjustment disorders (18 percent), PTSD (9 percent), bipolar disorders (6 percent), anxiety disorders (6 percent), and suicidal ideation and associated behaviors (3 percent).[61] Notably, peak psychiatric evacuations coincided with significant combat operational events, highlighting a clear connection between operational intensity and BH outcomes. Given the potential magnitude of these BH symptoms in a LSCO environment, having enough highly trained behavioral health specialists to effectively detect, manage, and treat these conditions will be a significant challenge. Just as triage and tourniquet utilization significantly improved survival on the battlefield, broad dissemination of psychological first aid and techniques to mitigate acute stress reaction will be critical to conserve fighting strength.

A holistic approach to battlefield BH will be essential for addressing the challenges associated with LSCO. The development of methods to expand the ability to detect and manage BH issues, especially given the magnitude of the potentially impacted personnel and the shortage of BH specialists across the battlefield, should be prioritized in resourcing decisions. All personnel must be trained to recognize and address immediate BH concerns, which impact readiness and ultimately survival on the battlefield. A short course for combat medics to enhance their ability to screen and address BH issues (BH-GEAR) has been developed, including buddy aid and psychological first aid.[62] These approaches need to be standardized and integrated across the force during initial entry training and refreshed regularly throughout a service member's career. iCOVER,

a validated method from Israeli and U.S. militaries for mitigating the impact of acute stress reaction, provides a structures six-step approach to identify a team member who is having an acute stress reaction, connect to bring them to the present moment (eye contact, touch, hearing), offer commitment to reduce sense of isolation, verify facts with simple questions to get the thinking brain back in gear, establish order of events to reorient the individual, and request action to reengage in purposeful action.[63]

Overall, the ability to be predict and effectively address BH challenges at both the individual and collective/unit level will remain a significant battlefield challenge, especially when aiming to optimize service members' full potential and performance. In competition with peer and near-peer competitors with technologic parity on the battlefield, mental agility and cognitive flexibility become more critical to maintain an operational advantage. Increased efforts to monitor stress and fatigue, potentially through wearable technology, must be developed to alter commanders and medical professionals when service members are losing mental acuity, cognitive flexibility, emotional regulation, resilience, and grit; signaling the risk to the service member (e.g., acute stress reaction) or to the unit through impaired performance or decision-making. Predictive insights into risks for sleep deprivation, PTSD, acute stress response, and suicidal ideation can empower commanders and healthcare professionals with actionable data. Once identified, these insights must be integrated into doctrine, training, leader development, and policies to systematically support service members and maximize their performance under the stress of a LSCO environment.

Nonbattle Injury

Nonbattle injuries (NBI) markedly impacted lost duty days during the Vietnam War with up to 415,140 loss days in 1968 and elevated hospital rates across World War II, the Korean War and the Vietnam War (see tables 1, 4, and 5).[64] During OIF/OEF, NBI was the leading cause of evacuation at approximately 32 percent.[65] The leading NBI causes were sports and physical training (~23 percent), falls and near falls (~24 percent), motor vehicle (~10 percent), crushing and blunt trauma (~10 percent), and lifting/pushing/pulling (~6 percent).[66] In a study of a Stryker brigade combat team involving 593 volunteers, 45 percent sustained an injury, resulting in 5,049 days of limited duty, an average of 8.5 days per injury.[67] The most common injury sites were lower back (17.4 percent), knee (12.7 percent), and shoulder (10.0 percent) with 65 percent occurring while working.[68] The most common causes were lifting and carrying (9.8 percent), dismounted patrolling (9.6 percent), and physical training (8.0 percent).[69] Risk factors for NBI include older age, higher enlisted rank, female sex, months deployed, time spent standing, longer strength training sessions, heavy ruck load, and heavier or more frequent lifting tasks. Admission rates for NBI per 1,000 soldiers during ODS/S were 0.110, dropping to 0.071 in OIF, and rising again to 0.122 in OEF.[70] The most common NBI admissions were concussion (5.7 percent), facial bone fracture (4.4 percent), ankle fracture (3.9 percent), other injury (3.9 percent), and fracture of the tibia and fibula (3.8 percent).[71] Because limited NBI injury data has been collected from the war in Ukraine, its impact remains underrepresented in current casualty models, thereby limiting the ability to adequately inform commanders regarding expected return-to-duty rates in LSCO.

The capability to rehabilitate in theater for NBI would be similar to requirements for BI casualties. The presence of far-forward providers including a physical therapist and other members of the Army's Holistic Health and Fitness (H2F) team could facilitate rapid rehabilitation and help sustain performance while also implementing preventive strategies to reduce the causes of NBI. This is particularly important given the common causes of NBI during OIF/OEF would likely not change in LSCO. Having these resources embedded in the unit's footprint would allow soldier easier access to providers who can help keep them focused on the mission. Additionally, a Role 4 facility for BI would also enable surgical correction and rehabilitation of some NBI to further maximize return to duty. Overall, maximizing return to duty improves soldier and unit lethality and combat power.

A better understanding of the NBI impact on the battlefield will allow for the development of models to better equip commanders to make an operational decision based on service members' performance and potential. In addition, preventive strategies that can be implemented far forward to enhance service member lethality.

Soldiers from Company C, 4th Battalion, 9th Infantry Regiment, 4th Stryker Brigade Combat Team, 2nd Infantry Division, transport a trauma victim to a medical helicopter on 30 September 2007 in Tarmiyah, Iraq. Al-Qaida members triggered an explosion earlier in the day that wounded many Iraqi civilians. U.S. Army medics assisted local hospital personnel in administering aid to the victims before calling in a MEDEVAC. (Photo by Petty Officer 2nd Class Summer Anderson, Defense Imagery Management Operations Center)

Summary

LSCO will markedly change casualty care, placing a priority on clearing the battlefield to enable commander's freedom of movement. Maximizing return-to-duty rates will maximize lethality. To do so, the MHS must increase the emphasis on prevention, diagnosis, treatment, and rehabilitation of DNBI and BI casualty care, aligning more closely with prior conflicts like World War II, the Korean War, and the Vietnam War. Insights from Ukraine can offer a glimpse into to this future operational environment, highlighting the need for advancements in BI care, especially with CASEVAC, triage, and prolonged care.

Addressing these challenges will require new doctrine, organizational structure, training, and policies. Key BI considerations include reevaluating the role of dialysis on the battlefield, the management of MDR bacterial wound infections that will threaten the homeland, and the postsurgical rehabilitation in theater. In addition to BI, models must be refined to further assess the impact of DNBI on lost duty days and operational performance. Emphasis on infectious diseases must prioritize pathogens prevalent in the future operational environment, particularly in regions with a high tropical disease threat risk like the U.S. Indo-Pacific Command. A lack of medical intelligence throughout the Department of Defense remains a critical knowledge gap to include disease prevalence, attack rates, and lost duty days along with impact on human performance.

Behavioral health prevention and treatment options, including fatigue management and resiliency building, are especially vital as challenges faced in garrison will be exacerbated in combat. H2F activities addressing NBIs could be adapted to the operational environment with rehabilitation facilities in theater, reducing evacuation of those who could potentially return to the battlefield.

The Defense Health Agency's role as a combat support agency presents an ideal opportunity to centralize key aspects to conserve fighting strength

across the joint force. Cultural and operational service differences across the all-domain LSCO of the future remain key.

These challenges and the developed solutions must be integrated into battle labs, combat training centers, experiments, and exercises. Consideration should be given to dedicated training exercises or extension of current exercises to focus on medical and sustainment functions, including mortuary affairs, protection, and personnel for reconstitution modeling. These models must enable predictive and prescriptive data analytics and enable an improved medical common operating picture of the battlefield utilizing AI. Across DOTMLPF-P, key updates to warfighting formations are required to enable rehabilitation in theater, material solutions for far-forward diagnostics, and prevention

and treatment platforms. Evacuation policies should be amended to maximize appropriate care in theater to maximize return to duty; doctrine needs to align with the LSCO operations of the future; and training point of injury must account for prolonged care, triage on the MDO-LSCO battlefield, and the role of CASEVAC in contested environments.

The combat medic and the entire MHS are vital to a soldier's will to fight harder, further, and longer. The soldier on the battlefield and the American people know that medical personnel will run to the sound of need surrounded by the sound of gunfire. This trust is foundational to soldier performance on the battlefield. Military medicine will optimize their chance for survival and maximum potential for functional recovery. We MUST be our best on the soldier's WORST day. ∎

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When the Golden Hour Goes Away

Prolonged Casualty Care in LSCO—Considerations for Commanders and Decision-Makers

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Evacuating the large number of casualties expected to occur across the depth and breadth of the battlefield in the [future operational environment] will heavily challenge [Army Health System] evacuation assets [and logistical support] … Medical and non-medical leaders will face challenging triage decisions with unknown timelines [for] resolution … [we must] envision the use of prolonged care to sustain life until evacuation is possible.

—Army Futures Command Pamphlet 71-20-12,
Army Futures Command Concept for Medical 2028

Evacuating casualties to operating rooms within the Golden Hour of injury will be a foregone luxury in large-scale combat operations (LSCO) and other austere operational environments (OE). The OE will be both too contested and too congested; it will not be unreasonable to expect the killed-in-action rate to be near 30 percent in some conflicts.[1] Prolonged casualty care (PCC) will become the collective effort by close combat forces at the brigade-and-below levels to hold back death a little longer for their severely wounded casualties. And, while the Golden Hour may be going away, clinically it is here to stay, as casualties with potentially lethal injuries require timely life saving interventions such as blood transfusion and hemorrhage control. Lifesaving interventions delivered too late are no longer lifesaving.

The current expectation for combat medics is to stabilize casualties for up to seventy-two hours on the battlefield. This is a lofty standard that combat medics and corpsmen are not trained, equipped, or experienced to support. This article presents attainable time standards for *how long commanders should strive to*

Spc. Trevor Milbury, a crew chief with the Medevac Platoon Dustoff, Charlie Company, 3rd Battalion, 238th Aviation Regiment, Task Force Dragon, pulls a litter on a hoist back into a UH-60 Black Hawk helicopter during a training exercise near Forward Operating Base Fenty, Nangarhar Province, Afghanistan, on 16 September 2013. MEDEVAC teams provided emergency care to U.S. and coalition forces, and transport patients by air to medical treatment facilities. Using a hoist allows MEDEVAC crews to raise and lower supplies and personnel into remote or treacherous areas where landing the aircraft is impossible. (Photo by Sgt. Margaret Taylor, U.S. Army National Guard)

prolong care at each tactical echelon on the battlefield. Codified time standards will help structure training, equipping, and organizing unit medical teams from the company to the brigade level.[2]

The Joint Trauma System describes PCC as "the need to provide patient care for extended periods of time when evacuation or mission requirements surpass available capabilities and/or capacity to provide that care."[3] Close combat forces will perform PCC to buy time—just a couple of hours—while operational commanders align the conditions to evacuate casualties to higher levels of care.[4]

Military medicine leaders have analyzed and debated the issue for several years and have championed initiatives to help address systemic shortfalls across military medical practices. But *the conversation of prolonged casualty care really belongs in the operational community,* among commanders, civilian leaders, and policymakers. Preparing for restricted casualty care in LSCO requires more than altering medical training at the unit level. Preparing for this inevitable problem requires military transformation at multiple levels within the Department of Defense. PCC is a medical concept that becomes an operational commander's responsibility in a major conflict.

The Evolution of Casualty Care

The medical practices that evolved around the evacuation paradigm of the Golden Hour expectation over the last twenty years will not be feasible in LSCO.[5] Implementing tactical combat casualty care (TCCC) saves lives on the battlefield and will be

(Image from Canadian War Museum, https://www.warmuseum.ca/firstworldwar/objects-and-photos/archival-documents/documents-created-by-organizations/the-tourniquet/)

Figure 1. "The Tourniquet" Poster from the American Red Cross, 1918

necessary on any future battlefield. While the Golden Hour policy significantly decreased mortality on the battlefield, it unintentionally eroded the U.S. military's prehospital battlefield care by rapidly moving casualties to Role 2 surgical teams where both hemorrhage control and blood transfusion could occur. Nonsurgical facilities were prudently bypassed in recent conflicts in Iraq and Afghanistan since commanders could reliably evacuate patients directly to surgical teams who were readily available throughout the combat zones. The policy also resulted in propagation of multiple nondoctrinal surgical teams without standardized manning, training, or equipping.[6]

Medical evacuations in contested environments will become combined arms maneuver operations, relying on both lethal and nonlethal effects to create windows where air or ground assets can backhaul casualties to higher levels of care. In the indeterminate time it takes to carve out these windows, combat forces will likely rely on buddy aid and medics (or corpsmen) performing TCCC and prolonged care devoid of organized medical units and advanced medical/surgical capabilities.

PCC is the continuation of TCCC; it requires additional training in resuscitation, triage, pain control, airway management, and wound care. Prolonged care was rare for prehospital and frontline providers in U.S. Central Command (USCENTCOM) and is a new component of the battlefield trauma care continuum when compared to combat operations with rapid evacuation.

The future OE will necessitate a revitalization of our medical evacuation systems. Tactical units will fight isolated from one another and intermittently out of reach from field hospitals. Artillery and rocket strikes will occur in volumes and frequencies that the U.S. military rarely faced in recent conflicts like Iraq and Afghanistan. Shrapnel wounds to the torso—bleeding that tourniquets cannot stop—will become a prevalent and distinct challenge in LSCO. Wounded may have to wait hours, perhaps days, in prehospital settings waiting for surgeries they urgently need. If they wait too long, they will suffer slow, demoralizing deaths caused by internal bleeding and sepsis.

Bleeding Out on the Battlefield

Research performed in the 1980s and 1990s concluded that bleeding from the extremity was the leading cause of preventable death in Vietnam. The United States has a long history of tourniquet use on the battlefield. During World War I, it was required that every soldier "know how to fix a garrot" (figure 1). During World War II, tourniquets fell out of favor due to inappropriate use and the risk of limb loss. During Vietnam tourniquets were not used, resulting in deaths from extremity hemorrhage.[7] Despite this knowledge, the United States entered the conflicts in Iraq and Afghanistan without tourniquets.[8] Data-driven processes and the Joint Trauma System helped resurrect the widespread employment of tourniquets, and the death from extremity hemorrhage decreased substantially. Several battlefield medical advancements included the development of the combat application tourniquet—a modest device made of nylon, plastic, and Velcro. The

simple but effective tourniquets went on to save thousands of lives over the last twenty years in Iraq and Afghanistan. Bleeding from extremities is no longer a major cause of death from survivable injuries thanks to the accessibility and familiarity with these tourniquets among individual soldiers and marines.

The challenge for the next war won't be gunshot wounds to the arm or severed limbs from improvised explosive devices. It will be treating *hemorrhage that is not amenable to a tourniquet or direct compression,* particularly the chest and abdomen (called "noncompressible torso hemorrhage" [NCTH] by medical professionals). Future conflicts against major adversaries are likely to include high volumes of artillery and mortar fire—the sorts of massive barrages that are regrettably good at finding the gaps and seams of a soldier's body armor (figure 2).

It is also worthwhile to recognize the limitations of tourniquet use and when to replace it with a hemostatic pressure bandage (known as *tourniquet conversion*). Tourniquets save lives, but misusing them threatens both limbs and lives. The importance of tourniquet conversion has been moved into the spotlight from "lessons observed" in Ukraine.[9] Given the short transport times in recent conflicts, liberal use of tourniquets was standard practice. If not needed, the tourniquet was removed at the Role 2, usually in less than an hour. However, studies reveal that up to 49 percent of tourniquets applied in Iraq and Afghanistan were not necessary.[10] Prolonged or unnecessary tourniquet use threatens the limb and the life. Medics and combat lifesavers must train and get comfortable with tourniquet conversion for extremities without a vessel injury. Recent experiences in Ukraine have underscored the severe consequences of prolonged tourniquet use, with a notable increase in avoidable amputations and cases of kidney failure due to delayed removal. These outcomes highlight the critical need for U.S. military training to adapt—emphasizing proper tourniquet application, timely conversion techniques, and a deeper understanding of PCC to prevent similar complications on future battlefields.

The only way to reliably stop internal bleeding is on the operating table. In Iraq and Afghanistan, combat medics relied on hasty measures like stuffing torso wounds with gauze and transfusing blood, and they relied on the efficiency of the "operational" Golden Hour to save the life of a casualty suffering from NCTH. The
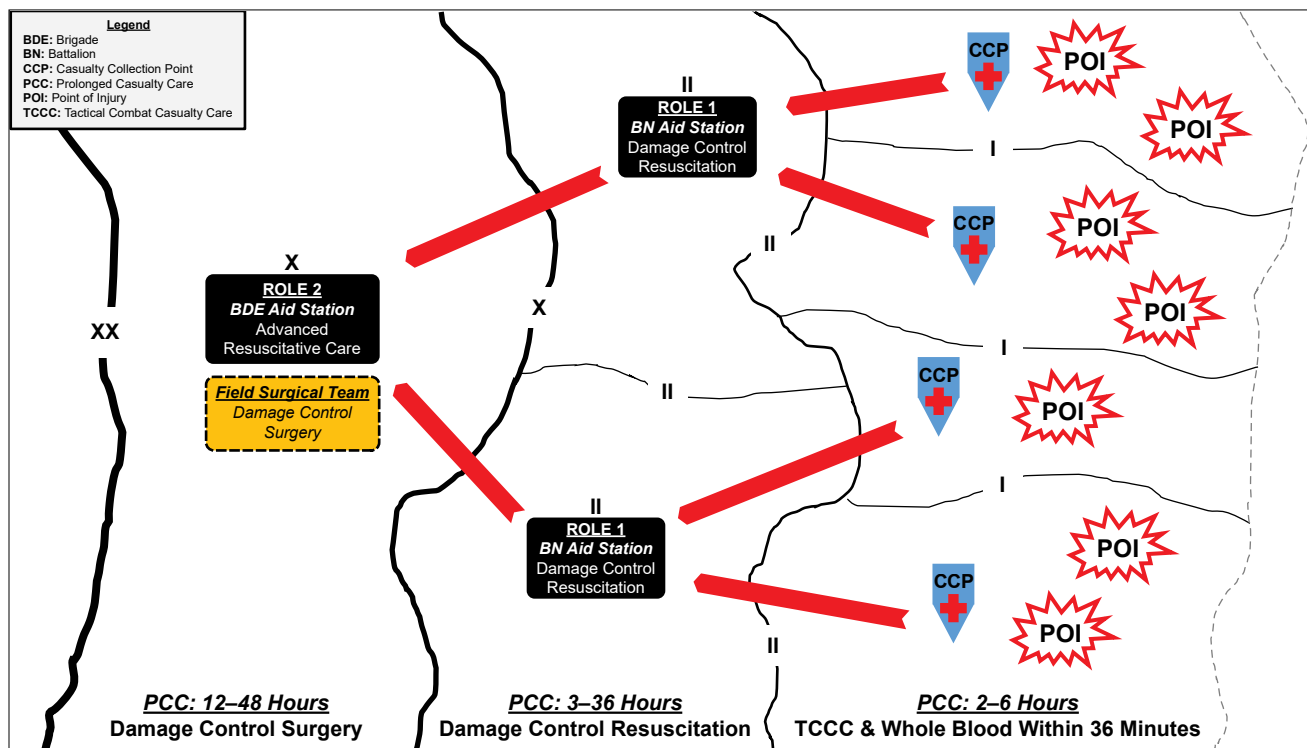

(Figure by Lt. Col. D. Max Ferguson)

Figure 2. Zone of Noncompressible Torso Hemorrhage

Golden Hour of evacuation mitigated the risk of the clinical Golden Hour (or less) of bleeding out on the battlefield. Stuffing a wound with hemostatic gauze and prehospital transfusion buys precious minutes, but only minutes. In LSCO, *combat units will need to buy hours, not minutes, to save the lives* of their wounded given that during LSCO the Golden Hour of evacuation will go away; however the Golden Hour of bleeding out is still here to stay without quick interventions to control bleeding and transfuse blood.

Extending the time before casualties expire will require multiple efforts. Frontline commanders must orchestrate the transfer of casualties from the point of injury to nearby presurgical resuscitative care nodes before gaining access to established surgical facilities. Evacuations in LSCO will require time, resources, and measured risk.

The Three Echelons of Tactical Care

The process of buying time for casualties on the battlefield starts with self-aid and buddy aid by trained nonmedical soldiers and those trained as combat lifesavers. Combat lifesaver training is currently

Figure 3. Three Echelons of Tactical Care on the Battlefield and Medical Capabilities

considered Tier 2 TCCC training; given the threats of the future battlefield, these "medically enabled" nonmedical service members will support medical care on a LSCO battlefield. Commanders cannot prolong the lives of their casualties if those wounded bleed out at the point of injury. *Therefore, the whole process of PCC depends on soldiers mastering the fundamentals of tactical combat casualty care and training nonmedical personnel in combat lifesaver skills.*[11] The importance of this basic capability cannot be overstated. TCCC relies on leaders at the platoon and company levels to train and implement sufficiently.[12] In future scenarios, when the Golden Hour of evacuation goes away, a severely injured soldier may have to wait hours before there is a safe route to bring that casualty to higher levels of care. This highlights the importance of the entire team or crew being well versed in TCCC as battle injuries are battle injuries regardless of circumstance.

One critical addition currently missing from unit-level training is learning how to *transfuse whole blood on the battlefield*. When the Golden Hour of

evacuation is not attainable, the alternative time standard becomes "thirty-six minutes," which is based on evidence. Studies from the military clearly demonstrate that transfusion in less than thirty-six minutes is the optimal benchmark to provide stored or fresh whole blood to casualties at risk of dying from severe hemorrhage; this is the Golden Hour that is here to stay.[13] Walking blood banks offer a field-expedient option to provide fresh whole blood to injured soldiers far forward on the battlefield. It simply requires awareness, prescreening, and training. If soldiers can stick an IV, they can learn to transfuse blood. Tactical unit commanders just need to incorporate the practice of whole blood transfusions within their formation. It starts with learning who can be donors, how to store blood, or how to draw fresh whole blood from prescreened volunteer donors within the ranks. Having access to whole blood far forward on the battlefield will save lives.

If units perform diligent TCCC training and adopt whole blood transfusion programs at the tactical level, commanders can expect to extend a casualty's life *by*

two to six hours (depending on the severity of the injury and the amount of blood available) before they expire.[14] Without whole blood, *within thirty-six minutes*, that planning factor drops to an hour or less for those with severe injuries. The two-to-six hours gained with whole blood transfusions, reliable TCCC practices, and the implementation of PCC buys commanders just enough time to evacuate to the next level of care: the battalion's Role 1, depicted in figure 3.

Battalion aid stations, referred to as "Role 1 medical facilities," provide presurgical lifesaving measures. This entails maintaining the airway, immobilizing fractures, and protecting wounds. Most importantly, Role 1s can store whole blood and have better capability for a walking blood bank; therefore, Role 1s can provide damage control resuscitation. "Damage control" is a bundle of clinical interventions that will hold off death from traumatic injury. The most important aspects of damage control resuscitation are hemorrhage control and early blood transfusion; some of the other interventions include preventing hypothermia, tourniquets/external hemorrhage control, advanced airway and breathing management, basic procedures, and wound care. All these can mitigate the otherwise lethal shock state from blood loss and injury.[15]

Role 1 medical facilities currently lack the capacity to "hold" patients for extended periods after initial stabilization. Training and equipping can mitigate that. Role 1 medical teams stabilize casualties and allow for medical evacuation to resuscitative care at Role 2.[16]

Role 2s are the last level of medical care in a tactical environment. Role 2 care is exemplified by damage control surgery; this is rapid surgery care to restore physiology and prevent death—delaying fixing the anatomic aberrations at a later operation. Role 3 field hospitals are theater-level assets (formerly called combat support hospitals) with multiple operating rooms, advanced medical specialty care, and neurosurgical care. Role 4 hospitals are long-term facilities outside the combat zone (e.g., Landstuhl and Walter Reed medical facilities).

During World War II, the 7th Army Field Hospital maintained one thousand beds in France. Casualties were held in France for thirty days and either returned to the fight or returned to the United States.[17] Modern-day combat support hospitals shrank from two hundred beds in USCENTCOM to a thirty-six-bed field hospital. These combat support hospitals maintain an impressive surgical capability, but the capacity is woefully insufficient in the future OE. Major combat operations in the next major war could lead to thousands of casualties in concentrated periods that may overwhelm contemporary field hospitals.

Surgical care should be the standard for Role 2 facilities, but the level of care is not consistent across the services. In particular, the Army does not have enough surgical teams to support all their Role 2 units. All services should adopt the same expectation for levels of medical care, and Role 2 care needs to be synonymous with access to damage control surgery.

Damage control surgery stops hemorrhage, restores blood flow, and controls wound contamination. These emergency surgeries prioritize quickly controlling hemorrhage and wound contamination to keep casualties alive prior to definitive surgical treatment at Role 3 and Role 4 facilities. Role 2 surgical teams exist to ward off death for casualties who will not survive long transports to Role 3. Surgical care, done by board certified and credentialed surgeons, should be the Role 2 standard. Everything prior to an actual surgical capability, no matter how many people a facility can treat, should be considered the "Role 1 space."

The U.S. Navy, Marine Corps, Air Force, and NATO all currently have surgical teams permanently assigned to their home station Role 2 units. The U.S. Army, however, still relies on pairing deploying units with surgical teams because it does not have enough teams available to assign all brigade Role 2s with permanent teams. That will become a troubling issue in LSCO.

A Note About Surgeons

An outside glance at the task organization for an Army brigade combat team will show that each unit has a brigade surgeon assigned, so it would seem that every Role 2 can establish some sort of surgical capability. But these are just antiquated (and misleading) titles for unit *physicians*, not surgeons, and sometimes not even physicians.

Commanders understand that words have meaning in combat, and they do not designate tasks like destroy, suppress, seize, or neutralize casually. Nor should we indiscriminately designate key positions like unit surgeons. Yet the military still uses a carryover practice to call unit physicians *field surgeons* or *force surgeons* even

though they are not surgeons at all and therefore cannot perform damage control surgery. The title dates back to the Civil War era when titles of "doctor" and "surgeon" were used interchangeably.[18] It has been decades since the military staffed battalions and brigades with surgeons who perform surgery. The physicians in a Role 1 (or Army Role 2) medical facility are still highly trained medical doctors, they just cannot perform damage control or definitive surgical care to treat hemorrhage. Nor can these physicians perform surgeries to prevent infection from extremity and abdominal injuries (the types of surgeries that LSCO will increasingly demand).

Most often, battalion and brigade physicians are residency trained in primary care or other nontrauma focused specialties, predominantly internal or family medicine. In rare occasions, they may be emergency medicine and trauma specialists. It is important to ask the question about what type of experience a physician has prior to joining a combat unit. The experience will vary widely from one PROFIS [Professional Filler System] doctor to another. But these unit "surgeons" will rarely be trained in surgery. The military needs to retire this legacy title to clarify the distinction between surgical versus resuscitative care on the battlefield; command medical officers would be more appropriate for these positions.

Forward Surgical Teams

Gaining access to actual forward surgical teams or, as they are currently designated in the Army, forward resuscitative surgical detachments on the battlefield is not only necessary to prevent death from hemorrhage but also to manage wounds of the extremities and abdomen that will cause sepsis (and death) if not addressed surgically. In the Army, forward surgical care became regular additions to Role 2 facilities at the brigade level in recent conflicts throughout USCENTCOM. Various Role 2 surgical teams emerged, including Golden Hour offset surgical teams, special operations surgical teams, austere resuscitative surgical teams, expeditionary resuscitative surgical teams, and ground surgical teams. Their manning spans from five to twenty personnel and includes anywhere from 350 to 7,000 pounds of equipment.[19]

Forward surgical teams provided lifesaving capabilities, so services fielded them in whatever construct they could develop. Yet inadequate doctrine guided the training, manning, and equipping of these bespoke teams. Services often assembled teams together piecemeal without letting them train or certify as a crew. "An ad hoc approach across the services for two decades has resulted in undertrained and underprepared austere surgical teams, which poorly reduces risk and may cause it to increase both for the teams themselves and the combat forces they support."[20] There remains no joint training standard across the services for forward surgical care. This is a risk because it should not be assumed that individuals who have never trained for this mission set should be able to accomplish it based only on their baseline medical training.[21]

A surgical team can be compared to a tank crew. Armor units take great pride in their crew gunnery tables. Tank crews can only deploy once they train together. Breaking the crew decertifies their team. Similarly, surgery only happens as a team. Surgeons are analogous to the tank commander; they cannot perform surgery without their team. Commanders would not accept a tank crew to deploy unless they trained together. They should hold the same expectations for their surgical teams.

Another challenge with battlefield surgery is the dilemma of getting close to the point of injury but not *too* close. This dilemma was voiced by Dr. William Ogilvie (1887–1971): "Good surgery must be done as far forward as possible. If it is too good, in the sense of too elaborately equipped, it will not be far enough forward, and if it is too far forward it will not be good enough."[22] This dilemma is real. The future OE will necessitate forward surgical teams to remain capable and nimble. Mobility, dispersion, and small signatures will be key to survival on a LSCO battlefield. If they grow too large, they risk being too cumbersome to deploy across the battlefield. Conversely, if forward surgical teams become too lean, they will not keep up with the number of casualties needing damage control surgery held up in austere environments.

Higher Echelons of Care: Understanding Capability versus Capacity

The patient capacity of any echelon of care will drastically depend on the acuity of the casualties being treated. Each higher role of care has increased capability but not always increased capacity.

Staff Sgt. Azgad Cardona and Sgt. Kimberly Williams, assigned to William Beaumont Army Medical Center, perform cardiopulmonary resuscitation on a medical training mannequin as part of the prolonged casualty care portion of the Medical Readiness Command, West Best Medic Competition at Fort Cavazos, Texas, on 19 November 2024. (Photo by Spc. Josefina Garcia, U.S. Army)

High-acuity casualties require immense resources. It only takes one high-acuity casualty to consume all available blood at a medical facility, and one casualty can take up all the resources of an entire surgical team.[23] Commanders and medics will face unsettling choices in LSCO about how to provide the best for the greatest number of casualties. Surgeons will have to make judgment calls about whom to treat based on the availability of time and supplies.

The reason the U.S. military's trauma system developed such a small footprint in USCENTCOM is because of rapid evacuation and air superiority. Commanders were able to maintain small medical footprints because casualties moved quickly along the continuum of care. Many casualties were back in the United States within seventy-two to ninety-six hours of severe injury. This is unlikely in LSCO.

Buying Time at Echelon in LSCO

Current military standards expect tactical units to stabilize casualties for up to seventy-two hours in pre-hospital facilities using battlefield resuscitative care.[24] This is a bold benchmark that is more aspirational than medically attainable for any tactical battlefield facility.

Keeping trauma patients alive is incredibly difficult even in the most sophisticated settings. Emergency medicine physicians spend four years in undergraduate education, four years of medical education, and then three years of residency training before they are certified.[25] Emergency medicine physicians who work in intensive care units spend an additional two to four years of critical care training.[26] Afterward, these highly trained civilian emergency medicine practitioners perform their duties in fully equipped hospitals and trauma centers across the country.[27]

Despite all this training, emergency medicine physicians cannot perform surgery. Trauma surgeons have the same baseline education: four years undergraduate, four years of medical school, then five to six years of residency training, followed by one to two years of additional trauma fellowship training. The average

Table. Unit/Command Elements, Medical Capability, and LSCO Planning Factors

Echelon	Medical Level	Attainable Planning Factors for LSCO		Key Functions
Platoon & Company (Nonmedically Regulated)	Medic / Corpsman	2–6 hours**	Per Medic: • Up to 2 casualties (that require lifesaving interventions) • Up to 5 casualties (that **do not** require lifesaving interventions)	**Tactical Combat Casualty Care** ✔ Whole Blood Transfusion ✔ Wound Care ✔ Airway/Breathing Management
Battalion	Role 1* *(Non-Surgical)*	6–24 hours**	10–15 Ambulatory and Litter Casualties	**Prolonged Casualty Care** ✔ Whole Blood Transfusion ✔ Damage Control Resuscitation (DCR) ✔ Wound Care Management/Basic Burn Management ✔ Antibiotics/Sepsis Management ✔ Nursing Care (Brigade Only)
Brigade (C-MED *Only*)			15–45 Ambulatory and Litter Casualties	
Brigade *with* **Forward Surgical Team**	Role 2 *(Surgical)*	12–48 hours**	15–45 Litter Casualties	**Advanced Resuscitative Surgical Care** ✔ Damage Control Resuscitation (DCR) ✔ *Damage Control Surgery* (DCS) with Hold Capacity ✔ Nursing Care

*Surgical care should be the standard Role 2 facilities but the level of care is not consistent across the services.

These times and number of casualties reflect **what could be attained with deliberate efforts to train and equip tactical units for prolonged casualty care and prolonged care (once casualty enters medical regulation). Acuity and quantity of injuries also matters. High acuity casualties require a large number of resources. One high acuity casualty can consume all available blood at a medical facility.

(Table by authors)

trauma surgeon is "schooled" for fourteen years to practice their trade.

In contrast, combat medics get sixteen weeks of initial entry training and a week of refresher training per year. Frontline medics are lucky if they find an abandoned building for their casualty collection point and get to work on their patients without bullets kicking up the dirt around them. Then they must work with whatever they have on their backs to keep their casualties alive.

We put the most challenging tasks (keeping a dying casualty alive) on those with the least education and training. It is no wonder that the Golden Hour for evacuation became a mandate: it is inherently difficult to stabilize casualties for more than an hour without surgical intervention in combat. In LSCO, commanders will need more than one hour to evacuation casualties. But they are misguided to expect to have seventy-two hours as currently advertised. Commanders can more realistically expect to keep casualties alive between two and thirty-six hours in LSCO, depending on the type and quantity of injuries at different levels of

prehospital care, the availability of blood products, and the training of medics.

The benchmarks and timelines for prolonged casualty care need to be delineated by echelon. With revised training and equipping standards, frontline medics can achieve a two-to-six-hour standard for keeping severely injured casualties alive. Role 1 facilities at the battalion and brigade levels should strive to stabilize and hold multiple severely wounded casualties from six to twenty-four hours before they need more advance resuscitative and surgical care. A U.S. Army brigade does not expand the timeline for casualties that need surgical intervention for either hemorrhage control or to manage wounds that would result in infection and death without a surgical team. Forward surgical teams and nursing care at a Role 2 can help hold back death for up to forty-eight hours on the battlefield by performing advanced resuscitative surgical care.

Let it be understood that the current training, equipping, and experience levels do not meet these time standards (see table). Additionally, doctrine must evolve to reflect the realities of Role 2 care and support

the need for Role 2 care to always include a surgical team to advance the hold times to ninety-six hours with an acceptable preventable death rate. The reality is additional measures at echelon must be incorporated to achieve these marks.

Current Department of Defense protocols set practice guidelines for forward surgical teams to be prepared to be able to operate on two to four surgical patients and hold three to eight patients for sixteen to seventy-two hours without resupply.[28] Casualty figures coming out of the ongoing war in Ukraine and medical planning estimates by the Joint Trauma System suggest that number is too low. Role 2s should be prepared to perform ten damage control surgeries in twenty-four hours.[29] Holding severely wounded casualties for seventy-two hours is also a stretch, where sepsis and infections will consume available equipment, supplies, and staff attention. Commanders should expect Role 2 facilities to hold severely wounded casualties alive for forty-eight hours in LSCO before they will need higher level of care.

Conclusion

There are a couple key takeaways from this article. First, the Golden Hour for evacuation is going away; however, the Golden Hour of hemorrhage physiology is here to stay. Therefore, the joint force needs to be prepared to hold casualties longer at tactical echelons of care and extend the lifesaving interventions of TCCC into this nebulous area of prolonged casualty care. There are not enough surgical teams in the joint force to move them close enough to maintain the Golden Hour, and conventional surgical teams do not have the tactical training for isolated survivability in these environments. Tactical units from platoon to brigade and dispersed warships at sea will struggle with uncertain evacuation timelines. Commanders will rely on their organic medics and providers to treat internal bleeding (with whole blood transfusion), sepsis, and infection for prolonged periods. The future OE will produce casualties in quantities and breadth that no currently serving

leaders have encountered over the last two decades of conflict. Logistics will become both contested and congested at various stages in the conflict. Casualties will have to wait hours, likely days at times, as commanders organize deliberate operations to backhaul casualties.

Prolonged casualty care is more than a medical task. It is a commander issue that requires clear parameters and planning factors. Time is the most important consideration. Current doctrine lacks specificity and is more aspirational than attainable for what LSCO will demand. This article establishes time considerations at echelon for commanders to plan against as they sustain casualties in high-intensity and restrictive environments.

The first step is at the platoon and company levels, where units become proficient at TCCC and whole blood transfusions. These efforts can buy two to six hours for frontline commanders to organize medical evacuations to nearby battlefield medical facilities. Battalion and brigade commanders should expect their Role 1 (nonsurgical) facilities to perform damage control resuscitative care for critically wounded casualties. This should keep casualties alive for six to thirty-six hours. Role 2 care must be synonymous with forward surgical care and damage control resuscitation and surgery to keep critically injured casualties alive for forty-eight hours until evacuation to Role 3 care (or augment these teams with holding capability and capacity).

The force needs to transform the training, organization, and processes to meet these time standards, but they are attainable. With the loss of the Golden Hour for evacuation, "blood far forward" (early transfusion) will mitigate some risk of the physiologic Golden Hour (which with some casualties is much shorter than sixty minutes depending on the severity of the injury); and patients arriving at Role 2s will be sicker as delays increase. Subsequent care will be proportionately more complex during transport and all subsequent echelons of care. This will require a different mindset than what combat units experienced in recent conflicts. These changes, implemented now, will save lives and maximize combat power in the next fight. ■

Notes

Epigraph. Army Futures Command (AFC) Pamphlet 71-20-12, *Army Futures Command Concept for Medical 2028* (AFC, 2022), 9, 18, https://api.army.mil/e2/c/downloads/2022/04/25/ac4ef855/medical-concept-2028-final-unclas.pdf.

1. David B. Hoyt, "Blood and War—Lest We Forget," *Journal of the American College of Surgeons* 209, no. 6 (2009): 681–86, https://www.doi.org/10.1016/j.jamcollsurg.2009.09.005.

2. This article focuses primarily on the perspective of ground combat for U.S. Army and U.S. Marine Corps units, but the principles of prolonged casualty care in large-scale combat operations have application for all U.S. Department of Defense services.

3. Michael Remley, Paul Loos, and Jamie Riesberg, *Prolonged Casualty Care Guidelines*, ed. Michael Remley and Dan Mosely, Joint Trauma System Clinical Practice Guideline 91 (Joint Trauma System, 2021), https://jts.health.mil/assets/docs/cpgs/Prolonged_Casualty_Care_Guidelines_21_Dec_2021_ID91.pdf.

4. Close combat forces refers to tactical elements at the front line of battle. These often include infantry, armor, field artillery, combat engineers, and other combined arms maneuver forces, but the term broadly applies to any unit engaged in direct fighting with the enemy.

5. Russ S. Kotwal et al., "The Effect of a Golden Hour Policy on the Morbidity and Mortality of Combat Casualties," *JAMA Surgery* 151, no. 1 (2016): 15–24, https://www.doi.org/10.1001/jamasurg.2015.3104; Stacy A. Shackelford et al., "The Golden Hour of Casualty Care: Rapid Handoff to Surgical Team Is Associated with Improved Survival in War-Injured US Service Members," *Annals of Surgery* 279, no. 1 (2024): 1–10, https://www.doi.org/10.1097/SLA.0000000000005787. The Golden Hour was originally described during the Vietnam War, when it was observed that wounded casualties are likely to bleed to death within an hour unless they receive advanced interventions. In 2009, the Department of Defense adopted the Golden Hour policy for a reason: saving lives on the battlefield requires arrival to a higher echelon of medical care quickly; prehospital units were unable to consistently stabilize casualties for more than an hour without surgical intervention. In 2012, prehospital units also began using blood as a "Golden Hour extender."

6. Jennifer M. Gurney et al. "Committee on Surgical Combat Casualty Care Position Statement on the Use of Single Surgeon Teams and Invited Commentaries," *Journal of Trauma and Acute Care Surgery* 93, no. 2S (2022): S6–S11, https://doi.org/10.1097/TA.0000000000004058.

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10. Butler, "Tactical Combat Casualty Care," S12–S17.

11. Michael A. Remley et al., "Committee on Tactical Combat Casualty Care (CoTCCC) Position Statement on Prolonged Casualty Care (PCC)," *Journal of Special Operations Medicine* 24, no. 2 (1 May 2024): 111–13, https://www.jsomonline.com/Updates/20242111Remley.pdf.

12. Tactical combat casualty care training is a leader's priority and should be implemented at the company and platoon levels.

13. D. Max Ferguson, "Blood Types and Titers: Saving Lives on the Battlefield with Blood Far Forward," *Military Review* 105, no. 1 (2024): 92–100, https://www.armyupress.army.mil/Journals/Military-Review/English-Edition-Archives/March-April-2024/Blood-Types/.

14. Casualties who are bleeding to death require transfusion within thirty-six minutes. In situations without surgical capability, a percentage of casualties will die. Transfusion can sustain life in most casualties if they can reach a surgical capability within a few hours. The exact percent of casualties and times are unknown given that in U.S. Central Command surgical care was usually within an hour.

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16. Richard G. Malish, "United States Army Battalion Surgeon: Frontline Requirement or Relic of a Bygone Era?" (master's thesis, U.S. Army Command and General Staff College, 2009), https://apps.dtic.mil/sti/pdfs/ADA512526.pdf. Army Role 2 medical facilities are typically staffed by two physicians or "field surgeons" (who are medical doctors but not actual surgeons, by common understanding), two physician assistants, a dentist, a behavioral health section, a physical therapist, a laboratory/radiology section, and twelve medics. They also include a patient hold section of one nurse and three medics. Like with Role 1, Army field surgeons are usually responsible for continued stabilization and resuscitation of the casualty pre- and postsurgically through interpretation of labs, airway management, and medication administration.

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25. "Furthermore, as part of residency, they are required to lead 45 adult medical and 35 adult trauma resuscitations, perform 20 central lines, 10 chest tubes, three cricothyrotomies, 10 dislocation-reductions, 150 clinical ultrasounds with interpretation, 35 intubations, and 15 procedural sedations, along with several other less combat-relevant procedures." Schauer et al., "Risks of Prolonged Casualty Care for Conventional Forces."

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28. Baker, "Austere Resuscitative."

29. Aaron Epstein et al., "Putting Medical Boots on the Ground: Lessons from the War in Ukraine and Applications for Future Conflict with Near-Peer Adversaries," *Journal of the American College of Surgeons* 237, no. 2 (2023): 364–73, https://www.doi.org/10.1097/XCS.0000000000000707.

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Army National Guard soldier Pfc. Fabian Orozco completes an eleven-mile march with a forty-pound rucksack during the Idaho Army National Guard's Best Warrior Competition, held 14–17 September 2023 at Gowen Field and at the Orchard Combat Training Center near Boise, Idaho. For four days, fifteen Idaho National Guard soldiers competed for the title of Best Warrior by participating in multiple intensified tests with little sleep and high stress that challenged candidates both physically and mentally while evaluating their ability to shoot, move, communicate, and survive. (Photo by Master Sgt. Becky Vanshur, U.S. National Guard)

Prolonged Psychological Endurance and Its Relationship to Increased Resilience

Lt. Cmdr. Adam T. Biggs, PhD, U.S. Navy

Resilience is a complicated topic. Everyone seems to agree that resilience is important, yet the consensus often ends there. People debate how to describe resilience, how to measure resilience, and what differentiates resilience from other constructs like grit or hardiness—and these debates happen at a purely theoretical level of psychological scholarship. Practical implementation becomes even more difficult. Developing resilience programs can be challenging enough when tailored to the individual, but when considering force-wide adaptation of large programs like Holistic Health and Fitness, the integration challenges grow exponentially larger.[1] No two service members need the same program. However, individually tailored programs cannot really exist at an organizational level since their efficacy depends on the final integration rather than higher echelon designs. So, how should services approach resilience in the context of this larger problem?

The current discussion will offer some suggestions on teaching and developing resilience when viewing the problem across multiple organizational levels. Specifically, the first question will address whether resilience should be approached as an individual trait, personal strategy, or organizational challenge. This understanding can provide further context into the confusion that often arises when elaborating on resilience-related topics. Next, the topic of "good stress" (or eustress) will be considered as it relates to resilience and how misunderstandings could predispose individuals to higher rates of burnout. Finally, a comprehensive resilience model will be provided that identifies the importance of resilience as a strategy for prolonged psychological endurance. Borrowing from Army doctrine related to sustainment, the intent is to explore how psychological endurance depends upon resilience to provide an individual recharging function that sustains long-term effort. The combined goal is to enhance Army ideas and teachings when addressing resilience to sustain a mentally and physically ready force over their entire career in the Armed Forces.

Is Resilience a Trait, Strategy, or System?

This question is often asked, yet it is a red herring. Resilience is a multifaceted concept with implications at the individual, team, and organizational levels. There is no unequivocally "right" answer, as any perspective will capture some element of prolonged endurance in human behavior. That said, some answers provide insight at different levels of the concept, and some answers conflate resilience with other psychological terms, especially at the individual level. The first goal must be to unpack resilience and understand its implications as a multilevel construct with consequences across the individual, teams, and systems levels.

Foremost, resilience can be examined at the individual level. Resilience is commonly defined as bouncing back in some way following adversity.[2] This straightforward definition belies the underlying complications, such as whether resilience is state-based or trait-based.[3] That is, some scholars and practitioners approach resilience as a relatively stable trait over time akin to a dimension of personality. Alternatively, resilience can be deemed state-based and dynamic, changing based on recent physical, psychological, or emotional conditions. Both arguments have merit. Trait-based interpretations can be considered as the individual capacity for resilience, whereas state-based interpretations can be considered as the current levels relative to the overall capacity. From a trait-based perspective, even highly resilient individuals can have low state-based resilience based on recent life events. The first takeaway is therefore that resilience has both stable and dynamic elements when viewed at the individual level.

Another important individual-level consideration is the confusion with related topics. Factors such as hardiness and self-control are often linked to resilience or even described interchangeably as synonyms, yet important differences exist between the concepts. The example considered here involves grit and resilience, which are distinct concepts in psychological science. Grit represents an ability or desire to sustain effort

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and interest when pursuing long-term goals.[4] Passion and perseverance are critical components of grit, although goal orientation is also essential. Adapting common military parlance, grit is "embracing the suck" and persevering despite adversity. Resilience similarly incorporates elements of enduring despite adversity, where perhaps the only common element across resilience definitions involves adapting despite adversity.[5]

The subtle distinction is how grit and resilience differ. Grit describes endurance through goal orientation, whereas resilience involves bouncing back or recharging—ostensibly implying a restorative function. As a metaphor, grit is how well a vehicle performs under intense conditions, while resilience is the maintenance required to keep the vehicle performing well. Each element has a distinct contribution to enduring performance. Moreover, confusing them can lead to problems. Conflating grit and resilience could encourage people to continue performing under high-stress conditions when they truly need the restorative elements associated with resilience. Without them, the individual becomes prone to burnout or other negative consequences. Both are critical components, but if used interchangeably, individuals can become predisposed to burnout as they do not receive the requisite rest needed for prolonged endurance.

A related concept also creates confusion since it describes resilience in a different way. Materials resilience, developed largely from design and engineering fields, generally describes the ability of physical material to absorb changes while retaining the integrity of its surrounding infrastructure.[6] This conglomerate definition of resilience demonstrates its interdisciplinary potential as resilience can apply to fields ranging from construction or ecological applications to the psychological and social dimensions of human behavior. Nevertheless, resilience should not be conflated when applied to materials versus psychology. Materials resilience amounts to how much a certain material can endure while retaining structural integrity—that is, "take a licking and keep on ticking." The material eventually becomes worn down until it loses integrity and needs to be replaced. This latter element is important for a resilient system, yet problematic if applied to people. A broken-down part can be easily replaced. A broken-down individual suffers a decline in mental health, and even if easily replaced within the organization,

the individual's mental health damage remains. Any replacement is also likely well aware of what their predecessor suffered, making the position undesirable and diminishing the reputation of the wider organization. In short, resilience cannot mean equating people to easily replaceable materials to be swapped as soon as they break down. Resilience should remain viewed by the organization, from a psychological perspective, as a restorative function to ensure the long-term health and well-being of the individual.

The systems-level implications further demonstrate how resilience should be considered in teams and organizations, not just the individual. Team resilience typically refers to the ability of multiple individuals interacting to achieve continued success despite adversity.[7] At a superficial level, there are few differences between individual resilience and team resilience. Both concepts involve adapting to changing conditions while successfully managing stressors. The difference involves the relative importance of certain concepts due to interpersonal interactions. Psychological safety is a key example, which describes the perception that an individual is free to speak among the team without fear of harm, scorn, or other repercussions.[8] If an individual feels free to speak up, the advantages are numerous. Individual stress will decline as the individual will not perseverate on small problems or concerns. Small problems are also less likely to become major issues as they can be brought up and addressed at the lowest possible level, and innovation flourishes in a psychologically safe environment as ideas freely flow between personnel. Of course, the inverse is true as well, where poor team dynamics can exacerbate stressors and reduce team resilience. Psychological safety thus encapsulates interpersonal dynamics that are not present at the individual level. The key implication is that a more complex system, in this case a team rather than an individual, introduces additional components that could either benefit or complicate building resilience.

Furthermore, there is the compounding challenge of building a resilient organization. This level often implies organizational climate and culture issues, where the interactions are multifaceted and introduce a host of potential contributing factors.[9] Resilience enables organizational success and prolonged endurance by ensuring the organization can continue to function despite losing people or other resources. In some sense,

there is a parallel between organizational resilience and materials resilience as the organization often views individuals as replaceable components of a larger system, especially at higher echelons. Still, key differences reside in responsibilities and opportunities. An organization must replace personnel when they are lost as a key part of sustainment, which incurs continued responsibility. The opportunity arises because an organization has resources that an individual does not. An organization can create policies and programs designed to enhance individual endurance through resilience. Underscoring the many efforts available, programs could include anything from morale building to professional development and mental health programs. Thus, organizational resilience is about ensuring subordinate personnel can maximize individual resilience through restorative functions by providing resources to support this optimization.

Eustress and the Challenges of Teaching "Good Stress"

Stress has long been a favored term to describe psychological and physiological responses to adverse or challenging conditions.[10] The common presumption is that stress negatively impacts mental health and human performance. However, further development would come to differentiate between distress—when the demands placed upon an individual exceed their capacity—and eustress, which is an optimal level of stress
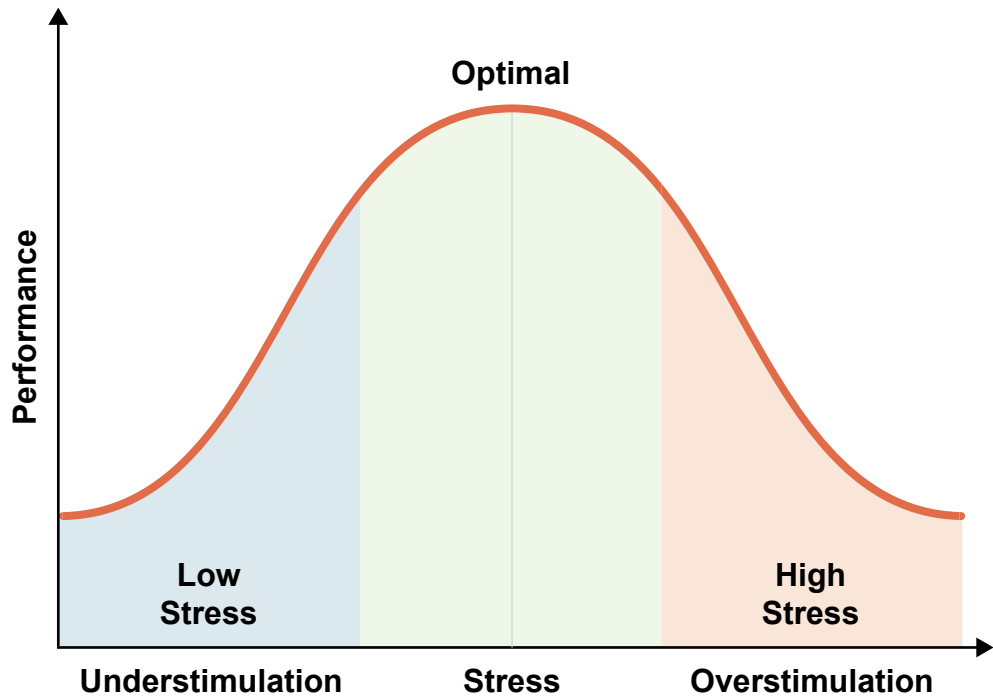
Example of the Yerkes-Dodson law illustrated graphically. Note that there is significant debate regarding where the zones should be differentiated. For example, the green zone could be narrower, or the high stress zone could extend further to the left. The shape of the curve and characteristics associated with "optimal" performance remain subject to debate.

(Figure by author, generated with the support of ChatGPT)

Figure 1. Example of Yerkes-Dodson Law

that helps an individual achieve optimal performance.[11] As a concept, eustress emphasizes that some level of arousal can be important to help people perform. There is additional nuance to differentiating between eustress and distress, especially in terms of how the individual responds to stressors, although the central idea is that not all forms of stress or arousal are inherently negative.

In the process of identifying whether the scenario imposes eustress or distress, scholars and practitioners alike often reference the Yerkes-Dodson law.[12] According to this idea, performance is linked to mental or physiological arousal. The relationship presents itself as an inverted U-shaped or bell-shaped curve (see figure 1). Essentially, performance increases along with increased arousal, although this benefit peaks at a moderate level of arousal. Performance thereafter deteriorates as additional stress or arousal only overwhelms the individual. Most descriptions of the Yerkes-Dodson law end with this simplistic interpretation. Nevertheless, the true relationship is more complex.

Spc. Carlos Carreno, assigned to the 7th Transportation Brigade (Expeditionary), provides security during a react-to-fire scenario 16 April 2025 as part of the XVIII Airborne Corps Best Squad Competition at Fort Campbell, Kentucky. The Best Squad Competition tests squads' physical, technical, and tactical abilities under stress and fatigue to determine which squad from the XVIII Airborne Corps will advance to the Forces Command Best Squad Competition later in the year. (Photo by Pfc. Richard Morgan, U.S. Army)

There are many different factors that influence the curve's shape and create a different relationship entirely from the bell-shaped interpretation, including task difficulty, task complexity, and individual familiarity with the task. These multiple conditions imply that the Yerkes-Dodson law may be too simplistic to capture the intricacies of complex cognitive performance and emotional arousal.[13] Some recommendations even call for industrial/organizational psychology to avoid the practice of informing managerial practices by using the Yerkes-Dodson law as a model for manipulating stress to enhance performance.[14]

There are issues with approaching stress, eustress, and the Yerkes-Dodson law without the requisite nuance that should accompany them, yet another problem looms. Specifically, the issue is teaching "good" stress or increasing stress/arousal without adequate recovery accompanying these ideas. Good stress can be used as a surrogate argument for increasing the workload of personnel or for pushing them harder. If placed within the context of growing and developing future leaders or preparing personnel for stressful situations, there is an element of necessity to this argument. Some training should be intense and exceptionally stressful. Two specific examples come to mind: Survival, Evasion, Resistance, and Escape (SERE) training and Basic Underwater Demolition/SEAL (BUD/S) training.[15] These programs are intentionally grueling because they must be exceptionally intense to meet the training needs. That said, the experience cannot simply be deemed eustress given the beneficial purpose of the training regimen. People often conflate stressful exercises with eustress when it should more accurately be considered a combination of eustress and controlled distress to accomplish a specific objective or organizational need.

Another complication arises when a stressful event becomes deemed eustress. If something is supposedly good stress, it can be deemed beneficial and therefore a positive process. Although there is truth to this point, the process itself remains stressful and requires

recovery. Deeming something eustress can be used as an excuse to increase the stress imposed on an individual or team and a reason, implicitly or explicitly, to eschew adequate recovery time. After all, why would someone need to recover after a positive experience? Do people need recovery time after coming home from vacation? This flawed logic is the implicit problem with eustress. Even if the experience is beneficial for personal or professional development, the experience itself can be exhausting and requires proper recovery. Teaching eustress without linking it to recovery can predispose personnel to burnout since they have neither the time nor the opportunity for rest and adaptation.

A practical example of this problem is taught in the U.S. Army's professional military education.[16] Some leadership courses teach managing organizational resilience by helping personnel achieve the "halo of excellence."[17] According to this idea, leaders intentionally increase stress by creating an environment or conditions for both individuals and the organization where performance peaks at the right time, for the right reasons, and to achieve the right outcome. There is nothing wrong with this interpretation as controlled stress, both eustress and distress, can be managed to achieve personal growth in training environments so that military personnel can achieve optimal performance in combat scenarios. That said, the application of this halo fails without the proper contextual factors related to recovery that ensure sustained performance.

To illustrate the larger issue, consider the following challenges with applying the halo of excellence as currently instructed in military education. Foremost, messaging suggests that increasing stress to optimal levels is a good thing. Complications such as catastrophic failure are acknowledged, but only if the leader pushes too far—without guidance or identification of what might contribute to pushing too far. Teaching eustress without recovery thus predisposes leaders to increasing stress without proportional increases in recovery mechanisms, which can produce individual burnout. Within this same argument, the intended message is that applying this stress motivates personnel at critical points during a performance evolution. This approach only works for short bursts in specific applications for limited periods. These factors—short, specific, and limited—do not subsist in messaging around the halo of excellence. The presumption becomes that increasing

stress helps an individual perform better, and the stress subsequently becomes sustained over time without the recovery message. An individual supposedly adapts to the stress and the halo moves higher, requiring more stress to achieve optimal performance.

There is a truth to the metaphor of growing pains, yet without recovery mechanisms, the practical application for the halo of excellence is to increase stress on underperformers to help them achieve excellence. Unfortunately, the practical result is the burnout of personnel who experience distress as they lack resilience without the time to recover and adapt to changed circumstances. Even the graphical materials used to illustrate the halo support this conclusion. Whereas the halo of excellence, as originally depicted, occurs at the intersection of eustress and distress, the model as taught aligns the halo of excellence past the point of optimal yield strength and squarely with the development of distress.[18] If using this model, then the halo of excellence occurs only in the category of distress.[19] A graphic error in illustration unintentionally demonstrates the implicit problem. Presuming an optimal level of stress only works for short periods and without a recovery mechanism, applying this idea will push the halo of excellence further to the right until it can only be achieved under distress. Eventually, the individual will reach a breaking point of burnout or catastrophic failure.

These implicit problems underscore why managerial psychology identifies that good stress should be rejected as a broad conceptual idea.[20] Stress is unavoidable in military careers, as with virtually all human endeavors, which is why a better counterargument would be appropriately teaching people how to handle stress. One such example would be to replace good stress with the construct of hardiness. As a psychological concept, hardiness is a personality construct that helps protect against the adverse influences of stress.[21] The original concept offered three core components: commitment, control, and challenge. Additional factors have likewise been suggested to supplement these core principles and to expand the larger concept of hardiness.[22] Still, the focus will remain on the original concepts for the current discussion.

Commitment helps motivate people because they have a core reason to engage in particular behaviors; control helps them manage stress because people feel they have some measure of active control over their

circumstances; and challenge represents a balance among resources, skill, and demands that determines whether an individual would become overwhelmed. These three factors present differently when applied to different stressors. For example, the same service member who could excel in combat stress might react poorly to the stress of a romantic breakup or family funeral. Not all stress is equal, and not all stressful situations are equal. As a construct, hardiness allows people to delineate why and how they might be able to manage stressors in some complicated situations but not others.

Increasing stress never represents a positive application in this construct. Instead, an individual might feel increased stress if their control component falls out of balance and they can no longer actively control the circumstances around them. The best way to manage these circumstances is not to increase or decrease stress but rather to help an individual determine what factors would be necessary so that they overcome the sense of powerlessness. Once the individual believes they have a sense of control over their environment again, they will more effectively manage stress within the given situation. Within this context, increasing stress is not the answer—the better solution is to ensure the individual has appropriate tools to manage the stressors around them.

Of course, this example helps demonstrate the importance of individual stress management. Replacing eustress with hardiness could solve some issues, although further problems remain. Hardiness neither addresses recovery itself nor does it account for conflating different psychological concepts. For example, the same text introducing the halo of excellence also describes psychological resiliency as interchangeable with mental toughness and hardiness.[23] These concepts are distinct with important differences in their understanding and application. Accordingly, the Army's teachings about resilience should be updated in a way that addresses both the need for recovery and clarity among different psychological constructs.

Prolonged Psychological Endurance Can Align Resilience with Army Sustainment

Army Doctrine Publication 4-0, *Sustainment*, explains how the strategic purpose of sustainment is to provide freedom of action, prolonged endurance, and operational reach necessary for sustained offensive and defensive actions.[24] Army Field Manual 4-0, also titled *Sustainment*, further documents operational energy as the energy required for training, moving, and sustaining military forces.[25] Energy is ostensibly construed here in terms of fuel or other consumables necessary to sustain a military force, yet there is also a psychological parallel. These concepts can apply at an individual or psychological level with the same underlying implications for individual sustainment as with force sustainment. Whereas prolonged endurance requires reconstitution through reorganization and regeneration at an organizational level, prolonged psychological endurance requires adaptation through rest and recharging.[26] The purpose remains the same—only the procedures change.

To better integrate the psychological concepts with military doctrine, there is a conceptual framework known as the psychological endurance model that could be applied.[27] Although not originally designed for Army use, the framework could adapt exceptionally well to Army sustainment doctrine to become prolonged psychological endurance. It offers several critical advantages for Army applications. First, the model utilizes existing definitions from the current psychological literature while appropriately distinguishing roles for factors such as grit, hardiness, self-control, and resilience. Many holistic performance models conflate these terms, whereas the psychological endurance model partitions them in ways directed by empirical evidence. Second, the model addresses both energy expenditure and energy restoration. These combined functions allow the model to describe operational energy as a psychological concept well-aligned with Army sustainment principles. Third, the model is relatively straightforward as a concept, often explainable in as little as sixty seconds. Ease of explainability and a straightforward metaphorical concept help enhance retainability and make the model ideal for use in holistic Army readiness programs.
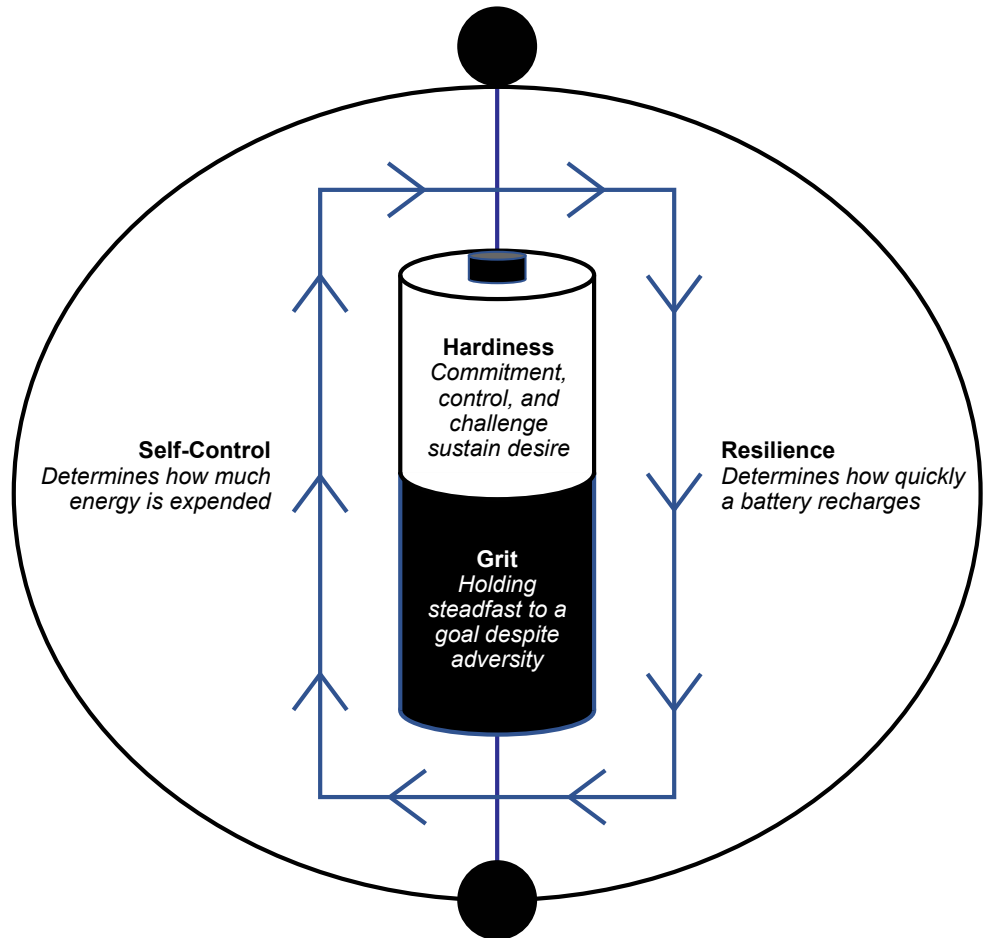
The psychological endurance model operates around the metaphor of a central psychological battery (see figure 2). Psychological and physiological stressors require energy expenditure while restorative processes recharge the battery. Prolonged psychological endurance is thus a product of energy expenditure, the specific rate depending on the scenario, along with conditions that permit recharging at various intervals. Grit and

hardiness represent personality constructs that potentiate the maximum charge of the battery. Grit describes factors that help people endure despite adversity, whereas hardiness describes positive factors that motivate people to sustain performance. As largely personality traits, these factors change slowly over time, if at all, and make poor candidates to alter through short-term training programs. These personality factors are better if consciously engaged based on the individual rather than developed through some organizational program. Meanwhile, self-control and resilience affect energy expenditure. Self-control allows the individual to modulate how much energy is spent on a given situation, whereas resilience represents the restoration strategies an individual uses to recharge the battery and adapt. Prolonged psychological endurance occurs as people deplete the energy in their batteries, restore their charge as available, and continue performance without leading to burnout, which occurs if the battery charge hits zero.

The conceptual model is novel only as it organizes existing concepts around the battery metaphor—intentionally so. Its purpose involves aligning doctrinally adaptable material with empirical literature. In this framework, factors such as hardiness and resilience have distinct meanings. Hardiness is a personality construct that helps people enhance their psychological

Psychological Stressors
Drain the battery through stress, anxiety, or mental health issues

Hardiness
Commitment, control, and challenge sustain desire

Self-Control
Determines how much energy is expended

Resilience
Determines how quickly a battery recharges

Grit
Holding steadfast to a goal despite adversity

Physiological Stressors
Drain the battery through lack of sleep, physical exertion, or general health issues

(Figure by author)

Figure 2. The Psychological Battery and How Its Components Function to Support Prolonged Psychological Endurance

endurance if appropriately engaged, which might mean helping individuals align their performance with commitment, control, and challenge. Conversely, resilience is a strategy for recovery that can be taught and adapted. A common example among service members might be playing video games to relax. Although this process can have a restorative function, there is a key difference between relaxing with friends and playing ranked video games online with strangers that induces stress. This example highlights how a seemingly restful

or relaxing hobby can impair resilience—that is, a stressful hobby might drain the psychological battery while recharging it, akin to watching movies on your phone while it charges. Resilience further differentiates energy restoration from the energy expenditure regulated by self-control. An individual can accelerate energy expenditure as needed with good self-control, although they might perseverate on negative thoughts, which leads to unnecessary energy expenditure that depletes the psychological battery.

These combined ideas represent only a few ways to integrate the psychological endurance model to become prolonged psychological endurance. Compared to other conceptual models, the advantage is not only an alignment with existing Army sustainment but also the inclusion of restorative measures that emphasize a need to avoid burnout. Eustress or good stress could still apply in this model, albeit eustress would drain the battery and allow the individual a chance to permanently adapt to changes during the recharging phase. In this sense, recharging is both restorative and transformative. Eustress and other stress continue to deplete energy with the understanding that some restful period is required again before the individual can integrate the changes into their system and continue pursuing maximum performance.

Summary

Resilience is a complex and multifaceted concept. As taught throughout military services, the implication is that resilience helps a force sustain superior performance. This interpretation has some truth, although the problem is often how the concepts are handed down during instruction. Many practitioners conflate psychological concepts like resilience, grit, hardiness, and self-control. They are not interchangeable in empirical literature, and describing them interchangeably can have adverse consequences. For example, teaching someone to improve their hardiness might be counterproductive since the instruction essentially tries to change their personality. This change would happen very slowly over time rather than creating adaptation through a series of lectures. Holistic human performance programs thus have a key need to clarify whether resilience is a skill, trait, or system.

As a concept, prolonged psychological endurance provides several advantages that can address some problems related to confusion. Foremost, resilience should be considered a multilevel construct with different implications at the individual, team, and organizational levels. The individual level should address concepts such as eustress or stressful activities with the potential for individual growth, yet these concepts should be taught in the proper context. Burnout is a critical issue at the individual level and requires restorative or regenerative functions. If resilience instructions are taught at any level without considering burnout alongside the same information, the consequence can be a false presumption that increased good stress will help the individual achieve better performance. Without restoration, this approach is a recipe for individuals burning out and causing retention problems. The prolonged psychological endurance model provides an opportunity for the Army to integrate current psychological theory into Army doctrine in a way that can enhance holistic human performance without disrupting existing teachings. ■

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1st Lt. Sydney Moskovitz, a U.S. Army Warrior Fitness Team athlete, demonstrates the hand release push-up for students at Miami Jackson Senior High School during a school visit in support of Army Recruiting and Outreach in Miami on 12 January 2022. (Photo by Sgt. 1st Class Corey Vandiver, U.S. Army Marketing and Engagement Brigade)

Did School Closures Matter for the Army's Recruiting Crisis?

Lt. Col. Brandon Colas, U.S. Army

In terms of shortfall percentages for U.S. Army, 2022 and 2023 were the worst years in recruiting since the all-volunteer force was established in 1973.[1] In each year, the Army missed its active-duty recruiting goals by about fifteen thousand soldiers. Active-duty Army recruitment met recruitment goals for fiscal year 2024 by enlisting recruits under a program that provided remedial help in education, fitness, or both.[2] The size of the Army varies from year to year depending on the budget, but historically, the Army has excelled at setting and achieving its recruiting goals for the active force. In the post 9/11-era, the Army only missed its active-duty recruiting goals in 2005 (at the beginning of the Iraq Surge) and 2018. For 2022 and 2023, however, the Army averaged only 76 percent of its goals for the active-duty force.[3] The reasons behind the recent recruiting shortfalls, as seen in figure 1 (which includes both active duty and reserve recruitment numbers), have been disputed. However, many officials have claimed that school closures hurt Army recruitment by limiting recruiter access to high school students.

This claim makes intuitive sense and was endorsed at the highest levels of the Department of Defense. For instance, in October 2024, Secretary of Defense Lloyd Austin released a statement commending the military for its recruitment outcomes for the previous fiscal year, adding, "We must continue to push against the ongoing headwinds in recruiting—including low unemployment and the legacies of the COVID years. We're reaching young people where they are, including in schools."[4] Secretary of the Army Christine Wormuth explained in late 2022 that recruiters were "reeling from the two-year gap in face-to-face contact with high school students during the COVID-19 pandemic."[5] During her last interview with the Associated Press in January 2025, Wormuth discussed recruitment under her tenure, and the reporter noted that "the coronavirus pandemic shut down enlistment stations and in-person recruiting in schools and at public events that the military has long relied on."[6] Dr. Agnes Gereben Schaefer, the assistant secretary of the Army for manpower and reserve affairs, provided congressional testimony in December 2023 that "COVID-19 caused lower productivity for recruiters due to loss of access to schools."[7] Uniformed officers made similar claims. In 2022, the commanding general of U.S. Army Recruitment Command, then–Maj. Gen. Johnny

Davis, emphasized that during COVID, recruiters were cut off "from an entire generation" of recruits due to the "roughly two years" of school closures.[8] Lt. Gen. Maria Gervais, the deputy commander of U.S. Army Training and Doctrine Command, made a similar claim at a media roundtable while discussing the recruiting shortfalls, saying, "If you think about it 2+ [sic] years we haven't had the access to schools."[9]

Although these officials have all directly or indirectly stated that school closures affected U.S. military recruitment, it is not immediately clear *why* school access is so critical for recruitment; after all, high school students know that the military exists, whether or not they see a recruiter in their lunchroom. And secondly, not only did a considerable number of school districts keep in-person learning models throughout the pandemic school year of 2020–2021, but it was only a small proportion of districts that kept virtual learning or hybrid learning throughout the entire school year. This allows for a comparison between districts, which might allow us to answer not only whether school closures affected U.S. Army recruitment but also how much these closures actually mattered. This article seeks to estimate the extent to which changes in school format during school year 2020–2021 harmed U.S. Army recruiting by measuring the change in recruiting in different types of districts before, during, and after the pandemic.

Theory

Studies about military recruiters offer evidence that recruiters matter in enlistment but do not

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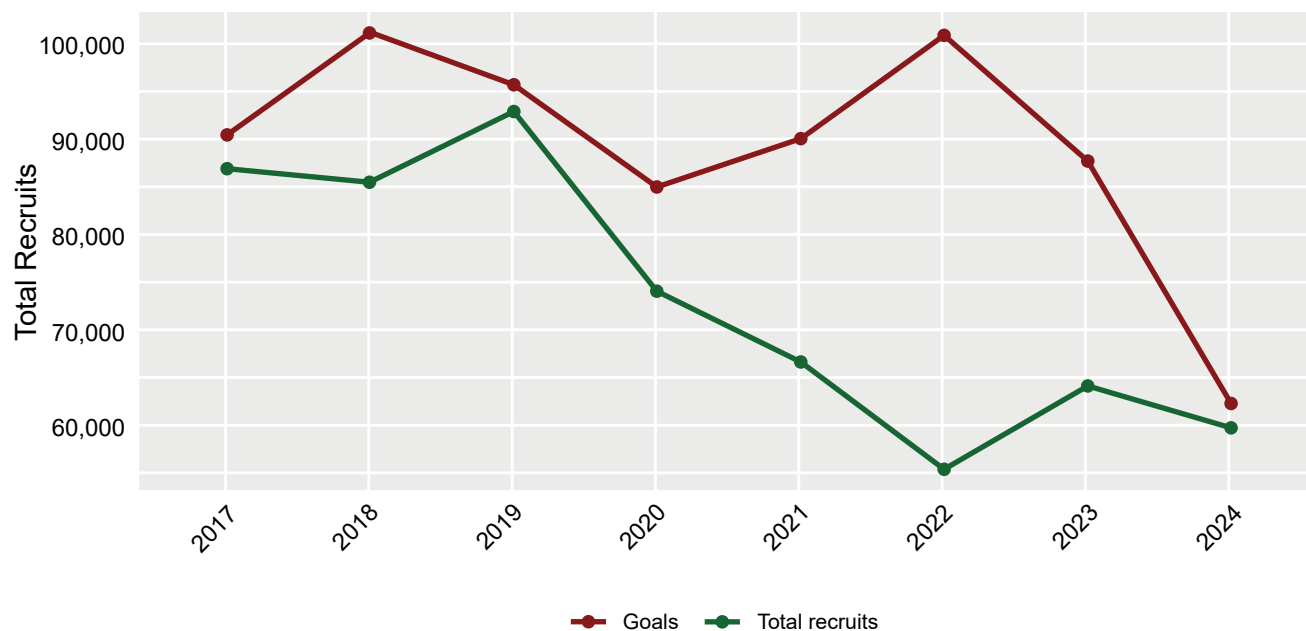
(Figure by author; data derived from U.S. Army Recruiting Command and includes both active-duty and reserve recruits)

Figure 1. Army Annual Recruitment Goals and Outcomes

generally explain why, focusing instead on quotas and incentives for recruiters.[10] Although there is considerable evidence that incentives and quotas affect recruiters' effort level, and thus incentives and quotas also affect recruitment outcomes, it is not immediately clear what "working harder" looks like, whether it be longer hours, more phone calls, or so on. An alternate way to consider why recruiters might matter for enlistment comes from studies about occupational recruitment in general, which have found that recruiters not only help individuals with finding and accepting a role in a corporation but also are critical in setting expectations for the future employee.[11] Perceptions of trustworthiness on the part of recruiters, who are organizational agents, seems to play an important role in shaping an applicants' attraction to an organization as well.[12] Further, recruiters who can provide detailed information about their employer can help make their organization appear more effective to would-be employees by demonstrating their own competence.[13]

A second way to explore how recruiters matter is to look at internal military documents that provide a baseline set of instructions and expectations

for recruiters. Based on a close reading of U.S. Army recruiter documents, including recruiting regulations, recruiting training guides (formal and informal), recruiter briefings, and web pages, recruiters matter for three reasons.[14] First, recruiters serve to help shepherd recruits through the complicated process of signing up for military service—not unlike recruiters in the civilian sector. Second, they serve as benefits managers, helping potential recruits see how the military will fulfill a particular need they have or helping a recruit's parent understand what life in the military will really be like. In this regard, they also emulate the role of civilian recruiters who are able to provide information to would-be employees: some specific questions about future employment are best answered by someone who is on the inside. But the third role of military recruiters does not have a direct civilian analogy in the employment realm, because military recruiters also serve as mobilizing agents for the state. Enlistment in the military is a political act because recruits are committing themselves to defending the state. But this does not mean that enlistment is, or should be, related to partisan identity. Indeed, recruiters help provide recruits

with a sense of social identity, enabling their vision of themselves as future service members.[15]

I suggest that this third role as a mobilizing agent for the state is one uniquely suited to in-person engagement. Much of the bureaucratic wrangling takes place behind the scenes; a recruit will be told when to show up at an appointment, but it is the recruiter working in the background to ensure that the right exams take place at the right times. Similarly, the promise of military benefits can often be explored by the recruits themselves on official Army websites or perhaps Reddit boards, and even if a would-be recruit might not know of a particular bonus program suitable for them, there is no inherent reason why such knowledge could not be readily provided via phone or email as the recruiter seeks to influence their decision to join. But the latent sense of identity is different. How credible would a recruiter's assurances about a recruit's likelihood of future military success really be if the recruiter never actually met with them in person? In short, senior leaders' claims about school closures harming recruiting seem inherently credible in part because those of us who have chosen the profession of service in the military understand that, regardless of the length of time served and regardless of the underlying motivations for service, joining the military is a choice that very few people make lightly. Having in-person access to someone currently serving, namely the recruiter, makes logical sense for making enlistment more likely.

The recruiter as a mobilizing agent. In-person engagement with recruiters might make intuitive sense—having a positive relationship will lead to positive recruitment outcomes—but it requires a close look at recruitment literature to see this relationship. This gap in explanation might be because recruiters are presumed to be functioning as salespeople. But according to the U.S. Army's "how-to" manual— U.S. Army Recruiting Command Training Circular 5-03.1, *Prospecting, Processing, and Analysis*—the "Recruiting Funnel" (which comprises three steps: prospecting, the Army interview, and processing) is not merely a filter with which would-be recruits may realize that the Army is not for them or the Army may realize that a would-be recruit is not suitable for service.[16] It can also be seen as a staircase: as the process continues, the recruiter does not simply convince the individual of the benefits of service but also fosters a

particular civic identity in the recruit that convinces the recruit that they can serve as a future soldier. It is this identity building, I argue, that uniquely benefits from in-person engagement.

One example of how recruiters are trained to use in-person engagement comes from contact scripts, mentioned in Training Circular 5-03.1. These scripts provide insight into what the U.S. Army believes are primary motivations to recruits and imply that the recruiter can develop a *social* identity in would-be recruits. For instance, the description of how a recruiter can use leading questions to help interest a recruit who wants to join based on a motivation of service to the country consists of two examples:
- "Billy, do you consider yourself patriotic?"
- "Lisa, how do you feel when you see someone burning the American Flag?"[17]

Note that both ("patriotic" and "opposed to flag-burning") are a form of direct social identity and are directly suggested as a means to generate an enlistment. Granted, other suggested contact scripts do focus on other benefits of service (including occupational, leadership, income, excitement, and respect).[18] But the point is that recruiters are encouraged to push both extrinsic (what their country can do for them) and intrinsic (what they can do for their country) motivations for would-be recruits. This is why recruiters are not just facilitators and salespeople but also mobilizing actors who can help create civic identity in a subgroup of the state's population. New recruits do not only sign a contract but take an oath as well.[19]

These Army manuals that demonstrate both types of motivation for enlistment—benefits to oneself but also seeking to benefit one's country—have been reflected in previous studies. David Segal, for instance, suggests that the military and its members are motivated by both occupational and institutional features, contrary to previous work that suggested a volunteer force would lean more heavily toward occupational motivation for enlistment.[20] John Eighmey, relying on various Department of Defense Youth Polls, suggests that seven underlying themes exist that explain why individuals enlist. Eighmey's data suggests that value-driven themes, more than material benefits, tend to drive enlistment decisions.[21] A third example of an effort to survey enlistment motivation from 2006 came in Todd Woodruff, Ryan Kelty, and David Segal's

"Propensity to Serve and Motivation to Enlist Among American Combat Soldiers." Woodruff, Kelty, and Segal were able to survey two battalions of infantryman from Fort Lewis with a goal to focus on first-term soldiers from both battalions. They find that those who had a higher propensity for service were motivated more by patriotism and plans for the future, whereas low-propensity soldiers expressed motivation in terms of occupation and finance.[22]

School closures can open the black box of recruiter techniques. If the recruiter is thought of as a mobilizing agent, it is entirely plausible that a lack of high school access would subsequently damage recruitment. Individuals who enlist do so, at least in part, by developing an identity that enables them to have enough confidence in themselves to enter the challenges of basic training, with all the stress—physical, mental, and emotional—that it entails. Those who are willing to enter that training have done so, whether in small or large part, thanks to a recruiter who has mediated between the recruit and the bureaucracy required for enlistment, as well as helping the recruit develop a new identity as a future soldier. Based on the belief that recruiters can help activate recruits' civic identities, this study will test whether recruiter access, or lack of access, in school districts impacted recruiting. Rather than explaining recruiter success or failure as the outcome of recruiter motivation, this study looks to explore how one particular tool of the recruiter—access to high schools, which is a legal obligation for schools—shapes recruiter outcomes.[23]

Data

The puzzle. It seems reasonable to believe that if recruiters lost the chance to have in-person engagement with potential recruits, it would harm recruiting. Numerous senior officials have claimed directly that school closures during the pandemic meant that recruiters lost access to high school students. However, this claim by senior officials needs careful contextualization.

The claim that school closures hurt recruitment needs to be contextualized because there were numerous school districts that stayed open for in-person learning throughout the pandemic. The number of districts that were *only* offering virtual learning to their students during school year 2020–2021 was relatively few, although a majority of districts offered a blend of hybrid and virtual learning for that pandemic school year. In fact, during the pandemic, there were four types of districts: only in-person, only hybrid, only virtual, and some mix of the above. In short, we should expect that recruiters in some states, such as Florida, which stayed open throughout 2020–2021, had considerably more access to engage with high school students than recruiters in California, in which nearly all districts were some blend of virtual and hybrid.

Besides the wide heterogeneity across districts and between states in school learning models, on-campus school visits are not the only way in which recruiters "access" high schoolers. School districts are legally required to offer the same access to recruiters that they do to colleges, and although sometimes school districts are not supportive of recruiters, at a minimum, this access usually means that recruiters will receive names, addresses, phone numbers, and emails of students (juniors, seniors, or both). If recruiters still had contact information for students, they ought to have been able to reach out to them (or their parents) regardless of the pandemic situation.

Besides the facts that recruiters had alternate ways to reach recruits and many schools stayed open for in-person learning during school year 2020–2021, it is not clear why recruiters could not adapt to their local conditions even if schools were closed to visits. If a school district was only offering virtual learning, why couldn't a recruiter participate as a guest speaker or be able to set up a separate counseling session for interested students just like a college admissions counselor might? Although the U.S. Army Recruiting Command shifted its recruiting operations to virtual in March 2020, it allowed for in-person recruiting, depending on the conditions, in May 2020, which suggests that by school year 2020–2021, recruiters should have had options to communicate with high school recruits.[24]

State selection. For this study, I selected the top quartile of states for Army recruitment based on their average annual recruitment numbers from 2002 to 2021. I chose the 2021 cutoff because the collapse in 2022 may have distorted the ranking of states. Using the average recruitment numbers up to that point should give a strong indicator of what states mattered the most for the post-9/11 Army, prior to the pandemic.[25] On

average, during the years 2002 to 2021, relatively few states contributed the bulk of Army recruiting from year to year. The states in the top two quartiles contribute almost 85 percent of the mean annual recruitment, and the states of Texas, California, Florida, Georgia, New York, North Carolina, Ohio, Illinois, Virginia, Pennsylvania, Michigan, and Arizona, which I use as my sample, provide well over half of the mean annual recruitment (see table 1).

Department of Defense data. The Department of Defense's Defense Management Data Center provided accessions data for each active-duty Army recruit in the fiscal years 2018 through 2023. This information included the recruit's age, home zip code, and entry date into the U.S. Army. I filtered these data to only include those who enlisted at the age of seventeen or eighteen to allow for high school students or very recent graduates.[26]

COVID-19 School Data Hub. The COVID-19 School Data Hub provided information about the share of time spent in each form of learning (in-person, hybrid, or virtual) for the school districts in our states of interest.[27] I used these data to make two sets of models. For the first set of models, I selected only districts that offered in-person learning or virtual learning of hybrid learning for more than 95 percent of school year 2020–2021. For the second set of models, I look at four district types: those with in-person learning for more than 95 percent for school year 2020–2021, those that were hybrid for more than 95 percent for school year 2020–2021, those that went virtual for more than 95 percent for school year 2020–2021, and those that had some other combination of learning for the pandemic school year.

Combining the data. Finally, to estimate which recruits went into which school districts, I grouped individual recruits by their zip code into school districts (which usually encompass multiple zip codes). I used a crosswalk from the National Center for Educational Statistics for this step, which used areal weighting of each zip code for each school district.[28] As a robustness check, I also plotted the centroid of each recruit's zip code directly into the school district geography (which would then just assume that whichever school district had the "most" area of that zip code would get full credit for the recruit), and my results were substantively the same.

Table 1. Army Active-Duty Recruitment by State 2002–2021

State	Annual Average	Percentage
Texas	7,501	11.10
California	7,097	10.50
Florida	5,291	7.80
Georgia	3,043	4.50
New York	3,020	4.50
North Carolina	2,805	4.10
Ohio	2,397	3.50
Illinois	2,261	3.30
Virginia	2,190	3.20
Pennsylvania	1,996	2.90
Michigan	1,806	2.70
Arizona	1,790	2.60
Total	**41,197**	**60.7%**

(Table by author)

Results

How many districts were closed during school year 2020–2021? First, table 2 helps explain one way of grouping my dataset. The table differentiates school districts by a very simple measure: if the school district was in-person for 95 percent of the 2020–2021 school or more, it is considered in-person, and if the school district was in-person for 5 percent of the 2020–2021 school year or less, it is considered not in-person. (I realize that is slightly overstating the case since hybrid schooling models did have some time in-person. I thought about using the terms "conventional learning" and "unconventional learning" instead but felt that was also confusing.) One important note from table 2 is that even though the district counts and estimates of total youth in the districts were different, the overall number of enlistments for both districts was roughly the same in school year 2020–2021. Table 3 goes further back in time as well, showing that at least in terms of total enlistments prior to the pandemic, these districts seem to be fairly well balanced.

Another way to look at these data is to consider each district's pandemic learning model in somewhat

Table 2. School Year 2020–2021 (Pandemic) Enlistments by Binary Closure Category

Closure Category	Total Enlistments	Total Youth	District Count
In-Person	3,781	3,221,299	1,568
Not In-Person	3,869	5,228,964	1,740

(Table by author)

more detail as depicted in table 4. Here, districts are classified as "in-person" (in-person for 95 percent or more for school year 2020–2021), "hybrid" (hybrid for 95 percent or more for school year 2020–2021), "virtual" (virtual for 95 percent or more for school year 2020–2021), or "other" (some other combination for school year 2020–2021, e.g., 50 percent hybrid, 10 percent virtual, and 40 percent in-person). This table is important in part because it shows that there were relatively few districts in this sample that chose to completely shut down the school by only offering virtual learning to students. In fact, of all the districts in the sample, 28 percent were fully in-person, compared to 10 percent that were fully hybrid and 9.5 percent that were fully virtual. This does not, of course, mean that even learning in the in-person districts did not have some constraints or disruptions. But it does mean that there is considerable heterogeneity among school districts—enough, I believe, to compare them and draw some tentative conclusions about the effect of pandemic schooling, however it looked, on recruitment.

What were recruiting outcomes in in-person versus not-in-person districts before, during, and after the pandemic? My next approach to looking at these data was to take the district groupings, based on district behavior during the pandemic, and measure recruitment trends before, during, and after the pandemic. In other words, even though the not-in-person districts

Table 3. Pandemic Enlistments by Binary Closure Category Across Years

Closure Category	Total Enlistments	Percent Change from Previous Year
2018–2019		
In-Person	5,997	NA
Not In-Person	6,398	NA
2019–2020		
In-Person	4,860	-19
Not In-Person	5,080	-21
2020–2021		
In-Person	3,781	-22
Not In-Person	3,869	-24
2021–2022		
In-Person	3,169	-16
Not In-Person	3,145	-19

(Table by author)

did actually offer in-person learning prior to the pandemic, and after the pandemic, I label them as "not-in person" for school years 2018–2019 and 2019–2020 (when they were in fact *actually* in-person) and also for school years 2020–2021 (when they were *actually* not in-person) and 2021–2022 (when they were again *actually* in person). Thus, the school district's choice during the pandemic categorizes the school so that we can compare both types of districts in a reasonable way. By labeling the districts as such, we can see the direction of their pre-pandemic (and post-pandemic) recruitment trends. In other words, suppose that the in-person districts had flat recruitment prior to the pandemic

Table 4. School Year 2020–2021 (Pandemic) Enlistments by School District Type

District Type	Total Enlistments	Total Youth	District Count
In-Person	3,781	3,221,299	1,568
Hybrid	579	711,926	473
Virtual	542	877,845	147
Other	5,779	7,109,603	3,499

(Table by author)

and then suddenly jumped after the pandemic, while the not-in-person districts also had flat recruitment prior to the pandemic and then collapsed afterward; this would be strong evidence that the pandemic school closures did harm recruitment.

Here I provide both table 3 and figure 2. Figure 2 does appear to show a slight improvement in recruitment outcomes for in-person districts over not-in-person districts in school year after the pandemic, 2021–2022. However, if we use the count of recruits from table 3 to assess the difference between both types of districts, we can see that the count is marginal.

The percentage change from the previous year is important to note because it highlights what is in figure 2: there has been a steady decline of seventeen-to-eighteen-year-old recruits into the Army, and it began before the pandemic. The year-to-year losses were different, and in school year 2021–2022 were indeed higher for the districts that did not maintain in-person learning. However, these differences were also not substantively significant: in-person districts saw their recruits decline by 16 percentage points the year after the pandemic, and not-in-person districts had a loss of 19 percentage points. Similarly, if we are to just compare the losses between school years 2018–2019 and 2021–2022, the in-person districts had a loss of 47 percent. The not-in-person districts had a loss of 51 percent. My point here is that school closures seem to have had a marginal effect on recruiting compared to the decline, year over year, in the number of enlistments of seventeen-to-eighteen-year-old prospects.

What were recruiting outcomes in in-person versus virtual versus hybrid districts before and after the pandemic? In table 3, I showed that although there

were differences in relative losses of recruits from two types of districts following the pandemic. In-person districts were better, not-in-person districts were worse. But of course, the problem is that in absolute terms, the losses were about the same. The in-person districts lost 612 recruits in the year after pandemic schooling (2021–2022) compared to the year of the pandemic (2020–2021). The not-in-person districts lost 724 recruits. The difference of 112 recruits is a rounding error for an Army attempting to enlist about fifty-five thousand a year. (And if we remember that I am using about 60 percent of the annual recruitment pool for my sample, we would estimate a difference of under two hundred recruits between these types of districts nationwide.)
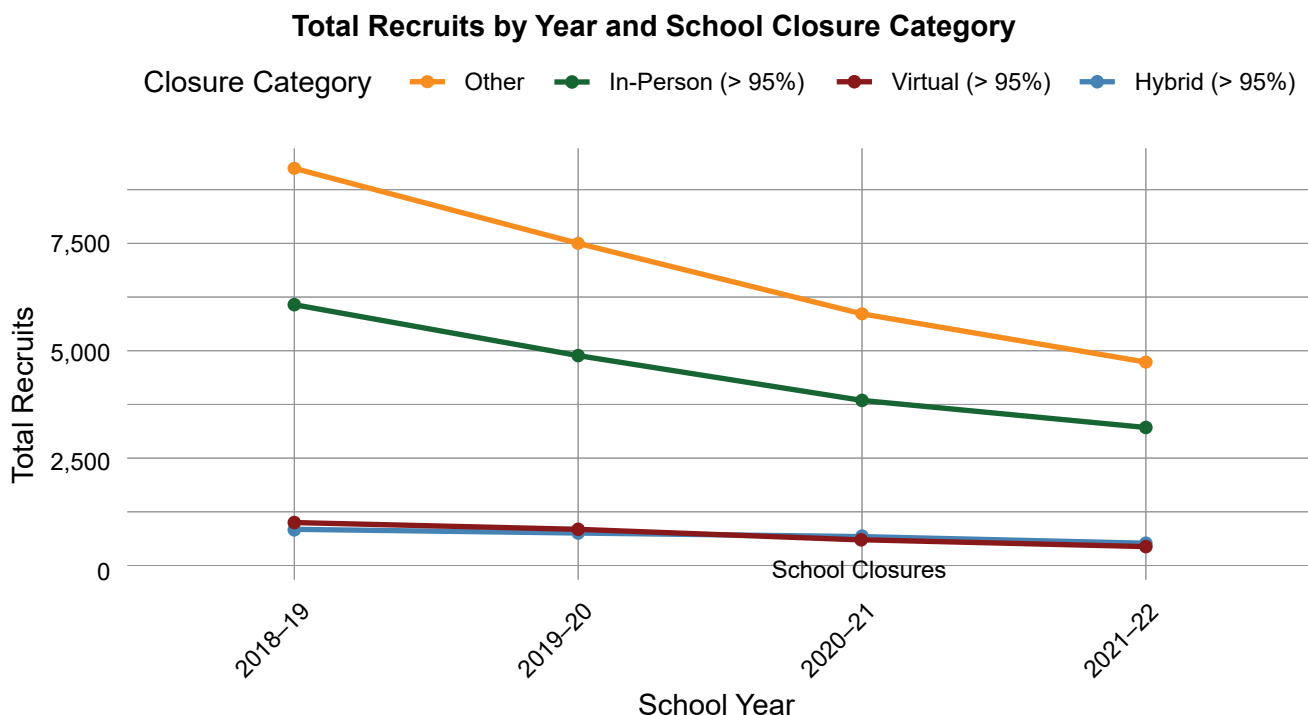
A second way to assess the data is to group the districts into the previously mentioned four types: in-person, hybrid, virtual, and other. Table 5 shows these differences. Here, I highlight that the "virtual" districts did seem to have a steep drop from 2019–2020 to 2020–2021, a loss of 242 recruits, or about 31 percent. But in substantive terms, this type of district was already recruiting relatively few recruits, considerably fewer than the in-person or other districts. The much worse loss came from the in-person districts that dropped 22 percentage points but had a loss of 1,079 recruits comparing the year before pandemic schooling (2019–2020) and the year of pandemic schooling. Figure 3 shows the trends.

Summary of data. The combination of figures 2 and 3 as well as tables 3 and 5 shows that claims that school closures harmed recruitment need considerable nuance. Granted, my work is based on estimates and assumptions; although I have exact recruit counts, I am

Total Recruits by Year and School Closure Category

School District Type ●— In-Person (> 95%) ●— Not In-Person (Hybrid or Virtual [> 95%])
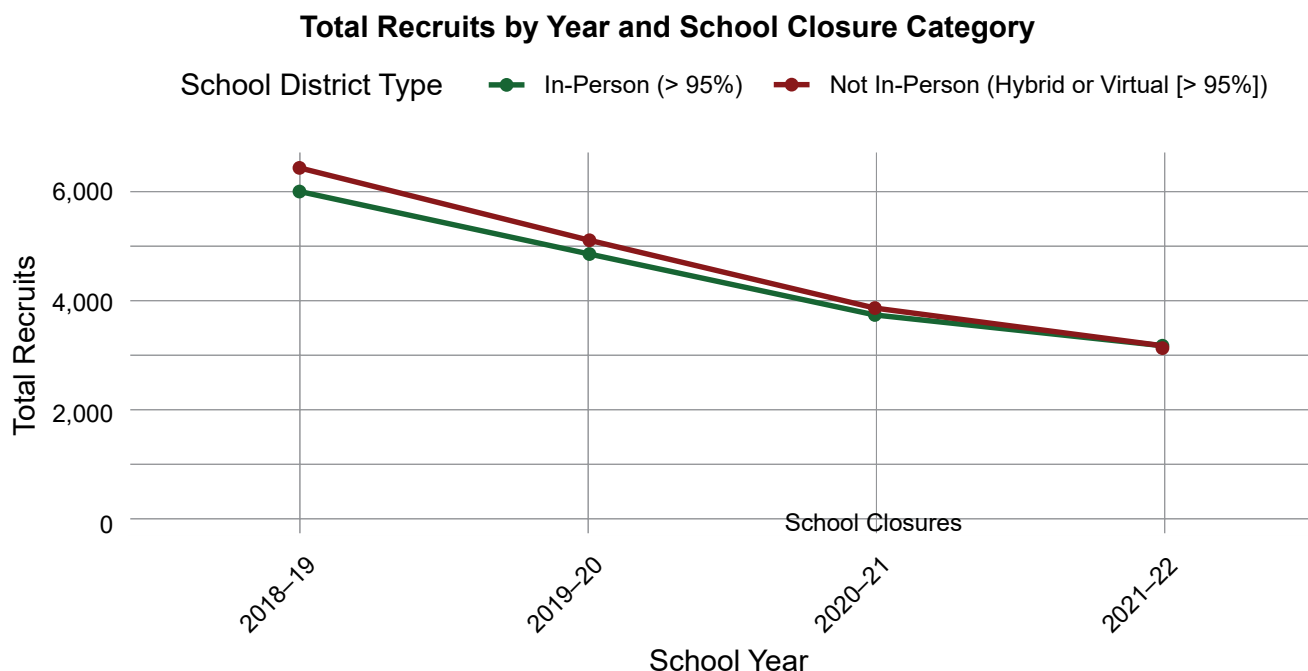
(Figure by author; data derived from Defense Management Data Center and COVID-19 School Data Hub; learning model based on 2020–21 school year)

Figure 2. Recruitment Trends Over Time for In-Person and Not-In-Person Districts

Total Recruits by Year and School Closure Category

Closure Category ●— Other ●— In-Person (> 95%) ●— Virtual (> 95%) ●— Hybrid (> 95%)

(Figure by author; derived from data from the Defense Management Data Center and COVID–19 School Data Hub; learning model based on 2020–21 school year)

Figure 3. Recruitment Trends Over Time for Four Types of Districts

estimating which school district they came from as well as assuming that they attended school in that district (rather than, say, a private school); although I know which districts conducted which types of learning during school year 2020–2021, I am assuming that "open" school districts would have been more likely to permit recruiter visits; and, of course, I am also assuming that recruiters still *tried* to visit schools (regardless of the type of district). Although these assumptions are imperfect, I argue that if school closures really did have adverse effects on recruitment outcomes, we should be able to see *much* more significant differences in these data.

Conclusions

This study has suggested that claims that school closures hurt recruiting may be incorrect because they fail to account for particular aspects of the recruiting crisis. First, not all schools were closed during the pandemic. Second, even with school closures, recruiters still had alternate means to contact would-be recruits (such as contact lists). Finally, recruiters ought to, in theory, have had alternate means to communicate with students through local school districts, even for districts that were fully virtual, for instance, by communicating with guidance counselors and district officials to explain the importance of *some* sort of access. My estimate based on recruits' home zip code and local school district boundaries suggests that there was relatively little difference during or after the pandemic between in-person and not-in-person districts in terms of recruitment outcomes.

It does make intuitive sense that school closures would matter. Although Army recruitment has much in common with other marketing endeavors (such

Table 5. Pandemic Enlistments by District Type Over Time

Closure Category	Total Enlistments	Percent Change from Previous Year
2018–2019		
In-Person	5,997	NA
Hybrid	817	NA
Virtual	954	NA
Other	9,287	NA
2019–2020		
In-Person	4,860	-19
Hybrid	717	-12
Virtual	784	-18
Other	7,547	-19
2020–2021		
In-Person	3,781	-22
Hybrid	579	-19
Virtual	542	-31
Other	5,779	-23
2021–2022		
In-Person	3,169	-16
Hybrid	476	-18
Virtual	447	-22
Other	4,708	-19

(Table by author)

as choosing one's college), asking someone to possibly put their life on the country probably is best done in a recruiter-recruit, in-person relationship rather than a virtual connection. The COVID-19 pandemic affected many aspects of our lives: it is wholly reasonable to believe that it would affect Army recruitment as well. The problem, however, is that this simple metric—how many recruits were enlisting and from what school district types, before and after the pandemic—does not indicate a substantive difference between these different district types. These data strongly suggest that school closures themselves are unlikely to have played a significant role in the recruiting crisis. Although Army

recruiting is currently doing well, it is worthwhile spending time and effort to understand the root causes of the recruiting crisis. My hope is that this study can both challenge conventional wisdom and serve as a model for similar studies in the future that make use of modern data science tools and the rich datasets available to the military to understand the factors that did, and did not, matter during the recruiting crisis. ■

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Write for *Military Review*
Suggested Themes and Topics for 2025

- Compare Russia's revanchist justifications for seizure of terrain in Ukraine and Central Europe to Nazi Germany's justifications used to seize territory in Eastern Europe in the lead up to World War II. Assess current and historical (i.e., Chamberlain in Munich) case studies of the international community's attempts to prevent war.

- Compare and contrast Imperial Japanese justifications and actions used for seizure of terrain leading up to World War II to current claims asserted by Communist China for justifying seizure of terrain also claimed by its neighbors. These nations include Russia, Japan, India, Vietnam, and the Philippines. How are the Chinese planning for multidimensional global campaigns to support territorial expansion and territorial influence?

- From a U.S. military perspective, what are the greatest security threats to the United States? How specifically is the United States preparing to mitigate those threats employing the elements on national power?

- Using case studies, discuss evidence of employment of irregular warfare (IW) using instruments short of large-scale military violence to achieve strategic objectives. Is there evidence that states as well as non-state actors are conducting IW against the United States? Discuss evidence of cooperation among state or non-state actors in such efforts.

- The United States and the Americas — assess the emerging actors, roles and relationships in North, South, and Central America. Is Mexico our friend or foe, or disinterested neighbor? Is Mexico a staging ground for malevolent actors conducting IW against the United States?

- Do China, Russia, Iran, North Korea, and Venezuela have "Achilles' heels"? What are their centers of gravity? If each has one, how can it best be attacked/exploited?

- What do China, Russia, Iran, North Korea, and Venezuela view as the United States' "Achilles' heel" or center of gravity? How specifically are they attacking it?

- What is the current role of the U.S. Armed Forces in Africa? Far East? Middle East? What should it be?

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A squad carries a simulated friendly casualty after performing tactical combat casualty care 29 May 2025 at Fort Riley, Kansas, during the 1st Infantry Division's Best Squad Competition. (Photo by Sgt. Tyler Selige, U.S. Army)

Farewell Col. Andrew Morgado

Military Review bids farewell to Col. Andy Morgado, the director of the Army University Press (AUP) and the editor in chief of *Military Review,* as he moves on to take a position on the Army University staff. His propensity for reading and prolific writing for military publications gave him a unique perspective on professional discourse that complemented his leadership experience—most recently as the director of the School of Advanced Military Studies—and served our organization well. As the director of AUP, he tirelessly championed the Harding Project and fostered both the Harding Fellowship and the LTG (Ret) James M. Dubik Writing Fellows programs.

We will miss Col. Morgado's personable and approachable leadership style, and we wish him great success in his next assignment and in all his future endeavors.

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