FUTURES SEMINAR
THE UNITED STATES ARMY IN 2025 AND BEYOND
A COMPENDIUM OF U.S. ARMY WAR COLLEGE STUDENT PAPERS

VOLUME TWO (2015)

Samuel R. White, Jr.

Editor

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The United States Army in 2025 and Beyond

THE
UNITED STATES
ARMY WAR COLLEGE

STRENGTH *and* WISDOM

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FOREWORD

The Academic Year 2015 (AY15) Futures Seminar was asked by the Army Capabilities Integration Center (ARCIC) to assume an expanded role to help the Army examine the Future Force and understand how the Army will operate over the coming decades. 23 Army War College students stepped forward to enroll in the 8 credit elective and form a diverse and tremendously experienced group from across the joint force and interagency. Active and Reserve Component; military and civilian; capabilities development veterans and novices; the Seminar enjoyed a richness in experience and perspective that was powerful and necessary. Group-think was not a problem.

The pathway for the AY15 Seminar was built upon our exploration of a central idea – a guiding principle. Grounded by the framework provided in the October 2014 *Army Operating Concept*, the Seminar explored the fundamental question: ***"What kind of Army does the nation need in 2025 and beyond?"***

The Seminar moved along two separate but supporting lines. First, through classroom work the students gained an understanding the environment which will shape the Army of 2025 and beyond. The Seminar applied a variety of lens – political, military, fiscal, technological and structural – to add perspective to our vision and view. Second, the students played substantive roles in the Unified Quest 15 (UQ 15) series of workshops and wargames. UQ 15, the Army's Title 10 wargame, gave the Seminar the opportunity to experiment with emerging concepts and thought and add a robust experience to their classroom education. The beneficial outcomes of the Seminar's two lines of inquiry are this compendium of student papers, 23 Army War College graduates who are engaged and contributing to the future of the enterprise and, perhaps as importantly, hundreds of hours of thought, debate, discussion and reflection on the future Army – which also serves as the seed-corn for ideas and questions to be explored by Futures Seminar students and the Army in the years to come. A few examples:

- *The Army is focused on developing agile and adaptive Soldiers and leaders. How does the Army build both culture and institutions which are receptive to and nurturing of this initiative?*

- *Is the Army chasing overmatch? In a fiscally constrained environment, is the Army purposefully determining and articulating: 1) in which capabilities areas overmatch is required, 2) in which areas is parity acceptable and, 3) in which areas is the risk of falling behind acceptable?*

- *Can the Army create asymmetrical advantages in certain capability areas by less reliance on advanced technologies? Is it possible to achieve overmatch by taking a technological step backwards?*

- *Is the Army measuring and assessing the <u>cumulative</u> vulnerabilities and risk to the force induced by advanced technology? What is the maximum allowable risk we can/should accept? Has the Army unintentionally created single-points of failure?*

- *The future environment is admittedly complex; it is prudent to assume that adversaries will be successful in defeating Army advantages. Should the Army consider establishing a baseline operational capability that systems must achieve in a future degraded environment?*

This compendium represents 23 students' peek into the Army of 2025+. Some ideas and recommendations are specific and affect narrow slices of the Army; others are broad and span multiple services or components. Some are tactical; others strategic. Some very aspirational; others very practical. Regardless, they are the thoughts of strategic thinkers who have embraced their responsibility to help posture the enterprise for the future by thinking and writing about tough issues. The enterprise is better for their effort.

Samuel R. White, Jr
Deputy Director, Center for Strategic Leadership
Faculty Lead, The Futures Seminar

Using a Grand Strategy to Build an Army of the Future

Colonel David S. Pierce

The debate over grand strategy and strategy is not new to our military or the civilian leaders who lead the nation. The most notable debate rises from the 1950 National Security Council (NSC) paper 68, or NSC 68. The end of World War II (WW II) resulted in a significant shift in the world order – the United States became a world power and was thrust into a prolonged confrontation with the Soviet Union during the Cold War.[1] Devastated by war, Europe remained in ruins and was vulnerable to coercion or outright aggression by the Soviet Union. The outbreak of the Korean War furthered American beliefs that the Soviets were committed fanatically to disrupt the traditional way of life and to destroy the international authority of the United States in order to secure Soviet power.[2] Americans viewed the

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1. Sidney S. Alexander, *The Marshall Plan* (Washington, DC: National Planning Association, Planning Pamphlets Nos. 60 & 61): 7.

2. Ernest R. May, "Introduction: NSC 68: The Theory and Politics of Strategy," in *American Cold War Strategy: Interpreting NSC 68* (Boston: Bedford Books of St. Martin's Press, 1993): 4.

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Korean War as a Soviet means to expand the reaches of communism, directly threatening U.S. interests in the Far East.[3]

President Harry S. Truman ordered the NSC to reexamine the country's objectives in peace and war and the effect of those objectives on the nation's strategic plans.[4] The task fell to the Department of State (DOS) and the resultant document, NSC 68, provided the United States an option that did not include an outright war with the Soviet Union. Instead, NSC 68 skillfully used the elements of national power (Diplomatic, Information, Military and Economic) to strengthen the U.S. position in an unstable post war environment.[5] Initially after the war, President Truman sought to cut the military to pay for his domestic policies.[6] The Korean War along with Soviet Union rhetoric provided Truman enough evidence to change his plans. He reluctantly adopted NSC 68 and tripled the military's budget. Truman's decision to temper domestic policies to increase the military's budget ensured the defense of the nation.

In similar fashion, the end of the Cold War was another significant world order realignment as the Soviet Union's breakup and weakened influence fostered numerous unstable Soviet states seeking independence. This power vacuum provided Violent Extremist Organizations (VEO) freedom to significantly strengthen their abilities to assemble, plan and execute plots of terror to disrupt American traditional ways of life and values or threaten international authority to protect and seek vital interests for the good of the United States. Today, the United States is attempting to recovery from more than fourteen years of costly, continuous war. Like the post-WW II political environment, there is an on-going effort between Congress and the president to make budget tradeoffs between what is necessary to maintain the readiness of a smaller Army and increased domestically-focused appropriations.

But unlike post-WW II, the United States does not have an NSC 68-like grand strategy that can inform future force decisions and provide

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3. Charles L. Mee Jr., *The Marshall Plan, The Launching of the Pax Americana* (New York: Simon and Schuster, 1984): 17.

4. May, "Introduction: NSC 68: The Theory and Politics of Strategy."

5. "A Report to the National Security Council-NSC 68" (Washington, DC: Presidents Secretary's files, *The Truman Papers*, April 12, 1950): 1.

6. May, "Introduction: NSC 68 The Theory and Politics of Strategy," 3.

focus on the "long" way ahead. The 2015 *National Security Strategy* (NSS) emphasizes the necessity to maintain a smaller military force capable of remaining dominant in all domains through the use of all elements of national power.[7] The NSS stresses the requirement to build a versatile and responsive force prepared to execute a more diverse set of contingencies, such as defending the homeland, building capacity to prevent conflict and preventing the spread and use of weapons of mass destruction while principled and selective in the use of force.[8] However, the NSS does not state with any clarity the specific U.S. adversaries and, as importantly, the means by which the United States should protect and advance its interests. The NSS does mention Russia and VEO as adversaries with whom we must focus our attention, however from a grand strategy perspective it does not provide the granularity necessary to build a future force.

To achieve a proper balance and ensure the future force is capable of meeting the nation's future security needs, the United States must use the post-WW II example of NSC 68 to once again develop a grand strategy that will drive future force development. The United States must look to all corners of the world (to include the homeland) for significant threats that jeopardize the American way of life and our global interests. Building a future force requires a sound grand strategy that demonstrates resolve and flexibility and is enduring enough to transcend multiple administrations. It must be clear and concise and articulate to the whole of government the Nation's interests, the Nation's most significant threats and how the Nation will respond to threats. A grand strategy must be flexible enough to withstand the test of time and strategic variations caused by routine changes in the global and domestic political environment and adapting adversaries.

NSC 68 provided U.S. political and military leaders with a vision to build an Army to best defend its vital interests at home and abroad. Doing so required the United States to maintain a level of military readiness for as long as necessary to deter Soviet aggression.[9] Over time, NSC 68 proved its flexibility, remaining the Nation's principle strategy

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7. Barack Obama, *National Security Strategy* (Washington, DC: The White House, February 2015), 7-8.

8. Ibid.

9. May, "Introduction: NSC 68: The Theory and Politics of Strategy," 3.

through nine administrations, lasting in principle until the collapse of the Soviet Union. It allowed military senior leaders the ability to design and then maintain a modern force that protected national interests for more than four decades.

The focusing power of NSC 68 and a codified grand strategy was illustrated at the end of the Vietnam War and the inevitable U.S. military downsizing. Conscious of the negative effects of the drafted force on long-term national security, senior military leaders sought to develop a future force of volunteers with resources and equipment that would dominate future battlefields.[10] Working with less than optimal budgets, the Army focused its modernization program on five primary items of equipment that served as the land forces backbone for more than three decades: the Bradley Fighting Vehicle, the Apache Helicopter, the Abrams Tank, the Patriot Missile System and the Blackhawk Helicopter.[11] As force levels declined, the Army maintained enough force structure to sufficiently deter the Soviets. The new equipment and force structure carried the Nation forward, protecting its interests and those of its Allies and partners.

The 2015 NSS does not appear to offer a similarly clear and concise grand and enduring vision to those charged with building the Nation's future land forces. Current global challenges are much different from those of just fifteen years ago, which is why a grand strategy is more important today than ever before. The recent wars in Iraq and Afghanistan demonstrated the need for new vehicles and other equipment to protect the force from new threats posed by a very determined enemy. Rapidly fielding new equipment served the U.S. soldier well in the short-term during these conflicts, but is not the answer to equipping the future force. Building an Army of 2040 is difficult and requires the Army to derive future assumptions and predictions from what is known today. The future force must be designed and constructed to accomplish the long-term strategic objectives within a broad and enduring strategic framework. Fighting in a complex world requires the development of a grand strategy that considers long-term adversaries, national objectives

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10. Richard W. Stewart, "Rebuilding The Army, Vietnam through Desert Storm," in *American Military History, U.S. Army Global Era, 1917-2003* (Washington DC: Center for Military History, 2005): 369.

11. Ibid., 380.

and how the United States intends to shape world events to achieve national interests.

The Army of 2040 will not be much different than today's Army if informed by the NSS 2015 and current budget constraints. It does not appear that the Army will have the latitude to design new equipment systems to meet future needs. Technological advances in the cyber and space domains tend to overshadow conversations when discussing future conflict. While the cyber and space domains are critically important and should be exploited to meet the demands at all levels of war, it is important to remember that technology only changes battlefield tactics, technology is not a tactic in of itself. Technological advances, such as robotics and drones, foster misperceptions that technology can and will replace future force structure. Designers of the future Army must refrain from an over-reliance on technology, which in some instances can be developed faster than a soldier, but which has a much shorter shelf life, is inflexible and induces risk into the force. Resources dedicated to developing technology pay dividends only until the next innovation comes along; resources dedicated to developing soldiers bear fruit for generations. The fast paced growth and reliance on technology incentivizes adversaries to develop capabilities to defeat U.S. systems, increasing risk and the possibility of failure. The endless back and forth technology versus structure debate is reminiscent of World War I and the employment of the machine gun and trench warfare. There are secondary and tertiary effects of Army force structure reaching such low "technology enabled" manning levels that the Army is capable of defeating adversaries but is unable to control terrain. This is particularly true when dealing with mega cities, extreme terrain and large nation states like those found throughout Africa and Asia.

According to the NSS 2015, the military equipment systems will modernize while cyber and space capabilities continue to grow. In reality, modernizing the force means simply updating existing systems on platforms such as the Abrams tank. This short-term strategy increases the life span of older systems with the hopes of remaining dominant on future battlefields. Until a U.S. grand strategy identifies an adversary that can defeat existing systems, future budgets will not include new fighting systems. The big five systems were developed in response to Soviet advances and capability gaps found in U.S. Army

force structures. They were created just after the Vietnam War and during a budget constrained environment. Funds were appropriated because the Army effectively communicated the need for more modern equipment based on the 1973 Arab-Israeli War.

The United States is focused globally, looking across regions to apply the elements of power to achieve national interests. The regional complexities require independent regional strategies, typically found with the Geographic Combatant Command (GCC) campaign plans. Retired Marine Corps General James L. Jones stated in the article, "All Elements of National Power: Moving Toward a New Interagency Balance for U.S. Global Engagement," that approaching future complex problems using just the Military portion of the elements of power is not sufficient and fails to properly address the challenges we face now and in the future.[12] In an effort to develop long term strategies in pursuit of national interests, the U.S. Army developed "The U.S. Army's Operating Concept [AOC]; Win in a Complex World." The AOC provides the Army with a broad overview of the anticipated 2040 operational environment, focusing on winning at the strategic level to provide multiple options to the President, Secretary of Defense (SECDEF) and GCC to accomplish national security objectives.[13] Focusing on strategic level objectives suggests a need for force structure changes by DoD and the Army. Jones suggests restructuring the GCC headquarters (HQs) because they are not designed to function in today's complex environment.[14] An important theme within the AOC rests with the concept of the Regionally Aligned Forces (RAF), which provide the nation a strategic power projection platform designed to shape future environments, create lasting partners, deter hostilities and assure regional friends and Allies. Perhaps the future restructuring should also focus on the Army Service Component Commands (ASCC) and the notion of Regionally ASSIGNED Forces (vice

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12. James L. Jones, "All Elements of National Power: Moving Toward a New Interagency Balance for US Global Engagement" *Atlantic Council,* Combatant Command Task Force (July 2014): 1-2. http://www.atlanticcouncil.org/images/publications/All_Elements_of_National_Power.pdf

13. U.S. Army Training and Doctrine Command, *The United States Army Operating Concept: Win in a Complex World*, Pamphlet 525-3-1 (Fort Eustis, VA: 7 October 2014), 1.

14. Jones, "All Elements of National Power." 1-2.

regionally aligned forces). The construct found in U.S. Army Pacific Command (USARPAC) provides the GCC the ability to rapidly project forces regionally because the forces are fenced from the global force management pool.[15] I Corps' dedicated alignment to USARPAC provides additional capabilities and flexible options to the ASCC and the GCC.[16] The ASCC (through the Corps HQs) positions the aligned forces regionally to ensure a continuous presence to meet the dynamic challenges throughout the GCC area of responsibility (AOR). Assigned forces best supports the AOC RAF concept and provides commanders with the most flexibility to give the President options.[17]

The size of the Pacific Command AOR requires a GCC, ASCC and a dedicated Corps HQs to support any regional contingency. Other GCCs may not require an ASCC and a dedicated Corps HQs. Considerations should be given to convert the current ASCCs into Corps HQs. Doing so provides GCCs with regionally assigned forces, which offers flexibility, rapid response and presents multiple options. Additionally, it enables Army Corps' to fully integrate as Joint HQs or Joint Task Forces answering directly to the GCC with force structure. The GCC force strength is a balanced Joint and Interagency staff capable of effectively coordinating the execution of foreign and defense policies.[18] This ensures the best possible inter-organizational integration and meets the expectations set forth within the NSS 2015.

NSC 68 served as the nation's grand strategy for more than forty years. Throughout its time it offered political and military leaders clear national objectives and interests. It demonstrated flexibility, enabling presidential policies to match a changing global environment to prevent outright war with the Soviet Union while advancing and protecting national interests. It provided a long-term vision to defeat the Soviet Union and greatly assisted military leaders to design and develop an Army of the future. The strategy within NSC 68 provided the guidelines to develop the big five equipment sets that have successfully served the

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15. "The U.S. Army in Motion in the Pacific," Association of the United States Army (April 2015), 1-2. http://www.ausa.org/publications/ilw/DigitalPublications/Documents/tbip-pacific/files/6.html

16. Ibid., 3.

17. U.S. Army Training and Doctrine Command, *The United States Army Operating Concept*, 17.

18. Jones, "All Elements of National Power," 3.

nation for more than thirty years. The Army effectively communicated to the President and Congress the dire need to update ageing less superior equipment than that of their adversaries. They were able to do so because the nation's grand strategy was very clear in its long-term objectives and national interests. That is not necessarily the case today. It is difficult today to create such arguments to Congress because the Army cannot clearly communicate long-term objectives that require new equipment, technologies or costly force restructuring. Building an Army (and the Joint Force) of the future requires a grand strategy to ensure the Nation is not accepting unnecessary risk by building a force that cannot achieve national strategic objectives.

The Future of Army Futures

Mr. Byron L. Smith

As the country ends more than a decade at war and finds itself with a multi-trillion dollar debt, the United States is seeking to reap some of its peace dividends to pay down the balance. The problem is while we have withdrawn most of our troops from Iraq and Afghanistan, the world remains in turmoil. Nuclear concerns remain with Korea and Iran, China is on the rise, we are contending with a resurgent Russia, ISIS and al-Qaeda continue to wage their terrorism campaigns while many other challenges continue to pose significant threats.

The myriad of security challenges along with our alarming debt make it imperative to shape the size of our military forces in order to ensure we meet our national objectives while assuming an acceptable level of risk and minimizing our costs. When shaping the force, we must address the level of our debt, which has become a national security concern.

Because of the criticality and importance of force structure issues, the U.S. Congress has become involved. The 2015 National Defense Authorization Act (NDAA) mandates a commission to determine the Army's size, force mixture, missions, force generation policies and how to modify the structure to fit mission requirements and available resources.[1]

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1. Mike Patton, "National Debt Tops $18 Trillion: Guess how much you owe?," *Forbes*, 24 April 2015, http://www.forbes.com/sites/mikepatton/2015/04/24/national-debt-tops-18-trillion-guess-how-much-you-owe/

Mr. Byron Smith, a U.S. Navy Government Service employee, served most recently as the Director of Africa Engagement with U.S. Naval Forces Europe/Africa in Naples, Italy. As part of the Defense Senior Leader Development program he will be moving onto a developmental assignment. His Strategy Research Paper (SRP) examined modifying the approach to improving Maritime Security in Africa.

Apart from the NDAA mandated commission, the U.S. Army was already utilizing Unified Quest (UQ) to help shape the Army's future. "Unified Quest is the Army Chief of Staff's think tank for capturing ideas that help drive change for the Army 2020 and beyond."[2] UQ examines a variety of possibilities against various threats of the future to formulate potential Army missions. In 2015, the Army War College Futures Seminar elective teamed with the Army Capabilities Integration Center (ARCIC) to participate in UQ – the Army's deep future wargame – to support the wargame's goals while helping to shape the future of the Army.

This was the first exposure that the author has had to Unified Quest and the Army's future force development process. As such, the author provides UQ feedback as a non-parochial and truly well-intentioned observer who sees UQ as a microcosm of the Army's future force effort. It may be useful to examine the observations in three UQ categories: Guidance, Participation, and Scenarios. The author was not privileged to all aspects of planning for UQ or the thought processes used by the organizers. However these unbiased UQ perceptions may provide insights as templates to assist in the much larger Army future force development effort.

UQ Guidance

Guidance is essential when developing a process, especially a process that builds over time as UQ does. Unfortunately, in some cases guidance was lacking while in other instances there was too much or overly specific guidance. For example, during a multi-day UQ Planning Exercise (PLANEX), the deliverables – the PLANEX endstate – were not articulated in a method that was adequately understood nor was the PLANEX placed into strategic context. The lack of a "strategic cap" up-front caused the teams to struggle initially. Well-educated and well-intentioned professionals could not make progress without an appropriate vision or strategic direction. It was not until PLANEX organizers stepped forward and put the event into perspective were the teams able to make progress.

To supplement or augment the Army Operating Concept (AOC) and other strategic guidance, the team issued a draft forty page Future Force

2. Unified Quest working papers, http://uq15.cubic.com, accessed 23 May 2015.

2025 Design Guidance document. Conceptually, the challenge with too little guidance is that the team may wander aimlessly without any clear direction. However, too much guidance risks providing the team a pre-determined solution. Guidance that consists of more than forty pages and highlights specific capabilities of future forces may paint the team into corners that require pre-defined solutions. The process delivers a proposed future force mission or capability not because of an honest thoughtful process but because that condition was written into the overall design guidance – guidance which led the teams to reach conclusions which support the narrative.

A more concerning element of the process was that a few organizers would visit teams sharing "steering thoughts," such as: "remember the Army doesn't want to do that in the future," or "I don't think leadership will be happy with a force that doesn't have this certain capability," or "remember we want to justify x number of soldiers." This was not helpful as the UQ process should be designed to develop what the Army needs to look like in the future not what the Army wants to look like in the future. While these statements may be well intentioned, they run counter to a "think-tank" solution that provides unbiased proposals. Recognizing that the author is not a career Army officer and is from a sister service, a certain bias may exist. However, throughout UQ there was the distinct perception that the organizers knew the solution and wanted to guide the team to certain "realities".

UQ Participation

The inclusion of the Army War College Futures Elective in UQ was a welcome addition. The class brought a wealth of experience from various branches, services and agencies. In initial meetings, it was evident that UQ has drawn repeated attendance from various professionals across the Army. Many would echo that it was their tenth or twelfth UQ that they had participated in and would be back next year. While consistency is important and all participants brought a great deal to the table, it is difficult to raise new innovative thoughts and ideas without infusion of fresh talent.

Many of the UQ participants were responsible for specific future programs that the Army was already exploring or developing. They were staunch supporters for their programs and shaped the outcomes

accordingly. In order to provide fresh alternatives UQ should explore inviting greater diversity to the events. In addition, the joint and interagency viewpoints were lacking from the participant base. Very few participants brought those perspectives to bear, partly because of the attendance and partly because the scenarios tended to be U.S.-only and required Army centric solutions. The discussion on the Army's future must include Joint, interagency, inter-governmental and multi-national participants. Additionally, in order to gain creativity and benefit from the millennials' perspective, junior representatives should be invited to participate in UQ.

UQ Scenarios

Despite most senior leader guidance stressing the need to work jointly and with international coalitions, the UQ scenarios leaned toward a U.S. Army only solution. While decreasing military budgets may create a tendency among the services to fight for the limited funds available, the joint service needs to retain the lessons learned from the past decade of war and stay committed to fighting together both on the battlefield and off.

When a scenario drives the team to a service centric solution, that service may tend to develop a force structure unreliant on the joint, interagency or coalition communities; a service which can do it all by itself. This in turn leads to inefficiencies within the joint force and added cost across the Department of Defense (DoD).

To build on the great work that UQ has achieved and the work that the NDAA commission will accomplish over the next several months, another option could augment these efforts. Going forward to ensure a more balanced joint perspective, the Army War College should work with the other service colleges to replicate the Futures Seminar elective in their curriculum. The Professional Military Education (PME) facilities could provide an unbiased, methodical and creative approach to what the DoD future force should look like. Instead of utilizing expensive contractors, the war-gaming sections of each PME institution could assist in developing the construct. A Futures Seminar elective in each school could provide ample talent from a variety of services and agencies.

The National Defense University could take the lead and act to remove service biases if they arise. After the initial selection of a joint scenario, all schools would work together to develop the proposed approach. After establishing service roles and challenges, each school could work their service issues at their respective schools, while being augmented by the other PME Future seminars. The teams could collaborate over the school year, culminating near graduation with an overall proposal of how to structure the "Joint Force" and how each component could support the overall fight. The Future Seminar electives across all universities could provide valuable insight and thought provoking proposals on how to shape the joint force without any burdensome service rivalries to sway opinion.

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STRENGTH and WISDOM

Adapting to Strategic Trends: Reweighting the Army's Three Components

Lieutenant Colonel Jeffrey Vandaveer

The U.S. Army enters the 21st century facing a diverse array of challenges. During the former Cold War period, the Soviet Union's land formations provided a formidable, credible threat in an ideologically bifurcated world order. As such, the USSR's military threat to the United States and its allies cemented the Army's role as the premier guarantor of American security interests around the globe. The Soviet Union's dissolution in late 1991 resulted in the United States emerging as the sole global superpower. In this new role, the United States used its military dominance to assure global stability for domestic and international benefit.

The USSR's dissolution significantly diminished the specter of large monolithic, conventional militaries as a primary threat to U.S. security interests. However, a broad spectrum of unconventional threats emerged to replace the bipolar security dynamic. Increasingly, tribal and ethnic rivals, non-state actors, and malcontent regional states developed low-cost, asymmetric advantages to counter, complicate, or negate U.S. military power.

Given the widening breadth of U.S. adversaries with access to lethal technologies and a looming cap on U.S. fiscal resources, is the Army

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ideally postured to meet the American defense demands for the next quarter century? This paper examines potential challenges in the U.S. security environment the Army could face by 2040 and broadly outlines capability sets among its three components that may best posture the service to meet expectant demands.

By its very nature, predicting a future shaped by unforeseen events is often a futile endeavor. However, gaining an understanding of the potential future security environment is essential in optimizing a force for a probable set of challenges. Using the National Intelligence Council's *Global Trends 2030* publication as an initial lens to discern a future global security environment, the convergence of the four megatrends reveals a stark operational environment for the Army.[1]

The aggregation of four "megatrends" (Individual Empowerment, Diffusion of Power, Demographic Patterns, and the Resources Nexus) suggests a trajectory away from Westphalian nation-state paradigms towards more malleable, responsive modes of localized governance where provision of finite basic human needs is the premium for government legitimacy.[2] The tension created by increasing population and decreasing natural resources suggests demands will exceed the capacity of national governments to provide and sustain a standard of living that promotes general welfare and stability.[3] In a potential era of global austerity, localized rifts within burdened societies will widen into conflict. Additionally, ubiquitous lethal physical and disruptive virtual technologies provide small groups destructive abilities that can outright challenge a nation's conventional military capabilities.

Within this trajectory, nations already limited in natural resources and institutional capacity will struggle to maintain control of citizenry, allowing grievances to metastasize to insurrection. These insurrections,

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1. National Intelligence Council, "Global Trends 2030: Alternative Worlds" (Washington, DC: National Intelligence Council, 2012), ii-v.

2. Colin Clark, "CJCS Gen. Dempsey Signals Strategy Change; Cites Sequestration, Decline of State Power, Technology Spread," *Breaking Defense*, March 18, 2013, http://breakingdefense.com/2013/03/cjcs-gen-dempsey-signals-strategy-change-touts-decline-of-stat/

3. Manfred Max-Neef, *Human Scale Development* (New York: The Apex Press, 1991), 30-33. Max-Neef provides a hierarchical categorization of basic human needs as Subsistence, Protection, Affection, Understanding, Participation, Idleness, Creation, Identity, and Freedom.

however, will likely not transition to wholesale national revolutions. Instead, state systems will devolve into smaller, defiant fiefdoms made contiguous by local identity dynamics.[4] The struggle for control of unreliable finite resources will be especially acute in nations without homogeneous populations or with sectors of disenfranchised peoples. In short, regional instability will be exacerbated in the next twenty-five years by a sharp increase in failed, failing, and fractured states.

Correspondingly, nations with reliable, but finite national resources and stable central governments will act relative to its empowered, central cultural citizenry. Nation-states with relatively homogenous populations may exploit regional turmoil to extend territory and incorporate sympathetic peoples. Militarily acquiring and controlling new territory is an expensive proposition that must bear more future benefit than the expected cost. However, influencing territory via coercion is an economical method to achieve geopolitical ends without the burden of extending sovereignty by force or occupation.

Those with heterogeneous citizenry may opt to satisfy aggrieved segments of its population in order to stem inclinations for rebellion and secession. In general, the trend for stable nation-states will be towards achieving limited geopolitical objectives commensurate only with its ability to satisfy its domestic population. As such, national risk calculation will involve accurately gauging internal popular support, and a cost-benefit exercise, weighing extra-territorial gains against the risk of foreign actor miscalculation.

In that context, the probability of a foreign, existential threat to the United States in 2040 remains low. Certainly, several nations have (and more will likely attain) technological capabilities (i.e. nuclear, cyber) to threaten American existence or way of life. However, actual follow-through would be deleterious to their own ends, as many current and potential peer adversaries will still stand to benefit from a vibrant U.S. – from an economic perspective at a minimum. Nations which do not share U.S. interests and oppose America's current hegemonic status will seek limited regional objectives via less overt means of power. Success in these actions will directly increase their influence while simultaneously diminishing the global credibility of the United States. The emerging security dynamic will be of a global competition

4. Clark, "CJCS Gen. Dempsey Signals Strategy Change."

between the United States and a few prominent regional actors vying for disputed, peripheral territory. Geopolitical maneuvering by U.S. rivals over the coming two decades will be focused on establishing extra-national buffer states designed to protect sovereignty vice simply accumulating new territory to expand the homeland.

Domestically, the United States will not be immune to projected global trends despite advantageous geography and abundant natural resources. A heterogeneous society, America's core strength lies in that its national will is developed and implemented through democratic institutions vice a principal ethnicity. However, akin to other central governments, the U.S. federal system may find difficulty in providing basic needs for all Americans, especially aggrieved segments of the population. The future global trends will stress the underlying socio-economic disparity within the U.S. population, increasing instances of civil unrest. While likely not an issue of national survival, significant domestic civil turmoil will constitute a crisis that will significantly tax finite security resources and erode popular support for U.S. military forays abroad.

Foreign Violent Extremist Organizations (VEOs) will continue to increase in the next twenty-five years as an increasingly viable alternative to Westphalian-state governance. While many foreign VEO's communicate intent to eradicate the U.S. government, very few will actually attain a destructive capability that could inflict severe harm to the U.S. domestically. Projected VEOs will not have depth in resources and capacity to overturn American governmental and its institutions.

None of the projected threats, in isolation, signal an existential threat to the United States. However, the increasing multiplicity of foreign crises, paired with the potential for significant domestic discontent, could never-the-less constitute a significant challenge for the United States. Achieving hegemony requires greater emphasis on opportunity than energy while maintaining hegemony is the converse; continual energy is required to assure positional advantage. As such, if the United States enters a period of finite resources and diffused power, trends suggest American global hegemonic capacity will decline markedly over time. However, the likelihood of another nation supplanting the United States as a global hegemon is low.[5]

5. Christopher Layne, "The Global Power Shift from West to East," *The National Interest*, May-June 2012, http://nationalinterest.org/article/the-global-power-shift-

Should this general trajectory remain constant, what are the potential U.S. national security ramifications for the next quarter century? This question cuts at the core of the U.S. Army's design for the future. If America's decline in influence is a probable outcome, an acceptable range of U.S. foreign policy countermeasures follow two broad, opposing objectives: 1) expend energy to forestall decline, or 2) accede less important regions to gradual decline while concentrating in specific areas of strategic importance. Conceptually, these objectives indicate whether the future U.S. Army is an operational or strategic force within a U.S. security strategy.

A "hegemonic maintenance" approach requires an Army to be an operational force; readily available to all Geographic Combatant Commands (GCC) to counter the diverse array of overseas regional threats and stem a decline in U.S. power. By contrast, a "strategic retrenchment" approach accepts an overall decline in U.S. global influence and focuses the U.S. Army as a strategic force to thwart select peer competitors and ensure dominance in areas which guarantee national survival.

Arguably, of the two conceptual approaches, the U.S. Army's near-continuous overseas combat commitments for the past twenty-five years suggest its usage as an operational force. As expected, the Army modified its size and composition to accommodate the increase in the Nation's demands during that timeframe. However, the 2011 Budget Control Act (BCA) makes the prospect of sustaining that model nearly impossible.[6] The Army has an unenviable mission of supporting national security strategies desirous to maintain U.S. influence without the adequate resources to do so. Given that a change in the fiscal landscape is doubtful over the coming decade, an alternative framework for a future Army as a strategic force to support a global retrenchment approach is offered for consideration.

In Fiscal Year 2014 (FY14), the Army manpower was divided across the three Army components – with 46% in the Active Component (AC), 20% in the U.S. Army Reserve (USAR), and 34% within the

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6. "DoD releases Report on Estimated Sequestration Impacts," *American Forces Press Services*, April 15, 2015, http://www.defense.gov/news/newsarticle. aspx?id=122065

Army National Guard (ARNG). This proportion is reflective of a readily deployable operational force.[7] Should sequestration occur in FY16, projected Army troop reductions would be substantial but overall component ratios will remain the same. Within the three components, only the AC and ARNG maintain the Army's combat formations: Brigade Combat Teams (BCTs) and Combat Aviation Brigades (CABs). The USAR, the smallest of the three components, maintains no combat formations but holds the preponderance of key enablers and combat service support units that support and assist the Army and GCC's.

To redesign the Army to support a shift to a strategic force would require a significant rebalance of manpower and functionality within the components. In broad terms, the AC would reduce to around 30% of the total force, the USAR would increase to approximately 40%, and the ARNG would remain relatively stable in the 30% threshold. Within those components, the AC would transfer manpower-intensive combat formations (e.g., BCT/CABs) to the USAR and take-on lower density key enabler units.

Primarily, the overall decrease in the AC represents an economy-of-force methodology for both the Army and GCC's from fiscal resource and force capability perspectives. An anathema to traditional service and branch-specific sensibilities, economy-of-force units are the reciprocal of mass formations. As such, AC will only maintain functional capabilities necessary to support select GCC demands in "Shape" and "Deter" phasing constructs. This change requires heavier emphasis, and a correspondent increase, in Air and Missile Defense (AMD), Special Forces (SF), and key enabler units such as Theater Sustainment, Cyber, and Information Operations (IO) units in order to set favorable conditions.

Certainly, growth in the aforementioned units directly benefits U.S. strategic and operational objectives but provides little tangible tactical value to the Army as a cohesive armed service. However, the explicit nature of asymmetries in adversary capabilities requires a corresponding adaptation of U.S. Army approaches in force organization. In fact,

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7. U.S. Department of Defense, *Defense Manpower Requirements Report: Fiscal Year 2014* (Washington, DC: Office of the Assistant Secretary of Defense for Readiness and Force Management, August 2013), 2.

the U.S. Army's unmatched prowess in combined arms land warfare is a key catalyst for potential adversaries' shifts away from massed, conventional forces.

To achieve the overall total reduction in AC manpower, heavier BCT's and CAB's transfer to the USAR while lighter, more agile infantry-based BCT's constitute the core combat capability of a modified AC. A result of the AC's rebalance is the majority the Army's heavier formations, and therefore preponderance of its combat power, would reside in the USAR (which doubles in size). Arguments regarding USAR unit readiness and competency in combat operations are distinct, but would not outweigh adherence to BCA-imposed fiscal constraints. In fact, designing a conventionally outfitted USAR that is not rapidly responsive to emergent demands provides a strategically deliberative quality in deciding to wield national military power in foreign affairs. A heavy, combat capable USAR may be strategically analogous as a major piece in chess (such as the queen or rook) whose introduction in the game applies only after pawns and minor pieces (a forward deployed joint force) have developed conditions advantageous for its effective use.

The proposed shift in combat power towards the USAR vice the AC constitutes a dramatic re-visioning in how the service views its role and how U.S. senior leadership approaches its use in national security. Such a shift would only result per a correspondent, significant alteration in how the United States approaches a potential era of dispersed power, heightened instability, scarce resources, and intense regional competition. The U.S. Army has negotiated these challenges in the past and, through careful discernment of continuities and change inherent in conflict, will adapt to serve the Nation in the capacity expected.

In summary, General Dempsey's remarks in 2013 should serve as harbinger for future Army force design vis-à-vis global trends and sequestration: "We'll need to relook our assumptions. We will need to adjust our ambitions to match our abilities. That means doing less, but not doing it less well."[8]

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8. Clark, "CJCS Gen. Dempsey Signals Strategy Change."

A General Purpose Fighting Force:
The Foundation to Win in the Complex World of the 21st Century

Lieutenant Colonel K. Scott Katrosh

In October 2014, U.S. Army Training and Doctrine Command (TRADOC) unveiled the *U.S. Army Operating Concept (AOC): Win in a Complex World,* which describes *how* the Army will employ Soldiers and capabilities as part of a joint, inter-organizational, and multinational (JIM) force to prevent conflict, shape the security environment, and win the nation's wars.[1] The AOC outlines the Army's contributions to *globally integrated operations*, a term articulated in the *Capstone Concept for Joint Operations: Joint Force 2020* which defines *what* operations are necessary to protect U.S. national interests in a volatile, uncertain, complex, and ambiguous (VUCA) security

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1. U.S. Army Training and Doctrine Command (TRADOC), *The U.S. Army Operating Concept: Win in a Complex World,* TRADOC Pamphlet 525-3-1 (Fort Eustis, VA: TRADOC, October 31, 2014), i; See Janine Davidson, "'Winning In a Complex World:' The Army Gets It. Now Can the Lesson Stick?" *Council on Foreign Relations*, October 16, 2014, http://blogs.cfr.org/davidson/2014/10/16/winning-in-a-complex-world-the-army-gets-it-now-can-the-lesson-stick/ (accessed April 13, 2015) (describing TRADOC's release of the AOC at the 2014 AUSA conference).

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environment.[2] The AOC will guide the development of doctrine, organization, training, material, leadership, personnel, facilities, and policy (DOTMLPF-P) solutions to build the Army's future force.[3]

This paper highlights the purpose, key concepts, and challenges of the AOC and explains how the Army envisions the employment of Landpower in the 21st century to achieve strategic objectives in peace, conflict, and war. This paper posits the Army should continue to organize, man, train and equip a general purpose (GP) fighting force that can be tailored to meet the unknown challenges of the future operating environment.[4]

Purpose, Key Concepts, and Challenges

The TRADOC Commander, General David G. Perkins, articulates the purpose of the AOC in its preface—to address three overarching issues: (1) the level of war necessary to achieve success; (2) the anticipated future operating environment; and (3) the Army's problem to solve.[5]

Level of war at which the Army must operate. One of the most insightful concepts in the AOC is the recognition that winning occurs at the strategic level; in other words, a victory on the battlefield does not necessarily guarantee a desired political outcome.[6] Strategic success requires our senior military leaders develop *multiple* options that may achieve desired political ends.[7] As recently explained by the Deputy

2. TRADOC Pamphlet 525-3-1, 7; also see Michelle Tan, "Army unveils new plan to 'win in a complex world,'" *Army Times* (October 13, 2014), http://www.armytimes.com/story/military/pentagon/2014/10/13/army-unveils-new-plan-to-win-in-a-complex-world/17180141/ (accessed April 13, 2015) (describes the principle of "win in a complex world" for the AOC).

3. TRADOC Pamphlet 525-3-1, 7.

4. The foundation of this paper is derived from an unpublished paper written by the author for a different course: "U.S. Army Operating Concept and Employment of Landpower in the 21st Century," Theater Strategy and Campaigning course (Carlisle Barracks, PA: U.S. Army War College, January 20, 2015).

5. Ibid., iii.

6. See Joshua Jones, "Wisdom in Doctrine? Success, the Role of Force, and the Unknowable" *War On The Rocks* (November 12, 2014) http://warontherocks.com/2014/11/wisdom-in-doctrine-success-the-role-of-force-and-the-unknowable/ (accessed April 13, 2015).

7. Ibid., iv; also see Sydney Freedberg, Jr., "The Army Gropes Toward A Cultural Revolution" *Breaking Defense* (October 22, 2014) http://breakingdefense.com/2014/10/the-army-gropes-toward-a-cultural-revolution/ (accessed April 13,

TRADOC Commander, Lieutenant General Herbert R. McMaster, Jr., the Army can no longer afford to divorce tactics and operations from strategy.[8] Instead of focusing on the Army's traditional role of fighting to win, the AOC recognizes the Army's contribution to winning without fighting by shaping the operating environment and preventing wars.[9] To remain successful in the 21st century, the Army must design its future force and capabilities to function at all three levels of war.[10]

Future operating environment. The AOC recognizes that describing the future operating environment is not possible.[11] Gone are the days when the nation's enemy (i.e., the Soviet Union), its capabilities, and the type of war the nation is likely to encounter (conventional state versus state engagement) are well-defined. Tomorrow's operating environment is both unknown and unknowable.[12] Traditional, unconventional, and hybrid threats will continue to emanate from state and non-state actors, including terrorist organizations, transnational criminals, and insurgents.[13]

The AOC identifies five characteristics of an anticipated future operating environment that will impact unified land operations: (1) increased velocity of human interaction; (2) increased potential for technological overmatch, including enemies with anti-access and area denial (A2AD) capabilities; (3) increased risk of proliferation of weapons of mass destruction; (4) increased enemy space and cyberspace capabilities; and (5) increased concentration of enemies operating in an urban environment.[14] The AOC recognizes that we must build the future Army to address a myriad of adversaries that we do not and cannot fully appreciate.[15]

In lieu of the *Big Five* operating systems of the predecessor AirLand Battle concept (M1 Abrams tank, Bradley fighting vehicle, Apache

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2015) (wherein General Perkins explains the job of senior military leaders is to provide policymakers with multiple options to address strategic issues).

   8. Gary Sheftick, "Army Operating Concept expands definition of combined arms" (October 17, 2014) http://www.army.mil/article/136453/Army_Operating_Concept_expands_definition_of_combined_arms/ (accessed April 13, 2015).

   9. Ibid.; TRADOC Pamphlet 525-3-1, iii-iv.

   10. Ibid.; Freedberg, "The Army Gropes Toward A Cultural Revolution."

   11. TRADOC Pamphlet 525-3-1, iii, Chapter 2.

   12. Ibid., iii; Tan, "Army unveils new plan to 'win in a complex world.'"

   13. TRADOC Pamphlet 525-3-1, 10.

   14. Ibid., 11-12.

   15. Jones, "Wisdom in Doctrine?"

and Black Hawk helicopters, and the Patriot missile system), the AOC recognizes the need for future forces focused more on the human dimension, including a new *Big Five*: (1) optimized performance of individual Soldiers; (2) adaptive and innovative leaders (committed to the use of mission command); (3) interoperability of forces; (4) scalable joint combined arms forces; and (5) capabilities overmatch.[16] The Army can no longer rely simply upon its technological superiority and must ensure its Soldiers' cognitive capability remains significantly better than that of its adversaries.[17]

The Army's problem – winning in a complex world. General Perkins explains that in order to achieve strategic success in a VUCA environment, "Army forces must provide the Joint Force with multiple options, integrate the efforts of multiple partners, operate across multiple domains, and present our enemies and adversaries with multiple dilemmas."[18] As the only military force capable of conducting sustained operations on land, the Army serves as the cornerstone of the joint force and provides foundational capabilities (e.g., communications, intelligence, rotary wing aviation, missile defense, logistics, and engineering) in support of a JIM effort to resolve the nation's complex problems.[19]

The seven core Army competencies essential to joint combined arms operations include the ability to: (1) shape the security environment; (2) set the theater; and (3) project national power. In addition, the Army must successfully conduct: (4) combined arms maneuver; (5) wide area security; (6) cyberspace operations; and (7) special operations.[20] It is useful to emphasize the AOC recognizes cyberspace and special operations as core Army competencies with emphasis on the need to integrate these forces with conventional forces to ensure success in

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16. David G. Perkins, "Army Operating Concept: Delivering the Future" *Army* (October 2014): 68, http://www.ausa.org/publications/armymagazine/archive/2014/documents/11november14/perkins_grbook2014.pdf (accessed April 13, 2015).

17. Ibid., also see TRADOC Pamphlet 525-3-1, 20-22 (identifying eight tenets required to best align JIM efforts: initiative, simultaneity, depth, adaptability, endurance, lethality, mobility, and innovation).

18. Ibid., iii.

19. Ibid., iv, 10.

20. Ibid., 22-25.

the future operating environment.[21] Moreover, the AOC emphasizes the use of tailored forces in a decentralized manner to protect the homeland, foster security, deter conflict, and defeat adversaries.[22] The AOC leaves open the likelihood that future Army forces may deploy in configurations significantly different than how currently organized in Brigade Combat Teams (BCTs).

While the AOC provides a tremendous foundation for how to build future Army forces to operate in a complex operating environment, leaders are faced with at least two important challenges with implementation of its concepts. First, budgetary constraints will impact the number of Soldiers available to meet the nation's military needs.[23] In addition to the size of our military, funding will greatly impact the ability of forces to participate in training necessary for success in a VUCA operating environment. For example, regionally aligned forces (RAF) are of diminished value unless they have sufficient funding required to conduct training with their regionally aligned international partners.[24]

Second, while the AOC provides that Army forces must maintain a core competency in combined arms maneuver, the Army has arguably lost its high level of proficiency in conventional fighting.[25] Over the past decade, the Army has primarily focused on preparing for and conducting counter-insurgency (COIN), counter-terrorism (CT), stability, and nation-building operations. With the AOC's emphasis on conducting decentralized operations in scalable formations, it

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21. Ibid., 24; also see Sheftick, "Army Operating Concept expands definition of combined arms," (describing Lieutenant General McMaster's discussion at the AUSA conference of special operations as an added Army core competency).

22. TRADOC Pamphlet 525-3-1, 17.

23. See Joe Gould, "Odierno: With commitments up, U.S. must rethink cuts to Army end strength" *Army Times* (November 21, 2014) http://www.armytimes.com/story/military/pentagon/2014/11/19/odierno-army-end-strength/19275911/ (accessed April 13, 2015) (discusses the Army Chief of Staff's concerns about cuts to end strength in light of emerging requirements on the Army; for example, eight of ten division headquarters are currently deployed due to crises around the world).

24. See TRADOC Pamphlet 525-3-1, App. D-2 (recognizing reduced funding as a risk to the Army's ability to properly respond to and resolve crises in the future).

25. See Gian P. Gentile, "The Imperative for an American General Purpose Army That Can Fight" *Orbis* 53, 3 (Summer 2009), 461-462, 468 (describing strategic risk caused by atrophy of the Army's fighting skills).

may prove difficult to regain and sustain the Army's core warfighting competency in combined arms maneuver.

Employment of Landpower in the 21st Century

Given the purpose, key concepts, and challenges with implementation of the AOC this paper will now explore how the Army envisions the employment of Landpower in the 21st century to achieve strategic objectives in peace, conflict, and war.[26] The AOC recognizes the best use of Landpower is not simply to defeat an enemy when required on the battlefield; a robust, regionally engaged, and globally responsive land force also helps to prevent conflicts and shape the security environment as part of the JIM force. The Army's contribution to joint combined arms operations is best articulated through the concepts of *prevent – shape – win.*

Landpower short of war (Prevent – Shape). The AOC recognizes the use of land forces across a wide range of situations short of war strengthens our national security. As former Chairman of the Joint Chiefs of Staff Admiral Mike Mullen stated, "We must not look upon the use of military forces only as a last resort, but as potentially the best, first option when combined with other instruments of national and international power."[27] Land forces contribute to international order by offering multiple options to reassure our allies/partners and deter our adversaries.

The United States seeks to prevent and deter war through the combined use of forward deployed forces, rotational forces, RAF, and special operations forces (SOF).[28] Army forces engaged regionally build relationships and partner capacity, enhance our understanding

26. Landpower will continue to play a critical role in the fundamental purpose of military power: defeat, deter, compel, reassure, engage, and support the nation. See William T. Johnsen, "Re-Examining The Roles of Landpower In The 21st Century and Their Implications" *Strategic Studies Institute* (November 2014): xi http://www.strategicstudiesinstitute.army.mil/pdffiles/PUB1237.pdf (accessed April 13, 2015).

27. United States Department of the Army, United States Marine Corps, United States Special Operations Command, *Strategic Landpower: Winning the Clash of Wills* (Washington, DC: 2013) http://www.tradoc.army.mil/FrontPageContent/Docs/Strategic%20Landpower%20White%20Paper.pdf (accessed April 13, 2015).

28. TRADOC Pamphlet 525-3-1, 17; Ibid., 17, 22 (wherein the AOC similarly recognizes the use of Army Reserve and Army National Guard partnered units to develop and maintain relationships with international partners to shape the security environment).

of complex operational environments, and set conditions for the deployment of forces if deterrence and diplomacy fail.[29] These forces further reduce the chance of strategic surprise to the United States, miscalculation by our adversaries of U.S. resolve or capability, and increase U.S. responsiveness to global crises.[30]

Landpower at war (Win). Despite our best efforts to deter conflict, land forces must maintain the capacity to quickly respond to crises around the world and conduct decisive joint combined arms operations when our national interests are threatened.[31] Army units specifically tailored for the mission, as part of a joint force, must maneuver from multiple locations, present multiple dilemmas, in multiple domains to bypass or overwhelm an enemy's A2AD capabilities, seize the initiative, and accomplish our nation's strategic objectives. Army forces must effectively project power across all domains to secure the terrain and population, preserve operational reach, maintain security, and sustain the force during joint combined arms operations.

Maintain a General Purpose Fighting Force

Finally, this author argues in order to most effectively employ Landpower in the 21st Century, the Army should continue to organize, man, train and equip a GP fighting force that can be tailored to meet the unknown challenges of the future operating environment.[32] Gian P. Gentile, an Associate Professor of History at the U.S. Military Academy, discusses in an article, "The Imperative for an American General Purpose Army

29. TRADOC Pamphlet 525-3-1, 17-19; see Johnsen, "Re-Examining the Roles of Landpower," 29 (wherein the author described a number of shaping activities: "rotational deployments for exercises and training, foreign attendance in U.S. professional military education activities, building partner capacity, security force assistance, civil affairs support for stabilization, reconstruction, and development efforts, foreign internal defense, counterterrorism and support to counterterrorism, and foreign humanitarian assistance and disaster relief").

30. TRADOC Pamphlet 525-3-1, 17-19.

31. Ibid.

32. One criticism of the term "general purpose" force is that it implies the Army must be prepared to do everything. Clearly, given our political landscape and fiscally austere environment the Army cannot be fully prepared to do it all. However, it must answer any challenge presented by our civilian leadership. The best way to meet this conundrum is to organize, man, train and equip our forces for full-spectrum operations – one ready for any type of fighting not optimized for lower end of the conflict spectrum operations.

That Can Fight," the need for the Army to organize itself around the principle of fighting.[33] Professor Gentile agrees the future operating environment is unknown; however, he cautions against the desire by some defense experts to build a light infantry constabulary force optimized to conduct lower end of the conflict spectrum operations that many believe are more likely to occur in the future.[34]

> *The United States needs an Army that can learn and adapt very quickly, built around the pillars of protection, mobility, firepower, and organized and trained primarily as a fighting force. That kind of force can easily step in different directions to do other types of missions like counterinsurgency operations. History and the recent past have shown this to be the case.*[35]

Professor Gentile provides convincing examples (including the U.S. invasion into Iraq in 2003) to support his position that conventionally trained forces can effectively conduct COIN, stability, and nation-building operations, but the converse is not necessarily true.[36] Professor Gentile is not advocating for the United States to ignore lower end of the conflict spectrum operations. The United States must maintain these critical skills, but if the Nation maintains an Army prepared for conventional fighting, leaders can adapt to successfully conduct other operations.[37]

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33. Gentile, "The Imperative for an American General Purpose Army That Can Fight," 457.

34. Ibid., 458; Ibid., 463 (wherein Professor Gentile disagrees with defense analyst Andrew Krepinevich's suggestion to build a "bifurcated" Army wherein two-thirds of BCTs would be optimized for COIN, stability and nation-building operations and the remaining one-third of BCTs would be optimized for higher end of the spectrum operations); Ibid., 464 (wherein Professor Gentile disagrees with defense analyst John Nagl's suggestion to build a twenty thousand man advisory corps); also see Thomas E. Ricks, "What the last 10 years tell us about what kind of military we'll need in the future," *Foreign Policy* (January 31, 2013) http://foreignpolicy.com/2013/01/31/what-the-last-10-years-tell-us-about-what-kind-of-military-well-need-in-the-future/ (accessed April 13, 2015) (wherein Thomas Ricks agrees with the suggestion by John Nagl to create an advisory organization within the Army focused on security assistance operations).

35. Gentile, "The Imperative for an American General Purpose Army That Can Fight," 459.

36. Ibid., 460-461.

37. Ibid., 462.

However, designing a force optimized for COIN, CT, stability, and nation-building operations which have dominated the past 14 years of fighting in Iraq and Afghanistan, presents a significant risk to future success. For example, if a company from a maneuver formation optimized to conduct lower end of spectrum operations deploys to Africa to conduct peacekeeping operations and fighting breaks out, how well will its Soldiers transition to defend themselves? The possibility of significant casualties in such a scenario is not remote. We must avoid any temptation to build a light infantry constabulary force, or an Army split between GP forces and light infantry constabulary forces, or face significant risk of strategic catastrophe.[38]

The United States built its force in the 1950s and 1960s based upon a GP force – one organized to operate across the full spectrum of military operations. It was not designed for combat in either a nuclear or non-nuclear setting or optimized for a specific type of war but was created to face a variety of existing threats.[39] Professor Gentile argues we should follow this model and design an Army for the 21st century capable of handling the most dangerous conventional threats we could potentially encounter along with a myriad of other possible threats.[40] This author agrees; the United States should design its future force organized, manned, trained and equipped to effectively conduct joint combined arms maneuver as required to defeat potential conventional threats presented by such countries as Russia, North Korea, Iran, and China.[41] If we are prepared

38. Ibid., 463.

39. Ibid., 462.

40. Ibid.

41. The author agrees with most national security scholars that large-scale conventional state-on-state war is unlikely in the next twenty years. The United States will do everything in its power to prevent a confrontation with Russia and China. The most likely possibility for a conventional type of war is probably with North Korea, although conflict with Iran if nuclear weapons negotiations fails is not out of the realm of possibility. See Steven Metz, "Strategic Landpower Task Force Research Report" *Strategic Studies Institute* (October 3, 2013) http://www.strategicstudiesinstitute.army.mil/index.cfm/articles/STRATEGIC-LANDPOWER-TASK-FORCE/2013/10/3 (accessed April 13, 2015) Wherein the author stresses two points to counter the argument that conventional war is unlikely with other states in the 21st century: first, effective U.S. ground forces help deter conflict with aggressive states such as North Korea and Iran and without such forces these states are more likely to act in an aggressive manner; second, the U.S. sometimes gets involved in conflicts between other nations that it does not predict.

to fight these possible adversaries, we can adapt our forces quickly as necessary to accomplish other missions not currently anticipated.

One model for a future force suggested by Professor Gentile is a robust Battle Group recommended by retired Army Colonel Douglas Macgregor "centered on the pillars of mobility, firepower, and protection."[42] This maneuver formation would be comprised of four primary elements: maneuver; strike; intelligence, surveillance, and reconnaissance (ISR); and sustainment.[43] It would be significantly larger than our current BCTs (with approximately 5,500 Soldiers versus an Infantry Brigade Combat Team (IBCT) with 4,400 Soldiers, a Stryker Brigade Combat Team (SBCT) with 4,500 Soldiers, and an Armor Brigade Combat Team (ABCT) with 4,700 Soldiers) and commanded by a Brigadier General (*vice* a Colonel).[44] This author agrees with Colonel Macgregor that our future force must be organized around a maneuver formation designed to operate autonomously when deployed to fight in the full range of future conflict scenarios. However, this author does not agree that such formation should be significantly larger than our current BCTs or commanded by a Brigadier General. If any substantial change is made in size, a new maneuver formation should be smaller than our current BCTs to render it more mobile.

This author further agrees with General Ray Odierno that our future maneuver formation must be scalable to meet the needs of each individual mission.[45] The complexity of the future operating environment requires a responsive force that may be expanded or contracted rapidly as requirements on the battlefield change.[46] To be effective once deployed, Soldiers must also be adept in conventional skills ready to fight if necessary when conducting lower end of spectrum military operations. In addition, they must be experts in the human

42. Ibid., 463.

43. Colonel (Ret.) Douglas A. Macgregor, "Futures Seminar Presentation," briefing slides with scripted commentary (Washington DC, Burke-Macgregor Group LLC, March 30, 2015).

44. Ibid.; also see Douglas A. Macgregor, *Breaking the Phalanx: A New Design for Landpower in the 21st Century* (Westport, CT: Center for Strategic and International Studies, 1997); and Douglas A. Macgregor, *Transformation Under Fire: Revolutionizing How America Fights* (Westport, CT: Praeger, 2003).

45. Ray Odierno, "The Force of Tomorrow" *Foreign Policy* (February 4, 2013) http://foreignpolicy.com/2013/02/04/the-force-of-tomorrow/ (accessed April 13, 2015)

46. Ibid.

dimension with a full understanding of the cultural environment in which they are operating.[47]

Recommendations

Our current IBCTs, SBCTs, and ABCTs offer a good starting point for building our future maneuver formations. While these BCTs are designed as GP forces, they arguably lack the depth necessary to conduct autonomous operations and are not designed to be tailored to meet the operational needs of a joint force commander. This author provides three recommendations when considering modifications to our current BCTs:

1. Maintain GP Forces. We must continue to build GP forces organized around the principle of fighting – manned, trained and equipped to conduct full spectrum military operations vice a particular type of operations. We must avoid the temptation to build a light infantry constabulary force optimized for lower end of the conflict spectrum operations or a force split between special purpose (SP) and GP fighting forces. This recommendation does not imply that we should forego increasing our Special Forces (SF) capacity. We must also develop DOTMLPF-P solutions to capitalize on SF capabilities in our GP formations in order to gain a better understanding of future operating environments.

2. Maintain BCT-like maneuver formations. We must design our GP forces capable to defeat the most dangerous conventional threats that we could potentially encounter in the next 20 to 30 years. Future maneuver formations must be designed to operate autonomously, tailorable to quickly meet mission requirements, and centered on the pillars of mobility, firepower, and protection. They should not be significantly larger than our current BCTs and should remain commanded by a Colonel. We should expect the deployment of forces significantly smaller than BCTs in future operations.

3. Avoid over-specialization. We must avoid over-specialization of our GP forces. The current organization of IBCTs, SBCTs, and ABCTs enables the Army to effectively conduct joint combined arms operations across the full spectrum of operations. The Army should avoid complicating these three divisions of GP forces by unnecessary specialization of

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47. Ibid.

formations which arguably makes them function less as GP forces. The Army must also ensure our GP forces immediately invest in training necessary to regain and maintain their dominance in conventional fighting skills.

Conclusion

This paper highlights the purpose, key concepts, and challenges of the AOC and explains how the Army envisions the employment of Landpower in the 21st century to achieve strategic objectives in peace, conflict, and war. This author posits the Army should organize, man, train and equip a general purpose fighting force that can be tailored to meet the unknown challenges of the future operating environment. The Army must remain prepared to defend the homeland, foster security around the world, project power, and win our nation's wars. A general purpose fighting force provides a proper foundation for winning in the complex world of the 21st century.

Preserving the U.S. Army's Land Combat Power

Colonel David M. Knych

As U.S. policy-makers attempt to define the future strategic environment and make decisions about the type of forces and capabilities the Army will require, it is easy to be influenced by today's budgetary climate and, in the wake of two recent wars, the perceived reluctance of political leaders and the American public to contemplate future large-scale employment of land forces for political ends. Defense experts inside and outside government are increasingly emphasizing the need to shift resources from ground forces towards naval, air and special operations forces.[1] The temptation is to cut deeply into the fundamental and unique capability provided by the U.S. Army through conventional ground combat employment, currently residing in the Brigade Combat Team (BCT) force structure, and focus more of available resources on those capabilities the Army provides to the Joint Force (e.g. missile defense, logistics, engineering, rotary wing aviation, special operations forces). However, policy and decision-makers must avoid being trapped in the belief that Landpower is becoming less relevant. They also must avoid underestimating the unique and important contribution Army conventional combat power provides to the Joint fight.

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1. "U.S. Ground Force Capabilities through 2020," *Center for Strategic and International Studies* (October 2011): VI.

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Though we want to look to the future and not be fixated on past wars, history suggests that the application of Landpower remains both a paramount mission for the Army and also a critical element of U.S. national power. U.S. Landpower remains as relevant and necessary today as it has throughout American history. The United States routinely finds itself engaged in mid-to-large scale land force interventions abroad, often within just a few years of politicians publicly eschewing the likely future employment of such forces. "History has demonstrated that every post-Cold War president has come into office vowing to avoid large, costly, foreign interventions requiring tens of thousands of 'boots on the ground,' only to have their hand forced by unforeseen events," according to the Center for Strategic and International Studies.[2] The reality is that civilian leaders will continue to need options to deal with complex, uncertain threats and the U.S. Army is the only service within the Joint Force, capable of applying the most extreme measures amongst those options (e.g. ground invasion, ground combat, and wide area security) for a sustained duration. Diminishing the Army's conventional ground force capability would result in restricting presidential options to address conflicts or threats.[3]

Then Secretary of Defense Robert Gates stated in 2011, "any future defense secretary who advises the president to again send a big American land army into Asia or into the Middle East or Africa should 'have his head examined.'"[4] Yet, just three years later, the United States sent some 3,000 soldiers back to Iraq to lead multinational efforts in an effort to defeat the Islamic State of Iraq and the Levant (ISIL), and recent polls show that more than 60 percent of Americans believe the United States should send combat troops there to defeat ISIL.[5] We have seen similar hopes for a diminished requirement for conventional ground forces in the past – following World War II, the Korean War, Vietnam, Desert Storm, and the Balkans. Today, all told, forces from

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2. Ibid.

3. Ibid., VII.

4. Robert M. Gates, Speech delivered at the United States Military Academy (West Point, NY) February 25, 2011. http://www.defense.gov/speeches/speech.aspx?speechid=1539 (accessed May 18, 2015)

5. Quinnipiac Poll, March 4th 2015: http://www.quinnipiac.edu/news-and-events/quinnipiac-university-poll/national/release-detail?ReleaseID=2171 (accessed March 15, 2015)

nine out of the ten remaining Regular Army divisions are deployed to Africa, Afghanistan, Jordan, Korea and Europe.[6] It is difficult to predict what threats or conflicts may require the employment of Landpower; however, the Army must be prepared for that eventuality.

According to the U.S. Army Operating Concept 2020-2040, "State and non-state actors [will] employ traditional, unconventional, and hybrid strategies" to challenge the U.S.' competitive and technological advantages.[7] Military professionals can expect the character of warfare and conflict to become increasingly volatile, uncertain, complex, and ambiguous. This will require U.S. land forces capable of conducting missions in the homeland or foreign lands encompassing the full range of potential operations (Defense Support to Civil Authorities, Disaster Relief, Security Cooperation, Crisis Response, or large-scale combat operations). As the Army's Operating Concept describes, "… the employment of land forces will remain essential to achieve political outcomes."[8]

U.S. Landpower is decisive. It is capable of compelling adversaries; exerting control over populations and nations. When looking at all instruments of national power (diplomatic, economic, information), and military power (air, sea, land), all are capable of *denying* the adversary control over their respective domains. However, as Lukas Milevski points out, Landpower is the only tool capable of not just *denying* the adversary control of a specific domain, but actually wresting complete control from that adversary.[9] You can deny the enemy use of his air, sea, economic, and cyber capabilities through other instruments, but he can still remain in control of the land and its people until you put soldiers on the ground to seize control. As T.R. Ferhernbach put it, "…

6. John M. McHugh and General Raymond T. Odierno, *A Statement on the Posture of the United States Army 2015*, submitted to the Committees and Subcommittees of the United States Senate and United States House of Representatives, 1st Session, 114th Congress (United States Army, March 2015), 6. http://www.army.mil/e2/rv5_downloads/aps/aps_2015.pdf (accessed May 18, 2015)

7. *U.S. Army Operating Concept, Win in a Complex World 2020-2040*, TRADOC Pamphlet 525-3-1 (Ft. Eustis, VA: HQ TRADOC, 7 October 2014) 15, para 2-6. http://www.g8.army.mil/pdf/Army_Operating_Concept_TP_525-3-1_7Oct2014.pdf.

8. Ibid., 9, para 2-1,c.

9. Lukas Milevski, "Fortissimus Inter Pares: The Utility of Landpower in Grand Strategy" *Parameters* 42.2 (Summer 2012): 6-15. http://strategicstudiesinstitute.army.mil/pubs/parameters/Articles/2012summer/Milevski.pdf

you may fly over a land forever; you may bomb it, atomize it, pulverize it, and wipe it clean of life—but if you desire to defend it, protect it, and keep it for civilization, you must do this on the ground…by putting your young men in the mud."[10]

The Army's primary Landpower capability currently resides in its BCT structure. "BCTs are the Army's combat power building blocks for maneuver, and the smallest combined arms unit that can be committed independently."[11] They are capable of full spectrum operations and are flexible, scalable, tailorable and interchangeable. In the future, highly-uncertain security environment such capability needs to be preserved. BCTs or similar formations capable of combined arms maneuver will be needed to provide rotational forces and to posture for rapid global response.[12]

The declining U.S. military footprint overseas makes robust security cooperation increasingly important in shaping the environment. Historically, the Army's presence and engagement abroad has helped to preserve U.S. access, basing and influence with our partners and allies. Landpower presence reassures partners and allies and instills confidence in the United States and helps to reduce conflict. Less permanent presence overseas will require greater use of rotational units, from regionally-aligned BCTs, to participate in multinational exercises and engagements abroad. The Army's role in this is particularly important, since the greatest preponderance of adversary military forces are land forces or ground security forces. The U.S. Army, as part of the Joint Force, will either need to be employed to defeat such forces in any potential conflict or will need to partner with these forces to shape the environment, prevent conflict, or engage in coalition warfare. All of this suggests that continued investments in preserving the fundamental combined arms maneuver capability as well as its Phase 0 security assistance, military to military engagement and multinational partnering will be key to the joint, inter-organizational, and multinational team.

Technology will continue to advance and humans will develop ever more efficient, more precise, and less risky methods of warfare.

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10. T.R. Fehrenbach, *This Kind of War* (Brassey, 1994): 290.

11. FM 3-90.6, *The Brigade Combat Team* (Headquarters, the Department of the Army, September 2010), 1-1.

12. *Win in a Complex World*, 17, para 3-3a and b.

However, regardless of the predicted technological advances, it is likely that putting American soldiers on the ground in conflict areas will be the only real means of exerting control over future adversaries. We cannot fully predict all of the potential technological advances when looking 25-30 years into the future, but we can look back to history to see what unique capabilities the Army has historically provided and ascertain from it that its conventional Landpower role will remain as relevant in future decades as it always has been. Warfare will remain a human endeavor despite humanity's continued attempts, with the aid of technology, to develop more efficient, more precise, and less risky means of defeating adversaries. However, as we look to the future to answer questions about what type of Army the United States Army needs in 2030-2040, we find it looks very much like our past.

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STRENGTH *and* WISDOM

The Army Service Component Command: Critical to Force 2025 and Beyond

Colonel Robert V. Urquhart, Jr.

I n describing the importance of understanding future conflict in developing future military capabilities, the UK historian Sir Michael Howard observed, "No matter how clearly one thinks, it is impossible to anticipate precisely the character of future conflict. The key is to not be so far off the mark that it becomes impossible to adjust once that character is revealed."[1] The challenge for the U.S. Army is to provide relevant future Army capabilities to the Joint force in order to achieve U.S. National policy objectives in a complex world – and do so in a fiscally responsible manner.

The Army Service Component Command (ASCC) is the foundational structure for Army land forces in the Joint force due to its assigned relationship to Combatant Commands. Unfortunately though, the Army routinely focuses capabilities development at the Brigade Combat Team (BCT) level and too often sacrifices the capacity and capabilities of the tactical and operational headquarters (Division to ASCC) to retain BCT capacity. The future capacity and capabilities of the ASCC will be critical to retaining an operational landpower headquarters that

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1. U.S. Department of the Army, *The Army Operating Concept Win in a Complex World,* TRADOC Pamphlet 525-3-1 (Washington, DC: U.S. Department of the Army, October 31, 2014), iv.

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provides flexibility and options for the Combatant Commander and national leaders in securing vital U.S. interests. The ASCC provides unique and valuable capacity and capabilities to the Army, Combatant Commands, and the Joint force. Unlike other service component headquarters, the ASCC provides a forward presence which supports all phases of joint operations: set the overall theater, prevent conflicts, shape security environments, and deter adversaries. [2] These activities must be considered as the Army looks to Force 2025 and beyond.

The Future Operating Environment

As the U.S. attempts to define and redefine the future global/regional security environment, policymakers are wise to heed Sir Michael Howard's comment about defining future conflict in determining future capabilities. It will be paramount for the United States to retain the adaptability and flexibility to adjust to shape security environments, deter adversaries, and win conflicts. Many U.S. government strategic documents broadly state the future environment is one confronted by an increasingly set of complex challenges and opportunities requiring the integrated use of all instruments of national power to achieve U.S. policy objectives.[3] Current assessments and projections describe the future environment as more ambiguous with multiple layers of complexity and a range of adversaries who will challenge the Army's capacity and capabilities.[4]

The future operational environment of 2025 and beyond has been described as a diverse array of adversaries (state, non-state, criminal, terrorists, proxies, and transnational organizations) who will use the full array of conventional, irregular, and hybrid ways and means anywhere in the world.[5] The Army Operating Concept (AOC) describes these

2. For the purposes of this paper forward presence is defined as maintaining forward-deployed or stationed forces overseas to demonstrate national resolve, strengthen alliances, dissuade potential adversaries, and enhance the ability to respond quickly to contingencies. See U.S. Joint Chiefs of Staff, *Department of Defense Dictionary of Military and Associated Terms*, Joint Publication 1-02 (Washington, DC: U.S. Joint Chiefs of Staff, amended through 15 March 2015), 96.

3. Leon Panetta, *Sustaining U.S. Global Leadership: Priorities for 21ˢᵗ Century Defense* (Washington, DC: U.S. Department of Defense, January 2012), 1.

4. Training and Doctrine Command (TRADOC) G2, *Operational Environments to 2028: The Strategic Environment for Unified Land Operations* (August 2012), 13.

5. Ibid, 17.

future adversaries as asymmetric thinkers, focused on avoiding U.S. strengths, emulating U.S. capabilities, countering U.S. ability to project power and limit freedom of action, employing easily obtained technology to disrupt U.S. advantages in all domains, and who will accomplish their objectives by expanding their activities to the U.S. homeland.[6] Adversaries will seek to accomplish this by employing capabilities to create an anti-access/area denial (A2/AD) environment. No matter how the future is described, it is paramount the Army challenges the assumptions and assessment of the future environment, and dissect the continuities and changes in conflict to gain an informed understanding of the drivers of conflict in a particular region. Gaining situational understanding, as the Army commits landpower capabilities to the Joint force, is essential to preventing conflicts, shaping security environments, and deterring adversaries in the future.

The Army Operating Concept (AOC)

The release of the AOC in late October 2014, provides the Army with the foundational concept and vision of how the Army in 2025 and beyond will support U.S. policy objectives. The AOC aim, as described by the TRADOC Commanding General, is "to increase clarity and focus on how future Army forces will operate, articulates how the Army provides the Joint force commander with options, and describes how the Army prevents conflict, shapes security environments, and wins wars."[7] Winning battles and campaigns at the tactical and operational level will not be sufficient in the future. Winning in the future will take the full integration and synchronization of all the instruments of national power in conjunction with multinational partners. According to the AOC, the Army must provide capacity and capabilities to the Joint force and national leaders that allows multiple options, integrates the efforts of multiple partners towards unity of effort, and synchronizes

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6. U.S. Department of the Army, *The Army Operating Concept Win in a Complex World*, 10.

7. General David G. Perkins, "Army Operating Concept: Delivering the Future," *Army*, October 2014, http://www.ausa.org/publications/armymagazine/archive/2014/Documents/11November14/Perkins_GRBook2014.pdf (accessed January 17, 2015), 70.

activities across multiple domains, all to present multiple dilemmas to our enemies and adversaries.[8]

The Army concept emphasizes landpower capacity and capabilities to project power across all domains to ensure freedom of action for the Joint force. It is Army leaders who synchronize the activities of multiple partners across the domains towards unity of effort in peace, conflict and war. To achieve the effects of joint combined arms operations, the Army must continuously shape the security environment by remaining regionally engaged, able to respond globally, situationally aware through action, and postured to set the theater for the Joint force. The employment of U.S. Army regionally aligned forces (RAF), alongside U.S. Army Special Operations Forces and engaged regionally with other Joint, Interorganizational, and Multinational (JIM) partners provide opportunities to develop relationships of trust. The Army can enable the United States and our partners to share critical information and intelligence and build capacity to provide options and flexibility for the Combatant Commander and national decision-makers. The Army's capacity for enduring forward presence (forces, HQs, and prepositioned equipment) and rotational forces provide the Joint force freedom of action. The role of the ASCC is a critical resource and platform in establishing access for the employment of the Joint force, enabling the projection of national power creating multiple dilemmas for our adversaries, and a visible sign of U.S. commitment to allies and partners in the region.

The Army Service Component Command and Theater Army

Since 1943 the Army has struggled (and learned) from the many efforts at employing a land component command headquarters to achieve military and policy objectives in a theater of operations/area of operations. In his Institute of Land Warfare Essay, *Unified and Joint Land Operations: Doctrine for Landpower*, Dr. John Bonin examined a number of historical vignettes (e.g., Kasserine Pass, Battle of the Bulge, Vietnam, etc.) in which a unified ground component was not identified or established. While Dr. Bonin cautions that the challenges encountered in these vignettes cannot be directly attributed to the lack

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8. U.S. Department of the Army, *The Army Operating Concept Win in a Complex World,* iii.

of a dedicated ground component headquarters, all of the operations were hampered by the joint force commanders' inability to control land operations.[9] There are however, also many examples of the successful employment of land component commands, from Normandy in 1944 to today's efforts in CENTCOM and PACOM AORs. These situations allow the joint force commander to ensure unity of land force effort and reduced overall span of control for the theater commanders – allowing them to focus on strategic activities.[10] The Army's recent revision of FM 3-94, *Theater Army, Corps and Division Operations*, coupled with Joint Publication 3-31, *Command and Control of Joint Land Operations*, has recognized the unique value of the Army's operational headquarters to the Combatant Command and Joint force.[11]

The Combatant Commander continually assesses the AOR to ensure Joint force options are readily available to accomplish campaign and policy objectives. In the land domain, the Combatant Commander relies on the ASCC to determine the right mix of landpower capabilities to prevent, shape, and win. The ASCC is an operational level headquarters assigned to the Geographical Combatant Command (GCC) to plan for, integrate, employ, and control landpower anywhere in the GCC AOR.[12] The ASCC has direct responsibilities to both the Combatant Commander for operational matters related to the employment of landpower capabilities, and to the Secretary of the Army for administrative matters related to U.S. Army forces assigned, attached, deployed or stationed in the GCC AOR under Title 10, U.S. Code.[13]

As the Theater Army for the GCC, the ASCC takes on many roles, tasks and responsibilities when supporting the Combatant Commanders overall theater campaign plan. The ASCC is organized, manned,

9. John A. Bonin, *Unified and Joint Land Operations: Doctrine for Landpower, Land Warfare Paper No. 102* (Arlington, VA: The Institute of Land Warfare, Association of the United States Army, August 2014), v.

10. Ibid.

11. FM 3-94 (Theater Army, Corps and Division Operations) replaced FM 3-93 (Theater Army Operations) in April 2014.

12. U.S. Department of the Army, *Theater Army, Corps and Division Operations*, Field Manual (FM) 3-94 (Washington, DC: U.S. Department of the Army, April 21, 2014), 2-1.

13. U.S. Department of the Army, *Army Commands, Army Service Component Commands, and Direct Reporting Units*, Army Regulation 10-87 (Washington, DC: U.S. Department of the Army, September 4, 2007), 4-10.

trained, and equipped to execute three major roles for the GCC, serve as the Theater Army for the GCC, with augmentation function as a Joint Task Force (JTF) for limited contingency operations in the AOR, and with augmentation function as a Joint Forces Land Component Command (JFLCC) for limited contingency operations in the AOR.[14] Four times since 2000, an ASCC has been the headquarters of choice for the JFLCC and/or the Coalition Forces Land Component Command (CFLCC) has been the ASCC.[15] There are a few reasons: habitual, assigned relationship with the Combatant Command between the ASCC and Combatant Command staffs; deeper and more abiding understanding of the area of responsibility due to regional alignment; and long term lasting relationships with regional ally and partner nation forces with whom the United States will partner with and support the building of their capacity. ASCCs provide the regional cultural competence the AOC seeks in the future and must retain it in order to build trust with regional partners. This trust facilitates access for the Joint force to provide flexibility for the Combatant Commander even when tactical landpower capabilities are not employed in a given theater. The ASCCs provide the Combatant Commander with the most responsive access to Army capabilities in the form of a robust regionally focused headquarters and theater enabling capabilities.

The Army has six (6) ASCC/Theater Armies assigned to GCCs and four (4) functional ASCCs assigned to the four functional Combatant Commands.[16] Though the Army has tried to standardize the organizational structure, manning, and responsibilities of each

14. U.S. Department of the Army, *Theater Army, Corps and Division Operations*, Field Manual (FM) 3-94, 1-5.

15. The first time a GCC designated a JFLCC was in 1998 when CENTCOM designated ARCENT as a JFLCC for operations in the Middle East. Since 2000, a GCC has designated an ASCC as a JFLCC/CFLCC to support and control land operations in the AOR. 2001 and 2003 ARCENT was designated a JFLCC and then a CFLCC by CENTCOM for operations in Afghanistan and Iraq. In 2013, USARPAC was designated a Theater JFLCC by PACOM to control all activities of the join land force. In 2014, ARCENT remains a CFLCC, as designated by CENTCOM, controlling integrated cross domain operations against ISIS in Iraq and Syria. See John A. Bonin, *Unified and Joint Land Operations: Doctrine for Landpower, Land Warfare Paper No. 102*, 7, 9-10, 14.

16. See Army Regulation (AR) 10-87 and the U.S. Army Homepage (http://www.army.mil/info/organization) for information and a full listing of ASCCs. The newest functional ASCC is U.S. Army Cyber Command which is assigned to U.S.

ASCC, each one is organized slightly different including functions, responsibilities, and different general officer rank level. This is due the nature of capabilities and support required by one Combatant Command over another.[17] The ASCCs are organized with three primary elements: main command post, contingency command post, and a headquarters and headquarters battalion. Additionally, the ASCC has several theater enabling capabilities assigned to it to support the Army and other services across the AOR. These enabling capabilities consist of: Theater Military Intelligence Brigade, Theater Sustainment Command, Theater Signal Command, Theater Medical Command, and Civil Affairs Command.[18] Other enabling capabilities consist of the Theater Aviation Command, Army Air and Missile Defense Command, Theater Engineer Command, and many other capabilities to support Army forces and other services.[19]

Value of the ASCC to Force 2025 and Beyond

Looking to the future, the Army acknowledges in the AOC it will not take on future threats unilaterally, but will do so as part of the Joint force, with Interorganizational members and multinational partners. The Army will support and integrate a whole of government approach towards unity of effort to prevent, shape, and win. The ASCC has proven itself over the last 13 years as capable of providing the invaluable link between tactical level activities and strategic objectives. It is these activities executed and controlled on land by the ASCC that enable assured access to a region, build long-term relationships and trust with our partners all in an efforts to create strategic maneuver space for the Combatant Commander and U.S. senior leaders.

The ASCCs are an absolute critical level of mission command capacity and capability the Army must retain in Force 2025 and beyond. While the Corps and Division headquarters remain the enduring headquarters for tactical land operations in the joint operating area, the ASCCs are

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Cyber Command was established on October 1, 2010 and will not be found in the 2007 version of AR 10-87.

17. U.S. Department of the Army, *Theater Army, Corps and Division Operations*, Field Manual (FM) 3-94, 2-15 – 2-20.

18. Ibid., 3-1.

19. Ibid, 3-8 – 3-14.

viable options for limited contingency operations and land campaigns and have distinct advantages to Corps and Divisions in an AOR:

- Corps and Divisions lack a habitual assigned relationship nor do they respond to daily Combatant Command requirements as the ASCC does.

- Corps and Divisions do not have the long term daily relationships with regional partners to facilitate trust and confidence towards building partner capacity.

- Corps and Divisions may not have the requisite cultural competence of the region to foster situational understanding in sanctuary as the AOC seeks to take advantage of in the future.

Corps and Divisions are valuable to the overall Army capacity and capabilities, but the Army should consider whether a Corps or Division is able to meet the Combatant Commander's requirements.

In the future, the value of the ASCC will be realized to be its ability to manage landpower and support JIM partners across all phases of joint operations, while continuing to support AOR-wide steady state activities to include security cooperation. This future requirement underscores the need for a robust theater army.[20] The ASCC's permanent assigned relationship to the GCC and, in most cases, a forward presence in the GCC AOR make it an indispensable capability the Army must retain in the future. If the Army maintains the regionally aligned forces (RAF) concept to 2025 and beyond, the ASCC is the critical link for RAF development of situational understanding in sanctuary, employment during theater security cooperation activities to shape security environments, and expeditionary operations to protect vital U.S. interests. ASCCs provide the key connectivity and bandwidth to conduct reach-back and reach forward activities enabling the rapid deployment of RAF assets and ability to transition quickly to execute joint combined arms operations with regional partners.

The nesting of Joint Pub 3-31, *Command and Control of Joint Land Operations*, and FM 3-94, *Theater Army, Corps and Division Operations*, is not without coincidence. Both documents acknowledge the requirement for Army operational and tactical level headquarters (above brigade combat team) to perform the roles and responsibilities

20. Ibid., 3-94, 2-6.

of a JFLCC and JTF when directed by the Combatant Commander. The requirement uniquely provides the Army with the necessary motivation to strongly consider the ASCC as a permanent JFLCC going forward to 2025 and beyond. Today, two ASCCs – U.S. Army Central (USARCENT) and U.S. Army Pacific (USARPAC) – have been designated as JFLCCs by two Combatant Commands, while still retaining their service obligations as an ASCC. The Army would be wise to assess how these two ASCCs function in the respective GCC AORs. Designation as a standing JFLCC has merit and validity in providing a standing Joint headquarters, with other integrated JIM partners, manned, trained and equipped to prevent, shape, and win throughout all phases of joint operations. It builds on the long lasting cultural competence the Joint force and Army seek of future leaders and service members. Finally, if this concept is considered and implemented, the Joint staff should evaluate and assess the possibility of authorizing joint credit for those who serve on the JFLCC staff.

Conclusion

As the Army continues to assess and evaluate the lessons of 13 years of conflict, endeavor to describe the future operational environment, and determine the Army Force of 2025 and beyond, it must consider retaining the capacity and capabilities of the ASCC. Each GCC has an ASCC assigned, organized and trained to provide a regionally focused long term forward Army presence in the GCC AOR. The ASCC in the future can continue to serve in essential roles as a theater Army for the GCC; a JTF with augmentation for limited contingency operations; and a JFLCC with augmentation for limited contingency operations. Today, Combatant Commands continue to designate ASCCs as a JFLCC to control land operations in the AOR, set the theater for the Joint force, support theater security cooperation activities with regional partners, and develop long term and lasting regional relationships with U.S. allies and partners. Going forward in the next 15-20 years, the ASCC will continue to prove its worth to the Army, the Combatant Command, JIM partners, and U.S. National leadership. The ASCC provides a platform where situational understand begins and networks of partner relationships form in the name of unity of effort towards common objectives. The Army, other services, and the Joint Staff should

give honest consideration to the significance of the ASCC organization as a permanent JFLCC to meet the GCC demands now and in the future. The structure provides the venue to integrate and synchronize all land forces (Army, Marine, and Special Forces) activities with the other domains (maritime, air, space, and cyber) to support the efforts of U.S. instruments of national power. Doing so facilitates the path of trust in partner relationships, enables access to counter A2/AD challenges, and provides opportunities to create strategic maneuver space for the Combatant Commander and U.S. national leadership.

Establish Permanent JFLCCs and Reduce or Eliminate Service Component Headquarters

Colonel Rodney Honeycutt

Operating in the environment beyond 2035 will require the Army to continue to create efficiencies and maximize resources. The purpose of this paper is to analyze and provide recommendations for future Army force design by highlighting efficiencies and effectiveness gained by the Commander, United States Pacific Command (USPACOM) in the application of land forces by establishing the Pacific Theater Joint Forces Land Component Commander (TJFLCC). The TJFLCC model in the PACOM AOR has the potential to evolve into the future standard land force command and control headquarters. The PACOM model highlights the current Army Operating Concept (AOC) of operating jointly.

In July 2013, as part of the "Pacific Rebalance," the Secretary of the Army elevated Commander, United States Army, Pacific (USARPAC) to a four-star general officer position. The elevation of USARPAC to a four-star command created an opportunity for the Commander, USPACOM to gain efficiencies and maximize the application of land force resources in the USPACOM Area of Responsibility (AOR). A September 2013 PACOM memorandum, "Initiating Directive -

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Designation of Theater Joint Forces Land Component Commander and Deputy" began this effort.[1]

In the directive Commander, USPACOM elaborated on streamlining the application of land forces as one component of a larger effort to operationalize the USAPCOM Headquarters. The directive designated the Commanding General, USARPAC as Commander, Theater Joint Forces Land Component and designated Commander, Marines Forces Pacific (MARFORPAC) as Deputy Commander. Special Operations Command, Pacific (SOCPAC) was also included in the TJFLCC. The USPACOM directive tasked the TJFLCC and each component individually. This is important because it signified the dual responsibility of each component's service-centric nature and simultaneously committed each to assisting in achieving Commander, USPACOM land force unity of effort.

The directive tasked USARPAC to execute a clearly joint mission, but did not provide the personnel authorizations nor the resources necessary to accomplish the joint mission. By directing each service to participate "within resource constraints," the PACOM CDR risked creating an environment in which the services do not fully participate because of constrained resources in meeting other competing demands. In addition the directive did not give the TJFLCC tactical control (TACON) of other Pacific land forces as suggested in Joint Pub 3-31, "The JFLCC will normally be delegated TACON of other Service forces. The JFLCC and staff must understand the capabilities and limitations of other Service forces."[2]

In November 2013, USARPAC established an initial TJFLCC-Coordination Center (TJFLCC-CC) operating capability comprised of eighteen personnel detailed from across the USARPAC staff. Six months later, in May 2014, the JFLCC-CC was still comprised of all Army personnel with proposals to fill some of the billets with MARFORPAC and SOCPAC personnel. A troop-to-task analysis

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1. Commander, U.S. Pacific Command (PACOM) S J. Locklear, III, "Initiating Directive – Designation of Theater Joint Forces Land Component Commander and Deputy," Memorandum For Commanding General. U.S. Army Pacific Command Commander, Marine Forces Pacific, Camp H.M. Smith, Hawaii, September 12, 2013.

2. *Command and Control for Joint Land Operations*, Joint Publication 3-13 (Washington, DC: U.S. Joint Chiefs of Staff, 24 February 2014). http://www.dtic. mil/doctrine/new_pubs/jp3_31.pdf (accessed January 2015): P II-9

and personnel turnover further reduced the number of USARPAC personnel operating in the TJFLCC-CC to fifteen. A little over a year after starting operations, MARFORPAC and SOCPAC began to partially add personnel to the TJFLC-CC as required. In December 2014, MARFORPAC began placing full time liaisons in the TJFLC-CC. The JFLCC-CC was finally able to demonstrate joint operation capabilities through full-time Army officers and MARFORPAC and SOCPAC liaison officers – although the effort comes at a cost to other sections within the staffs of each of the contributing components. Permanently manning the TJFLCC-CC with joint personnel will require authorization documents. Establishing future authorization documents to include TJFLCC-CC will increase the effectiveness of the JFLCC and its ability synchronize Pacific Land Force operations. The current ad-hoc process is subject to loss of momentum and continuity.

Joint Publication 3-31 provides guidance for JFLCC manning, "The JFLCC's staff should, by necessity, be composed of personnel from each Service and various Department of Defense (DoD) organizations and other supporting agencies. This provides the JFLCC with staff members who have the expertise and experience to assist in making informed decisions."[3] Joint Pub 3-31 further explains, "new members are not simply liaisons; they are part of the JFLCC's staff and ensure the synchronized execution of joint land operations."[4] The TJFLC-CC could facilitate the transition to permanent joint land force command and control solution that could reduce the size and scope of the current USARPAC, MARFORPAC and SOCPAC headquarters operating in the AOR.

The TJFLCC designation creates a collaborative environment between the service land force components of PACOM. USARPAC, MARFORPAC, and SOCPAC have a forum to efficiently and effectively synchronize and collaborate planning and operation efforts. Formal land force synchronization and collaboration below the combatant commander level did not previously exist. This form of collaboration will become increasingly critical as resources become even more constrained. Joint Pub 3-31 states the advantages of designating a JFLCC as: "Unity of effort…synchronized and integrated land force

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3. *Command and Control for Joint Land Operations*, P II-7.
4. Ibid., II-8.

planning and execution (prioritization and therefore de-confliction of competing land force requirements)."[5]

In addition to unity of effort and unity of command, USPACOM realized resource effectiveness and efficiencies of an (ad-hoc) organization that reaches across service lines. Efficiencies include establishing and transmitting a land force Common Operating Picture (COP) for situational awareness, coordinated land force crisis planning, synchronization in achieving security cooperation objectives, and collaboration in setting the theater plans. As the TJFLCC continues to refine its purpose and mission, the ad-hoc organization should transition into a permanent organization with the ability and capabilities to operate in the Joint Interagency, Intergovernmental and Multinational (JIIM) environment.

Significant in the effort to enhance effectiveness is the collaboration and recommendations achieved through the TJLFCC battle rhythm and working groups. The TJFLCC-CC facilitates gathering information and presenting joint, collaborative recommendations to the TJFLCC command group (Commander, USARPAC and Commander, MARFORPAC). This detailed land force collaboration did not occur as smoothly prior to standing up the TJFLCC. TJFLCC coordination process includes maintaining the land force Common Operating Picture (COP), synchronizing crisis planning and executing battle rhythm events to identify opportunities, gaps, risks, and mitigation recommendations to the TJFLCC command group.

In addition to unity of effort and command, resource efficiencies are and can continue to be realized through the collaboration and synchronization that did not previously exist. The potential collaboration and synchronization includes, coordinated and synchronized land force crisis planning in order to present a collaborative land force recommendations, synchronized security cooperation objectives through the immediate de-confliction of key and senior leader engagements in the AOR and a combined setting-the-theater plans by synchronizing the availability of resources, de-conflicting objectives and coordinating efforts to share HADR sites, exercise and operation facilities.

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5. USCJCS, *Command and Control for Joint Land Operations*, P I-7.

In order to maintain joint momentum and land force component buy-in, the TJFLCC must produce qualitative and tangible results. Realizing maximum effectiveness and gaining efficiencies will require the TJFLC-CC to be manned full-time by personnel from each land force component. Each land force component should be represented full time with knowledgeable and experienced personnel to assist in the collaboration process. Additionally, the command authority of the TJFLCC should be addressed. The current coordinating authority leaves room for friction. A Tactical Control (TACON)[6] authority would be much cleaner and assist in facilitating increased unity of command and unity of effort. Although General Brook's, current Commander, USARPAC and TJFLCC, indicated the current "HANDCON" (Collaborating by handshakes) is working very well, he further noted that the pace of change and command authorities will remain at the discretion of the Commander, USPACOM.[7] Validating the effectiveness and efficiencies gained through the TJFLCC and TJFLC-CC in a resource constrained environment is necessary and could provide an option to reduce or eliminate land force service component headquarters operating in the Combatant Commands Area of Responsibility.

6. *Doctrine for the Armed Forces of the United States*, Joint Publication 1 (Washington, DC: U.S. Joint Chiefs of Staff, 25 March 2013) V-7, para 4. http://www.dtic.mil/doctrine/new_pubs/jp1.pdf (accessed March 28, 2015)

7. General Vincent Brooks, "USARPAC Information Brief" U.S. Army War College, Carlisle Barracks, PA, March 22, 2015, cited with permission.

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STRENGTH *and* WISDOM

The Defense of Duffer's Domain

Colonel Lance Oskey

Colonel Charles D. Smith awoke from his mandatory four-hour sleep session and climbed out of his lightweight sleeping bag. He still was not accustomed to the Army's newest device – the portable sleep chamber. The high tech sleep system monitored his vital signs and provided restorative deep sleep but reminded him more of the sleeping bags astronauts use in space. Like all good Infantrymen, he still packed his olive drab poncho liner he used as a platoon leader twenty years ago during the Iraq War surge. As Battle-Group commander, his combined arms formation was a lethal and agile 5,000 strong combat force light enough to able to deploy quickly and yet strong enough to finish most fights. This force was the early-deployed element to help stabilize regional aggression in the Caspian Sea country of Atropia.[1]

Colonel Smith quickly reviewed his calendar and intended to troop the lines as soon as possible. He worried that the Battle-Group's current disposition clustered at the small staging base adjacent to the port made his troops vulnerable. COL Smith's arrival six hours ago with the main body led to his decision to allow combat power to continue to build.

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1. Training and Doctrine Command, *Decisive Action Training Scenario* v 2.1, February 2014, https://atn.army.mil/tradoccommonsscenarios/docs/QuickLinks/DATE%202.1%20Feb%202014.pdf (accessed 24 May 2015).

Colonel Lance Oskey is an Infantry Officer who most recently served as the Deputy Brigade Commander for the 4th Brigade (506th Infantry Regiment), of the 101st Airborne Division. He is currently the Chief of Strategic Plans and Assessments (G5) for the United States Army Cadet Command and will next assume command of the 7th Brigade, ROTC. His Strategy Research Paper (SRP) presents Outcomes Based Training and Education (OBTE) as learning and education model for the Army.

Atropia

The Battle-Group Executive Officer (XO) assured him that security was set and that the logistical support structure was not yet established to support maneuver away from the port. The unmistakable earth shaking blast immediately made COL Smith question his decision. Withstanding his initial impulse to run to the direction of the attack, COL Smith quickly darted down the hallway to the operations center to determine the situation. His Battle Captain quickly called for a two-minute drill to apprise the commander of the situation. "Unknown explosion at the front gate of our compound" reported the Intel Sergeant. "Our estimate is that this attack will be followed by swarming Unmanned Aerial Vehicles (UAV) directed at this command post, and additional targeted strike attacks at our motor pool where most of our vehicles are preparing for movement later today." The young battle captain struggled to handle the various calls and text messages simultaneously entering the command post battle station, but managed to report that half of 1st Squadron's vehicles combat vehicles are now reported as combat ineffective. The Information and Media Officer

reported that the South Atropian People's Army (SAPA) – a Violent Extremist Organization had already claimed credit for the attack on social media. This report was in addition to previous reports of American aggression and "Colonial pursuits" widely rebroadcasted by the various regional media outlets. COL Smith immediately felt the heavy burden of command, as he knew that there were casualties associated with the reported vehicle losses. He let himself fall into a nearby chair and quickly directed his Air Squadron to launch and employ anti-swarm maneuvers. He directed his 2nd Squadron to adjust their security to cover the entire compound, and noted with satisfaction that his Fires Squadron was already firing counter-battery fires. This could all have been avoided, thought COL Smith as he sat down to send quick commander's Situation Report (SITREP) to his boss.

> 1. *Large bases and logistical clusters should be avoided as these provide lucrative, predictable targets to the enemy.*
>
> 2. *Disperse your forces to both protect them against enemy reconnaissance, while aggressively developing situational understanding while shaping the security environment. These actions require commanders to take prudent risks balancing force sustainment with the ability to develop the situation.*
>
> 3. *Do not wait for the enemy to shape the information battle space. Although the enemy is not limited by the truth, our forces must make the information battle space a contested environment.*

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COL Smith once again awoke from his portable sleep system and rushed to the Operations Center to find that no attack was imminent. He immediately task organized his subordinate squadrons into self-sustaining expeditionary task forces and deployed them forward into respective areas of operations. COL Smith tasked his XO and Support Squadron Commander to devise a concept of support that would allow for his forward deployed squadrons to maintain vital fuel, ammunition and water resupply despite being physically separated from the port of embarkation. COL Smith also tasked his Information and Media

Officer to begin a full information awareness program to inform the population of the mission. These actions occurred more quickly than COL Smith envisioned, as his subordinates were eager to deploy and had made preparations for the move and were merely awaiting authorizations. Twelve hours later, his entire battle group was now deployed across the province with one of his squadrons deployed adjacent to the town of Sumgayit, one squadron screening along the border, and one squadron serving as the battle group reserve on readiness status one – prepared to move immediately. Despite these prudent preparations, the Battle-Group found itself on the defensive as all reporting from their 1st Squadron abruptly ended. Backup communications in the form of tactical satellite radio as well as UAV over flight verified that 1st Squadron was under attack with smoke emitting from their headquarters. Upon further analysis, the smoke was from a series of Vehicle Born Improvised Explosive Devices (VBIEDs) that did not penetrate the perimeter, but did serve as a deception attack. The main attack consisted of a series of events which included a Radiological Dispersal Devise (RDD) detonation. Most of the damage occurred when a crude non-nuclear electromagnetic pulse detonation temporarily rendered most electronic communication ineffective. Preceding these attacks, the entire local network was under a series of cyber-attacks intended to gain information and alter protocols within the tactical network. The SAPA has quickly launched a media campaign claiming that these attacks are a result of U.S. forces employing illegal weaponry with the intent to destroy local populations. The means in which SAPA gained these capabilities resulted from a nexus of activity between local criminal networks which financed much of the operation, and sponsorship from the neighboring country of Minaria. These adversarial forces coalesced towards one purpose – area denial of U.S. forces.

COL Smith again prepared a SITREP:

> 1. *Physical dispersion and preparations for adversarial attacks are incomplete – preparations across the domains of air, space and cyber are of equal importance in the battlefield of the future.*

2. *The more complex the enemy scheme of maneuver, the more likely that these plans are predicated on a network of actions and actors. Intelligence preparation of the battlefield must begin early and remain constant in order to disrupt these actions.*

3. *Cyber, Information Operations (IO), Space and Joint enablers are all necessary for defense of future battlefields.*

4. *Local forces should be engaged when possible to help build a security buffer and establish local intelligence.*

5. *Constant synchronization with Special Operations Forces (SOF) must be maintained in order to harness unity of effort in the campaign. SOF unique ability to understand and destroy enemy networks is a force multiplier.*

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COL Smith abruptly jolted from his sleep to address tactical errors which he hoped were merely dreams induced from the combination of too much bad coffee and the flu-like symptoms that his advanced party warned him about – dubbed the "Atropian Flu" by his staff. COL Smith's bedside tactical monitor showed that his forces were still arrayed forward into the battlespace. The commander immediately contacted the Task Force liaison – the Major whose branch and service still remained unclear to him as this officer wore a completely grey sterile uniform but seemed to have a solid pulse of the local environment. The Liaison Officer (LNO) informed him that there is an ongoing operation to defeat enemy networks within the Battle-Group's area of operations, and he then outlined the multiple ongoing missions that could be complementary to his efforts. COL Smith interrupted the LNO and asked him to restart his brief as he quickly had all of his subordinate commanders uplinked to receive the same brief. The 1st Squadron Commander harnessed this information and immediately formed a task force comprised of one of his Combat Troops, a SOF detachment, and an element of local security force troops trusted and vetted by the SOF element. With the intelligence already gained from the SOF force, this task force attacked within six hours against an insurgency/

criminal network cell which was planning to launch a complex RAD attack. COL Smith directed his XO to cut short the morning update, and instead convene the Space Officer, Information and Media Officer, Air and Navy LNO and the civilian Cyber specialist to relook the existing space, cyber, and IO standard operating procedures – and then to modify these as necessary to gain the initiative against the enemy. The staff recommended a pre-emptive cyber strike against known adversaries. This cyber-attack was approved at the 2-Star level, and was assessed that this successful operation forestalled a SAPA offensive cyber-attack. Meanwhile, air elements from the Air Force and Navy were deployed to patrol the airspace in and around the force – this proactive measure was helpful in countering a UAV swarm attack attempt later that afternoon. Strategic space assets were redirected to support the Battle Groups operations to include various assets to include MASINT and IMINT resources. Lastly, humanitarian efforts in local villages coordinated by the Civil Affairs Officer in partnership with the Battle-Group's Department of State permanent cell allowed for the actions of the U.S. forces towards the local population to match the IO messages already being broadcasted locally and regionally. Later that evening, COL Smith was alerted that a local attack on his 1st Squadron was thwarted as the enemy effects were piecemealed and were easily repelled. This occurred despite the fact that the Squadron's tactical network (to include position navigation devises) was temporarily jammed. First Squadron's initial contact was gained with their unmanned vehicles. Manned air and ground elements successfully maneuvered under artillery fire to finish the fight. The 1st Squadron commander forced all of his units to execute battle drills in which they had to fight against the enemy despite the tactical network failure. This contingency training paid off today. COL Smith felt certain that he had gained the initiative and was on solid ground towards achieving his missions. Always on his guard, he sent a brief message to his commanders emphasizing the following actions:

> 1. *Early deployed forces must be self-contained Joint and Interagency Task Forces that can immediately leverage joint enablers, interagency force multipliers, and coalition partners. These forces must train together and remain stabilized throughout the deployment.*

2. *The concept of "gaining the initiative" as a phase of the operation is misleading. In most operations, U.S. forces will deploy when the adversary has weeks if not months of advanced preparations and as such they likely will have the tactical and operational initiative. U.S. forces will not "gain" the initiative, but will have to re-seize the initiative from their adversary.*

3. *Technological augmentation will provide units advantages, but this will not obviate the need for training in all weather and all environments. The 20th century advantage of technological and training efforts to "own the night" is no longer sufficient. The future force must "own the 3D battle space" to include IO, Cyber and Space. Even so, the future force must be able to fight without these augmentations and will need to face a situation in which they are overmatched locally, but are still able to forestall the enemy to allow for operational and strategic assets to deploy to reestablish local dominance. Complete tactical defeat in the future battlefield must not be allowed to occur, as the adversaries' media exploitation of this event could lead to strategic failure.*

4. *Warfare must be fought in all domains, using all elements of combat power. The ability to generate these effects in all domains must be resident in the Battle-Group.*

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The Army Platoon as a Joint Warfighting Combat Team

Colonel Bryan Laske

The U.S. Army Operating Concept recognizes Army forces will be essential components of joint operations to create sustainable political outcomes while defeating enemies and adversaries who will challenge U.S. advantages in all domains.[1] While budgets grow smaller, the Joint Force must be able to achieve national security objectives against threats that are increasingly difficult to define.[2] The environment in which military forces will operate continues to grow more complex. Hybrid threats that employ dynamic combinations of conventional, irregular, terrorist, and criminal capabilities will proliferate while state actors will increasingly utilize proxy forces, criminal organizations, orchestrated civil unrest, and non-governmental networks of computer hackers in concert with traditional war fighting capabilities to create instability.[3] Joint operations are critical to cope

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1. United States Army Training and Doctrine Command (USTRADOC), *The U.S. Army Operating Concept, Win in a Complex World 2020-2040*, TRADOC Pamphlet 525-3-1 (Washington, DC: U.S. Department of the Army, October 7, 2014), i.

2. Martin E. Dempsey, *18th Chairman's 2nd Term Strategic Direction to the Joint Force 2014* (Washington, DC: U.S. Department of Defense, 2014), 5.

3. John M. McHugh and Raymond T. Odierno, *The Army Vision, Strategic Advantage in a Complex World* (Washington, DC: U.S. Department of the Army, 2014), 5.

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with such complexity, and the Army's contribution must provide unique capabilities and multiple options.[4]

The environment discussed above coupled with decreasing Department of Defense (DoD) budgets and end-strengths require the Army to maximize the use of technology and joint capabilities at the lowest level to empower smaller units to perform the tasks and cover the operational areas that have formerly been the responsibility of larger elements. The Army platoon has traditionally relied upon direct control of only the leadership and maneuver war fighting functions to perform its tasks. To succeed in the modern and future complex environment, it must have the ability to directly employ all war fighting functions through organic capabilities dedicated to the platoon and its squads.

The Army has identified the following capabilities as critical to being an essential component of joint operations and to win in a complex environment:

1. Provide foundation for joint operations
2. Deploy and transition rapidly
3. Develop the situation in close contact
4. Maneuver from multiple locations and domains
5. Present multiple dilemmas to the enemy
6. Operate dispersed while maintaining mutual support
7. Integrate partners
8. Consolidate gains[5]

To accomplish these tasks and to decrease the seam between shaping and fighting the fight, the Army must design and build organizations that can rapidly move information, enhance decision-making, and apply capabilities across expanses of geography in complex environments. While technical solutions to these capabilities continue to emerge, without the establishment of organizational capabilities at the platoon-level, technical advances cannot be employed to their fullest capacity and effect.

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4. USTRADOC, *The U.S. Army Operating Concept, Win in a Complex World 2020-2040*, i.

5. David G. Perkins, "'Win in a Complex World'— But How?," *Army AL&T* (January-March 2015, Fort Belvoir, VA), 107.

Lethal, protected, and situationally aware Soldiers and squads are the centerpiece of Army formations.[6] The complexities of the contemporary and future operating environments have elevated the squad's impact, yet, it is at this level that there is no appreciable overmatch capability against the current threat.[7] While lethal, protected, and situationally aware squads are an effective way to achieve the Army's vision and strategy, the means currently identified to empower these squads are overly reliant on technological advances and the squad's ability to employ them.

To provide the squad with improved lethality, protection and situational awareness, a platoon-level organization must exist to plan and execute operational concepts based upon internal intelligence collection and situational understanding; plan and employ joint fires to lethal effect; plan and employ physical and electronic countermeasures to provide protection; and collect, exploit, and fuse information to provide situational awareness. To connect the squad with information and joint, interagency, intergovernmental, and multinational capabilities required in a complex environment, the platoon must have a headquarters structure capable of collecting, analyzing, and synthesizing information and coordinating action from these partners. In order to employ technologies and capabilities that ensure Soldiers remain prepared for decisive action, a platoon-level organizational model must exist that contains the required expertise to effectively understand and manage the support systems required to sustain operations autonomously.

To fully exploit the potential of the squad's strategic impact and achieve appreciable overmatch capability against current and future threats, the Army must consider a platoon command post capable of employing joint capabilities to effectively perform tasks and control battle space currently assigned to larger formations. This will require the ability for platoons to conduct operations and intelligence fusion that is integrated with organic and higher echelon collection capabilities, adjacent and higher operational activities, organic and higher echelon exploitation assets, and joint mobility and fires capabilities.

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6. U.S. Department of the Army, *Army Equipment Modernization Strategy* (Washington, DC: U.S. Department of the Army, March 4, 2013) 3.

7. Kristin Molinaro, "Enemy strategy to 'bleed us by a thousand cuts' at squad level," October 12, 2011, http://www.army.mil/article/67106/ (accessed May 22, 2015)

The platoon command post must have robust mission command systems, organic Intelligence, Surveillance, and Reconnaissance (ISR) assets, analytical capability, a planning cell, and the ability to conduct consequence management. It must have a fires component that can employ joint fires as well as sniper or precision organic fires. Additionally, it must have the ability to employ unmanned reconnaissance and strike capabilities and maintain the ability to transfer these platforms down to the squad level for employment when required.

For mission support, the platoon headquarters must have embedded engineer, communications, medical, and sustainment capabilities that are interconnected with exploitation, geospatial, explosive ordinance disposal, and unmanned resupply capabilities. To enable mobile dispersed operations, it must be able to employ and maintain robust networked information systems, conduct terrain analysis, facilitate mobility and counter-mobility, employ sophisticated physical and electronic countermeasures, conduct logistics operations using unmanned systems, and deal with trauma injuries autonomously.
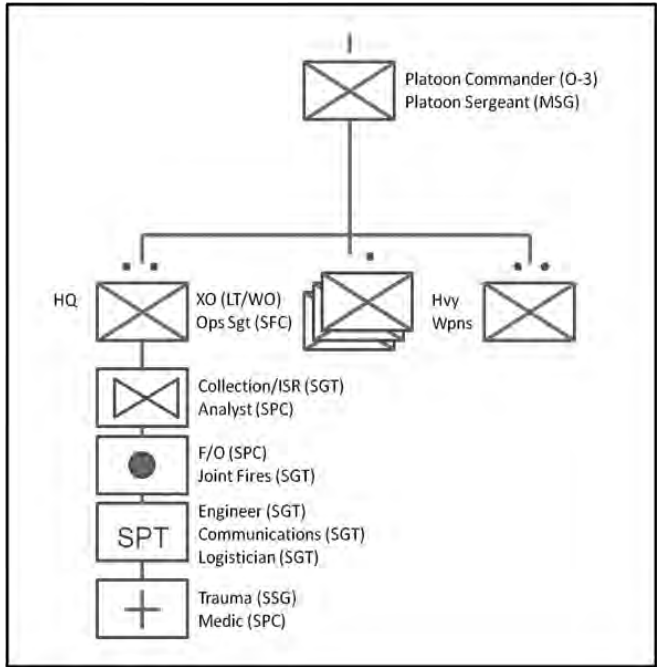

Figure 1. Proposed Platoon Task Organization

Figure 1 represents the key characteristics of the organization described above. This transformation will require significant change across the Doctrine, Organization, Training, Materiel, Leadership, Personnel, Facilities and Policy (DOTMLPF-P) spectrum. Unlike the development of the company intelligence support teams and company command posts employed in Afghanistan and Iraq, the Army must capture organizational changes in force generation models and codify their use in doctrine. In addition to incorporating mission command, intelligence, ISR, and protection systems, unit training and exercises must include joint and interagency partners to develop the capabilities and capacity required incorporate them into planning and effectively employ them. While this change is not dependent on material solutions, it is aimed at employing them more effectively at platoon level. As addition technical or material capabilities become available, additional capacity within the platoon headquarters may be required to operate systems.

The most significant impact this concept will have will be in the areas of leadership and personnel – especially in platoon leadership. The added responsibility and expertise required to employ the additional capability will require the position of platoon leader to rise above that of an entry-level position. The position will require the experience and leadership of a senior first lieutenant or captain. The expanded headquarters will require a second officer or warrant officer to coordinate actions and planning. Operations will continue to fall under the responsibilities of the platoon sergeant but, due to the increased level of complexity and capability may require a more senior non-commissioned officer than currently fills this position. The expanded intelligence functions of the platoon will require both collection and analytical personnel. The intelligence cell will be filled by junior non-commissioned officers from maneuver or military intelligence backgrounds and must have the ability to operate ISR platforms and conduct target exploitation. The fires cell will maintain the minimum ability to plan for and employ Army and U.S. Air Force manned and unmanned platforms. It will require dedicated U.S. Air Force controllers to ensure interoperability and currency to eliminate the requirement to train and validate this capability as part of a pre-deployment training requirement. Finally, the platoon mission support cell will require engineer, signal, medical

and logistics personnel. Like the intelligence cell, this cell will be filled by junior non-commissioned officers that have the ability to plan and execute operations within their areas expertise as well as operate and maintain systems that are critical to these operations.

The Army must pursue DoD policy to create enduring relationships to support joint and interagency participation at the platoon level. The Department of the Army must pursue agreements on core Army platoon capabilities and the resources and personnel to support comprehensive transformation that addresses performance goals, funding priorities, and accountability. The department must also pursue agreements with interagency partners to train and deploy as part of platoon-level organizations to meet Geographic Combatant Commander requirements in specific areas of operations.

For Army forces to effectively operate under the principles of mission command, platoons must be able to quickly generate their own mission concepts based on commander's intent and their unique understanding of their operational environment and take action to shape it or achieve decisive effects. By adapting the platoon headquarters, Army forces will not only develop the ability to effectively execute decentralized mission command but also provide the capability to quickly transition to centralized command and control to exploit targets or conduct consequence management if the situation dictates. They would establish the ability to operate across the operational spectrum at the lowest level and maximize autonomy by employing joint capabilities on ground mobility platforms or by moving quickly via rotary wing or intra-theater fixed wing platforms. Lastly, the Army would empower next-generation squad leaders with joint and intelligence capabilities to truly employ squads as the 'building block' of the Army.

An enabled platoon headquarters allows the Army to directly address the fundamentals of winning in a complex world. Army forces will be able to rapidly transfer joint capabilities to the lowest level possible, thus providing a foundation for joint operations within the force. By habitually training with joint fires, Command, Control, Communication, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR), exploitation, protection, and sustainment capabilities resident in platoon headquarters, larger formations will be

able to deploy without long lead-up training and rapidly transition to combat operations. These capabilities will enable platoons to develop situations while in close contact and, therefore, enable commanders at higher echelons to operate in a dispersed manner while maintaining mutual support. They will also allow larger formations to maneuver from multiple locations and domains thus presenting multiple dilemmas to the enemy. The platoon headquarters also provides a 'plug-in portal' for joint and interagency components, allowing Army forces to better integrate these partners at the point of employment rather than remotely applying their capabilities from higher echelons of command. Lastly, the situational understanding and joint, interagency, intergovernmental, and multinational capabilities enabled by the platoon headquarters will allow Army forces effectively consolidate gains.

This platoon organizational model will maintain the key characteristics required to develop the Army of 2025 and beyond described in the Army Vision. By increasing operational and intelligence fusion and employing joint and interagency capability directly, the platoon will be able to increase Army forces' agility and expertise in order to respond to unforeseen events and seamlessly transition across the range of military operations. The capabilities and expertise provided in this model will enable Army forces to rapidly identify and address complex problems as well as develop problem-solving techniques through self-education in order to adapt and achieve results. They will also further Army forces' interoperability by allowing them to better support joint, whole-of-government, and multinational land-based operations over much more dispersed areas. Habitual relationships with organizations and personnel providing these capabilities and expertise will increase Army forces' ability to rapidly deploy as well as aggregate and disaggregate forces to quickly and efficiently respond to operational demands. They will also increase Army forces' capability to operate effectively across the range of military operations and ensure an appropriate distribution of capabilities across the force.

In the absence of a predictable adversary, there is robust debate over the approach the U.S. Army must take to be prepared for future conflict. The complexity of future armed conflict will require Army forces capable of conducting missions in the homeland or in foreign lands including defense support of civil authorities, international

disaster relief and humanitarian assistance, and security cooperation.[8] Some believe the U.S. Army should be organized for unexpected, strategic surprise such as Korea in 1950 or Sarajevo in 1914.[9] Those with an eye toward technology believe that modern war – with modern technologies – relies on achieving information dominance using cyber and electronic warfare weapons.[10] Robert H. Simpson and Mark C. Smith provide an imperative for Army adaptation under fiscal austerity. They call for focused energy on making the internal adaptations to doctrine, organizations, training, materiel, leader development, and personnel that posture it to respond when the inevitable next first battle occurs.[11] Attention to this reasoning will allow the Army to establish a foundation for preparedness under any of these approaches. Decreasing DoD budgets and Army end-strengths require the Army to maximize the use of technology at the lowest level to empower the smallest unit possible to provide joint capability that can perform the tasks and cover the operational areas that have formerly been the responsibility of larger elements. To fully exploit the potential of the Army squad's strategic impact and achieve appreciable overmatch capability against current and future threats, the Army must consider a platoon command-post capable of employing joint capabilities to effectively perform tasks and control battle space currently assigned at much larger formations. The current model lacks capacity and responsiveness to employ the capabilities required to effectively operate in a complex environment. Empowering squads by linking them to joint capabilities and emerging technology through a robust joint and, potentially, interagency, intergovernmental, and multinational platoon headquarters will provide Army forces with a joint foundation that can decrease the gap between shaping and fighting the fight and establish lasting change within the building block of the Army.

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8. USTRADOC, *The U.S. Army Operating Concept, Win in a Complex World 2020-2040*, 7.

9. Douglas Macgregor, "Futures Seminar Presentation," briefing slides (Carlisle Barracks, PA, U.S. Army War College, March 31, 2015).

10. Cheryl Pellerin, "Work Details the Future of War at Army Defense College" (April 8, 2015), http://www.defense.gov/news/newsarticle.aspx?id=128550 (accessed May 22, 2015)

11. Robert H. Simpson and Mark C. Smith, "Army Adaptation from 1898 to the Present: How Army Leaders Balanced Strategic and Institutional Imperatives to Best Serve the Nation," *The Land Warfare Papers* (September 6, 2013), 6.

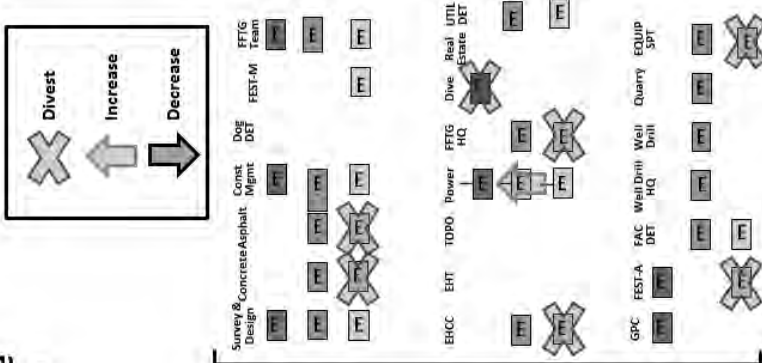# The Army Engineer Regiment and the Future

Colonel Mike Ellicott

The future operating environment requires a fundamental shift in focus and structure for the Army engineer regiment. The engineer regiment must provide the joint force with the expeditionary capability to understand terrain and location; enable strategic, operational and tactical movement and maneuver; defend the homeland and help shape the strategic environment. To accomplish this, the regiment must re-distribute those engineer forces currently outside of the Brigade Combat Teams. The U.S. Army Reserve (USAR) engineer force and structure must shift from a component that provides niche capabilities to a component that provides the joint force a source of high-demand engineer capacity on a consistent basis. Likewise, the EAB Army National Guard (ARNG) engineer force and structure must shift to better support a focus on state support, Defense Support of Civil Authorities (DSCA), and theater setting support to combatant commanders. Both the Army Active Component (AC) and the USAR must increase their capacity to provide geospatial engineering. To achieve this, the regiment must increase the numbers, flexibility and capability of its geospatial forces; divest or shift redundant and niche capabilities across all three components; and align resources to increase USAR engineer readiness while activating and deploying one fifth (1/5) of the USAR engineer force each year.

Colonel Mike Ellicott is an Engineer officer who served most recently as the Division Engineer for the 1st Armored Division. His next assignment is the Director for Engineering for Operation Inherent Resolve. His Strategy Research Paper (SRP) examines the future of the Engineer regiment.
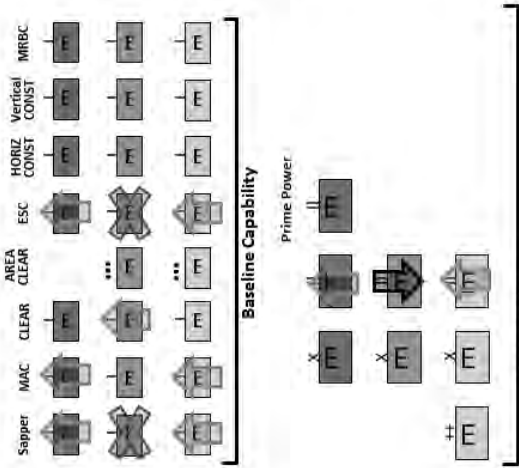
Figure 1. A Future Engineer Force. The changes highlighted above reflect the alignment of engineer regiment capabilities with future component focus. This is not a depiction of current or future MTOE composition.

The Engineer Regiment has 19% of its total force in the AC, 31% in the USAR and 50% in the ARNG.[1] Only 15% of echelons above brigade engineers are in the AC.[2] While we cannot predict the specific character of the future threat, trends indicate that the threat is not tied to nation-states, will be increasingly responsive and capable across all domains,[3] will seek to avoid the strengths of the U.S. military,[4] and will attack the homeland directly.[5] Recognizing that an attack on the homeland is likely and will undoubtedly have significant impact, it is important to acknowledge that the ARNG – in particular those units that provide disaster response and mitigation such as engineers, military police and CBRNE – are critical first responders. 50% of the total engineer force will likely not be available for deployment outside their home state, much less outside the U.S in support of the joint force. 50% of the total engineer force will be unavailable should the nation require a military response to <u>both</u> an attack on the homeland and a regional adversary (or two). The remaining 50% in the AC and in the USAR must provide both a rapid response and a sustained expeditionary support to the joint force. With the current force distribution and Quadrennial Defense Review guidance (defeat one adversary and deny a second adversary's objectives while simultaneously defending the <u>homeland</u>),[6] AC engineer capacity is insufficient to quickly support the

1. Jason Smallfield, "TTPs for employment of Brigade and Task Force Engineers," *Infantry Magazine* (January-March, 2014), 13, http://www.benning.army.mil/infantry/magazine/issues/2014/Jan-Mar/Smallfield.html (accessed January 18, 2015).

2. David C. Hill, "The Army Engineer Total Force: Transformation, Training and Leader Development," *TME The Military Engineer Online* (March-April, 2014) http://themilitaryengineer.com/index.php/staging/item/302-the-army-engineer-total-force (accessed on February 13 2015).

3. *Global Trends 2030: Alternative Worlds* (Washington, DC: National Intelligence Council, December 2012), ii, http://www.dni.gov/files/documents/GlobalTrends_2030.pdf (accessed on May 13, 2015).

4. U.S. Department of the Army, *The U.S. Army Operating Concept: Win in a Complex World 2020-2040*, TRADOC Pamphlet 525-3-1 (Fort Eustis, VA: Training and Doctrine Command, October 31, 2014), 10, http://www.tradoc.army.mil/tpubs/pams/tp525-3-1.pdf (accessed on January 18, 2015).

5. Paul B. Stares, *Preventive Priorities Survey 2015* (Washington, DC: Council on Foreign Relations, December 2014), 6, http://www.cfr.org/peace-conflict-and-human-rights/preventive-priorities-survey-2015/p33990 (accessed on 13 May 2015).

6. Charles T. Hagel, *Quadrennial Defense Review* (Washington, DC: U.S. Department of Defense, March 2014), vi, http://www.defense.gov/pubs/2014_Quadrennial_Defense_Review.pdf (accessed on 16 February 2015).

joint force – and the USAR and ARNG are unable to provide timely and sustained crisis response abroad. The Army Operating Concept (AOC) requirements to provide multiple options to the joint force, multiple dilemmas to the adversary and operate dispersed with the ability to rapidly aggregate exacerbates this shortfall.[7]

Army engineers build and maintain the cognitive (through terrain understanding) and physical links between the Air, Sea and Land domains for an expeditionary military. Those links make it possible for the joint force and nation to project power, enforce its will and achieve a sustainable positive outcome. Those cognitive and physical links between domains and across the land domain outside the U.S. must be a focus of AC and USAR engineers.

The engineer regiment delivers terrain understanding via geospatial engineering. Geospatial engineering provides "a clear understanding of the physical environment"[8] and "the foundation that supports the combat and general engineering."[9] The Army engineer regiment has geospatial engineering capacity in every Brigade Combat Team (BCT), almost every functional brigade, and in mission command nodes at the Division, Corps and Army Service Component Command (ASCC) – but none in EAB engineer battalions. This is a capability that will become more critical for the Army and joint force in the future.

As technology advances, the regiment must increase both its geospatial capacity and capability. Adversaries already contest U.S. dominance in electronic warfare and have the capability to deny U.S. access to the Position, Navigation and Timing (PNT) information that is the backbone of mission command and precision strike capabilities. With the regiment's long history as the nation's source for terrain understanding and its partnership in Geospatial Intelligence (GEOINT) cells within BCT-through-ASCC mission command nodes, Army engineers are uniquely suited and almost completely positioned to provide the joint force an alternate PNT solution to

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7. U.S. Department of the Army, *The U.S. Army Operating Concept; Win in a Complex World 2020-2040,* iii.

8. U.S. Department of the Army, *Engineer Operations,* Field Manual 3-34 (Washington, DC: Department of the Army, April 2, 2014), 1-2, http://armypubs. army.mil/doctrine/DR_pubs/dr_a/pdf/fm3_34.pdf (accessed on 16 February 2015).

9. Ibid, iv.

overcome that challenge. The regiment must develop new capabilities that use alternate methods and sensors to gather, process and distribute PNT and geospatial information to distributed, expeditionary joint forces. Gaining this expanded capability requires geospatial capacity within each EAB engineer battalion and the resources to develop the material and doctrinal solutions to use and exploit alternate geospatial information sources.

The ARNG EAB engineer force and structure must shift towards a strategic force aligned with homeland defense and theater-strategic missions. The engineer regiment provides an unequaled capability to respond quickly and to mitigate disaster within the homeland. The regiment's ARNG EAB forces also provide an invaluable strategic benefit via the State Partnership Program (SPP). The partnerships built within the homeland and abroad via the SPP are critical, and maintaining those relationships remains among the regiment's top priorities when it changes force structure and allocates resources.

Changes to the ARNG EAB engineer force structure must focus the ARNG engineers on capabilities that support the homeland and SPP initiatives. Remove the ARNG Sapper and Engineer Support Company (ESC) capabilities and harvest those billets to pay for the reshaped force structure. First priority for those billets is building a geospatial detachment in each AC and USAR engineer battalion headquarters. Next is increased Sapper, ESC and Mobility Augmentation Company (MAC) capacity in the AC and USAR. Final priority is building additional prime power and route clearance capacity in the ARNG.

Even with these changes, EAB ARNG engineer force structure retains tremendous capability. It maintains the majority of the baseline horizontal and vertical construction capacity, almost 50% of the bridging capability, and a preponderance of niche engineer capacities such as well drilling, fire-fighting and facilities/utilities maintenance. Creating prime power capacity in the ARNG explicitly places a critical disaster response capability within the most appropriate component, while adding route clearance capacity to the ARNG is a recognition of the strategic importance (and vulnerability) of the U.S. road transportation network.

USAR engineer force structure must shift from a provider of niche capabilities to a provider of high demand, like capabilities and it must provide those forces on a consistent, sustainable basis. Divest the USAR Concrete and Asphalt teams, Explosive Hazards Coordination Cells, Fire Fighting Headquarters, Equipment Support platoons, and FEST-As. Use the billets harvested to build additional Sapper, ESC and MAC capacity in the USAR. The increase in baseline capacity, available on a reoccurring basis, will enable the regiment to support the joint force with multiple movement options and provide the adversary multiple dilemmas.

Divest the AC dive capability. It is a low density capability better placed within the Naval Construction Regiment which can retain this capability and provide it to the joint force. Additionally, restrict any increase in engineer battalion headquarters within the AC and USAR to the absolute minimum. Any increase in mission command requirements should maximize the capability of existing C2 headquarters before additional headquarters are created. Engineer Support Companies rapidly deploy to dispersed, austere locations and construct expeditionary links between the domains. Increase the AC Engineer Support Company capacity to provide multiple movement options to the joint force. Increase the Mobility Augmentation Company capacity to ensure that once the expeditionary force arrives, it will be able to maneuver rapidly to achieve the joint force objective and increase sapper capacity to improve the regiment's flexibility.

The structural changes within the ARNG and the increase in geospatial capability and mobility capacity in the AC and USAR reinforce the shift in priorities for each component. While the shift in focus to the homeland and to theater-strategic support requires higher resourcing, the smaller ARNG force will have more resources for its still significant engineer forces. ARNG engineers remain the disaster response force of choice. Recognizing and aligning the ARNG engineer force with defense of the homeland and Phase 0 support to the combatant commanders is a regimental obligation. The USAR must be the source for both surge and sustained high demand forces and must increase readiness, activating one-fifth (1/5) of the USAR engineer force annually. Adding geospatial engineering capacity to the EAB battalion headquarters in the AC and USAR and creating the capability to solve

regional PNT challenges must be a priority for the engineer regiment. The development of technology, organization and doctrine to provide regional PNT and geospatial engineering via non-traditional solutions must start immediately, and must occur simultaneously with a resurgent geospatial engineer professional education effort. These changes are critical to preparing the regiment to support the nation at home and abroad and are the regiment's responsibility to the joint force.

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Mission Command and the Future Force

Colonel Michael A. Konczey

Mission command serves as a central concept for the Army and the Joint force. Its three pillars – mission command philosophy, mission command warfighting function, and mission command system – empower the Joint force leader of today and 2035 and beyond to "operate in a dynamic security environment"[1] which General Martin Dempsey, Chairman of the Joint Chiefs of Staff, characterized as "increasingly competitive and interconnected…threats that routinely span regional boundaries and can rapidly assume global dimensions."[2]

The mission command philosophy is the "exercise of authority and direction by the commander using mission orders to enable disciplined initiative within the commander's intent to empower agile and adaptive leaders in the conduct of unified land operations."[3] The mission command warfighting function is made up of "the related tasks and systems that develop and integrate those activities enabling a commander to balance the art of command and the science of control in order to integrate the other warfighting functions."[4] Finally, the mission

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1. Chairman of the Joint Chiefs of Staff, General Martin E. Dempsey, "Mission Command," 3.

2. Ibid.

3. U.S. Department of the Army, *Mission Command*, Army Doctrine Publication 6-0 (Washington DC: U.S. Department of the Army, May 17, 2012), iv.

4. Ibid.

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command system comprises the "personnel, networks, information systems, processes and procedures, and facilities and equipment" that enable mission command to flourish.[5]

Together, the system and the warfighting function enable the philosophy, with the focus on developing shared understanding across the organization. In essence, mission command is about how leaders command their units, their ability to communicate clear intent and to gain shared understanding and then to empower their subordinates through trusted relationships to exercise disciplined initiative within that intent.[6]

The mission command philosophy is the most important pillar. Its guiding principle, to "build cohesive teams through mutual trust," is fundamentally important. Trust is the "the moral sinew that binds"[7] teams and organizations together and is "one of the most basic and yet most critical components in a human relationship."[8] Trust is echoed across the four services in their values: Loyalty, Duty, Respect, Selfless Service, Honor, Integrity, and Personal Courage (Army);[9] Honor, Courage, and Commitment (Marine Corps and Navy);[10] and Integrity, Service, and Excellence (Air Force).[11] Trust within the military is essential to the good order and discipline of our armed forces. Trust is the contract, written in blood throughout our Nation's history that the Army, Marine Corps, Navy, and Air Force will be there to "provide the military forces needed to deter war and to protect the security of our country."[12]

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5. Ibid.

6. Michael A. Konczey, *An Army at Rest: Encouraging Mission Command in a Garrison Environment*, Strategy Research Project (Carlisle Barracks, PA: U.S. Army War College, April 1, 2015), 3.

7. Dempsey, "Mission Command," 6.

8. Linda K. Stroh, *Trust Rules: How to Tell the Good Guys from the Bad Guys in Work and Life*, (Westport, CT: Praeger Publications, 2007), 5.

9. The United States Army Home Page, http://www.army.mil/values/ (accessed May 16, 2015).

10. The United States Navy Home Page, http://www.navy.mil/navydata/nav_legacy.asp?id=193, and The United States Marine Corps Home Page, http://www.marines.com/history-heritage/principles-values (accessed May 16, 2015).

11. The United States Air Force Home Page, http://www.airforce.com/learn-about/our-values/ (accessed May 16, 2015).

12. U.S. Department of Defense Home Page, www.defense.gov/about/ (accessed May 16, 2015).

As our country enters one of the most diversely challenging chapters in its history, mission command, and the teams built on mutual trust, continue to play an important and necessary role in its success. Trust within our services remains high. The past decade-plus of sustained combat in Iraq and Afghanistan clearly demonstrated the high degree of trust within, and between, the respective services operating in this Joint environment, and the American people's trust in our Armed Forces. Likewise, the numerous partners and allies that served with us during Operations Iraqi Freedom, New Dawn, and Enduring Freedom demonstrated the high degree of trust they shared with our Armed Forces. However, in the increasingly competitive fight for annual budget dollars, a natural degree of distrust has begun to build between the services. This distrust stems from a competition between services for the same dollars, and in some cases, for the same capabilities.

Part of this competition is the cost of doing business. There is a finite amount of money available in the annual budget and each of the services compete with each other, as well as with all the other federal agencies, for their share of the budget. During the previous decade, the fight for defense dollars was not as fierce, due in part to Congress appropriating funds through overseas contingency operations (OCO) funding and continuing resolutions. This funding, above and beyond the base annual military budget, led to a great deal of redundancy in capability and capacity which was essential to the Central Command commander's need to fight simultaneously in Iraq and Afghanistan. Capability and capacity overlap occurred in manning increases in both the Army and the Marine Corps, as well as in system increases in areas such as unmanned aerial systems (UAS) fielded by the Army, Marine Corps, Navy and Air Force.

With the wars in Afghanistan and Iraq drawing to a close, along with the impact of the Budget Control Act (BCA) and sequestration, budgets are shrinking and the competition for defense dollars is increasing. As a result, the service secretaries and chiefs find themselves in a tougher fight to balance the financial challenges of manning, equipping, and modernizing their respective services.

This paper looks at two possible courses of action to remove the threat to trust between the services that arise from competition for funding.

These courses of action must ensure that we retain the units, and more importantly, the services, built on the trust that makes mission command successful.

The first course of action calls for assigning Service specific missions. Assigning each Service a specific mission set would address "one of the most significant shortfalls of previous QDRs [Quadrennial Defense Reviews]," which has been to "explain the central purposes of each of DoD's [Department of Defense] four military services."[13] Service specific missions would clearly delineate each service's responsibilities as they relate to fighting and winning America's future conflicts which, in turn, would serve to make the defense budget more efficient. First, such missions would articulate the capabilities each service is required to retain, which would reduce the redundancy in equipment and capability that currently exists. A perfect example of reduced capability lies with the Marine Corps. As a result of the need for increased capacity and capability during the wars in Iraq and Afghanistan, the Marine Corps "were forced to function as a second land Army."[14] To accomplish this, Congress authorized an increase of 22,000 active duty Marines.[15] As operations normalize, the Marines see themselves as a "middleweight force" and a service specific mission for the Marine Corps could find its sweet spot as an expeditionary force well suited to address the emerging Anti-Access/Area Denial (A2/AD) threat, perhaps focusing on "joint theater entry operations to establish control over maritime chokepoints, ports, and airbases."[16] Likewise, the Army's service specific mission could focus on "major hybrid conflict against enemies that have asymmetric capabilities."[17]

Second, service specific missions could clearly assign proponency or Executive Agency to a service in areas such as unmanned aerial systems

13. Mark Gunzinger, "Shaping America's Future Military: Toward a New Force Planning Construct," June 13, 2013, http://www.csbaonline.org/publications/2013/06/shaping-americas-future-military-toward-a-new-force-planning-construct/ (accessed May 18, 2015), 38.

14. Ibid., 47.

15. U.S. Congressional Budget Office, *Estimated Cost of the Administration's Proposal to Increase the Army's and the Marine Corps's Personnel Levels* (Washington, DC: Congressional Budget Office, April 16, 2007), 1. http://www.cbo.gov/sites/default/files/04-16-militaryendstrength.pdf (accessed May 18, 2015).

16. Gunzinger, "Shaping America's Future Military," 47 and 50.

17. Ibid., 50.

(UAS). Currently, all four services have their own UAS programs. In this case, assigning proponency would allow for centralized control of all UAS under one service and a reduction to one common UAS system, rather than the multiple (and different) systems that currently exist across all services. This would also reduce overhead costs, as well as investments in science and technology (S&T) research and repair part costs. Utilizing a common system should result in a reduction in S&T redundancy and less need for different lines of repair parts.

Service specific missions would also increase trust between the services. The new system would force the services to work together by creating interdependency, which would help sustain the relationships and mutual trust achieved during the past decade-plus of combat in Iraq and Afghanistan. It would also more closely meet the intent of the Goldwater-Nichols Department of Defense Reorganization Act of 1986, which aimed to better integrate the services in a Joint manner in order to "enhance the effectiveness of military operations."[18]

To be fair, service specific missions also have drawbacks. First, they reduce much of the redundancy accrued over the past decade-plus of conflict. Reducing this redundancy equates to a reduction in capability and capacity, which also reduces the flexibility afforded the President and combatant commanders. However, given the realities of BCA and sequestration, we may have no other choice than to reduce some of this redundancy.

The second course of action is much more controversial and calls for the merging of all services into one combined or Joint armed force. There are several advantages for this course of action. First, merging the services reduces the personnel and infrastructure overhead. A "One Service" system would eliminate the need for the service chiefs and service headquarters, their large staffs, headquarters and associated infrastructure. These personnel savings could be converted to combat force structure and more senior and robust staffs for the combatant commands.

Second, merging the services would improve unity of command by removing at least two levels of staff bureaucracy across the strategic

18. Public Law 99-443, October 1, 1986, Goldwater-Nichols Department of Defense Reorganization Act of 1986, history.defense.gov/Portals/70/Documents/dod_reforms/Goldwater-NicholsDoDReordAct1986.pdf (accessed May 18, 2015).

to tactical spectrum. Unity of command translates into faster communication up and down the chains of command, quicker dissemination of orders, and more timely and accurate sharing of intelligence. Likewise, unity of command would also translate to increased trust across the one Joint force, having eliminated the need to compete against the other services.

Of course, this course of action is not without its drawbacks. One disadvantage includes the need to overcome 240 years of service history and culture. Merging the services into one Joint service would also require extensive work to redesign command and control systems; standardize operating procedures; formalize reporting, pay, promotion, assignment and retention policies. This alone would require time to develop and synchronize prior to the merger and would likely be costly and time consuming. Lastly, and most importantly, the transition could lead to a reduction in readiness as new organizations and procedures are established.

The Joint nature of the wars in Iraq and Afghanistan demonstrated the great degree of trust among our Armed Services. Mission command succeeded in these environments precisely because of this trust. Commanders empowered leaders at all levels across the Joint force to execute within their intent with tremendously positive results. This paper addressed two possible courses of action to sustain the trust that is critical to sustaining mission command in future conflicts. Clearly, both courses of action bring controversy. It is equally clear, however, that the days of OCO funding and continuing resolutions are behind us and the realities of the BCA and sequestration that will shape future defense budgets for the next decade and beyond will sharply increase inter-Service competition for dwindling defense dollars. It is therefore imperative that DoD takes the appropriate action to eliminate this competition and sustain inter- and intra-Service trust. Desperate times call for desperate measures.

Single U.S. Defense Force for the Future

Colonel Chris Lackovic

Budgetary realities, impending sequestration for the next seven years, and known/unknown capabilities gaps are the framework in which future strategic leaders will need to consider how best to effectively use scarce resources to ensure our national objectives are met. We need to efficiently utilize the precious, albeit dwindling, budgetary resources to ensure we have the proper balance of skills and technology to combat future threats with our military portion of the instruments of national power.

Traditionally, the four military Services (Army, Navy, Air Force, and Marines) have competed for finite resources and expended an inordinate amount of time, energy, and talent creating and "selling" their Service's specific narrative to civilian leadership. Effective engagement was critical since these elected officials controlled the purse strings to the Service's budget allocation and thus, the monetary support to the individual Service's strategic train, equip, man, and fight plans. The current narrative engagement has become so bloated that "the military's narrative and perception begins to outweigh the reality of the military,"[1]

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1. Richard I. McNamara, "How the Narrative Paradigm Affects Military Stories" (Gonzaga University, ProQuest Dissertations Publishing, May 9, 2014) http://search.proquest.com/docview/1554030823 (accessed May 18, 2015).

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causing our elected civilian leadership to question anything being presented by senior defense leadership.

This paper will describe how a future combined military force can provide a viable alternative to this construct that achieves a combined narrative to explain the new concept, and a consolidation of requirements through the approved Joint Capabilities Integration and Development System (JCIDS) process. Also, the nature of the ambiguous future will be covered as well as the enduring responsibility of the United States to stay globally engaged with the requisite capabilities to address any potential adversary or threat. The Coast Guard will still be providing a "homeland defensive" capability under the Department of Homeland Security, which may be augmented in law by the future single Title X Defense Force, but is not included in this research with the other Services.

Narrative Impacts

> *That's the essence of good communication: having the right intent up front and letting our actions speak for themselves. We shouldn't care if people don't like us; that isn't the goal. The goal is credibility. And we earn that over time.*
> —Admiral Michael G. Mullen (2009)[2]

The U.S. defense budget is shrinking and it is anticipated that the Service's individual funding levels will shrink commensurately, making each Service's narrative more critical than ever in "telling a good story" and defending each Service's bottom line with the civilian leadership in Congress. This individualistic focus on budgetary necessity is inefficient and doesn't provide for a common narrative for our country's defense. This current approach lacks what Aristotle would label as moderation in purpose and prevents each Service from walking a balanced path between Congressional oversight and individual Service's dictates for support.[3]

The National Defense Authorization Act (NDAA) provides the authorization for the Department of Defense (DoD) to exercise budget

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2. Michael G. Mullen, "Strategic Communication: Getting Back to Basics," *Foreign Policy*, August 28, 2009, http://foreignpolicy.com/2009/08/28/strategic-communication-getting-back-to-basics (accessed May 19, 2015).

3. Em Griffin, "A First Look at Communication Theory," *A First Look Chronicle*, 2015, http://www.afirstlook.com/changes_in_the_9th_edition (accessed May 18, 2015).

authority through a framework for each Service to submit its plan to fulfill its specific defense mission. The Presidential budget lays out each of the submissions of the individual Services in response to this budgetary authority.[4] Often, the individual Services tell very different narratives to support their submissions even at the detriment of the other Services. This "playing favorites" to congressional members doesn't show the urgency or relevance of any particular Service's need to fill a capability gap. It provides a venue for oration that rewards those with the best narrative with a greater share of the available budget which may not support our national security objectives.

Historically, our national budget has been getting smaller (as a percentage of GDP) each fiscal year and discretionary spending is being squeezed to offset rising entitlements, all the while, the interest on our national debt continues to rise. Sequestration is still a very real threat for the next seven years and consistent messaging by DoD is critical since there doesn't appear to be any "grand bargain" available to get the opposing sides of Congress to agree on a compromise package.[5] As a sustainable way to counter the effects of this bi-partisan stalemate, forming a single National Defense Force would provide a focused allocation of future resources for our nation's defense and create a credible response capability for our allies in times of crisis.

Currently, the four DoD Services compete for their budgets, prioritized requirements, and development of future technology-informed capabilities to combat a set of unknown future threats. They develop strategies that best suit their narratives and support their individual plans for providing their unique contribution to national defense. One of the most obvious results of this strategy-based budgeting paradigm is that eventually, the Service's money finds its way into specialized requirements such as distinctive uniforms and stand-alone technologies epitomizing the competition between Services.[6] This effect could be

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4. "National Defense Authorization Act (NDAA)," House Armed Services Committee Home Page, United States Congress, http://armedservices.house.gov/index.cfm/ndaa-home?p=ndaa (accessed May 19, 2015).

5. Kurt R. LaFrance, "Congressional Engagement: Keys to Success," *Defense Transportation Journal*, (March 2015): 24, in ProQuest (accessed May 18, 2015).

6. Nathaniel H. Sledge, "Defense Spending: Today's 'Broken' Budgeting Process Must Change," *Viewpoint* (November 2010): 18-20, in ProQuest (accessed May 18, 2015).

negated by development of a single defense force with one uniform and a singularly-focused technology exploitation policy.

JCIDS Process Impacts

> *The primary objective of the JCIDS process is to ensure the capabilities required by the joint warfighter are identified, along with their associated operational performance criteria.*
>
> —AcqNotes[7]

The JCIDS process was created to allow for a joint review and validation process for all of the Services to prevent development of redundant capabilities to fill requirement gaps and to efficiently allocate finite budgetary resources to the most beneficial and effective capabilities in consideration of a return on investment (ROI) methodology.[8] As stated earlier with the Service narratives, the JCIDS review boards are usually chaired by senior leadership that has little knowledge of the unique requirements of each Service and relies on the information provided by the Services to base a recommendation. The quality of the delivery of the capabilities required by each Service, along with their operational performance criteria, results in a "story telling" competition between the Services.[9] Requirements generation through the JCIDS process, along with its validation and approval system, leads to competition between the individual Services for prioritization of the scarce resources; we can anticipate this will be the "norm" in the future.

Since the JCIDS process relies on a narrative and the understanding of decision makers in the approval process, the individual Services often seek advocacy by senior defense leadership to "grease the skids" and increase the likelihood of approval when it comes to engagement with elected leadership and lobbyists. The Quadrennial Defense Review, NDAA, and Service specific guidance from senior leadership all shape guidance for future allocation of resources and prioritization of Service specific efforts in support of our national objectives. It is inefficient to have four separate Services under the DoD that work and support

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7. "JCIDS Process Overview," *Acquisition Notes*, http://acqnotes.com/acqnote/acquisitions/jcids-overview (accessed May 26, 2015).
   8. Ibid.
   9. Ibid.

competing and sometimes redundant or overlapping requirements. As former Secretary Gates said: "The problem isn't that there isn't enough money, but that the process for allocating resources is broken."[10]

A single National Defense Force construct would eliminate the practice of nepotism and salesmanship between individual Services and trusted senior leaders and create a single focal point for identification and resourcing of the national priority capability gaps in addressing our global engagement strategy. Elimination of the wasteful practice of individual Service's participation in the JCIDS process, with sometimes competing requirements, and properly utilizing this adequate and effective mechanism for identification and validation of requirements, will efficiently use future resources. Along with the value of focused and nationally relevant requirements determination based on national objectives will be the added bonus of ensuring a singular narrative from our military leadership to Congress and bolster our collective credibility with our elected civilian leadership.

Ambiguous Future

> *Every now and then someone will ask me about the Army of 2020*
> *and [how it will look]. It's not an end state; it's about transition.*
> —Lt. Gen. Keith Walker[11]

We can all agree that the future will be volatile, uncertain, complex, and ambiguous (VUCA), and despite our best efforts, still unrevealing as to where future major conflicts will occur. Recently, the DoD's concerns with reduced budgets has been distracted by events in Ukraine, Syria, and the administration's focus on Asia.[12] Since ambiguity is certain to be a part of any future planning, senior leaders must balance their response to current challenges with an eye to how events will impact the future in second and third order effects. Who would have imagined

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10. Sledge, "Defense Spending: Today's 'Broken' Budgeting Process Must Change," 18-20.

11. Janeene Yarber, "Versatility Critical to Future Army Capabilities," *Targeted News Service* (October 24, 2012): 2, in ProQuest (accessed May 20, 2015).

12. Gideon Rachman, "Obama's Asia Policy is distracted and Ambiguous," *The Financial Times*, April 21, 2014, http://search.proquest.com/docview/1526553029/fulltext?accountid=4444 (accessed May 18, 2015).

that "de-Baathification" efforts in Iraq would sow the seeds of dissent and unrest fueling the current crisis in the Middle East?[13]

It is often said that future conflicts will be unknown and that we need to be efficient in utilizing our scarce resources in preparing for this great ambiguity at the expense of more effectively utilizing current talent, technology and treasure to support our national objectives. Previous leaders (and especially their staffs) should have seen the future VUCA environment and considered the historical context of the various regions of the world when considering the long-term outcomes to the policies of the time. Their inability, or reluctance, to see future engagement in the global commons has led to our current policies being distracted and ambiguous and squandering our precious resources again (as in Iraq). The future force won't have the luxury of reengaging in areas of the world where we miscalculated due to the size of our force and a likely meager DoD budget. Combining available critical capabilities of each of the Service's domains (land, air, sea, cyber, and human) into a consolidated force with sustaining assets for transport and logistical support seems like a natural transition in efficiency and effectiveness.

The Army Operating Concept states that the future force will have to prevent conflicts, shape the environment in various global settings, and win our nation's wars as part of a joint concept utilizing the capabilities of multiple partner nations and agencies.[14] A single U.S. National Defense Force is an efficient option to consider in achieving our future strategic objectives. Although a consolidated and singularly funded entity devoid of inter-service fighting for resources makes sense, getting the political establishment to agree to form this single defense entity may be a different story all together.

Russia's actions in Eastern Ukraine, Iran's pursuit of nuclear technology, future unrest in the area of Moldova and the continued uncertainty in the Baltic region also support versatile, more adaptable, and quickly deployable forces with adequate capabilities to respond to ambiguous threats. The current Regionally Aligned Forces and the experimental

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13. Miranda Sissons and Abdulrazzaq Al-Saiedi, "A Bitter Legacy: De-Baathification in Iraq," March 2013, https://www.ictj.org/sites/default/files/ICTJ-Report-Iraq-De-Baathification-2013-ENG.pdf (accessed May 20, 2015).

14. Raymond T. Odierno, Chief of Staff of the Army, "Win in a Complex World," *The US Army Operating Concept*, TRADOC PAM 525-3-1 (October 31, 2014): i.

Global Response Force are two examples of how we can achieve an incremental transition to a future "all-in-one" construct between the Services during this critical unknown future.[15] These interim alignments would be a transitional effort by the Army which could be gradually infused with capabilities from the other Services for complete domain coverage by a future singular defense force.

Global Engagement

> *Global involvement looks different through the prism of 'crisis'; how the crisis consequently can bring a shift in how individuals imagine the 'global.'*
>
> —Kristin Loftsdottir[16]

The engagement of the United States in the world will not decline anytime in the foreseeable future as our allies are reducing their defense budgets and appear to be less willing to conform belligerents in their regions of the world. The United States may see itself acting more unilaterally than it wants to since many of our allies and many in the international community are more frequently ensnared by trade agreements and resource arrangements that, unfortunately, are controlled by these same belligerents.

A strong and capable U.S. military that is agile, ready, and trained to achieve superior "balance" in the effectiveness of the technological capabilities already in our formations will best serve our national objectives and bolster reliability for our allies throughout the world. Relying too much on sophisticated technology will achieve complex solutions that are too often cheaply defeated by a wise adversary. Economies of scale come into consideration when we have to use a very expensive weapon technology to defeat a relatively cheaper adversary's efforts to swarm our capabilities by sheer numbers of equipment in a type of "poor man's" asymmetric warfare.[17]

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15. Janeene Yarber, "Versatility Critical to Future Army Capabilities," *Targeted News Service* (October 24, 2012): 1, in ProQuest (accessed May 20, 2015).

16. Kristin Loftsdottir, *Crisis in the Nordic Nations: at the Intersection of Environment, Finance and Multiculturalism* (Burlington, VT: Ashgate, 2014), 162.

17. Michael Peck, "How the US Army Plans to Defeat the Unthinkable: Drone Swarms," *The National Interest*, http://nationalinterest.org/print/feature/how-the-us-

Options for providing affordable "cutting edge" technology seems to be even more exasperated with dwindling budgets. The United States. must strike a balance between a "good enough" technical solution, and the effective use of the other instruments of national power: diplomatic, information, military and economic (DIME) considerations for a whole of government approach to future global engagement.[18] We may no longer need to grasp for the brass ring of overmatch and concede that parity is good enough when combined with the effects of DIME. But this strategy relies on the acceptance of risk, which up until now, has been mitigated with endless funding.

Overcoming the great challenge of embracing a single defense force will require buy-in by senior leadership, both military and civilian, to gain the best advantages of each of the current Services' capabilities. This challenge will bring with it opportunities to design capabilities that are not joint in and of themselves, but which have the ability to adapt to the various domains to best counter future threats.[19] Command structure would also be reduced and allow for the consolidated funding stream to be allocated to build and train a smaller and more agile force with adequate sustainment capabilities, all tailored to specific global threats that are yet to be defined for the future.

Conclusion

> *The system has to change. Too much is at stake to allow the status quo to remain entrenched.*
>
> —Nathaniel H. Sledge[20]

Creation of a single national defense force is achievable under current laws and budgetary framework of the Planning, Programming, Budgeting, and Execution (PPBE) process through consolidation of a single defense narrative in justifying the ends for funding streams

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army-plans-defeat-the-unthinkable-drone-swarms-12057 (accessed May 20, 2015).

18. Brett D. Shehadey, "Putting the 'D' and 'I' Back in DIME, *In Homeland Security* (October 27, 2013) http://inhomelandsecurity.com/putting-the-d-and-i-back-in-dime (accessed May 20, 2015).

19. LaFrance, "Congressional Engagement: Keys to Success," 12-13.

20. Sledge, "Defense Spending: Today's 'Broken' Budgeting Process Must Change."

currently being allocated to the individual Services.[21] Senior defense leadership must consider the value and efficiency in combining future scarce resources for what is best for our country as a whole, rather than continue down the inefficient and ineffective practices of the past which limited every Service. This effective streamlining of the JCIDS process, holistically focused on the needs of the many (country) as opposed to the needs of the few (individual Services), will also help to address the inefficiencies built into our current acquisition process by better aligning our requirements with national objectives.

The creation of a single U.S. National Defense Force in the future will facilitate an efficient and effective tailoring of specific land, air, maritime, cyber, and human domain capabilities to counter any ambiguous future threats in our yet unknown future global engagement. Combining the various individual Service's capabilities into a single entity will provide a smaller force size, tailored capabilities for specific threats, an "appropriate" level of redundancy and the structural agility to adapt to the volatile environment. The flexibility of a pool of tailorable resources to call upon as needed to combat specific, yet undefined, threats with smaller formations will provide agility to respond and truly show a unified command structure under a single leadership chain.

The adoption of a single U.S. National Defense Force will end the current "turf wars" by commanders at various component and leadership levels, which is inefficient and requires time-intensive consensus building for global engagement. The current reality of current budgetary and force allocation between the individual Services will become a thing of the past as strategic leaders at all levels embrace the single National Defense Force concept and finally realize that "operational adaptability requires flexible organizations and flexible institutions."[22] As in war, effectively managing the fiscal opportunities of the future requires a combined government and military engagement involving both civilian and uniform leadership since the impact to our national defense is too important to be left solely to the generals.[23]

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21. Ibid.

22. Yarber, "Versatility Critical to Future Army Capabilities," 2.

23. Sledge, "Defense Spending: Today's 'Broken' Budgeting Process Must Change," 18-20.

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STRENGTH *and* WISDOM

Will Technology be an Advantage or a Vulnerability for the U.S. Army in 2030?

Lieutenant Colonel Jeffrey T. Van Cleave

Senior U.S. Army leaders have already begun designing the Army of 2030. According to Lieutenant General Legere, Deputy Chief of Staff, G-2: "The U.S. Army of 2030 must be responsive to our Combatant Commanders' and Nation's requirements in order to accomplish the mission – prevent, shape, win – in any operational environment, against a wide variety of enemies and adversaries."[1] General Legere described the 2030 future operating environment:

> The global operational environment is complex, characterized by a multitude of actors presenting a wide range of possible threats under conditions of uncertainty and chaos. Adversaries' regular forces, irregulars, our coalition partners, criminals, refugees, NGOs and others intermingle in this environment and interact in many ways. Each of these actors may have an agenda, often at odds with our objectives, those of other actors, and those of the existing political order. Besides a broad range of readily available conventional weapons, threats and malign forces can select from an

1. LTG Mary A. Legere, "The Operational Environment Through 2030," briefing slides, Carlisle Barracks, PA, U.S. Army War College, 2012.

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array of affordable technologies, adapting them to create unexpected and lethal weapons. Social media will enable even small groups to mobilize people and resources in ways that can quickly constrain or disrupt operations. This complex operating environment will continuously evolve as conditions change.[2]

Brigadier General Gary Brito, past Director of Force 2025 and Beyond, believes some trends we see today will likely continue through 2030, "[f]or example, individuals and non-state actors, terrorists, and nationalistic organizations will continue to take advantage of technologies to become more lethal and to have more global reach. The cyber domain will become more contested."[3]

The future operating environment will be complex with cheaper advanced technologies readily available to U.S. adversaries. The challenge for the Army in 2030 will be to protect its technological force and capabilities in multiple domains against adversarial cyber-attacks. The Army addresses this challenge in the updated Army Operating Concept (AOC). The AOC highlights twenty Army Warfighting Challenges which represent enduring principles the Army must address in order for the future force to be successful. Army Warfighting Challenge number seven identifies the problem:

> *The future Army force, as part of joint, interorganizational, and multinational (JIM) efforts, lacks the ability to provide fully integrated space and cyberspace capabilities across all warfighting functions at operational and tactical echelons, in contested, congestive, and competitive conditions, in order to support the commander.*[4]

This paper addresses the lack of cyber security at the tactical and operational level, the risks to a technologically advanced force, and the

2. Ibid.

3. BG Gary Brito, "Force 2025 and Beyond: The Way Ahead," February 6, 2015, linked from *Army Capabilities Integration Center* Home Page at "Army Warfighting Challenges," http://www.arcic.army.mil/Articles/f2025bd-Force-2025-and-Beyond-The-Way-Ahead.aspx (accessed May 22, 2015)

4. "AWFC FY15/7 Conduct Space and Cyber Electromagnetic Operations and Maintain Communications," linked from milSuite Home Page at "milWiki Army Warfighting Challenges," https://www.milsuite.mil/wiki/AWFC_FY15/7_Conduct_Space_and_Cyber_Electromagnetic_Operations_and_Maintain_Communications (accessed May 19, 2015)

slow acquisition process that could prevent the U.S. Army of 2030, "to prevent conflict, shape the security environment, and win wars."[5]

Future Technologies

According to General Perkins, the Commanding General of the Training and Doctrine Command (TRADOC), the Army assumes the future operating environment will be complex. The Army defines a future complex environment as an "environment that is not only unknown, but unknowable and constantly changing."[6] Additionally, "[t]he Army cannot predict who it will fight, where it will fight, and with what coalition it will fight. To win in a complex world, Army forces must provide the Joint Force with multiple options, integrate the efforts of multiple partners, operate across multiple domains, and present our enemies and adversaries with multiple dilemmas."[7]

In order to achieve General Perkins' vision for the Future Army, the Army must rely on technological advances that allow it to operate in multiple domains and develop a situational understanding of the complex operational environment within which it will operate. Intelligence acquired from space, air and cyber domains will help define the complexity of the operating environment. Unmanned aerial systems, space based systems, and cyberspace will help define the unknown and constantly changing environment and reduce unknowns.

Regardless of whether the Army continues to be centered on the Brigade Combat Team (BCT), or adopts a radically different force structure, the future Army will build new capabilities and adjust existing ones to meet emerging threats and achieve overmatch.[8] Advanced technologies such as robotics, automated systems, unmanned aerial systems (UAS), ground combat system (UGS), and precision weapons are currently in Army formations and will expand exponentially by 2030.

Army aviation is an example of the Army leveraging advanced technology to its advantage. The Army is divesting its OH-58 Kiowas

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5. U.S. Department of the Army, The Army Operating Concept, TRADOC Pamphlet 525-3-1, Washington DC: U.S. Department of the Army, October 31, 2014), iii.

   6. Ibid.

   7. Ibid.

   8. Ibid., 35.

and replacing them with UAS to pair with manned AH-64 Apaches as manned/unmanned teams. By 2030, it is highly likely that the Army will employ more unmanned aircraft than manned aircraft, a trend that is likely to spread across other Army formations. General Robert Cone, former TRADOC Commander, hinted at the possibilities when he spoke at the Army Aviation Symposium in 2014: "In the future, an Army brigade might have 3,000 human troops instead of 4,000, but a lot more robots."[9] Nevertheless, our adversaries will also have advanced technologies along with an increased ability to defeat or disrupt our technologies in the cyber and space domains.

Risk to the Future Army

In a recent speech at Stanford University, Secretary of Defense Carter described how advances in technology present a degree of risk in the wrong hands.

> *But in recent years, it's become clear that these same advances and technologies also present a degree of risk to the businesses, governments, militaries, and individual people who rely on them every day…making it easier, cheaper, and safer to threaten them. The same Internet that enables Wikipedia also allows terrorists to learn how to build a bomb. And the same technologies we use to target cruise missiles and jam enemy air defenses can be used against our own forces – and they're now available to the highest bidder. Whether it's the cloud, infrared cameras, or the GPS signals that provide navigation for ride-sharing apps, but also for aircraft carriers and our smart bombs – our reliance on technology has led to real vulnerabilities that our adversaries are eager to exploit.[10]*

General Dempsey, Chairman of the Joint Chiefs of Staff, argued that, "Global integrated operations demands a far greater capacity to see,

9. Alexis C. Madrigal, "The Future of the Army: Fewer Soldiers, More Robots, More 'Lethality,' Autonomous vehicles and robots won't be used just for Google," *theatlantic.com,* January 21, 2014, http://www.theatlantic.com/technology/archive/2014/01/the-future-of-the-army-fewer-soldiers-more-robots-more-lethality/283230/ (accessed May 22, 2015)

10. Secretary of Defense Ashton Carter, "The Sidney Drell Lecture," April 23, 2015, linked from *The Department of Defense Home Page* at "News Transcripts," http://www.defense.gov/Transcripts/Transcript.aspx?TranscriptID=5621 (accessed May 26, 2015)

understand, operate in and defend cyberspace. Our ability to do this is undermined by a lack of interoperability, cyber vulnerabilities, and the pace of technological change and associated costs. Together, these factors limit our ability to integrate an information environment within dynamic joint force operations."[11] By 2030, advances in technology will create vulnerabilities in cyber and space domains not only for the U.S. Army but for its adversaries as well.

The AOC predicts the United States will have less freedom of action across the global commons in the future: "The land, air, maritime, space, and cyberspace domains will become more contested as U.S. military technological advantages decrease."[12] The future Army has to put as much emphasis on protecting its technology as it does on developing its technology. A weaker adversary will not attack the Army's strength but will seek to exploit its weakness. Losing cyber and space domain dominance to an adversary degrades the future Army's technological strengths and levels the operational environment in the land domain.

Unfortunately, the Department of Defense (DoD) and U.S. Army's cumbersome acquisition process do not allow DoD or the Army to get into its adversaries observe, orient, decide, and act (OODA) Loop. The Army tends to reach for innovative technologies that cost too much and never make it to production. Two examples are the failed Future Combat System and the Ground Combat Vehicle programs in which the Army invested heavily in time, thought and money for a disproportionally small return. Acquisition programs that are high-buck and low-bang place the future Army and DoD at risk of losing their technological advantages. The future Army's adversaries will be in the Army's OODA loop by building cheaper, faster systems that can degrade and potentially disable the Army's technological advantages, thus creating a near-level operating environment.

Recommendations

General Perkins addressed developing the future force in the AOC: "We must assess our efforts continuously and be prepared to adapt to unexpected opportunities and unanticipated dangers. Our Army must

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11. General Martin Dempsey, "Joint Information Environment White Paper" (January 22, 2013), 4.

12. U.S. Department of the Army, *The Army Operating Concept*, 8.

continuously learn, adapt, and innovate."[13] As the future Army develops innovative technologies, it must continue to develop cyber security at the tactical and operational level and improve its current acquisition process in order to build and protect a technologically enhanced force in 2030 from future adversaries.

A future force development first principle the Army is to, "optimize performance of the Army through a force mix that accentuates relative strengths and mitigates weaknesses of each component."[14] The Army must focus on cyber security at the tactical and operational level in order to protect its vulnerable technological force in 2030. Furthermore, if interoperability is important to the U.S. Army, it must work with its joint, interorganizational, and multinational (JIM) partners. "As with innovation, cybersecurity also needs to be collaborative," Secretary Carter said to a group of Silicon Valley professionals:

> *The combined threat to military and other government systems, commercial intellectual property and allies' systems means that cyber defense has to involve all parties working together. With the growing number of state and non-state actors capable of carrying out sophisticated attacks, the cyber threat "is bigger than who we are as individuals, bigger than who we are as companies," and noting that one of the principle areas is…[w]orking with foreign allies and partners to build up their cyber capabilities.*[15]

If the U.S. Army is unable to protect its technological force at the tactical and operational level, then the Army will not be able to accentuate its strengths and mitigate its weaknesses. Technology will become a vulnerability and indeed the U.S. Army of 2030 will find itself facing multiple dilemmas in multiple domains.

Secretary Carter recently stated the need to fix DoD's slow acquisition process. "I don't want us to lose out on an innovative idea or capability we need because the Pentagon bureaucracy was too slow to fund something, or we weren't amenable to working with as many startups

13. Ibid., iv.

14. Ibid., 35.

15. Kevin McCaney, "DoD recruits Silicon Valley for cyber, innovation efforts," April 23, 2015, *Defensesystems.com*, https://defensesystems.com/Articles/2015/04/23/DOD-Carter-cyber-strategy-Silicon-Valley.aspx?Page=1 (accessed May 22, 2015)

as we could be."[16] Technology grows at an exponential rate which easily outpaces the current acquisition process. This rapid rate of growth in technology makes it difficult for policy makers and military senior leaders to field innovative systems in a timely manner.[17] By 2030, the Army's acquisition process must allow it to continue to invest in future innovative technologies but must also allow it to produce technological improvements within 18 months. Off the shelf technologies will allow the Army to keep pace with technological advancements and not lose its overmatch to its adversaries.

Conclusion

The Army in 2030 will be more technologically advanced as future technologies are realized and brought on-line. A more technologically advanced Army must address the lack of cyber security at the tactical and operational level in order for the future Army forces "to prevent conflict, shape the security environment, and win wars."[18] Additionally, the U.S. Army must help DoD develop a new acquisition system in order to get new innovative systems and technologies into the force faster or at pace with its advisories. The current slow, antiquated acquisition process must change in order to keep pace with technology and its advisories by 2030 and beyond.

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16. Ibid.

17. Paul Croke, "Unpredictable future: Computer technology growing faster as time passes," *Baltimorepostgexaminer.com,* January 27, 2015, http://baltimorepostexaminer.com/unpredictable-future-computer-technology-growing-faster-time-passes/2015/01/27 (accessed May 26, 2015)

18. U.S. Department of the Army, *The Army Operating Concept*, iii.

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Electromagnetic Spectrum Operations

Lieutenant Colonel Tommy (Drew) Cornstubble, Jr.

As the information age gives way to the information revolution, the U.S. Army must project Electromagnetic Spectrum (EMS) combat power in the information environment as effectively as it delivers precision lethal fires in the physical environment. EMS operations must deliver informational fires and precise electronic fires with the same level of effectiveness and responsiveness that enables Landpower formations to control and influence terrain. Fire support planning across the range of military operations must expand to encompass the increased EMS capabilities and develop a more detailed understanding of the Electromagnetic Environment (EMOE) to support the combat commander's intent and decision-making. EMS operations and EMS fire support planning cannot be an afterthought; it is a foundational component which supports and enables all warfighting functions. This paper will review future Landpower formation attributes and capabilities necessary to achieve desired outcomes in non-state informational, conventional, and hybrid conflict scenarios. These scenarios are characterized by environments of Anti-Access/Area Denial (A2AD) that are restrictive or prohibitive to information exchange and EMS access. While there are current political and fiscal challenges facing future capabilities development and employment, this paper will focus on leadership and capabilities that will facilitate effective EMS operations.

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Landpower has the ability to influence human behaviors and actions by the direct application of combat power or the credible threat of the projection of combat power onto the land domain of land. Combat power is generated and projected by the coordinated execution of the Army warfighting functions of Mission Command, Intelligence, Movement and Maneuver, Fires, Protection, and Sustainment. Virtually all activities that project power and execute warfighting functions are enabled by wireless radio frequency (RF) transmission through the medium of EMS and are reliant upon EMS-dependent systems. The demand for EMS access will only increase with proliferation of Information Technology (IT) devices, precision weaponry and employment of unmanned, remotely operated or autonomous systems. Exploiting adversarial use of EMS will be critical in neutralizing and countering hostile capabilities and maintaining friendly access to EMS. To effectively operate in this EMS intensive environment, the Army requires adaptive, informed, and resilient EMS leaders who are able to plan, integrate, and generate cross-domain and service informational and EMS combat power.

The character of warfare and conflict has transitioned from the industrial age to the information age. Adversaries purposefully seek asymmetric advantages on the edges of declared conflict to counter recognized conventional military strength and political power. States, state sponsored groups, criminal networks, and theocratic ideological-based factions actively develop an in-depth understanding of regional interests, international organizational relationships, and domestic political divides. These groups opportunistically exploit vulnerabilities to create maneuver space within the strategic environment. Adversaries implement sophisticated physical and informational campaigns against U.S. strategic vulnerabilities. Through centralized or decentralized control, they can direct messages that reach and influence both international and domestic audiences through human networks and social/public media outlets. In many cases these refined, coordinated information warfare efforts are paired with equally sophisticated, lethal and non-lethal precision weapons systems that represent risk to U.S. forces and power projection. These adversarial activities, short of open conflict, approach the boundaries of accepted international norms and thus allow for deniability. In some cases adversaries have accurately

gaged and managed strategic risk by clearly violating international norms, without consequence. This is an indication of their proficiency and skilled understanding of the operating environment. These strategic and operational successes allow them to consolidate power, garner support, enhance prestige, and emboldens the actors to continue to push the limits within international communities to pursue their interests. The reality of highly capable threats has the potential to delay or prevent the U.S. military's ability to conduct operations, assist partners, and provide humanitarian assistance.

Adversaries are actively executing coordinated, in-depth efforts across conventional, irregular, informational, economic, criminal, and cyber lines of effort to attain strategic outcomes which are inconsistent with U.S. interests. The adversarial groups and non-cooperative states exploit the historical standards of the state's monopoly on warfare through a hybrid warfare construct – generally described as a combination of conventional, irregular, and terrorist/criminal components that form the concept of hybrid warfare.[1] Hybrid warfare represents a challenge due to its purposeful ambiguity, uncertainty, and psychological effects. Hybrid warfare is effective because it has an unwavering focus on the political object, with few constraints, while existing in a form which is difficult to attribute to illicit actors and causers.

While hybrid warfare is the challenge we face today, the ambiguous nature of hybrid conflicts will continue to be challenge the U.S military in the future as well. Informational conflict will continue into the future because of the proliferation of wireless IT devices that connect populations and the range and speed at which information is distributed. IT devices provide disenfranchised populations with open access to information and an aperture by which their attitudes and perceptions can be influenced. This connectedness through technology increases a group's awareness of their perceived or actual plight and creates an ad-hoc, adaptive and responsive C2 network that expedites actions orchestrated by those with influence. These groups and networks represent a potential actor or surrogate that can be influenced, mobilized, and controlled by state-directed irregular

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1. Alex Deep, "Hybrid War: Old Concept, New Techniques," *Small Wars Journal*, March 2 2015, http://smallwarsjournal.com/jrnl/art/hybrid-war-old-concept-new-techniques (accessed 26 May 2015)

warfare elements, ideological extremists, or criminal networks to conduct higher intensity conflict. This was demonstrated during the Arab Spring by the development and action of disenfranchised groups against their state's political systems – to include the rise of the Islamic State in Syria. These destabilizing factors increase the likelihood of conflict when disenfranchised groups reside within weak states and gain control of and dominate the informational environment. As disruptive elements continue to operate unchecked and gain influence, sponsors may arm them with heavier and more sophisticated weapons systems. When combined with an international order that favors non-confrontation and appeasement over enforcing international norms, conditions are set for increased probability of high intensity conflict – particularly in A2/AD regions where the United States has limited influence or is not able to respond quickly.

An A2/AD environment presents a new dimension to U.S. land force operations. The U.S. military has been fortunate to maintain sufficient overmatch in recent conflicts to generally have unconstrained freedom to perform the warfighting functions. The adversary will likely challenge that assumption in the future through a range of prohibitive interference measures at the strategic and operational levels. Prohibitive interference, the degree to which the enemy can interfere with, or prevent the accomplishment of the mission, is a subjective term, defined by the commander to evaluate risk to mission and force.[2] The threshold of prohibitive interference can be influenced by asset degradation, attrition, mission aborts, or likelihood of destruction.[3]

The concept of prohibitive interference, a term familiar in Anti-Air Warfare, Counter-air, and Suppression of Enemy Air Defense missions, has applicability to other domains as well. Indications are that the informational environments and the EMS will be more intensely contested and denied in future conflict.[4] EMS Operations (Electronic Warfare and Spectrum Management) used to exploit, attack, protect,

2. U.S. Marine Corps, *Suppression of Enemy Air Defenses,* Marine Corps Warfighting Publication 3-22.2 (Washington, DC: U.S. Marine Corps, 18 May 2001), 1-1.

3. Ibid.

4. National Intelligence Council, *Global Trends 2030: Alternative Worlds* (Washington, D.C.: National Intelligence Council, December 2012), 2.

and manage the EM operational environment.[5] EMS actions enable control of the EMS conceptually by conducting sense/exploit (Intel), attack/deny (Ops/Fires), access/protect (Signal), and Electromagnetic Battle Management (Msn C2) activities of EMS.[6] These environments are continually under surveillance and influence. Just as prohibitive interference exists in the physical environment, prohibitive interference also exists in the informational environment and EMS and must be met with the same level of determination and rigor. When land forces are engaged in a kinetic operation to (re)gain key (physical) terrain, it is often the main effort and the leader spares no resource in weighting the effort and accomplishing the mission. Considering the importance of the EMS to future operations, leaders must develop a similar main-effort approach when engaging and overcoming prohibitive interfere in key informational and EMS terrain.

The combined efforts of EMS operations, expertise, and processes enable EMS freedom of action across all domains supporting the execution of the warfighting functions.[7] Incorporating the concepts of EMS Operations into operational and tactical capabilities will contribute to improved situational understanding and provide the Joint Force Commander multiple options to maintain EMS control, prevent EMS prohibitive interference, and limit adversary/hybrid access to the informational and EM environments. EMS operational efforts enable the EMS control necessary to perform the warfighting functions and counter hybrid adversaries.

For EMS Operations and Electromagnetic Battle Management (EMBM) concepts to be effective, they must have the attributes of interoperability, levels of automation, and adaptive communications.[8] Interoperability allows functionality across platforms, payloads, and processes. Automation and artificial intelligence applications assist in the sheer number, complexity, and timelines of EMS events within the

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5. Chairman Joint Chiefs of Staff, *Joint Electromagnetic Spectrum Management Operations*, Joint Publication 6-01 (Washington, D.C.: Chairman Joint Chiefs of Staff, 20 March 2012), vii.

6. United States Strategic Command, *Operational Concept for Electromagnetic Battle Management,* (Omaha, NE: U.S. STRATCOM, 25 January 2013), 1.

7. Ibid.

8. Ibid, 13.

EMOE.[9] Adaptive communications facilitates Mission Command in denied, degraded, or emission controlled environments.[10] Employing EMS and EMBM operational concepts provide the ability to dynamically counter prohibitive interference. However, concepts require proper leadership, resourcing, capabilities development, and organization to successfully conduct assigned missions.

To be successful in environments of uncertainty and informational denial, operational leadership must use mission command and control by "ensuring subordinates have understanding of the situation and commander's intent before conflict, while encouraging initiative and creativity once the fight is joined."[11] Technology can only assist the commander. Technology is no substitute for shared understanding of intent, mutual trust, creativity, judgment, and military education in the art of war.[12] Additionally, institutional leadership must deliberately influence development and retention of necessary EMS skill specialties and expertise required in the future. Institutional leadership must also shape fiscal priorities to adequately resource the necessary EMS systems that will be critical to the future force's ability to operate in the prohibitive environment of the future.

Weapons system platforms, payloads, manned, unmanned, ground, and air platforms of the future must be expected to operate in a denied EMS and information environment. Seven qualities define the characteristics and capabilities of these systems:

1. The Army has an elemental requirement for secure, hardened, and redundant network of digitally interoperable data platforms and weapons payloads that can sense, detect, and exploit the EMS environment and store, retrieve and project EW and informational power.[13]

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9. Ibid.

10. Ibid.

11. Paul K. Van Riper, "Information Superiority," *Marine Corps Gazette* 81, no. 6, June 1997, 54-62. http://search.proquest.com/docview/221470137?account id=4444.

12. Ibid.

13. United States Strategic Command, *Concept for Electromagnetic Battle Management*, 13.

2. EMS systems must accurately distinguish, measure, identify, and report EMS transmissions in a congested EMOE.[14]

3. High technology, autonomous and semi-autonomous platforms and payloads in low and high intensity lethal conflicts must conduct irregular and conventional informational and EMS operations necessary to counter hybrid threats.

4. Delivery platforms that can deploy active and passive multi-purpose, cross-domain EMS munitions for redundancy will facilitate operations in denied EMS environments.

5. Real and simulated training and test environments are required to conduct mission rehearsals and validate concepts.

6. Integrated service and joint EMS sensor-shooter manned and unmanned teamed capabilities must be developed and trained to collect, locate, and deliver EMS fires and increase understanding for EMS, Informational, and Cyberspace Operations.

7. Success in the EMS requires assured connectivity and quality data exchange

The nature of future EMS capabilities requires strategic, operational, and tactical EMS leaders and organizations (elements) to respond to EMS prohibitive interference and regain EMS control for the JFC. Landpower formations should have EMS elements and capabilities at all echelons to develop, integrate, and implement the commander's EMS and informational support plan. With multiple networked, air/ground platforms and payloads distributed on the battlefield, EMS elements must be located or disaggregated with maneuver formations to observe, coordinate, and tactically direct EMS capabilities. Using the lethal fires control model (Fire Support Elements) to implement EMS operations is a proven concept to combine and integrate lethal and non-lethal informational, electronic, and cyberspace fires.

The ability to effectively conduct EMS Operations to control the EMS, increase EMOE situational understanding, and effectively counter the challenges of the informational character of hybrid conflicts provides the JFC options to influence the operational environment across the

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14. Ibid, 15.

range of military operations. Continuing to assume unhindered EMS access represents a significant risk to the global projection of combat power. Committed and emboldened actors with highly capable threat systems represent a challenge to the U.S. military's ability to conduct operations. The Army must develop advanced EMS concepts and capabilities that can provide the necessary EMS control to enable the warfighting functions. Coherent and integrated EMS operational concepts and capabilities are required to dynamically regain EMS control when reaching a threshold of informational or EMS prohibitive interference.

STEM Impacts on Army Warfighting Challenges and Manpower

Ms. Celeste Kennamer

The purpose of this paper is to analyze the impacts of science, technology, engineering, and mathematics (STEM) on the Army Warfighting Challenges, focusing on manpower across the military, civilian and the industrial base. The 2015 National Security Strategy (NSS) cites scientific discovery and technological innovation as key enablers to empowering American leadership, military advantage, and economy.[1] These in turn are key enablers to make the United States a world leader and to utilize its Diplomatic, Information, Military, and Economic (DIME) elements of power. Sustaining the U.S. edge in science, technology, engineering, and mathematics (STEM) requires federal investment in basic and applied research and education, in order "to produce tomorrow's discoverers, inventors, entrepreneurs, and high-skills workforce."[2] The NSS also cites commercial partnerships with national laboratories and support for "a wide range of start-ups and firms at the leading edge of America's innovation economy."[3] STEM proficiencies and capabilities are foundational to the Army's

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1. Barack Obama, *National Security Strategy* (Washington DC: The White House, February 2015) http://www.whitehouse.gov/sites/default/files/docs/2015_national_security_strategy.pdf (accessed 14 February 2015).

2. Ibid.

3. Ibid.

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Warfighting Challenges. A STEM-proficient Army will maintain agility in the Future Force by adapting, evolving or innovating new technologies or by recapitalizing or repurposing existing capabilities.

STEM is a cross-cutting capability that affects the military, civilian and industrial workforce alike. A strong STEM background is a requirement for many enlisted, warrant, and officer positions (e.g., pilots, engineers, doctors, and astronauts) in all services. Current and emerging mission requirements continue to pose STEM workforce challenges for the Department of Defense (DoD). One third of DoD jobs are STEM-related.[4] The Army careers website lists over 50 different STEM jobs,[5] while the Army's Office of the Assistant G-1 for Civilian Personnel (AG-1 CP) identified similar requirements for DoD civilians.[6] Developing a highly competent STEM workforce requires partnerships among government, industry, and academia and begins early in a person's education.

According to the U.S. Department of Education, STEM jobs in the U.S. will increase 14% by 2020, and of these about 3 million will go unfilled by 2018.[7] The average age of aerospace engineers in the U.S. is 47, and many of these jobs can't be filled by foreign workers. A survey by *Aviation Week* showed that by 2017 18.5% of aerospace and defense public sector employees will be eligible for retirement.[8] The DoD faces the same realities, but while U.S. businesses can seek employees worldwide, most DoD military and civilian positions require personnel be U.S. citizens and be able to hold a secret or top secret clearance. Additionally the leaders of 2030 are the Lieutenants and Captains of today, so one can assume the Army has met its requirement for STEM senior officers. For that cadre the issue will be retention. Between now and 2040 the issue becomes attracting and retaining STEM qualified

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4. Clarence Johnson, *DoD STEM Diversity Summit*, November 2012

5. U.S. Army, Careers and Jobs page, Army STEM Careers and Jobs, http://www.goarmy.com/careers-and-jobs/about-army-stem.html

6. CPOL (U.S. Army Civilian Personnel), Career Management page, http://cpol.army.mil/library/career/ (accessed 4 May 2015).

7. Bill Nye, "Fixing the U.S. STEM problem," 16 January 2015, http://www.cnbc.com/id/102342536# (accessed 14 February 2015).

8. Claire Zillman, "America's defense industry is going gray," *Fortune*, November 12, 2013, http://fortune.com/2013/11/12/americas-defense-industry-is-going-gray/ (accessed 4 May 2015)

enlisted, warrant, officer, civilian, and contractor personnel to meet DoD requirements.

The 2014 Quadrennial Defense Review (QDR) did not specifically cite STEM as a shortfall, however, it did note that Joint Forces must be prepared to battle sophisticated threats with advanced warfighting capabilities who will try to deny U.S. forces access to space and cyber assets.[9] The QDR noted that DoD would continue to sustain priority investments in science, technology, research, and development.[10] The only specific science and technology investment identified, however, was the USMC Amphibious Combat Vehicle (ACV), and that investment was limited to extended littoral maneuver. In accordance with the Secretary of Defense letter, the 2014 QDR focused on adapting, reshaping, and rebalancing in light of fiscal austerity. While this may be in line with sequestration demands, it does not address the larger NSS issues identified with respect to emerging STEM issues.

The DoD STEM strategy and programs tend to focus on the Civilian employee sector. However as previously stated, a strong STEM background is a requirement across all sectors of all services – military and civilian. The Cyber domain has brought this problem to the forefront. The U.S. Army established a cyber branch in September 2014, providing officers, warrant officers, and enlisted personnel a career path. The U.S. Army has established a Cyber School at Ft. Gordon, Georgia, which will reach full operational capability in 2016.[11] As Bill Newhouse, program lead for the National Initiative for Cybersecurity Education (NICE), recently noted: "Where does cybersecurity fit into STEM? All STEM fields rely on computing and information technology and network and device infrastructure. My hope is to add cybersecurity into STEM conversations."[12]

The complexity of staffing the cyber domain offers an opportunity for the Army to explore other staffing options, such as combinations of

9. U.S. Department of Defense, Office of the Secretary of Defense, *2014 Quadrennial Defense Review* (Washington DC: The Pentagon, March 4, 2014) http://archive.defense.gov/pubs/2014_Quadrennial_Defense_Review.pdf.

10. Ibid.

11. "U.S. Army Builds Cyber Branch One Step at a Time," George I. Seffers, *Signal* (April 2015), 38-41, http://www.afcea.org/content/?q=node/14327.

12. "Cyber is NICE Work, If You Can Get It," Sandra Jontz, *Signal* (April 2015), 43-45, http://www.afcea.org/content/?q=node/14328.

civilians, military, and contracted personnel. The Army should look at the resourcing implications of a "grow your own" military cadre, and evaluate the potential for supplementing large military staffs with contractor personnel who can surge and release, on an "as required" basis. In a 23 April 2015 speech at Stanford University, "Rewiring the Pentagon: Charting a New Path on Innovation and Cybersecurity," Defense Secretary Ash Carter announced a new partnership between industry and government.[13] Secretary Carter cited numerous instances of industry and government partnerships, and also noted the standup of a DoD branch of the U.S. Digital Service, which will bring together engineers and scientist to address specific issues on a project basis.[14] In the 2015 *DoD Cyber Strategy*, Strategic Goal 1 is to "Build and Maintain Ready Forces and Capabilities to Conduct Cyberspace Operations." A tenet of this goal is to enable exchange programs with industry, in order to supplement DoD's civilian cyber workforce. The private sector exchange programs bring measurable benefits through the design and development of new operational concepts for DoD's cyberspace missions.[15]

A second area of concern across the Army is STEM workforce diversity. In response Executive Order 13583, "Establishing a Coordinated Government-Wide Initiative to Promote Diversity and Inclusion in the Federal Workforce," the DoD Research and Engineering Enterprise and the DoD Office of Diversity Management and Equal Opportunity (ODMEO) have taken steps toward enacting the order by developing plans to increase the diversity of DoD's science, technology, engineering, and mathematics (STEM) workforce.[16] In 2011, the National

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13. Cheryl Pellerin, "Carter Seeks Tech-sector Partnerships for Innovation," DoD News, Defense Media Activity (Washington DC: April 23, 2015) http://www.defense.gov/news/newsarticle.aspx?id=128655 (accessed 4 May 2015)

14. Ibid.

15. Department Of Defense, *The DOD Cyber Strategy* (Washington DC: The Pentagon, April 17, 2015), 13, http://www.defense.gov/Portals/1/features/2015/0415_cyber-strategy/Final_2015_DoD_CYBER_STRATEGY_for_web.pdf.

16. Nelson Lim, Abigail Haddad, Dwayne M. Butler, and Kate Giglio, *First Steps Toward Improving DoD STEM Workforce Diversity, Response to the 2012 DoD STEM Diversity Summit*, RAND, prepared for the Office of the Secretary of Defense (OSD), 2013, http://www.rand.org/content/dam/rand/pubs/research_reports/RR300/RR329/RAND_RR329.pdf.

Academy of Sciences released a report, "Expanding Underrepresented Minority Participation: America's Science and Technology Talent at the Crossroads,"[17] citing minorities are seriously underrepresented in America's Science & Engineering (S&E) workforce. For many years, the U.S. STEM workforce has been "predominately male and overwhelmingly white and Asian."[18] Additionally, the current DoD workforce also lacks diversity; for example, the proportion of women scientists and engineers in DoD laboratories has not kept pace with the proportion in the U.S. workforce as a whole.[19] In a 2012 study RAND conducted on DoD STEM Workforce Diversity, titled "The First Steps Toward Improving DoD STEM Workforce Diversity,"[20] established the ends, ways, and means for addressing STEM Workforce Diversity shortfalls. The study recommended clearly articulating which aspects of diversity to prioritize and establish a common set of goals toward reaching desired outcomes (Ends). The study also recommended coordinating efforts across DoD organizations to reach its STEM-diversity workforce goals. The synchronization of organizational efforts would also improve effectiveness and reduce costs (Ways). Finally, the study recommend the pursuit of a managed-change plan of short-term (1-12 months), mid-term (1-3 years), and long-term (4+ years), steps to improve STEM workforce diversity (Means).

Conducting studies and developing goals for achieving diversity in the Army's STEM workforce is a start. However the Army community must look at the environmental factors facing recruiting STEM candidates. Attracting a diverse group of STEM candidates is an issue across the entire aerospace and defense industry. "Younger folks are taking a keen interest in industry outside aerospace; in health care, technology, and the Googles of the world," says Annalisa Weigel, a senior aerospace policy and economics lecturer at the Massachusetts Institute of Technology. This is because STEM students – like their

17. National Academy of Sciences, National Academy of Engineering and Institute of Medicine, *Expanding Underrepresented Minority Participation: America's Science and Technology Talent at the Crossroads*, (National Academies Press, 2011) http://www.nap.edu/catalog/12984/expanding-underrepresented-minority-participation-americas-science-and-technology-talent-at

18. Ibid, 9.

19. *DoD STEM Education and Outreach Strategic Plan 2010-2014*, OSD(ATL), Director, Defense Research and Engineering

20. Lim, et al., *First Steps Toward Improving DoD STEM Workforce Diversity*.

counterparts who major in other topics – want responsibility, the ability to move around in a job, and an instant sense of achievement, which is not typical in aerospace jobs, where one project can take a decade to complete.[21] Couple this with a Congressional Joint Economic Committee report which estimates that about 14 percent of engineers in the work force are women and diversity in the workforce seems hard to achieve.In a *New York Times* OpEd piece by Lina Nilsson, titled "How to Attract Female Engineers,"[22] she noted that across the U.S. women are drawn to engineering projects that attempt to achieve societal good. These programs included the Massachusetts Institute of Technology's (MIT) program on developing, "technologies that improve the lives of people living in poverty," and Arizona State University's humanitarian engineering courses.

Many good programs and projects come out of DoD STEM research and investments that transition to industry and benefit society. DoD and specifically the Army could improve their strategic communications and messaging to attract potential STEM candidates. When most people think of DoD, they think of lethal capabilities, however, the Army involves much more than fighting and kinetic capabilities. The U.S. Army Medical Research and Materiel Command (USAMRMC) serves as Army's medical materiel developer, responsible for medical research, development, acquisition and medical logistics management. Qualified STEM personnel execute science and technology programs such as: biomedical research, military infectious diseases, combat casualty care, military operational medicine, medical chemical and biological defense, and clinical and rehabilitative medicine.[23] Much of this technology transfers for use in non-DoD environments, for example self-clotting bandages are now available for all consumers, to biomarkers for use in diagnosis of brain injuries.

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21. Zillman, "America's defense industry is going gray."

22. Lina Nilsson, "How to Attract Female Engineers" *New York Times*, April 27, 2015, http://www.nytimes.com/2015/04/27/opinion/how-to-attract-female-engineers.html?smprod=nytcore-ipad&smid=nytcore-ipad-share&_r=0 (accessed April 27, 2015)

23. U.S. Army Medical Department, Medical Research and Material Command, *About MRMC*, http://mrmc.amedd.army.mil/index.cfm?pageid=about.overview (accessed May 4, 2015)

The Office of the Assistant Secretary of Defense for Research Development and Engineering, Research Decorate Office, coordinates STEM programs for DoD and across each of the services. Each service has programs to promote STEM education for K-12 grades. These programs range from teacher support to student competitions, designed to expose students to scientific research methods and engineering principles. DoD offers STEM students fellowships, grants and tuition-for-service programs in addition to the STEM educational opportunities available through military service. DoD awarded 214 STEM scholarships in 2014.

The DoD STEM Education and Outreach Strategic Plan released in 2010, cited four challenges facing DoD.[24] First, the average age of federal scientists and engineers continues to rise, diminishing STEM capabilities in the workforce.[25] Second, the government's hiring procedures have been criticized as cumbersome and too slow from initial engagement to hiring.[26] Third, the competition for world-class talent begins with hiring entry level employees. In 2015, the difference in starting salaries for an aerospace engineer in the public sector is between $58-64K,[27] while a DoD engineer starts at $43K.[28] The final area is laboratory revitalization. DoD laboratories employ more than 35,000 scientists and engineers.[29] A technically strong and productive laboratory system is essential to attracting and retaining world-class STEM professionals.[30] As noted

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24. OSD(ATL), *DoD STEM Education and Outreach Strategic Plan 2010-2014*

25. National Science Foundation, Science Resources Statistics, "Federal Employment of Scientists and Engineers Remained Steady from 2003 to 2005" (NSF 09-312, March 2009) http://www.nsf.gov/statistics/infbrief/nsf09312/nsf09312.pdf.

26. Rebecca Neal, "HR Chief at VA Is Cheerleader for Hiring Reform," *Federal Times*, August 18, 2009, http://archive.federaltimes.com/article/20090818/DEPARTMENTS04/908180302/HR-chief-VA-cheerleader-hiring-reform

27. Salary.com, Aerospace Engineer I, http://swz.salary.com/SalaryWizard/Aerospace-Engineer-I-Salary-Details.aspx?&degree=EDLEV4&ddldegree=Bachelor%27s%20Degree (accessed February 14, 2015)

28. opm.gov, Salaries and Wages, http://www.opm.gov/policy-data-oversight/pay-leave/salaries-wages/#url=2015 (accessed February 14, 2015)

29. Jocelyn M. Seng (Project Leader) and Pamela Ebert Flattau, *Assessment of the DoD Laboratory Civilian Science and Engineering Workforce,* Institute for Defense Analyses (Alexandria VA: IDA Paper P-4469, June 2009) http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA506429.

30. OSD(ATL), *DoD STEM Education and Outreach Strategic Plan 2010-2014*

in this paper, some of these issues are being addressed by current DoD programs, but hiring and retaining a strong STEM workforce will remain a key tasks for DoD in the coming decades.

In conclusion, as the services continue to draw down in order to meet sequestration limits, they must achieve a balance between budget and personnel goals and continuing to invest in STEM capabilities to meet future demands for scientists, technicians, engineers and mathematicians. While investments in STEM programs to support K-12 education are important they must not take place at the expense of near term capabilities. Investments must be made in current research and development 6.1 and 6.2 programs (which require STEM personnel and facilities) due to the aging workforce and to address diversity gaps. STEM investments must take place across military, civilian, and contractor workforces to strengthen the defense of our nation. A strong STEM workforce is foundational to meeting the Army's Warfighting Challenges. As stated in Army Warfighting Challenge number 10: the Army must continue to develop agile and adaptive leaders who thrive in conditions of uncertainty and in complex environments.[31] The STEM environments are also part of the uncertain and in complex environments.

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31. *The U.S. Army Operating Concept, Win in a Complex World, 2020-2040,* TRADOC Pamphlet 525-3-1 (Ft. Eustis, VA: TRADOC, 31 October, 2014), 31.

Robotics and Artificial Intelligence Come of Age: Military Implications

Mr. Timothy Kevin Griffin

Throughout history, oppressive governments have been constrained by the size of the population they wish to control and the need to have talented people running their military. Oppressive regimes have had to expend resources to keep their population working or find creative ways to motivate them. Once automation reaches the level of self-replication, the advantage of the masses will be greatly reduced, upsetting a long standing balance. The few could have the tools, robotics and Artificial Intelligence (AI), in hand to dominate. The current international order must determine a means of detecting this in order to control the robotic arms race.

Three questions will be addressed. First, in the next several decades, will technology progress to the point where robotics will replace significant parts of the military? An affirmative answer to the first question develops the second, what changes in law and policy are required to prevent a robotic arms race? Third, what are the possible paths forward?

Technology now performs many formerly exclusively human activities and, inevitably more current exclusively human endeavors will be taken over by automation. Society is undergoing a radical and accelerating rate of change. The question in the military context is: will technology progress to the point where robots will replace humans in performing significant tasks in the next several decades? These tasks could include transport, purchasing, military manufacturing, training, equipment maintenance, attack vehicles, and strategy development.

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The answer to this question requires scanning the environment with a focus on robotics and AI. In general, the "what is AI" bar gets raised soon after technology achieves a significant milestone. Each technology milestone reduces the space in which humans are uniquely intelligent. "Intelligence should be viewed as a physical process that tries to maximize future freedom of action and avoid constraints on its own future."[1] Components missing from this definition are the environment within which the agent acts and the breadth of the decisions made. A modified definition of intelligence within a Volatile Uncertain Complex Ambiguous (VUCA) environment is the ability to avoid constraints on one's own future, while maximizing future options via a broad set of decisions.

Strategy development in a military context is a prime example of an intelligent activity. Strong AI can rival humans' ability to scan the environment, detect changes, identify gaps, sort an abundance of data into actionable options, and find paths to modify learning in a VUCA world. This is only a partial list, but demonstrates that, in theory, AI could produce strategy. However, strategic thinking requires awareness of one's own strengths, weaknesses and cultural biases along with knowing the path to correct the weaknesses. Judgment is a key piece of the art in strategy development – and a challenging quality for AI to master (the balance of art and science). But gains are being made. Technology is making great advances in approaching human-like judgment in some areas. In fact, technology out-performs humans in rapid sensor to kill chain systems, game players, and high-speed financial trading. AI is approaching human level ability in other areas such as writing and driving. These developments demonstrate AI's developing art, judgment, and communication skills – key ingredients of strategists.

Radar guidance is an early WWII example that demonstrates technology outperforming humans. Radar replaced the sensory human system in the guided machine gun used to attack enemy aircraft. The required reaction time took the human out of the loop for part of the kill chain. By the 1980s radar signal processing could identify in milliseconds the type and location of the enemy weapon system that fired a projectile.

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1. Alex Wissner-Gross, "A new equation for intelligence," transcript, TED.com (November 2013), at 10:51, http://www.ted.com/talks/alex_wissner_gross_a_new_equation_for_intelligence/transcript?language=en (accessed February 1, 2015).

Prior to this, a human expert had to analyze the radar signature, a process taking many minutes.

Game playing AI began to outperform human players in the 1990s. In 1997, IBM Big Blue beat the world's best human chess player, Garry Kasparov – a task considered impossible just a decade prior.[2] Another IBM milestone in game play was reached in 2011 when the computer, Blue Gene, beat the best human Jeopardy player, Ken Jennings.[3] Jeopardy is a game requiring a broad range of knowledge that is in a much less constrained environment than chess. Blue Gene demonstrated the ability to interpret the question presented, sort through large unstructured data, and communicate the answer more quickly than the best human player. Rapidly sorting through a large amount of unstructured data to select key information is a useful capacity for a strategic military leader. Blue Gene was designed to perform medical diagnoses and has already displaced some highly educated medical professionals.[4]

Alan Turing proposed an interesting test using the imitation game. Turing offered an alternative to the question: "Can machines be intelligent?" He wanted to know if a machine and a person could have complex text-based dialog with a human judge, who would try to discriminate between the computer subject and the human subject.[5] In a recent Turing test, AI failed to fool the majority of the judges …but was successful in fooling a third of the judges.[6] This test is an example

2. Beau Sheil, "Thinking About Artificial Intelligence on line," *Harvard Business Review* (60 Harvard Way Boston, MA 02163: Harvard Business Publishing, July 1987):8. https://hbr.org/1987/07/thinking-about-artificial-intelligence. (accessed March 19, 2015).

3. "The Onrushing Wave; the Future of Jobs on line," *The Economist* 410, no. 8870 (January 18, 2014):4. http://search.proquest.com/docview/1490545943?accountid=4444. (accessed February 24, 2015).

4. Brad Power, "Artificial Intelligence Is Almost Ready for Business on line," Harvard Business Review (60 Harvard Way Boston, MA 02163: Harvard Business Publishing, March 19, 2015):1,3. https://hbr.org/2015/03/artificial-intelligence-is-almost-ready-for-business. (accessed March 19, 2015).

5. A. Turing, "Computing machinery and intelligence on line" *Mind* 59, 236 (Oxford England: Oxford University Press on behalf of the Mind Association Issue Stable, October 1950): 434. http://www.jstor.org/stable/i313290. (February 26, 2015).

6. Elizabeth Lopatto, "The AI that Wasn't: Why 'Eugene Goostman' Didn't Pass the Turing Test on line," *The Daily Beast* (June 10, 2014), 2. http://search.proquest.

of AI performing complex communication to a reasonably high level, a strategist's core competency.

Today, computers are playing and winning at chess but the overall champion in 2014 was a human-computer team. Human players have also improved since the advent of strong computer chess players. The computers are training humans.[7] This development raises some important possibilities. If people become better chess players by using computers, can strong AI produce better strategists using AI-based human training? Like the reigning chess team, the strongest strategist team of the near future may well be an AI-human team.

Writing is another human endeavor where AI is starting to gain traction. Software designed to track missiles and anticipate what bad actors will do in a given scenario was applied to writing a novel in the style of an author who died in 1974.[8] Professor Selmer Bringsjord thinks that AI is limited in this field. He thinks AI will write simple contracts, proposals, and stories in the very near future.[9] While AI is not yet writing better than humans, the expanding research demonstrates that AI's growing communication skills could be applied to strategy.

Google cars are now self-driving in California. Ten years ago experts thought this would not happen in the foreseeable future.[10] Self-driving vehicles will be the norm in the next 20 years if the legal issues are resolved. The military will also likely use self-driving vehicles to reduce the number of service members put in harm's way. Leveraging robotic

com.ezproxy.usawcpubs.org/docview/1648993932/fulltext/6FAD5BCB9F32471FPQ/1?accountid=4444#. (accessed February 28, 2015).

    7. Kevin Kelly and Robert Mcmillan, "Brain Power on line," *Wired* 22, 11 (November 2014): 118. http://search.proquest.com/docview/1621844010?accountid=4444. (accessed February 23, 2015).

    8. Robert Dvorchak, "Beyond the Valley of Computer Writing Fiction: A Macintosh Endowed with Artificial Intelligence has Produced `Just this Once,' a Potboiler in the Style of Jacqueline Susann on line," *Los Angeles Times* (July 6, 1993), 1. http://search.proquest.com/docview/282112259?accountid=4444 (accessed December 31, 2014).

    9. Selmer Bringsjord, "Just Imagine: What Computers can't do," *The Education Digest* 66, 6 (February 2001): 31. http://search.proquest.com/docview/218162937?accountid=4444 (accessed March 18, 2014).

    10. "The Onrushing Wave; the Future of Jobs," *The Economist* 410, 8870 (January 18, 2014): 4, http://search.proquest.com/docview/1490545943?accountid=4444 (accessed February 24, 2015).

transport makes troop reductions possible, freeing these Soldiers for other missions. iRobot made a popular time saving commercial product Roomba, a robot that cleans floors without human help.[11] High volume is essential in commercial markets and helpful in defense markets, so the research and development costs can be spread over many customers. The Roomba is a simple robot, but an example of machines replacing human activities.

The financial industry is driving technological change which will radically shape societal change. Like warfare, financial trading requires rapid sensing of the environment, analysis, decision making, and execution. The financial incentives to get the man out of the loop in order to increase response time is intense. Patents are awarded for finding ways to speed this up.[12] The AI developed to speed up high-frequency trading may be the prototype used to "get the man out of the loop" in strategic and tactical levels of warfare as well.

Strong AI is a game changer, but a strong AI that generates the next generation of AI will result in run-away improvement. Scaling is a missing element AI still lacks that is limiting its impact on warfare. Major societal change or a change in warfare requires the scaling quality. Scaling is moving from a limited volume or capability to a high volume or revolutionary capability. A scaling example is a painting compared to an on-line photograph. An artist can only paint a fairly small number of paintings. Once a photograph is on-line, it can be replicated tens of millions of times. Self-replication will do to manufacturing what on-line photography did to painting with the added quality that the item created will not be virtual.

The nature of societal organization will change with the advent of self-replicating machines. From a manufacturing perspective robots that fabricate copies of themselves will greatly reduce costs and allow

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11. "Special Report – Robots: Good and Ready; the Build-Up," *The Economist* 410, 8880 (Mar 29, 2014):3. http://search.proquest.com/docview/1511423680?accountid=4444 (accessed January 1, 2015)

12. Cameron E. Freer and Alexander D. Wissner-Gross, "System and method for relativistic statistical securities trading," (Massachusetts Institute of Technology, Cambridge, MA, January 21, 2014). http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO1&Sect2=HITOFF&d=PALL&p=1&u=%2Fnetahtml%2FPTO%2Fsrchnum.htm&r=1&f=G&l=50&s1=8635133.PN.&OS=PN/8635133 (accessed February 1, 2015)

for massive scaling. 3-D printers are an example of a technology that is capable of self-replicating most of its own components.[13] Self-replication also allows for robots to operate in hostile environments.

Industry 4.0 is allowing German companies to automate manufacturing. China is leveraging Industry 4.0, a low cost high volume manufacturing process. If applied to military production, this will present a serious challenge to DoD. A Siemens factory in Amberg is a current example of Industry 4.0. A production line runs continuously without human intervention until parts need to be restocked.[14] At the same company AI is used to automate simple contract management and purchasing. AI initiates a call to the digital marketplace querying who can build 1,000 units at the lowest price to specification. The AI selects the best bid and issues a purchase order, without a human in the loop.[15]

AI has also been applied to virtual strategic situations such as playing the "Ultimatum Game."[16] The "Ultimatum Game" demonstrates human nature in bargaining and negotiation. Much commercial value is extracted by automating the negotiation phase of business. Negotiation is a key skill for strategic leaders – and AI now possesses this skill (and it is growing). Negotiating AI agents could be applied to the material acquisition process in DoD. This has the potential to reduce fraud and human error, saving resources that could be applied to other military needs. These AI agents are an example of how to replace some of the human supporting elements of an organization. The automation of DoD supporting functions by AI avoids the legal issues of robotics at the "pointy end" of the kill chain decision, freeing up more resources to apply traditional man-power to that task. "At current rates of improvement, computers are approaching the complexity and

13. George Zarkadakis, "Robot Sex could be the Future of Life; some Scientists Argue that Self-Replicating Machines are the Next Stage of Human Evolution," *The Vancouver Sun* (January 25, 2014),1. http://search.proquest.com/docview/1491708 206?accountid=4444 (accessed October 26, 2014).

14. Chris Bryant, "Welcome to Age of Self-Replicating Machines," *Financial Times* (April 11, 2014). http://search.proquest.com/docview/1523084522?account id=4444 (accessed October 26, 2014).

15. Ibid.

16. Fang Zhong, Steven O. Kimbrough, and D.J. Wu, "Cooperative Agent Systems: Artificial Agents Play the Ultimatum Game," *Group Decision and Negotiatio*n 11, 6 (November 2002):445. http://search.proquest.com/docview/2238 26692?accountid=4444 (accessed December 31, 2014)

computational capacity of the human brain. Perhaps computers will prove to be the ultimate outsourcer."[17]

The United States currently leads in the development and deployment of military robotic systems. Its output is more than the next ten most powerful militaries combined.[18] Other nations are ramping up their efforts as well. However, non-democratic countries' robotic programs are not as visible as the U.S. efforts.[19] There are more than 26 different types of Unmanned Aircraft Systems (UAS) in use today across 12 nations.[20] Forty-three nations are developing robotics for military applications.[21] The UASs range in sophistication from a few highly capable Global Hawk ($35M each) to many fairly simple Ravens ($35K each).[22] The age old argument of quality versus quantity still exists in the robot world.

As the Global Hawk and Raven programs illustrate, the U.S. programs span both ends of the quality-quantity spectrum. The DoD leverages commercial robotics research while commercial companies benefit from DoD robotics research. The availability of commercial robotics is a two edged sword. On the positive side it saves DoD research and development money and time. On the downside, it provides adversaries an easier path to advanced capabilities. Adversaries will employ robots to disrupt the military operations of the U.S. and its partners. Managing this risk requires new systems, tactics, training, and doctrine.[23] One example is the IED. The IED problem can be made more severe by

17. William D. Nordhaus, "Two Centuries of Productivity Growth in Computing" *The Journal of Economic History* 67, 1 (March 2007):14. http://search.proquest.com/docview/216443613?accountid=4444 (accessed February 23, 2015).

18. Paul J. Springer, "Military Robots and Drones" (Santa Barbara, California: ABC-CLIO, LLC, 2013), 65.

19. Ibid., 66.

20. "DRONE SURVIVAL GUIDE," http://www.dronesurvivalguide.org/DSG_840x335.pdf (accessed February 28, 2015).

21. Peter Goodspeed, "When Robots Kill; Urgent Moral and Ethical Questions Over a 'Riskless War' Arise," *National Post* (April 30, 2011), 1. http://search.proquest.com/docview/865001208?accountid=4444. (accessed December 31, 2014)

22. Ibid. Springer, *Military Robots and Drones*, 40.

23. U.S. Joint Chiefs of Staff, *Unmanned Systems Integration Roadmap, FY2013-2038* (Department of Defense publication 14-S-0553, Washington, DC: U.S. Joint Chiefs of Staff, May 27, 2014), 10, http://www.defense.gov/pubs/DoD-USRM-2013.pdf (accessed Feb 7, 2015).

making the IEDs mobile via the air, ground, or sea using low cost robotics. Imagine several hundred armed "hobby" UASs swarming a political leader. A very low cost tactical attack could generate strategic results. One possible defense to this type of attack is a robust deeply embedded surveillance network to monitor all acquisitions of UAS materials within the U.S. homeland. Robotics and strong AI will consequently require legal and policy analysis in the surveillance arena.

The evidence is very strong that robotics and AI have reached the point where they will replace or augment significant tasks of the military, including strategy development, in the next several decades. Indeed, AI is on the verge of fulfilling many of the attributes of strategic leaders. Command and control is an authorized commander giving direction and exercising authority over subordinate forces to accomplish a given mission.[24] This requires communication between the commander and the assigned forces. In a hostile Radio Frequency environment, this communication is impaired, increasing the pressure to allow AI and robotic systems to exercise mission command. Mission command is a method to perform military operations via a decentralized process following the commander's intent.[25] The nation or actors that allow AI mission command gain a strong advantage over those nations or non-state actors who insist on man-in-the-loop for lethal action. The advantage is due to the AI following the commander's intent even when the communication link is jammed. Without mission command the AI could not perform any action.

Before too many resources are expended, additional research on the emergence of strong AI should be performed. Past predictions of the coming AI age were premature; in reality AI is just emerging. A unified U.S. government approach to place limitations on robotics and AI for the deployment phase should be developed. An additional recommendation is to leverage robots and AI for as many non-lethal military applications as possible. A primary military AI application is to train Soldiers at all levels. This will allow Soldiers to focus on the <u>fires decision p</u>art of the mission. Diffuse weapon systems capable of

24. *Department of Defense Dictionary of Military and Associated Terms*, Joint Publication 1-02 (Washington DC: Department of Defense, November 8, 2010 [As Amended Through 15 December 2014]), 40, http:// www.dtic.mil/doctrine/ new_pubs/jp1_02.pdf (accessed January 17, 2015)

25. Ibid. 168.

defeating a swarm of UASs should be researched. An Electro-Magnetic Pulse weapon could be an example of such a defensive system.

The natural trend for science is to progress, making technology more capable, cost effective, and widespread. The natural tendency for humankind is to leverage technology as a military tool. Robotics and AI are perfect tools to construct a dispersive weapons of mass destruction system. An extremely large number of UASs in a swarm is an example of a dispersive weapon. The international community must develop methods to verify compliance with established conventions and regulation to avoid a run-away robotics arms race. Compliance verification itself generates at least a three-pronged problem. First, who is to be trusted as the agent to perform this task? Second, how can this agent perform the task with enough confidence that rogue actors can't cheat? Third, what prevents this agent from usurping citizens' or a nation's rights?[26] This is a "wicked problem" of the first order.

Sometime this century, strong artificial intelligence may surpass all human intelligence combined. Such a machine could then produce strategy that would out-perform groups of humans leading to a major change in warfare. This would move technology from a characteristic of warfare to a factor in the nature of warfare. Warfare would move past an activity that is exclusively human. Such a phenomenon would require significant changes in law and policy to manage the profound changes to the character and nature of war.

DoD Directive 3000.09 currently imposes restrictions and responsibilities on the acquisition, use, development, and testing of autonomous and semi-autonomous weapon systems. The directive sunsets November 2022 unless renewed or replaced.[27]

Some items are explicitly excluded from the directive, such as manually guided munitions, mines, unguided munitions, non-armed unmanned systems, and cyberspace systems used for cyberspace missions.

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26. Robert S. Leiken, "Event Horizon on line" *The National Interest* 88 (March 2007): 87. http://search.proquest.com/docview/218406200?accountid=4444 (accessed January 3, 2015).

27. *Autonomy in Weapon Systems*, DoD Directive 3000.09 (Washington, DC: Under Secretary of Defense (P), November 21, 2012), 1, 4, http://www.dtic.mil/whs/directives/corres/pdf/300009p.pdf (accessed March 8, 2015).

nongovernmental organizations such as the Red Cross and Human Rights Watch assert that autonomous weapons are already restricted under Article 36 of Additional Protocol I to the Geneva Conventions.[28] However the United States is not a signatory to Protocol I. In May 2014, the UN held its first meeting that exclusively covered lethal autonomous weapons in Geneva. Five countries presented letters calling for a complete ban on autonomous weapons. John Lewis argued in the *Yale Law Review* that regulation is a better option than a ban. Regulation will get more buy-in from major powers and provide more transparency.[29]

Other nations and actors may not impose limits on their robotic and AI programs. Examples of robots in the kill chain are in the press. Machine-gun bearing robotic guards patrol the border between Israel and Gaza. They also patrol the border between North and South Korea. Robotic snipers were used in Iraq to kill targets up to two kilometers away.[30]

Robust methods to monitor foreign actor robotic and AI research programs should be developed. Techniques to attribute a robotic attack to its perpetrators should be researched as well. As an example of monitoring techniques, the Defense Advanced Research Projects Agency (DARPA) has leveraged crowd sourcing game play to improve the tracking of quiet submarines and to test robotic components.[31] This is a creative way for small actors to get large numbers of people to train their robots. Knowing this, DoD could monitor crowd sourcing game sites, which may reveal potential rogue actors doing robotic research and training. This may also provide a vector for how to disrupt an adversary's activity.

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28. Bonnie Docherty, "Losing humanity: the case against killer robots," *Human Right Watch* (New York: November 19, 2012) https://www.hrw.org/report/2012/11/19/losing-humanity/case-against-killer-robots (accessed March 21, 2015)

29. John Lewis, "The Case for Regulating Fully Autonomous Weapons" *Yale Law Journal* 124, 4 (January 2015): 1. Database: LexisNexis Academic, http://www.lexisnexis.com.ezproxy.usawcpubs.org/hottopics/lnacademic/?verb=sr&csi=7363 (accessed March 21, 2015)

30. Ibid. Goodspeed, "When Robots Kill," 1.

31. Kaipa N. Krishnanand, Joshua D. Langsfeld, and K. Gupta Satyandra,"robot see robot do" *Mechanical Engineering* 136, 9 (September 2014): 39. http://search.proquest.com/docview/1559578724?accountid=4444 (accessed January 4, 2015).

The attribution task may require changes in policies and law to be effective. The U.S. should make sure potential adversaries agree to limitations similar to the policy outlined in DoD Directive 3000.09, with which the U.S. already complies. If an international agreement is made with regard to lethal AI, clear consequences should be in place before any violations occur. The pace of change is too rapid for the international community to deliberate on responsive action after a violation. If such an arrangement cannot be secured, the United States should modify DoD Directive 3000.09 to maintain parity with potential adversaries.

Furthermore, the DoD procurement process is too slow for the pace of change in the robotics and the AI field. To manage this problem, a robotics and AI research program similar to the NASA program of the 1960s should be created. A new agency, the National Administration of Robotic and Artificial Intelligence (NARAI) should be established at a secure location. Finally, commercial and military research and development should be blended. This will reduce the cost burden to DoD, reduce the talent available for potential adversaries, and spur a booming U.S. commercial sector.

Robotics and AI have reached the point where they can significantly supplement parts of a military force. The U.S. needs to maintain overmatch in robotics and AI and integrate them as fully as possible into the DoD infrastructure. The U.S. government needs unified action. A possible method is to create a national robotics-AI agency. Military robotics and AI efforts should adhere to DoD Directive 3000.09 or a modified version to adapt to adversarial actions.

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STRENGTH *and* WISDOM

Seizing Objective 2040

Colonel Jerry A. Hall

Upon the fields of friendly strife are sown the seeds that upon other fields on other days will bear the fruits of victory.

—General Douglas MacArthur[1]

Aftermath

From a distance, the escarpment protruding from the plains was eerily quiet as dawn gave way to morning. The only sign that a battle had just occurred was the smoke from near-by burning vehicles and the tattered vegetation. A whirring sound broke the silence as a small electric medical evacuation (MEDEVAC) vehicle marked by the Red Cross symbol swiftly made its way down from the escarpment, away from the smoke plumes.

Aboard the automated MEDEVAC vehicle, a U.S. Army sergeant reflected on his first battle as he felt another wave of pain medication wash over him. Following the first shock of receiving a hail of machine-

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1. While General MacArthur was speaking of athletic fields, in this case the "fields of friendly strife" are the synthetic battlegrounds of simulations used to enhance Army capabilities. "Douglas MacArthur," http://faculty.washington.edu/kendo/macarthur.html (accessed May 10, 2015).

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gun bullets, the medical protocols in his light cavalry scout "chameleon suit" took over, injected him with pain medication, activated tourniquets on his injured arm and leg, and sealed his wounds with medi-foam to stop the bleeding and prevent infection – all this before he even hit the ground from the impacts. The robotic medic suite within the small MEDEVAC vehicle stabilized him, scanned his wounds and then sent the information to all echelons of the supporting medical staff.

At the troop aid station, a surgeon examined the incoming data and fused it with the latest MRI from the wounded sergeant's medical records to form a complete 3D holographic image of the casualty on the field operating table. The surgeon could tell from the health and status indicators that the casualty was stable, but he also learned that he would need to perform several surgeries in a few minutes. So he ordered the surgical team and suite into simulation mode. In seconds he was simulating fusing the sergeant's shattered bones together, then reinforcing them with screws and plates. As he concentrated on repairing the sergeant's 3D avatar in preparation for the actual procedure, the surgeon asked the senior medic, "How many of the new silk ORIF kits do we have?"[2]

Back at the escarpment, the commander of the light cavalry troop focused on watching the excruciatingly slow – to her – progress of the MEDEVAC vehicle with "her" casualty in it.

"Ma'am?" The First Sergeant's voice in her earpiece finally registered in the commander's consciousness after several attempts.

"Roger, SITREP please," the captain managed as her attention focused away from the sub-screen following the MEDEVAC to the dizzying array of information displayed on the augmented reality screens overlayed on the armored window of her command vehicle.

"One WIA. He is being evac'd as we speak. Doc says based on the simulation he'll be fine. We lost zero manned vehicles, but first platoon

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2. Open Reduction and Internal Fixation, the type of surgery to repair a broken bone using metal screws, pins, rods, or plates to hold the bone in place. "Bone Fracture Repair," http://www.healthline.com/health/bone-fracture-repair#Overview (accessed May 10, 2015). The use of silk instead of metal screws, pins, rods, or plates is discussed in "Silk-Based Surgical Implants Could Offer a Better Way to Repair Broken Bones," http://now.tufts.edu/news-releases/silk-based-surgical-implants-could-offer-better-way-repair-broken-bones (accessed May 10, 2015).

has one down for an unknown engine malfunction. Maintenance is troubleshooting it now. We lost five automated dismounted scouts and two unmanned wingman vehicles across the troop. Second Platoon's VLS (Vertical Launching System) pod with all remaining rockets was also destroyed.[3] Wait one…Maintenance just reported they have connected with Support and they are running a diagnostic and simulation on swapping the malfunctioning engine…they should have one here via unmanned lift and the engine swapped out within an hour."

"Roger, First Sergeant, thank you."

Seizing Objective 2040

The young captain's mind wandered back in time less than 48 hours. She and her troop were on Tier 1 alert status along with the rest of the brigade when they were activated to respond to escalating ethnic violence along the border of a distant country, the same border that split the escarpment she was on roughly down the center. At an elevation of 2040 feet above sea level on her digital maps, it was indicated by a "2040" and called Hilltop 2040, or simply Hill 2040.

During the flight from the United States, her command vehicle was connected to the power and network of the Army (Vertical Take Off and Landing) VTOL tilt-rotor tactical transport she shared with her brigade commander's vehicle; the VTOL transport was in turn connected to the power and network of the Air Force strategic transport that was carrying it. In conjunction with higher headquarters commanders and staffs, she had participated in multiple simulated wargames of the entire operation while in flight. After several iterations, the brigade commander approved one of the simulated courses of action. Her mission as the first unit on the ground was to conduct a zone reconnaissance to the border, establish a defensive screen, and prevent hostile forces from crossing it.

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3. As envisioned in this article, configurable, scalable and easily deployable ground or aerial VLS "rocket pods" will be available at all echelons for immediate strike support, replacing traditional mortars and tube artillery. Future VLSs could be loaded with a variety of anti-personnel, anti-armor and air defense rounds, among others.

As her flight approached the destination country, the huge strategic transport launched the Army tactical transports from its cargo hold. The Army tactical transports deployed her troop directly into a remote tactical assembly area, avoiding a more conspicuous arrival at an international airport or established military airstrip. The next thing the young captain knew she was departing the assembly area toward the border while observing imagery of streams of refugees transmitted by her aerial drones.

Once the troop reached an escarpment parallel to, but a little lower than, Hill 2040, she deployed it in a screen line and waited for the situation to develop. Her situational understanding was obtained from an all-source intelligence feed from higher headquarters, verified and augmented with her own manned and unmanned ground and air systems. From her perch, she observed emerging reports that added layer after layer of data to what she could actually see through the ballistic windshield of her vehicle. Refugees continued to stream over the border and along the roads to either side of Hill 2040; they conserved the extra energy needed for them to walk up and over the hill.

Her attention settled on a blinking hostile icon deep in the country opposite her, but rapidly approaching Hill 2040. She zoomed in on the drone feed and observed a loose formation of more than a hundred armored cars, armored personnel carriers, "technical" trucks, and assorted other military and civilian vehicles. Despite the ragged appearance of most of the vehicles, the formation was obviously organized into sub-units; it moved with a purpose. She captured the formation and pasted it into the embedded simulation database.

"XO, I want to run a full sim against this formation, down to the individual soldier level. Set it up. Get with Intel and have the "red" formation I just dropped into the database use multiple approaches and objectives. Let's start with a defense from our actual positions on this hilltop…" she paused to check the map, "…Hilltop 2015. Then we'll try it from a variety of other positions. Have the sim play out several iterations of the cyber and drone counter-recon fight in accelerated time and use the median results as our starting situation. I have a pretty good idea of where I want to defend from, but let's see how the sim goes. Tell Intel to challenge us! Let's do it in 30 minutes."

Thirty minutes later the simulated enemy formation approached Hill 2040 from the opposite side as the troop observed it with the national, higher headquarters and organic ISR (Intelligence, Surveillance and Reconnaissance) assets that survived the surprisingly lethal counter-recon fight. The enemy's cyber capabilities had neutralized several networks and systems. Despite the enemy's niche cyber and armed aerial drone capabilities, he could only significantly degrade, not defeat, the array of defensive cyber and drone capabilities that protected the U.S. formation. In the simulation's augmented reality mode, the enemy icons were just another overlay on her already cluttered mission command screens. She favored purple icons for simulated entities, but this was a configurable setting…some commanders preferred no difference between real and simulated units when they conducted mission rehearsals.

While the real enemy formation was still hours away, in the simulation the troop initiated the battle with higher echelon and organic armed drones as the enemy paused in the dead space behind the escarpment. She supplemented the drone fires with several guided munitions from her troop VLSs. She observed multiple kills as the enemy paused in apparent shock and confusion, then withdrew in disorder.

"Captain, that went well. However, legal pointed out that the enemy never actually crossed the border, nor did they engage you from across the border." She recognized the voice of an allied officer from the brigade staff.

'Great,' she thought to herself as she opened a private holographic channel to brigade, 'Nothing like brainstorming for an audience.' Once the channel opened, she replied to her long-time friend, "Things were simpler when we were making actual sand tables at Ranger School!"

"Indeed," he replied. "I hear that students actually use portable holographic sand tables now…how lax things have become! But worry not, I do not think anyone in the White House Situation Room is watching on their 3D holographic terrain board right now." She could see him smile in the "holo" window she had opened in her peripheral vision.

'Even better,' she thought to herself. "Then I guess I need to get back to it before someone starts paying attention," she replied as she moved to terminate the connection.

"Again, worry not. Your brigadier has reiterated at every opportunity that just because everyone between you and your President can see the situation, and are observing what you are doing about it, does not mean that they should feel compelled to start issuing orders…mission command and all that, you see." He was still smiling, seeming to ignore her understandable discomfort. She terminated the connection.

She switched to a private immersive holographic screen as she waited for the XO to start the next sim iteration. She took deep breaths and tried to relax as she ran her avatar through a single routine of Yang 24 Form Tai Chi using the resiliency simulation. In the meantime she allowed the simulated enemy formation to occupy Hill 2040 before opening the next iteration of the upcoming battle.

On the reverse slope of the troop's position on Hill 2015, the young sergeant who would soon be a casualty was also in an immersive holographic simulation displayed on the Heads Up Display (HUD) of his helmet. He surveyed the synthetic environment around Duffer's Drift from the top of Regret Table Mountain as he allowed the narrator to start the Sixth Dream of British Lieutenant Backsight Forethought's final instructive defense of Duffer's Drift against the Boers.[4] The commander had assigned him to study this sim before she would provide him with a letter of recommendation for Office Candidate School (OCS).

"Sergeant Forethought!" The First Sergeant's voice broke into the simulation. "I know you want to go to OCS, but let's get into the real simulation before I talk to the Commander about deleting that draft letter of recommendation." The First Sergeant smiled to himself at the irony of 'Sergeant Forethought' and 'real simulation' as he ascertained the sergeant had terminated the Duffer's Drift leader development sim. He then opened the next soldier's health and status screen on his virtual status board to see what she was up to. Meanwhile the commander ran the troop through several more iterations against the various enemy courses of action until she was satisfied with her plan and issued the required adjustments.

"Cyber and EW (Electronic Warfare), any insights based on the sim?"

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4. Ernest D. Swinton, *The Defense of Duffer's Drift* (Wayne, NJ: Avery Publishing Group, 1986).

While she waited for answers, the captain reviewed the troop's power situation. The rail guns mounted in the unmanned turrets of the combat vehicles expended a large amount of energy per shot at maximum power and rate of fire, so she wanted to ensure that she could allow them to engage the enemy at the highest settings for both.[5] Fortunately it was summer in an arid region, so her unit's extensive solar capabilities were operating at maximum efficiency. Non-reflective and camouflage solar panels were built into the surfaces of all vehicles and dismounted exoskeletons and suits, as well as into the self-deploying camouflage netting used to conceal them. All vehicles, as well as dismounts, had the capability to share electricity via wireless power transfer; the vehicles could do so over several kilometers. Additionally, a large non-reflective solar array deployed well to the rear provided more than enough power for the entire troop via cable (or in an emergency via short range wireless transfer) to the troop command post, where it could be further wirelessly transmitted to wherever it was needed.[6]

"Ma'am, this is Cyber," replied her cyber operations warrant officer. "Nothing significant to report at the tactical level; our network was not penetrated. We are running narrow-beam line-of-sight only, relayed through the section and platoon aerial drones, with all transmissions encrypted and in frequency-hopping mode. An adversary would have to get inside our formation, or behind it, then get on one of our vehicles or between two of our nodes, to even have a chance of hacking into our tactical network from within. Probes and scans were reported from higher, and several higher echelon aerial drones were hacked into and temporarily taken over during the counter-recon fight, but there were no reports of penetrations that could be traced down to us."

"Roger, Chief, thanks. Confirm the protocol for a suspected penetration for me, just in case."

"Ma'am, if I even suspect that our local tactical network has been penetrated, I will initiate a routine that will attempt to install a virus

5. Mike Hoffman, "BAE Proposes Rail Guns for Army's Future Fighting Vehicle," DefenseTech.org (October 23, 2014) http://defensetech.org/2014/10/23/bae-proposes-rail-guns-for-armys-future-fighting-vehicle/ (accessed May 16, 2015).

6. "Japanese Scientists Make Breakthrough in Wireless Energy Transmission" *Japan Times* (March 13, 2015) http://www.japantimes.co.jp/news/2015/03/13/national/science-health/japan-space-scientists-make-wireless-energy-breakthrough/#.VVe4fvlVikp (accessed May 16, 2015).

into the intruder system or systems. That virus will then transmit the intruder's system data to various Cyber Command controlled proxies for further exploitation. Then based on your guidance, and only if necessary, I will immediately bring our entire tactical network down. I will then work on a patch to identify and remove any program or code the hackers introduced so we can bring the network back up as soon as possible."

"Roger, Chief, thanks again. I know that bothers you, but after some of the disastrous hacks of tactical networks in the past, we can't have anyone in our network. If you have to initiate that protocol, we'll operate on directional voice, with unmanned systems in emergency defensive mode. We'll make sure all of that 'old school' training the First Sergeant likes to put us through pays off."

"Ma'am, this is EW. Because of the current system configuration already mentioned by Cyber, we are almost undetectable as long as we do not use our wireless energy transmission capability. If we transition to directional voice over radio instead of over IP (Internet Protocol), it will also increase our detectability, although if they have hacked into our system to trigger that, they probably already know where we are. As you requested and the SCO (Squadron Commander) approved, we deployed with all three of the squadron's back-up electronic signature decoy systems, so we have five – our primary and alternate, as well as the three additional systems. I have deployed them across our zone, but have not activated them yet. I have your activation criteria, and used them in the sim. The median result was that enemy EW detected two of the decoys per run and engaged them with strike assets rather than us."

"Excellent, Chief, thanks to both of you, let me know if anything changes."

"Guidons, this is Black 6, estimate ninety minutes until contact, conduct final rehearsals and report when complete, Six, out." With that she let her platoon commanders turn to their own responsibilities. She reflected on the mission command screens before her, especially on Hill 2040.

"OP (Observation Post) One, report," ordered the platoon commander to the two dismounted scouts he had just deployed on the flank of Hill 2040. The commander's tactical adjustments were based on the

mission rehearsal simulations; they included OPs on Hill 2040, as well as section screens covering the roads on either flank of the escarpment in case the enemy went after the refugees, as they had in one of the simulated enemy courses of action. She had also designated Hill 2040 as Objective 2040 for a planned counterattack if the enemy attempted to physically seize it.

"Blue Six, this OP One, set, over," replied the section sergeant. As instructed, he had established the OP to maintain human observation beyond the escarpment without crossing the international border, which he could see in his HUD was about two feet in front of him and his fellow human scout. He had deployed two additional dismounted wingmen, several robotic air and ground sensors, and a scout VLS box. His section's aerial relay drone was hovering between him and the rest of the platoon on the Hill 2015, in dead space to the approaching enemy formation and its EW detection capability.

"OK, let's run a simulated engagement sequence against some of these approaching yahoos, just in case we have a chance encounter," the sergeant announced to his wingman as he entered augmented reality mode. An additional overlay appeared in their HUD's, and he toggled to "Live" mode instead of "Virtual," which gave further commands to their weapons to allow for manual manipulation, but with simulated effects. He and his wingman raised their weapons and reacted to a simulated enemy stealth three-wheeled ATV (All-Terrain Vehicle) stumbling on their position as their platoon sergeant monitored with a nod of approval.

The section that was tasked to screen the border further along the flank of OP One completed its movement a few minutes later. The section sergeant ensured that his manned vehicles and their robotic wingmen were arrayed to take advantage of the terrain, then instructed his section to conduct a simulation of an enemy attack against the refugee column fleeing along the road to his front. He left the section in "Virtual" simulation mode, which allowed for manual manipulation of all vehicle controls, but disengaged them from the actual vehicle systems to reduce their signature…it would be no good if the vehicles started moving their turrets while waiting for the enemy. After a few simulation runs he was satisfied that his section was ready. He then

disabled the simulation and reported his updated readiness condition to his platoon commander. He settled in to wait for the anticipated engagement.

Objective 2040: Coda

The troop commander reflected on the battle as she monitored the progress of the MEDEVAC vehicle toward the troop aid station. As the age-old aphorism suggested, no plan survives initial contact with the enemy. Hers had met the same fate. She watched the replay of the battle on her mission command information system, recognizing the point at which the enemy succeeded in hacking into the troop's tactical network using an insect-like nano-swarm that had evidently lain dormant on Hill 2015 until triggered by the seismic activity of the troop's vehicles. The intrusion triggered the protocol that shut the network down. She cringed as she again saw the enemy release dozens of armed tactical and ground drones it had withheld until just before it arrived at Hill 2040, starting another round of drone-on-drone combat. By the end of the battle the troop had destroyed most of the enemy vehicles, saved hundreds of refugees, counter-attacked and seized Objective 2040 from the enemy – all while in degraded mode, outnumbered and thousands of miles from home. The XO and First Sergeant consolidated and reorganized the troop on the objective while she provided a situation update to the brigadier and his staff.

Author's Note

This vignette builds on a similar, albeit much shorter, vignette entitled "A Soldier's Story" in the Executive Summary for Unified Quest 2013, "Exploring Conflict from Hilltop 2030."[7] In "A Soldier's Story," Hilltop 2030 represents the year 2030, and the capabilities highlighted in the

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7. "A Soldier's Story' describes a platoon leader's perspective and anticipated experiences in the context of a probable conflict involving U.S. Army Forces in the 2030 timeframe. The leader symbolizes the Army's exploration of future conflict while the hypothesized environment – Hilltop 2030 – replicates the strategic and operational trends that served as a foundation for the Army's Unified Quest Deep Future Wargame 2030-2040." Army Capabilities and Integration Command (ARCIC), "Exploring Conflict from Hilltop 2030," p.2. http://www.arcic.army.mil/app_Documents/ARCIC_Executive-Report_Unified-Quest-2013_Deep-Future-Wargame-2030-2040_20Nov2013.pdf (accessed April 26, 2015).

vignette represent those the Army may need in the future. Similarly, in this vignette, we are metaphorically observing from Hilltop 2015, attempting to identify the capabilities and strategies we need to seize Objective/Hilltop 2040. This vignette, however, specifically explores the future possibilities of Modeling and Simulation (M&S) across the warfighting functions in keeping with the most recent Army Operating Concept (AOC).[8] It deliberately makes the scenario as generic as possible to focus on M&S, although it does postulate potential future capabilities to reify the future setting.

The Army has made remarkable progress in M&S over the past several decades, transitioning from an era of stove-piped Live-Virtual-Constructive (LVC) simulations, to training that used *ad hoc* "blended" LVC and Gaming (LVC-G) simulations, to the current LVC Integrating Architecture (LVC-IA) that enabled the Integrated Training Environment (ITE). The Army is already planning the next step, the Synthetic Training Environment (STE), which will deliver seamless simulation capabilities to the "point of need" as depicted in this vignette. To achieve the full synergy postulated in this vignette, however, the Army must overcome the barriers between system (i.e., weapon and vehicle programs) and non-system (general training) simulations to create a cloud-enabled, single synthetic, embedded, and immersive training environment using one-world terrain and common models fully integrated into the Army Common Operating Environment (COE), all readily available over a global network.

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8. U.S. Training and Doctrine Command, *The U.S. Army Operating Concept: Win in a Complex World 2020-2040*, TRADOC Pamphlet 525-3-1 (Fort Eustis, VA: U.S. TRADOC, October 31, 2014)

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STRENGTH *and* WISDOM

Simulation: The Remedy to Future Joint Readiness and Leader Development

Colonel Heath J. Niemi

The future starts today, not tomorrow.
—Pope John Paul II

A View from 2035

In 2017, sequestration and the Budget Control Act (BCA), a congressional reaction to a National Debt of over $19 trillion, devastated Joint service readiness.[1] This resulted in the Army only able to maintain two deployable brigade combat teams outside of the forces required for presence in Afghanistan, Europe, Korea, and Okinawa. Local and national training became more expensive and, with a National Training Center rotation costing an average of $25 million per rotation in the year 2014, training and the resultant readiness started to decline with inflationary cost increases.[2] As a consequence of defense cuts totaling over $1 trillion through FY 2021, service readiness for contingency plans in support of the Geographic Combatant

1. U.S. National Debt is at $18.23 trillion as of May 18, 2015.
2. John M. Ruths, "Preparing to Succeed at the National Training Center," *Army Sustainment* (July-August 2014), http://www.alu.army.mil/alog/2014/JulAug14/PDF/128699.pdf (accessed September 30, 2014).

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Commanders (GCCs) waned and as a result, the Department of Defense (DoD) could not source and fight the requirements directed in the National Security Strategy.[3] By 2025 the federal budget of $6.117 trillion included $827 billion of interest on the national debt – this interest payment surpassed the entire defense budget.[4]

Now in 2035, the federal government finances the defense budget through deficit spending, placing the security of the United States at risk and its national interests in the hands of foreign purchasers of U.S. debt. Private security firms fill an ever-increasing percentage of global security needs as the international community now "contracts out" to fill the security gap created by reduced U.S. defense spending. Army readiness suffers as realistic training is reserved only for a small percentage of the top units in the tiered-readiness model. The term "hollow force" is used increasingly to describe U.S. readiness and capability.

An Alternate View from 2035

The world became increasingly more volatile in 2015 and based on mounting costs to conduct realistic training and the limitation on the number of assets available to conduct joint training, an advanced simulations suite was necessary. In 2017, the DoD transformed to a holistic, simulated Synthetic Training Environment (STE) program embracing the Army's Future Holistic Training Environment – Live-Synthetic (FHTE-LS).[5] The DoD FHTE-LS connected the Service's Integrated Training Environments (ITE) composed of live, virtual, constructive and game integrated architecture training (LVC-G IA). This DoD program integrated all of the service ITEs and produced cost-effective, realistic training for Joint technical combat competence, leadership development and empowered subordinate elements.

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3. Department of Defense, *Estimated Impacts of Sequestration-Level Funding*, Fiscal Year 2015 Budget Request (April 2014), 1-2, http://archive.defense.gov/pubs/2014_Estimated_Impacts_of_Sequestration-Level_Funding_April.pdf (accessed May 18, 2015).

4. Congressional Budget Office, "The Budget and Economic Outlook 2015-2025," January 26, 2015, https://www.cbo.gov/publication/49892 (accessed May 15, 2015).

5. David Szondy, "US Army Examining Next-Gen Augmented Reality 'Live Synthetic' Simulations," gizmag.com, April 1, 2014, http://www.gizmag.com/army-live-synthetic-future-combat-simulation/31312/ (accessed May 18, 2015).

Concurrent with the new STE, the DoD created a network simulation standard to replace the 2015 conglomeration of CTIA, DIS, HLA, ALSP and TENA[6*] architectures.[7] Stand-alone devices which existed as late as 2017, such as the Army Transportable Black Hawk Operation Simulator (T-BOS) UH-60M and the Transportable Flight Proficiency Simulator (TFPS) CH-47F simulators, were replaced with devices that network, not only for multi-aircraft operations but for air to ground operations with the Navy, Marines, Air force and Special Operations.
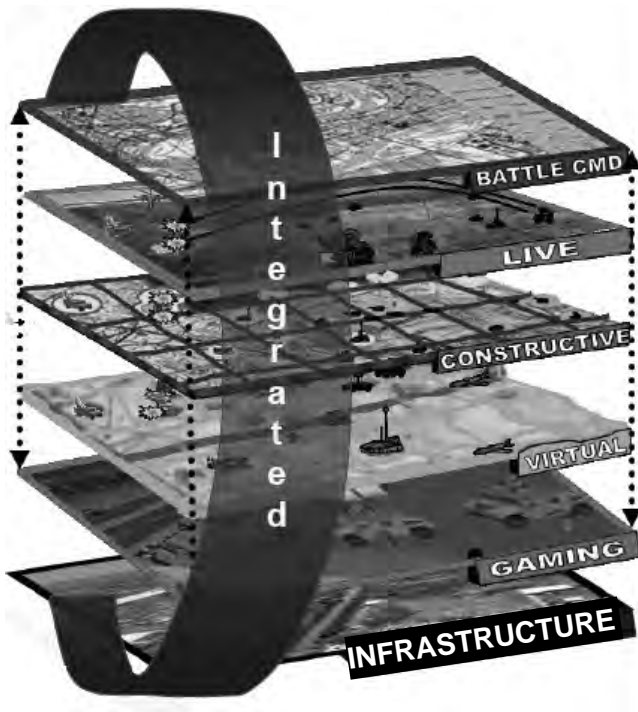

Figure 1. The Army Integrated Training Environment (ITE) [8]

6. Acronyms defined:
- CTIA = Common Training Instrumentation Architecture
- DIS = Distributed Interactive Simulation
- HLA = High Level Architecture
- ALSP = Aggregate Level Simulation Protocol
- TENA = Test and Training Enabling Architecture

7. Wikipedia.com, "Live, Virtual and Constructive," June 20, 2015, https://en.wikipedia.org/wiki/Live,_virtual,_and_constructive (accessed May 15, 2015).

8. MG Michael S. Tucker, "Home Station Training and the Army Training Strategy: Transition to Home Station Training," http://www.benning.army.mil/mcoe/maneuverconference/2012/presentation/pdf/MGTucker.pdf (accessed May 15, 2015).

Each service, to include the National Guard and Service Reserves, expanded their LVC-G IA programs and soon interwoven virtual simulation is linked within realistic combat training environments that connected geographically distributed mission operation (DMO) units and assets. Joint LVC-G training, underdeveloped in 2015, is pushed as the number one training resource requirement through the Chairman, Joint Chiefs of Staff (CJCS) and was implemented in 2020.

In 2035, the DoD simulations program includes virtual synthetic environments, combined with artificial intelligence, immersing the user in simulated scenarios via virtual reality. Strategic, operational and tactical level exercises now run through simulation, within constructive synthetic environments, as live training becomes too expensive to conduct.

Joint Readiness

Stove-piped service parochialism was shattered after the September 11, 2001 attack on the Twin Towers. The next 14 years marked the rise of Joint special and conventional integrated operations in Operation Enduring and Iraqi Freedom. In 2015, all of the Service Chiefs understood that to return to a pre-9/11 mindset was to step back in U.S. preparedness. Joint operations were hailed as the way forward. The *Army Operating Concept (AOC)*, TRADOC Pam 525-3-1 dated October 2014, recognized that joint operations were the key to meeting the future uncertain global environment in the five domains of land, air, maritime, space, and cyberspace.[9] Furthermore, the AOC recognized that future Army organizations were to become "tailorable and scalable combinations of special operations and conventional forces, regionally aligned and globally responsive combined arms teams, and foundational theater capabilities to enable joint operations."[10] The groundwork for progressive Joint Operations and Joint Task Organization was laid; it took major shifts in Service culture to put them into action.

In 2017, U.S. global readiness was weakened as a result of the fiscal environment. As a result, the DoD began restructuring the Services

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9. U.S. Department of the Army, *The United States Army Operating Concept Win in a Complex World*, TRADOC PAM 525-3-1 (Washington, DC: U.S. Department of the Army, October 31, 2014), iv, http://www.tradoc.army.mil/tpubs/pams/tp525-3-1.pdf (accessed January 8, 2015).

10. Ibid.

into Regionally Aligned Joint Expeditionary Task Forces (RAJTFs) that organized, trained and deployed in a Joint Task Force Generation cycle (note the Burke-Macgregor ISMS Framework) to support prioritized GCCs.[11] Fiscal challenges also led the Army to reorganize the Army National Guard (ARNG) and the Army Reserve (USAR). The Office of the Secretary of Defense moved all operational unit formations from the USAR to the ARNG, while keeping unique expertise in the USAR (Judge Advocate General, Medical, etc.) to diminish duplicate lines of effort in personnel, infrastructure and reduce Army end strength. This leaner USAR freed up funds and when integrated with the new DoD-wide FHTE-LS, allowed the National Guard to substantially increase their readiness posture beyond the required 39 days of training per year. Additionally, the Army restructured the personnel system to allow soldiers to remain with an organization for longer periods of time (if not for their entire careers) to enable regional and joint expertise for the Global Landpower Network.[12]

The proficiency required for these regionally aligned teams was difficult to achieve as most geographic regions contain diverse environments and eco-systems, to include complex urban terrain in emerging mega cities. The ability to train to these diverse environments was limited in the continental United States (CONUS) and access to train with joint assets in the interim years of the reorganization was hard to coordinate based on Service requirements and cost. Furthermore, peer or near-peer nation state competitors with sophisticated anti-access/anti-denial systems (A2/AD), as well as, state-of-the-art conventional forces combined with special operations within a hybrid warfare construct, created scenarios that were difficult to replicate with live training.[13]

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11. Douglas Macgregor, "Streamlining Defense for the 21st Century (Preparing for austere 'interwar period' levels of military funding)," briefing slides for Secretary of Defense Hagel, December 21, 2013. The Burke-Macgregor Group ISR-Strike-Maneuver Sustainment Framework (the Framework), which proposes Joint Force Command rotational readiness for the GCCs.

12. U.S. Department of the Army, *The United States Army Operating Concept Win in a Complex World*, TRADOC PAM 525-3-1 (Washington, DC: U.S. Department of the Army, October 31, 2014), iv, http://www.tradoc.army.mil/tpubs/pams/tp525-3-1.pdf (accessed January 8, 2015).

13. Per the author's Hybrid Warfare definition: *A form of warfare that synthesizes and tailors the amalgamation of conventional and irregular (unconventional) military, economic, cyber, psychological (media/propaganda), intelligence operations, and proxy*

Networked gaming simulation, from the individual soldier all the way to the Joint Task Force Staff, was required to build readiness that was starting to rapidly decay.

The implementation of advanced Joint simulation training was required to enable the frequent use of limited service assets, against robust threat scenarios in all possible environments, to train full spectrum operations. As a result, joint doctrine superseded all service doctrine in training (except for unique niche capabilities), as joint exercises became the new normal.[14] Advanced, networked simulation, meshed with live and constructive training events, transformed the DoD and the threat of expensive, hollow service structures gave way instead to proficient technical and tactical joint organizations and leaders.

Leader Development and Mission Command

General Allyn, the Vice Chief of Staff of the Army, stated at the U.S. Army War College in 2015, that leader development is the key to 'win in the complex world.'[15] So how do the Army and DoD develop innovative leaders that conduct mission command in the future? The answer…simulation.

In 2015, it was recognized that information technology was creating an environment of such enhanced situational awareness (SA) and understanding (SU) that senior leader's perceptions of O3 (omniscience, omnipresence, and omnipotence) began to interfere with subordinates' responsibilities and duties.[16] Increased risk, due to modularity and speed to enable joint aggregation, also created obstructions to the employment

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(terrorist/criminal/mercenary) tools to affect an enemy in depth sequentially and simultaneously in order to achieve political objectives.

14. All U.S. doctrine must be consistent with joint doctrine; joint doctrine takes precedence over Service doctrine and multi- Service doctrine. U.S. Joint Forces Command, Chairman of the Joint Chiefs of Staff Instruction, *Joint Doctrine Development System* (Washington, DC: U.S. Joint Forces Command, January 5, 2015), http://www.dtic.mil/doctrine/new_pubs/cjcsi5120_02d.pdf (accessed June 18, 2015), A-3.

15. Lockerdome.com, "Allyn: Leader Development is Key to 'Win in Complex World,'" April 7, 2015, https://lockerdome.com/6428497165953601/7576910049 969428 (accessed May 21, 2015).

16. Heath J. Niemi, *Did the Radio Kill Aftragstaktik?,* Strategy Research Project (Carlisle Barracks, PA: U.S. Army War College, April 1, 2015), 2.

of true mission command.[17] Even without ADHOC organizational structures undermining the required trust in subordinates, it was difficult for subordinate leaders to gain the required experience for the next level of command because they increasingly operated in an environment of continual oversight. Paradoxically, peer nation-state A2/AD electronic warfare and Cyber capabilities <u>increased</u> the requirement to operate in a denied environment (similar to the days of the U.S.-Soviet Cold War) and made it even more necessary to train to Mission Command.

As the continuum of control flexes according to the level of mission sophistication and risk, movement forward demanded that the Army and DoD examine their leadership fundamentals. As leadership, management and control are the components of command, in 2017 Joint Doctrine recognized the term 'Flexive Command' to replace 'command and control' in order to encapsulate scenarios that required different levels of leadership and control. Flexive command was tested and validated in complex LVC-G ITE frameworks as well as real world combat missions. From the tactical leader to the Strategic senior leader, simulation allowed them to learn how to apply this command philosophy.

In 2017, simulation was acknowledged as the vehicle that could create an environment of empowerment and provide the tools to combat senior leader risk aversion due to O3, modularity and the speed of operations. In order to gain the necessary experience and proficiency to conduct trusted mission command, subordinates began to train in a simulated environment that allowed for them to learn from their mistakes. As subordinate leaders made mistakes in simulation and learned from them, senior leaders were trained to exercise mission command by applying appropriate barriers to prevent interference at the wrong time and place.[18] Leaders were taught in simulation that increased SA and SU, provided by technology and big data, could resource and enhance mission command while restraining the desire to over control.

By 2020, limited artificial intelligence (AI) was added to the senior leader's command arsenal. Synthetic infrastructure provided the training ground for leadership to take advantage of the enhancements

17. U.S. Joint Forces Command, *Joint Concept for Rapid Aggregation* (Washington, DC: U.S. Joint Forces Command, March 2015).

18. Niemi, *Did the Radio Kill Aftragstaktik?,* 19.

provided by AI versus struggling against the perceived friction between man and machine. Now in 2035, artificial intelligence has significantly advanced and is just short of 'awareness.' AI, along with supercomputing and massive bandwidth, instantly provides the best statistical course of action for commanders and O3 is fast approaching reality. It is important that leaders are assessed and groomed at very early stages of development in order to establish *coup d'oeil* – the intellectual capacity of military commanders to evaluate geography and apply that evaluation to the successful prosecution of war – that is required of O3. Advanced virtual settings are provided for the specific training required to evolve these handpicked leaders. By 2040, unmanned air and ground machines will conduct unmanned teaming maneuvers connected through hardened networks and commanded by AI enhanced, O3 leaders. *Ender's Game* is becoming a reality and simulation is the connective tissue.[19]

Conclusion

We must face the fiscal reality of the ballooning national debt that Admiral Mullen referred to as the number one threat to the security of the United States.[20] The DoD and the Army must make the necessary investment in a DoD-wide FHTE-LS framework before the fiscal situation worsens. The services can no longer resist the upfront cost required to implement a holistic simulation network to stop the decay in readiness that is manifesting as we pull back from 14 years of combat. Leaders fear simulation will pull live training hours from current programs – but those same leaders will face mandated cuts to those hours starting in 2016. Simulation is cheaper by an order of magnitude and the technology is becoming virtual reality at a pace beyond expectations.[21]

19. Orson S. Card, *Ender's Game* (New York: A Tor Book, Tom Doherty Associates, 1977).

20. Laura Bassett, "Adm. Mike Mullen: 'National Debt is our Biggest Security Threat,'" *Huffington Post* (June 24, 2010), http://www.huffingtonpost.com/2010/06/24/adm-mike-mullen-national_n_624096.html (accessed May 18, 2015).

21. National Training and Simulation Association. "Why Use Simulation? - Return on Investment," http://www.trainingsystems.org/publications/simulation/roi_effici.cfm (assessed May 18, 2015). CH-47 ratio is 7:1 while an FA-18C is 18:1 and an S-3A is 30:1.

Simulation, integrated into the FHTE-LS hybrid concept, is the quickest way to implement the Joint training required in the AOC. FHTE-LS will also create a synthetic environment to develop leader experience, which in turn will create the trust senior leaders required to allow mission command to flourish. Limited Joint resources, geographically separated amidst tightening military budgets, can train together in synthetic environments that replicate any location and all threats. Enhanced through the use of artificial intelligence in 2035, these threat scenarios provide unpredictable challenges to leadership at the tactical level that positively impact the training at the operational level. As senior leaders are exposed to high risk situations in simulation and confronting these trials with their staffs and subordinates, situations deemed too risky to allow empowerment are now considered opportunities to produce creative initiative and adaptive Joint Army combat units.

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STRENGTH and WISDOM

Adaptive Leader Training – Finding the Sweet Spot

Colonel John Best

The development of adaptive leaders possessing the critical and creative thinking capacities to solve complex problems in a volatile, uncertain, complex, and ambiguous (VUCA) environment is an important component in leader development. However, cultural learning differences between the current generation of mid- and senior-grade Soldiers (Generation X) could be a source of friction in the future development of the rising junior Soldiers (the Millennials) joining the service today.

The Millennials (Network Generation or Net Gens) crave information and prefer learning more from group discussion and web surfing than from textbooks and lectures, and, in lieu of long reading assignment or long "text-based" step-by-step instructions, they prefer graphic layouts.[1] They also prefer to conduct research on the Internet instead of physically visiting the library or even physically turning printed pages. In essence, these individuals prefer multimedia to books and videos to photographs; all obtainable on the worldwide web. In contrast whereas Millennials prefer autonomy, Generation X (Xers) tend to be structured, punctual and linear.[2]

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1. Tony Wagner, *The Global Achievement Gap* (New York: Perseus Books Group, 2010), 271.

2. Rob Asghar, "Gen X Is From Mars, Gen Y Is From Venus: A Primer On How To Motivate a Millennial," (January 14, 2014). http://www.forbes.com/sites/robasghar/2014/01/14/gen-x-is-from-mars-gen-y-is-from-venus-a-primer-on-how-to-motivate-a-millennial/ (accessed January 1, 2015).

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To harness the full potential of Millennials, Xers must recognize and embrace the need for change. The nature of the VUCA environment requires adaptive, critical and creative thinkers, yet within the Army systems for training and developing these skills across generational differences are not in synch – successful organizations naturally resist change. This disconnect requires a fundamental cultural shift in how the Army approaches training and development.

How Generation X Trains

The military's prevailing concepts and practices are based upon the point at which "the service last displayed its institutional competence and power at its very best" – preparing to fight our last war. This linkage (between prior success and current practice) creates the military's inherent resistance to change. Xers are reluctant to adapt new training methodologies due to their bias towards "things that have worked in the past."[3] They are comfortable with training environments structured around instructor-centric curriculum, step-by-step checklists, and rote memorization learning. Perhaps unintentionally, due to their own particular behavioral development in "an authority-based, lecture-oriented school," Xers have designed training to teach 'what' to think versus 'how' to think.[4] This method for developing Army leaders has a solid track-record of successes: the reformation of the Army NCO Corps in the post-Vietnam era, the development and implementation of the AirLand Battle doctrine, the end of the Cold War, and victory in Operation Desert Shield/Storm.[5] As a result, a revision in leader development thinking is met with valid anti-innovation arguments from the current generation of senior leaders.

In today's training base, rote memorization and information regurgitation are the standard in initial military training (IMT). During IMT, an instructor presents the Soldier with an unfamiliar problem, then instructs the Soldier on how to solve the problem using a detailed list of sequential tasks. For example, the employment of a <u>hand grenade r</u>equires successful completion of 20 tasks – 7 individual

3. Andrew Hill, *The Shock of the New: Innovation in Military Organizations*, Faculty Paper (Carlisle Barracks, PA: U.S. Army War College, June 2014), 9.

4. Wagner, *The Global Achievement Gap*, 338.

5. Leonard Wong, *Generations Apart: Xers and Boomers in the Officer Corps* (Carlisle Barracks: Strategic Studies Institute, October 2000), 10.

steps, each with 2 to 3 sub-steps.[6] To determine if cognitive learning is occurring, the instructor requires the Soldier to repeat the tasks they were shown. Success is defined by the Soldier's ability to repeat the sequence of tasks exactly as shown. This learning validation commonly occurs immediately after the period of instruction (i.e. regurgitation). Throughout initial military training, this method of instruction is used for all Soldier common tasks in order to provide the Soldier with the necessary skills to shoot, move, communicate, save lives, and be physically fit. As a graduation requirement, Solders are immersed in a culmination event – a field exercise designed to test their ability to apply a learned skill to a specific problem (i.e., test of memorization and regurgitation). For example, a Soldier is exposed to a wounded teammate and must apply first aid; or the Soldier is presented with a weapon malfunction and must reduce the stoppage. Similar to their training, success is based on the Soldier's ability to successfully repeat the sequence of tasks necessary to solve the problem.

IMT is a snapshot of the much broader Xers' learning environment – instructor-centric, step-by-step checklist driven, rote memorization, regurgitation – explicitly designed to assess memory and recall. However, this method of teaching fails to foster or cultivate critical and creative thinking, two key competencies that are necessary for adaptive development and a cornerstone of leader skills for the future force.

What Do the Millennials Require?

In the performance of a task or a project, Xers are more risk averse, preferring to research the problem and prepare a solution before validating it. Conversely Millennials tend to approach the same problem with a discovery learning mindset, content to explore until a solution is found.[7]

> *[Xers] tend not to want to try things unless or until [they] already know how to use them. If [they] don't know how to use the appliance or software, [their] instinct is to reach for a manual or take a course or call up an expert…The [Net Gens] want to turn the thing on, get in there, muck around, and see what works. [They] get on the*

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6. "The Army Study Guide," http://www.armystudyguide.com/content/SMCT_CTT_Tasks/Skill_Level_1/0713254407-sl1-employ-han.shtml (accessed 23 May 2015).

7. Ashgar, "Gen X Is From Mars, Gen Y Is From Venus."

Web and link, lurk, and watch how other people are doing things, then try it for themselves.[8]

These fundamental differences between Xers and the Net Gens present challenges in shaping how today's leaders will develop the adaptive and innovative qualities of the future generation of leaders. Foundationally, tomorrow's leaders require new learning methods:

- TNet Gens learn through multimedia, classroom discussion and "information navigation."[9]
- They associate learning as a discovery-based environment versus "an authority-based, lecture-oriented school."[10]

To harness the full potential of the Net Gens, Xers must recognize the paradigm shift and embrace it.

How to train the Millennials – Adaptive Training

To build adaptive leaders and capitalize on behavior development, the training environment must consist of states of equilibrium and disequilibrium. From a cognitive learning theory perspective, human nature prefers to maintain a state of equilibrium (or a state of understanding of the environment). When a problem exists that is unfamiliar to the individual, then disequilibrium occurs. The state of disequilibrium is considered the optimal learning environment. As individuals discover solutions to the problem and return the environment to equilibrium, this is where the greatest learning
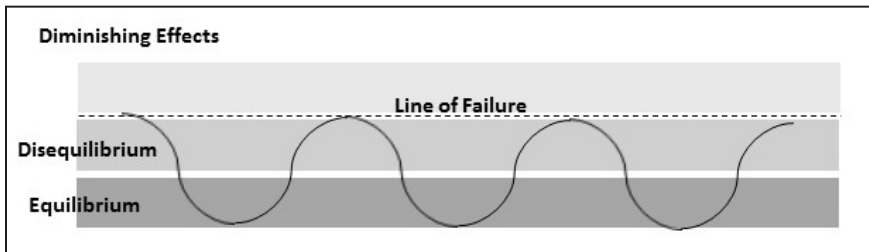

Figure 1: Adaptive Training Model

8. John S. Brown, "Growing Up Digital: How the Web Changes Work, Education, and the Ways People Learn," (April 2000) quoted in Tony Wagner, *The Global Achievement Gap* (New York: Perseus Books Group, 2010), 226.

9. Wagner, *The Global Achievement Gap*, 336.

10. Ibid., 338.

occurs. In Figure 1, the Adaptive Training Model, the wave curve denotes disequilibrium, which is a stimulant that forces a change from equilibrium to disequilibrium. The "Line of Failure" denotes an imaginary line that, if crossed, will result in a diminishing effect on learning and development. Figure 2, Land Navigation – Adaptive Training Development, is an example of an adaptive land navigation-based training program using the adaptive training model. In this exercise, the Soldier has received instruction on basic land navigation skills. He/she is physically located in the vicinity of A.

In the traditional "Xer" model, the Soldier would be presented with a problem (e.g., navigate from A to a known point) and would rely on his/her land navigation checklist to provide a solution. In contrast, the Adaptive Training Model, presents the Soldier a similar problem (navigate from area A to CP3) but adds several unique and non-

Figure 2: Land Navigation - Adaptive Training Development

standard challenges: complete the task using a map with no scale, no gridlines, and no north-seeking arrow. Additionally, CP3 has not been identified on the map!

These challenges, or catalysts, are designed to disrupt the Soldier's equilibrium by introducing a seemingly impossible task. This sense of disruption moves the Soldier from a state of equilibrium to one of disequilibrium and, per human nature, will compel him/her to find a solution. Some problems however, may seem too complex and

Figure 3: Land Navigation (solution)

whelming. If the Soldiers are not monitored and their efforts facilitated, the environment could move from a state of disequilibrium to a state of diminishing effects. This transition point is the "line of failure". The instructor/facilitator provides guidance and hints to prevent the Soldier from crossing the line of failure."

To harness the unique cognitive characteristics of Millennials, this the adaptive training model challenges them to apply their analytical skills to research and experiment to arrive at a solution. Also unique to this method is that the instructor/facilitator may encourage the use of multimedia devices such as cell phones and tablets to find a solution. Group discussion, collaboration, and discovery learning are also encouraged. These particular tools are unique to the future development of adaptive Soldiers and draws them to arrive at an innovative solution to a complex problem – such as highlighted in Figure 3, the Land Navigation (solution).

Conclusion

Developing future leaders to solve complex problems in a VUCA environment will require training programs that capitalize on the use of critical and creative thinking. Although the current method of an instructor-centric, checklist-oriented, rote memorization learning environment has been effective in the past, this method of learning will prove to be less effective in developing the future generation of leaders. The Millennial generation makes up a significant portion of the Army at the junior and mid-level leader echelon. In order to develop the adaptive, critical, creative thinking traits that will be necessary to lead the future Army, the Army must adapt its learning environment to the Millennial's particular needs – collaborative/experimental environment, multimedia-centric, discovery learning. The future Army requires leaders who do not rely on checklists to solve complex problems, but rather have the critical and creative thinking skills that allow them to solve problems thru adaptation.

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STRENGTH *and* WISDOM

Talent Development for the Army of the Future

Lieutenant Colonel Lamar Parsons

The Army of the future will face a complex strategic and operational environment. To meet these challenges, the Army will need smart and innovative leaders who can operate independently, make quick sound decisions, and adapt to fast changing conditions. The Army must manage and develop talent to ensure that there is enough breadth of experience and capability at all echelons to meet these requirements. As the defense industrial base strives to produce the "next best" piece of equipment to defeat evolving threats, our future force must focus on developing the best resource already in its arsenal, its Soldiers and leaders. The Army must develop talent which can "conduct sophisticated expeditionary maneuver and joint combined arms operations."[1] Adjusting our current talent <u>management</u> policies to a talent <u>development</u> focus will build better results for the future force.

The next conflict will not be won solely by the next generation of Abram's tanks and Apache helicopters but by the next generation of resilient and innovative leaders. The Army will conduct operations in a complex environment as part of joint, interorganizational, and multinational team and will need leaders who can lead in a diverse operating environment.[2] The battlefield of tomorrow will be fought

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1. U.S. Department of the Army, *The U.S. Army Operating Concept," Win in a Complex World,"* TRADOC Pamphlet 525-3-1 (Washington, DC: U.S. Department of the Army, October 31, 2014), i.
2. Ibid., 8.

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across multiple contested domains with our adversaries presenting multiple dilemmas to U.S. forces. To meet these challenges, the Army requires talented leaders who can contribute to the diverse set of enduring missions as outlined in the 2014 Quadrennial Defense Review.[3]

The pivotal asset to win the next conflict is talented leaders who have been mentored and developed through their careers. As technology advances, so must leader creativity and innovation. The Army should focus on talent development that shifts away from specific leader training and best practices to "next practices" that builds the innovative and creative leaders required for the complex environment of the future.[4]

There are several areas in which the Army can explore: 1) Create a blended learning environment by introducing educational sabbaticals, 2) Expand key and development assignments and make broadening experiences mandatory, 3) Develop a system that rewards career "Iron Majors" and recognizes those with high potential. These new innovation can help the Army develop and maintain the right leaders for the right challenge.

Educational Sabbatical

Learning and development takes place in several forums and across multiple domains to include institutional, operational, and self-development.[5] The Army should consider a mandatory 90-day educational sabbatical for all leaders after serving 18 to 24 months in an operational assignment. Educational sabbaticals, conducted at home station, blend institutional and self-development domains of learning. The educational sabbatical would be conducted separately from the unit and would be the leader's sole focus for its duration. This allows the leader freedom to focus on their individual growth without having to balance the demands of a key leadership position.

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3. Chuck Hagel, *Quadrennial Defense Review* (Washington, DC: U.S. Department of Defense, 2014), 60.

4. Mike Myatt, "The Number 1 Reason Leadership Development Fails," *Forbes* (December 19, 2012), http://www.forbes.com/sites/mikemyatt/2012/12/19/the-1-reason-leadership-development-fails/ (accessed 19 May 2015).

5. U.S. Department of the Army, *Commissioned Officer Professional Development and Career Management,* Department of the Army Pamphlet 600-3 (Washington, DC: U.S. Department of the Army, December 3, 2014), 5.

Educational sabbaticals could be both independent and directed curricula that complement the current professional military education system. The sabbaticals are a tool to maximize the potential and development of our young leaders. Sabbaticals could be used in conjunction with organizational mentoring and would enhance talent development and professionalization of the force. Professional mentoring builds trust and passes along the knowledge and wisdom of someone with more experience.[6] Mentoring compliments the educational sabbatical as new practices are passed from the mentor to mentee and vice versa.

Developing leaders of tomorrow that understand the enemies of the future will help develop the future force of 2030-2045. Educational sabbaticals focus on three lines of effort with each lasting approximately 30 days. The first line of effort is professionalism and character building. The second line of effort focuses on current and evolving threats. This includes technological advances, possible adversaries, and current events. The third line of effort is an individual specific study that develops a skill or talent the individual selects. The unit talent development program would set priorities for the educational sabbatical and would modify based upon the commander's intent.

Educational sabbaticals should occur around the 18 to 24 month mark of an operational assignment. A break at this point enforces the limitation on key and developmental time and gives a dedicated opportunity for the leader to learn, think, and reflect. After the educational development opportunity, the leader is quickly put back into the operational environment to capitalize on the lessons and practices learned. These lessons learned complement the knowledge gained at the other professional military educational schools.

Progress during the sabbatical is captured and passed along to the unit. The directed and elective studies become part of a total leader picture and are used for consideration of future assignments. The current operational commander provides input on a potential course of study and captures all information required for developmental opportunities on the Officer Evaluation Report.[7]

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6. Ibid., 2.
7. Ibid., 10.

Broadening Experience (the new KD)

Talent development continues with maximizing broadening opportunities and experiences. Broadening opportunities should not be viewed as the exception but rather as the rule and should be considered equal with other traditional key and developmental assignments. Broadening experiences with industry, intergovernmental, and civilian agencies provide key talent development for the future force. Leaders serving in broadening assignments start the process of nurturing and developing a network of professional contacts that will enable future operations.

Broadening experiences can be used as part of the educational sabbatical or part as the professional educational model. Tomorrow's war will be fought in a joint, interagency, multinational environment with unilateral operations as a thing of the past. Since the conflicts will be waged as part of larger coalitions, we must expose our younger Soldiers and leaders to a broadening environment sooner and more often during their careers. The exposure to partners and alternative ways of problem solving arm leaders with additional points of view and generate greater situational understanding. The relationships that are established during broadening assignments are continuously cultivated when the leader returns to the operational force.

As a complementary initiative, broadening experiences allow the Army talent development process to identify high potential individuals early in their career and develop a special track for these individuals. These high potential individuals should have individually tailored professional military education portfolios and assigned specific mentors to develop their unique skills. Identifying early a unique skill set and developing that skill will give the Army an edge against future potential adversaries.

Career Iron Major

Revamping the current centralize promotion system is critical to develop talent without penalizing great leaders. Current systems that have lock step "up or out" systems of promoting year groups that have met certain gates does not support the development of talent for the future. The current promotion process does not allow without penalty that a leader may have reached their maximum potential and talent at the company grade or field grade level. For the Army to be successful in

the future, we need very technical officers and leaders at certain grade plates for an enduring period of time. The Army of the future should have career staff captains and majors and not penalize officers that do not wish to move up in responsibility or authority.

A reconfigured promotion system in conjunction with a complementary redesigned evaluation system can manage talent at the current positions. With "up or out," the Army might lose talent and critical skills that could otherwise be retained. As an example, Major Smith, who is extremely talented in the cyber domain, has started a network for an organization and is an extremely proficient and valuable team member. The Major is eligible for promotion but does not want to be promoted out of his position. Under the new system, Major Smith would not be penalized and allowed to continue to serve and contribute to the organization with his talents. The new system would create other incentives to include educational opportunities and special training to reward those that stay at the current grade and continue to perform at high levels.

Personnel replacement systems and incentives should reward those that specialize in focus areas and geographical regions. These unique areas of knowledge and cultural understanding help commanders build situational understanding and perspective on complex topics. Commanders need the flexibility to control personnel relocations within an organization to cultivate and develop talent that will better support the organization. Keeping a service member on station longer allows the commander to build trust, cultivate shared understanding, and give the necessary time to build teams.[8] The Army should give more authority to operational commanders to move leaders around formations without relying on the current personnel system to decide when a Soldier moves. This added flexibility gives commanders the tools to cultivate and develop talent within their formations.

Conclusion

The Army must continue to prioritize talent development to maintain its edge over potential future threats and adversaries. In the Army

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8. Many of the thoughts expressed in this paper regarding the career Iron Major were derived from a previous paper I authored on Mission Command during my time at the Army War College.

Operating Concept, General Perkins, Commander of TRADOC, states, "we must…build leaders and institutions that recognize and leverage opportunities."[9] The Army will fight on a complex uncertain battlefield across multiple domains. To fight and win the Nation's wars and to achieve results the Army must develop and retain the right mix of talent that is innovative, creative, and agile. To develop these leaders, the Army must establish a system that provides educational opportunities, maximizes broadening opportunities, and rewards those with special skills. Promotion systems must reward those with special talents and not penalize those that wish stay in a current position. A program that develops talent ultimately sets the conditions for the Army to excel as part of whole of government approach to achieving the Nation's strategic goals.

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9. U.S. Department of the Army, *The U.S. Army Operating Concept,"Win in a Complex World,"* v.

Human Capital and the Future Army: Balancing Talent and Resources

Lieutenant Colonel Richard S. Taylor

What should the Army look like in 2035? That question is being considered by senior military leaders as they try to balance the capabilities and capacity required to meet current operational requirements while simultaneously developing the capabilities and capacity for the future force. This short article will look at one small part of the challenge: Human resource management.

Innovative human resource management will be critical to the future Army. The 'span of possibilities' of a future operating environment is likely to be far different from what the Army has encountered in the past.[1] If history is any indicator, weapons will continue to become more diverse and lethal and battlefields will continue to grow in size and complexity as a result of technology.[2] The proliferation of high technology, low volume weaponry among peer competitors will pose one problem to military planners. The proliferation of low technology, high volume weapons among trans-national terrorist organizations and economically limited threats will pose quite another. Consequently,

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1. See generally, Charles Hagel, *2014 Quadrennial Defense Review* (Washington DC: Department of Defense, March 2014).

2. Hagel, *2014 Quadrennial Defense Review*, 61. "Nearly any future conflict will occur on a much faster pace and on a more technically challenging battlefield."

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the U.S. military must be prepared to defend against the most comprehensive expanse of threats to ever face a military.

A limited number of potential adversaries will continue to pose traditional force-on-force threats, while an increasing number of adversaries will turn to non-traditional/asymmetric warfare to defeat U.S. military overmatch.[3] Adversaries both rich and poor will operate extensively in cyberspace, space, land, water, and air in the very near future.[4] And, while adversaries may not cooperate with one another in their attacks against the United States and or its allies, near constant attacks from multiple adversaries will place demands on the U.S. military that far exceed those seen today. The challenges of defending against multiple adversaries, acting across multiple domains on a daily basis will require the U.S. military to think out of the box, especially in the realm of human resources. According to the Army Operating Concept, the difference between winning and losing on the future battlefield will be the quality of the future force.[5]

A fully manned Army capable of meeting the threat posed by adversaries across the 'span of possibilities' is prohibitively expensive, especially in an era of declining military budgets. Currently, personnel costs "reflect some 50% of the Pentagon budget."[6] Additionally, military retirement and health care costs are expected to continue to rise, consuming an ever larger percentage of the budget.[7] The impact is fewer dollars available

3. Ibid., VII. "Future conflicts could range from hybrid contingencies against proxy groups using asymmetric approaches, to a high-end conflict against a state power armed with WMD or technologically advanced anti-access and area-denial (A2/AD) capabilities."

4. Ibid., III. "Meanwhile, modern warfare is evolving rapidly, leading to increasingly contested battlespace in the air, sea, and space domains – as well as cyberspace – in which our forces enjoyed dominance in our most recent conflicts."

5. See generally, U.S. Department of the Army, *The U.S. Army Operating Concept: Win in a Complex World 2020-2040*, TRADOC Pamphlet 525-3-1 (Washington DC: Department of the Army, October 31, 2014).

6. Dion Nissenbaum and Julian E. Barnes, "U.S. Military to Unveil Plan to Cut Personnel Costs," *Wall Street Journal* On-line, February 21, 2014, http://www.wsj.com/articles/SB10001424052702303636404579397333410583004 (accessed 14 April 2015).

7. Rowan Scarborough, "Defense Cut Projections Seen as Risk to Recruitment," *The Washington Times* On-line, October 10, 2011, http://www.washingtontimes.com/news/2011/oct/10/defense-cut-projections-seen-as-risk-to-force-recr/?page=all (accessed 26 April 2015). "…the current [retirement] system costs the U.S.

for training as well as for research, development, and procurement of new and modern equipment. The Army will find it more difficult to maintain overmatch and field next generation equipment if personnel costs continue to consume ever greater portions of the budget. Knowing this, Congress will likely continue to reduce personnel end-strength authorizations to affect cost savings in the federal budget. These anticipated end-strength cuts will significantly impact the Army as it is the most personnel heavy service of the U.S. military.[8]

To maintain effectiveness when faced with down-sizing, the Army must recognize the necessity of evolving its organizational structure towards a smaller, highly skilled manned force that is heavily supplemented by robotics, remotely piloted vehicles, artificial intelligence, and other emerging advanced technologies.[9] Innovative human resource solutions will be required if the Army is to create and then maintain such a highly skilled force while shrinking its organizational structure. Solutions must be based on a 'whole of Soldier life cycle' approach. The Army must ensure it has a generous pool of qualified recruits from which to draw.[10] It must be able to offer attractive compensation packages to recruit and retain talent. The Army must also be able to regularly cycle portions of this talent pool in and out of high-tech industry and other non-government positions to build/maintain critical competencies and

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government more than $100 billion annually and will grow to $1 trillion by 2076….Tricare costs have ballooned from $19 billion 10 years ago to $53 billion today [2011]."

8. See generally, Don J. Jansen, et al., "2014 National Defense Authorization Act: Selected Military Personnel Issues," Congressional Research Service, https://www.fas.org/sgp/crs/natsec/R43184.pdf (accessed 14 April 2014); "U.S. Military Personnel End Strength," *Globalsecurity.org*, http://www.globalsecurity.org/military/agency/end-strength.htm (accessed 14 April 2014).

9. Scarborough, "Defense Cut Projections Seen as Risk to Recruitment." According to Colonel Douglas A. Macgregor (Ret.): "We're now dealing with a technology-rich military establishment, and that includes the United States Army. …That means you've got to attract skilled, intelligent people who can master the technologies."

10. Joe Gould, "Army Recruit Command Boss: Overweight Youth a Growing Problem," *USA Today* online, August 29, 2014, http://www.usatoday.com/story/news/nation-now/2014/08/29/army-recruiting-obesity/14798757/ (accessed 26 April 2015). "More than 71% of America's youth would fail to qualify for military service because of their physical, moral or cognitive shortcomings, according to recruiting command statistics."

prevent the permanent drainage of experienced Soldiers to industry. Undertaking such extreme human resource changes will require a complete overhaul of the current, industrial age personnel system. Finally, the Army will have to take the lead in changing the way Americans perceive military service. Americans must value military service and be willing to serve at personal sacrifice as the Army will never be able to compete economically with private industry.

Tomorrow's Soldiers must be technologically savvy, linguistically and culturally diverse, adaptable, and highly motivated to serve. The Army can undertake a number of steps now to build this critical pool of future recruits. First, it must re-invest now in its Junior Reserve Officer Training Corps (JROTC) and Reserve Officer Training Corps (ROTC). These two entities can form the core of a renewed emphasis to revalue education, physical fitness, and military service within American society. Second, it must work with congress and the Department of Defense (DoD) to change laws and policies pertaining to recruiting and retention. Finally, it must inculcate in the broader public a desire to serve in the military.

While some in American society do not believe the Army should have a role in education, it is important to note that the Army and other services have long maintained JROTC and ROTC programs in American primary and secondary education institutions. The U.S. government could use existing the JROTC and ROTC structure as a nucleus to expand physical fitness, military training, and rigorous science, technology, engineering, and math (STEM) programs. Utilizing the military to lead change in society is not without precedent.

The U.S. government has used the military in the past to lead social change. One prime example is racial and gender integration. Much as President Harry Truman used the military to lead integration efforts,[11] the next President should use the military to mobilize popular support for improved education and military service. JROTC and ROTC programs offer existing platforms upon which the U.S. government could begin to shape America's youth to focus more on physical fitness,

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11. "This Day in Truman History July 26, 1948 President Truman issues Executive Order No. 9981 Desegregating the Military," Harry S. Truman Library and Museum, http://www.trumanlibrary.org/anniversaries/desegblurb.htm (accessed 14 April 2014).

military training, and STEM education. Failure to resolve the declining pool of qualified recruits will result in the inability to staff the future force.

Next, if the Army is to recruit and retain talent, it must offer attractive compensation packages and innovative personnel management options. Americans of all ages must see the Army as a career of choice and opportunity. Compensation packages will always be meager compared to what the private sector can offer. As such, the Army must focus on innovative personnel management options in order to attract and retain highly qualified Soldiers.

At the most fundamental level, recruiting and retention policies must be updated to attract and retain trusted individuals at all stages of adult life. Future conflict will require mature technical expertise across the broad spectrum of competencies. To attract and retain seasoned technical experts, the Army's future human resource system must eliminate upper age limits, revise physical and mental qualifications to reflect actual MOS requirements, permit regular transfers between services and service components, and be flexible enough to regularly cycle portions of this talent pool in and out of high-tech industry and other non-government positions. Such a system will allow Soldiers to build and maintain critical competencies, supplement meager government salaries, improve cross-talk with industry, and avoid permanent drainage of talent to the private sector.

While policy changes and incentives will have some impact on recruiting and retention, the permanent loss of talent to the private sector can only truly be reversed by a change in public perception towards military service. The Army, the DoD, and the U.S. government writ large must begin to change the way Americans view military service. Currently, only a very small portion of society chooses to serve in the military. Revaluing public service within American society must occur simultaneously with the improvement of education, physical fitness, and the revision of recruiting and retention policies if the Army is to develop a sufficient pool of qualified recruits who are actually willing to serve in the future force. Again, the Army only has to look to recent history to find an example of a President who was able to motivate a generation to value education and public service.

President John F. Kennedy used the race to space as a means to revalue education and public service within American society in the early 1960's. After the Russians launched Sputnik, President Kennedy energized a generation to study math, science, and engineering in order to regain U.S. dominance and international prestige.[12] He also created the Green Berets and used the aura of their superior military prowess to attract members of that same generation to serve in the military.[13] The power of his message could be replicated today to energize a revised valuation of public service in the younger generation.

Tomorrow's Army depends on the quality and commitment to public service of today's youth. The future Army will be smaller, more adaptable, and more technologically advanced than today's force. It will require highly skilled, physically fit, leaders and Soldiers. The Army must ensure it has a sufficient pool of qualified recruits. This will require the Army to invest now in JROTC and ROTC programs to develop the individuals it will need for future operations. The Army will compete with private industry to attract and then retain the best and brightest. It cannot compete financially; as such, it will have to develop creative human resource practices in order to incentivize service across a Soldier's whole life. Offering Soldiers the opportunity to swiftly and frequently transition between military service and industry must be a cornerstone of any new personnel system. Finally, the Army and other services must lead the way in inculcating a renewed desire toward public service in the next generation. Failure to invest in these reforms now will lead to a hollow force in the future.

    12. "The Space Race," The John F. Kennedy Presidential Library and Museum, http://www.jfklibrary.org/Exhibits/Permanent-Exhibits/The-Space-Race.aspx (accessed 14 April 2014).
    13. "Green Berets," The John F. Kennedy Presidential Library and Museum, http://www.jfklibrary.org/Exhibits/Permanent-Exhibits/The-Space-Race.aspx (accessed 14 April 2014).

Talent Management for Mission Command of an Information Age Army

Lieutenant Colonel James D. Willson

We demand rigidly defined areas of doubt and uncertainty![1]
—Douglas Adams

The epitaph by author Douglas Adams succinctly captures the dilemma facing the Army as we try to visualize the kind of force we will need in 2030. We would prefer precise policy guidance from our national leadership that can be translated into X number of combat ground vehicles and Y number of aerial systems, but that level of detail will not be coming. We would prefer to know our future enemies with a reasonable degree of confidence so we can match combat power man-for-man or offset it with technology – but those days are over. We would prefer to be assured that our decades-long technological advantages will continue into mid-century – but the proliferation of technology around the world suggests otherwise. But fortunately, the theorist Carl von Clausewitz was right 185 years ago when he wrote in his treatise *On War*:

> *There is only one single means, it is the FIGHT. However diversified this may be in form, however widely it may differ from a rough vent of hatred and animosity in a hand-to-hand encounter, whatever number of things may introduce themselves which are not actual fighting, still it is always implied in the conception of War that all the effects manifested have their roots in the combat.*[2]

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1. Douglas Adams, *The Hitchhiker's Guide to the Galaxy* (New York, Ballantine Books, 1979), 86.

2. Carl Von Clausewitz, *On War*, edit. and trans. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1989).

Clausewitz' insight into the nature and character of war is still relevant today and offers guiding principles on how think about shaping the Army of the future. While technology has factored into warfare since earliest history, it is ultimately the performance of the people fighting WITH the technology that matter most. As Lieutenant General Robert Brown offered in a speech at Fort Sill Oklahoma in 2014:

> *The Army used a quantitative advantage in the 1940s to defeat Nazi Germany. Then in the 1970s, the United States trained to defeat the Soviets with a technological advantage. Now the Army is focusing on developing Soldiers as its best defense. The right leaders can solve any problem, but if we have leaders who can't think through the problem, can't thrive, we're hurting.*[3]

This paper will argue the Army's talent management system inherited from World War II and designed to resemble an industrial age assembly-line is antithetical to fostering a climate that attracts and retains highly capable and talented individuals who thrive in an entrepreneurial environment imbued with Mission Command.

Decades of reinforcing mechanisms imbedded in Army culture serve to perpetuate outdated assumptions about the need to 'mass-produce' soldiers to replace high casualties. The environment is particularly stifling and unattractive for the millennial generation who tend to be uncomfortable with rigid structure and information silos which are (unfortunately) enduring characteristics of today's institutional Army.[4] In 2011, *The New York Times* pointed out an interesting trend in the human cost of war since World War II – casualties have declined steadily. "Overall, the annual rate of battle deaths worldwide has fallen from almost 300 per 100,000 of world population during World War II, to almost 30 during Korea, to the low teens during Vietnam, to single digits in the late 1970s and 1980s, to less than 1 in the 21st century."[5] While the trend has been steadily declining for more than sixty years, some of the most antiquated aspects of Army talent management are hopelessly codified in outdated laws designed keep

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3. Ibid. 1.

4. Price Waterhouse Coopers International. *Millennials at Work: Reshaping the Workplace.* London, March 13, 2011. 3.

5. Joshua S. Goldstein and Steven Pinker, "War Really Is Going Out of Style," *The New York Times*, December 11, 2011: 1.

the Army stocked with a reliable stream of interchangeable technicians. The Officer Personnel Management Act of 1980 (DOPMA) mandates short and rigid career timelines, but a 2011 Defense Science Board (DSB) report noted:

> *Careers of the Department's military personnel, active and reserve, are currently managed within a restrictive set of laws, regulations, and policies, all reinforced by culture and tradition. Many of these laws and regulations have been in force fifty years or more. They all have been sensible fifty years ago but the DSB believes they certainly have the effect today of inhibiting the Department's flexibility and adaptability, lessening its ability to use and deploy people efficiently, and ultimately wasting human capital.*[6]

By 2025, the millennial generation will account for about 75% of the available national workforce and employers will not be able to ignore the unique expectations they share about work and personal satisfaction.[7] In a Price Waterhouse Cooper study published in 2011 on the coming Millennial workforce, one finding stands out prominently from the others. "Moving up the ladder faster: Career progression is the top priority for millennials who expect to rise rapidly through the organization. 52% said this was the main attraction in an employer, coming ahead of competitive salaries in second place (44%)."[8] But their expectation to rise through the ranks rapidly based on merit will clash with the DOPMA and Army culture, frustrating potentially talented Millennials ideally suited to thrive in the information age.

A report from the Center for Strategic and International Studies (CSIS) broadened the argument for more flexibility in the promotion system not only as tool to attract and retain Millennials, but as a hedge against, "a growing divergence between an increasingly dynamic future and an officer management system optimized for static conditions."[9] Maren

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6. Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics. *Enhancing Adaptability of U.S. Military Forces.* Independent Federal Advisory Committee Report (Washington DC: Department of Defense, 2011), 139.

7. Price Waterhouse Coopers International. *Millennials at Work: Reshaping the Workplace* (London, March 13, 2011), 3.

8. Ibid., 4.

9. Maren Leed and David Sokolow. *The Ingenuity Gap: Officer Management for the 21st Century.* Report of the CSIS International Security Program, Washington: Center for Strategic & International Studies, 2010., VI.

Leed from CSIS wrote that, "[t]hey must fundamentally shift the basis for promotion eligibility from a system focused on time (in service or in grade) to one predicated on competencies, or broad sets of interrelated knowledge, skills, and abilities in a given area. Relaxing existing time constraints will allow for more varied experiences, resulting in a more a robust and flexible officer corps."[10] Leed's prediction of an increasingly dynamic future is shared in the *Army's Operating Concept*: "What all Army Operations will have in common is a need for innovative and adaptive leaders and cohesive teams that thrive in conditions of complexity and uncertainty."[11] In response to these trends, the Army should modernize the DOPMA-era promotion system in favor of a competency-based system that would allow for more variation in career paths.[12]

But even if DOPMA laws were relaxed to give the Army more flexibility to promote truly prodigious and exceptional individuals faster, it still lacks the systems and objective criteria necessary to make granular decisions about individual assignments and promotions. The most powerful tool the Army has to modify culture and affect change lies in the assessment and evaluation system for officers. But officer evaluation system lacks comparison by objective criteria that can be measured by testing. Author Douglas Macgregor writes that, "[s]erving Army officers continue to express dissatisfaction with an Army that lacks objective measures to discriminate between levels of performance, thus undermining leadership development."[13] While efforts have been made to force raters and senior raters to make calls about individual performance relative to 'average performance,' judgment is primarily based on subjective criteria which are difficult to measure. A competency-based promotion system would enable identification of exceptional individuals who could be earmarked for what author Malcolm Gladwell calls; extraordinary opportunities to leverage hidden advantages which separate good from greatness.[14]

10. Ibid., V.

11. U.S. Army Training and Doctrine Command. *The U.S. Army Operating Concept: Win in a Complex World TRADOC Pam 525-3-1*. TRADOC Pamphlet 525-3-1, Fort Eustis: TRADOC, 2014, 16.

12. Leed and Sokolow. *The Ingenuity Gap*, VII.

13. Douglas Macgregor, "Strategic Means: Building and Army for and Era of Strategic Uncertainty," in *American Grand Strategy and the Future of Landpower* (Carlisle, PA: Strategic Studies Institute, U.S. Army War College, December 2014), 169.

14. Malcolm Gladwell, *Outliers* (New York: Little, Brown and Company, 2008), 19.

In Gladwell's book *Outliers*, he notes that when we observe people who have achieved greatness, we usually assume they were born with some kind of innate talent or gift, but that is almost never the case.[15] Gladwell wrote that, "[t]he people who stand before kings may look like they did it all by themselves. But in fact they are invariably the beneficiaries of hidden advantages and extraordinary opportunities and cultural legacies that allow them to learn and work hard and make sense of the world in ways others cannot."[16] Gladwell writes that individuals just need to be "good enough" at the entry level and encouraged and afforded opportunities to hone their skills.[17] With this in mind, the Army should continue to take great care to recruit people into commissioning programs who are good enough to excel in a complex world and provide them with a wide range opportunities and experiences to develop expertise across the Joint, Intergovernmental, Multinational and Commercial environment. This approach would have the best chance of generating intellectual variety through the intentional use of extraordinary opportunities to foster creativity and initiatives which are essential preconditions for the most fragile and elusive war fighting function, Mission Command, to take root.

Mission Command is about tapping into the creativity and initiative of soldiers to accomplish the mission within the commander's intent. For Mission Command to work, commanders at all levels must have full trust and confidence in subordinates to exercise judgment to get the job done in order to take advantage of opportunities as they arise in order to consolidate gains. Mission Command is emphasized now because the Army has built up 'trust-equity' after more than a decade of war and senior leaders sense an opportunity to bottle-up trust before the collective memories of combat fade. But Colonel Tom Guthrie warned in *Army Magazine* in June 2012: "Without trust, mission command – as a routine practice and warfighting function, in garrison and in combat – has little hope."[18]

The extent individual commanders can establish and maintain high <u>trust between s</u>ubordinates and superiors is foundational to achieving

15. Ibid., 19.
16. Ibid., 17.
17. Ibid., 19.
18. Tom Guthrie, "Mission Command: Do We Have the Stomach For What Is Really Required?" *Army Magazine*, June 2012, 26.

an environment compatible with Mission Command. The trust must start from the highest commanders and flow downward to the squad level. For subordinate commanders to feel trusted and empowered, they must be afforded freedom of action to try new approaches to problems and be allowed to fail occasionally without serious career ending consequences. According to author Steven Covey, organizations with high levels of trust perform better in every respect. "When trust is high, the dividend received is like a performance multiplier, elevating and improving every dimension of your organization and your life."[19] Covey continued: "When you trust people, you have confidence in them – in their integrity and in their abilities. When you distrust people, you are suspicious of them-of their integrity, agenda, capabilities, or their track record."[20] Trust and the underlying confidence between people (the chain of command) forms the elementary bond that makes Mission Command possible. Commanders must have confidence in their subordinate leaders before they can fully extend their trust and subordinates must have confidence that their bosses will support them as they maneuver within the commander's intent.

In his paper on the tension between Mission Command and the Army personnel management system, Donald Vandergriff, from Army Training and Doctrine Command, suggests we should abandon the assembly-line metaphor that considers soldiers as technicians who perform rote tasks to one that regards them as craftsman who master and possess the ability to apply their art.[21] He argues that DOPMA and Army culture are set up now, "not to invest them with any real abstract knowledge or skills that make them too valuable; therefore, they can be more easily replaced."[22] Vandergrift posits a metaphor shift requires challenging two long held assumptions:

1. Individuals must be centrally managed.

2. We need an excess of middle rank officers because the Army must quickly scale upward during mobilization. [23]

19. Stephen Covey, *The Speed of Trust: The One Thing That Changed Everything* (New York: The Free Press, 2006), 14.

20. Ibid., 5.

21. Donald D. Vandergriff, "One Step forward, Two Steps Back" Mission Command versus the Army Personnel System," *The Land Warfare Papers*, August 2011, 1.

22. Ibid., 2.

23. Ibid.

The first assumption is counter to the basic tenants of Mission Command (pushing power downward), and the second assumption requires a surplus of middle grade officers and an 'up-or-out' promotion system which generates unproductive competition and mistrust. In contrast, a future personnel system would focus on finding and rewarding individuals who have honed their talent more like craftsman than assembly line products. The paradigm shift would also ease intense peer competition and dampen the temptation to retain control at the top and withhold trust from subordinates when reputations are at stake. The system should abandon centralized control and management to a more distributed system that keeps soldiers assigned to units longer so trust can be established and maintained over time. Ideally, whole companies and even battalion-sized units should generate as a cohort and remain together for many years to harness the long term trust benefits that can flourish when trust relationships are cultivated over time.

Frederick the Great used the phrase '*coup d'oiel*' to describe how leaders size up a situation 'at a glance' and quickly decide what to do.[24] Similarly, Colonel John Boyd espoused a similar idea in his Observe, Orient, Decide, Act, decision cycle model.[25] Separated by hundreds of years, both of these men described the essence of Mission Command at its core. It's a skill practiced by talented leaders who can observe and act with the authority and resources to take advantage of opportunities in real time without having to seek approval from higher headquarters. But ultimately, Mission Command relies on the skill and experience of the practitioners (leaders) empowered by trust and armed with diverse experience to see what others may not.

The Army's approach to personnel management is antiquated and hamstrung by outdated laws and entrenched culture. Laws passed in 1980 still apply today which prescribe rigid time-based promotions, narrowly focused career paths and up-or-out career progression. This means that conformity to a narrow band of assignments and experiences have the best chance of leading to individual success but are not necessarily the most beneficial for the institution faced with

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24. Dennis Showalter, *Frederick The Great: A Military History* (New York: Longman Publishing, 1995), 180.

25. Robert Coram, *Boyd: The Fighter Pilot Who Changed The Art of War* (New York: Back Bay Books, 2002), 333.

rapid geopolitical change and uncertainty. In contrast, the millennial generation has sharply different views from previous generations on career progression and talent management that will likely clash with Army culture and chase the best performers away. If left unchanged, this recipe could squander the trust equity and culture of Mission Command built over twelve years of conflict and make Army culture unfertile ground for Mission Command to thrive.

Reconsidering DOPMA: Creating a Flexible Officer Career Timeline

Colonel Tess Wardell

The generals who will appear before Congress in twenty-five years are in the Army right now. They're junior officers, probably captains. And keeping them in uniform might be the Army's most important mission.[1]

—Andrew Tilghman

The 2015 Army Vision describes a future Army led by agile, expert, versatile innovators; clearly the Army must recruit, develop, and retain officers with these characteristics. Yet numerous speeches, articles, books, and studies describe an Army that loses its best talent because an "industrial age" personnel management system fails to satisfy modern officer expectations. Continuing to attract and keep the highest quality officers requires a better officer personnel management model.

While many factors contribute to officer dissatisfaction, and to officers choosing to leave the service early in their active duty careers, one theme remains consistent: the officer career timeline is inflexible. It neither rewards top performers with accessible fast-track options, nor

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1. Andrew Tilghman, "The Army's Other Crisis," *Washington Monthly* (July 2007), 3.

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accommodates those who would prefer extra developmental time or a variety of professional choices. The Army should expand the standard officer career timeline to accommodate flexible promotion windows and increased development and personal opportunities.

Background

The current military services' personnel systems originated in the Defense Officer Personnel Management Act (DOPMA), a federal law enacted by the House and Senate in 1980 and implemented by the force in 1981. DOPMA regulated officer personnel management and provided standardized, predictable career timelines. It created cohort year groups and the initiated "up-or-out" practices. Although designed to better serve the officer corps, DOPMA also created unwanted effects. The predictability it provides officers carries a cost – little career flexibility and limited efforts to identify and reward talent.

DOPMA mandates for Active Duty officer promotions are codified in Department of Defense Instruction 1320.13 documents and Title 10 U.S. Code § 619. The following table depicts DOPMA promotion requirements, although Service Secretaries may waive or extend some Time in Grade (TIG) requirements:

DESIRED ACTIVE-DUTY LIST PROMOTION TIMING AND OPPORTUNITY		
TO GRADE	**TIMING**	**OPPORTUNITY**
O-4	10 Years +/– 1 Year	80%
O-5	16 Years +/– 1 Year	70%
O-6	22 Years +/– 1 Year	50%
*Promotion opportunity and timing, as determined by the Secretary of the Military Department concerned, may vary from those targets based on needs.		

DoDI 1320.13, October 30, 2014

Department of the Army Pamphlet (DA PAM) 600-3 outlines Time in Service (TIS) requirements, and also adds promotion timing and opportunity information to the grades of First Lieutenant/O-2 and Captain/O-3:

Table 5–2

Time in service, time in grade, and promotion opportunity			
Promote to:	**Time in service***	**Time in grade****	**Promotion Opportunity**
1LT/0-2	8 months	18 months	Fully qualified
CPT/0-3	4 years plus 1 year	2 years	Best qualified (90%)
MAJ/0-4	10 years +/- 1 year	3 years	Best qualified (80%)
LTC/0-5	16 years +/- 1 year	3 years	Best qualified (70%)
COL/0-6	22 years +/- 1 year	3 years	Best qualified (50%)
* DODI and 10 USC			
** DODI			

DA PAM 600-3, 3 December 2014

The TIS requirement in particular provides little flexibility – only plus or minus one year, which accounts for the very small percentage of officers selected below or above the primary promotion zone. According to Title 10 U.S. Code § 616, below-zone promotions cannot exceed 10-15 percent of authorized promotion numbers. Clearly, DOPMA presents extremely limited opportunity to promote talented officers early or to permit officers to delay promotion in accordance with their individual professional and personal objectives.

Impact

Officers dissatisfied with current personnel management practices may be unwilling to continue serving. Mid-grade officers are not easily replaced; mid-grade officers with multiple combat tours and extensive professional experience and education are impossible to replace. Their mass departure would hollow the bench of future senior leaders. Tim Kane has written several articles and the book, *Bleeding Talent*, describing an exodus of talented officers from the military. He characterizes the Army personnel system as one that honors seniority over individual merit, a common complaint among junior officers. In the *Foreign Policy* article "Brain Drain," Retired General David Barno warns about exceptional, experienced young officers leaving the force in large numbers. He suggests: "…find a way to give today's officers more of a voice in their assignments and in their lives. If there is one key generational difference between today's young officers and those of my generation (and there are many), expecting a voice in their future is the one that most stands out – for the officer, for his or her spouse with
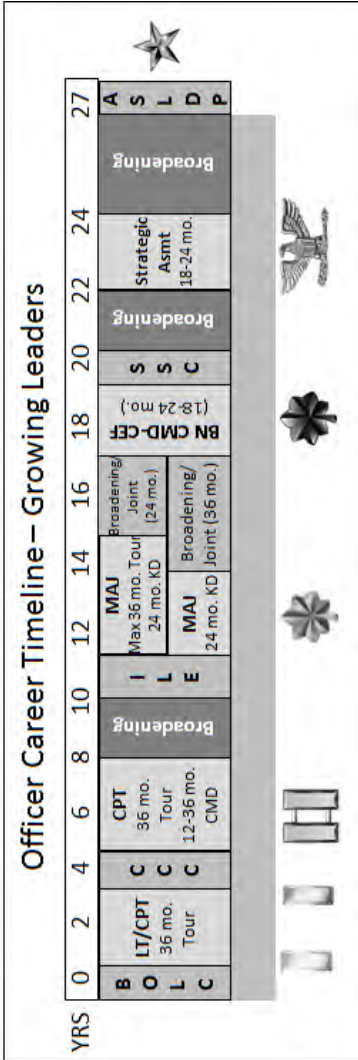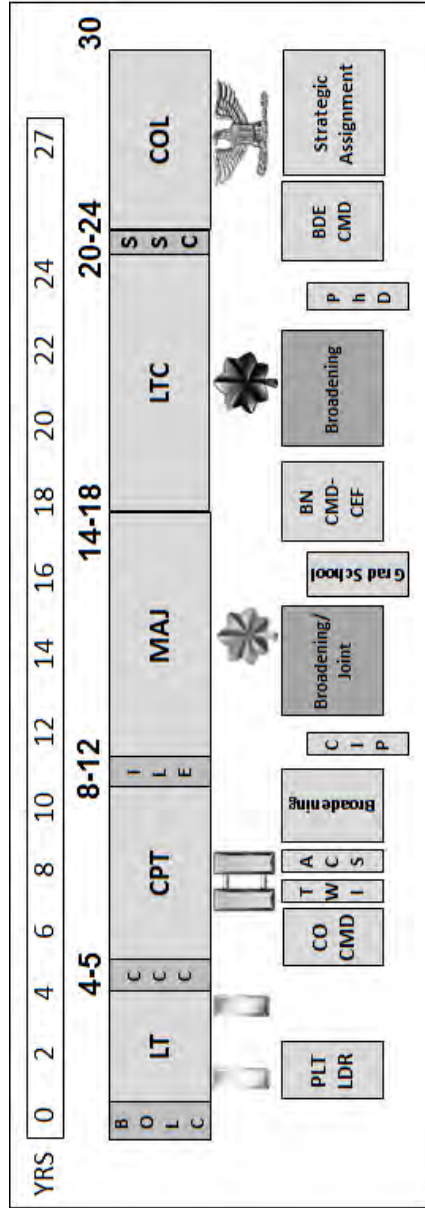
Figure 1: Per DA PAM 600-3

Figure 2: Author's Proposal

a separate career, and for their family."[2] The same considerations that cause officers to leave the Army also make it more difficult to recruit future officers. The predictability and security DOPMA was designed to ensure no longer serve the professional expectations of young leaders.

Maintaining an outdated personnel management system doesn't just risk reducing future officer quality. Dissatisfaction with the system generates attrition – and attrition is expensive immediately. The Army invests in accessions, education, training, and experience. When officers separate from service early, the Army is unable to realize a return on its investment. Furthermore, it incurs extra costs to replace officers who separate, as well as costs to develop those new officers.

Proposal

The Army standard career timeline is overdue for an overhaul. The Army should expand DOPMA promotion windows for Active Component (AC) officers at each grade from Captain through Colonel. The service should allow any captain to exercise the "plus 1 year" addition to the 4-year TIS promotion requirement. Most will be impatient for promotion, but some will choose extra time as a captain for personal or professional opportunities. Instead of limiting flexibility for promotion to Major, Lieutenant Colonel, and Colonel to just TIS +/-1 year, standardize a flexible model of +/-2 years on either side of the directed TIS for everyone. The current narrow TIS requirements would become 4-year windows: 8-12 years for promotion to Major, 14-18 years for Lieutenant Colonel, 20-24 years for Colonel. Qualified officers would opt in or out for consideration without penalty or prejudice. Changes to AC officer personnel management would generate changes for Reserve Component (RC) officer management as well as AC and RC Warrant Officer and Non-Commissioned Officer management. This proposal acknowledges those impacts but does not explore them.

Expanding the promotion consideration window accomplishes a number of things. It neutralizes up-or-out. It expands cohort year-group management to provide broader groups of qualified officers available for assignment. Additionally, the proposed timeline revision enables three specific improvements: Talent management, increased officer career satisfaction, and flexible operational strength.

2. David Barno, "Military Brain Drain," *Foreign Policy*, (February 2013), 4.

The first chart on page 186 shows what a great career could look like under the current model. DA PAM 600-3 provides this chart, as well as variations of it specific to the different branches and functional areas.[3]

The second chart on page 186 shows how opening that window to +/-2 years would create opportunities more tailored to individual talent, preference, family situations, and other variables. Officers could choose to compete for early promotion or could choose to remain at a certain rank for the full window of time. Broader timelines at each grade (for those who choose them) would expand opportunities for a combination of operational assignments, advanced education, training, sabbaticals, fellowships, career intermission, and the many broadening avenues that help develop experienced, educated, strategic thinkers.

Talent Management

The current officer personnel management system does not attempt to identify or develop the most talented officers. The proposed model enables talent management in multiple ways. It identifies highly motivated achievers and provides accelerated advancement opportunities to them. It inspires officers to pursue professional and educational excellence, and provides the knowledge that these efforts would be recognized. It also permits retention of outstanding officers who exercise the flexibility to focus on education, family, or other variables according to their individual objectives – officers who might otherwise have left the service to pursue those objectives. Finally, the model maximizes the Army's utilization of trained, educated, experienced officers by accommodating both challenging operational assignments and broadening opportunities.

In addition to perceived indifference to talent, officers also complain that they have little control over career choices. The expanded career timeline model treats officers as unique individuals, and accommodates their individual personal and professional priorities. It permits greater career satisfaction by providing increased flexibility for both early advancement and/or additional time in each grade. It enables top performers to advance according to their potential, and also relaxes

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3. Headquarters, Department of the Army, *Commissioned Officer Professional Development and Career Management*, Department of the Army, Pamphlet 600-3 (Washington, DC: U.S. Department of the Army, December 3, 2014), 17.

windows at each grade to accommodate individual preferences. Under the proposed model, officers would need deliberate, consistent, high-quality mentorship and counseling to establish goals and identify opportunities. Periodic assessment of each officer's personal timeline could revitalize mentorship, and could be the cornerstone of performance counseling.

This proposed model would also enable the Army to rapidly expand for operational demands. Encouraging officers to pursue professional development and broadening during peacetime allows the Army to maintain a robust officer corps that could refocus quickly if required for major operations. It would facilitate shifting to a stronger operational force when necessary, without incurring long, expensive training periods or aggressive accessions similar to the rapid expansion for operations Enduring Freedom and Iraqi Freedom. Expanding the TIG windows would also give the Army flexibility to grow specific grades as required.

Implementation and Challenges

Changing promotion requirements requires changing the law – which our lawmakers did in 1947, 1954, 1981, 1984, and 1994 in order to update personnel management policies to align with changes to the force and the environment. Changing the law is feasible. The Army would certainly conduct extensive analysis, planning, modeling, and resource assessment before proposing any significant change to the current system. Changing the law is only the first step to implementation; ensuring the Army accepts the changes may be the greater challenge. Implementing a new officer personnel management model will require substantial cultural change. Senior officers could reject new practices that contradict the institutional values they grew up with. Junior officers might mistrust an unproven system. Phasing-in changes among different cohorts will be complicated. Leaders will require substantial education and training on the new system. Evaluations and board proceedings must recognize changes, and reinforce the new system's objectives. The Army must develop and conduct a deliberate, comprehensive, senior leader driven communication plan to promote changes, as well as a complementary education campaign to guide implementation.

Conclusion

The Army should consider standardizing an officer career model with flexible windows for time in each grade from Captain through Colonel. This could facilitate talent management, improve officer career satisfaction, and enable flexible operational strength. In his introduction to *The Army Operating Concept*, TRADOC Commander General David Perkins insists that, "[w]e must…build leaders and institutions that recognize and leverage opportunities. Leaders at all levels must encourage prudent risk taking and not allow bureaucratic processes to stifle them.…Our Army must continuously learn, adapt, and innovate."[4] Modernizing the officer personnel management system is an opportunity the Army cannot afford to postpone.

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4. Headquarters, Department of the Army, *The Army Operating Concept*, Army Training and Doctrine Command Pamphlet 525-3-1, Washington, DC: U.S. Government Printing Office, October 31, 2014, v.

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