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THE FUTURE ROLE OF STRATEGIC LANDPOWER

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Editors

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Contributors

US ARMY WAR COLLEGE CENTER FOR STRATEGIC LEADERSHIP

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The Future Role of Strategic Landpower

A US Army War College Center for Strategic Leadership Integrated Research Project

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Table of Contents

Acknowledgments ..... **vii**

Introduction ..... **ix**
Dr. Gregory L. Cantwell and Major Justin M. Magula
Background ix
This Study xiii

Chapter 1: Irregular Warfare: Increasing Gray-Zone Deterrence **1**
Colonel Gregory R. Foxx
Strategic Competition and Traditional and Irregular Warfare 2
The China Threat 6
Multidomain Operations and Conventional Deterrence 9
1995–96 Taiwan Strait Crisis and Large-Scale Conflict Avoidance 11
Scarborough Shoal and Chinese Success in the Gray Zone 14
Army Special Operations Forces and Unconventional Deterrence 15
Conclusion 16

Chapter 2: The State Partnership Program: Building Host-Nation Capabilities for Multidomain Operations **17**
Lieutenant Colonel Philip F. Baker
The Environment 18
Measures of Performance 19
Objective 1: Gain and Maintain Strategic Access and Influence 20
Objective 2: Disrupt VEO Threats to US Interests 22
Violent Extremist Organization Activity 22
Somalia 23
Chad Basin 24
The Western Sahel 25
Mozambique 26
State Partnerships 27
Objective 3: Respond to Crises to Protect US Interests 29
Nigeria and the California National Guard 30
Objective 4: Coordinate Action with Allies and Partners to Achieve Shared Security 31
The Future State Partnership Programin Multidomain Operations 33
Conclusion 33

Chapter 3: Intelligence, Surveillance, and Reconnaissance in the Pacific: Expanding US Army Pacific's Reach **35**
Kirk A. Sanders
Background 35
The United States' National Pacific Strategy 36

Developing ISR Strategy for Multidomain Operations 38
Army ISR in Competition 42
Set the Theater 44
Intelligence, Surveillance, and Reconnaissance in Combat Operations 45
The Planning and Synchronization of ISR 46
Interoperability with Allies and Partners 46
Embassy Team and Interagency Coordination 49
Operationalizing Strategy through Engagement 50
Incorporating Security Force Assistance Brigade and National Guard Training ... 51
Information Sharing 52
Recommendations and Challenges 52
Conclusion 53

Chapter 4: The Modernization of Theater Army Sustainment for Multidomain Operations 55

Colonel Curtis S. Perkins

The Transformation of the US Army 56
Theater Army Roles and Responsibilities to Set the Theater 60
Historical Examples of the Modernization of Theater Army Sustainment 61
Operation Torch 61
Operation Desert Shield 63
Recommendations for Theater Army Sustainmentin Multidomain Operations 67
Transportation 67
Supply 68
Reception, Staging, Onward Movement, and Integration 69
Sustainment Experiments 70
Conclusion 73

Chapter 5: Rethinking and Revising Logistics for Multidomain Operations in the Pacific 75

Lieutenant Colonel Timothy L. Clark

Logistics Challenges and the Future Operating Environment 76
Critical Shortages and Capability Gaps 78
Future Operating Environment 80
Finding Informed, Untethered Solutions 83
Historical Insights on Logistics 83
The Clausewitz of Logistics 83
Eccles's Logistics Bridge 84
The Commander's View 87
Preventing the Logistics Snowball 88
Applying Eccles to the Multidomain Operations Strategy Gap 90
Additive Manufacturing and Predictive Logistics 90
Additive Manufacturing 91
The Internet of Things 92

Rapid Growth and Military Use 93
Inevitable Convergence 96
Challenges to Adaptation 97
Next Steps for Integration 99
Recommended Next Steps 100
Conclusion 101

Chapter 6: Informed Competition: The Theater Army's Role in the Information Environment 105
Colonel Timothy A. Sikorski
Threats 107
China 108
Russia 109
Joint Force Requirements in the Information Environment 112
Theater Army Requirements in the Information Environment 121
Enable Decision Making 125
Protect Information 126
Inform Domestic and International Audiences 126
Influence Foreign Audiences 127
Conduct Information Warfare 128
Resourcing Theater Armies for Information Advantage 129
Conclusion 132

Chapter 7: Intelligence Impacts on Expeditionary Advanced Base Operations and Reconnaissance Employment 135
Colonel Carl L. Zeppegno
Expeditionary Advanced Base Operations 137
How Emerging Technology Impacts Operations 141
China's Digital Technology Threat 144
Ways for the Marine Corps to Overcome Technological Challenges 148
Conclusion 149

Chapter 8: Conclusion 153
Dr. Gregory L. Cantwell and Major Justin M. Magula 153

About the Editors 155

About the Contributors 155

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Introduction

Dr. Gregory L. Cantwell and Major Justin M. Magula

Over the last five years, the US Army has shifted its focus from counterinsurgency operations in Afghanistan, Iraq, and Syria to competing—and, when necessary, fighting and winning—against near-peer adversaries. During this time, the Army has developed the multidomain operations concept and rapidly modernized and transformed itself to address these changing conditions. Operations in Ukraine have demonstrated the value of working with allies and partners. These operations have also reinforced the importance of understanding the warfighting functions (mission command, movement and maneuver, intelligence, fires, sustainment, and protection) at the strategic level to help to organize efforts to achieve national objectives. The Ukrainian forces demonstrate warfighting remains a human endeavor that depends on the will of the people and the means available to provide resistance against an opposing force. Over the coming decade, the Army will continue this transition as the service seeks to become the multidomain-capable Army of 2030.

The Army's multidomain operations concept places increased emphasis on the need for the Army to compete short of armed conflict. The concept nests within a broader Department of Defense and national security focus on the return to great-power competition against near-peer adversaries like Russia and China. This new emphasis has led to technological, doctrinal, and organizational changes, and, for the first time in decades, the Army is making significant investments in its theater army headquarters.

Background

In a 2015 white paper, US Army Training and Doctrine Command recognized the Army was not "sufficiently trained, equipped, or postured to deter or defeat capable peer enemies."[1] Two years later, the command published a multidomain battle concept that proposed three strategies for solving this problem: calibrating force posture, employing resilient formations,

1. David G. Perkins, "Multi-Domain Battle: Driving Change to Win in the Future," *Military Review* 97, no. 4 (July-August 2018).

and converging capabilities.[2] Soon afterward, the command released *The US Army in Multi-Domain Operations 2028* and *US Army Concept: Multi-Domain Combined Arms Operations at Echelons above Brigade 2025–2045*. As then-Chief of Staff of the US Army Mark Milley wrote:

> [T]he American way of war must evolve and adapt. The US Army in Multi-Domain Operations, 2028 is the first step in our doctrinal evolution. It describes how US Army forces, as part of the Joint Force, will militarily compete, penetrate, disintegrate, and exploit our adversaries in the future. This product is not a final destination, but is intended to provide a foundation for continued discussion, analysis, and development.[3]

This concept envisioned a future environment where adversaries would contest the United States in all domains—air, land, sea, space, and cyberspace—both abroad and in the US homeland. *The US Army in Multi-Domain Operations 2028* described the United States as being in a state of continuous competition with China and Russia. The pamphlet recognized the need for the Army to take an active role in competing below armed conflict, a notion other policy documents, such as the *Joint Concept for Integrated Campaigning* and Joint Doctrine Note 1-19, *Competition Continuum*, also identified.[4] In multidomain operations, Army forces would set conditions before conflict and consolidate gains as the Joint Force returned to competition. Furthermore, the multidomain operations concept envisioned the Army would also contest Russia and China's gray-zone activities through "counter coercion, unconventional warfare, and information warfare directed at partners."[5]

The second of US Army Training and Doctrine Command's two pamphlets, *Multi-Domain Combined Arms Operations*, emphasized the theater army's role in multidomain operations. The pamphlet recognized the Army must uniquely tailor theater armies and resource theater army command and staff positions with trained and ready personnel. Theater armies would set conditions for the employment of Landpower and defeat adversary aggression

2. US Army Training and Doctrine Command (TRADOC), *Multi-Domain Battle: Evolution of Combined Arms for the 21st Century 2025–2040* (Fort Eustis, VA: TRADOC, December 2017), 2.

3. TRADOC, *The US Army in Multi-Domain Operations 2028*, TRADOC Pamphlet 525-3-1 (Fort Eustis, VA: TRADOC, December 6, 2018), i.

4. Joint Chiefs of Staff (JCS), *Joint Concept for Integrated Campaigning* (Washington, DC: JCS, March 16, 2018); and JCS, *Competition Continuum*, Joint Doctrine Note 1-19 (Washington, DC: JCS, June 3, 2019).

5. TRADOC, *Multi-Domain Operations 2028*, vii.

below armed conflict within their designated theaters. Likewise, theater armies would provide significant support to combatant commands in crisis and war. These documents clearly stated the Army envisioned theater armies would play a critical role in enabling the success of multidomain operations and the service must improve its ability to compete short of war. In addition, the documents indicated the Army would need to refine the multidomain operations concept further through experimentation as the service designed its future doctrine and force structure.

In 2021, General James C. McConville, chief of staff of the US Army, published two white papers. The first, *Army Multi-Domain Transformation*, outlined how the Army would overcome an adversary's anti-access/area-denial capabilities to shape conditions within theaters. The theater army would serve as the nexus for all Army forces within a theater. In competition, the Army would undertake measures that would allow it to expand the "landpower network," set theaters through assured power projection and dynamic force employment, and develop new capabilities.[6] These areas would prove necessary to ensuring the Army could successfully transform to meet future threats.

McConville's second Chief of Staff Paper, *The Army in Military Competition*, emphasized the strategic roles the Army fills as a member of the Joint Force. The paper defined military competition as the "range of activities and operations employed to achieve political objectives and to deny adversaries the ability to achieve objectives prejudicial to the United States."[7] The Army competes to achieve objectives without fighting, deter adversaries, ensure allies, or prepare for conflict. In summary, the paper further developed the Army's warfighting concepts to improve the service's ability to support national strategies and to contest adversaries short of conflict.

The *2022 National Defense Strategy of the United States of America* proposed a new concept called "integrated deterrence."[8] Although similar to the concept of unity of effort, integrated deterrence places more emphasis on "developing and combining our strengths to maximum effect, by working seamlessly across warfighting domains, theaters, the spectrum of conflict, other instruments of

6. James C. McConville, *Army Multi-Domain Transformation: Ready to Win in Competition and Conflict*, Chief of Staff Paper no. 1 (Washington, DC: Headquarters, Department of the Army, [HQDA], March 16, 2021), 15–19.

7. James C. McConville, *The Army in Military Competition*, Chief of Staff Paper no. 2 (Washington, DC: HQDA, March 1, 2021), 1.

8. Department of Defense (DoD), *2022 National Defense Strategy of the United States of America* (Washington, DC: DoD, 2022).

US national power, and our unmatched network of Alliances and partnerships. Integrated deterrence is enabled by combat-credible forces, backstopped by a safe, secure, and effective nuclear deterrent."[9] Similarly, the concept of unity of effort "refers to coordination and communication amongst USG agencies toward the same common goals for success; in order to achieve unity of effort, it is not necessary for all agencies to be controlled under the same command structure (as with community of command), but it is necessary for each agency's efforts to be in harmony with the short- and long-term goals of the mission."[10]

The Army—especially, the theater armies—will support the 2022 National Defense Strategy concept of integrated deterrence through the service's ongoing transformation efforts. To support the National Defense Strategies from both 2018 and 2022, the Army has rapidly modernized over the past few years, especially at the theater level.

Theater armies serve as the Army's primary competition headquarters and a hub for integrated deterrence operations. A theater army is the only forward presence in a theater that works on setting the conditions for combat operations in accordance with US national priorities. To meet the 2022 National Defense Strategy priorities of defending the homeland and focusing on China and Russia, the Army has invested heavily in its theater armies—especially, US Army Europe and Africa and US Army Pacific. These theater armies will gain air defense, operational fires, and information advantage commands to address the threats posed by Russia and China's long-range weapons, anti-access/area-denial bubbles, and influence campaigns. Additionally, the new Multi-Domain Task Force will enable theater armies and corps to synchronize precision effects and fires in all domains against enemy anti-access/area-denial networks to enable Joint freedom of action. Theater fires commands and elements will control long-range fires and hold adversaries at risk while friendly forces maintain significant standoff. The Intelligence, Information, Cyber, Electronic Warfare, and Space battalion and the Theater Information Advantage Element will enable the Army to conduct multidomain operations, exercise freedom of action in space, contest adversaries in the cyber domain, and open windows of opportunity in the

9. DoD, *Fact Sheet: 2022 National Defense Strategy* (Washington, DC: DoD, 2022).

10. Joint Staff J7 Future Joint Force Development, *Unity of Effort Framework Quick Reference Pamphlet* (Washington, DC: Joint Staff, 2013).

information environment.[11] Together, these new organizations will deliver effects from all domains to create multiple dilemmas for adversaries, enable Joint Force decision dominance, and create a significant deterrent effect.

This Study

The Army plays a significant role in military competition, and the operational and strategic headquarters of the service will enable its success. This role is not restricted to overseas operations. Significant challenges remain for the Army to defend the homeland. Much of the infrastructure in the United States is privately owned and maintained by commercial organizations. Nevertheless, US Army North supports civil authorities in the accomplishment of their missions. Setting the theater at home and abroad provides combatant commanders with assets and agreements to create multiple, credible, strategic options for civilian authorities.

Information operations, or operations in the information environment, offer additional challenges to military operations at home and abroad. Near-peer competitors have made significant investments in controlling information where possible and dominating the information environment where open access permits any actor to participate and potentially exploit the environment to the adversary's advantage.

This study contains seven chapters that focus on some of the challenges the Army will face in future operations. Some chapters explore some very specific recommendations through a scenario description; others highlight some significant challenges without providing full context to offer actionable recommendations for a simple solution. All chapters recognize the challenges cannot be considered out of context. The Army will always operate without all the resources, modernized equipment, and personnel the service may need. Risk must be accepted in accordance with national priorities. When possible, before adopting a recommendation, the Army must understand all associated risks to its mission and the Joint Force. This compendium of US Army War College strategic leadership student papers has endeavored to examine the following seven broad issues to spur some thought for future analysis:

11. Lisa M. Litchfield, "USACAPOC(A) and Interoperability in MDO at JWA," US Army Reserve (website), August 4, 2021, https://www.usar.army.mil/News/Article/2720101/usacapoca-and-interoperability-in-mdo-at-jwa/; and Sydney J. Freedberg Jr., "Army's Multi-Domain Unit 'a Game-Changer' in Future War," Breaking Defense (website), April 1, 2019, https://breakingdefense.com/2019/04/armys-multi-domain-unit-a-game-changer-in-future-war/.

irregular warfare and gray-zone deterrence; the state partnership program and the development of host-nation capabilities; intelligence, reconnaissance, and surveillance in the Pacific; theater army sustainment modernization; a reexamination of logistics operations in the Pacific; the theater army's role in information operations; and the impacts of intelligence on expeditionary advanced base operations and reconnaissance employment. We welcome feedback and encourage additional consideration of the challenges identified in this report as well as any additional issues that may emerge in the future.

— 1 —

Irregular Warfare: Increasing Gray-Zone Deterrence

Colonel Gregory R. Foxx

Today, in the Indo-Pacific region, a tension seems to exist between advocates for traditional and irregular warfare in deterring Chinese aggression. Irregular warfare and traditional warfare may not be seamless counterpropositions, but they are mutually supporting doctrinal concepts. The tension arises from different camps who often subconsciously gravitate to one or the other and argue from that position alone. Former National Security Advisor and retired Army Lieutenant General H. R. McMaster believes viewing China as a threat, "may be the most significant shift in US foreign policy since the end of the Cold War."[1] The *2018 National Defense Strategy* questions how the United States should organize and employ national power to defend US territory and interests and those of the nation's allies while deterring adversary aggression with minimal risk to personnel, credibility, resources, and national interests.[2]

This chapter argues increased US Army Special Operations Forces are critical to deterring Chinese aggression, and the Army should effectively integrate them with conventional forces at the theater level. An understanding of traditional and irregular warfare, China's threat to US interests, and China's approach to warfare reveals a requirement for both strong military deterrence and an ability for the United States to deter China's efforts below the threshold of armed conflict. An effective strategy to use persistent Army Special Operations Forces engagement across the Indo-Pacific region, as

1. Kenji Minemura, "INTERVIEW: McMaster says tariffs on China should stay until behavior changes," *The Asahi Shimbun*, June 22, 2019, https://www.asahi.com/ajw/articles/13063019.

2. James Mattis, *Summary of the 2018 National Defense Strategy of the United States of America* (Washington, DC: Department of Defense [DoD], 2018), 4.

a compliment to theater army preparation for possible conflict and other government activities to manage risk below the threshold of open conflict, is critical to achieving integrated deterrence as described in the *2018 National Defense Strategy*.

Army Special Operations Forces include the US Army branches of Civil Affairs, Psychological Operations, and Special Forces. This chapter focuses on Army Special Operations Forces and not all US special operations capabilities for two reasons. First, Army Special Operations Forces are proficient in foreign cultures and languages with specific education and training in special warfare and are capable of understanding and influencing foreign populations.[3] Second, a 2018 RAND Corporation study argued Army Special Operations Forces "may constitute an effective and cost-sensitive capability" in an environment of strategic competition. Army Special Operations Forces provide the capability to engage persistently allies and partners and assist the combatant command to set the theater for potential conflict.[4]

This introduction presents a rationale and significance for researching Army Special Operations Forces integration with a theater army to manage risk during strategic competition with China while achieving deterrence in both traditional and irregular warfare. The chapter begins by defining strategic competition as defined by the *National Defense Strategy* in the context of traditional and irregular warfare. The significance of the China threat is described through a review of China's *Three Warfares* doctrine that coordinates traditional and irregular warfare. The US military's ability to provide conventional military deterrence is also described, focusing on the critical role of the multidomain operations concept and theater army in creating military overmatch. This chapter concludes with historical examples of US deterrence of China and promotes the use of Army Special Operations Forces to conduct irregular warfare activities against China as unconventional deterrence.

Strategic Competition and Traditional and Irregular Warfare

Many Americans will remember 2021 as the year the US war in Afghanistan came to its dreadful termination. Many will not remember that 2021 also marked the 30th anniversary of the US and coalition victory in the Gulf War. Operation Desert Storm remains a textbook case study of short-

3. Edward C. Croot, *There Is an Identity Crisis in Special Forces: Who Are the Green Berets Supposed to Be?* (Carlisle, PA: Strategic Studies Institute, US Army War College Press, 2020), 7.

4. Linda Robinson et al., *Improving the Understanding of Special Operations: A Case History Analysis* (Santa Monica, CA: RAND Corporation, 2018), xv.

duration and decisive warfare. After the Vietnam War, the Army developed its doctrine of AirLand Battle resulting in the stunning victory against Iraq.[5] The development of AirLand Battle doctrine reoriented the US military from a tactical to operational warfighting focus: to defeat a massive conventional army (namely the Soviet Union) by applying speed, agility, and decisive action with a technologically superior force.

Although large-scale conflict with the Soviet Union never occurred, the Gulf War provided an opportunity for the US military to apply AirLand Battle doctrine in armed conflict. In 1991, the Army's swift ground campaign ended in 100 hours and routed the Iraqi Army from within Kuwait. Furthermore, the military successes of Operation Desert Storm demonstrated that the US military was indeed the world's premier fighting force.

Success in the Gulf War engrained a belief that the military alone could accomplish whole-of-government efforts. Former Defense Secretary Robert Gates believes the United States has become too reliant on its military, which he argues is problematic when the country attempts to impose democracy through the application of military force.[6] Gates further argues that despite high levels of military funding and resourcing, other US institutions that apply diplomatic, information, and economic instruments of power have significantly atrophied.[7] This imbalance between US instruments of national power may require the military to coordinate and lead whole-of-government activities that accomplish foreign policy goals. Interagency leadership is not an inherently military task. It requires a different cultural approach with appropriate terminology and has proven challenging for US military leaders to execute.[8]

Meanwhile, theories of strategic competition suggest the character of war, how militaries are structured and wage war, is changing.[9] AirLand Battle and the focus on conventional military strength may not be optimal in future conflicts. Strategists at the US Army Futures Command described an uncertain operational environment in the 2035–50 time frame characterized

5. William Thomas Allison, *The Gulf War, 1990–91 (Twentieth-Century Wars)* (London: Palgrave Macmillan, 2012), 55.

6. Robert M. Gates, *Exercise of Power: American Failures, Successes, and a New Path Forward in the Post–Cold War World*, (New York: Alfred A. Knopf, 2020), 8.

7. Gates, *Exercise of Power,* 74–76.

8. William J. Davis Jr., "The Challenge of Leadership in the Interagency Environment," *Military Review* 90, no. 5 (September/October 2010): 94–96.

9. Ronald O'Rourke, *Renewed Great Power Competition: Implications for Defense—Issues for Congress*, Congressional Research Service (CRS) Report R43838 (Washington, DC: CRS, updated October 7, 2021), 1–4.

by a "New Cold War" dominated by the US-China relationship where the United States promotes the liberal-democratic order versus China's promotion of authoritarian socialism.[10] Army Futures Command strategists further explain, "Aggressive and active competition, rather than kinetic warfare, dominates the US-China relationship," with proxy wars and influence efforts in competition more likely than large-scale conventional warfare.[11] Technological proliferation and increased human connection also require a nuanced, whole-of-government approach with decreased use of military force and the primacy of information.[12] The Army could best address the changing character of war in strategic competition by maximizing the unique capabilities and contributions Army Special Operations Forces bring to the Joint Force and interagency.

The United States requires a strong military to protect national interests and deter potential adversaries. But current national defense documents and the types of warfare that the United States conducts indicate a greater need for irregular warfare. The 2022 Russian invasion of Ukraine highlights the importance of the capability to defeat an adversary's conventional land forces. The *2018 National Defense Strategy* warns of adversaries' "increased efforts short of armed conflict by expanding coercion to new fronts, violating principles of sovereignty, exploiting ambiguity, and deliberately blurring the lines between civil and military goals."[13] Similarly, the 2018 US Intelligence Committee's global threat assessment cited potential for conventional military conflict between countries and violent Sunni extremism as the two greatest future threats to national security.[14] A recent RAND Corporation report similarly argues that gray-zone strategies below the threshold of US military response will be a significant challenge for the United States in the next 10 to 15 years.[15] The United States participated in only five conventional military conflicts, from 1915 to present, authorized by a Congressional Authorization for the Use of Military Force or UN Security Council Resolution. During the same period, the US military deployed over 50 times and participated in

10. US Army Futures Command (AFC), *Future Operational Environment: Forging the Future in an Uncertain World, 2035–2050*, AFC Pamphlet 525-2 (Austin: AFC, 2021), 7–8.

11. AFC, *Future Operational Environment*, 7.

12. US Army Training and Doctrine Command (TRADOC), *The Operational Environment and the Changing Character of Warfare*, TRADOC Pamphlet 525-9 (Fort Eustis, VA: TRADOC, October 2019), 21–23.

13. Mattis, *Summary of the 2018 National Defense Strategy*, 2.

14. Daniel R. Coats, "Statement for the Record: Worldwide Threat Assessment of the US Intelligence Community," Office of the Director of National Intelligence (website), February 13, 2018, https://www.dni.gov/files/documents/Newsroom/Testimonies/2018-ATA---Unclassified-SSCI.pdf.

15. Forrest E. Morgan and Raphael S. Cohen, *Military Trends and the Future of Warfare: The Changing Global Environment and Its Implications for the US Air Force,* RR-2849/3-AF (Santa Monica, CA: RAND Corporation, 2020), 39–46.

armed conflict, including recent operations in Iraq and Afghanistan.[16] These US military deployments, designed to achieve objectives absent declared war, fall in "an operational space between peace and war."[17] They are often called irregular, hybrid, or gray-zone warfare and describe activities that the United States must address in strategic competition.

US military doctrine may not adequately account for competition in irregular warfare (competition to crisis) and traditional warfare (escalation to conflict). Joint Doctrine Note 1-19 describes "competition" as actions taken by states and nonstate actors "to protect and advance their own interests."[18] Further, this publication describes the world as a competition continuum of cooperation, competition below armed conflict, and armed conflict.[19] Joint doctrine defines irregular warfare broadly as "a violent struggle among state and non-state actors for legitimacy and influence over the relevant population(s)."[20] Irregular warfare consists of five core activities executed to establish order in a fragile or unstable state. The activities are counterterrorism, unconventional warfare, foreign internal defense, counterinsurgency, and stability operations.[21] Joint doctrine also defines traditional warfare as "a violent struggle for domination between nation-states or coalitions and alliances of nation-states."[22] This tension in warfare may result from a lack of ownership of activities below the level of armed conflict to achieve military objectives, diplomatic goals, and political aims.

The Afghanistan experience is an example of the tension between traditional and irregular warfare. In early 2002, General Stanley McChrystal, a staff officer in Afghanistan at the time, remarked, "It wasn't clear whether there was any war left. The hunt for al-Qaeda continued, but the Taliban seemed to have been defeated decisively; most had essentially melted away, and we weren't sure where they had gone."[23] While conventional warfare seemed to

16. Jennifer K. Elsea and Matthew C. Weed, *Declarations of War and Authorizations for the Use of Military Force: Historical Background and Legal Implications,* RL31133 (Washington, DC: CRS, April 18, 2014), 88–107.

17. Lyle J. Morris et al., *Gaining Competitive Advantage in the Gray Zone: Response Options for Coercive Aggression below the Threshold of Major War*, RR-2942-OSD (Santa Monica, CA: RAND Corporation, 2019), 8.

18. Joint Chiefs of Staff (JCS), *Competition Continuum*, Joint Doctrine Note 1-19 (Washington, DC: JCS, June 3, 2019), v.

19. JCS, *Competition Continuum*, v.

20. JCS, *DoD Dictionary of Military and Associated Terms*, Joint Publication 1-02 (Washington, DC: JCS, November 2021), 63.

21. Robert O. Work, *Irregular Warfare (IW)*, DoD Directive 3000.07 (Washington, DC: Office of the Under Secretary of Defense for Policy, updated May 12, 2017), 1–2.

22. JCS, *Doctrine for the Armed Forces of the United States*, Joint Publication 1 (Washington, DC: JCS, updated July 12, 2017), x.

23. Carter Malkasian, *The American War in Afghanistan: A History* (New York: Oxford University Press, 2021), 81.

have defeated the Taliban regime, al-Qaeda and Osama Bin Laden remained a terrorist threat to the United States. The US experience in Afghanistan centered on irregular warfare through counterterrorism, counterinsurgency, and foreign internal defense operations during the subsequent 19 years. The counterterrorism efforts that US forces took against the Taliban and Haqqani network operating within Afghanistan were only one piece of the global counterinsurgency fight that the United States and its allies undertook to contain the Taliban and Haqqani network.[24]

The *2018 National Defense Strategy* warns the US military's advantage has eroded with the "reemergence of long-term, strategic competition."[25] Part of this erosion stems from state and nonstate actors leveraging asymmetric capabilities intent on destabilizing international order and rising peer competitors like Russia and China.[26] Despite these challenges, 20 years of irregular warfare operations during the war on terrorism have honed conventional Army units' irregular warfare capabilities and prepared Army Special Operations Forces to execute irregular warfare successfully in any theater.

The China Threat

China's approach to warfare includes increased conventional military capabilities coordinated with a focus on nonkinetic capabilities. As a peer competitor, China is strengthening its capability to execute traditional warfare while focusing on maritime, economic, and "Three Warfare" doctrine activities as part of its irregular warfare operations. China developed an approach to warfare that coordinates traditional and irregular warfare that People's Liberation Army (PLA) Colonels Qiao Liang and Wang Xiangsui described in a 1999 essay, *Unrestricted Warfare*, literally translated as, "Warfare Beyond Bounds."[27] *Unrestricted Warfare* articulates China's preference for and focus on irregular warfare over traditional warfare stating, "When carrying out war with these people, there is no declaration of war, no fixed battlefield, no face-to-face fighting and killing, and in the majority of situations, there will be no gunpowder smoke, gun fire, and spilling of blood."[28] China tends to favor nonkinetic capabilities; therefore, conventional defense dominance alone

24. Malkasian, *American War in Afghanistan*, 448–62.

25. Mattis, *Summary of the 2018 National Defense Strategy*, 1.

26. Mattis, *Summary of the 2018 National Defense Strategy*, 2–3.

27. Tony Corn, "Peaceful Rise through Unrestricted Warfare: Grand Strategy with Chinese Characteristics," *Small Wars Journal* (website), June 2010, https://smallwarsjournal.com/blog/journal/docs-temp/449-corn.pdf.

28. Qiao Liang and Wang Xiangsui, *Unrestricted Warfare* (Beijing: PLA Literature and Arts Publishing House, 1999), 134.

may now be inadequate to deter China effectively. The United States should use another strategy that also addresses China's irregular warfare threat.

Although China might prefer the irregular warfare tactics of *Unrestricted Warfare*, China is also modernizing conventional military capabilities to negate US military advantages in logistics, intelligence, surveillance and reconnaissance, and communications.[29] China views increased conventional military capabilities as key to achieving its goal of having a "world-class military" by the end of 2049.[30] China's increased conventional military capabilities include shipbuilding (China has the largest navy in the world), long-range missiles (conventional, ballistic, and hypersonic), robust and redundant integrated anti-access/area-denial capabilities designed to deter or defeat military intervention in China's first island chain, and cyber and nuclear capabilities rivaling the United States.[31] China's national policy is to resolve maritime claims in the East and South China Seas favorably, posture and prepare to defeat adversaries in the Indo-Pacific region, and exert regional influence.[32] China's national defense objectives are clear and threaten the United States and its allies.

China often operates in what security experts describe as the gray zone to accomplish its objectives. Operations in the gray zone are "competitive interactions among and within state and nonstate actors that fall between the traditional war and peace duality," with "uncertainty about the relevant policy and legal frameworks."[33] Several terms are historically used to describe gray-zone activities, including asymmetric warfare, military operations other than war, small wars, and irregular warfare.[34] China's effective gray-zone operations in the East and South China Seas are often referred to as "salami slicing."[35] Salami slicing describes small, incremental maritime claims that have strategic value but remain below the threshold of armed conflict.[36] China's maritime militia challenges the international military presence within the South China Sea by asserting Chinese sovereignty and historic rights to

29. Office of the Secretary of Defense (OSD), *Military and Security Developments Involving the People's Republic of China 2020* (Washington, DC: OSD, September 1, 2020), 141–49.

30. OSD, *Military and Security Developments*, 43.

31. OSD, *Military and Security Developments*, 43–97.

32. OSD, *Military and Security Developments*, 43–97.

33. Philip Kapusta, "The Gray Zone," *Special Warfare* 28, no. 4 (October-December 2015): 20.

34. Kapusta, "The Gray Zone," 20.

35. Robert Haddick, "Six Ways to Resist China's Salami-Slicing Tactics," *National Interest* (website), November 24, 2014, https://nationalinterest.org/feature/six-ways-resist-chinas-salami-slicing-tactics-11723, 2.

36. Haddick, "Six Ways," 2.

resources while avoiding armed conflict.[37] In its gray-zone activities, China incorporates economic "sticks and carrots" and cyber activities alongside its large maritime militia.[38] The gray-zone activities allow China to avoid potential armed conflict with the US military while executing "the great rejuvenation of the Chinese nation" by 2049 to surpass US global power.[39]

Guided by *Unrestricted Warfare*, China executes a vast information warfare operation. It uses traditional media forms and cutting-edge social media through a doctrine known as "Three Warfares." This doctrine integrates traditional warfare capabilities with irregular warfare by coordinating psychological warfare, public opinion, and legal conflict. The Chinese propaganda machine undermines US interests, shapes national narratives to their benefit, and corrupts the information environment in a way that sews doubt between the United States and its allies.[40] The "Three Warfares" doctrine is irregular warfare that falls between routine diplomacy and armed conflict, placing emphasis on psychological, media, and legal warfare to advance China's national interests.[41]

China's increased conventional military capabilities combined with the "Three Warfares" doctrine postures China as a regional hegemon that challenges US dominance internationally. Army Special Operations Forces irregular warfare capability effectively integrated with the theater army's conventional military strength competes with China's gray-zone activities and deters potential threats from the PLA. The US military is developing new operational concepts to counter Chinese military forces in the Indo-Pacific region, including multidomain operations for the Army, distributed maritime operations for the Navy and Marine Corps, and expeditionary advanced base operations for the Marine Corps.[42] These new operational concepts integrate US military capabilities across all domains (including space and cyber) with advanced conventional military capabilities.[43] Although all three concepts are

37. Zachary Keck, "Shaming Won't Stop China's Salami Slicing," *Diplomat* (website), July 16, 2014, https://thediplomat.com/2014/07/shaming-wont-stop-chinas-salami-slicing.

38. Kathleen H. Hicks and Joseph P. Federici, "Campaigning through China's Gray Zone Tactics," in *The Struggle for Power: US-China Relations in the 21st Century*, ed. Leah Bitounis and Jonathon Price (Washington, DC: Aspen Institute, 2020), 98–99.

39. OSD, *Military and Security Developments*, III.

40. OSD, *Military and Security Developments*, 132.

41. Sangkuk Lee, "China's 'Three Warfares': Origins, Applications, and Organizations," *Journal of Strategic Studies* 37, no. 2 (April 2014): 198–221.

42. O'Rourke, *Renewed Great Power Competition*, 16.

43. O'Rourke, *Renewed Great Power Competition*, 16.

critical to US military deterrence of Chinese aggression, this chapter focuses on multidomain operations as the foundational concept for Army operations.

Multidomain Operations and Conventional Deterrence

The recently released *Fact Sheet: 2022 National Defense Strategy* states, "The Department will act urgently to sustain and strengthen deterrence, with the People's Republic of China as our most consequential strategic competitor and the pacing challenge for the Department."[44] The term "deterrence" involves the ability to prevent an adversary from action by fear of punishment being imposed for acting, "by announcement, by rigging the trip-wire, by incurring the obligation—and waiting."[45] The Department of Defense similarly defines deterrence as "The prevention of action by the existence of a credible threat of unacceptable counteraction and/or belief that the cost of action outweighs the perceived benefits."[46] Deterrence is not active and aims to influence an adversary to refrain from action. It should not be confused with "compellence," which is active and targets a state to perform an action.[47] Deterrence is most often defined as nuclear deterrence, nuclear capabilities that provide the threat of pain and extinction, and conventional deterrence, conventional military capabilities with the threat of military defeat.[48] China leverages conventional military capabilities with irregular warfare to contest US and allies' interests in all domains. Based on these actions, the United States must similarly adjust to deter Chinese efforts effectively.

Most strong states rely on conventional military capabilities, but traditional warfare and conventional capabilities may not always deter irregular threats. The United States must successfully deter China's gray-zone activities in competition below armed conflict to avoid suffering serious threats to its interests. Although strategic competition is marked by the human dimension where Landpower is critical, the *US Army in Multi-Domain Operations 2028* concept proposes rapid and continuous integration of all domains of warfare to deter in competition as its contribution to the Joint Force. The multidomain operations concept includes three core tenets: calibrated force posture, multidomain formations, and convergence. Calibrated force posture provides positional advantage with land

44. DoD, *Fact Sheet: 2022 National Defense Strategy* (Washington, DC: DoD, 2022).

45. Thomas C. Schelling, *Arms, and Influence* (New Haven, CT: Yale University Press, 1966), 71.

46. JCS, *DoD Dictionary*, 63.

47. Tami Davis Biddle, "Coercion Theory: A Basic Introduction for Practitioners," *Texas National Security Review* 3, no. 2 (Spring 2020): 7–8, 94–109.

48. Schelling, *Arms and Influence*, 23.

forces physically positioned to reassure US allies; combined with convergence, it provides conventional deterrence. Convergence is defined as "rapid and continuous integration of capabilities in all domains, the electromagnetic spectrum, and information environment that optimizes effects to overmatch the enemy."[49] Speed, range, and convergence provide overmatch in potential future conflict with China through modernized capabilities, such as long-range precision fires and vertical lift, enabled by mission command.[50]

Multidomain formations provide long-range precision effects with intelligence, information operations, electronic warfare, and cyber capabilities that operate below the threshold of armed conflict. Multidomain formations are developing long-range precision fires (hypersonic), midrange fires with antiship capability, and precision strike capability to penetrate integrated air missile defenses.[51] These systems will help the Joint Force penetrate China's area-denial capability and increase Joint Force lethality.[52] The multidomain operations concept ultimately enables the Army and Joint Force to forward deploy, rapidly process data, and adjust plans to shape a changing, dynamic environment in both competition and conflict. An multidomain-enabled positional advantage enables long-range fires to defeat China's maritime fleet, penetrate China's anti-access/area-denial capabilities, and provide counterfire with ballistic missiles, bolstering conventional deterrence through credible military forces.

Security Force Assistance Brigades provide another opportunity to enhance conventional deterrence. A Security Force Assistance Brigade is regionally aligned to the Indo-Pacific region and coordinated with Army Special Operations Forces, who have always had a foreign internal defense capability. It works with conventional forces to develop their capabilities and capacities to be more capable partners. The Security Force Assistance Brigade is an important component of Landpower and calibrated force posture in the Indo-Pacific region, developing interoperability with US allies and partners. A Security Force Assistance Brigade is another component of multidomain operations that provides for increased conventional deterrence in the Indo-Pacific region.[53] But these conventional deterrents may fail to stop China's irregular warfare ability to shape the environment in the human

49. TRADOC, *US Army in Multi-Domain Operations 2028*, TRADOC Pamphlet 525-3-1 (Fort Eustis, VA: TRADOC, December 6, 2018), vii.

50. TRADOC, *Multi-Domain Operations*, vii–xii.

51. *TRADOC, Multi-Domain Operations*, 42–44.

52. TRADOC, *Multi-Domain Operations*, 24–27.

53. "America's Theater Army for the Indo-Pacific," US Army Pacific (website), September 2021, https://api.army.mil/e2/c/downloads/2021/10/04/e0c655bc/usarpac-america-s-theater-army-for-the-indo-pacific.pdf, 6.

dimension of the gray zone. To achieve their full deterrent potential, they require Army Special Operations Forces' foreign internal defense, security force assistance, and unconventional warfare operations to strengthen US deterrence.

The historical examples of the 1995–96 Taiwan Strait crisis and 2012 Scarborough Shoal seizure indicate that US conventional military capability may deter China from executing conventional military operations to accomplish a fait accompli. However, conventional military capabilities may also fail to address China's gray-zone activities. China's territorial advances below the level of armed conflict in the East and South China Seas impose gains at the expense of the United States and its allies and partners while avoiding traditional warfare.[54] Although its conventional and nuclear military threat are the most dangerous, China has demonstrated that its gray-zone and irregular warfare threats are the most likely.

1995–96 Taiwan Strait Crisis and Large-Scale Conflict Avoidance

China likely favors gray-zone activities and avoids large-scale conflict due to US effectiveness at deterring conflict. The United States demonstrated conventional military deterrence during the 1995-96 Taiwan Strait crisis after China launched two series of missile attacks, one in July and August 1995 and a second in March 1996. The United States responded with a show of force, sending two aircraft carrier battlegroups centered on the USS *Nimitz* sailing through the Taiwan Strait.[55]

The crisis began on May 22, 1995, when the United States approved a visa for Taiwan's President Lee Teng-hui to visit his alma mater, Cornell University, after assuring the Chinese foreign minister that a visa would not be issued.[56] Beijing immediately countered by recalling their US ambassador, allowing economic piracy, detaining US citizen Harry Wu, and demanding no more visas for high-ranking Taiwanese officials.[57] China's ends, the ultimate outcomes they wanted to achieve through their national strategy, appeared clear: prevent the United States from developing a Taiwan policy that allowed

54. Michael Kofman, "Getting the Fait Accompli Problem Right in US Strategy," War on the Rocks (website), November 3, 2020, https://warontherocks.com/2020/11/getting-the-fait-accompli-problem-right-in-u-s-strategy/.

55. Wallace J. Thies and Patrick C. Bratton, "When Governments Collide in the Taiwan Strait," *Journal of Strategic Studies* 27, no. 4 (December 2004): 564–74.

56. Thies and Bratton, "When Governments Collide," 562.

57. Thies and Bratton, "When Governments Collide," 564.

Taiwan's leaders to declare sovereignty from China. The United States also developed clear ends, desiring to maintain a One China policy that supported the existence of two rival governments, the People's Republic of China in Beijing and the Republic of China in Taipei.[58] China executed a strategy to compel the United States to change policies by imposing costs through recalling their US ambassador, enforcing military sanctions, and conducting missile tests off the coast of Taiwan.[59] Maintenance of the One China policy provided credibility to the US commitment to Taiwan, and President Clinton supported the policy beginning with his presidential campaign in 1992, where he accused President George H. W. Bush of "coddling" China.[60]

The United States leveraged information, diplomacy, and the military to maintain the One China policy and status quo in East Asia in the 1995–96 Taiwan Strait crisis. Using information as a national instrument of power, the United States observed and refrained from public reaction to Chinese provocation. The Departments of Defense and State and the White House refrained from public statements and media engagements for much of the crisis. The United States appeared to view China's threat to Taiwan as minimal and less than credible, and the risk of acting in response to China outweighed potential benefits. China was likely frustrated by the lack of US public response to its actions, although formal diplomatic engagement persisted privately.[61]

Diplomatic engagement allowed the United States to accommodate China, if possible, and limit other competition while trying to persuade China that the One China policy was not being revised in favor of Taiwan's interest and a return to the status quo was in the best interest of both parties. In August 1995, after the first series of Chinese missile tests, State Secretary Warren Christopher met with Chinese Foreign Affairs Minister Qian. Secretary Christopher stressed the US resolve to maintain a One China policy while not agreeing to a policy denying visas to Taiwanese officials in the future. Secretary Christopher also privately provided Qian a letter from President Clinton affirming the One China policy and the People's Republic of China as the only representative of the Chinese people.[62] After Secretary Christopher's meeting, President Clinton and General Secretary Jiang held an unofficial summit in October 1995. President Clinton repeated the assurances of his

58. Richard C. Bush, *A One-China Policy Primer*, East Asia Policy Paper no. 10, (Washington, DC: Brookings Institute Center for East Asian Studies, March 2017), iii.

59. Thies and Bratton, "When Governments Collide," 564.

60. Thies and Bratton, "When Governments Collide," 563.

61. Thies and Bratton, "When Governments Collide," 563–74.

62. Thies and Bratton, "When Governments Collide," 565.

earlier letter, and in November 1995, Assistant Defense Secretary Joseph Nye visited Beijing and engaged with defense officials.[63] Diplomacy was successfully executed with engagements from department officials, secretaries, and the president. In March 1966, China's aggressiveness culminated with missile tests near Taiwan, a combined arms military exercise on Fujian Islands replicating an amphibious attack on Taiwan, and comments from Chinese Defense Minister Chi Haotian that China would "never tolerate any attempts to split our country."[64]

A US military show of force aided information and diplomacy in coercing China to cease missile tests and force posturing. The USS *Nimitz* and USS *Independence*, along with their battle groups, deployed near Taiwan. Although the PLA continued exercises from March 12–25, the two carrier battlegroups deterred Chinese aggression and prevented further military escalation. After the PLA's military exercises concluded, Taiwan held a presidential election and the One China policy remained peacefully unchanged.[65]

The 1995–96 Taiwan Strait crisis is an example of the United States maintaining the status quo in the Indo-Pacific region through a graduated approach from inactive observation to active diplomatic engagement and negative coercive engagement. The United States used feasible informational, diplomatic, and military means with low risk to achieve its end of maintaining the One China policy. The threat of US-China confrontation over Taiwan persists: Chinese President Xi Jinping stated in October 2021 that "reunification" with Taiwan "must be fulfilled."[66] The 1995–96 Taiwan Strait crisis shows that US conventional military deterrence is effective, and China may avoid future large-scale operations. If the United States effectively deters China's conventional military threat while failing to deter China in the gray zone, China has no incentive to escalate from irregular warfare to conventional military confrontation.

63. Thies and Bratton, "When Governments Collide," 567–68.

64. Thies and Bratton, "When Governments Collide," 572.

65. Thies and Bratton, "When Governments Collide," 572–74.

66. "China-Taiwan Tensions: Xi Jinping Says 'Reunification' Must Be Fulfilled," *BBC News* (website), October 9, 2021, https://www.bbc.com/news/world-asia-china-58854081.

Scarborough Shoal and Chinese Success in the Gray Zone

The United States does not want conventional military conflict and neither does China. China's gray-zone operations allow it to avoid confrontation with the United States, which makes it difficult for the United States to pursue escalatory measures like it did during the Taiwan Strait crisis. Scarborough Shoal is an example of Chinese success in the gray zone, where China physically took terrain, the Scarborough Shoal.

Scarborough Shoal is the largest island near the Philippine island of Luzon and consists of a chain of reefs that are highly valuable for fishing. The shoal is disputed territory between the Philippines, China, and Taiwan. All three nations claim Scarborough Shoal through the disputed nine-dash line in the South China Sea, which includes the Paracel Islands, Spratly Islands, and Pratus Island. China now controls all the contested territories of the nine-dash line.[67]

The Scarborough Shoal standoff between the Philippines and China occurred between April and June 2012 after eight Chinese vessels blocked the shoal and resisted the Philippine Navy.[68] Since seizing Scarborough Shoal, an estimated 240 Chinese fishing vessels operate around the shoal, harvesting more than 260 tons of fish.[69] Chinese fishing and exploitation of the Philippine's natural resources on and around the shoal continues, despite a UN tribunal declaring China's claims to Scarborough Shoal invalid.[70] Ambassador David Shear, who served as the US ambassador to Vietnam, relates in late 2013, a Vietnamese General told him "in 2012, the Chinese took over Scarborough Shoal from the Philippines, a US ally, and the United States failed to protect their ally, the Philippines. Why should we [Vietnam] trust you?"[71] The Vietnamese general appeared to assert that US credibility is being damaged by the Scarborough Shoal standoff and Chinese gray-zone activities. Conventional military strength is not always a deterrent to Chinese

67. Bruce Elleman, Stephen Kotkin, and Clive Schofield, *Beijing's Power and China's Borders: Twenty Neighbors in Asia* (New York: Routledge, October 1, 2012), 237–93.

68. "TIMELINE: The Philippines-China maritime dispute," Rappler, July 12, 2016, https://www.rappler.com/world/139392-timeline-west-philippine-sea-dispute/.

69. Joanna Rose Aglibot, "'Worse Than Invasion': China Ships Poach 240,000 kg of Fish Daily in PH Seas, Says Group," *Philippine Daily Inquirer* (website), April 1, 2021, https://globalnation.inquirer.net/195237/worse-than-invasion-china-ships-poach-240000-kg-of-fish-daily-in-ph-seas-says-group.

70. "Courting Trouble," *Economist*, July 16, 2016, https://www.economist.com/china/2016/07/16/courting-trouble.

71. Laura Jones and Shawana Sinnott, "China's Strategically Irregular Approach: The Art of the Gray Zone," in *Irregular Warfare Podcast*, 55:42, https://mwi.usma.edu/chinas-strategically-irregular-approach-the-art-of-the-gray-zone/.

gray-zone activities, and the United States may require irregular warfare to deter Chinese competition effectively below the threshold of armed conflict.

Army Special Operations Forces and Unconventional Deterrence

"Unconventional deterrence" involves the ability to foment insurgencies in populations of fragile states who are discontent with domestic governance. One state can leverage the target state's fear of destabilization and collapse by an incited population as a means of unconventional deterrence. Unconventional deterrence can deter a state from competing below the threshold of armed conflict.[72] Irregular warfare, specifically unconventional warfare, is possibly the most credible threat to China's gray-zone activities. Unconventional warfare is "activities conducted to enable a resistance movement or insurgency to coerce, disrupt, or overthrow a government or occupying power by operating through or with an underground, auxiliary, and guerrilla force in a denied area."[73] As with nuclear and conventional deterrence, unconventional deterrence is not focused on action but credible threat. China exploits the US aversion to escalation of force by operating in the gray zone. A credible threat of unconventional warfare to entice and create an insurgency in the Chinese homeland could provide powerful unconventional deterrence to Chinese competition below armed conflict. Army Special Operations Forces are best postured to create an unconventional warfare threat against an adversary. Based on the previous explanation of multidomain operations, US policies should integrate Army Special Operations Forces with conventional forces through the theater army.

Army Special Operations Forces possess a long and successful legacy using the capabilities of indigenous approaches to develop understanding and wield influence. They also use precision targeting operations to accomplish complex tasks absent of conventional military dominance.[74] This concept also implies that the Army should integrate all Army Special Operations Forces and conventional forces through the theater army for unified action and efficient use of resources.

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72. Robert C. Jones, "Deterring 'Competition Short of War': Are Gray Zones the Ardennes of Our Modern Maginot Line of Traditional Deterrence?," *Small Wars Journal* (website), May 14, 2019, https://smallwarsjournal.com/jrnl/art/deterring-competition-short-war-are-gray-zones-ardennes-our-modern-maginot-line.

73. Work, *Irregular Warfare*, 14.

74. Robert Toguchi and Michael Krivdo, ed., *The Competitive Advantage: Special Operations Forces in Large-Scale Combat Operations* (Fort Leavenworth, KS: Army University Press, 2019), 1–6.

Conclusion

In the strategic environment, a dichotomy exists between irregular and traditional warfare that is central to the understanding of the future of warfare. Irregular warfare involves drones, artificial intelligence, cyber, and special operations, and traditional warfare is appropriate to prepare for large-scale ground combat. Army Special Operations Forces provide the Army with critical capability for irregular warfare, and the roles, functions, and tasks of a theater army set the conditions for success in large-scale combat operations. The effective integration of Army Special Operations Forces with the theater army allows the Army to focus on irregular and traditional war simultaneously. A larger study may indicate that similar coordination is required for other theater armies outside the Indo-Pacific region to deter China.

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The State Partnership Program: Building Host-Nation Capabilities for Multidomain Operations

Lieutenant Colonel Philip F. Baker

The US Army's concept of multidomain operations challenges Army leaders to view world events on a continuum that vacillates from competition to crisis, conflict, and back to competition. Although previous operational concepts focused almost exclusively on conflict, the multidomain operations concept intentionally focuses on the competition phase and activities short of conflict. The concept challenges geographic combatant commands to identify the requirements for competing and deterring adversaries in this competition phase. Though joint staffs around the globe seek to answer how they will execute this guidance, General James C. McConville, chief of staff of the Army, in a recent Chief of Staff paper, noted part of the answer is for the Army to build relative positional advantage persistently by cultivating a strong network of allies and partners.[1]

The Army can use the National Guard as a significant asset in this endeavor by leveraging the National Guard State Partnership Program, which is currently in place around the globe and in every theater. This chapter will show that the National Guard State Partnership Program builds host nation capabilities geographic combatant commands can leverage in multidomain operations. This chapter will focus on United States Africa Command (USAFRICOM) in three main parts. First, this chapter will briefly examine the theater environment to include a brief look at the USAFRICOM mission and challenges. This section includes a short review of the State Partnership

1. Department of the Army, *Army Multi-Domain Transformation: Ready to Win in Competition and Conflict*, Chief of Staff Paper #1 (Washington, DC: Headquarters, Department of the Army, March 16, 2021), 16.

Program's purpose and footprint. The central part of the paper will focus on the four campaign objectives of United States Africa Command and demonstrate the plausibility of leveraging the State Partnership Program in these efforts. The final portion will raise questions for further study and make recommendations for decisionmakers to consider. The array of factors aligned with building the relative positional advantage called on by McConville is broad and unstructured. These aspects come together to influence decision making in multidomain operations, which is unique and yet common to all combatant commands, irrespective of their specific theater.

The Environment

The choice to use the USAFRICOM theater to showcase the viability of the State Partnership Program in multidomain operations is not an accident. Of all the commands, United States Africa Command deals with the most countries (potential allies and partners), and it deals with a variety of issues and concerns that transcend the various other theater commands. One senior Pentagon official recently commented that no other region in the world encompasses the entirety of global issues like Africa. With a stated mission to counter malign actors and transnational threats, respond to crises, and strengthen security forces in the region, USAFRICOM staff members have several challenges to account for while building a strategy to enhance partnerships.[2] In their efforts to advance US interests and promote regional security, stability, and prosperity, the staff must account for and respond to activities of competitor states such as China and Russia, violent extremist organizations (VEOs) disrupting security, and general instability of the economy over much of the continent. Before looking at the four campaign objectives the USAFRICOM commander provides as a framework to accomplish the task, reviewing the State Partnership Program is beneficial before highlighting where and how the program builds host nation capabilities in theater.

The State Partnership Program has been successfully building relationships for over 25 years and now includes 85 partnerships with 93 nations around the globe and is expanding every year.[3] The State Partnership Program is a US Department of Defense program, administered by the National Guard Bureau, guided by State Department's foreign policy goals, and executed by each individual state's National Guard. The program links a state's National

2. *National Security Challenges and US Military Activities in the Greater Middle East and Africa, Before the House Armed Services Committee*, 117th Cong. (2021) (statement of Stephen J. Townsend, commander of United States Africa Command), 2.

3. "State Partnership Program," US National Guard (website), accessed on December 18, 2021, https://www.nationalguard.mil/leadership/joint-staff/j-5/international-affairs-division/state-partnership-program/.

Guard with a partner nation's military, security forces, and disaster response organizations in a cooperative, mutually beneficial relationship. The provision of the National Defense Authorization Act for fiscal year 2010 that allowed members of other agencies to participate in State Partnership Program activities significantly broadened the range of congressionally authorized engagements.[4]

Those engagements line up with the program's observed goals, which are to improve the capabilities of partner nations to protect their citizens, strengthen relationships with partners to facilitate cooperation, access, and interoperability, and improve cultural awareness and skills among US military personnel.[5] Sixteen nations are currently partnered with 14 US states in the USAFRICOM theater alone, with the newest being Cape Verde's partnership with New Hampshire in 2021.[6] By design, the focus of State Partnership Program activities differ depending on the needs of the partner nation, the capabilities of the state National Guard, the goals of the respective US ambassador, the goals of the combatant commander, all in compliance with appropriate statutory authorities and restrictions.[7] This program has all of the components needed to be a good starting place for building host-nation capabilities geographic combatant commands can leverage.

Measures of Performance

In a statement before the House Armed Services Committee in April 2021, the USAFRICOM commander identified four campaign objectives as key to maintaining a secure, stable, and prosperous Africa aligned with US national interests. These four objectives provide a ready measure of performance to evaluate the State Partnership Program's usefulness in building host-nation capabilities for multidomain operations. In the order listed in the report, these objectives are:

1. Gain and maintain strategic access and influence;

2. Disrupt VEO threats to US interests;

4. Lawrence Kapp and Nina M. Serafino, *The National Guard State Partnership Program: Background, Issues, and Options for Congress*, R41957 (Washington, DC: Congressional Research Service, August 15, 2011), 14.

5. Kapp and Serafino, *Partnership Program*, i.

6. "National Guard State Partnership Program," US National Guard (website), accessed on January 30, 2022, https://www.nationalguard.mil/leadership/joint-staff/j-5/international-affairs-division/state-partnership-program/.

7. Kapp and Serafino, *Partnership Program,* 6.

3. Respond to crises to protect US interests; and

4. Coordinate action with allies and partners to achieve shared security objectives.[8]

What follows next is a collection of both general capabilities and specific instances that demonstrate the National Guard helping to meet these objectives.

Objective 1: Gain and Maintain Strategic Access and Influence

Unsurprisingly, the first focus of this objective is building trust and strengthening military relationships.[9] But building trust has one key component that makes it difficult for geographic combatant commands to surmount. As an adjunct staff member of the RAND Corporation and accomplished author Simon Sinek described, understanding trust is a feeling is the key to building trust. Like all feelings, "they take a series of actions to prove that you are worthy of trust."[10] Between personnel and budget limitations, geographic combatant commands often find providing forces routinely to even one country difficult. But the State Partnership Program allows the soldiers and airmen of a partnered state to maintain long-term relationships that strengthen alliances and enhance interoperability.[11] This is achieved through exchange training conducted in both the United States and partner nations in almost every case. This training includes leader training that brings leaders from partner nations to the United States to partake in leadership schools, exchange training with enlisted members to hone skills, and typically some form of disaster management training conducted on both continents. Since most National Guard members remain in the same state for their entire career, repeat and often frequent visits afford the kind of trust-building relationships sought after to gain and maintain strategic access and influence.

One example of the State Partnership Program strengthening alliances and enhancing interoperability is the partnership between the New York National Guard and the Republic of South Africa. This partnership was established in 2003 and was the first state partnership established in Africa.

8. *National Security Challenges*, 7.

9. *National Security Challenges*, 8.

10. Simon Sinek, *Building Trust Through Committed Leadership* (New York: Capture Your Flag, 2014) YouTube video, https://www.bing.com/videos/search?q=building+trust&docid=607999028089595049&mid=B301E 0523961E05F6A6CB301E0523961E05F6A6C&view=detail&FORM=VIRE.

11. Whitney Hughes, "State Partnership Program Helps Guard Build Relationships," US National Guard (website), October 26, 2021, https://www.nationalguard.mil/News/Article/2822526/state-partnership-program-helps-guard-build-relationships/.

Since 2003, New York and South Africa have sustained a vibrant relationship with exchanges, exercises, and events conducted in both countries. In a recent interview, New York's assistant adjutant general for the Army National Guard, Major General Michel Natali, unwittingly captured the essence of how the State Partnership Program excels at building trust and strengthening military relationships that combatant command leaders and staff can leverage. While discussing firefighter exchange missions, he shared, "We sent New York Air National Guard firefighters there two years ago. We are doing that operation now on a regular basis, and they help out with sharing best practices with the local firefighting agencies in Western Cape Town. It is a pretty rewarding operation."[12] This example points to the idea of a series of actions to prove the worthiness of trust discussed previously and many other examples exist.

Additional examples of engagements from this one partnership that build host nation capabilities for multidomain operations include items spanning the continuum of tasks appropriate to strengthening military relationships. For example, in November 2005, the New York National Guard conducted senior leader training for South African National Defense College Executive National Security Program members. The program provides the highest level of professional education available to South African Forces. The Executive National Security Program designed to prepare selected officers and officials for appointment in top-level posts of the South African Department of Defense. The week-long training included instruction on multinational organizations, national government and local governments, and the defense industry. As a result, South African delegates returned home better prepared to lead and govern their people. Another valuable training event occurred in November 2009 with a VIP visit to the New York National Guard's Vigilant Guard exercise. This exercise simulated a 5.9-magnitude earthquake in Buffalo, NY, leading to a Defense Support of Civil Authorities request that resulted in various rescue agencies working together on the rubble pile. Like so many other partners, the South African National Defense Force sought to increase understanding of joint military and civilian operations.

In a separate engagement, the partners conducted interoperability training where New York Army and Air National Guard members represented the United States a marksmanship competition in South Africa in March of 2014. Similarly, New York hosted harbormaster training, led by Captain Robert Pouch of the New York Naval Militia, in a State Partnership Program port-security event designed to enhance South Africa's maritime security techniques,

12. Jorge Garcia, "New York, South African Leaders Reinvigorate Partnership," New York National Guard (website), December 14, 2021, https://www.nationalguard.mil/News/State-Partnership-Program/Article/2872686/new-york-south-african -leaders-reinvigorate-partnership/.

tactics, and procedures.[13] These examples demonstrate the effectiveness of the State Partnership Program in building host nation capabilities across multiple domains. Regardless of the theater or the perceived needs, a US state likely possesses the knowledge, skills, and abilities necessary to grow host nation abilities, which theater commanders can leverage to gain and maintain strategic access and influence.

Objective 2: Disrupt VEO Threats to US Interests

The second campaign objective, which focuses on violent extremist organizations, provides the second measure of performance for determining whether the State Partnership Program helps to build host-nation capabilities in multidomain operations. President Joseph R. Biden states in the Interim National Security Strategy that America will help African nations combat the threats posed by violent extremism.[14] General Steven J. Townsend, commander of United States Africa Command, stated violent extremist organizations threaten US partners' capacity to govern effectively, protect their populations, and improve their economies, resulting in a less stable and secure theater.[15] Delving into the ideologies and compositions of the violent extremists operating on the continent is not germane to this argument. But this writing will focus on the key areas where violent extremists are operating and discuss those host nation capabilities needing improvement. Then, this writing will look at the active partners in these areas, what they are currently engaged in, and capabilities that may still be leveraged in future efforts. Although not intended to be comprehensive in scope, this chapter will provide sufficient evidence to demonstrate the measure of performance.

Violent Extremist Organization Activity

The Africa Center for Strategic Studies recently assessed the activity of prominent violent extremist organizations on the African continent. The center used annual data from the last 10 years derived from credible sources (for example, the SITE Intelligence Group and the Armed Conflict Location & Event Data Project) to map violent events involving the prominent violent extremist organizations on the continent. A key finding is the problem on the

13. "State Partnership Program Events," New York National Guard (website), updated September 2, 2020, http://dmna.ny.gov/spp/?id=events.

14. "Interim National Security Guidance," The White House (website), March 2021, https://www.whitehouse.gov/wp-content/uploads/2021/03/NSC-1v2.pdf, 11.

15. *National Security Challenges*, 6.

African continent is getting worse. The number of reported violent events in June 2020 demonstrate a sixfold increase from the beginning of the sample period in 2011. This rise in violent extremist activity is predominately found in four areas: Somalia, the Chad Basin, the western Sahel, and Mozambique. These results suggest violent extremist organizations gravitate toward less stable governments, where the population is vulnerable to their rhetoric.[16] What follows is a brief review of the four troubled regions to provide information about the VEO threats that are the targets of objective two.

Somalia

The Horn of Africa has been fraught with nearly uninterrupted violent extreme activity for the last decade. The Somali National Army (SNA) and the African Union Mission in Somalia have many issues preventing them from maintaining security, including poor training, clan rivalries, and severe corruption problems.[17] The Human Rights Watch noted security forces continue to lack formal command and control mechanisms and are, instead, made up of an array of groups, including allied militia and militia linked to select government officials.[18] Although mainly concentrated in Somalia, the VEO activity is a whole-of-region concern.[19] The Ugandan government helps train the SNA and militia who are integrated into them. Ethiopia forces work alongside SNA forces to defeat aggression and quell VEO activity. Kenya finds itself hosting many displaced civilians fleeing from the violence. Interestingly, the Africa Center for Strategic Studies identifies only one violent extremist event in Djibouti in the 10-year survey (even with actors like al-Shabaab, Islamic State in Iraq and Syria, and al-Qaeda active in Somalia) possibly due to the strong USAFRICOM presence in Camp Lemonnier. According to United States Africa Command, al-Shabaab is the most imminent threat to US interests in the region. Africa's most active militant Islamist group, al-Shabaab recently revealed intent to strike at the American homeland. But al-Shabaab's activity only draws popular support from its ability to close the gap between local needs and the local government's lack of ability or

16. "African Militant Islamist Groups Set Record for Violent Activity," Africa Center for Strategic Studies (website), July 21, 2020, https://africacenter.org/spotlight/african-militant-islamist-groups-new-record-violent-activity/.

17. Michael Horton, "Reclaiming Lost Ground in Somalia: The Enduring Threat of al-Shabaab." *Terrorism Monitor* 15, no. 5 (July 28, 2017)

18. "No Place for Children: Child Recruitment, Forced Marriage, and Attacks on Schools in Somalia," Human Rights Watch (website), February 20, 2012, https://www.hrw.org/report/2012/02/20/no-place-children/child-recruitment-forced-marriage-and-attacks-schools-somalia.

19. "African Militant Islamist Groups."

willingness to meet those needs, not from its ideology.[20] As United States Africa Command works to determine a plan for leadership training for the SNA, riot control and peacekeeping tactical training for response forces, and regional medical capabilities training, it can leverage the available skills found in the National Guard State Partnership Program.

Chad Basin

The Chad Basin in Northern Central Africa and is shared among Algeria, Cameroon, Central African Republic, Chad, Libya, Niger, Nigeria, and Sudan. Active violent extremist organizations in the region include Boko Haram, al-Qaeda, and the Islamic State in West Africa. (The Islamic State in West Africa is also known as ISIS-West Africa, ISIS West Africa, ISIS West Africa Province, Islamic State of Iraq and Syria West Africa Province, Islamic State of Iraq and the Levant-West Africa, and Islamic State West Africa Province.) This area is a significant concern because Lake Chad constitutes a strategic source of freshwater for the countries and is essential to local agriculture, the backbone of the regional economy. Both Boko Haram and the Islamic State in West Africa have created strongholds in the area, further compounding the humanitarian crisis in Nigeria, Niger, Chad, and Cameroon.[21] Though not a direct threat to the American homeland, a name like "Westernization is Sacrilege," which is what Boko Haram translates to in English, creates significant concern for Western contractors, investors, and even nongovernmental organizations who are in the area to assist the local population. According to a CNN report, "tens of thousands of people have been killed, and more than three million people have been displaced during the more than a decade-long Boko Haram insurgency in Nigeria's northeast."[22] The effects of this VEO activity threaten the stability of the entire region, even though much of it has been localized around the borders of Nigeria, Cameroon, Chad, and Niger.[23] Making a difference in these nations is challenging for United States Africa Command. In addition to leadership and tactical response training for local peacekeeping elements, a priority must be

20. Andrew Milburn, "Out of Africa: The Strategic Mistake of Disengagement From Somalia," Modern War Institute (website), September 16, 2021, https://mwi.usma.edu/out-of-africa-the-strategic-mistake-of-us-disengagement-from-somalia/.

21. Alex Whiting, "Lake Chad Basin Is World's Most Neglected Humanitarian Crisis: UN Aid Chief," *Reuters* (website), May 24, 2016, https://www.reuters.com/article/us-humanitarian-summit-lake-chad/lake-chad-basin-is-worlds-most-neglected-humanitarian-crisis-u-n-aid-chief-idUSKCN0YF2UV.

22. Bukola Adebayo and Isaac Abrak, "81 Killed in Bloody Boko Haram Attack in Nigerian Village," *CNN* (website), June 10, 2020, https://www.cnn.com/2020/06/10/africa/boko-haram-faduma-attack/index.html.

23. "African Militant Islamist Groups."

determined for infrastructure repair by trained engineers to make resettlement and normalization possible again for many displaced persons. These skills are practiced and widespread in the National Guard State Partnership Program.

The Western Sahel

The western Sahel is the region with the most substantial increase in VEO activity on the African continent. For clarity, the Sahel is the transitional zone between the Sahara to the north and more humid areas to the south, stretching from the Atlantic Ocean on the west to the Red Sea on the east. The Sahel passes through northern Senegal, southern Mauritania, the great bend of the Niger River in Mali, Burkina Faso, southern Niger, northeastern Nigeria, south-central Chad, and the nation of Sudan.[24] The increase of VEO activity in the western Sahel discussed in the Africa Center for Strategic Studies report refers to activity in Burkina Faso, Mali, and Niger.[25] In those areas, the likes of al-Qaeda, Jama'at Nusrat al Islam wal Muslimin, and the Islamic State in the Greater Sahara are the dominant violent extremist organizations.[26] In a recent article, the Washington Post indicated thousands of West Africans have died, and millions have lost their homes as fighters who claim adherence to extremist al-Qaeda and Islamic State groups have grabbed more territory. Complicating the situation further, France has promised to withdraw all of its troops from the war-torn country of Mali. Reports of over 1,000 Wagner Group Russian mercenaries being invited by what French Foreign Minister Jean-Yves Le Drian calls an "illegitimate" and "out of control" Malian junta appear to be the final straw for France.[27] Even the UN Multidimensional Integrated Stabilization Mission in Mali peacekeeping mission, which has been working alongside the French since 2013 to help restore and maintain Mali's territorial integrity, is in jeopardy. The May 2021 coup d'état, Mali's second in nine months, has nations like Sweden promising to withdraw its troops from the UN force, leaving a vulnerable population in the hands of questionable leadership.[28] Efforts to promote security, stability, and prosperity in this region of Africa will require a concerted effort from United States Africa Command. The State Partnership Program is designed for this mission.

24. *New World Encyclopedia*, s.v. "Sahel," accessed on February 18, 2022, https://www.newworldencyclopedia.org/entry/Sahel.

25. "African Militant Islamist Groups."

26. "African Militant Islamist Groups."

27. Danielle Paquette and Rick Noack, "France Signals Intention to Pull Rest of Its Troops Out of Mali," *Washington Post* (website), February 15, 2022, https://www.washingtonpost.com/world/2022/02/15/france-mali-troops/.

28. Paquette and Noack, "France Signals."

Whether in Africa, Europe, Asia, or elsewhere, the program can help by developing capabilities in partner nations geographic combatant commands can leverage along the continuum of multidomain operations short of conflict.

Mozambique

In 2018, Mozambique began to see violent extremism in its northernmost province of

Cabo Delgado. Initially propagated by a group calling itself Swahili Sunnah (the Swahili path), among other names, the group has been responsible for many violent attacks, including beheadings, in the area. The group burned or destroyed over 1,000 homes, and several kidnappings have been reported. Al-Sunna wa Jama'a (which is linked to the Islamic State) appeared in 2020 and expanded its attacks against villages, killing civilians, kidnapping women and children, and conscripting boys as soldiers in its fight against government forces. Organized crime networks and large-scale narcotics trafficking further complicates the security situation. The drug traffickers rely on bribery and a general lack of law enforcement to ply their trade by land and sea. Some suggest the violent extremist organizations benefit from participation in the illicit trade, enabling them to continue fighting.[29]

The final piece is US-based Anadarko Petroleum Corporation's considerable investments in Cabo Delgado province's infrastructure to support extraction of petroleum and natural gas, introducing concern for US interests to the unfortunate situation. This situation is unlikely to resolve itself with the current actors, evidenced by state security forces engaging in human rights abuses, heavy-handed tactics, and the unlawful use of force against civilians in their continued response to the violent extremist organizations' activity. In response to the Mozambican government's recent requests, Rwanda, the Southern African Development Community, Portugal, the United States, and the EU have provided assistance in the situation.[30] The Human Rights Watch estimated 800,000 people had been internally displaced and found themselves lacking water, food, and other essential services. Even though South African Development Community has extended its mission in Mozambique

29. Gregory Pirio, Robert Pittelli, and Yussuf Adam, "The Emergence of Violent Extremism in Northern Mozambique," Africa Center for Strategic Studies (website), March 25, 2018, https://africacenter.org/spotlight/the-emergence-of-violent-extremism-in-northern-mozambique/.

30. The Southern African Development Community is a Regional Economic Community comprising 16 Member States: Angola, Botswana, Comoros, Democratic Republic of Congo, Eswatini, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Tanzania, Zambia and Zimbabwe. Read more about the organization at: https://www.sadc.int/about-sadc/.

indefinitely, United States Africa Command faces significant security assistance, police and law enforcement training; humanitarian and internally displaced people assistance; and, possibly, infrastructure reconnaissance and repair challenges in the region.[31] These challenges are representative of the same type of challenges combatant commanders face in every theater.

State Partnerships

The State Partnership Program was initially designed to use professional contacts between the US military, specifically the National Guard, and the militaries of the newly independent nations of the former Soviet Union to help reform the defense establishments of those nations.[32] After almost two decades executing this mission, the National Guard has developed many tactics, techniques, and practices that make it successful. The program matches like skills and needs when considering which state should be partnered with which country. For example, countries with aviation capabilities pair with states with the same. This careful selection criterion allows both parties to share training events and procedures that benefit everyone involved. When considering how the State Partnership Program might develop capabilities for the fight to disrupt VEO threats to US interests in Africa, first determining where the State Partnership Program is currently engaged is rudimentary. The State Partnership Program is working in many areas surrounding the high VEO event concentrations. This availability situates the National Guard to work with countries most likely to deal with violent extremists.

The VEO threat in Somalia has three active partnerships surrounding it. To the south, the Massachusetts National Guard is partnered with Kenya. Massachusetts works with Kenya's peacekeeping forces to hone their skills before deploying on UN Peacekeeping missions. Through joint training exercises and critical leadership engagements in Djibouti, the Kentucky National Guard has strengthened relationships and interoperability, enhanced military capabilities, and increased cultural awareness and professional skills since 2015. Likewise, the Nebraska National Guard in regional Rwanda strengthens cooperation in peacekeeping operations and readiness for the Rwanda Defense Force. Rwanda contributes more troops each year to UN peacekeeping missions than all but a few much larger countries.[33] These

31. "Mozambique: Events of 2021," Human Rights Watch (website), accessed on February 18, 2022, https://www.hrw.org/world-report/2022/country-chapters/mozambique.

32. Kapp and Serafino, *Partnership Program*, 1.

33. "State Partnership Program," United States Africa Command (website), accessed on February 19, 2022, https://www.africom.mil/what-we-do/security-cooperation/state-partnership-program.

partnerships surround the persistent concern in Somalia, conducting training and building host-nation capacity United States Africa Command can leverage as it solves problems in the region. Other theater commanders could duplicate these results by leveraging their state partnerships.

The Chad Basin has two active partnerships. Niger's partnership with Indiana benefits both nations in military and civilian interests such as Humanitarian Assistance/Disaster Response, counter narcotics operations, border security, health and leadership training.[34] In bordering Nigeria, the California National Guard units work with Nigerian first responder medical capabilities, emergency management, UN Peacekeeping Operations, junior leader development, counter narcotics, Nigerian security procedures, the rule of law, aviation maintenance, human rights, and service member welfare.[35] Conclusively, both of these nations benefit from the State Partnership Program training. Of note is the aviation training received. The result is an increase in the partner nation's capabilities the USAFRICOM commander can leverage when dealing with violent extremist organizations in the Chad Basin region. Any nation in other theaters with the capability can receive specialized training, such as aviation training, thereby increasing their capacity for geographic combatant commands to employ effectively.

Eight nations around the western Sahel have active state partnerships. To the east are both Niger and Nigeria. Ghana, Togo, and Benin frame the south of the area of concern and partner with the North Dakota National Guard. These partners have enjoyed military-to-military engagements and missions, civilian-to-civilian training, and business-to-business partnerships, all designed to strengthen these countries' military, governments, and economies. Since 2019, the District of Columbia National Guard has partnered with Burkina Faso in the heart of the conflict area. The District of Columbia National Guard brings a legacy of training military-to-military, military-to-security force, and military-to-emergency response/disaster response agencies to that partnership to improve long-term security cooperation while expanding partner capacity.[36] Though slightly removed from the Sahel, Liberia and the Michigan National Guard have partnered together since 2009. Michigan's Army Guard offers numerous venues for training to include transportation, infantry tactics, military policing, civil engineering, and medical capabilities. Once developed

34. Lonnie Wiram, "Indiana National Guard Boosts Partnership with Niger," US National Guard (website), September 12, 2018, https://www.nationalguard.mil/News/State-Partnership-Program/Article/1628887/indiana-national-guard-boosts-partnership-with-niger/.

35. "State Partnership Program," United States Africa Command (website).

36. "State Partnership Program," District of Columbia National Guard (website), n.d., accessed on February 19, 2022, https://dc.ng.mil/State-Partnership-Program/State-Partnership-Program/.

in the host nation, these capabilities help that nation provide internal and regional security and stability. Finally, Senegal partners with the Vermont National Guard. These partners have conducted various medical, engineer, and aviation exercises during this partnership to enhance the Senegalese Armed Forces interoperability and readiness to respond when needed. In addition, the Vermont National Guard's skilled medical staff have recently partnered with Senegalese forces to enhance their medical skills through real-world medical services to people in Senegal.[37] Although United States Africa Command does not operationally control these countries, as the VEO fight heightens in the western Sahel, the local forces are learning how to work with and alongside US forces in various State Partnership Program exercises. These capabilities are vital in every theater, especially increased medical training for military and civilians.

Lastly, looking toward VEO activity in Mozambique, no fewer than four countries in the area are active in the State Partnership Program. This chapter has already discussed Kenya (partnered with Massachusetts) and Rwanda (partnered with Nebraska). In addition, the chapter discussed South Africa (partnered with New York) in support of United States Africa Command's primary objective, to gain and maintain strategic access and influence. Lastly, Botswana and the North Carolina National Guard have partnered since 2008. Their concentration on Special Forces development, air and ground force development, emergency management, and peace-keeping operations is ideal for building the type of capacity the USAFRICOM commander will likely desire.[38] These four countries have significantly increased their capabilities due to training with US partners. An easily overlooked valuable benefit is the increased interoperability, which only comes from learning how the United States fights and works alongside US forces in training exercises. This interoperability is valuable in every theater, and combatant commands can leverage this benefit wherever nations are actively involved with the State Partnership Program.

Objective 3: Respond to Crises to Protect US Interests

Townsend notes the Department of State, the US Agency for International Development, and other organizations have dramatically reduced the impact of diseases like HIV/AIDS, Ebola, and coronavirus 2019 on the continent.

37. "State Partnership Program," United States Africa Command (website).

38. "State Partnership Program," United States Africa Command (website).

But this objective is an enduring mission.[39] The World Health Organization's weekly bulletin from the last week of January 2022 shows an evident need to reduce the impacts of disease across the entire continent.[40]

In his testimony before Congress, Townsend identified four areas United States Africa Command is always adjusting to respond to the many crises on the continent. These areas provide the State Partnership Program opportunities to build host nation capacity to relieve some of the burdens of limited resources. The four areas Townsend identified are collection, medical, transportation, and response assets.[41] This chapter will focus on the two geographic areas identified by the World Health Organization as having protracted level three events: Nigeria and South Sudan.[42] In the first case, the California National Guard is a partner and helps develop first responder medical capabilities and emergency management. South Sudan has no direct partnership with a state National Guard. But nearby Rwanda and Djibouti are enrolled in the State Partnership Program. This demonstrates that even if not every nation has a partner, the ability of the State Partnership Program to increase overall capacity in a region is valuable for geographic combatant commands.

Nigeria and the California National Guard

California has an array of medical capabilities that it can employ to assist partner Nigeria and United States Africa Command in their crisis response effort. First, California has medical teams. Several California Guard Regional Medical Strike Teams are currently assembled and deployed throughout the state to assist with coronavirus 2019 testing (collection) and vaccination (response). These teams consisted of physician's assistants, nurses, and administrators who were thoroughly trained and deployable.[43] Although having teams that can deploy to relieve urgent needs is helpful, the goal is to build that capacity within the nation. A second capability the National Guard provides is training. This training includes institutional training, leadership training, and exchange programs facilitated by the State Partnership Program. This format builds partnerships and meets the criterion for building partnership capacity.

39. *National Security Challenges*, 9.

40. "Weekly Bulletin on Outbreaks and Other Emergencies," World Health Organization (website), January 23, 2022, https://apps.who.int/iris/bitstream/handle/10665/351164/OEW04-1723012022.pdf.

41. *National Security Challenges*, 10.

42. "Weekly Bulletin."

43. Edward Siguenza, "Cal Guard Medical Team Supports COVID-19 Nursing Facility," California National Guard (website), January 11, 2021, https://www.nationalguard.mil/News/State-Partnership-Program/Article/2467332/cal-guard-medical-team-supports-covid-19-nursing-facility/.

Clearly, Medical Readiness Training Exercises, though officially designed to train US service personnel, have an incredible value in building host nation capacity when conducted within the construct of a bilateral relationship such as California and Nigeria. Additionally, the likelihood that participating host nation hospitals will grow in reputation among the local population and regional peers is of great stabilizing benefit to participating nations. When one evaluates the need to accomplish crisis response in any theater around the globe with fewer resources than ever, it becomes clear that developing capacity within host nation partners so they can take a more significant role is the answer.[44]

Objective 4: Coordinate Action with Allies and Partners to Achieve Shared Security

This objective includes the specified tasks of coordinating action, enhancing interoperability, and sharing costs and risks of activities across the continent, all pointing to the focus of achieving mutual security goals. The USAFRICOM commander cites the African Lion exercise as the premier example of achieving this objective. Conducted annually since 2002, African Lion has brought together partners and allies to enhance interoperability, build readiness and strengthen relationships in Northern Africa.[45] Elements of African Lion are conducted in Morocco (partnered with Utah) and Tunisia (partnered with Wyoming), making this a straightforward application of the assertion that the State Partnership Program builds host nation capabilities. The State Partnership Program conducts several exercises with host nation partners annually. This interaction frequency builds capabilities and the host nation's understanding of how US forces operate and fight, improving interoperability. As mentioned previously, interoperability is a significant force multiplier the host nation brings to joint exercises such as African Lion and real-world responses as necessary.

Furthermore, this capacity is not limited to what some may consider traditional National Guard missions such as disaster relief. For example, the Utah National Guard and Morocco cooperate on tactical capabilities like combined arms execution, including Special Forces, attack helicopters, artillery, and fighter jet refueling interoperability. The added benefit of longstanding relationships between guard members and partner country officials, sometimes

44. Bradley J. Boetig, "Bilateral Institutional Relationships: A New Mission for US DoD Medical Capabilities in Support of Health Diplomacy," *Military Medicine*, 177 (July 2012): 763–65.

45. *National Security Challenges*, 10.

through entire careers, is a unique resource to help combatant commanders and ambassadors achieve their goals.[46]

African Lion is not the only effort aimed at reaching this objective. In Djibouti, the Combined Joint Task Force-Horn of Africa's security forces mission is another example of state partners building capacity and helping United States Africa Command reach its objective. The Combined Joint Task Force-Horn of Africa has an annual rotation of National Guardsmen. In 2021, Task Force Iron Gray made up more than two-thirds of the Combined Joint Task Force-Horn of Africa. The task force is comprised approximately 1,000 Soldiers from the Connecticut, Colorado, Maine, Massachusetts, and Vermont National Guard and was East Africa's largest US military ground force. Until January 2022, the task force performed security operations in Kenya, Somalia, and Djibouti and worked alongside many African and allied partners, building capacity and interoperability.[47] In January 2022, Task Force Red Dragon replaced them. Task Force Red Dragon comprises soldiers from National Guard infantry units from Virginia's Army National Guard and a company from the Kentucky Army National Guard.[48] Task Force Red Dragon will continue to work with allies and partners, building capacity and being a ready asset for United States Africa Command to leverage in its mission set.

46. Jim Greenhill, "African Lion: National Guard Supports Continent's Largest Military Exercise," National Guard Bureau (website), June 20, 2021, https://www.nationalguard.mil/News/Article/2663557/african-lion-national-guard-supports-continents-largest-military-exercise/.

47. Whitney Hughes, "National Guard Soldiers Provide Security, Partnerships in Horn of Africa," National Guard Bureau (website), December 29, 2021, https://www.nationalguard.mil/News/Article/2885279/national-guard-soldiers-provide-security-partnerships-in-horn-of-africa/.

48. Gauret Stearns, "National Guard Infantry Units Support East Africa Mission," National Guard Bureau (website), January 14, 2022, https://www.nationalguard.mil/News/Article/2900058/national-guard-infantry-units-support-east-africa-mission/.

The Future State Partnership Program in Multidomain Operations

The State Partnership Program is well positioned in the current era of evolving security threats and declining budgets to serve geographic combatant commands by building capacities and relationships commanders can leverage to meet the Army's mission in multidomain operations. Regardless of theater, combatant commanders, US country teams, and the host nations' aspirations all come together when designing existing State Partnership Program activities. The National Defense Strategy's priorities point toward expanding alliances and partnerships in the Indo-Pacific, fortifying alliances in Europe, and forming enduring coalitions in the Middle East.[49] With that in mind, combatant commanders should review nations in their theater and consider which would benefit from the capacity building efforts of the State Partnership Program.

Conclusion

Multidomain operations require combatant commanders and their subordinate organization to build relative positional advantage by cultivating a strong network of allies and partners with capabilities that the United States can leverage. The State Partnership Program supports that effort significantly. But areas of further research include but are not limited to the potential role of the State Partnership Program in future cyber security efforts, amendments to 10 US Code § 401 *(Humanitarian and civic assistance provided in conjunction with military operations)* that would allow for permanent structures to be constructed on foreign soil, and the expansion of annual conferences between the geographic combatant commands and states partnered with nations in their area of responsibility.[50]

The USAFRICOM commander's four objectives to maintain a secure, stable, and prosperous Africa provide a reasonable measure other commanders could apply in their theater of operation to determine the performance of the State Partnership Program in building host-nation capabilities for multidomain operations. The State Partnership Program excels at building long-term and lasting relationships that enhance capability and trust between nations to gain and maintain strategic access and influence. Much of this chapter focused

49. Joseph L. Lengyel, "Securing the Nation One Partnership at a Time," *Strategic Studies Quarterly* 12, no. 3 (Fall 2018): 8.

50. Kapp and Serafino, *Partnership Program*.

on VEO threats and the objective of disrupting those threats. This chapter demonstrated the existing benefit of the State Partnership Program activities toward building host nation capabilities commanders can call upon in this fight. The State Partnership Program is another way to improve host-nation assets to respond to crises and assist in future operations. Finally, the State Partnership Program develops interoperability and tactical skills in partner nations, helping to coordinate actions with allies and partners to achieve shared security objectives. Although this chapter applied its analysis to United States Africa Command, other geographic combatant commands can also produce similar results. As demonstrated, the State Partnership Program builds host-nation capabilities geographic combatant commands can leverage in multidomain operations. Building host-nation capabilities in each theater remains vital for the Army's future success, and commanders would be well served to find ways to enhance the State Partnership Program with nations in their respective theater.

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Intelligence, Surveillance, and Reconnaissance in the Pacific: Expanding US Army Pacific's Reach

Kirk A. Sanders

This chapter recommends US Army Pacific (USARPAC) develop plans to provide more intelligence, surveillance, and reconnaissance (ISR) capabilities forward in the Pacific theater to align capabilities better with national and United States Indo-Pacific Command (USINDOPACOM) strategies; contribute to the theater ISR needs; support modernization efforts outlined in the US Army multidomain operations concept; and enhance the Army's interoperability and information sharing with allies and partners in the region. This chapter will also identify some of the challenges to implementing these recommendations.

Background

United States (US) Army Pacific currently provides forces and capabilities for United States Indo-Pacific Command to address the challenges of the current environment in support of national defense policy priorities. The component command contributes forces to provide deterrence and the ability to transition from competition to conflict. As the environment changes and new requirements emerge, US Army Pacific will need to adjust to these changes and incorporate new processes, capabilities, and possibly new base requirements to improve its force posture in the Pacific. These changes will help US Army Pacific to support the new national and theater strategy in the Pacific.

One way US Army Pacific can meet future challenges is to update the way it employs ISR assets in the theater. The US Air Force and Navy currently

provide most ISR in the Pacific theater. For the Army to start to contribute more to this effort, it needs to update how the Army can provide ISR in theater at forward locations within the first island chain to provide a persistent capability to conduct ISR and satisfy some of the theater requirements.

The United States' National Pacific Strategy

The Trump administration's National Security Strategy and National Defense Strategy identified China as one of America's primary threats. These documents recognized that the United States faces new global security challenges, which Defense Secretary James Mattis described as "the reemergence of long-term, strategic competition by what the National Security Strategy classifies as revisionist powers. It is increasingly clear that China and Russia want to shape a world consistent with their authoritarian model."[1] He also emphasized the importance of Pacific allies and partners to this strategy by stating, "First, rebuilding military readiness as we build a more lethal Joint Force; and second, strengthening alliances as we attract new partners."[2] In 2021, the Biden administration built on the previous National Security Strategy by publishing the *Interim National Security Strategic Guidance*. It described China in the following terms: "China has rapidly become more assertive. It is the only competitor potentially capable of combining its economic, diplomatic, military, and technological power to mount a sustained challenge to a stable and open international system."[3]

In February 2022, the White House released the *US Indo-Pacific Strategy 2022*. It outlines the overarching US national strategy for the Indo-Pacific region across diplomatic, economic, informational, and military actions. Directed military efforts include "bolster Indo-Pacific security, deepening our five regional treaty alliances—with Australia, Japan, the ROK [South Korea], the Philippines, and Thailand—and strengthening relationships with leading regional partners."[4] The document sets a task for the Department of Defense to address these objectives as they build their military strategy going forward.

1. James Mattis, *Summary of the 2018 National Defense Strategy of the United States of America*, (Washington, DC: Department of Defense [DoD], 2018), 2.

2. Mattis, *Summary,* 5.

3. Joseph R. Biden, *Interim National Security Strategic Guidance: Renewing America's Advantages*, (Washington, DC: White House, March 2021), 10.

4. Joseph R. Biden, *Indo-Pacific Strategy of the United States of America*, (Washington, DC: White House, February 2022), 7, https://www.whitehouse.gov/wp-content/uploads/2022/02/U.S.-Indo-Pacific-Strategy.pdf.

The USINDOPACOM commander built on the national guidance by identifying the need to achieve a more lethal Joint Force in the Pacific theater and to build relationships with allies and partners in the Pacific. The USINDOPACOM strategy includes the following key tenets: "US Indo-Pacific Command's approach for addressing Great Power Competition centers on advancing a Free and Open Indo-Pacific by focusing on four critical areas: 1. Increasing Joint Force Lethality, 2. Enhancing Design and Posture, 3. Strengthening Allies and Partners, and 4. Modernizing our Exercises, Experimentation, and Innovation Programs."[5] One of the areas embedded in these critical areas is the need for an increase in capability for ISR in the theater.

The USINDOPACOM commander continues to stress a need for greater ISR capacity and capability in the theater. United States Indo-Pacific Command has stated a need to increase ISR and place more ISR forward in the theater. In his 2019 confirmation hearing, former USINDOPACOM Commander Admiral Philip Davidson told the committee, "INDOPACOM is only getting about one-quarter of its total ISR needs."[6] Davidson told the senators the military is not funding or providing the quantity of ISR forces up to the level it promised in the region. Davidson said, "If INDOPACOM is indeed the priority theater, we need to continue to look at our intel apparatus . . . to make sure that we have the warning that is required to get our forces to respond, alert our allies and partners, and prevent any kind of Chinese external attack in the region."[7] In addition, Davidson commented about the ample amount of information the command shares with partners and allies and stated he supports increased sales of ISR assets to allies and partners because it would help to "add capacity to the picture in these regions."[8] Davidson also emphasized the benefits ISR provides to allies and partners and how information sharing is an added benefit to the use of ISR. These considerations will need to be included in US Army Pacific's overall strategy and more specifically how they implement ISR operations. Each component, including Pacific Fleet, Pacific Air Forces, US Army Pacific, Marine Forces Pacific, and Special Operations Command Pacific, is diligently developing and refining its strategy to meet the theater commander's guidance, with specific focus on increasing ISR capabilities in the theater.

5. *US Indo-Pacific Command Before the Senate Armed Services Committee on US Indo-Pacific Command Posture* (March 9, 2021) (statement of Admiral Philip S. Davidson, US Navy Commander).

6. *US Indo-Pacific Command Before the Senate Armed Services Committee*.

7. *US Indo-Pacific Command Before the Senate Armed Services Committee*.

8. Brian W. Everstine, "INDO-PACOM: Deterrence Fund Increase Needed for ISR, Missile Defense in the Pacific," *Air & Space Forces Magazine*, March 9, 2021, https://www.airandspaceforces.com/indopacom-deterrence-fund-increase-needed-for-isr-missile-defense-in-the-pacific/.

United States (US) Army Pacific continues to refine its strategy for the theater to meet the needs of the theater commander. Army Chief of Staff General James McConville discussed the Army's Pacific strategy as: "US Indo-Pacific Command needs Army forces to be inside the region's first island chain, which sweeps down from Japan to Taiwan, along the western edge of the Philippines to the northern portion of Indonesia. There, the Army expects to have in place light multi-domain forces with operational and strategic range fires, including anti-ship, anti-aircraft, and surface-to-surface missiles."[9] McConville also added a point on ISR by saying, "The Army will provide the capability to conduct continuous surveillance and reconnaissance. . . . These capabilities will provide Combatant Commanders with a 'multi-domain theater screen force' that gains contact in competition and maintains that contact in crisis."[10] With this background and the continuous planning and development of strategy both in the theater and within the Army, the Army will look to address two themes, ISR capabilities into the theater and working with allies and partner nations.

Developing ISR Strategy for Multidomain Operations

As the Army addresses how to enhance its ISR posture and its relationship with allies and partners, it is also reviewing how these requirements align within the Army's overall strategy in the theater and the forces needed to support expanded ISR capabilities for competition. The Army plans to have a more active role in military operations in the Pacific during competition, developing strategies and operations that provide a mix of forces forward and within a cooperation and competition framework that seeks to prevent conflict while also positioning forces to win in conflict, should the need arise. Ultimately, the Army wants to become more agile and lethal in support of US national objectives to compete with China in the Pacific theater.

The Army aims to remain an integral part of the Joint Force in all facets of operations. *The US Army Concepts in Multi-Domain Operations 2028* describes the objective of the Joint Force as expanding "the competitive space through active engagement to counter coercion, unconventional warfare, and information warfare directed against partners."[11] The Army plans to

9. Todd South, "Chief Lays Out Army Role in the Future Fights across the Globe," *Army Times* (website), March 25, 2021, https://www.armytimes.com/news/your-army/2021/03/25/chief-lays-out-army-role-in-the-future-fight-across-the-globe/.

10. Headquarters, Department of the Army (HQDA), *Army Multi-Domain Transformation: Ready to Win in Competition and Conflict,* Chief of Staff Paper no. 1 (Washington, DC: HQDA, March 16, 2021), 10.

11. US Army Training and Doctrine Command (TRADOC), *The US Army in Multi-Domain Operations 202*8, TRADOC Pamphlet 525-3-1 (Fort Eustis, VA: TRADOC, December 2018), vii.

achieve these goals through development and implementation of a strategy that addresses each of the concerns and creates a military advantage over potential adversaries in line with the theater strategy and Army concepts. As the Army strives to accomplish these goals, it envisions its multidomain operations concept as the way to achieve them. Field Manual 3-0*, Operations*, defines multidomain operations as "the combined arms employment of all joint and Army capabilities to create and exploit relative advantages that achieve objectives, defeat enemy forces, and consolidate gains on behalf of joint force commanders."[12] "To compete and meet the tasks outlined in Army concepts and doctrine, the Army must reexamine its ISR capabilities within the Pacific theater.

As the Army examines how to develop capabilities and forces in the Pacific theater to achieve the multidomain operations concept, the Army must consider the nation's two primary adversaries, China, and Russia, and how it can negate their ongoing developments in anti-access/area denial (A2/AD). The A2/AD concept proposes to deny access to an adversary through an integrated air/ground and missile denial system, denying an adversary the ability to deploy forces within a region, and quickly inflict significant losses on those forces as they attempt to penetrate these defenses. *The US Army in Multi-Domain Operations 2028* describes the strategy as being designed as "a systematic approach to 'fracture' AirLand Battle by countering the Joint Force's increasingly predictable use of time-phased and domain-federated operational approaches in armed conflict."[13]

Placement of forces inside the A2/AD bubble ahead of conflict affords the Army the ability to respond immediately to an action. This placement of forces would also require the adversary to plan actions against those forces from the onset. *The US Army in Multi-Domain Operations 2028* emphasizes the point of not losing during the first part of a conflict, stating "Now and in the future, first battles are decisive to the outcome of campaigns. Winning the first battle or preventing a fait accompli in crisis will be necessary to prevent prolonged conflict and escalation."[14] Forward force presence will be essential to contesting A2/AD and not permitting the adversary a quick victory. But these forward forces incur greater risk as they will be immediately in range of adversary fires during the opening stages of a conflict.

12. HQDA, *Operations*, Field Manual 3-0 (Washington, DC: HQDA, 2022), 3-1.

13. TRADOC, *Multi-Domain Operations*, vii.

14. HQDA, *Army Multi-Domain Transformation*, 1.

The Army is also considering other means to hinder or negate an adversary's A2/AD capabilities further. One way is to locate ISR capabilities as far forward as possible within the A2/AD bubble. These capabilities would provide much needed collection and a presence forward as a deterrence through the constant known observation of the adversary's movements. Additionally, forward placed ISR with current technology will need to operate within the adversaries' A2/AD zones or they will not be able to provide the information required to support competition or improve ISR collection. *The US Army in Multi-Domain Operations 2028* expresses this need for ISR during the competition phase to "physically access certain geographic regions while also maintaining access to intelligence networks."[15]

In the Pacific theater, US Army Pacific will need to develop a strategy that outlines how it will accomplish the task of placing these assets forward, and in some instances inside countries already within the perceived A2/AD bubble. The USINDOPACOM strategy calls for ISR assets to provide coverage forward and provide the early warning and situational awareness. US Pacific Fleet, Pacific Air Forces, and Special Operations Command Pacific are currently executing this requirement.

Another key factor in ISR coverage from forward areas is the need for persistent and consistent collection on important operating areas. Persistent ISR could cover key areas in the Pacific Ocean, island landmasses, the South China Sea, and vital choke points. United States Indo-Pacific Command uses its collection capabilities to maintain tracking of adversary military capabilities, pattern of life of military forces, and to develop the theater awareness on potential adversaries. Components of United States Indo-Pacific Command must continue to plan and conduct these operations in and around China and the adjoining seas.

Department of Defense commands conduct their ISR operations in accordance with the commands' competitive relationship with China and Russia. United States (US) Pacific Fleet, Pacific Air Forces, and Special Operations Command Pacific conduct the vast majority of ISR operations in the Pacific. Army forces contribute to the overall ISR effort through capabilities located on the Korean Peninsula, but these are predominantly tactically oriented toward North Korea. The Army has also contributed to the counterterrorism fight in the Philippines with platforms and personnel, but again, these were oriented on tactical-level collection. Finally, satellite collection also contributes to the ISR picture. These are national-level assets

15. TRADOC, *Multi-Domain Operations*, 18.

and provide a daily amount of collection over the Pacific but are not persistent and have other limitations such as weather and systems issues, which effect their collection.

A shortcoming of the current ISR capabilities is their lack of persistence to focus exclusively on Chinese and Russian threats due to the limited numbers and availability of airborne platforms, naval vessels, and satellites. Other services' capabilities have not filled these deficiencies and may not ever fill all the gaps in theater. Longer duration platforms could fill these gaps through increased coverage time over the collection areas. Additionally, more platforms would help cover the extreme distances that make up the Pacific theater. The Army could also use fixed capabilities located on landmasses that can cover some of the required collection areas and free up other platforms for emerging collection requirements.

The USINDOPACOM components are aware of this ISR gap and are examining ways to address it. The components are all developing plans for future capabilities and strategies to address the needs stated by United States Indo-Pacific Command. The Air Force has advocated for more capable assets, like long-duration ISR, with new intelligence capabilities. It has also stressed increased interoperability and information sharing with allies and partners to improve integration.[16] These steps would facilitate situational awareness and the ability to influence the interactions with China in competition. The ability to share information is a consideration that US forces must consider when operating with partners.

The Navy also wants to add more capable platforms that provide longer duration of flight and better onboard capabilities. It also wants to increase the number of Navy vessels in the Pacific that can provide intelligence collection to increase duration and coverage in key areas of concern.[17] Even with these adjustments, the Air Force and Navy will still not provide the theater with persistent ISR coverage.

As the Army examines ways it can increase its ISR presence and be a key contributor, it should advocate for its ability to improve persistent ISR capabilities through land-based assets. The Army is the most capable service in conducting land-based collection and has done so in the past. Land-based assets can provide a near-continuous presence in key areas and fill some of the gaps

16. Jacob J. Holmgren, "Expanding Cooperative Intelligence, Surveillance, and Reconnaissance with Allies and Partners in the Indo-Pacific," *Journal of Indo-Pacific Affairs* 4, no. 2 (Spring 2021): 13.

17. John R. Hoehn, *Intelligence Surveillance and Reconnaissance Design for Great Power Competition*, Congressional Research Service (CRS) Report R46389 (Washington, DC: CRS, June 4, 2020), 25.

that other services cannot provide. The Army can increase its contributions by moving forward on its plans and proposals to invest in ISR capabilities and place them in forward locations to expand its competition efforts. The Army Pacific component command, the US Army Intelligence and Security Command, and the Theater Military Intelligence Brigade (500th Military Intelligence Brigade) need to examine how to provide forward presence, early warning, and forces to set the intelligence picture for the current environment. The Army is best postured to provide unique land-based capabilities for the Pacific theater.

Army ISR in Competition

United States (US) Army Pacific has two operational considerations that will impact its ISR employment strategy. First, US Army Pacific must consider ISR in a competitive environment to set the theater for future operations. Second, US Army Pacific must plan for ISR in conflict. The component command will have to consider these two operational requirements in its ISR strategy to employ assets and the impact on how and where it proposes to locate these assets.

The first consideration is to employ ISR assets for the competitive environment and to set the theater. An integral part of US Army Pacific's strategy should be the emplacement of ISR assets to support the USINDOPACOM plan for theater ISR collection efforts. The component command should assist to fill gaps in the overall theater plan and, in parallel, plan to meet the needs of the Army and US Army Pacific's concept. The component command must consider two different aspects of ISR employment in competition. First, US Army Pacific needs to examine how to provide ISR capabilities to fill current and projected the gaps in theater ISR operations, particularly focused on setting the theater. Second, they need to develop ISR capabilities designed for long-term theater requirements in early warning and situational awareness.

The component command has the responsibility for Army operations in the Pacific during the competition phase and through combat operations. The component command's integral intelligence force, the 500th Military Intelligence Brigade, developed a concept that demands a forward presence of ISR capabilities, as explained here:

> US Army Pacific MIB [Military Intelligence Brigade] establishes an ISR forward presence, as part of the "contact forces" forward deployed in theater, to provide warning intelligence, maintain an accurate and timely common intelligence picture of the threat across all domains, support

> competition phase operations in contested spaces, provide analysis from the deployable intelligence support element and be in position in the event of crisis or escalation. . . . The ISR dynamic forward posture is supported by established and future basing and access rights and enables the achievement of positional advantage through prepositioned capabilities and support packages. The MIB establishes sensor and collection capacity forward to increase situational awareness of threat competitor activities taking place across and through standoff layers before transition to conflict, not after.[18]

This concept envisions the Army using forward locations to house ISR assets to conduct operations in the theater. These platforms fit directly into the Army's current theater plan and improve the Army's ability to conduct future ISR multidomain operations in the Pacific theater. These adjustments provide a frontline or forward presence in the theater, with ISR forces and collection capabilities located in areas that are near the adversary's country within their A2/AD bubble.

The Army can contribute in various ways to the theater's overall ISR efforts. The Army is uniquely positioned to offer land-based capabilities that the other service components are not suited to provide. Some examples include using fixed sites or mobile platforms, on land or water-based platforms, or through aerial platforms. The fixed site or mobile capabilities can provide an advantage over other ISR assets because Army forces can tailor them for the mission requirements. In addition, these platforms have less size and weight restrictions and suffer less from inclement weather impacts. As McConville stated, land-based assets provide "24/7" coverage without the drawbacks of air and naval assets.[19] These assets provide persistent and consistent coverage for the theater, and greatly improve the coverage compared to airborne platforms alone.

The Army can also provide smaller airborne platforms, either manned or unmanned, that can provide added capability to either compliment other service's capabilities or fill gaps in either time or coverage within the theater of operations. These Army capabilities can add to the theater strategic reconnaissance operations collection that Air Force and Navy assets normally fulfill. In addition, Army collection platforms can add to the signal collection

18. Davis P. Elsen et al., "Military Intelligence Brigade-Theater Support to MDO in the Indo-Pacific Strategic Environment," *Military Intelligence Professional Bulletin* 34-20-1 (January-March 2020): 30.

19. Matthew Beinart, "McConville Sees Critical Role for Army's Future Long-Range Fires in The Indo-Pacific," *Defense Daily* (website), March 12, 2021, https://www.defensedaily.com/mcconville-sees-critical-role-armys-future-long-range-fires-indo-pacific/army/.

(including signals intelligence and electronic intelligence) and radar coverage to assist in maritime domain awareness and sea control, providing a fuller intelligence picture within the theater.

The ISR capabilities that the Army develops for the competition phase may not be suitable for combat operations due to their vulnerability as fixed sites or as known locations. Even so, during the competition phase they serve as a persistent means for commanders to maintain situational awareness. Planners can also incorporate risk mitigation efforts to ensure that these ISR capabilities remain operational during the competition phase and initial stages of conflict. These measures will ensure that more sites remain viable during conflict so US Army Pacific can incorporate collected information into the overall intelligence picture.

The Army theater intelligence teams also provide production, exploitation, and dissemination to exploit platforms and use gathered data to provide an intelligence product for the entire theater. The theater army has the responsibility to gather this intelligence and provide analysis that is derived from the data. As indicated in *The US Army in Multi-Domain Operations 2028*, theater armies "conduct intelligence and counter adversary reconnaissance. In competition, coordinates collection against and analysis of the adversary's operational and tactical systems. . . . Subsequently, the field army disseminates information to allocated joint and Army expeditionary forces."[20] By using production, exploitation, and dissemination to get the most out of its platforms, the Army provides a much-needed intelligence capability to the theater.

Set the Theater

The Army must consider how it will set the theater through its placement and employment of ISR. *Theater Army Operations* describes setting the theater as "the broad range of functions and tasks conducted to shape the operational area and establish the conditions across the AOR [area of responsibility] that enables the executions of the strategic plans as established by the combatant commands."[21] The tasks associated with setting the theater may differ slightly due to the requirement to support different operational plans. The placement of ISR capabilities, both location and type of capability, will vary depending on the strategic, operational, and tactical plans they are meant to support. Additional variables in the placement and utilization include the need to

20. TRADOC, *Multi-Domain Operations*, 28.

21. HQDA, *Theater Army Operations,* Army Techniques Publication 3-93 (Washington, DC: HQDA, August 27, 2021), 5-1.

support the possible transition to conflict and the need to deploy to possible new locations that units are currently not using in competition.

The Army describes its intelligence tasks for setting the theater in *Theater Army Operations* as: "The intelligence warfighting function is focused on collecting, producing, and disseminating intelligence during setting the theater. The theater army utilizes all of the intelligence collection capabilities to include signal, geospatial, counterintelligence, human, open source, measurements and signature intelligence, atmospheric, and technical intelligence to support situational understanding of an Operational Environment."[22] These tasks associated with ISR operations and collection requirements will drive what collection assets the Army will place to set the theater during competition. These assets may include ISR, other Army collection capabilities under development or those that are currently part of the Military Intelligence Brigade, theater army capabilities, or more tactical forces such as airborne or ground-based systems.

Intelligence, Surveillance, and Reconnaissance in Combat Operations

Theater armies must also consider their ISR needs during conflict. They must consider combat requirements, such as where to place assets for collection and survivability purposes. Currently, the Army has to rely on its existing ISR capabilities for combat operations support. But current capabilities will be insufficient to meet the demands for ISR capabilities that support Army concepts for 2028 and 2035. Army Futures Command, the Combat Development Integration Directorates, and future integrators who develop future concepts will need to consider this increased demand when formulating solutions. Each theater will require specific capabilities to correspond to the challenges in that theater. New ISR capabilities may require new basing locations in the theater and greater stand-off requirements. Planners of US Army Pacific must also consider these aspects when determining where to place ISR assets.

22. HQDA, *Theater Army Operations*, 5-4.

The Planning and Synchronization of ISR

The component command will need to synchronize its planning processes across the various staff elements to employ ISR assets effectively. They will need to ensure that they imbed ISR planning requirements in operational and engagement plans to address coordination with partner nations to facilitate the emplacement of ISR capabilities in the theater. Once US Army Pacific determines the ISR capabilities they want to employ and the locations in which they choose to place them, US Army Pacific's staff will need to staff the proposal with the appropriate agencies and entities within the theater to determine the feasibility and acceptability of their proposal.

Internally, USARPAC staff sections need to coordinate as a staff, with their assigned units, and with other Army units either in theater or periodically working in theater. Each element plays a role determining when, where, and how to deploy ISR. The component command must ensure it properly employs assets while providing value to its regional partners. The headquarters must synchronize and incorporate ISR planning throughout its staff to build the best proposal for employment of forward ISR assets.

The USARPAC engagement staff facilitates ISR employment across the theater. They incorporate the ISR plan into the USARPAC engagement plan, which the USINDOPACOM theater engagement staff can then action. The USINDOPACOM staff can add their expertise and effort to staff the proposal in the theater and externally to other agencies outside the theater. Together, US Army Pacific and United States Indo-Pacific Command can develop a plan to engage the US lead agency in the country, the State Department or US embassy. The US lead agency can then discuss the proposal with those allies, host nations, or partner nations where the theater staff would like to place ISR assets. This level of planning and strategy development may require new staffing and processes on US Army Pacific's part, to transition its engagement and theater strategies from one of engagement with partners in exercises and training events to one that addresses placement of Army units (ISR included) into locations to conduct daily operations in the theater.

Interoperability with Allies and Partners

Interoperability and information sharing with allies and partners supports the theater army's endeavors to operationalize ISR capabilities in theater. First, one can examine the strategy process and the actors required to develop a strategy proposal, coordinate the proposal, and get country approval. Second,

units in theater must operationalize the proposal to achieve USARPAC and theater objectives. Third, the theater army staff and its assigned forces must engage allies and partners to establish a coordinated information collection and information sharing plan. Achieving interoperability and information sharing are theater objectives that the theater army can achieve through ISR forward placement and host-nation development.

The component command, in coordination with the combatant command and embassy team, needs to drive the effort to plan and emplace assets forward in partner nations. As *The US Army Concepts in Multi-Domain Operations 2028* emphasizes, "The Theater Army (USARPAC) is responsible for preparing the operational environment by building partner capacity and interoperability and setting the theater through such activities as establishing basing and access rights."[23] The component command's coordination for forward deployment of Army ISR ultimately relies on US allies and partners permitting the basing and use of ISR within their sovereign borders.

The component command should place Army ISR forward in the theater along the first island chain. Countries within the first island chain must allow US forces to base the assets there and will likely risk Chinese opposition for those decisions. The Army should consider coordinating with the Philippines, Brunei, Thailand, Malaysia, Indonesia, and Vietnam to place ISR in each nation. These deployments would run along the first island chain and adjacent to the South China Sea.

The United States has established good relations with many of these countries in large measure through active engagements, exercises, and training events coordinated with and through the State Department and the US embassies located in each country. As an example, the Army signed an agreement with Thailand "in July 2020, where the Chief of Staff of the Army General James McConville signed a Strategic Vision Statement, undertaken in an effort to reassure allies about American commitment to the region."[24] The current relationships between the United States and these regional countries vary in degrees of cooperation and military interrelationships, but the United States proactively works its theater engagement strategy and other activities to maintain and sometimes expand these relationships. McConville states, "The Army's theater engagement and partnership program has been a bedrock of American defense cooperation for many years. Such engagement improves

23. TRADOC, *Multi-Domain Operations*, xi.

24. George P. Coan Jr. "The Army on Point: A Detailed Summary of Current Operations and Responsibilities," Association of the Unites States Army (website), July 10, 2020, https://www.ausa.org/publications/army-point-detailed-summary-current-operations-and-responsibilities.

the readiness of Army forces and their partners, reinforces US commitments, assures regional powers of US intentions, and strengthens cooperative networks."[25] Planners of US Army Pacific should use these relationships as a basis for the negotiations and coordination that is needed for the basing of ISR assets in these countries.

Component command and theater engagement elements, in coordination with the US embassy, must engage and negotiate with host countries to reach an agreement for ISR basing. The strategy to introduce ISR into these countries will require the United States to leverage existing relationships and illustrate the benefits that ISR basing will have for each nation. For instance, a nation can derive benefits from the placement of these assets, ranging from simple information sharing to coordinated interoperability operations. Negotiators can add other factors like the need for training to run a system or to operationalize the data in the host nation to gain host-nation concurrence for ISR basing.

The theater army planning team would have to consider two possibilities for ISR placement to negotiate a mutually beneficial arrangement. In the first option, the United States would operate the system inside the host nation. This would align the US requirements to have a capability in the needed collection area, under US control, to support current US operations. This option is flexible to changing requirements or national needs. But this option does not encourage interoperability or make information sharing easier.

The second option is to include the host nation in the operation. This option can take many forms. First, the agreed on plan could make the host nation a full member of ISR employment from the beginning. US forces could share intelligence gathered from the platform directly with host nation members on the team. In this option, the intent is to continue to operate the platform as long as it is useful. Second, the negotiators and planners could also consider the possibility of the host nation gradually taking on greater responsibility in operating the system or developing a similar capability that replaces the US system while still continuing to share information. Finally, the United States could sell a system to the host nation through foreign military sales and develop an information sharing process using this system. In whichever option the US team chooses to negotiate, the objective is to gain concurrence from the partner nation to position the ISR capability in the country and operate the system to meet theater requirements.

The inclusion of the partner nation in some capacity ties into the US and theater objectives of building interoperability and developing a deeper relationship

25. Beinart, "McConville Sees Critical Role."

with the partners and allies who participate. *Interoperability* defines this characteristic as "the ability to act together coherently, effectively, and efficiently to achieve tactical, operational, and strategic objectives."[26] Having assets that can readily share data helps US Army Pacific to facilitate interoperability and develop a closer relationship with the host nation. In addition, when US and host nation personnel undertake ISR platforms' operations, interoperability will increase and lead to host nation proficiency. The planners can highlight these benefits as they work with the host nation to base the ISR platforms.

Embassy Team and Interagency Coordination

The US embassy plays a key role in coordinating with the host nation and developing a plan to approach the government with a proposal for US forces to do any operations or exercises with that country. Each embassy has its own objectives and plans for how to engage each country, taking that country's needs into account. The embassy plans and coordinates with the partner nation on military exercises and training and helps to develop US foreign military sales support to assist the host nation. When coordinating with the embassy, it is important they understand the proposal for the employment of ISR into the host country and the capabilities of the platforms. The embassy provides expertise in the current state of the country's political landscape and can help outline methods to negotiate for ISR emplacement.

When USARPAC and USINDOPACOM engagement members brief the embassy, embassy staff will need to have a full picture of the strategy that the commands are developing. In addition, staff members can provide the overarching strategy for the theater ISR employment and how it fits into the overall scheme of intelligence collection in the theater. The component command will need to provide the rationale to base ISR assets in the host country and convey what the command needs from the embassy to facilitate its successful basing. The embassy can do a better job and provide better support if its members have the overall picture from USINDOPACOM theater and USARPAC ISR planners.

In addition to the US embassy, theater-level staffs should incorporate the Intelligence Community representatives in the theater into the planning process and the discussions with the Theater Intelligence personnel. By including intelligence community agencies into the planning process and the overall concept of the ISR proposal, they can provide much needed expertise and assistance in determining the capabilities needed. They can also provide

26. HQDA, *Interoperability,* Army Regulation 34-1 (Washington, DC: HQDA, April 9, 2020), 1–6.

advice on the best locations to employ capabilities to maximize their collection opportunities. The intent would be to gain their concurrence on the plan and strategy behind the deployment of these assets, and gain their assistance in advocating for the plan where needed.

Operationalizing Strategy through Engagement

United States Indo-Pacific Command and US Army Pacific will also need to coordinate with the host nation on how they can use the data from the ISR platform. Data from the ISR platform supports plans and operations and facilitates the targeting process. Having a strategy to operationalize ISR data with the partner and convey the data's usefulness can greatly facilitate US efforts to get support from the host nation to base the ISR platform. Providing the ISR products and assisting in the host nation's ability to operationalize the data directly supports the theater and USARPAC objectives of increasing interoperability and information sharing with US partners.

Through its engagement plan, US Army Pacific can work with partners to operationalize the data, using either specially designed teams of intelligence trainers to conduct this training or security cooperation methods to accomplish this task. The component command can coordinate with the Security Force Assistance Brigade, conventional Army forces in theater, special operation forces, or National Guard rotational units to accomplish this training.

The Army can train host nations as part of the package for employment of the ISR assets. In this case, the plan should cover specialized training on the ISR capability, integrating data from the platform, and operationalizing information for the host or partner nation's use. Planners should ensure that they link the training to equipment or applications that Army units require to facilitate use of the data with the host nation.

Security cooperation programs provide one proven method to deliver quality training to a host nation. The military does not lead security cooperation; the State Department is the lead agency for security cooperation. The State Department provides oversight of the security assistance programs though its embassies and other entities within the State Department. United States Indo-Pacific Command and US Army Pacific coordinate many activities through the State Department for security cooperation activities. These include security cooperation programs that conduct training, exercises, and engagement efforts. The component command has many responsibilities regarding security cooperation, as outlined in *Theater Army Operations*: "Theater army planners plan and integrate security cooperation activities.

The theater army helps coordinate and provide resources to support security cooperation activities, including those efforts focused towards enhancing land forces interoperability, building capacity and capabilities, and strengthening relationships with allies and partners."[27]

The component command plays a key role in leading the engagement strategy and working with partner nations. Theater planners must determine the locations to employ ISR and the methods to operationalize data with the host nation. Furthermore, they must include this information in the engagement plan and coordinate with the host nation to execute the plan.

Incorporating Security Force Assistance Brigade and National Guard Training

Security Force Assistance Brigade and National Guard units that have a partner program with the host nation could help the nation improve its ability to operationalize ISR data. The component command should include the nation in the planning and management of intelligence training as part of their engagement strategy with partner nations.

The component command can help to align overall theater objectives and ISR employment and operationalization by working closely with Security Force Assistance Brigades in theater. The brigades could incorporate ISR intelligence training into their unit training objectives as they plan for engagement with partner nations. By working with Security Force Assistance Brigades, US Army Pacific can address some of the points that a recent security force assistance study highlighted, such as the need to link security force assistance to the theater strategy and ensure that training forces are proficient in their security force assistance missions.[28] Security Force Assistance Brigades can provide intelligence training needs for host nations to operationalize the data provided through information sharing from the platforms that the Army could emplace in their country.

Another training capability the Army could harness is the National Guard State Partnership Program. Most of the countries in which US Army Pacific would be interested in placing ISR assets have a US National Guard counterpart. This program could train partner nations to employ ISR into that country and use the intelligence from the ISR. As an example, if Indonesia has

27. HQDA, *Theater Army Operations*, 5-8.

28. Scott Nauman, "Security Force Assistance" (PowerPoint presentation, Carlisle Barracks, PA, January 26, 2022).

already agreed to host an ISR base or asset, the Army could deploy a Security Force Assistance Brigade to conduct a training program there. The Security Force Assistance Brigade could include an intelligence cell in its force structure to train the Indonesians on processing the data the ISR platform provides.

Information Sharing

Planners of US Army Pacific must ensure US forces facilitate information sharing with partners to increase theater situation awareness of the United States and its partners. These measures help to achieve USARPAC and theater objectives by having ISR forward and developing host-nation capabilities. The Department of Defense defines information sharing as, "making information available to participants (people, processes, or systems)."[29] In this circumstance, US Army Pacific would provide information derived from the platform to the host nation. More broadly, unless the partner nation specifically does not want the information derived from the platform, US Army Pacific will have to negotiate the appropriate information sharing arrangements that lead to greater US and host nation situational awareness. Furthermore, US Army Pacific must consider how to employ the full use of the capability within the host or partner nations along with means to share information with them. The Army can initiate or continue a military-to-military relationship with each partner to deepen the level of information sharing. The theater army should discuss information sharing and incorporate it into the planning effort at the onset to display the benefit of the system to the host nation and accomplish the important task of increasing the partner's capacity and capabilities in the theater. The information sharing agreements and the accompanying training will greatly facilitate the interoperability and create a tighter bond between the United States and the host nations as they learn to use the data that the platform would collect.

Recommendations and Challenges

The primary objective of the planning and coordination outlined in this chapter is the agreement from the proposed host nations to permit US Army Pacific to position and operate ISR capabilities in select host countries. The Army ISR system would operate from these host nations that surround the South China Sea either remotely or manned and provide much needed intelligence in the region. ISR would fill intelligence gaps for the theater

29. DoD Information Sharing Executive, *Department of Defense Information Sharing Strategy* (Washington, DC: DoD Office of the Chief Information Officer, May 4, 2007), ii.

and the nation. While conducting these operations, ISR can provide data that theater units will process and share with the host nation to use in their operations and provide situational awareness on Chinese actions in their exclusion zone or other Chinese activities in the region.

The Army must deploy and emplace ISR capabilities forward in the Pacific theater to provide immediate ISR capabilities to fill gaps in the theater collection plan and to achieve the Army's goal of setting the theater for multidomain operations. The component command will ultimately need to determine what capabilities, whether fixed site, mobile, airborne, or other means, best suit its needs and those of the entire theater to accomplish its goal of increasing forward ISR capabilities.

The component command needs to improve its staff processes to include ISR planning in its planning teams and theater engagement strategy. The staff must facilitate the placement of ISR capabilities into the desired countries with the proper support and synchronization with training and exercise operations. The headquarters must continue to assess the process and strategy to adapt to changes in the operational environment. The component command must determine its measures of performance and measures of effectiveness on ISR deployments and use them to assess their effectiveness.

The Army faces multiple challenges as it plans to position ISR assets forward in the theater. These challenges warrant further study as US Army Pacific examines the possibility of placing ISR assets forward in the Pacific theater. First, China's influence will affect these decisions. The United States must consider China's response. Likewise, many host nations might hesitate to allow the United States to emplace ISR assets for fear of reprisal from China. A second area to investigate further are the costs associated with these initiatives. The component command will need to consider the training, fielding, basing, and employment costs associated with forward ISR. Lastly, theater commanders and staffs will need to determine intelligence collection and training priorities within theater. Even if the Army allocates these assets to the Pacific theater, Security Force Assistance Brigades and National Guard units might place this training at a low priority, thus leading to host nation units that cannot effectively employ ISR.

Conclusion

United States Indo-Pacific Command has identified a need for ISR to fill gaps in intelligence collection against key areas and provide persistent coverage on key locations throughout the theater. The component command can develop

a plan and provide solutions to these gaps through land-based capabilities. This paper provides evidence and information to support the recommendation US Army Pacific needs to develop the plans to provide more ISR capabilities forward in theater. By doing so, US Army Pacific would better align its ISR capabilities with national and USINDOPACOM strategies. Forward deployment of ISR will contribute to the theater ISR identified gaps and needs while developing capabilities to support the Army's multidomain operations concept. The component command should incorporate and synchronize ISR planning into the overall USARPAC planning strategy while enhancing the Army's interoperability and information sharing with allies and partners in the region. This study and the planning recommendations found in this chapter could be used in other theaters as a model for further study.

— 4 —

The Modernization of Theater Army Sustainment for Multidomain Operations

Colonel Curtis S. Perkins

The US-led buildup of coalition forces and logistics support during Operation Desert Shield marked a new era of military power projection. The US military shipped more than 38,000 personnel and more than 160,000 tons of equipment to Saudi Arabia in the first 30 days of the conflict. This movement of personnel and equipment eclipsed the first 30 days of the US Army's efforts in World War II, the Korean War, and the Vietnam War.[1] Significant modernization efforts throughout the 1970s and 1980s preceded the success of Operation Desert Shield. The US government invested billions in readiness and modernization efforts under the Army's doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy model. As a result, the Army emerged as one of the most technologically advanced fighting forces on the planet.

To overcome challenges and set the conditions for success in Operation Desert Shield and Operation Desert Storm, the Army required exponential amounts of logistics innovation and creativity. Theater transportation; supply management; and reception, staging, and onward movement and integration (RSOI) of equipment presented significant challenges to combat operations.[2] The Army learned from the logistics challenges, developed solutions, and codified them in the theater army's doctrine for setting theater sustainment. These sustainment responsibilities included planning and providing

1. William G. Pagonis, *Moving Mountains: Lessons in Leadership and Logistics from the Gulf War* (Harvard Business Review Press, 1992), 7.

2. Pagonis, *Moving Mountains*, 202–11.

sustainment functions to support theater opening, receiving initial forces, staging equipment and supplies, assembling them into mission-tailored units, and transporting them to their destination.[3]

Current Army modernization for multidomain operations against near-peer Russian and Chinese adversaries requires forethought to anticipate and overcome the current and anticipated Army logistical challenges.[4] Therefore, the Army must examine and align the modernization of theater army sustainment capabilities to set the theater for the multidomain operations environment and avoid encountering historical logistics challenges again. This chapter focuses on five areas to consider for the modernization of theater army logistics. The first section provides historical context for Army transformation over the last 20 years and describes the future multidomain environment. Additionally, the section describes gaps in equipment and sustainment modernization priorities within the Army Modernization Strategy. The second section describes the roles and responsibilities of the theater army and illustrates how their efforts support theater operations in competition. This section also provides a closer look at the responsibilities of theater sustainment commands and how they can enable success in the multidomain environment. The third section analyzes historical examples from Operation Torch and Operation Desert Shield that describe challenges commonly faced in theater army sustainment. These sustainment challenges in the supply, transportation, and RSOI of Army forces have shaped current Army doctrine and can offer lessons for the multidomain environment. The fourth section provides recommendations and opportunities for mitigating future sustainment challenges. These recommendations include facility improvements, the dispersal of sustainment capabilities, and opportunities to generate theater sustainment requirements through experiments. The final section emphasizes the alignment of efforts to modernize theater army sustainment to support the multidomain environment effectively.

The Transformation of the US Army

This section outlines the Army's transformation, describes the future multidomain environment, and discusses modernization priorities that present potential gaps in sustainment modernization. Multidomain operations is the newest Army operating concept. The Army's success in the multidomain

3. Headquarters, Department of the Army (HQDA), *Theater Army Operations*, Army Techniques Publication 3-93 (Washington, DC: HQDA, August 2021), 5-5.

4. Army Futures Command (AFC), *Army Futures Command Concept for Maneuver in Multi-Domain Operations 2028*, AFC Pamphlet 71-20-1 (Austin: AFC, July 7, 2020), 1–5.

environment requires a shift from the tactical capabilities that were successful over the last 20 years of counterinsurgency to dispersed forces with improved integration throughout all domains: air, land, sea, cyberspace, and space.[5] The multidomain operations concept requires the Army to deter adversaries in competition and crisis, transition into conflict to defeat adversaries, and then return to the competition phase. The theater army must set the theater by establishing sustainment capabilities that enable Joint Force interoperability with allies while deterring adversaries during competition.[6] Furthermore, the Army must evaluate its maneuver and sustainment capabilities and align them in the modernization process to execute multidomain operations in 2035.

The Army became proficient at counterinsurgency operations over the last 20 years of conflict. The Iraq War and the Afghanistan War required the Army to create a modular conventional force structure the Army could tailor and scale to various irregular warfare missions.[7] The Army codified this approach in counterinsurgency doctrine and modified material and equipment to match the operational requirements. The brigade combat team was the centerpiece for the command and control of these tailored forces. Army logistics adapted to these changes by developing smaller forward support companies with sustainment capabilities tailored to maneuver company requirements. Intermediate staging bases and agreements were established to support brigade combat teams that were conducting counterinsurgency operations. These bases and agreements supported the vital sustainment functions of the operating force.

China and Russia studied the American way of war in Iraq and Afghanistan and developed advanced military technologies to defeat the US military's ability to project military power into distant theaters of operations. These advanced military technologies include anti-access/area-denial (A2/AD) integrated weapon systems that create challenges for US military force projection.[8] Similarly, these adversaries plan to disrupt the theater army's "set the theater" sustainment capabilities that are critical to sustaining the Joint Force. The Army must examine the responsibilities of theater army sustainment and conduct targeted modernization of capabilities to support multidomain operations in a contested environment.[9]

5. AFC, *Concept for Maneuver*, 1–5.

6. US Army Training and Doctrine Command (TRADOC), *The US Army in Multi-Domain Operations 2028*, TRADOC Pamphlet 525-3-1 (Fort Eustis, VA: TRADOC, December 6, 2018), viii–x, 47.

7. AFC, *Concept for Maneuver*, 6.

8. TRADOC, *Multi-Domain Operations 2028*, 1.

9. Ryan D. McCarthy, James C. McConville, and Michael A. Grinston, *2019 Army Modernization Strategy: Investing in the Future* (Washington, DC: HQDA, 2019), 6.

The future environment will require the theater army to conduct operations with the Joint Force across the competition continuum against near-peer adversaries. Additionally, the theater army will be responsible for setting the theater to sustain the Joint Force from the strategic support area to the operational support area in a contested environment. As described in the *Joint Concept for Integrated Campaigning*, the competition continuum consists of competition, crisis, and conflict.[10] The theater army's primary goal in competition is to deter adversaries by setting conditions through the alignment of capabilities and the development of agreements with allies.[11] Similarly, setting the conditions includes enhancing the survivability of capabilities against A2/AD and enabling forces to transition to a crisis deliberately if required. In a crisis, the theater army continues many of the functions from the competition phase, including the ability to maintain contact with all domains, threaten the interests of adversaries, defend against A2/AD, and transition to conflict. Finally, in the conflict phase, the theater army is postured to enable the Joint Force to defeat adversary A2/AD networks rapidly, strike in depth, achieve objectives, and consolidate gains to defeat the enemy before transitioning back to competition.[12]

Similarly, setting the theater for sustained, multidomain operations, which is the theater army's responsibility, supports operations across the competition continuum. Adversaries will contest theater army sustainment in the multidomain environment. The Army will need to reposition and modernize its capability to sustain the theater army to support the Joint Force.[13] In competition, sustainment operations enable a theater army to transition troops from the strategic support area to the operational support area and to develop requirements and agreements. Additionally, the theater army builds partner capacity and interoperability with allies, maintains prepositioned equipment sets, and enables material readiness to sustain the Joint Force in crisis.[14] These requirements are critical for supporting Joint Force operations in crisis and conflict. In conflict, all sustainment capabilities must be set to provide endurance and operational reach for the Joint Force.[15] During

10. Joint Chiefs of Staff (JCS), *Joint Concept for Integrated Campaigning* (Washington, DC: JCS, March 16, 2018).

11. James C. McConville, *Army Multi-Domain Transformation: Ready to Win in Competition and Conflict*, Chief of Staff Paper no. 1 (Washington, DC: HQDA, March 16, 2021), 16.

12. McConville, *Multi-Domain Transformation*, 6.

13. TRADOC, *US Army Concept: Multi-Domain Combined Arms Operations at Echelons above Brigade 2025–2045*, TRADOC Pamphlet 525-3-8 (Fort Eustis, VA: TRADOC, December 6, 2018), 43.

14. TRADOC, *Combined Arms Operations*, 38–43.

15. TRADOC, *Combined Arms Operations*, 51.

all phases of the competition continuum, the theater army's sustainment responsibilities remain critical to supporting multidomain operations.

Army leaders have identified six modernization priorities that will best prepare the Army to compete and win against Russia and China by 2035: long-range precision fires, next-generation combat vehicles, future vertical lift, Army network modernization, air and missile defense, and soldier lethality.[16] These capabilities, which are critical to the Joint Force commander and the theater army, allow for integrated and synchronized operations across all domains.

Sustainment modernization efforts supporting multidomain operations must include a range of capabilities to enable future Army operations. Much of the current sustainment structure is based on consolidated sustainment capabilities that are designed to support uncontested theater operations at various echelons. This sustainment approach was successful during the Cold War and was easily modified to support the last 20 years of counterinsurgency operations. In the future, this approach will present elevated risks to sustainment on a contested battlefield. The enemy will target sustainment and command-and-control units. Sustainment units can disperse, but doing so does not provide adequate protection and may not support maneuver operations.[17] The protection of sustainment capabilities to support the Joint Force represents a shortcoming against near-peer adversaries.

Army Futures Command leads the development of sustainment modernization priorities with crucial sustainment stakeholders to mitigate shortcomings. These advancements will enable sustainment forces to exploit windows of opportunity and support operational and strategic objectives. Specifically, the six sustainment priorities provide the following capabilities to the multidomain Army of 2035: analytic decision tools, advanced power solutions, alternative water sources, advanced manufacturing, autonomous resupply, and ammunition.[18] But the Army has not specified how the six sustainment priorities support the six equipment modernization priorities. Also, the Army has not specified how these sustainment capabilities will enable theater army sustainment while in competition. A deeper understanding of the specific roles and responsibilities of the theater army and historical theater sustainment challenges can inform the sustainment modernization approach.

16. McCarthy, McConville, and Grinston, *2019 Army Modernization Strategy*, 9.

17. McConville, *Multi-Domain Transformation*, 18.

18. McCarthy, McConville, and Grinston, *2019 Army Modernization Strategy*, 7.

Theater Army Roles and Responsibilities to Set the Theater

This section highlights the responsibilities of the geographic combatant commands, Army service component commands, and theater sustainment commands and the significance of executing theater sustainment in support of the current and future operating environment. A geographic combatant command exercises directive authority for logistics through the Director, Logistics (J-4).[19] This responsibility involves providing logistics directives to subordinate commanders to align with the planning and execution of theater operations. Title 10 of the US Code appoints the theater army or Army service component command the role of providing for sustained operations on land.[20] This responsibility includes Army support to other services and common-user logistics support to the Joint Force.[21] Theater supply management, transportation and reception staging, and outward integration are three typical responsibilities critical to setting the theater. Additionally, the theater army must coordinate with interagency partners to manage operational sustainment requirements and generate authorities and agreements.

The theater sustainment command is the principal sustainment organization responsible for planning and executing sustainment in support of theater operations. The theater sustainment command, which is subordinate to the theater army or Army service component command, consists of staff and unit organizations required to manage and perform all theater sustainment functions.[22] All geographic combatant commands have a theater sustainment command tailored to support their area of responsibility mission requirements. The theater sustainment command assumes the planning and execution of the theater army's lead service and common-user logistics responsibilities. The theater sustainment command plays a critical role in setting the theater for supply management, transportation and reception staging, and outward integration. Specifically, the theater sustainment command exercises operational control over the current and planned sustainment units to support mission requirements.[23] Theater sustainment commands perform a variety of planning and coordination tasks that are instrumental to establishing

19. HQDA, *Theater Army Operations*, 4-3.

20. HQDA, *Armies, Corps, and Division Operations*, Field Manual 3-94 (Washington, DC: HQDA, July 2021), 3-4.

21. HQDA, *Theater Army Operations*, 4-3.

22. HQDA, *Theater Sustainment Command*, Army Techniques Publication 4-94 (Washington, DC: HQDA, June 2013), 4-1.

23. HQDA, *Theater Sustainment Command*, 4-2.

sustainment in the strategic and operational areas while setting a theater for a contested environment.

As part of its theater-setting responsibilities, the theater army must conduct research and analysis to identify the forces, footprints, and agreements required to support geographic combatant command operations throughout competition, crisis, and conflict.[24] Setting the theater shapes the environment to desired conditions for future operations. Creating these conditions requires a continuous shaping effort in competition enabled by military engagements; security cooperation; and Joint, interagency, intergovernmental, and multinational coordination.[25] These responsibilities cover a broad spectrum of tasks and functions, including sustainment, air missile defense, engineering, and intelligence. Effective sustainment demands significant planning and preparation to anticipate and establish theater requirements. The geographic combatant commands have varying requirements based on threat level, geography, and availability of resources. The geographic combatant command J-4 leads Joint sustainment planning and preparation. The theater army and theater sustainment command plan, coordinate, and execute theater sustainment tasks. Some of these sustainment tasks are timeless. The theater army sustainment tasks conducted during World War II's Operation Torch and the Persian Gulf War's Operation Desert Shield provide examples of these timeless supply, transportation, and RSOI challenges.

Historical Examples of the Modernization of Theater Army Sustainment

Operation Torch

The Army has derived many theater-setting requirements from lessons learned in conflict. Recognizing the importance of theater-setting responsibilities informs the Army of challenges it may encounter as it modernizes. Operation Torch provides an example of the difficulties of conducting operations in a contested environment where theater sustainment infrastructure is not prepared to support Army forces. Additionally, the Persian Gulf War's Operation Desert Shield provides an example of sustainment challenges related to the modernization of Army forces. These two examples offer lessons to inform the modernization of theater army sustainment for multidomain operations.

24. HQDA, *Theater Army Operations*, 5-4.

25. HQDA, *Theater Army Operations*, 5-1.

When the Army's 3rd Infantry Division arrived on the shores of western Morocco during Operation Torch in the European theater of operations, the division experienced challenges with sustainment in the contested environment. The challenges included the planning and synchronization of transportation and supply requirements. These tasks were vital to setting the theater for Operation Torch and will remain critical to aligning sustainment capabilities in the multidomain environment. The purpose of Operation Torch was to defeat the Axis forces in North Africa and establish a second front against German forces on the European continent. Vichy French forces in Morocco controlled the area of operations where Army forces landed, with German forces holding east of Morocco to Libya.[26] Assigned to the Western Task Force, the 3rd Infantry Division arrived in a theater where conflict had persisted for two years and against adversaries with prepared defenses. Additionally, the Army had transitioned to larger mechanized forces and required increased logistics support.

The urgency of Operation Torch disrupted the establishment of traditional theater-setting sustainment goals, which amplified the complexity of initial operations in western Morocco. Similarly, challenges in sustainment planning were evident well before the 3rd Infantry Division made landfall in western Morocco. The Western Task Force leadership did not direct the integrated planning of maneuver and sustainment operations for Operation Torch. The leadership were vaguely aware of the sustainment requirements to support operations once in the theater.[27] Specifically, the task force experienced challenges with synchronizing transportation, supply, and RSOI for forces.

Transportation challenges created immediate concerns for the task-force operations. Both sea and land transportation were limited due to the lack of US Navy vessels and cargo trucks. The shortage of Navy vessels required the task-force leadership to prioritize maneuver and sustainment capabilities for landfall. The lack of integrated planning degraded the task-force staff's ability to recommend a balanced mix of maneuver and sustainment, which led the staff to prioritize available transport space for maneuver forces. To save space on Navy vessels, the staff prioritized smaller vehicles, like Jeeps, in place of 2.5-ton cargo vehicles. These adjustments significantly degraded cargo capacity and multiplied driver requirements.[28] Additionally, the task force lost accountability of shipping manifests and did not have the appropriate

26. David Dean Dworak, *War of Supply: World War II Allied Logistics in the Mediterranean* (Lexington: University Press of Kentucky, 2022), 11–12.

27. Dworak, *War of Supply*, 11–14.

28. Dworak, *War of Supply*, 21.

material handling to determine equipment and combat loads. The beaches of western Morocco became flooded with tons of unsynchronized equipment, personnel, and supplies. These problems resulted in significant delays and an opportunity for enemy forces to disrupt task-force operations.[29] After days of uncertainty, the task force was able to stage and expand operations into Morocco, but the force still encountered various sustainment challenges, such as rail distribution of supplies and equipment. The railways were not standardized, and the local population pilfered supply stocks. The Army also experienced prolonged fuel and supply shortages, which units remedied through local contracts and agreements.[30] Aligning the capabilities of theater army sustainment for transportation, supply, and RSOI remain vital to setting the conditions for the multidomain environment.

Although Operation Torch proceeded and achieved all operational objectives, it also provided significant lessons for setting the theater for operations. First, integrated planning is required to develop and coordinate functional logistics requirements for a theater of operations. Integrated sustainment planning could have prevented the unsynchronized arrival of personnel, supplies, and equipment. Second, the Army could have conducted exercises and rehearsals to understand how to support a more modern mechanized force. The Army had limited experience with amphibious operations and mechanized equipment. Third, planners should have thoroughly analyzed the area of operations to understand the geography, infrastructure, and resources available. These preparations could have facilitated the pre-coordination of local resources and agreements to support operations. Also, if local resources were not available, the planners could have increased organic resources to support operations. Operation Torch illustrates the importance of integrated sustainment planning to set the theater for Army operations. The enduring theater army sustainment challenges exemplified by Operation Torch provide lessons from which the Army can learn so it can align sustainment capabilities for the future environment.

Operation Desert Shield

Army operations in the Gulf War provide a more contemporary example of theater sustainment challenges that occurred after the Army's force modernization efforts of the preceding decade. During the Cold War, the United States undertook various modernization efforts to maintain a competitive advantage over the Soviet Union. But while mired in the

29. Dworak, *War of Supply*, 17–22.

30. Dworak, *War of Supply*, 34–36.

Vietnam War, the Army fell behind the Soviet Union. While the United States conducted operations in Vietnam, Moscow expanded its influence globally and challenged global security. In response to the Soviet threat, the Army made significant investments to expand and modernize capabilities and doctrine. The Army prioritized its "Big Five" platforms during this modernization period. These systems included the Abrams tank, Bradley Infantry Vehicle, Blackhawk and Apache helicopters, and Patriot Air and Missile Defense System. Simultaneously, the Army developed the Airland Battle doctrine to complement its employment of modernized capabilities. Modernized capabilities and revised doctrine allowed the Army to employ distributed lethal capabilities to seize the initiative and mass firepower against enemy forces.[31] While combat capabilities and doctrine evolved, sustainment modernization was less integrated. Pre-Gulf War modernization efforts provide insight into challenges with aligning operational and sustainment modernization capabilities for the multidomain operations concept.

In the Gulf War, the Big Five displayed the superiority of Army operational capabilities. (The Big Five refers to the M1 Abrams tank, M2 and M3 Bradley Infantry Fighting Vehicle, AH-64 Apache helicopter, Sikorsky UH-60 Black Hawk utility helicopter, and MIM-104 Patriot air defense missile.)[32] In Operation Desert Shield, challenges in transportation, supply management, and RSOI provided theater sustainment lessons. These challenges highlighted the misalignment of sustainment modernization. During Desert Shield, Third Army (US Army Central) spent five months setting the theater with sustainment capabilities in Saudi Arabia for operations in Iraq but still encountered unforeseen challenges due to a mix of legacy and modernized equipment.[33] Third Army, with support from 22nd Support Command, prioritized and synchronized all aspects of sustainment. The formation established thousands of contracts and coordinated interoperability between coalition partners. The Army oversaw a buildup rate and volume of supplies not previously experienced that many described as "iron mountains" of supplies.[34] These millions of tons of supplies would support one of the most extensive mechanized operations since World War II. This buildup represented a significant improvement when compared to that of Operation Torch. Despite

31. John Sloan Brown, *Kevlar Legions: The Transformation of the US Army, 1989–2005* (Washington, DC: Center for Military History, 2011), 15–17.

32. Brown, *Kevlar Legions*, 16.

33. Richard Moody Swain, *Lucky War: Third Army in Desert Storm* (Fort Leavenworth, KS: US Army Command and General Staff College Press, 1994), 161.

34. Pagonis, *Moving Mountains*, 144–49.

these improvements, the theater army still experienced unforeseen equipment modernization challenges.

The Big Five equipment brought a new set of challenges in transportation, supply, and RSOI of forces. The surplus of supplies required an increased amount of transportation assets that was not available in the theater. The task-force staff mitigated the transportation shortage by shifting the priority of movement assets to cover distances and requirements.[35] To compound this challenge, the Army had not modernized sustainment equipment. Instead, the service used legacy sustainment equipment to support modernized maneuver forces. Specifically, to position the new M1A1 tanks for the start of ground operations, the Army had to use the Heavy Equipment Transport System (HETS).[36] The HETS was a part of sustainment modernization but was not fielded until after the Persian Gulf War. Along with coalition partners, more than 12,000 vehicles required movement in and around the theater of operations.[37] The Army only owned 112 HETS vehicles at the time and had to rely on coalition partners and contracts to offset transportation movement requirements.[38] The Army pushed legacy transportation platforms to their limits; the platforms required significant maintenance to fulfill movement requirements. The Army developed and fielded the DRS Technologies M1000 semi-trailer and Oshkosh M1070 tractor in the mid-1990s to mitigate these transportation challenges.[39]

Similarly, material-handling and supply accountability presented a challenge during Persian Gulf War. The millions of tons of supplies required constant loading, unloading, and reconfiguring for distribution and delivery. Significant shortages of material-handling equipment (MHE), such as forklifts and operators, resulted in the Army establishing various contracts for host-nation support.[40] In addition, the surplus of supplies throughout the theater of operations created accountability challenges that resulted in the delayed issuance of supplies to customer units. The Army used manual input digital databases and printed spreadsheets at the unit level, decreasing supply accountability. Throughout the 1990s, the Army ushered in the concept of

35. Swain, *Lucky War*, 105.

36. Pagonis, *Moving Mountains*, 201–2.

37. Pagonis, *Moving Mountains*, 6.

38. Pagonis, *Moving Mountains*, 203.

39. "DRS Technologies Receives $9 Million to Refurbish Military Trailers Deployed in Operation Iraqi Freedom," GovCon (website), March 23, 2006, https://www.govcon.com/doc/drs-technologies-receives-9-million-to-refurb-0001; and "Oshkosh M10170 HET," Military Today (website), n.d., accessed on March 24, 2023, http://www.military-today.com/trucks/m1070_het.htm.

40. Pagonis, *Moving Mountains*, 205–6.

automated, unit-level logistics accountability to help ease the burden of manual accountability. Furthermore, the Government Accountability Office identified supply chain accountability as a high-risk area in 1990. The Army developed radio frequency identification and first employed it in 1996 to enhance the visibility of supply shipments and help to resolve this accountability issue.[41]

Finally, RSOI challenges in the Persian Gulf provided insight into equipment sequencing to meet operational needs. The most resource-intensive effort during Desert Shield was RSOI of equipment because of its quantity and volume. The US military did not have enough airplanes to ship all required equipment directly into the theater during Desert Shield. American forces used sea transport to offset this shortage, which extended ground transport movements from the seaports. Additionally, US forces used maritime prepositioned stocks, which entailed sets of brigade combat team equipment being loaded aboard maritime vessels and prepared for use.[42] The Army took this idea a step further and developed land-based Army prepositioned stocks (APSs) in Kuwait in 1997.[43] Establishing the Army Prepositioned Stock program in 1997 would decrease the response time, transportation, supply, and readiness requirements of future theater army requirements.

The theater army's significant sustainment responsibilities provide the cornerstone of logistics support for Army operations. Operation Torch underscored the importance of integrated logistics planning and synchronized transportation and supply requirements. Additionally, Operation Torch highlighted the importance of establishing contracts to address resource shortfalls. Current Army doctrine codifies these aspects of theater army sustainment planning and synchronization of requirements. These elements remain paramount to establishing theater sustainment capabilities.

In Desert Shield, the theater army encountered new challenges due to the scale of conflict and unforeseen challenges with equipment modernization. Theater sustainment requirements were discovered during and after conflict. This problem was more apparent in Desert Shield, in which Army modernization policy failed to align the capabilities of the modernization of theater army sustainment. Specifically, during the modernization period before the Gulf War, the Army should have anticipated theater sustainment requirements, but it did not. The analysis and alignment of theater sustainment requirements could have resulted in platforms such as the modernized HETS

41. Cary B. Russell, *Defense Logistics: DOD Has Taken Actions to Improve Some Segments of the Materiel Distribution System*, GAO-12-883R (Washington, DC: Government Accountability Office, August 3, 2012), 1.

42. Pagonis, *Moving Mountains*, 68–72.

43. HQDA, *Sustainment Operations*, Field Manual 4-0 (Washington, DC: HQDA, July 2019), 3-9.

(M1000 and M1070) being available during Desert Shield. The modernized HETS would have decreased reliance on local transportation contracts if it had been available.[44] Finally, integrated planning, transportation, supply, and RSOI challenges outlined in the previous historical vignettes identify timeless challenges the Army should anticipate in future modernization efforts. The following section discusses the implications of these challenges and provides recommendations for the Army to meet its theater sustainment responsibilities for multidomain operations in 2035.

Recommendations for Theater Army Sustainment in Multidomain Operations

An instrumental component of sustaining combat operations, the theater army will retain the responsibility to set the theater in multidomain operations. The previous historical vignettes highlighted enduring sustainment challenges. These examples illustrated transportation, supply, and RSOI issues the Army faces in multidomain operations. Future modernization strategists should anticipate these challenges and mitigate their impact on Army modernization efforts. Identifying these requirements starts with redefining how the theater army will fight under its new concept, which will drive changes to theater sustainment requirements. Based on the lessons learned from these historical challenges, the Army can conduct analysis and experiments and develop requirements for the alignment of Army modernization with theater army sustainment capabilities.

Transportation

In the future operational environment, adversaries will be able to target the Army's consolidated transportation capabilities more easily. To frustrate the efforts of adversaries, the Army must adjust its posture to support operations against near-peer adversaries more effectively. Each theater army will need to evaluate its posture to minimize risks to transportation capabilities. The Army must disperse transportation capabilities; analyze its doctrine, organization, training, materiel, leadership and education, personnel, and facilities; and integrate solutions to problems across the service. The Army must not wait until forces arrive in the theater army area to address these issues.

Recommendations for theater army transportation include investment in interim protective solutions, dispersed or innovative solutions, and alignment of future multidomain operations transportation requirements. The

44. Swain, *Lucky War*, 40.

United States Central Command and United States Indo-Pacific Command (USINDOPACOM) theaters of operation maintain APS transportation capabilities that are provided by either theater transportation units or local contractors. The transportation capabilities are stored in various conditions that could expose them to A2/AD threats. The theater army must consider better protective solutions for transportation capabilities, including indoor, hardened facilities or the dispersal of current capabilities to host-nation facilities. Additionally, the Army must decide whether the theater army will retain and distribute current transportation capabilities or develop a more innovative transportation solution for multidomain operations. Like the M1A1 in the Persian Gulf War, next-generation combat vehicles and long-range precision fires will require line-haul transportation. Further analysis is needed to determine whether current transportation capabilities can support new platforms. This analysis is important because the Army will require additional transportation assets to cover a more extensive division and corps rear area for supply. Additionally, larger supply areas can expose transportation assets to adversary A2/AD that targets transportation hubs. Finally, transportation posture adjustments must enhance the protection and dispersal of transportation assets required to support combat operations. By taking these measures, the Army can align its modernization strategy with improved sustainment capabilities.

Supply

In a similar fashion to the transportation challenges, Operation Desert Shield supply issues impacted operations and provided lessons to inform sustainment operations in the future environment. The Army synchronized supply requirements for Desert Shield and consolidated millions of tons of supplies at various locations throughout the battlefield. The surplus of supplies created challenges with material handling and accountability and supply deliveries during the buildup for Desert Shield. The supply challenges resulted in the delayed development of improved MHE capabilities and the inception of unit automated logistics tracking to improve the visibility of supplies. In response, the Army established consolidated theater MHE and supply stocks via the Army Prepositioned Stock program.

Recommendations for the theater army include evaluating its MHE and supply posture, making interim decisions to minimize risks, and conducting analysis to adjust sustainment posture and account for current sustainment modernization priorities. As with transportation assets in the future environment, adversaries will target consolidated supply capabilities. The Army must make an interim decision on ways to protect current supply and

MHE capabilities with a combination of hardened facilities and dispersed locations. To inform posture changes, the Army must first revise how it plans to perform operations in accordance with multidomain operations doctrine. This revision starts at the theater-army level with notional changes to campaign plans based on future capabilities and provides the framework for anticipating changes to sustainment requirements, posture supply, and MHE capabilities. For example, at United States Indo-Pacific Command, many theater army supply and MHE capabilities are consolidated between the islands of Japan and South Korea, two countries within range of Chinese ballistic missiles that threaten the sustainment capabilities. An interim solution to mitigate this risk is to harden the current consolidated storage facilities. In addition, the theater army can disperse capabilities to multiple locations throughout the Pacific by coordinating with allies. Furthermore, the Army can establish sustainment agreements with allies and partners in areas that best support operations in the future environment, with the goal of increasing the survivability of theater army sustainment capabilities and setting conditions for land operations.

Theater armies can also leverage emerging technologies such as autonomous resupply and advanced manufacturing in the future. These technologies support resupply to isolated and dispersed units and may offer additional insight for adjustments to supply posture. The Army will need to evaluate the material-handling aspect of this concept to determine whether the current posture is feasible or the service will need to develop an autonomous MHE capability to complement this resupply concept. Supporting areas with automation would decrease personnel requirements and increase supply efficiency. As with transportation, supply and MHE solutions require analysis of the development of organizational, facility, material, or personnel requirements. Developing these requirements now would reduce the need to create ad hoc sustainment solutions in future competition and conflict.

Reception, Staging, Onward Movement, and Integration

The ability of theater armies and other Army forces to stage equipment in support of theater operations and sustainment is critical to executing RSOI, a critical responsibility of the theater army. Reception, staging, onward movement, and integration (RSOI) includes the integration of troops, equipment, and supplies across a theater of operations. As the number of personnel entering a theater increases, so do the RSOI challenges. The RSOI challenges of Operation Desert Shield and Operation Torch emphasize the importance of staging equipment to support theater operations in setting the theater. After the Persian Gulf War, the Army developed the requirements

for its global Army Prepositioned Stock program, which supports a broad range of military operations with prescribed equipment and supply capabilities tailored to each combatant command. Each program combines consolidated indoor, outdoor, and afloat stocks and costs billions of dollars to maintain readiness. Host-nation facilities and contractors play a vital role in maintaining this program. The costs of adjusting facilities, modernizing equipment, and updating host-nation agreements present challenges for the Army in supporting multidomain operations.

Key recommendations for improving RSOI and equipment staging include reconfiguring the Army Prepositioned Stock program for survivability and modernizing equipment requirements. Integrating these adjustments into the Army Modernization Strategy will require additional funding and time. The Army must decide whether to protect, disperse, or reduce its stocks to increase survivability. A theater army must protect its existing APSs from adversarial threats as an interim solution. The Army could harden RSOI facilities or improve air and missile defense in the vicinity of APSs. For example, many APS storage facilities are not designed to survive ballistic missile strikes. Hardening these facilities could include upgrades for survivability or the more costly option of new military construction.

Similarly, dispersing APS sites for each geographic combatant command is required to protect this material, and these changes would differ significantly based on geography. A geographic combatant command may consider mini-APS facilities that distribute unit equipment requirements into smaller sets. This solution would require the expansion of facilities and an increase in contractors and host-nation agreements. For the Pacific theater, this solution might include dispersal to various partner-nation islands. For example, US defense partners Australia and Indonesia could provide facilities where the Army could disperse sustainment capabilities. In addition, Australia and Indonesia could purchase equipment or sets of brigade equipment and train to use them as the Army would. This additional capability could provide an increased deterrent effect against adversaries. Furthermore, the Army could coordinate for maritime prepositioned stocks to support equipment requirements beyond enemy A2/AD capabilities or as follow-on support to land operations.

Geographic combatant commands may also reduce the overall stock footprint by leveraging sustainment modernization priorities such as data analytics and advanced manufacturing, which would reduce the amount

of required stocks.[45] Also, the Army Modernization Strategy associates modernized equipment with its six priorities.[46] The theater army must synchronize the divestiture of legacy equipment and the integration of new equipment while maintaining operational readiness. Every solution for reconfiguring APSs for multidomain operations would require significant time and resources. As a result, these anticipated posture changes will require additional resources from the Department of Defense. If the department did not provide resources, adversaries would have a greater chance of inhibiting the capabilities of theater army sustainment, rendering them unable to support combat operations effectively. The Army can leverage experiments to mitigate the aforementioned transportation, supply, and RSOI challenges.

Sustainment Experiments

In addition to implementing the previous recommendations, the Army should improve its use of experiments to align the capabilities of theater army sustainment with the Army Modernization Strategy more effectively. The Army's Project Convergence 2022 concept and experiments are advantageous for determining future sustainment challenges and requirements. Project Convergence allows the Army to learn by testing ideas for future warfare in real-world conditions and determining whether the concepts are helpful. The purpose of experimentation is to refine concepts and to determine better ways for the Army to achieve its strategic goals.[47] The ongoing Project Convergence experiments focus on Joint All-Domain Command and Control modernization and the technology associated with tactical, operational, and Combined Joint Task Force operations.[48] Although Project Convergence does not explicitly focus on multidomain operations or sustainment, the project provides an opportunity for the Army to learn about future sustainment requirements and to develop ways to test and mitigate theater sustainment challenges.

Similarly, the Army Futures Command Futures and Concepts Center conducts experimentation through its Capabilities Development Integration Directorates to develop future capability requirements. The Futures and Concepts Center aligns Capabilities Development Integration Directorate capabilities to each Army center of excellence to focus on experimentation

45. Blake Schwartz, Brandon M. McConnell, and Greg H. Parlier, "How Data Analytics Will Improve Logistics Planning," US Army (website), November 4, 2019, https://www.army.mil/article/223842/how_data_analytics_will_improve_logistics_planning.

46. Whitley, McConville, and Grinston, *2021 Army Modernization Strategy*, 13–14.

47. Andrew Feickert, *The Army's Project Convergence*, Congressional Research Service (CRS) Report IF11654 (Washington, DC: CRS, updated October 8, 2020), 1–3.

48. Feickert, *Project Convergence*, 1–3.

and the development of future capabilities.[49] The Sustainment Capabilities Development Integration Directorate currently focuses on division-level sustainment experimentation based on guidance from the Futures and Concepts Center and Combined Arms Center. These experiments inform the reception and integration of Army capabilities in tactical assembly areas. The directorate has not yet experimented with the modernization of theater sustainment capabilities, such as APSs.

The Army could incorporate theater sustainment-focused simulations into the Project Convergence and Futures and Concepts Center Capabilities Development Integration Directorate experiments to analyze, learn, and generate requirements that inform multidomain operations sustainment. These Capabilities Development Integration Directorate-informed events could evaluate challenges the theater army has experienced with transportation, supply, and RSOI equipment. Historical models have served as the foundation for supply usage rates, expected casualties, medical support, and sustainment requirements. Lessons learned from these events may help to inform theater army operations and future planning. For example, Project Convergence could integrate the responsibilities of theater army sustainment into the competition phase of experiments to identify potential sustainment gaps in USINDOPACOM theater setting. The lessons learned and analysis could help to identify necessary adjustments to the capabilities of theater army sustainment and associated agreements. The USINDOPACOM theater army could consider these lessons learned and begin generating requirements to mitigate capability gaps. Based on the challenges of conducting sustainment in a contested environment, the conditions could lead to significant organizational, facility, personnel, and force posture adjustments. In addition, the adjusted requirements might justify additional funding for certain theater armies, which would affect fiscal programming and budget execution. Furthermore, posture adjustments may require revisions to agreements with allies. These updates would take time to verify, negotiate, and implement. Conducting experiments that focus on the requirements of theater army sustainment could mitigate the amount of research and time needed to align theater sustainment requirements. Delaying sustainment-focused experiments increases the risk of sustainment capabilities not effectively supporting multidomain operations because solutions require extended timelines to account for funding and reposturing forces and establishing host-nation agreements with allies and partners.

49. "Joint Modernization Command," US Army (website), n.d., accessed on March 29, 2023, https://www.army.mil/FuturesandConceptsCenter#org-organizations.

Conclusion

The Army must examine and align the modernization of the capabilities of theater army sustainment with multidomain operations doctrine to avoid repeating historical logistics challenges. Adversaries have studied the US way of war over the last 30 years and developed more capable militaries. Russia and China's near-peer threat has created an environment in which US forces would assume significant risks against advanced A2/AD capabilities that would disrupt, delay, and prevent US forces from massing effects in a theater of operations. The "big six" Army modernization priorities represent a transformative approach to mitigating the impact of adversarial capabilities in the future environment. Like the Big Five of the 1970s and 1980s, this modernized equipment will deliver the technology for executing multidomain operations.

A vital component of the Army's success in multidomain operations is the capabilities of theater army sustainment. Specifically, the Army's responsibility is to set theater sustainment to support operations in the theater. Historically, the theater army has experienced common challenges in theater sustainment that has impacted operations—for example, the delayed modernization of transportation platforms, supply management, and RSOI operations in Operation Desert Shield. This example illuminates the difficulties of supporting modern Army capabilities with legacy theater sustainment capabilities. Therefore, the modernization of theater army sustainment is critical to the Army Modernization Strategy.

The Army should implement the following recommendations. The service should make facility improvements that protect theater supply and transportation capabilities. Similarly, the Army must disperse supply and transportation capabilities to improve survivability and the ability to support theater operations. Furthermore, the Army must leverage experiments to help to generate sustainment requirements for multidomain operations. The Army's Project Convergence and Futures and Concepts Center Capabilities Development Integration Directorates provide an opportunity to conduct sustainment exercises and experiments that inform senior leaders. Finally, the modernization of theater army sustainment will take time and require funding and reposturing as well as updating agreements with allies and partners. Ultimately, the service cannot rely on ad hoc sustainment solutions. If the Army does not prioritize the analysis and modernization of the capabilities of theater army sustainment to support combat operations, the service will be destined to reencounter historical sustainment challenges in multidomain operations.

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Rethinking and Revising Logistics for Multidomain Operations in the Pacific

Lieutenant Colonel Timothy L. Clark

The US Joint Force is underprepared to conduct large-scale combat operations against a near-peer adversary. Weaknesses in the logistics enterprise will inhibit the United States from deploying and sustaining meaningful combat power in the Pacific. These critical shortfalls prevent compliance with the 2018 National Military Strategy and the 2021 Interim National Security Strategic Guidance, both of which direct readiness for large-scale Pacific operations.

Since World War II (WWII), the Joint Force has seen a slow and general decline in its logistical preparedness for large-scale combat. A review of principles from a revered, WWII-era Pacific logistics expert, Rear Admiral Henry Eccles, demonstrates ways to overcome projected strategic- and operational-level challenges. Specifically, he illustrates logistics is a meeting of civilian and military systems. A successful logistics enterprise considers the national strategy and works to align the national economy and military structure to meet the strategy's requirements. Both whole-of-government and industry partners are needed to address the current misalignment. New technologies such as additive manufacturing and the Internet of Things (IoT) will enable new thought on ways to conduct great power competition using all the instruments of national power. Therefore, the US Army must take considerable steps to ensure its logistics enterprise is prepared for the challenges of future war.

Seven decades have passed since the Army successfully planned and executed major combat operations in the Pacific. After WWII, the United

States made conscious end strength and budget decisions to assume risk in large-scale combat. Because of these decisions, the Army's ability to execute large-scale combat atrophied to a point where its leaders were forced to cancel a planned assault during the Korean War.[1] Yet just enough vessels, skill, and leaders remained to plan and execute Operation Chromite rapidly. The surprise landing at Incheon saved innumerable soldiers and shocked the Koreans into full retreat. Despite this early reminder of the challenge, danger, and importance of littoral movement and landings, the skills and materiel that enabled successful Pacific littoral operations continued to atrophy.

A long habit of leaders "trading tail for teeth," making reactive decisions, and desiring steady-state logistical efficiency has degraded expeditionary military and critical industrial base capabilities. In the 77 years since the US military demonstrated its ability to win a Pacific war, its force capabilities and doctrine have changed significantly. A slow devolution and a few simultaneous choices have now converged to create an Army ill prepared to win in the Pacific. A single WWII-era Army service squadron had a mix of combat and logistics vessels, not including merchant marine augmentation. Today the entire US government-owned and civilian maritime industry pales in comparison to its WWII predecessors.[2] The resultant shortfall is incompatible with the Army's "pivot to the Pacific" and "return to great power competition" campaigns.

Logistics Challenges and the Future Operating Environment

Section one explores how US capabilities, specifically its logistics enterprise, slowly devolved after WWII, recently organized for a single type of limited conflict, and took shortcuts that atrophied the military's expeditionary capabilities. By looking at the future operating environment, this section will demonstrate the challenges today's logistics enterprise faces due to adversaries' new capabilities and changes to the Joint Warfighting Concept. This section also exposes a need for new thinking about the needs of the future force, guided by the future operating environment.

After WWII, many leaders believed the character of war had changed. Strategic weapons promised cheap ways to deter or defeat adversaries, enabling the assumption of risk and lower defense budgets. Operations in Vietnam also

1. Josh Abbey, "Sea Mines in Amphibious Operations," Strategy Bridge, August 8, 2018, https://thestrategybridge.org/the-bridge/2018/8/8/sea-mines-in-amphibious-operations.

2. Chris Bernotavicius et al., "Ýou Go to War with the Watercraft You Have," War on the Rocks, July 26, 2022, https://warontherocks.com/2022/07/you-go-to-war-with-the-watercraft-you-have/.

justified evolving for a different type of future war and for secure operational-strategic lines of communication (LOCs). After Vietnam, the Army relied on a smaller, all-volunteer force and assumed the nation would have time to mobilize reserves and the logistics enterprise. Over time, lower budgets led the Army to divest expensive and rarely used logistics forces and platforms. Although the Army significantly modernized with its Big Five acquisitions during the 1980s and its AirLand Battle doctrine, these primarily focused on battling the Soviets in Europe. The Army did little to update its logistics capabilities and doctrine, especially for other theaters.

After the Cold War, US leaders believed the future would involve limited conflict against technologically inferior foes. In the late 1990s, the Army announced its desire to transform into a lighter, "middleweight fighter."[3] The assumption of easy global access, overmatch, and quick victories permeated the force. Though the Army made doctrinal changes, and fielded new platforms like the Stryker, the Army did not undertake complementary logistical changes.

After the September 11 attacks, the US military found itself involved in counterinsurgency conflicts. The enemy and environment were favorable for the constructed force and the strategic and operational levels offered multiple, robust LOCs. Despite the favorable environment, unforeseen tactical issues arose. Incessant deadly convoy attacks prevented the Army from freely moving soldiers and supplies.[4] The legacy logistics platforms and doctrine proved ill-suited for this environment. The Army's necessary and urgent reactions to the challenges again denied new and creative thinking. Rightly, the United States invested in what was rapidly available and made platforms larger and heavier.

Counterintuitively, the war on terrorism's favorable strategic and operational conditions worsened logistics readiness in three ways. First, rapidly modified or newly acquired platforms decreased transportability, cargo volume, payload, and range. Tactically, the resultant platforms and experience proved a liability to future operations in austere environments with long and contested LOCs. Secondly, a decade of repetitive missions led to force organization in support of wide area security, a narrow version of conflict.[5] Wide area security is not adequate for the forecasted demands at the operational and strategic

3. Headquarters, Department of the Army (HQDA), *US Army Posture Statement Fiscal Year 2000* (Washington, DC: HQDA, February 1999), 37–38, 48.

4. Jason Shell, "How the Improvised Explosive Device Won: Dispelling the Myth of Tactical Success and Innovation," War on the Rocks (website), May 1, 2017, https://warontherocks.com/2017/05/how-the-ied-won-dispelling-the-myth-of-tactical-success-and-innovation/.

5. Paul K. Davis, "Military Transformation? Which Transformation, and What Lies Ahead?," in *The George W. Bush Defense Program: Policy, Strategy, and War*, ed. Stephen J. Cimbala (Washington, DC: Potomac Books, Inc., 2010), 29–32.

levels. Third, when operational and urgent platform fielding costs combined with the financial crisis of 2007–08, short-term cost cutting from long-term needs became attractive to the Army brass. By focusing almost exclusively on contemporary missions, the Army brass justified theater-specific logistics cost efficiencies. But such concessions over a long duration created an ill-suited logistical force, a dangerous lack of logistical creativity, and a critical reliance on nongovernment-controlled logistics capabilities across the enterprise.[6] These conditions now endanger the force's capability and readiness to support Pacific operations.

Critical Shortages and Capability Gaps

A few concepts illustrate the size of the logistics capability gap across all areas of force structure, modernization, and readiness. First, the United States has experienced a massive decline in maritime capability. Second, leaders embraced immediate solutions to problems during the war on terrorism at the expense of long-term readiness. Third, the operating environment's rate of change outstripped doctrine and platform modernization. Lastly, the new warfighting concept remains underdeveloped, preventing the required overhaul of logistics capabilities and concepts.

Just over a century ago, the United States' maritime industry was foremost in the world. But the passage of the Jones Act in 1920 quickly reduced America's maritime dominance.[7] Since then, the volume of vessels and mariners, and the US market share have decreased by 94 percent.[8] The Jons Act also prevents the United States from partnering with allies to build, staff, or operate vessels. Simultaneously, government capabilities atrophied; the Navy is the smallest it has been since before World War I.[9] United States Military Sealift Command was created to execute and advocate for maritime logistics, including various partnership programs that ensured surge merchant marine capabilities. But underinvestment resulted in few new orders, mounting

6. Diane K. Morales and Steve Geary, "Speed Kills: Supply Chain Lessons from the War in Iraq," *Harvard Business Review* (website), November 2003, https://hbr.org/2003/11/speed-kills-supply-chain-lessons-from-the-war-in-iraq.

7. Colin Grabow, Inu Manak, and Daniel Ikenson, "The Jones Act: A Burden America Can No Longer Bear," Cato Institute (website), June 28, 2018, https://www.cato.org/publications/policy-analysis/jones-act-burden-america-can-no-longer-bear.

8. US Department of Transportation, Maritime Administration, Office of Policy and Plans, *Consolidated Fleet Summary and Change List* (Washington, DC: US Department of Transportation, Maritime Administration, Office of Policy and Plans, October 1, 2018); and "Number and Size of the US Flag Merchant Fleet and Its Share of the World Fleet," Bureau of Transportation Statistics (website), n.d., https://www.bts.gov/content/number-and-size-us-flag-merchant-fleet-and-its-share-world-fleet.

9. "US Ship Force Levels," United States Naval History and Heritage Command (website), November 17, 2017, https://www.history.navy.mil/research/histories/ship-histories/us-ship-force-levels.html.

costs of delayed services, and divestment of vessels. A recent example is the United States' underinvestment in the maritime industry during the multifront war on terrorism and the Great Recession. During this time, the US government favored cuts to maritime logistics because robust civilian trade routes could augment the Iraq War and the Afghanistan War. These routes masked the impact of years of neglect and enabled additional future delays. Today, beyond the Navy's steady-state capabilities, only 40 surge ships, each 40 years old, are ready to sail.[10] Unfavorable policies for the maritime industry and merchant marine academies have resulted in a shortage of 2,000 mariners.[11] The US government faces challenges in resolving ship and mariner shortages; building ships and gaining mariners takes years—especially those capable of maneuvering in contested Pacific littorals.[12]

Decades of government shortcuts and reactionary thinking have contributed to today's logistics capability shortfalls as military and civilian leaders often preserved combat platforms over logistical capabilities. For many of America's wars, extensive logistics were not needed to a great extent, a factor that could create an illusion that frontline forces alone can achieve national objectives. This thinking ignores the fact that a great force that cannot be employed and sustained is useless. Ultimately, a weak logistics system limits the United States' strategic options. Private industry typically underwrites these shortcuts, but archaic laws have gutted this segment. Further, a lack of military investment muted the industrial demand signal indicating which capabilities and what volume the military will require in an emergency.

The United States arrived at the war on terrorism already moving toward a lighter force but with general logistics concepts unchanged since WWII. The Iraq War and the Afghanistan War did not end quickly, and a noncontiguous battlefield replaced the long-assumed rear security area. Soon, increasing attacks along the LOCs demanded a quick solution to stem combat fatalities. The Army's solution was to increase the armor on its vehicles and have soldiers continue to perform the same missions.[13] Once in a near fight, the Army had no time to question or reenvision doctrine, techniques, or

10. Salvatore Mercogliano, "Suppose There Was a War and the Merchant Marine Didn't Come?," *Proceedings* 146 (January 2020).

11. Geoffrey Brown, "Strategic Sealift's Merchant Mariner Problem," *Center for International Maritime Security's Strategic Sealift Week* (blog), July 1, 2021, https://cimsec.org/strategic-sealifts-merchant-mariner-problem/.

12. "US Coast Guard Requirements for National Operator of Uninspected Passenger Vessels or Master up to 100 Tons," Maritime Institute (website), n.d., https://trlmi.com/u-s-coast-guard-captains-license-credential-requirements-oupv-up-to-100-gt/.

13. Norman Friedman, *This Truck Saved My Life!: Lessons Learned from the Mine Resistant Ambush Protected Vehicle Program* (Washington, DC: Joint Program Office Mine Resistant Ambush Protected Vehicles, December 2013).

logistics platforms' capabilities. The Army could have used red teaming of noncontiguous battlefield logistics as part of the lighter force design. Creative new concepts and platforms may have reduced ground movements or yielded safer transit solutions.

Future Operating Environment

As the US military entered the second decade of fighting the war on terrorism, leaders began realizing their forces were not adequately prepared for the rapidly changing operating environment. Despite accurate future predictions, the military was not ready for forward tactical and sustainment troop movements. During the war on terrorism, technology evolved exponentially—the size of capability jumps increased and the time between them decreased. The rapidly changing environment left the US military in an unenviable position: mired in conflict, unable to modernize, and losing its comparative advantage over adversaries. With the United States' recent focus on great power competition, the military is again becoming unprepared for the forthcoming sustainment demands at all levels of war and across the civilian and military logistics enterprises.

Future Pacific operations offer China distinct geographic, maritime, and technological advantages. China has purchased ports and fleet vessels across the globe.[14] Though its navy is underdeveloped, under the People's Republic of China's system, a Chinese flag carrier is essentially a military vessel.[15] As US capabilities shrank, China's grew. Now, China can control vital nodes such as the Panama Canal and the Strait of Malacca.[16] If the United States engages in Pacific operations, it will exacerbate the shortage of US maritime assets. Some maritime assets will divert to ancillary operations to seize critical nodes. On top of controlling key terrain and further dividing US capabilities, China has developed many superior and long-ranging technological systems, to include movement detection, communication denial, anti-access/area-denial (A2/AD), long-range precision missiles, and long-range stealth aircraft and submarines.[17] China's capabilities ensure detection of US forces before they

14. Alba Iulia Catrinel Popescu, "Control of Key Maritime Straits—China's Global Strategic Objective," *International Journal of Economics and Business Administration* 5, no. 1 (2017): 114.

15. Richard McGregor, "How the State Runs Business in China," *Guardian* (website), July 25, 2019, https://www.theguardian.com/world/2019/jul/25/china-business-xi-jinping-communist-party-state-private-enterprise-huawei.

16. Popescu, "Control of Key Maritime Straits," 114.

17. Office of the Secretary of Defense (OSD), *Military and Security Developments Involving the People's Republic of China 2020: Annual Report to Congress* (Washington, DC: OSD, August 21, 2020), 38–91.

depart their home station and the ability to track US forces throughout the area of operations.[18]

Enemies will also use emerging technologies US forces have not yet experienced. Almost any actor can now use attack drones.[19] Hobbyists have made air-, land-, and sea-based drones that autonomously navigate vast distances to precise locations through the use of open-source code, off-the-shelf mapping software, image recognition, and global positioning system capabilities. Drones could deliver explosives directly against US forces.[20] Adversaries can launch drones from a safe distance and wait for the target before attacking. These are cheap substitutes for precision-guided or "loitering" munitions, a way to achieve similar effects to a minefield and a mobile kill box rapidly.[21] Lastly, cyberspace and satellites are critical vulnerabilities in the interconnected modern world. Adversaries can use cyberspace and satellites to disrupt communications, mobilize domestic populaces, and navigate globally.[22]

The delay in logistics force development of concepts and platforms directly led to simulated defeat in recent US war games. Though the US military was using current concepts and platforms, it continued to lose. But a change in concepts enabled victory through increased logistics capabilities for strategic and littoral movements.[23] These findings exposed an essential assumption the Army, as part of a Joint Force, can rapidly project power, operate, and sustain forces worldwide. Given this end state is an essential underpinning of strategies defending existential and vital national interests, the Joint Force explored new ways to conduct operations.[24] Specifically, the Joint Force created

18. US Army Training and Doctrine Command (TRADOC), *The Operational Environment and the Changing Character of Warfare*, TRADOC Pamphlet 525-92 (Fort Eustis, VA: TRADOC, updated October 7, 2019), 23.

19. TRADOC, *Operational Environment*, 13–20.

20. T. X. Hammes, "The Future of Warfare: Small, Many, Smart vs. Few & Exquisite?," War on the Rocks (website), July 16, 2014, https://warontherocks.com/2014/07/the-future-of-warfare-small-many-smart-vs-few-exquisite/.

21. Hammes, "The Future of Warfare."

22. TRADOC, *Operational Environment*, 23.

23. James Kitfield, "'We're Going to Lose Fast:' US Air Force Held a War Game That Started with a Chinese Biological Attack," Yahoo News (website), March 10, 2021, https://news.yahoo.com/were-going-to-lose-fast-us-air-force-held-a-war-game-that-started-with-a-chinese-biological-attack-170003936.html; Colin Clark, "Not Enough C-17s, Tankers or Ships for Hot War: Transportation Command," Breaking Defense (website), May 2, 2017, https://breakingdefense.sites.breakingmedia.com/2017/05/not-enough-c-17s-tankers-or-ships-for-hot-war-transcom/; and Loren Thompson, "How the US Navy's Aging Sealift Fleet Could Lose America's Next War in Eurasia," *Forbes* (website), January 21, 2020, https://www.forbes.com/sites/lorenthompson/2020/01/21/how-the-us-navys-aging-sealift-fleet-could-lose-americas-next-war-in-eurasia/.

24. Tom Greenwood and Pat Savage, "In Search of a 21st-Century Joint Warfighting Concept," War on the Rocks (website), September 12, 2019, https://warontherocks.com/2019/09/in-search-of-a-21st-century-joint-warfighting-concept/.

a new Joint Warfighting Concept called all-domain operations. Under the new concept, the Joint Force attained strategic goals by dispersing forces in all domains to present multiple dilemmas to the enemy. The Joint Force also exploited opportunities based on enemy responses by synchronizing effects in all domains (sea, air, land, space, and cyber).[25]

Each service developed ways to support the Joint Warfighting Concept and identified necessary means. Called "multidomain operations," the Army's concept borrows from Antoine-Henri Jomini's concepts—specifically, dispersing forces and waiting to mass effects on the enemy by employing the most elite striking force at precisely the most susceptible location and critical moment.[26] Multidomain operations are an evolution of Jomini's concepts. But multidomain operations hinge on interconnectivity (any sensor, any shooter) to allow commanders to make rapid decisions and converge effects from any or all domains. For Jomini, coordinating fires with infantry and cavalry was difficult. Multidomain operations are an exponential leap to both literal and figurative dispersing and massing, in all domains, with near-perfect synchronization in purpose, space, time, and effect.

Multidomain operations' dispersion and convergence will create unprecedented difficulties for traditional logistics operations. Multidomain operations necessitate constant customization for simultaneous tasks, in ever-changing locations, for every individual unit. The concept requires the ability to insert survivable enablers rapidly ahead of conflict and requires strategic lift to project sizeable combat power despite global and all-domain contestation. Multidomain operations also demand units can disperse, operate, and self-sustain enough to confuse the enemy while also reconverging in time and space, ready to attack. Lastly, the multidomain operations concept assumes the logistics enterprise can sustain such dynamic operations. The Pacific's vast distances only add to this challenging task.

Multidomain operations require significantly more complex and contested logistics than the United States has encountered since WWII. Multidomain operations also exacerbate existing shortage problems. As discussed, sustainment platforms are both expensive and slow to produce. Regardless of ongoing combat capability modernization, treating sustainment as an afterthought will preclude the Army's ability to operate in this environment.

25. Andrew Feickert, *Defense Primer: Army Multi-Domain Operations*, Congressional Research Service (CRS) Report IF11409 (Washington, DC: CRS, updated November 21, 2022).

26. HQDA, *Operations*, Field Manual 3-0 (Washington, DC: HQDA, 2022), 3-1; and TRADOC, *The US Army in Multi-Domain Operations 2028*, TRADOC Pamphlet 525-3-1 (Fort Eustis, VA: TRADOC, updated December 6, 2018), 5.

Virtually no haven is out of China's reach and China offers fewer civilian options to augment the supply chain than in Europe and the Middle East.

Finding Informed, Untethered Solutions

If the United States wants to enact multidomain operations to improve its strategic influence in the Pacific, it must stop its pattern of reactive thinking about logistics capabilities. Prioritizing exquisite combat platforms and active duty end strength in budgets perpetuates the modern problem. Presently, logistical vulnerabilities span the tactical, operational, and strategic levels. These vulnerabilities resulted from years of atrophy in the maritime industry, associated military capabilities, and decades-old logistical concepts. A way forward should consider how logistics could be performed in the future. Rather than getting heavier with additional forces, the Army can conversely get lighter, require less sustainment, and use technology in place of a human footprint to simplify the calculus of Pacific expeditions. By coupling traditional (shipbuilding) and novel (unmanned delivery) solutions, the Army could find ways to decrease its capability gap more quickly and cost effectively.

Historical Insights on Logistics

Historical mindedness can help solve the current logistics dilemma. Nearly all Joint and Army Doctrine Publications about logistics focus heavily on the tactical level. Similarly, the past two decades of counterinsurgency wars caused the force to focus on solving immediate problems, often focusing down and in as opposed to focusing on the long-term picture. Conversely, Rear Admiral Henry Eccles focused on thoroughly understanding and influencing the logistics enterprise "up and out" from the operational level. Eccles's concepts of the "logistics bridge" between a nation and its military and the importance of keeping a "commander's view" and avoiding the "logistics snowball" serve as important lessons for modern planners.[27]

The Clausewitz of Logistics

In 1943, the Pacific Fleet commander entrusted Eccles with overseeing the arduous island hopping operations that ultimately won the war. Eccles would be honored with the Legion of Merit, followed by battleship command. But the Navy first asked Eccles to accept a flag-grade billet to create a logistics course as an equivalent to the command course.[28] Here, he would enshrine his

27. Henry E. Eccles, *Logistics in the National Defense* (Newport, RI: Naval War College Press, 1997), 10.

28. Eccles, *National Defense*, xvi–xviii.

experience and insight in the next generation of officers and Navy doctrine. His lectures fused practical operational and tactical experience with topics the senior service colleges are rediscovering today: the interplay of national policy and elements of national power; the continuum of conflict short of major war; testing plans through the suitability, acceptability, feasibility, and risk framework; and the understanding a commander in the field must be supported (Eccles's corollary is commanders understand logistics).[29] This later point Eccles would explain in two parts—logistics operations planning, rooted in strategic factors that inform options, and planning for logistical support, the direct sustainment of combat forces.[30] These ideas would form the basis for three books including *Logistics in the National Defense*, a 350-page treatise published in 1959. Eccles's insights earned him the nickname "the Clausewitz of logistics."[31]

To grasp Eccles's concepts fully, we must understand his vocabulary. Today the military commonly conflates the terms sustainment, logistics, and support. Even the Army's manuals do. Army manuals relate sustainment as all-encompassing, with logistics as a subset of sustainment.[32] Eccles reverses the definitions of sustainment and logistics used in Army manuals. For Eccles, "logistics operational planning" is the larger concept and "logistical support" occurs below the level of logistics operational planning.[33] Eccles uses "sustainment" to reference the most forward actions and services. As Eccles's nickname implies, he explores concepts of logistics and sustainment from multiple angles. But they all nest under his definition of logistics as "controlling all the means of war."[34] He then offers a critical insight the sole purpose of all logistics is "the creation and continued support of combat forces."[35]

Eccles's Logistics Bridge

Eccles's concept of logistics as a bridge results from unpacking, in breadth and depth, the importance of economic-logistic aptitude for commanders and civilian leaders. He is acutely insightful about how concerns shift at each level of command. But all levels overlap and combine to inform a national strategy and

29. Eccles, *National Defense*, 13–18, 58, 261–64.

30. Eccles, *National Defense*, 68–70.

31. Christopher R. Paparone and George L. Topic Jr., "The 'Clausewitz' of Logistics: Henry E. Eccles," *Army Sustainment* 46, no. 1 (February 2014): 9.

32. HQDA, *Sustainment*, Army Doctrinal Publication 4-0 (Washington, DC: HQDA, July 2019), vi, 1-1.

33. Eccles, *National Defense*, 68–70.

34. Eccles, *National Defense*, 10.

35. Eccles, *National Defense*, 252.

its operational objectives.[36] Eccles credits a contemporary with sparking his work expounding economic-military-logistic interconnections: "As the Link between the war front and the home front the logistic process is at once the military element in the nation's economy and the economic element in its military operations."[37]

Eccles displays how concepts about war and elements of national power weave together. Understanding his overarching argument is essential before discussing the deeper details. The main thesis of his book is a nation's resources and industry create an economy. Correspondingly, the size and type of economy limit the combat forces the nation can create. Additional factors such as leadership, tactical skill, and political acumen enhance or degrade the translation to war potential. Commanders and civilian leaders consider this war potential with internal military and external factors to develop a national strategy.[38]

Combining Eccles's definition of logistics and general thesis yields the following argument: the purpose of logistics is to create and support combat forces. A nation designs combat forces against a selected strategy stemming from the national objectives operating within the bounds of the national economy, as informed by natural and industrial resources. Such resources define a nation's means for war. Eccles defines logistics as controlling the means of war. This logical sequence ties logistics to military capabilities and ultimately to the selection of national strategy.

By tying logistics to military capabilities and national strategy selection, Eccles creates his synthesis, "logistics is the bridge between our national economy and the operations of our combat forces."[39] Rather than separating logistics from combat plans, Eccles believed logistical concerns must be solved in advance, hardwiring the right capabilities into the logistics enterprise. He uses parallel phrasing to drive home the connection. Eccles states applied strategy is "specific tactical operations preceded by logistical actions."[40] In another instance he states "specific logistics must precede a specific strategy" to create and sustain the necessary force.[41] He accepts organizations further down the chain of command turn to more immediate needs based on the provided force, but he believed all strategies and tactics are worthless without first setting the entire logistics bridge.

36. Eccles, *National Defense*, 57, 62, 65–68.

37. Eccles, *National Defense*, 5, 44.

38. Eccles, *National Defense*, 48–50, 65–68, 194, 222–27.

39. Eccles, *National Defense*, 56.

40. Henry E. Eccles, "Logistics and Strategy," *Naval War College Review* 11, no. 1 (January 1958): 11.

41. Eccles, *National Defense*, 316.

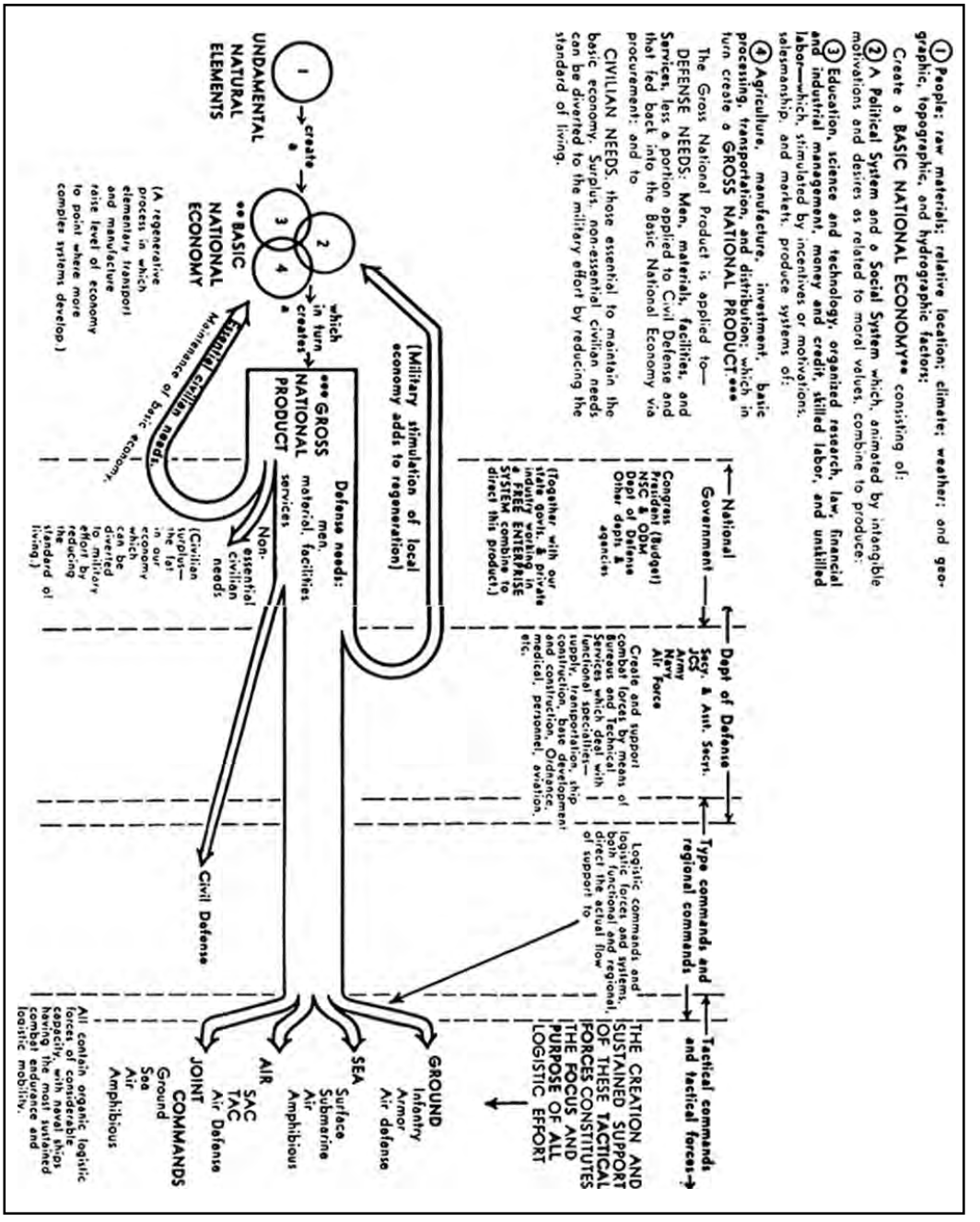

Figure 5-1. Eccles's logistics bridge (from Eccles, *National Defense*)

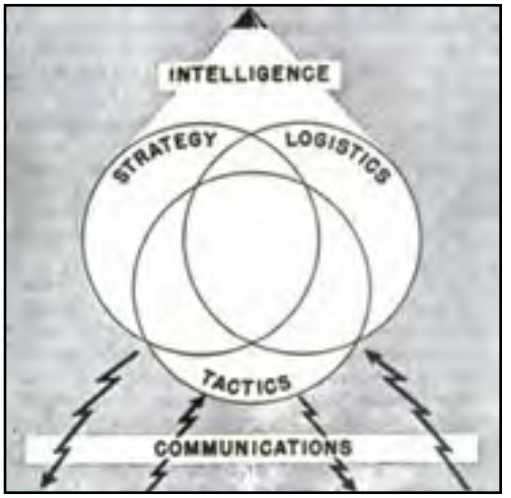

Figure 5-2. Eccles's commander's view (from Eccles, *National Defense*)

Replacing "economy" with "industrial base" increases the argument's clarity for modern readers. Viewing Eccles's sketch of the logistics bridge supports this interchange; the industrial base sets the upper limit of combat forces a nation can create. Logistical factors determine what combat forces can accomplish. Therefore, as shown in figure 5-1, logistics decide the strategy a nation can pursue.[42]

Logistics is the bridge between the industrial base and the operation of combat forces. This bridge, as a two-way connection, is an important metaphor. Since the industrial base and combat forces are tied to a common purpose, each side can influence the other to achieve that purpose. Further, bridges are rooted in engineering principles such as comprehensive planning, robust foundations, perfect alignment of both sides, and spans designed to support a given length and expected load.

The Commander's View

To Eccles, the commander's realm is understanding the interplay of strategy, logistics, and tactics while remembering how intelligence and communications cast light and shadows over each.[43] As shown in figure 5-2, a commander must not focus too intensely on any area without understanding how the combination of all areas shapes it.[44]

42. Eccles, *National Defense*, 54–55.

43. Eccles, "Logistics and Strategy," 8–9; and Eccles, *National Defense*, 19–21.

44. Eccles, *National Defense*, 20.

Through this illustration, Eccles elevates logistics to be ever present, interlinked, and coequal to the realms of tactics and strategy. Eccles also advises avoiding granularity when studying logistics because technical details rapidly absorb the discussion, and the true principles fall out of focus.[45] Eccles does not mean a depth of knowledge is not valuable; he directly argues the opposite.[46] To make his point, Eccles quotes Carl von Clausewitz: "[T]heory serves to pull up the weeds which error has sown everywhere."[47] This passage is part of Clausewitz's dialogue on the "commander's coup d'oeil," the ability to grasp complicated details at a glance.[48] A firm grasp of principles and a systems view enable a commander to focus his team during a crisis. Eccles establishes such a balanced view should drive decisions across echelons, from national policy, through force design, to shaping the logistics enterprise.

Preventing the Logistics Snowball

Preventing the "logistical snowball" is Eccles's most crucial synthesis.[49] Without understanding and applying the logistics bridge to inform a proper commander's view, logistical activities grow beyond all reason to deleterious effects. Eccles demonstrates how successive damage occurs to combat power, national policy, and costs through logistics planning and discipline errors.

Eccles's stated purpose of logistics is to sustain combat power. Unnecessary logistics personnel and equipment require more ships, supplies, port storage, cargo handling, and life support. These costs affect force design and what conflicts a nation is willing or able to enter.[50] Eccles also explains how different types of psychological overreaction can injure combat power. For example, suppose a complaint about logistics becomes public. In response to the complaint, the government taps the industrial base while sending more logistics forces to manage the system and the influx of associated material better, regardless of combat forces' actual needs. Increasing the logistics forces first consumes more of the national economy, including tax revenue and industrial capacity. Secondly, the expanded logistics activity full of nonessential personnel and equipment requires more storage facilities and cargo handling, longer waits to berth and discharge, and longer turnarounds for strategic and operational transportation assets. The combined effects of the expanded logistics activity ultimately decrease

45. Eccles, *National Defense*, 9, 52.

46. Eccles, *National Defense*, 312.

47. Carl von Clausewitz, *On War*, ed. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1989), 578.

48. Clausewitz, *On War*, 102.

49. Eccles, *National Defense*, 103.

50. Eccles, *National Defense*, xxii–xxiii, 30–31, 41, 67–68.

commanders' flexibility and prevent commanders from exploiting momentum.[51] As a theater evolves, these bloated activities become rigid and too cumbersome to transfer to more ideal locations.

Eccles used several case studies to illustrate the inputs and outcomes of what he termed the "snowball effect."[52] For example, suppose a 10-vehicle convoy must stop and becomes endangered because it used all 10 internal spare tires. The next mission will want an additional spare tire per vehicle, which will become a new norm. Soon, every battalion will order extra spare tires for every type of vehicle. This reality makes logisticians rapidly scale up forecasts across the logistics bridge to the industrial base. The industrial base's capability then begins producing tires in large quantities. Further, the government must agree to buy at whatever cost results from the rapid retooling and ramped-up production. Once the tires are produced, ships then use cargo space for the tires, which leads to extra requirements at each stop in the chain as workers cross load tires to other vessels, offload tires at advanced bases, and push tires forward to where no real shortage exists. The good intent to provide spare tires injures combat power by wasting money, time, manpower, and material at multiple echelons. Moreover, this case study is only for a single good or service. Consider this principle's simultaneous expansion to multiple commodities.

Eccles theorizes the snowball effect and its cost explosion are rooted in Americans' high standard of living coupled with a lack of logistics discipline from initial planners down to field ordering.[53] Commanders who do not understand the supply chain will order more and earlier than needed. Things that individually seem nominal add up without leaders resisting the snowball. History is replete with examples of this phenomenon. The North Vietnamese Army used 100 tons of nonfood supplies per day during the Vietnam War, and the US base exchanges alone shipped 1,350 tons of nonessentials per day.[54] Napoleon spent $3,000 per enemy killed. In World War I, the United States spent $21,000; by WWII, the nation had spent $200,000; and on the war on terrorism, the nation spent around $7.5 million.[55] The war on terrorism figure was calculated using only Department of Defense and Department of State

51. Eccles, *National Defense*, 113–14.

52. Eccles, *National Defense*, xxi, 103–95.

53. Eccles, *National Defense*, 103–4.

54. Eccles, *National Defense*, xxii.

55. Eccles, *National Defense*, 7; "US Budgetary Costs of Post-9/11 Wars through FY2022," Watson Institute for International and Public Affairs (website), September 2021, https://watson.brown.edu/costsofwar/figures/2021/BudgetaryCosts; and "Human Costs of US Post-9/11 Wars: Direct War Deaths in Major War Zones," Watson Institute for International and Public Affairs (website), September 2021, https://watson.brown.edu/costsofwar/figures/2021/WarDeathToll.

overseas contingency operations costs and opposition fighter figures. The snowball's costs injure military forces, industrial capacity, and the economy and influence national strategy decisions.

Eccles's argument is not to cut logistics to a bare minimum; in war, costs are of secondary importance, and not sustaining combat power violates the fundamental purpose of logistics.[56] Eccles's intent is to inform planners and commanders of the tradeoffs for not enforcing a commander's view of logistics in formations. He implies in many ways running light and lean has real benefits. His views, shaped by commanding Pacific operations, have renewed interest and value in readying the Army for Pacific operations. Eccles's key takeaway is all resources are limited somewhere along the logistics bridge.[57] At some point, resources' limits will forcefully alter a commander's view of the situation and eliminate what would otherwise have been viable options. Resource limits also add costs to the nation as the industrial base uses the wasteful funds or manufacturing capacity for other needs. By realizing any unneeded personnel and materiel clog the entire logistics bridge, planners can respond to commanders' shifting needs. Eccles proves residual capacity, such as underloaded ships or easily accessible ports, improves responsiveness via direct, ship to ship replenishment possibilities or faster port transfer.[58] Counterintuitively, residual capacity better sustains combat power than maximizing shipments and in-theater stockpiling. Proper force design incorporates residual capacity and discipline to prevent the logistics snowball.

Applying Eccles to the Multidomain Operations Strategy Gap

Section one explained a series of events that contributed to the military's current logistical shortfalls in carrying out national strategy. Section two demonstrated the necessary military force should be rooted in the nation's logistics enterprise. The current US force misalignment will struggle to meet the national strategy. Eccles portrays this position as untenable. Eccles's bridge shows logistics as the linchpin between the military and the nation. Across the two-way logistics bridge, industry shapes the military and the military can also influence the industrial base. The military should apply its influence to ensure readiness to meet assigned national strategies. Further, new technologies developing in the industrial base could prevent a logistics snowball and help produce a lighter and leaner logistics enterprise. The following section will expand on these new technologies.

56. Eccles, *National Defense*, 113–14, 124, 261–62, 321.

57. Eccles, *National Defense*, 113, 194–95.

58. Eccles, *National Defense*, 125–28, 153–78.

Additive Manufacturing and Predictive Logistics

For the Army to achieve its strategic ends in the Pacific against a near-peer threat, it must change its logistical support. In multidomain operations, combat forces disperse to survive, present the enemy with multiple conundrums, and remain flexible to exploit resulting opportunities. Lines of communication (LOCs) must follow similar guidelines or risk destruction. The Army teaches eight logistics principles to incorporate in operations.[59] At the core of the eight logistics principles is flexibility, both in response to combat forces' changing needs and in logisticians' ways of meeting combat forces' needs. Army doctrine echoes Eccles's fundamental principles of a military-industrial connection, a holistic commander's view, and an avoidance of system-clogging waste. These principles offer the creative military logistician a vision for new means to produce multiple, shorter, dispersed LOCs for a plethora of goods.

Eccles hoped his principles would better balance the tension between peacetime efficiency and wartime capability. Today, emerging technologies can improve both through industry-military partnerships. The military should leverage its influence to push industry for improvements in additive manufacturing and the IoT. By pushing for improvements, the military will advance technology and integrate it into the industrial base. Likewise, the military can absorb technological capabilities at multiple echelons, thus creating a more efficient and survivable force through shorter, flexible, and redundant LOCs.

Additive Manufacturing

Additive manufacturing, colloquially called 3D printing, will enable the reenvisioning of products and supply chains. The process is called "additive" manufacturing because it eliminates waste by using only the material needed for a specific function.[60] Conversely, traditional methods start with a piece of material and subtract portions to shape a good. Traditional techniques may still provide the best value in high-volume processes.[61] But additive manufacturing can augment traditional techniques should a factory line or supply chain break down. Additive manufacturing also allows cheap and rapid prototyping and dialogue between customers and designers.[62] Whether additive manufacturing is used to improve or customize a product, users incur little cost because no factory

59. HQDA, *Sustainment*, 1-2–1-4.

60. Rebecca Linke, "Additive Manufacturing, Explained," Massachusetts Institute of Technology Sloan School of Management (website), December 7, 2017, https://mitsloan.mit.edu/ideas-made-to-matter/additive-manufacturing-explained.

61. Linke, "Additive Manufacturing."

62. Linke, "Additive Manufacturing."

or tool changes are needed. The ability to create virtually anything anywhere and anytime provides advantages for the military and the nation's industrial base.

Additive manufacturing capabilities are often superior to traditional techniques as nearly any material can be used.[63] Additive manufacturing can build shapes from the inside out and thus create complex and intricate designs.[64] Additive manufacturing enables thinner, lighter, and more intricate parts than human hands can build.[65]

Every part has reduced waste, a smaller carbon footprint, and requires no downtime to retool. Further, every subassembly and end item can be reimagined to maximize cost, space, and weight.[66] These design characteristics save significant life-cycle fuel and maintenance costs, especially for military aircraft.[67]

Both the available materials and techniques range from simple to complex. Any material that can be spun into a filament or pulverized into powder can be used in additive manufacturing.[68] Additive manufacturing can even print titanium through directed energy deposition. To print titanium, a tiny laser continuously and microscopically "welds" the powder or filament.[69] Manufacturers use the cold spray technique for sensitive processes. In the cold spray technique, powder is supersonically jetted and this high-energy impact creates bonding in the desired area without heat. The cold spray technique allows new and unique options for modifying existing parts and repairing wear.[70] "Hybrid" machines can also add polished surfaces during the additive

63. "What Is Additive Manufacturing?," General Electric (website), n.d., https://www.ge.com/additive/additive-manufacturing.

64. Linke, "Additive Manufacturing."

65. "What Is Additive Manufacturing?"; Michelle J., "Topology Optimization for 3D Printing," 3Dnatives (website), December 9, 2020, https://www.3dnatives.com/en/topology-optimisation140820184/; and "Introduction to Topology Optimization," Engineering Product Design (website), n.d., https://engineeringproductdesign.com/knowledge-base/topology-optimization/.

66. Davide Sher, "GKN Announced 80% of Weight Saving in Additive Manufacturing Hydraulic Block Subassemblies," Additive News (website), March 15, 2020, https://additivenews.com/gkn-announced-80-weight-saving-am-hydraulic-block-subassemblies/.

67. Tamer Saraçyakupoğlu, "Usage of Additive Manufacturing and Topology Optimization Process for Weight Reduction Studies in the Aviation Industry," *Advances in Science, Technology, and Engineering Systems Journal* 6, no. 2 (March 2021): 815–20.

68. "Guide to 3D Printing Materials: Types, Applications, and Properties," Formlabs (website), n.d., https://formlabs.com/blog/3d-printing-materials/.

69. Abdollah Saboori et al., "An Overview of Additive Manufacturing of Titanium Components by Directed Energy Deposition: Microstructure and Mechanical Properties," *Applied Sciences* 7, no. 9 (September 2017): 883.

70. Ryan Bazinet, "Cold Spray Metal 3D Printing Tech & Printers," All3DP Pro (website), September 6, 2021, https://all3dp.com/1/cold-spray-metal-3d-printing-tech-printers/.

manufacturing process.[71] These processes make additive manufacturing applications nearly limitless.

The Internet of Things

The IoT is artificial intelligence enabled by a hyperconnected world with sensors embedded in nearly everything. The IoT derives its name from a network of big data that has been organized for use by things, not people. The IoT allows advanced analytics to find patterns and connections and share these findings to inform other systems' outputs.[72]

Explaining the IoT from a user's experience is easier. Your smart refrigerator, which can scan for barcodes or shapes, knows you took the milk out this morning and did not replace it.[73] The refrigerator knows you remove the milk without replacing it every few days, then the shape reappears, indicating a demand pattern. While driving through town, a reminder to buy milk pops up on your smartphone; clicking the reminder navigates you to a store. The reminder appeared because your phone sensed you were not at work, could read your calendar for the evening, and understood now was your best opportunity to buy milk. The IoT also works behind the scenes; the store your phone directed you to visit may have extra milk in its supply chain, or perhaps the milk was on sale, or maybe the store paid for geographic fencing services to direct you to them.[74] Many portions of the IoT are already used daily to improve consumers' lives and optimize business processes.

Rapid Growth and Military Use

The US government was an early investor in large-scale additive manufacturing. In 2012, President Barack Obama announced the creation of the first additive manufacturing institute and authorized the institute to incubate fifteen more.[75] By

71. "What Is Hybrid Manufacturing?," 3D Hybrid Solutions (website), n.d., https://www.3dhybridsolutions.com/whats-hybrid.html.

72. Josh Fruhlinger, "What is IoT? The Internet of Things Explained," Network World (website), May 13, 2020, https://www.networkworld.com/article/3207535/what-is-iot-the-internet-of-things-explained.html.

73. Kris Holt, "Amazon Is Reportedly Working on a Smart Fridge That Tracks What's Inside," TechCrunch (website), October 5, 2021, https://social.techcrunch.com/2021/10/05/amazon-is-reportedly-working-on-a-smart-fridge-that-tracks-whats-inside/.

74. Tamlin Magee, "Geofencing: What Is It?," Computerworld (website), February 24, 2020, https://www.computerworld.com/article/3528795/geofencing-what-is-it.html.

75. John F. Sargent Jr., *Obama Administration's Proposal to Establish a National Network for Manufacturing Innovation*, CRS Report R42625 (Washington, DC: CRS, updated February 27, 2014), 2.

2016, additive manufacturing patents and publications grew 400 percent.[76] Over President Obama's final term, the government invested $600 million in the institutes and private investments in additive manufacturing cleared $1.3 billion.[77] Domestic market revenue climbed from $1 billion in 2012 to $6.3 billion today.[78] Cash flow and stability are oft-cited fears in new and military markets; President Obama's efforts addressed both.[79] The Department of Defense oversaw the first additive manufacturing institute and its incubation mission and now oversees eight additive manufacturing institutes. These results prove the two-way nature of Eccles's bridge. Though military capability is rooted in industry; the military also drives industry.

Within three years of the first government investment in additive manufacturing, the military began to benefit. The Navy printed flight-critical engine components in-house and used them on the MV-22B Osprey in flight. The activity sent a picture captioned "what's next?" to their commander to celebrate the milestone.[80] The Marine Corps provided up to 70 printers to units across the Middle East to enable diverse capabilities such as printing drones; Bangalore torpedoes; Picatinny rails; and custom, mission-focused accessories.[81] The Marine Corps even made printer binder from recycled water bottles, ration packages, and utensils.[82] These successes inform a lighter, self-reliant future force by identifying ways to shorten the span of, and lighten the load on, the logistics bridge.

The Army is also using additive manufacturing. Project Convergence 2022 employs prototype warfare, rapidly fielding platforms targeting a specific need

76. Pascal Schmitt, Stefan Zorn, and Kilian Gericke, "Additive Manufacturing Research Landscape: A Literature Review," *Proceedings of the Design Society* 1 (August 2021): 335.

77. "New Progress in a Resurgent American Manufacturing Sector," White House Office of the Press Secretary (website), October 6, 2016, https://obamawhitehouse.archives.gov/the-press-office/2016/10/06/fact-sheet-new-progress-resurgent-american-manufacturing-sector.

78. Vipul Gupta, Pavel Nesterenko, and Brett Paull, "Chapter 1: An Introduction to 3D Printing," in *3D Printing in Chemical Sciences: Applications Across Chemistry* (London: Royal Society of Chemistry, 2019), 1.4.

79. Wesley Hallman, Nick Jones, and Robert Van Steenburg, "Annual Defense Sector Report Card," *National Defense* (website), February 2, 2022, https://www.nationaldefensemagazine.org/ articles/2022/2/2/annual-defense-sector-report-card-shows-failing-grade.

80. Craig Collins, "Additive Manufacturing," Defense Media Network (website), October 3, 2019, https://www.defensemedianetwork.com/stories/additive-manufacturing-department-of-defense-3d-printing-military-logistics/.

81. Hope Hodge Seck, "The Marines Are Sending 3D Printers to Combat Zones to Fix Their Gear Faster," Business Insider (website), July 6, 2017, https://www.businessinsider.com/marines-sending-3d-printers-to-combat-zones-to-fix-their-gear-faster-2017-7; and Miguel Cruz, "Adapting in Stride: Fighting Tomorrow's Battle Today," War on the Rocks (website), July 11, 2017, https://warontherocks.com/2017/07/adapting-in-stride-fighting-tomorrows-battle-today/.

82. Harold C. Hutchison, "How Marines Used a 3D Printer and a Little 'Grunt Ingenuity' to Make Gadgets That Help Them in Combat," We Are the Mighty (website), November 1, 2018, https://www.wearethemighty.com/mighty-trending/how-marines-used-a-3d-printer-and-a-little-grunt-ingenuity-to-make-gadgets-that-help-them-in-combat/.

while end users inform design iterations.[83] Additive manufacturing quickly and cheaply enables multiple improvements during events. This methodology frees up acquisition dollars, allowing the government to experiment more broadly and rapidly to attract new and innovative partners.[84] Many platforms' specifications incentivize additive manufacturing in construction and life cycle sustainment. The Army has also developed concrete printers, a deployable lab, and updated Rock Island Arsenal.[85] Soon the arsenal will have the world's largest metal printer capable of making jointless hulls for vehicles and more.[86] The Army also helped develop the current largest metal printer, which printed an entire boat from a binder incorporating local biomass.[87] These developments add even greater flexibility to expeditionary additive manufacturing. Efforts to expand additive manufacturing capabilities will protect the Army's supply chain from unforeseen issues or traditional delays.

To capitalize on the progress of these numerous and divergent efforts, the Department of Defense released a new instruction and a formal additive manufacturing strategy.[88] These send a demand signal to industry by requiring additive manufacturing in new contracts, purchasing organic additive manufacturing assets, and synchronizing efforts at the depot and service levels. Also, division-level commanders may purchase additive manufacturing equipment and services from smaller, local industry partners. Though the Department of Defense's instruction and formal strategy fall short of requiring or making funds specifically available for additive manufacturing, the

83. Nathan Strout, "At Second Project Convergence, US Army Experiments with Joint Operations in the Arizona Desert," C4ISRNET (website), November 10, 2021, https://www.c4isrnet.com/battlefield-tech/it-networks/2021/11/10/at-second-project-convergence-us-army-experiments-with-joint-operations-in-the-arizona-desert/; and Robert Kozloski, "The Path to Prototype Warfare," War on the Rocks (website), July 17, 2017, https://warontherocks.com/2017/07/the-path-to-prototype-warfare/.

84. Yasmin Tadjdeh, "Special Report: Pentagon Struggles to Attract New Entrants into Industrial Base," *National Defense* (website), February 4, 2022, https://www.nationaldefensemagazine.org/articles/2022/2/4/pentagon-struggles-to-attract-new-entrants-into-industrial-base.

85. Collins, "Military Game-Changer"; and Debralee Best, "RIA-JMTC Additive Manufacturing Center of Excellence Marks Initial Operating Capability with Ribbon," US Army (website), May 16, 2019, https://www.army.mil/article/221932/ria_jmtc_additive_manufacturing_center_of_excellence_marks_initial_operating_capability_with_ribbon.

86. Jerome Aliotta, "Ground Vehicle Systems Center Awards Contract to Build Largest Metal 3D Printer Ever," Defense Visual Information Distribution Service (website), June 1, 2021, https://www.dvidshub.net/news/397953/gvsc-awards-contract-build-largest-metal-3d-printer-ever.

87. Carlota V., "University of Maine Creates the World's Largest 3D Printed Boat," 3Dnatives (website), October 16, 2019, https://www.3dnatives.com/en/3d-printed-boat-university-of-maine-161020195/.

88. Office of the Under Secretary of Defense for Research and Engineering, *Use of Additive Manufacturing in the Department of Defense*, Department of Defense (DoD) Instruction 5000.93 (Washington, DC: DoD, updated July 6, 2021), 10–12; and Joint Defense Manufacturing Council, *Department of Defense Additive Manufacturing Strategy* (Washington, DC: DoD, January 2021), 9–11, 13, 16.

Department of Defense's efforts benefit both the economy and the military, just as Eccles foretold.

Simultaneously, the IoT is moving the Army toward predictive logistics.[89] The most developed input is the Prognostic and Predictive Maintenance initiative. United States (US) Army Materiel Command leads the Prognostic and Predictive Maintenance effort and has touchpoints with numerous partners such as the Defense Logistics Agency, United States Combined Arms Support Command, and US Army Futures Command. Army Materiel Command and its partners have already begun implementing Prognostic and Predictive Maintenance at Project Convergence and selected a unit at Fort Stewart to test and grow the capability. The Army will continue testing Prognostic and Predictive Maintenance capabilities during Project Convergence 2024, and the service plans to upgrade unit maintenance in the future.[90]

Inevitable Convergence

We live in the fourth Industrial Revolution. The first saw steam, a new form of power, replace human and animal labor with machines of production and transit. The second saw electricity enable new inventions and the assembly line to produce them. The third turned electricity into a new form of power, rapid information, through computers. The fourth combines the second and third. Hyperconnectivity will feed voluminous real-time data to computers for processing to improve the human experience. The ongoing convergence of additive manufacturing and the IoT, which are of civilian and military interest, is called "logistics for the fourth Industrial Revolution" (LOG 4.0).[91] This convergence will disrupt the entire logistics enterprise.[92]

Two rival global logistics companies, DHL and United Parcel Service, display the imminent rise of LOG 4.0. DHL has revolutionized the integrated data industry; embedding sensors and robotics to optimize every square inch of warehouses and transports in its global inventory. Real-time cloud computing, pattern recognition, and predictive analytics allow artificial intelligence to

89. Major General Charles R. Hamilton and Lieutenant Colonel Edward K. Woo, "The Road to Predictive Logistics: Perspectives from the 8th Theater Sustainment Command," US Army (website), November 4, 2019, https://www.army.mil/article/227933/the_road_to_predictive_logistics_perspectives_from_the_8th_theater_sustainment_command.

90. Jen Judson, "Army Sets Sights on 2024 for Next Project Convergence," *Defense News* (website), February 7, 2023, https://www.defensenews.com/land/2023/02/07/army-sets-sights-on-2024-for-next-project-convergence/.

91. Peter Layton, *Prototype Warfare, Innovation, and the Fourth Industrial Age* (Canberra, AU: Air Power Development Centre, 2019), 2–8, 14–17, 55–56.

92. Eliana P. Barleta, Gabriel Perez, and Ricardo J. Sanchez, "Industry 4.0 and the Emergence of Logistics 4.0," *Facilitation of Transport and Trade in Latin America and the Caribbean Bulletin* 375, no. 7 (2019): 3.

synchronize a global enterprise better than humans.[93] United Parcel Service has invested in additive manufacturing, believing the future is moving data, not objects.[94] Offering consumers additive manufacturing means the good is instantly transited. Combine DHL's data dominance with United Parcel Service's vision of the future, and the impending revolution seems evident. Pricing reflects factory, warehouse, and logistics overhead. The fourth Industrial Revolution nearly eliminates these costs. Further, Amazon.com's model already exists at the intersection of sensors, customers, logistics, and manufacturing.

The fourth Industrial Revolution will move the defense industry to a whole-of-enterprise view of logistics. Currently, the military separately considers transportation, supply, maintenance, acquisitions, and field services. The technology for convergence is already used seamlessly in the daily lives of civilians. Remember Eccles's anecdote about overloading vessels to increase throughput: isolated decisions can work against the system's purpose. The IoT will enable customized decisions for warehousing, ordering, manufacturing, transportation, in-transit visibility, local distribution, and even maintenance, all in relation to the others. With Prognostic and Predictive Maintenance's arrival, convergence for the military is set. The Global Combat Support System-Army already provides real-time inventory by location, shipment tracking, and funds available.[95] Artificial intelligence will monitor this data and direct best-value actions across the supply chain. In peacetime, artificial intelligence maximizes purchasing dollars. In combat, it maximizes sustained combat power for commanders. When coupled with existing industrial robotics, additive manufacturing, and unmanned transportation, LOG 4.0 foreshadows a future with increasingly autonomous supply chains.

Challenges to Adaptation

Not everything is lining up perfectly for LOG 4.0. A few hurdles remain, such as data rights and integrity. Contractors believe they own the rights to every system component in perpetuity.[96] As platforms age, more components need replacing, but demand is minimal, creating a lengthening backorder list

93. *DHL: Delivering the World*, directed by Paul Kittel, featuring Lewis Macleod, aired January 13–31, 2019, on Channel 5 (United Kingdom), https://vimeo.com/ondemand/deliveringtheworld.

94. Bob Trebilcock, "3D Printing Is Emerging as a Core Focus for United Parcel Service," *Logistics Management* (website), April 20, 2020, https://www.logisticsmgmt.com/article/3d_printing_is_emerging_as_a_core_focus_for_ups.

95. HQDA, *2013 Weapon Systems Handbook* (Washington, DC: HQDA, 2013), 118–19.

96. Jen Judson, "US Army Developing Process for Using 3D Printing at Depots and in the Field," *Defense News* (website), February 4, 2020, https://www.defensenews.com/land/2020/02/04/us-army-developing-process-for-using-3d-printing-at-depots-and-in-the-field/.

that affects military readiness. The wait for replacement components might be years.[97] Vendors will not make parts unless doing so is profitable; retooling for limited production raises the cost a manufacturer must charge and often forces the government to purchase unneeded volumes and bear subsequent storage costs. Additionally, the design drawings for system components often do not provide the data required for additive manufacturing. Solutions exist, such as 3D laser scanners and embedded sensors on 3D printers to certify tolerances and density during printing.[98] But the military assumes liability for design, manufacturing, certification, and resulting system damage.

Key questions related to data rights and file integrity include how to secure digital libraries and adequately compensate for the libraries' use. The fourth Industrial Revolution enables companies to produce goods domestically in a more secure environment that inhibits intellectual property theft. Further, the military always pays for system components, so fair and reasonable compensation should be issued to vendors unwilling to participate in digital libraries, and the vendors can pursue restitution later. Government contracting officers are trained to handle vendor relationships and compensation. The ultimate technological solution is called the digital thread and digital twin.[99] Private companies and the military are establishing digital exchanges to track data integrity, ensure payment, and start the digital thread.[100] These exchanges ensure file and payment integrity through the same technology empowering cryptocurrency—the blockchain.[101]

A blockchain is a vast number of certified and trusted nodes that witness every transaction. Only these nodes can make changes, and data is never overwritten—the data is added to and thus inspectable. Hacking blockchains is impossible because every node must certify and accept changes or the changes will be denied. Even after a change is made, when, what, and who made the change is auditable.[102]

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97. Collins, "Military Game-Changer."

98. "The Best Professional Handheld 3D Scanners," All3DP (website), updated February 10, 2023, https://all3dp.com/1/best-professional-3d-scanners-industrial/; and Collins, "Military Game-Changer."

99. Ginger Gardiner, "Digital Thread vs. Digital Twin," CompositesWorld (website), June 30, 2020, https://www.compositesworld.com/articles/digital-thread-vs-digital-twin (page discontinued).

100. "The Future Is Now: AMC Implements Additive Manufacturing Digital Thread," *PS: The Preventive Maintenance Magazine* (website), August 24, 2021, https://www.psmagazine.army.mil/News/Article/2743291/the-future-is-now-amc-implements-additive-manufacturing-digital-thread/.

101. Jon McCarter, "Department of the Navy Innovator Embraces a New Disruptive Technology: Blockchain," NavalX (website), June 22, 2017, https://www.secnav.navy.mil/innovation/Pages/2017/06/BlockChain.aspx.

102. Stuart Trouton and Jason Killmeyer, "3D Opportunity for Blockchain: Additive Manufacturing Links the Digital Thread," Deloitte Insights (website), November 17, 2016, https://www2.deloitte.com/content/www/us/en/insights/focus/3d-opportunity/3d-printing-blockchain-in-manufacturing.html; McCarter, "Navy Innovator"; and Barleta, Perez, and Sanchez, "Industry 4.0."

The essence of the digital thread is a recording of a blockchain pulling a design from a secure database, printing it, and creating the item's digital twin. The digital twin is like a public works department's geographical information system, which records in-depth information about facilities and infrastructure in an easily viewable, map-like interface. Through the IoT, products' digital twins would also know the status of platform sensors, know when subassemblies were changed, and enable predictions for preventative maintenance. The digital twin is a living, virtual model.

The Department of Defense additive manufacturing strategy absorbed the Navy's model of addressing data integrity and part certification.[103] The Department of Defense's additive manufacturing strategy identifies green parts (routine, low risk) and blue parts (life safety critical) and archives approved data packages in a secured cloud database. Units are empowered to assume risk with green parts, even letting technicians create data packages if data packages are not available. Units may still make blue parts internally, but blue parts require higher coordination and additional certifications for the printer, material, and quality assurance.[104] Military internal printing is just an augmentation, though it may appear to compete with industry. By printing internally, the military signals the industrial base to embrace additive manufacturing's responsiveness and flexibility if vendors want to be reliable. By printing internally and signaling the industrial base, the military creates a win-win situation that emboldens the military with self-reliance in future expeditionary environments and increases the quality of additive manufacturing in the national economy.

Next Steps for Integration

Currently, the technology for additive manufacturing and the IoT exists, but humans mistrust both additive manufacturing and the IoT which slows their convergence and impedes the new economic model LOG 4.0 could unleash. But the military must overcome this mistrust and continue pushing a demand signal to private industry. Additive manufacturing, the IoT, and LOG 4.0 provide a perfect opportunity to leverage the two-way logistics bridge relationship and reach back to pull a needed capability forward. The fourth Industrial Revolution offers solutions to the shortage of lift and the challenge of distance, enables smaller and lighter end products, and decreases logistics activities' size and needed inventory. The military must also prioritize telling legislators to continue funding the additive manufacturing institutes and undertake reforms to speed additive manufacturing's development and

103. Joint Defense Manufacturing Council, *Additive Manufacturing Strategy*, 13–14.

104. Collins, "Military Game-Changer."

create a digital rights market. Investments in additive manufacturing ensure the US economy leads an emerging field, improves domestic manufacturing, and strengthens industry-military trust. In short, LOG 4.0 aligns industry and military capabilities to ensure the US military can meet the nation's demands in the Pacific theater and all other environments.

Recommended Next Steps

The fourth Industrial Revolution both informs and enables platform and process modernization. Additive manufacturing and predictive analytics at depots, installations, theater support commands, and sustainment brigades can rapidly create redundant capability and flexibility. Any operationalization of LOG 4.0 in peacetime coupled with the technology's rapid growth and soldier creativity will perpetuate more growth.

Having additive manufacturing as far forward as possible reduces supply line distance and reduces the number of National Stock Numbers to acquire and track. Raw additive manufacturing material packs densely, making for efficient use of space and simpler handling. These benefits help address the Joint Force's transit shortage. Less material and manpower must cross the logistics bridge if the military sets the theater for additive manufacturing material and capabilities in host nations. Also, local sources markets are created if the host nation can produce parts.

A second benefit of forward-based additive manufacturing is strategic lift will carry more weight but fewer cubes, making port operations faster. The result makes more shipping available across the theater. Developing additive manufacturing in host countries through partnership with other instruments of power is an essential next step for the Army. Theater Army and combatant commanders should discuss partnership and investment opportunities with leaders from the diplomatic and economic communities. Understanding a theater's available raw materials and creating civilian industrial demand for additive manufacturing helps set the theater. Partnership and investment also stabilizes countries outside Chinese influence by making them internally resilient to supply chain problems in the event of war.

Another benefit of aggressively investing in additive manufacturing both in the military and through civilian partnerships is the positive effect on the industrial base. A healthy additive manufacturing field will give logisticians more flexibility and enable commanders to employ sustainable combat power. Due to the Army lacking a fighting and sustainment vision for multidomain operations in the Pacific, now is a perfect time to replace declaratives in

acquisition statements with capability-focused questions. For example, "how could littoral outposts be resupplied while prioritizing dispersion for forces and logistics hubs to limit losses in an attack?" If framed by the tri-service maritime strategy (simple and quantity) and using LOG 4.0 technology, industry partners will use smaller, lighter, and autonomous air, surface, and subsurface solutions.

Additive manufacturing and experimental logistics capabilities come with costs to finances and steady-state efficiency. Eccles again has an insight: costs should be minimized but ultimately judged by their effect on combat, not peacetime efficiency.[105] Entering conflict with peacetime efficiency will increase the cost of transitioning to war. Should the nation desire to act, logistics must first transition to wartime techniques, offering commanders few rapid options. The upfront costs of this transition may deter the nation from undertaking desirable strategic goals. Eccles's insight to prioritize setting the entire logistics enterprise proves valuable to the modern professional. Multidomain operations and the competition continuum assume rapid transitions between competition and conflict.

To hedge against the short-term cost of development and transformation, the Department of Defense should prioritize United States Indo-Pacific Command (USINDOPACOM) as the first command to use more advanced logistics capabilities, especially its theater support command units and sustainment brigades. Other combatant commands can more easily survive on traditional sustainment in the near term. An integrated planning team from the combatant commands, with an active liaison from the Army's lead additive manufacturing organization (selection pending, per Department of Defense instruction 5000.93), United States Combined Arms Support Command, and US Army Futures Command can ensure meaningful progress toward LOG 4.0's promise: a predictive and optimized supply chain.

Conclusion

Returning to Eccles's metaphorical bridge, bridges can fail from the strain caused by excessive volumes and overly long spans, especially when combined with damaging environmental conditions. Anything that reduces these stressors is beneficial to those reliant on the bridge. The fourth Industrial Revolution reduces demand, optimizes processes, and enables reenvisioning sustainment techniques and platforms. Logisticians and commanders must

105. Eccles, *National Defense*, 162, 175.

become subject matter experts on disruptive technologies in the emerging environment and lead their implementation in the military.

The Army alone cannot project nor sustain meaningful, survivable combat power throughout the Pacific. The Navy and United States Military Sealift Command cannot fill the gaps due to military and merchant marine shortfalls. The Army's multidomain operations concept will exacerbate the challenge of projecting and sustaining combat power in the Pacific by straining logistics beyond anything the United States has attempted before.

This chapter aims to provide baseline information to begin a dialogue regarding the presented challenges. First, what role can the military play in resolving archaic laws detrimental to the maritime industry? Policy currently forces uncompetitive pricing and bans partnering with allies. Second, should the military concede some of its budget to other instruments of power and to advice on economic incentives to revive the industrial base? Logistics that align the industrial base with forward force requirements decide the strategies a nation can pursue. Third, when should reinvestment in logistics capabilities begin? Logistics capabilities are slow to develop and expensive to maintain, but the current balance deviates from the stated strategy. Fourth, could rethinking the entire scheme of sustainment result in new methods that better align with multidomain operations? Old concepts colored by new technologies provide promise. Lastly, the Army and the Joint Force must break the cycle of treating logistics as an afterthought. Such a posture results in tremendous costs during conflict and offers adversaries a foothold in their battle against the national will.

A hybrid approach of all the above is most feasible. The military must tell Congress to save the maritime industry. The military must extend the life of current marine platforms and build new ones. Also, the military should use LOG 4.0 to inform new sustainment concepts, platforms, and doctrine. Here again, Eccles serves as a guide—reduce handling by directly replenishing forces. Modern unmanned systems and precision airdrop systems meet this charge. Direct delivery from ships, or planes, allows materials to be transported closer to highly mobile units and untethers the force from vulnerable static nodes. The fourth Industrial Revolution enables a spiral of demand reduction, as fewer troops and less fuel are needed due to shorter LOCs and lighter autonomous or leader-follower delivery.

This chapter started with an assertion the military cannot project and sustain combat power in a contested Pacific region. Logistics was the soft underbelly of recent campaigns against an inferior enemy over

simple geography. A near-peer enemy will create a contested and complex environment exacerbated by great distances and logistics capability gaps. The extreme novelty of the multidomain operations concept leaves warfighters and sustainers in a knowledge vacuum. Concepts are easy to write, but they must be proven in the real world, where the laws of Newtonian physics govern possibilities. The lack of Army doctrine for the Pacific limits the possible recommendations for setting conditions at the operational and strategic levels. If the argued culture of innovation and initiative is created, then entirely novel solutions, informed by Eccles's principles, will integrate new technologies and processes into the military. Novel solutions will better perform Eccles's single purpose of logistics: to project and sustain combat power in pursuit of national strategic objectives.

— 6 —

Informed Competition: The Theater Army's Role in the Information Environment

Colonel Timothy A. Sikorski

In his 2018 National Defense Strategy, Secretary of Defense James Mattis stated that the United States is entering a "period of strategic atrophy" following two decades of fighting terrorism perpetrated by nonstate actors.[1] Prolonged conflict created a generation of experienced warriors who were adept at winning tactical engagements in counterterrorism and counterinsurgency operations. Despite the tactical prowess of US forces, adversaries with limited means proved to be determined foes, capable of inhibiting the United States from achieving its strategic objectives. High operational tempo, multiple combat deployments, and ill-defined end states generated conditions that made victory elusive for the United States. This struggle to achieve strategic ends occurred under conditions in which the United States enjoyed uncontested communications, strategic lift, air superiority, and use of space-based platforms—all of which will be contested in future conflicts. Although the United States primarily focused on counterinsurgency in Afghanistan, Iraq, and elsewhere, adversaries like China and Russia heavily invested in capabilities to challenge the United States' dominance across the land, sea, air, cyber, and space domains in the event of a confrontation.[2] The 2018 National Defense Strategy recognized these challenges and identified competition with

1. Department of Defense (DoD), *Summary of the 2018 National Defense Strategy of the United States of America* (Washington, DC: DoD, 2018), 1.

2. DoD, *Summary*, 3.

China and Russia as the priority for the Department of Defense to counter their rising influence at the expense of the United States and its allies.[3]

Maintaining a competitive advantage in the context of national security requires a nuanced application of military instruments of power. Focusing on competition with China and Russia presents a significant shift from previous National Defense Strategies, which emphasized defeating violent extremism and containing the instability caused by rogue states.[4] The emphasis in strategic direction toward competition now places an equal—if not greater—focus on the military's role in national security before any shots are fired.

The Joint Staff describes competition as a continuum that spans from engagements, security cooperation, and deterrence; to conflict response and contingency operations; to major combat operations and campaigns—with no precise transitions separating those activities.[5] These activities are part of a whole-of-government effort to advance national political objectives and deny adversaries the opportunity to pursue objectives that are harmful to the United States.[6] Deterrence, conflict response, and contingency operations are about influencing the choices of adversaries to either prevent or de-escalate an emerging conflict. Engagements and security cooperation build relationships to influence allies and partners to cooperate in pursuing common goals and maintaining international norms and a rules-based order. Keeping the breadth and scope of military competition in mind, the role of information increases in significance with the focus on competition toward maintaining influence and positional advantage. The Joint Force plays a critical role in competition, particularly through forces that are postured to reassure allies and deter adversaries, with theater armies playing a key role by setting the theater. All military activities have an informational effect, and the theater armies are best postured to enable the United States to understand a complex information environment and set the conditions to achieve decision dominance by converging effects through multiple domains.

This chapter examines the role of the Joint Force in shaping the information environment during competition, with an emphasis on the theater army's actions. Examination of threats in the information environment shape requirements on how the Joint Force employs the national levers of diplomatic,

3. DoD, *Summary*, 4.

4. DoD, *National Defense Strategy* (Washington, DC: DoD, June 2008), 9.

5. Joint Chiefs of Staff (JCS), *Doctrine for the Armed Forces of the United States*, Joint Publication (JP) 1 (Washington, DC: JCS, 2017).

6. James C. McConville, *The Army in Military Competition*, Chief of Staff Paper no. 2 (Washington, DC: Headquarters, Department of the Army [HQDA], March 1, 2021), iv.

military, and economic power to support the information instrument of power. Requirements for the Joint Force to operate in the information environment are derived from understanding threats and how instruments of national power are related. As part of the Joint Force, theater armies play a critical role in competing for influence, understanding the information environment, and setting conditions to employ forces and capabilities to prevail in a contested information space.

Threats

Addressing Joint Force requirements in the information environment requires an understanding of how adversaries leverage the information environment to challenge the United States. Joint doctrine defines the information environment as "[t]he aggregate of social, cultural, linguistic, psychological, technical, and physical factors that affect how humans and automated systems derive meaning from, act upon, and are impacted by information, including the individuals, organizations, and systems that collect, process, disseminate, or use information."[7] China and Russia have goals of expanding influence (that is, dominance) over their respective neighbors, which they can only accomplish by challenging the post–Cold War international order that the United States and its allies built and maintain.[8] Unable to pose a direct military challenge to the United States and its allies, China and Russia pursue indirect means and novel uses of technology to gain positional advantage and negate US strengths. Many of these means focus on affecting decision making by influencing perceptions of key audiences, eroding cohesion of alliances, sowing disinformation, and controlling cyberspace and the electromagnetic spectrum (EMS)—all with the aim of undermining the will of the United States to act where its interests and those of China and Russia collide.

A review of Chinese and Russian activities and strategies in the information environment is indicative of how most threat actors will seek to counter the military advantages of the United States and gain competitive advantages short of armed conflict. At present—and in the foreseeable future—the United States can expect to confront persistent cyberattacks to steal information and threaten infrastructure disruption, propagation of disinformation narratives to undermine domestic policy and alliance structures, use of proxies and

7. JCS, *Information in Joint Operation,* JP 3-04 (Washington, DC: JCS, 2022), GL-5.

8. Eric A. Posner, "Sorry, America, the New World Order Is Dead," *Foreign Policy* (website), May 6, 2014, https://foreignpolicy.com/2014/05/06/sorry-america-the-new-world-order-is-dead/.

obfuscation to delay decision making, and demonstrations of force and capability challenging access to theaters as a deterrent.

China

China operates under its "three warfares" concept to advance its strategic objectives via psychological warfare, public opinion warfare, and legal warfare. Though published in 2003, this broadened concept of warfare aligns with Sun Tzu's maxim that "to subdue the enemy without fighting is the acme of skill."[9] During the Chinese Civil War, Mao Zedong emphasized leveraging the People's Liberation Army as a tool of the Chinese Communist Party to conduct political warfare and propaganda in addition to armed conflict, laying the foundation for the modern three warfares concept.[10] Understanding this historical continuity is important as China's strategic objectives are focused on achieving national rejuvenation following a century of humiliation from Western colonial powers that preceded the founding of the People's Republic of China.[11] The leadership of the People's Republic of China views the application of its socialist and authoritarian ideology at home and abroad as crucial to its rejuvenation. Recognizing this will cause tension with the West—specifically with China's efforts to restructure the international order in its favor and reintegrate Taiwan and Hong Kong under Chinese Communist Party control.[12]

The three warfares concept focuses on gaining long term advantage in the cognitive dimension of China's domestic population and foreign audiences. Public opinion warfare mobilizes China's vast population to ensure ideological conformity while shaping policy discussions abroad via a variety of diplomatic and economic means, such as using the Belt and Road Initiative and Confucius Institutes to spread global economic and cultural ties.[13] Psychological warfare focuses on affecting the decision making and behavior of key actors. China leverages social media to promote the Belt and Road Initiative, undermine Western policies and democratic institutions through disinformation campaigns, and intimidate and coerce expatriates to promote Chinese Communist Party narratives.[14] Legal warfare focuses on the manipulation of domestic and international law to advance interests and suppress dissent this concept was most recently applied to China's expansive

9. Sun Tzu, *The Art of War,* trans. Samuel B. Griffith (Oxford, UK: Oxford University Press, 1963), 77.

10. Mao Zedong, *The Selected Works of Mao Tse-Tung* (Beijing: People's Publishing House, 1960), 1:105–6.

11. Office of the Secretary of Defense (OSD), *Military and Security Developments Involving the People's Republic of China 2020* (Washington, DC: OSD, September 1, 2020), 4.

12. OSD, *Military and Security Developments*, 3, 7.

13. OSD, *Military and Security Developments,* 131.

14. OSD, *Military and Security Developments,* 131.

territorial claims in the East and South China Seas and political suppression in Hong Kong.[15] Use of legal means in the international arena is also a means to undermine the Western international order by using Western-built institutions to contest established norms and behaviors in China's favor.

The People's Liberation Army also developed a robust cyber and electronic warfare (EW) capability to buttress the three warfares concept by controlling information flow across cyberspace and the EMS, further affecting adversary decision making. Routine training and integration of EW, cyber, and space capabilities in field exercises demonstrates the People's Liberation Army's ability to jam the communication and navigation systems of potential adversaries. The People's Liberation Army considers investment in offensive cyber capabilities as vital to its modernization and has demonstrated the ability to hold critical assets at risk in cyberspace by infiltrating and maintaining a persistent presence on US government and civilian networks.[16] By holding key civilian and military infrastructure at risk—and signaling the capability and intent to do so—the People's Liberation Army adds additional credibility to the Chinese Communist Party's intent to achieve its national rejuvenation goals without breaking the threshold of armed conflict.

Russia

The United States faces similar challenges with Russia. Russia's strategic objectives are comparable to China's, emphasizing both informational and military power as competitive means to achieve strategic objectives below thresholds that would trigger armed conflict with the West. Where the two countries differ is with the aggressiveness and intensity of actions. China is taking a decades-long approach toward achieving its strategic objectives, with the 2049 centenary of the People's Republic of China's founding set as the benchmark for the fulfillment of China's rejuvenation goals—to include full reintegration with Taiwan.[17] Russia's self-perception as a global power broker, coupled with what it perceives as risks emanating from the West, has driven it to be more aggressive, as seen with its military interventions and

15. Brahma Chellaney, "China Runs Roughshod over International Law to Expand Its Territory and Influence without Firing a Shot," MarketWatch (website), updated December 11, 2021, https://www.marketwatch.com/story/china-runs-roughshod-over-international-law-to-expand-its-territory-and-influence-without-firing-a-shot-11638981324.

16. OSD, *Military and Security Developments*, 83..

17. OSD, *Military and Security Developments*, 3.

focused information campaigns against neighboring states, the United States, and Europe.[18]

Following the collapse of the Soviet Union and the eastward expansion of NATO and the EU, Russia viewed preserving its sphere of influence with former Soviet states as crucial to its survival. Key to maintaining influence is advancing the narrative of Russian exceptionalism and the Russian state's role as the leader and protector of ethnic Russians, particularly those who were separated from their country following the collapse of the Soviet Union.[19] This idea of a *Russkiy Mir* (Russian World) is a means through which the state promotes themes of Russian identity abroad and justifies actions to protect ethnic Russians—regardless of citizenship status or neighboring state sovereignty.[20] This impulse to protect the *Russkiy Mir* is more than just bluster, as Russia has shown a willingness to conduct interventions in its near abroad and is more militarily engaged outside its borders than any other US competitor—as shown with the 2008 war in Georgia, the 2014 annexation of Crimea, the 2015 intervention in Syria, and the recent invasion of Ukraine.[21] Creative uses of information warfare and direct military intervention, which are often mutually supporting efforts, characterize the means that Russia uses to ensure influence over its neighbors' affairs.

Prioritizing information to compete with the West stems from Russia's perception that Western countries and NATO, led by the United States, are using the same means to undermine Russia's status as a great power and subvert *Russkiy Mir*. As noted by Keir Giles in his study of Russian information warfare, "The perceived threat is an existential one. The received wisdom in Russia is that 'information confrontation campaigns' are developed by the West to compromise Russia's national sovereignty and facilitate regime change."[22] These perceived, Western-led information campaigns are exemplified by color revolutions in former Soviet states, mass protests following contested Russian elections in 2011, and US support to the Arab Spring protests. With Russian leadership "apparently unable to conceptualise [*sic*] spontaneous public

18. Samuel Charap et al., *Russia's Military Interventions: Patterns, Drivers, and Signposts*, RR-A444-3 (Santa Monica, CA: RAND Corporation, 2021).

19. Kari Roberts, "Understanding Putin: The Politics of Identity and Geopolitics in Russian Foreign Policy Discourse," *International Journal* 72, no. 1 (March 2017): 28–55.

20. Alexander Mattelaer and Laura Vansina, *Understanding Russian Foreign Policy*: *Towards a Coherent Belgian Policy* (Brussels: Egmont Institute, 2020).

21. Charap et al., *Russia's Military Interventions*, 96; Roberts, *Understanding Putin*, 30; and Caroline de Gruyter, "Putin's War Is Europe's 9/11," *Foreign Policy* (website), February 28, 2022, https://foreignpolicy.com/2022/02/28/putins-war-ukraine-europe-hard-power/.

22. Keir Giles, *Handbook of Russian Information Warfare* (Rome: NATO Defense College, 2016), 37, https://www.ndc.nato.int/news/news.php?icode=995.

expressions of mass civic dissent," a response in kind was needed to increase domestic information security in Russia and diminish Western influence in *Russkiy Mir*.[23]

Russia uses reflexive control to influence the actions of the West and Russia's near abroad neighbors in its favor. Reflexive control leverages all available means to manage perceptions of a target and attempt to predetermine the target's decisions and actions in Russia's favor.[24] Russia demonstrated this concept by creating ambiguity over its actions in Crimea in 2014 by gaining control of Crimean information infrastructure, embedding cyber expertise with Russian special operation forces, using proxy forces, and dominating the public narrative surrounding events with Russian-aligned themes.[25] These actions limited a weakened Ukraine's ability to react to Russia's incursion and provided just enough ambiguity to prevent any meaningful Western response until the fait accompli of annexation was complete. Russia also exhibited reflexive control through its meddling in the 2016 US elections with cyberattacks and disinformation leveraged to weaken the integrity of democratic institutions.[26] Although debate persists regarding the long-term effectiveness of reflexive control measures, Russia continues to heavily invest in capabilities to gain an advantage in the information environment via military and nonmilitary means and to demonstrate an increasing willingness to employ them.[27]

Russia has also demonstrated capabilities to control the information environment during combat operations in Ukraine and Syria through use of EW and cyber capabilities. Ukrainian forces experienced electromagnetic interference, affecting everything from communications, drone use, and counterbattery radar following the 2014 Russia-backed revolt in Luhansk and Donetsk.[28] These actions in Ukraine serve an operational purpose in supporting Russia-backed separatists; however, Russia's EW use in Syria is specifically employed to demonstrate its capability to the West and signal to the greater Middle East that the United States is not the only global power of significance. Electronic warfare (EW) activity in Syria interfered with US

23. Giles, *Handbook*, 39.

24. Giles, *Handbook*, 19.

25. Giles, *Handbook*, 51.

26. Jarred Prier, "Commanding the Trend: Social Media as Information Warfare," *Strategic Studies Quarterly* 11, no. 4 (Winter 2017): 50–85.

27. Blagovest Tashev, Michael Purcell, and Brian McLaughlin, *Russia's Information Warfare: Exploring the Cognitive Dimension* (Quantico, VA: Marine Corps Center for Advanced Operational Culture Learning, 2019).

28. Joseph Trevithick. "Ukrainian Officer Details Russian Electronic Warfare Tactics Including Radio Virus," War Zone (website), October 30, 2019, https://www.thedrive.com/the-war-zone/30741/ukrainian-officer-details-russian-electronic-warfare-tactics-including-radio-virus.

electronic surveillance against the Islamic State and the global positioning satellite navigation of unmanned systems, causing US forces to be reactive to Russia's actions and adjust their counterterrorism campaign.[29]

Joint Force Requirements in the Information Environment

As illustrated, the information threats that the United States faces are persistently focused on eroding the will of the United States and its allies to defend their interests and values effectively. Competing in the information environment requires a multidisciplinary approach that recognizes vulnerabilities and threats and crafts information strategies to advance US interests. Influencing the information environment requires a clear understanding from strategic leaders on what national priorities they should communicate, how to communicate those priorities, and to whom they should be communicated. A study from the National Defense University on US efforts to counter Soviet disinformation in the 1980s highlights that "American history illustrates the importance of all three basic building blocks of national security: strong US capabilities, good intentions, and the effective communication of both to diverse audiences."[30]

The "DIME" acronym (diplomatic, informational, military, and economic) is often used to describe the instruments of national power.[31] Since the disestablishment of the United States Information Agency in 1999, information remains the one instrument of national power that does not have a dedicated governmental department or agency—unlike the diplomatic, military, or economic power represented by the Departments of State, Defense, and Treasury. Leveraging all instruments of national power is crucial for the United States to compete in the information environment without falling into the trap of becoming overreliant on any one capability.[32] From a Joint Force perspective, it is important to understand the strategic priorities of the United States in competition, know how the Joint Force contributes to defending the nation against information threats at home and abroad, and understand how to refine and implement concepts that enable the Joint Force to be more effective in the information environment.

29. Anna Varfolomeeva, "Signaling Strength: Russia's Real Success is Electronic Warfare against the US," *Defense Post* (website), May 1, 2018, https://www.thedefensepost.com/2018/05/01/russia-syria-electronic-warfare/.

30. Fletcher Schoen and Christopher J. Lamb, *Deception, Disinformation, and Strategic Communications: How One Interagency Group Made a Major Difference* (Washington, DC: Institute for National Strategic Studies, 2012), 120.

31. JCS, *Strategy*, Joint Doctrine Note 1-18 (Washington, DC: JCS, 2018), vii.

32. Kathleen H. Hicks and Alice Hunt Friend, *By Other Means Part I: Campaigning in the Gray Zone* (New York: Rowman & Littlefield, 2019), 15.

Objectives for competing in the information environment should align with national security priorities. In his interim National Security Strategy, President Biden outlined the following three priorities that serve as a guide for competition.

- Defend and nurture underlying sources of American strength—including our people, our economy, our national defense, and our democracy at home.

- Promote a favorable distribution of power to deter and prevent adversaries from directly threatening the United States and our allies, inhibiting access to the global commons, or dominating key regions.

- Lead and sustain an open, international system that is underwritten by strong democratic alliances, partnerships, multilateral institutions, and rules.[33]

Tackling these priorities addresses both long- and short-term threats presented by adversaries in the information environment. Although the purpose of this chapter is to examine military contributions toward competition in the information environment, it is worth noting how government agencies leverage information both at home and abroad.

Competition requires that the United States focuses on the homeland and overseas, particularly with the US population as a persistent target of foreign disinformation efforts. Operating within the homeland poses challenges for the US government, with the Department of State and Department of Defense specifically prohibited by law to use funds or resources to influence public opinion within the United States.[34] Even with disinformation identified as a threat, any US government responses to counter, curb, or squelch disinformation within its borders will run into concerns regarding the government's role in policing opinions and limiting free speech. This puts the government in the paradox of either doing nothing against disinformation and leaving the country vulnerable to ideological attack or being accused of violating the constitutional values of free speech and the press by limiting the spread of disinformation.[35]

33. White House, *Interim National Security Strategic Guidance* (Washington DC, White House, 2021), 9.

34. United States Information and Educational Exchange Act Amendment, H.R. 5736, 112th Cong. (2012); and Prohibition on Use of Funds for Publicity or Propaganda Purposes within the United States, 10 U.S.C. § 2241a (2012).

35. Timothy P. McGeehan, "Countering Russian Disinformation," *Parameters* 48, no. 1 (Spring 2018): 49–59.

A whole-of-government response to information threats in the homeland should focus on making domestic populations more resilient against disinformation and cyber coercion efforts. Resilience starts with education, with a renewed US investment in critical thinking and civics education imperative to blunting the effects of disinformation on US citizens.[36] The United States also needs to update media regulation for the social media age by addressing questions as to whether circumventing authentic human communication with the use of bot networks and algorithms is constitutionally protected free speech. In essence, does the First Amendment apply to robots?[37] Legislation and governmental regulations also need to incentivize the reporting of cyber intrusions and interference in the private sector to counter the ability of foreign threats to gain advantage through coercion or theft of intellectual property and private data.[38]

The Joint Force contributes to whole-of-government efforts through a combination of direct and indirect means. Direct means includes a posture of active defense in cyberspace, with the Joint Force gaining and maintaining a persistent presence to defend forward to disrupt foreign threats outside of US-controlled cyber infrastructure.[39] The United States Cyber Command demonstrated its ability to disrupt foreign influence when it defended the US national elections in 2018 and 2020, with operations to stem the flow of disinformation at its source through the disruption of Russian troll farms and bot networks in Saint Petersburg.[40] Dedicated operations like these demonstrate the capability of the Joint Force to leverage its unique capabilities to meet National Security Strategy priorities by imposing costs on foreign threats. By leveraging the national values of transparent governance, the United States Cyber Command's public acknowledgement of its actions not only demonstrates to US citizens that the government is being proactive in ensuring the integrity of democratic systems, but it is also signals to adversaries that the United States is willing to impose costs for malign actions in the information environment. The Department of Defense needs to coordinate the publication of efforts to defend forward with interagency partners, with unambiguous

36. McGeehan, "Countering Russian Disinformation," 54.

37. James P. Farwell, "Countering Russian Meddling in US Political Processes," *Parameters* 48, no. 1 (Spring 2018): 37–47.

38. Hicks, *By Other Means*, 21.

39. DoD, *Department of Defense Cyber Strategy* (Washington, DC: DoD, 2018), 4.

40. Erica D. Lonergan, "Cyber Command's Role in Election Defense: Important, But Not a Panacea," *Lawfare* (blog), October 30, 2020, https://www.lawfareblog.com/cyber-commands-role-election-defense-important-not-panacea.

messages delivered through diplomatic, economic, and military channels that articulate what was done and why, to mitigate the risk of escalation.[41]

The Joint Force has a significant, yet supporting, role in competition overseas, centered on the regionally focused geographic combatant commands and the operational authority they maintain for military actions in their respective areas of responsibility. Although the Department of Defense's role in competition is to support other lead federal agencies like the Department of State, the Department of Defense is typically better resourced and more visible as a projection of global US power. This requires the Joint Force to have an innate understanding of where it can take the lead in demonstrating strength, capability, and resolve or where it is best suited to play a less visible role and facilitate other instruments of power.

Two areas where the Joint Force is uniquely suited to support the National Security Strategy in the information environment is through the US alliance system and reinforcing international norms. One bedrock principle that has underpinned US security since World War II (WWII) is a robust alliance system. Adversaries, however, have placed an increasing strain on this system because they consider current alliances as obstacles to their own objectives.[42] In Europe and Asia, the Joint Force is uniquely positioned to demonstrate the resilience and capabilities of alliance systems through sustained engagements and exercises that increase competence and interoperability. China and Russia are aware that their own limited alliances pale in comparison to those built by the United States furthermore, US alliances have the potential for continued growth due to the shared values, prosperity, and security guarantees that characterize membership in Western-based alliances since the end of the Cold War.

Strong alliances also enable the reinforcement of international norms cultivated by the United States, such as freedom of navigation and resolution of territorial disputes via diplomacy. Leveraging alliances to demonstrate capabilities and strength and showing resolve from a political, economic, and military perspective can prove valuable in deterring revisionist adversaries who seek to change the status quo through coercion of neighboring states.[43] Demonstrations of strength and freedom of navigation exercises with allies are ways in which the Joint Force can push back against coercion. Alliance structures help gain support for the development of new norms as technology

41. Farwell, "Countering Russian Meddling," 46.

42. Hicks, *By Other Means,* 26.

43. Andrew S. Erickson, "A Dangerous Decade of Chinese Power Is Here." *Foreign Policy* (website), October 18, 2021, https://foreignpolicy-com.usawc.idm.oclc.org/2021/10/18/china-danger-military-missile-taiwan/.

advances and creates ungoverned spaces. Having allies and partners who are willing to support norm-forming initiatives in areas like social-media regulation, cyberspace operations, and space governance can prove beneficial for influencing competitors like China and Russia into a more cooperative relationship. If competitors prove unable or unwilling to cooperate in the development of new norms, strong alliances will be crucial to deter malign behavior and provide a credible response in event of a crisis.[44]

The Department of Defense recognizes the need to better synchronize Joint Force actions with information effects through the Joint Concept for Operating in the Information Environment (JCOIE). Where current information operations doctrine focuses on integrating bespoke capabilities to influence or corrupt adversary decision making as a supporting effort of military operations, the JCOIE recognizes that all applications of military power can influence or persuade competitors.[45] The interdependency of physical actions with informational effects necessitates that planners integrate information into operational art at the outset of planning to "design operations that deliberately leverage the informational aspects of military activities."[46] The JCOIE is less concerned with affecting how information flows, instead placing emphasis on how a relevant actor interprets the details and aspects of military action and what meaning the actor assigns to that action.[47] This concept requires that the Joint Force leverage increased speed, lethality, and command capabilities in competition by applying military power in both constructive and destructive manners as part of an integrated effort to influence an adversary's behavior.[48]

To properly leverage information under JCOIE, the Joint Force requires a clear articulation of objectives and good situational understanding of the information environment. Planners should focus on understanding and shaping relevant actors' perceptions and attitudes, then designing military activities to achieve the desired behavior that provides a competitive advantage.[49] This is a significant paradigm shift from designing operations focused on affecting adversary capabilities. Planning to disrupt, degrade, or defeat capabilities is still necessary but only in the context of how those activities ultimately influence relevant actors' behaviors. The Joint Force must integrate with other

44. Hicks, *By Other Means,* 25.

45. JCS, *Information Operations*, JP 3-13 (Washington, DC: JCS, 2012).

46. JCS, *Joint Concept for Operating in the Information Environment (JCOIE)* (Washington, DC: JCS, 2018).

47. JCS, *Joint Concept for Operating*, 14.

48. JCS, *Joint Concept for Operating*, 11.

49. JCS, *Joint Concept for Operating*, 15.

agencies, and involving the diplomatic and economic stakeholders during operational design will increase the effectiveness of military actions. Planners need to have a nuanced understanding of broader policy and strategy to know when to apply military force in a constructive manner to induce cooperation or to deter or coerce relevant actors' behaviors.

Influencing the perceptions, attitudes, and behaviors of relevant actors is only possible if the Joint Force has sufficient situational understanding of the information environment and the motivations of relevant actors. The sheer amount of data that is available makes it challenging for the Joint Force to gain situational awareness—much less a situational understanding—of the information environment. Languages, cultural nuances, Internet access, social-media participation, press freedom, media regulations, and telecommunications infrastructure complicate the Joint Force's understanding of the information environment. The commercial market is flooded with a variety of software tools that are able to search various social media platforms and Internet sources for information of interest—though the effectiveness of these tools is only as good as the inputs provided by operators.[50] Practitioners need to be familiar with data science practices—such as social network analysis, lexical analysis, deep neural networks, and public analysis—to develop search taxonomies and to interpret machine-generated results to provide meaningful input to decisionmakers.[51] Building these skills will require a significant and sustained investment in analytical training—from strategic- to tactical-level headquarters.

Mapping and monitoring the EMS in theater adds an additional layer of complexity as the Joint Force tries to gain a situational understanding of the information environment. Since the Joint Force relies on the EMS for command and control (C2) of both manned and unmanned systems, understanding the baseline environment and changes to that environment are paramount for the Joint Force to identify and mitigate threats. Information sharing with allies and partners is one means of gaining an understanding of the EMS—particularly through spectrum deconfliction and the sharing of system configurations for partner communications networks. The Joint Force can also use commercial applications to collect publicly available EMS data and upload the information to a cloud-based platform for analysis. Cyber

50. Christopher Paul et al., *Improving C2 and Situational Awareness for Operations in and through the Information Environment*, RR-24898 (Santa Monica, CA: RAND Corporation, 2018).

51. William Marcellino et al., *Monitoring Social Media: Lessons for Future Department of Defense Social Media Analysis in Support of Information Operations*, RR-1742-OSD (Santa Monica, CA: RAND Corporation, 2017).

warfare and EW specialists can then conduct operational preparation of the EMS and detect anomalies indicative of potential threats.[52]

As with monitoring social media, automation will sort through the vast amount of collected data for analysts and decisionmakers to make use of it. Targeting specialists, intelligence analysts, operations center personnel, and specialists representing various information-related capabilities must learn artificial intelligence and data analytics practices to enable the planning and development of an information common operating picture for decisionmakers. Commanders and planners will need to recognize that a perfect picture of the information environment will never exist, despite the increasing capabilities of technology to detect and process data. Clausewitz's observations on friction in war are still relevant, "The good general must know friction . . . and in order not to expect a standard of achievement in his operations, which this very friction makes impossible."[53] To keep efforts focused and manageable, commanders and staff need to prioritize what parts of the information environment they must analyze to achieve objectives and mitigate threats by establishing clear collection and reporting requirements up front.[54] Investments in artificial intelligence will enhance—but not replace—the role of commanders and staff to set priorities and make decisions about where and how to influence the information environment.[55]

Commanders and staff can only act within the information environment if organized and resourced to do so. Joint doctrine provides little guidance for organizing staff and forces to integrate information into Joint operations effectively. Current information operations (IO) doctrine only has a passing mention of IO staff organization, focusing instead on describing information-related capabilities and inputs to the Joint planning process.[56] Joint Publication 3-0 specifically addresses C2 considerations in land, maritime, air, cyberspace, EMS, and space operations but falls short of identifying planning and coordinating mechanisms for information as a Joint function like it does for cyber, space, and EMS, which are key elements of the information environment.[57] Lack of directive guidance for C2 in the information

52. Herm Hasken, "EW & Cyber Enabling Support to Multi Domain Operations," Presentation at AFCEA TechNet Augusta, Augusta, GA, August 21, 2019, https://events.afcea.org/Augusta19/Custom/Handout/Speaker0_Session7856_1.pdf.

53. Carl von Clausewitz, *On War,* ed. Michael Howard and Peter Paret, trans. Michael Howard and Peter Paret (Princeton, NJ, 1976), 120.

54. Paul et al., *Improving C2*, 61.

55. Hicks, *By Other Means*, 30.

56. JCS, *Information Operations*, II-4.

57. JCS, *Joint Operations*, JP 3-0 (Washington, DC: JCS, 2018), III-6–III-10.

environment is a double-edged sword. Commanders do have greater leeway in determining staff organization and processes to plan and coordinate effects in the information environment. In coordinating for effects in the information environment, however, functional experts and experts in niche capabilities like cyber warfare, EW, and military information support operations (MISO)—all of whom are few in number—could be consumed by the rest of the staff without a clearly understood delineation of roles and responsibilities. Even without a directed organizational structure for coordinating effects in the information environment, doctrine needs to identify processes and offices of primary responsibility to establish a baseline for implementing the JCOIE.

Effective C2 for operations in the information environment requires the Joint Force to organize resources and processes to analyze, plan, and assess the informational impacts of military power. Senior leaders should recognize information-related expertise and employ it within the staff to maximize capacity for designing operations toward cognitive effects. Maximizing effects in the information environment is less about finding any one organizational structure or wire diagram that is more optimal than others but more about how leadership prioritizes information effects and energizes the staff and its processes toward that effort. Units have tried different organizational structures for coordinating information capabilities on military staff, such as a division in the operations directorate, as its own coequal directorate, by diffusing capabilities across the primary and special staff; combining with fires to create a Joint effects cell; or using hybrid combination of these organizational constructs. Each of these organizational structures has shown both success and failure, dependent upon the level of investment of the command team and key staff leaders toward integrating information capabilities into operations.

With no one organizational structure as the "correct" answer to integrating operations in the information environment, command priorities, resourcing, and processes remain key determinates to successful operations. In a 2018 study, the RAND Corporation identified 10 factors that are critical to the Joint Force's ability to conduct C2 in the information environment.

These factors are:

- understanding the capabilities available to affect the information environment (not just information-related capabilities) as well as the inherent informational aspects of operations;

- understanding authorities and procedures;
- understanding the command's goals in the information environment;
- knowing how to measure progress toward these goals;
- being aware of how the command will achieve objectives in the information environment (operational design);
- having sufficient capacity to staff operations in the information environment;
- knowing operations in the information environment are considered in all staff sections and processes;
- knowing operations in the information environment are included in and integrated with other operations;
- being able to designate operations in the information environment as the supported or supporting operations; and
- incorporating commander interest into operations in the information environment.[58]

Notably, the common themes throughout these factors revolve around command emphasis and processes, not on staff organization. Command emphasis is vital, because without it, staff will struggle to incorporate information effects into operational design. Staff expertise is also crucial for identifying how capabilities can be employed and the limitations of those capabilities.

Having subject matter expertise in information capabilities is particularly important for a command to understand authorities and procedures. No singular IO authorization document exists in either the Joint Force or interagency process that enables effects in the information environment. Capabilities like MISO, deception, and cyber each have different authorities associated with them based on the potential risks. Even if an execution order grants authority to a combatant commander to conduct all of these activities, Department of Defense and Joint Staff policies and instructions are in place that guide specific procedures and requirements for execution. For example, coordination

58. Paul et al., *Improving C2*, 63.

requirements may be in place that mandate concurrence from a US ambassador, technical and operational deconfliction with the intelligence community, a review of an activity by the Joint Staff, a legal review, or reporting or record-keeping activities.

Aside from operational authorities, planners will also need to understand the fiscal authorities for conducting activities. Activities like MISO fall under special funding categories, with Congressional reporting requirements tied to the expenditure of funds.[59] These requirements are in place to ensure the Joint Force operates with unity of effort across theaters and coordinates with interagency partners. Good planners will know how to use authorities and policies to generate better plans instead of treating authorities like obstacles.

Theater Army Requirements in the Information Environment

Theater armies have an important, if often misunderstood and under-resourced, role for competing in the information environment. This study will focus on US Army Service Component Commands that are assigned to a geographic combatant command to provide support to Army forces within or transiting through a geographic combatant command's theater these Army Service Component Commands are designated as theater armies.[60] Identifying a theater army's requirements for the information environment first requires understanding the functions a theater army provides to the geographic combatant command. These functions then need to be put into the context of competition as defined by Army leadership, how competition supports the Army's multidomain operations concept, and how aspects of competition and multidomain operations are implemented through the Army's draft information advantage doctrine. These functions and concepts then need to be integrated into Joint operations and unified action with sister services and other government agencies, which will, in turn, inform the technology and personnel resources needed for the theater army to fulfill its role in the information environment.

Theater armies have a wide array of functions to support geographic combatant commands and provide Army-specific support and advocacy to the theater. By doctrine, theater armies are responsible for the following seven functions.

59. Department of Defense Appropriations Bill Report of the Committee on Appropriations, H.R. Report 116-453, 116th Cong. (2021).

60. JCS, *Joint Land Operations*, JP 3-31 (Washington, DC: JCS, 2021), I-10.

- Exercise C2 over Army forces in the theater
- Execute combatant commander's daily operational requirements
- Provide administrative control of Army forces
- Set and maintain the theater
- Set and support operational areas
- Plan and coordinate for consolidation of gains in support of Joint operations
- Perform Joint roles in limited scope, scale, and duration[61]

Theater armies perform many of these functions simultaneously and in coordination with each other to meet Joint and Army requirements. The theater army's most critical task is to ensure the success of Joint and land forces by setting and maintaining the theater. Army doctrine describes setting the theater as "the broad range of functions and tasks conducted to shape the operational area and establish the conditions across an area of responsibility that enable the execution of the strategic plans as established by the combatant command campaign plan."[62] Despite being broadly associated with sustainment activities, setting the theater involves continuously creating and improving conditions for the Joint Force to conduct operations across all warfighting functions.[63] In competition, the theater army must set conditions for the Joint Force across the informational, physical, and human aspects of the information environment by understanding theater infrastructure, methods of communication, and motivators of relevant actors across the theater.

A theater army's setting the theater activities are vital to establish the conditions for the Joint Force to achieve information advantage. Field Manual 3-0 defines an information advantage as "the operational benefit derived when friendly forces understand and exploit the informational considerations of the operational environment to achieve information objectives while denying the threat's ability to do the same."[64] During competition, the theater army must continuously assess and characterize communications infrastructure to support

61. HQDA, *Theater Army Operations*, Army Techniques Publication 3-93 (Washington, DC: HQDA, 2021), 1-3.

62. HQDA, *Theater Army Operations*, 5-1.

63. HQDA, *Theater Army Operations*, 5-1.

64. HQDA, *Operations*, Field Manual 3-0 (Washington, DC: HQDA, 2022), 1-22.

C2 and network security across all aspects of the information environment. Engagements with partners and allies in host nations will influence access to infrastructure, spectrum deconfliction, and data-sharing agreements.[65] Surveys of EMS environments will establish a baseline to understand friendly EMS signatures and enable the detection of anomalies and potential adversary threats. The theater army can map the EMS environment simultaneously by assessing the infrastructure needed to establish headquarters locations; ports of debarkation; and Joint reception, staging, and onward movement and integration (RSOI) facilities. The access that a theater army gains during surveys and assessments is also valuable for calibrating nonlethal fires systems that leverage cyberspace, EMS, or space-based capabilities prior to a crisis or conflict.

Engagements are a critical part of setting the theater. Aside from the necessary engagements that the theater army conducts for access to C2 infrastructure and Joint RSOI, engagements conducted through theater security cooperation activities are a key component of competition. The theater army provides the enduring, regional expertise to establish relationships with the Department of State (as the lead government agency for security cooperation) and host-nation militaries to plan and resource security cooperation activities within the context of combatant commander objectives.[66] These engagements cement relationships with host-nation forces that enable interoperability, facilitate access to leadership and facilities, and build the military capacity of allies and partners.[67] More importantly for competition, the professionalism and technical expertise demonstrated by US forces during security cooperation activities leads to the United States being considered the partner of choice for developing nations, crowding out competitors with malign intentions.

The theater army's focus on setting the theater is important for competition because much like setting the theater, competition is a continual effort that requires sustained investment to be effective. The chief of staff of the Army describes competition as the interplay of three dynamics: narrative competition, indirect competition, and direct competition.[68] In steady state environments, the Army focuses on building the reputation of the United States through demonstrations of its professionalism and capabilities to support partners and allies with narrative competition. When combined with proactive messaging to both friends and adversaries, narrative competition will generate

65. HQDA, *Theater Army Operations*, 5-2.

66. HQDA, *Theater Army Operations*, 5-8.

67. HQDA, *Theater Army Operations*, 5-8.

68. McConville, *Army in Military Competition*, 3.

opportunities through partnerships, influence relevant actors in theater to operate under shared values with the United States, and support deterrence through perceptions of US strength.[69]

Reputation built over time is necessary—but not sufficient—for competing against adversaries who are seeking to expand their spheres of influence and undermine norms at the expense of the United States and its allies. Theater armies will also need to compete through indirect and direct means to provide options for policymakers to apply national power from positions of advantage or apply coercive leverage as competition threatens to escalate toward crisis and conflict. Indirect and direct competition are where the United States demonstrates the reputation that it built during narrative competition. During indirect competition, theater armies work through interagency and host-nation partners to expand the competitive space with low-to-middle cost options that give policymakers options for imposing costs on adversaries or hardening partnered and allied will.[70] Theater armies support indirect competition through activities such as multinational exercises, intel sharing, supporting new equipment fielding and training in security cooperation, and informing audiences of threat and friendly actions. The theater army could even employ limited lethal and nonlethal fires, if within the bounds of US and allied policy parameters.[71]

By contrast, direct competition enables the Army to support the Joint Force by providing a credible option to deliver superior power against an adversary to either compel an outcome in favor of the United States or prevent the adversary from reaching its objectives at the expense of the United States. In essence, the theater army can provide policymakers with capabilities at all levels of conflict intensity through multidomain operations.[72] To be effective, Army forces will need the reputation of lethality and capability combined with the placement and access to act at the speed of strategic relevance.[73] The theater army support direct competition through the rapid deployment and Joint RSOI of combat power, positioning of precision long-range fires assets, and establishment of contingency command posts.

All forms of competition rely on the ability to successfully influence relevant actors. New Army concepts and doctrine recognize the influencing

69. McConville, *Army in Military Competition*, 10.

70. McConville, *Army in Military Competition*, 16.

71. McConville, *Army in Military Competition*, 14.

72. McConville, *Army in Military Competition*, 12.

73. McConville, *Army in Military Competition*, 12.

aspect of military power. Multidomain operations concepts and draft information advantage doctrine recognizes adversaries seek to influence US decision making by expanding the battlespace and employing asymmetric tactics in the information environment. Being competitive in this operating environment requires US forces to converge capabilities across multiple domains to create effects from a position of advantage. Decision dominance is a necessary condition for effective multidomain operations and requires the delivery of effects at scale through multiple domains—and doing so faster and more effectively than the adversary.[74]

Theater armies create conditions for decision dominance in multidomain operations by setting the theater and enabling information advantage activities at echelon—from tactical units to integration with Joint and interagency partners. Information advantage is an evolution from previous information operations doctrine that aligns with JCOIE. Information advantage focuses on affecting relevant actor behavior through the coordinated application of military power through the five lines of effort: enable decision making, protect friendly information, inform domestic and international audiences, influence foreign audiences, and conduct information warfare.[75]

Theater armies can use the information advantage lines of effort as a guide to focus their efforts to achieve decision dominance and support multidomain operations by affecting relevant actor decision making. The following section describes how setting-the-theater tasks relate to each information advantage line of effort.

Enable Decision Making

Theater armies are uniquely postured within Army hierarchy to consistently focus on a single area of responsibility, with operational tasks informed by geographic combatant command campaign and contingency plans. By working closely with geographic combatant commands and sister service components, theater armies can invest in systems to monitor social media and publicly available information to develop a situational understanding of the information environment. Theater army commanders and staff will never have a perfect understanding of the information environment; however, they can use automated tools to monitor, filter, and display information of relevance.[76]

74. James C. McConville, *Army Multi-Domain Transformation: Ready to Win in Competition and Conflict*, Chief of Staff Paper no. 1 (Washington, DC: HQDA, 2021), 8.

75. US Army Training and Doctrine Command (TRADOC), *Information Operations (Draft)*, Army Doctrine Publication 3-13 (Fort Eustis, VA: TRADOC, 2021), I-14.

76. Paul et al., *Improving C2*, 28–29.

The entire staff—not just intelligence personnel—needs to be integrated into this process, with the fusion of data preferably occurring in an operations center for optimal fusion and dissemination.

Protect Information

Theater armies are again uniquely positioned to affect information protection through their role in establishing and maintaining theater communications infrastructure. Cybersecurity is increasingly vital as Joint and Army systems become more reliant on cyberspace and coordinate operations over greater distances. When theater armies add allies and partners to the equation, they potentially introduce additional vulnerabilities, especially if theater armies do not establish and exercise security and protection before a crisis. The availability of systems is also increasingly dependent on a congested EMS, which includes traditional radio frequencies, global positioning satellites, and space-based satellite uplinks and downlinks. Close coordination for spectrum deconfliction, emission control, and the use of low probability of interference or low probability of detection technologies across Joint and multinational networks helps to protect the availability and transmission of information.

Operations security (OPSEC) is another critical function at all echelons of the Army to protect friendly information. At the strategic level, theater armies need to identify critical information proactively to protect, then design and implement OPSEC countermeasures. With the Army's emphasis on gaining decision dominance to make decisions and deliver effects more effectively than an adversary, the theater army's ability to minimize indicators of how the force employs, communicates, and converges sensors with delivery of effects is crucial to success.[77] When a theater army implements OPSEC, the organization should involve a combination of obfuscation and deliberate deception to mislead an adversary or increase ambiguity regarding intentions, timing, or capabilities.

Inform Domestic and International Audiences

The persistent presence of theater armies in their respective areas of responsibility requires a robust and active public information posture. Their ability to inform host-nation publics is important to get ahead of disinformation narratives—particularly in countries where Russia and China are actively seeking to degrade the legitimacy of US presence and undermine key alliances and partnerships. Truthful, timely, and proactive public engagement builds

77. TRADOC, *Information Operations*, I-10.

credibility and advances the Western values of free press and transparent governance, which provide a more powerful long-term competitive advantage than the authoritarian alternative.[78]

Influence Foreign Audiences

The ability to influence foreign audiences is one line of effort within information advantage where the theater army receives limited resources to support in competition. Military information support operation (MISO) activities are typically also associated with military influence activities and operate under programs the secretary of defense approves. All of the Army's active-duty MISO capabilities reside within the US Army Special Operations Command, with MISO soldiers under the operational control of theater special operations commands when operating in theater.[79] Though active-duty MISO personnel support conventional headquarters at echelons above brigade for planning, the Army must resource actual capabilities to conduct MISO in support of conventional forces from the reserve component.[80] Congress also tightly controls funding for influence operations, with MISO funds allocated to the theater special operations commands through United States Special Operations Command. The geographic combatant commands also have apportioned MISO funding, which they use for theater strategic influence operations.

The lack of dedicated MISO resourcing requires the theater army to coordinate with the geographic combatant command and theater special operations command staff to address influence requirements through MISO. Using reserve component MISO resources in competition requires lead time to allow for mobilization. The theater army psychological operations staff must plan a messaging series, coordinate the series with embassies, and arrange funding through the geographic combatant command before the deployment of MISO personnel.

The theater army has other means of influence at its disposal besides MISO. Every military action sends a message, and theater armies should deliberately plan each action with its influence intent in mind.[81] Planners need to consider how relevant actors will perceive the actions of the theater army and its units and how those perceptions affect behavior. Reinforcing activities through timely information releases or engagements with key leaders

78. Hicks, *By Other Means*, 17.

79. TRADOC, *Information Operations*, VI-13.

80. TRADOC, *Military Information Support Operations*, Field Manual 3-53 (Fort Eustis, VA: TRADOC, 2013), 3-3.

81. TRADOC, *Information Operations*, V-4.

will further strengthen the intended effect. Coordination with the geographic combatant command and embassy is crucial to ensure the intended messages reflect US policy and that the appropriate authorities evaluate all actions for potential misinterpretation and risk of unintended consequences.

Conduct Information Warfare

Information warfare is a new doctrinal concept introduced in Army Doctrine Publication 3-13. The manual defines it as "actions taken to change adversary and enemy behaviors by affecting threat decision-making processes, C2 capabilities, and information-warfare capabilities."[82] Whereas the other lines of effort support decision dominance by enabling and protecting friendly C2 capabilities, information warfare contributes to decision dominance by interfering with adversary C2. Two avenues for theater armies exist to conduct information warfare: attack the systems that enable adversary C2 systems and attack the adversary's perceptions to affect actual decisions.

Attacking C2 systems includes targeting the adversary's capabilities to sense the operational environment and ability to communicate situational understanding, orders, and instructions. Previous theater army efforts to characterize the information environment are important to support targeting by understanding what systems and capabilities the adversary is using to sense and communicate. The targeting process can identify how the adversary gathers and transmits information, providing data on vulnerabilities that US forces can exploit through cyberspace, EW, or special technical operations. Although leveraging cyber, EW, or special technical operations against adversarial systems will most likely happen as indirect or direct competition during crisis or conflict, the theater army can support much of the preparation for leveraging those capabilities as set the theater activities. Gaining an understanding of the cyber and EMS environment, identifying vulnerabilities, developing targets for contingencies, and conducting operational preparation of the environment are all best accomplished prior to a crisis.[83]

Gaining an understanding of how an adversary senses the environment and communicates is also useful for the theater army to develop plans for influencing decision making through MISO, OPSEC, or deception. Disseminating information or conducting observable actions where an adversary is likely to observe the activity is important to building perceptions that will influence behaviors. With a reasonable understanding of adversary collection capabilities and intentions, theater armies can condition adversaries

82. TRADOC, *Information Operations*, VI-1.

83. TRADOC, *Information Operations*, VI-3.

to observe certain tactics, techniques, and procedures, while obscuring other tactics, techniques, and procedures. The theater army needs to manage and coordinate centrally what needs to be revealed and concealed to mitigate against displaying competing indicators to adversary sensors and ensure unity of effort at each echelon.[84] Operational design for information warfare will need to identify where the theater army wants to increase ambiguity to delay adversary decision making during horizontal and vertical competition and identify opportunities to decrease ambiguity at key points to ensure decision dominance.[85]

Resourcing Theater Armies for Information Advantage

Properly resourcing theater armies for information advantage starts with ensuring the staff has the right expertise and skill sets for planning and coordinating operations in the information environment. Theater armies will require information specialists from MISO, EW, cyber, space, special technical operations, civil affairs, public affairs, and IO fields. Having specialists in unique capabilities—along with experienced IO coordinators—will ensure that the theater army can incorporate information advantage considerations into theater army campaign plans and synchronize with the Joint Force across multiple domains. Planners of IO are also particularly useful for their specialized training in military deception and OPSEC, both of which require the integration of multiple information and physical capabilities to achieve desired effects.

Specialists from noninformation related disciplines are also critical to information advantage. Intelligence specialists—particularly in signals intelligence, human intelligence, open-source intelligence, and counterintelligence—are essential to helping the theater army characterize and understand the human, physical, and informational aspects of the information environment. Intelligence disciplines also help the theater army plan OPSEC and deception by informing how the adversary sees and perceives US military activity and supporting measures of effectiveness for information advantage activities. Targeting and fires specialists ensure theater army staff incorporates information advantage with multidomain effects to meet campaign objectives.

What all these subject matter experts provide the theater army staff is an intimate understanding of policies and authorities for each of their respective

84. TRADOC, *Information Operations*, VI-5.

85. Adam G. Lenfestey et al., "Achieving Secrecy and Surprise in a Ubiquitous ISR Environment," *Joint Forces Quarterly* 88 (1st Quarter 2018): 85–90.

fields and how to access capabilities that reside outside the theater army. Technical capabilities tend to be in high demand, but low supply. Classification levels and technical requirements for employment will limit the availability of assets without expertise on theater army staff to plan and coordinate for employment. Even nontechnical experts like MISO and deception planners are critical due to their familiarity with the myriad of policies, regulations, and requirements for their respective activities. Planners across all fields can identify and characterize risks, then develop risk-mitigation measures to reduce the likelihood or impact of unintended consequences for conducting actions that affect the information environment.[86] With competent risk mitigation, theater army commanders can better lobby geographic combatant command leaders for appropriate delegation of authorities based on conditions and competence.

Increasing staff capability at the theater army headquarters is only beneficial if the Army also invests in units that are capable of conducting and supporting information advantage then positions those forces to act—at the speed of relevance—to the operational environment. These changes will require the theater army to balance forward-positioned capabilities in theater with expeditionary forces capable of dynamic force employment to meet mission needs in competition.[87] The current multidomain task force focuses on theater fires and air defense capabilities with the intelligence, information, cyber, EW, and space battalion providing sensing, C2 capabilities, protection, and EMS effects.[88] If a theater army forward positions selected multidomain task force fires and air defense assets with sensing capabilities, it will increase a theater army's ability to influence competitor decision making in theaters where adversaries present an elevated risk of aggression. Other intelligence, information, cyber, EW, and space assets—such as EW and space effects—are effective when periodically deployed into theater for exercises and to conduct operational preparation of the environment.

Another concept that the Army is developing is the Theater Information Advantage Element, which would provide information enablers to a theater to enable multidomain maneuver. The concept of the Theater Information Advantage Element is still nascent; the Army intends to develop cross-functional teams focused on either engagement or information warfare to support the needs of the theater.[89] As the concept for the Theater Information Advantage

86. TRADOC, *The US Army in Multi-Domain Operations 2028*, TRADOC Pamphlet 525-3-1 (Washington, DC: TRADOC, 2018), 18.

87. TRADOC, *Multi-Domain Operations*, 18.

88. McConville, *Army Multi-Domain Transformation*, 12.

89. SMA Speaker Series, *220127 Gaines Hancock Sleevi Speaker Series* (Boston: NSI, 2022), YouTube video, https://www.youtube.com/watch?v=oUtpPMuBqPo.

Element solidifies, theater armies need to understand the value the element could provide at the tactical level through the strategic level of operations. As currently exercised, Theater Information Advantage Elements serve primarily as staff augmentation to division and higher headquarters. Staff augmentation has value—particularly, during periods of higher operational tempo when demand for planning expertise across information advantage functions outpaces organic staff capability. The Theater Information Advantage Element should have the capability to provide the theater army with additional expertise coordinating intelligence requirements, developing multidomain targets, monitoring the information environment, and conducting assessments of information advantage activities.

The active-duty 1st Information Operations Command and Army Reserve and National Guard component Theater Information Operations Groups already provide a planning and support capacity. The Army can further expand these capabilities into a more robust construct capable of standing up a tailored information advantage capability as a subordinate command that provides support to other headquarters or as a distributed capability simultaneously embedded across multiple echelons. A battalion headquarters-sized element will give theater army commanders the flexibility to tailor and organize a Theater Information Advantage Element to meet operational needs, including providing other enablers, such as combat cameras, reserve MISO capabilities, or mobile public affairs detachments, under the tactical control of the element as the core of an information advantage task force.

Materiel solutions for theater armies to leverage information advantage should focus on generating a situational understanding of the information environment and enabling camouflage, concealment, and decoy activities. Investments in situational understanding involve building a suite of tools to monitor all aspects of the information environment to identify perceptions, attitudes, and behaviors of relevant actors. These units will need software and training to filter the vast amounts of changing data. Artificial intelligence and machine learning are promising technologies that theater armies can use for automating the filtering and analysis of the information environment. Human analysts and operators will need training in data science techniques to ensure inputs to any tools provide the parameters to meet the commander's critical information requirements with the tool output.

Theater armies will also need to conduct a detailed mapping of the EMS to not only identify and counter potential threats but also to understand their

own signatures and vulnerabilities.[90] A theater army can collect technical data in the EMS through commercially procured equipment and software that collects publicly available information. As with monitoring social media, automated processing and the analysis of information will help organize and process the amount of EMS data available at any given time over changing networks. Operators must know how to train artificial intelligence algorithms to establish baseline data, identify anomalies, and identify friendly signatures.

Knowledge of friendly signatures with threat collection capabilities will inform a theater army's requirements for camouflage, concealment, and decoy capabilities. With China and Russia able to detect C2 nodes through the EMS, having the ability to replicate signatures through decoys and adopt OPSEC countermeasures to conceal actual command post signatures will greatly enhance the theater army's ability to protect forces by interfering with adversary targeting. Electromagnetic spectrum (EMS) decoys are only one component of multidomain camouflage, concealment, and decoy, with the ability to conceal and decoy visual and heat signatures also important for conducting high-fidelity deception operations.

Conclusion

The theater army serves a critical role supporting national objectives by competing in the information environment. While the United States spent two decades fighting transnational terrorism, China and Russia invested heavily in their capabilities and sought opportunities to expand their interests at the expense of the liberal democratic order cultivated by the United States and its allies following the Cold War. Both China and Russia weaponized information to undermine Western institutions and alliances. They also applied coercive measures against neighboring states to expand their spheres of influence at the expense of US interests.

Combined with information operations, multidomain operations provide the strategic ways through which the theater army competes in the information environment. By setting and maintaining the theater with a mindset of leveraging information as an element of combat power, the theater army ensures that it sets conditions for decision dominance in multidomain operations. Conducting security cooperation, conducting key leader engagements, actively informing foreign and domestic audiences, mapping cognitive and informational dimensions of the operational environment, influencing relevant actors, preparing the environment for technical operations, and conditioning

90. TRADOC, *Information Operations*, III-5.

adversaries to enable deception are all critical elements to successfully gain information advantage in theater. To achieve success, the Joint Force relies on the theater army's ability to achieve these missions.

The theater army cannot conduct any of these functions without resources and organization. The Army must invest in information-related expertise for theater staff, as intelligence analysis and fires are critical for navigating the myriad of authorities and permissions to generate multidomain effects. Developing technology and processes to monitor and assess the cognitive and technical aspects of the information environment is also critical to improve the theater army's ability to plan and assess the impacts of operations designed to gain decision dominance. As the Army looks to change force structure and invest in technology, leaders must emphasize information as a foundational consideration for military activities. Multiple studies on organizational design for conducting successful operations in the information environment observed that organizational design is less important than involved leadership and participant buy-in. The Active Measures Working Group in the 1980s succeeded where other Joint interagency working groups failed because of involved leaders, the expertise of working group members, and a shared focus on the mission.[91] Other studies identified commander interest in the information environment combined with staff processes, staff capacity, clear goals, an understanding of capabilities and limitations, and a clear understanding of how to leverage authorities is more important than any wire diagram.[92] With the results of these studies in mind, the institutional initiatives with JCOIE and information advantage doctrine—combined with the pressing threats of China and Russia outmaneuvering the United States in the information environment—should provide the impetus for leaders and staff to adopt information as an end of military power, not just a means.

91. Fletcher Shoen, *Deception, Disinformation, and Strategic Communications: How One Interagency Group Made a Difference*, 120.

92. Paul et al., *Improving C2*, 76.

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Intelligence Impacts on Expeditionary Advanced Base Operations and Reconnaissance Employment

Colonel Carl L. Zeppegno

Adversarial anti-access/area-denial (A2/AD) capabilities pose a significant risk to the United States' power projection. Peer adversaries use A2/AD systems to marginalize the US military's conventional warfare advantage. These capabilities present dilemmas to which the US military services and policymakers will have to adapt to project forces and apply the strengths that dominate the US way of combat. China and Russia's A2/AD capabilities and their enhanced defensive postures has driven the United States to update its strategy and modernize its forces. Adversarial A2/AD threats and technological advances create conditions that are unfavorable to US force projection as well as contest US land and amphibious deployments and sustainment operations.

In its latest operating concept, termed "multidomain operations," as well as its considerations for force modernization, the US Army recognizes this threat. The US Marine Corps is also modernizing its force structure and doctrine. The focus of the Marine Corps' efforts has been on prioritization of maneuver and flexibility to defeat A2/AD threats, and the focus of the Army's efforts has been adapting systems and doctrine to dominate land warfare in the future of conflict. But A2/AD is not the only threat the services must consider when evaluating the security environment of peer competition. For the Marine Corps' expeditionary advanced base operations (EABO) strategy (or any strategy for the employment of forces), to achieve successful outcomes, military planners must comprehensively understand adversarial capabilities. New technology assures A2/AD will remain a credible threat to US advantages and force projection as a part of EABO and multidomain

operations counterbalancing methodologies. Even so, adversaries will not rely solely upon A2/AD to disadvantage the United States.

Adversaries of the United States can now use intelligence derived from advanced data analytics as another set of offensive tools to deter US actions. Commercial, advanced analytical capabilities combined with state-level intelligence pose a significant threat to US military modernization efforts and the United States' ability to project power to achieve its strategic objectives. Technologies focused on identifying individuals, tracking their movements, developing pattern recognition, and understanding spending behaviors feed commercial algorithms that were once the province of nation-states. These technologies, which have flourished in the commercial sector, now expose the vulnerabilities of US servicemembers and units. If both state and nonstate actors can identify individuals or glean intentions using commercially available technologies (coupled with their intelligence apparatus), the pillars upon which EABO is based (mobility, persistence, communication, low signature, and ease of support) and the modernization investments of multidomain operations are at risk.

Over the last 15 years, state and nonstate actors have used facial recognition with pattern recognition applied to digital shopping records, travel documentation, and social media and cell phones with pattern recognition that uses metadata, sometimes referred to as "digital dust" or an individual's digital signature, to compromise intelligence operations or expose individual clandestine operatives. This digital dust, which creates a digital environment with incredible detail and fidelity within which EABO will operate, will certainly affect the US military's ability to project power. In 2014, General Michael Hayden, former director of the National Security Agency and the CIA, admitted, "We kill people based on metadata."[1] Technology and advanced analytics have progressed since then, and the availability and persistence of data make the impact of Hayden's comments even more profound today. Peer adversaries' use of advanced data analytics to develop intelligence on individuals, operations, units, and intentions through aggregated personal data presents vulnerabilities. When not mitigated, these operations create significant counterintelligence (CI) and operations security (OPSEC) risk to the advancement of US strategies and doctrine for the application of ground combat elements.

1. Gédéon Naudet and Jules Naudet, dir. *The Spymasters: CIA in the Crosshairs,* directed by Gédéon Naudet and Jules Naudet, aired November 28, 2015, on Showtime, https://www.sho.com/titles/3420665/the-spymasters---cia-in-the-crosshairs.

Expeditionary Advanced Base Operations

The Latin words meaning "decide, communicate, and execute" are embedded on the coin given to every marine officer who graduates from the Infantry Officer Course. These words underpin an innate decision-making process that is inculcated in marines from the beginning and on which the Marine Corps bases its employment of the force. The Infantry Officer Course teaches marine infantry officers the skills needed to lead marines in contested amphibious warfare and provides the basis for how the officers approach decision making. In addition to establishing credibility among young officers, the Infantry Officer Course imbues marines with a bias for action and the ability to make decisions rapidly, communicate clear intent, and accomplish the mission regardless of obstacles while pushing decisive action to the lowest level possible. Rooted in decisive action, mobility, and communication, the tenets instilled in young officers mold the Marine Corps' view of its role in American security.

The Marine Corps' role amounts to more than "shoot, move, and communicate." The commandant of the Marine Corps' (CMC's) concept of EABO embodies his vision for the modern security environment. The concept emphasizes decisive action, mobility, integration, communication, and persistent presence. The EABO concept embodies the CMC's vision of the integration of the US Navy and the Marine Corps to deliver strategic effects on land and decisive objectives against peer adversaries.

The CMC promulgated EABO in a draft doctrinal document in February 2021. As an operating concept, EABO represents the Marine Corps' shift in force employment away from the ground combat operations exhibited in the war on terrorism and toward defeating adversarial A2/AD capabilities. The draft document, which forms the basis for the CMC's EABO concept, was subsequently codified in the *Tentative Manual for Expeditionary Advanced Base Operations*. Nevertheless, the draft document represents the CMC's initial direction for shaping the future of the Marine Corps and how he envisions the future of amphibious operations. The draft document serves as a good baseline to help to understand the CMC's perspective and the drivers of change in the Marine Corps. This paper references both the *Expeditionary Advanced Base Operations (EABO) Handbook* and the *Tentative Manual for Expeditionary Advanced Base Operations*.[2]

2. Concepts and Plans Division, *Expeditionary Advanced Base Operations (EABO) Handbook: Considerations for Force Development and Employment* (Quantico, VA: US Marine Corps Warfighting Laboratory, June 1, 2018), 5–9.

The EABO concept relies on integration with the Navy and leverages forward-deployed marines, allied and coalition partnerships, and amphibious mobility between the sea and land. The operating concept is the foundation for the Marine Corps' iterative process of testing, refining, and codifying the CMC's concept and driving changes for the service. The operating concept also shapes how the Marine Corps sees its role in the defense of the nation through the Force Design 2030 process.[3] In the CMC's vision of the future, the 2030 Marine Corps will conduct a wide spectrum of operations in support of operational and strategic objectives to deliver the appropriate force when and where necessary, in both contested and uncontested situations.

> EABO are a form of expeditionary warfare that involves the employment of mobile, low-signature, persistent, and relatively easy to maintain and sustain naval expeditionary forces from a series of austere, temporary locations ashore or inshore within a contested or potentially contested maritime area in order to conduct sea denial, support sea control, or enable fleet sustainment. EABO support the projection of naval power by integrating with and supporting the larger naval campaign. Expeditionary operations imply austere conditions, forward deployment, and projection of power. EABO are distinct from other expeditionary operations in that forces conducting them combine various forms of operations to persist within the reach of adversary lethal and nonlethal effects. It is critical that the composition, distribution, and disposition of forces executing EABO limit the adversary's ability to target them, engage them with fires and other effects, and otherwise influence their activities.[4]

The CMC's vision for EABO is important for the Joint Force to understand. The EABO concept is rooted in the cultural strengths the Marine Corps believes it possesses and brings to the Joint fight. The concept articulates the roles for stand-in forces and outside forces. The stand-in forces are highly mobile, low signature, and predeployed to contested areas within an adversary's weapon engagement zone. Outside forces are forces outside the range of an adversary's weapons in the event of conflict. According to the *Tentative Manual for Expeditionary Advanced Base Operations*, "During armed conflict, the combination of stand-in and stand-off engagement capabilities places the

3. Headquarters, US Marine Corps (HQMC), *Tentative Manual for Expeditionary Advanced Base Operations* (Washington, DC: HQMC, 2021), iii.

4. HQMC, *Tentative Manual*, 1-3–1-4.

adversary on the horns of a dilemma: while the adversary seeks to discover and engage friendly standoff forces, he exposes himself to the sensing, nonlethal, and lethal capabilities of stand-in forces."[5] The concept of EABO has evolved since its initial inception in 2018, but stand-in forces must be able to leverage the decisive, massed capabilities of outside forces with intelligence, command and control (C2), enhanced fires support, and preeminent logistics.[6] The EABO concept is predicated on the idea marine forces will be able to move throughout a contested area and deliver decisive action, with support from forces either in theater or globally employed. Command and control (C2) is critical to this effort. Command and control (C2) allows EABO forces to operate throughout a contested area autonomously, using modular footprints that favor small force size and agility while targeting adversarial capabilities to allow follow-on forces to achieve integrated objectives.

Similarly, the Army is developing concepts of employment and force modernization to support multidomain operations. The Army intends to counter A2/AD vulnerabilities through forward presence and the culmination of national capabilities at the point of impact. As part of its effort to counter A2/AD vulnerabilities, the Army intends to execute operations concurrently across multiple domains while allowing for independent maneuver and mission command and using layered offensive and defensive capabilities that are coordinated between conventional and unconventional units. The Army's plan is as equally ambitious as the Marine Corps'. The Marine Corps' foundation is based upon individuals, small units, and leaders exercising judgment and freedom of maneuver to accomplish commander's intent, and the Army seeks to create decision advantage by bringing enhanced capabilities and greater capacity to the theater level. Both concepts rely upon capabilities only made possible by today's interconnected world. Although it affords more advanced autonomy at the individual and small-unit levels, this interconnectivity presents vulnerabilities for modern C2 that can impact the application of land and amphibious forces.[7]

The Army and the Marine Corps are currently undertaking force modernization efforts driven by adversarial threats and aligned with the concepts of multidomain operations and EABO. Both services intend to make fundamental changes to force structure and doctrine based on assessments of risk and each service's advantages. Success for the Joint Force in peer competition—

5. HQMC, *Tentative Manual*, 1-4–1-5.

6. HQMC, *Tentative Manual*, 3-1–3-21.

7. US Army Training and Doctrine Command (TRADOC), *The US Army in Multi-Domain Operations 2028*, TRADOC Pamphlet 525-3-1 (Fort Eustis, VA: TRADOC, December 6, 2018), v–xii.

particularly, for the Joint Force land component commander—is predicated upon understanding the approach each service takes to overcoming A2/AD and how each unique service culture shapes EABO and multidomain operations.

The Marine Corps espouses small-unit tactics and leadership, flexibility, and dispersion. These strengths form the core of EABO. By creating dilemmas to which adversaries must respond; deploying small, highly mobile, and lethal units throughout a contested area; and fostering initiative to meet commander's intent, EABO and the future marine force seek to capitalize upon asymmetry to create advantages for the Joint Force. But this approach brings with it inherent risks the Joint Force and land component must mitigate. The Joint Force commander and land component commander must understand these operating concepts to know how to employ EABO marines as part of a unified operational concept, how to resource and supply marine units, and how to reinforce success while capitalizing on force dispersion throughout the battlespace. Resupply, sustainment, communication, and mass, most of which require the Army to provide support for other services, will present challenges the Joint Force must overcome when attempting to integrate multidomain operations and EABO. Commanders will need to address any gaps in operational concepts for the Army and the Marine Corps to operate side by side through crisis and conflict.

The Army views its strengths as investment in capabilities, dominance in multiple domains, and overmatch through a modular approach. The Army seeks to expand the battlespace to allow for combat advantage, while producing effects in multiple domains to gain and maintain decision advantage. But this approach could lead to larger formations with cumbersome logistics that lack the flexibility to react to dynamic changes in the operating environment. The Army seeks to prevail in large-scale combat, and the Marine Corps seeks to create advantages for outside forces. Both approaches are rooted in service culture and are informed by threats, but the approaches are not readily complementary. Technology will be key for both concepts to take root, as will interoperability. The Army and the Marine Corps will need to interact more and test aspects of their operating concepts in real-world situations, collaborate on communication and decision support capabilities, and refine their visions before conflict.[8]

8. James C. McConville, *Army Multi-Domain Transformation: Ready to Win in Competition and Conflict*, Chief of Staff Paper no. 1 (Washington, DC: Headquarters, Department of the Army [HQDA], March 16, 2021), 4–9.

How Emerging Technology Impacts Operations

On February 17, 2003, the CIA conducted an operation in Milan, Italy, to capture an Egyptian-born Muslim cleric commonly known as Abu Omar. The CIA suspected Omar of helping to connect and transport young jihadists into Iraq to support al-Qaeda activities at the onset of the Iraq War. The CIA infiltrated multiple surveillance teams and a rendition team into Italy. The CIA coordinated with its local station, captured Omar, and exfiltrated him successfully. But this mission serves as an example of one of the first intelligence operations to be compromised when abnormal behavior was examined using analytical capabilities. In this instance, Italian authorities used analytical capabilities to examine poor digital tradecraft. The activities and communications of the operators directly involved with and supporting the operation left a digital path that, when evaluated later, would compromise every CIA officer involved.

Italian officials analyzed call records and metadata to identify telephonic and texting behavior that stood out as abnormal within the Italian cellular network. This investigation led to a link analysis of each of the Milan operation's team members, and a review of surveillance cameras at the time of the operation allowed the Italian police to compile a minute-by-minute record of the operation. With digital photos, Italian officials could then review travel documents and biometric information provided during immigration to identify the CIA officers. (The review of the CIA operation in Italy was conducted using multiple documents and a video. This discussion is not about how the United States or any nation conducts its intelligence operations; rather, this discussion is an assessment of how compromises occur. This chapter will not cover or evaluate classified methods of intelligence collection, but the chapter uses examples of known intelligence compromises to reinforce the point advanced analytics driving intelligence can negatively impact the Marine Corps' formulation and implementation of EABO and shape the Marine Corps for peer competition in 2030.)[9]

As another example, on January 19, 2010, an Israeli Mossad team assassinated Hamas leader Mahmoud al-Mabhouh in a Dubai hotel. Just like in the 2003 CIA operation, multiple Mossad teams traveled to the United Arab Emirates using fake documentation. The teams conducted surveillance activities, swapped out team members, passed intelligence, and executed a Hamas leader on foreign soil before safely leaving the country. As with

9. Daniel W. Drezner, "Worst Tradecraft Ever," *Foreign Policy* (website), December 25, 2005, https://foreignpolicy.com/2005/12/25/worst-tradecraft-ever/; and Black Hat, *Black Hat 2013 – OPSEC Failures of Spies* (London: Informa Tech, 2013), YouTube video, https://www.youtube.com/watch?v=BwGsr3SzCZc.

the CIA's rendition operation, the Mossad teams successfully completed their mission but every member of the Mossad team was identified and compromised. Using analytical capabilities, the chief of police in Dubai combined facial recognition software and travel documentation with anomalous cell-phone data to reconstruct the event, identify the fake passports used, and reveal the identities of each Mossad agent involved in the surveillance and assassination. The United Arab Emirates released a video documenting the entire event and identifying the true names of the officers involved. (The review of the events captured in the Mossad operation in Dubai was compiled from multiple sources.)[10]

These examples highlight the growing vulnerability covert operations face in today's ubiquitous data environment. The CMC's vision of EABO does not include covert action. Covert action refers to actions or operations meant to conceal the identity or affiliation of the action's sponsor, allowing for plausible deniability once the action has been revealed. Covert operations can include partisan operations or the use of special, capable units that do not wear uniforms. Although, as part of EABO, the CMC intends to conceal marines' intentions, targets, and actions until revealing them is absolutely necessary, marines will continue to wear uniforms and behave as regular combatants, in accordance with the norms established by the Geneva Conventions. Expeditionary advanced base operations (EABO) are not meant to mimic the clandestine tradecraft of strategic spy agencies. But without low-signature operations and tailored, secure communication between disparate teams, adversaries could likely detect US forces in the contested areas where EABO will take place. The operations intended for stand-in forces and specifically designed for reconnaissance units operating ashore will rely upon stealth, low-signature operations, and intelligence. The EABO concept involves conducting surveillance and reconnaissance, air interdiction and missile defense, sea control and denial of key terrain, submarine targeting and antisubmarine warfare, decoying and deception, strike operations, information operations (IO), and several other operations.[11] To achieve these aspirations, marines will have to incorporate techniques and capabilities that may resemble tradecraft employed by intelligence operations; thus, marines should learn from the mistakes compromised operations never intended to be made public.

10. "Does Mossad Really Make Israel Safer?," *Economist* (website), February 25, 2010, https://www.economist.com/middle-east-and-africa/2010/02/25/does-mossad-really-make-israel-safer; Dan Magen, *Israeli Mossad: Assassination of Mahmoud Al-Mabhouh: The True Story from Insider* (self-pub., 2017); and Gulf News, *The Murder of Mahmoud Al Mabhouh* (Dubai: Gulf News, 2014), YouTube video, https://www.youtube.com/watch?v=bJujIwtdk8w.

11. HQMC, *Tentative Manual*, 1-4; and Concepts and Plans Division, *Expeditionary Advanced Base Operations*, 30.

General David H. Berger has articulated his vison for the use of stand-in forces and marine reconnaissance in recent articles. The EABO concept will maximize stand-in forces' mobility, concealment, and enhanced lethality to create a decisive advantage, allow stand-in forces to move throughout the contested area, and capitalize on asymmetry to the Joint Force's advantage. The EABO concept will require the Marine Corps to develop capabilities that can help to create windows in which marines can operate securely in contested areas. In his assessment of the Milan compromise's implications for operations in the digital environment, Matthew Cole echoes Hayden's comment: "[M]eta data is far more telling than the conversation you're having."[12] Thus, marines conducting EABO will face the same challenges strategic intelligence organizations like the CIA and Mossad encountered almost 20 years ago, only in today's more sophisticated digital environment. Outside agencies compromised the Mossad and CIA operations using facial recognition, travel documentation (with first-generation biological data and fingerprint capabilities), and antiquated cell phones. The data collected by outside agencies persists in cyberspace, and the lives of the CIA and Mossad operatives are forever compromised. This level of attrition is not sustainable. No service can sustain the risk of having its servicemembers' or operatives' identities exposed, displayed for a public audience, or held at risk by a malign actor. The Marine Corps cannot train, equip, and instill the experience needed in its reconnaissance occupational specialty at this high risk level. Instead of being a viable deterrent, risk makes EABO too costly a resource for the Marine Corps to use. The digital environment in which EABO will operate includes peer competitors who have developed advances to analyze the next generation of facial recognition data, biological data, and travel records. Peer competitors have also incorporated the powerful tracking capabilities of current cell-phone technology and added rich contextual data acquired through social media. With access to this data—especially when combined with state-level intelligence resources—peer adversaries possess a powerful too they can use for individual targeting purposes. (In this case, targeting refers to identifying individuals discriminately, not necessarily for kinetic effects. The implications are an adversary could use targeting techniques to identify marine stand-in forces and apply a full spectrum of capabilities to interdict the forces' accomplishment of their tasks.)[13]

The intelligence derived from advanced data analytics impacts individuals, introduces risk into operations, and risks exposing CI activities when

12. Black Hat, *Black Hat 2013*.

13. David H. Berger, "A Concept for Stand-in Forces," *Proceedings* (website), November 2021, https://www.usni.org/magazines/proceedings/2021/november/concept-stand-forces.

adversaries characterize the activities or attributes of tradecraft involved in operations. Adversaries can develop algorithms designed to detect specific behaviors. Cole's discussion about the CIA operation in Milan also highlights other compromises of Mossad and CIA agents operating in Lebanon that occurred because of the characterization of anomalous metadata consistent with tradecraft activities.[14] In 2011, Hezbollah identified the majority of CIA operations in Lebanon based on poor digital tradecraft, and from 2010–12, the CIA was equally impacted in China. These failures resulted from the CI vulnerability associated with poor digital tradecraft as well as digital analytics' ability to identify digital behavior inconsistent with most of the population's use of computers, cell phones, and the Internet.[15] Adversaries will use their strategic intelligence apparatus to detect behavior they consider to be consistent with intelligence tradecraft. The data adversaries use to uncover intelligence operations will not differentiate between espionage and a reconnaissance team conducting EABO. Adversaries will view both as a threat, and the United States can expect adversaries to use strategic intelligence resources to identify reconnaissance activity before EABO begins.

China's Digital Technology Threat

What was possible over a decade ago pales in comparison to advances in data-driven intelligence in 2023, and the possibilities will continue to expand, presenting newer challenges to the Marine Corps and the military by 2030. For the Marine Corps to implement an EABO strategy and apply forces capable of defeating A2/AD capabilities on land and in the littoral regions, the service must understand how peer adversaries use modern technology to create intelligence that is designed to deter and counter the United States' advantages—specifically, in the Asia-Pacific region. China uses digital technologies in the form of individual social credit scores that are designed to protect the regime from its primary threat, the Chinese people. China identifies emerging, external threats with surveillance technology the country produces domestically and exports globally. China uses a network of surveillance platforms coupled with highly advanced data analytics and facial recognition to assign social credit scores to Chinese citizens. This data allows the regime to identify behaviors and root out individuals who challenge the

14. Black Hat, *Black Hat 2013*.

15. Mark Mazzetti et al., "Killing CIA Informants, China Crippled US Spying Operations," *New York Times* (website), May 20, 2017, https://www.nytimes.com/2017/05/20/world/asia/china-cia-spies-espionage.html; and David Choi, "The CIA Falsely Believed It Was 'Invincible' in China—Here's How Its Spies Were Reportedly Discovered and Killed in One of the Biggest Blows to the Agency," Business Insider (website), August 16, 2018, https://www.businessinsider.com/how-china-found-cia-spies-leak-2018-8?op=1.

order of the system through integrated technologies referred to as "smart cities" and "safe cities." Smart-city and safe-city technologies, which are integrated, layer sets of data to deliver services to users, including both citizens and the government. China can use smart-city and safe-city technologies to deliver timely services, such as emergency medical care or public safety services, and to bolster the security of the state. This combined technology can be used either to enhance the security, safety, and interconnectivity of society or to surveil it.[16]

Two fundamental technologies underpin China's strategy to keep the Chinese Communist Party in power: fifth-generation telecommunications technology (5G) and the Internet of Things (IoT). China's domination of the 5G market and the country's realization of the IoT means an authoritarian system of global surveillance could permeate society, reducing the United States' ability to counter Chinese expansion in the virtual and physical domains. This potential reduction is why China is driving to become the global leader in 5G and artificial intelligence.[17] The advance from fourth-generation telecommunications technology to 5G is more than just a technological upgrade. Fifth-generation telecommunications technology (5G) relies upon a different part of the electromagnetic spectrum (EMS) that enables the technology to transfer data 10 to 100 times faster than fourth-generation telecommunications technology and with far lower latency. Coupled with Internet Protocol version 6, which has exponentially increased the number of Internet Protocol addresses able to access the Internet at the same time, the move to 5G enables more devices to connect to greater bandwidth simultaneously. Thus, 5G makes the IoT a powerful and prescient new reality that affords unprecedented insight to an adversary that combines commercial technology with national means.[18]

16. Yang Li and Jie Li, "Study of Cloud Computing Security and Application in Safe City," *Applied Mechanics and Materials* 738–739 (2015): 299–303; and Jozef Ristvej, Maroš Lacinák, and Roman Ondrejka, "On Smart City and Safe City Concepts," *Mobile Networks and Applications* 25, no. 3 (June 2020): 836–45.

17. Karen M. Sutter and Michael D. Sutherland, *China's 14th Five-Year Plan: A First Look,* Congressional Research Service (CRS) Report IF11684 (Washington, DC: CRS, 2021); Office of the Secretary of Defense (OSD), *Military and Security Developments Involving the People's Republic of China 2020* (Washington, DC: OSD, 2020), 15–16; OSD, *Military and Security Developments Involving the People's Republic of China 2021* (Washington, DC: OSD, 2021), 21; John R. Hoehn and Kelley M. Sayler, *National Security Implications of Fifth Generation (5G) Mobile Technologies*, IF11251 (Washington, DC: CRS, 2021); Jill C. Gallagher and Michael E. DeVine, *Fifth-Generation (5G) Telecommunications Technologies: Issues for Congress*, CRS Report R45485 (Washington, DC: CRS, 2019); and Editorial Board, "China's Intrusive, Ubiquitous, Scary Surveillance Technology," *Washington Post* (website), December 17, 2017, https://www.washingtonpost.com/opinions/chinas-intrusive-ubiquitous-scary-surveillance-technology/2017/12/17/49f25c64-e048-11e7-89e8-edec16379010_story.html.

18. Gallagher and DeVine, *Fifth-Generation (5G) Telecommunications*, 6; and Patricia Maloney Figliola, *The Internet of Things: Frequently Asked Questions*, CRS Report R44227 (Washington, DC: CRS, 2015), 1, 11–12.

China might not realize the full potential of 5G and the IoT for another 10 years, but one can learn from how China uses existing capabilities and how it might adapt them to counter EABO. With an estimated 64 billion devices projected to access the Internet by 2025 and, possibly, trillions by 2040, 5G and the IoT are the engines that drive China's social credit system.[19] The computing power and bandwidth required to make China's social credit system and smart- and safe-city technologies a reality are only viable through the infrastructure provided by 5G. Elizabeth Van Wie Davis outlines three key components upon which China relies: military access and connectivity for C2 while fending off intrusion; an integrated economic strategy that allows for domestic and international cyberespionage; and a centrally controlled, national Internet for domestic surveillance and censorship.[20] This digital surveillance capability is not just a way for China to monitor domestic crime and protect the Chinese Communist Party from potential Chinese dissidents. China can use its global 5G infrastructure, once it has matured, to identify behavior and individuals capable of threatening the regime.[21] The stand-in forces and outside forces conducting EABO would be exposed to China's strategic intelligence efforts to identify and track anomalous behavior, regardless of whether the EABO forces use traditional tradecraft or conduct the low-profile activity the Marine Corps envisions. With greater bandwidth and exponentially more devices capable of running independent algorithms to look for behavior China perceives as a threat, Marine Corps units will face challenges when maneuvering stand-in forces in a contested area of operations. According to Kelley M. Sayler:

> Biometric surveillance systems also could hold implications for traditional military and intelligence operations. According to former CIA Deputy Director for Science and Technology Dawn Meyerriecks, around 30 countries have already deployed biometric surveillance systems that are capable of autonomously tracking foreign military personnel and intelligence operatives. Some estimates suggest that China alone has exported components of these systems to over 80 countries, including authoritarian regimes, such as Venezuela, and US allies, such as the United Kingdom. Fully integrated, large-scale biometric surveillance networks have not yet been

19. Strategic Futures Group, *Global Trends 2040: A More Contested World* (Washington, DC: National Intelligence Council, 2021), 2.

20. Elizabeth Van Wie Davis, *Shadow Warfare: Cyber Policy in the United States, Russia, and China* (Lanham, MD: Rowman & Littlefield, 2021), 85.

21. Davis, *Shadow Warfare*, 93, 95.

> realized; however, as component technologies continue to mature and proliferate, such networks could threaten the privacy or jeopardize the safety of targeted individuals or disrupt US clandestine operations or human intelligence gathering. As a result, US military and intelligence agencies may continue to develop alternative tradecraft and concepts of operation.[22]

The EABO concept is predicated on mobility, lethality, deception, and survivability. To seize key terrain, target littoral and key sea gateways, and interdict missile defense systems, stand-in forces must be able to communicate securely, especially with the Army and the Joint Force. Marines will need to protect the content of their communications while obfuscating the contact among teams, host-nation forces, and outside forces. Digital signatures (and in some cases, the lack thereof) are both the Achilles' heel and strength of reconnaissance units acting as stand-in forces. If a peer adversary like China can harvest data using an expanded digital surveillance capability, then the country could track stand-in forces throughout a contested area of operations and disrupt their mission. All US military services and allied and partner forces will face these problems. Safeguarding personal and operational data is a cornerstone of success in EABO.

The Marine Corps must develop new approaches to secure communication. The use of secure and regionally consistent, commercial communications will play a part in enabling marines to operate with greater autonomy in contested areas of operation. Stand-in forces will also need to interoperate with globally employed intelligence resources. The Marine Corps needs an operationally focused intelligence enterprise capable of responding to the needs of stand-in forces. The intelligence enterprise should provide global intelligence collection and analysis from inside and outside an adversary's weapon engagement zone and across the Marine Corps' intelligence, surveillance, and reconnaissance (ISR) enterprise. The relationship between stand-in forces and intelligence will be vital. Intelligence collection and processing helps the Marine Corps understand the operating environment and articulates capabilities and threats for stand-in forces. To win the reconnaissance and counter reconnaissance fight, marines will need intelligence tailored to meet their unique requirements. Competing for resources from outside intelligence sources will never adequately serve the Marine Corps' intelligence needs or prioritize the intelligence needed to support stand-in forces.

22. Kelley M. Sayler, *Biometric Technologies and Global Security*, CRS Report R44227 (Washington, DC: CRS, 2021), 1–2.

Ways for the Marine Corps to Overcome Technological Challenges

Sun Tzu's maxim "Those skilled at making the enemy move do so by creating a situation to which he must conform" is at the heart of the EABO concept.[23] The threats posed by intelligence derived from advanced analytics are not solely a CI or OPSEC threat to the Marine Corps and EABO. Intelligence vulnerabilities will apply across the Joint Force, the interagency, and the intelligence community. These vulnerabilities also impact the United States' ability to project forces and collect valuable information for decisionmakers. The EABO concept is the Marine Corps' vision for setting conditions to make adversaries react. The CMC envisions stand-in forces will set the conditions for follow-on success and cause peer adversaries to react. Agile units in the stand-in forces, such as reconnaissance units, will cooperate deeply with intelligence units to ensure stand-in forces have the tools and situational awareness they need to be effective. The Marine Corps will play a part in, to quote the *National Counterintelligence Strategy of the United States of America 2020–22*, "[e]nhanc[ing] our cyber counterintelligence toolkit."[24] The strategy states, "We will work to develop and acquire new capabilities to track and counter foreign cyber and technical operations against the United States and leverage partnerships with the private sector to develop effective countermeasures."[25] The EABO concept will enable the Marine Corps to support the Joint Force's use of capital capabilities for power projection with maximum effectiveness. Expeditionary advanced base operations (EABO) will force adversaries to react and allow the Joint Force, as Sun Tzu urges, to "bring the enemy to the field of battle" and not be "brought there by him."[26]

Innovation is critical to enabling EABO. The Marine Corps will require new tools for secure communications and digital deception. Deception and intelligence are inextricably linked. For EABO to be effective, marines will need to blind an adversary's digital intelligence collection capabilities and force the enemy to see that which the marines want it to see. This collaboration will take place both inside and outside the range of adversaries' weapons. The Navy and the Marine Corps must drive innovative approaches and incorporate new technologies to ensure the survival of stand-in forces. For example, the Navy and the Marine Corps can produce deepfakes that would allow units

23. Sun Tzu, *Art of War*, 93.

24. National Counterintelligence and Security Center, *National Counterintelligence Strategy of the United States of America 2020–2022* (Washington, DC: Office of the Director of National Intelligence, 2019), 10.

25. National Counterintelligence and Security Center, *National Counterintelligence Strategy*, 10.

26. Sun Tzu, *Art of War*, 96.

to appear somewhere they are not. According to a Congressional Research Service report, "Deep fakes could produce an effect that professors Danielle Keats Citron and Robert Chesney have termed the 'Liar's Dividend'; it involves the notion that individuals could successfully deny the authenticity of genuine content—particularly if it depicts inappropriate or criminal behavior—by claiming that the content is a deep fake."[27] The report claims deepfakes "could present a variety of national security challenges in the years to come."[28]

Used offensively, technologies like deepfakes cause adversaries to doubt the intelligence they derive from digital data surveillance. Coupled with commercially available encryption, virtual private networks, and commercially available messaging applications, innovative technologies will work like a tool kit for EABO. Marines will have to select the right combination of communication, disruption, deception, and intelligence technologies and tools to achieve the desired effect of their tasked EABO activity. Choosing the right combination will require marines to understand personal data footprints and how they will interact with military technologies, commercial tools, and adversaries' intelligence collection. The Navy and the Marine Corps will need digital deception capabilities, intelligence platforms, and dual-use communications capabilities that respond to service and Joint Force needs. Effective EABO will apply the right tools, military force, or humanitarian aid where and when needed. Expeditionary advanced base operations (EABO) is a global plan to balance deterrence and credibility with combat power to defeat A2/AD capabilities and to continue to project US military capabilities when and where the United States determines the need.

Conclusion

The National Security Agency released a declassified report in 1993 titled *PURPLE DRAGON: The Origin and Development of the United States OPSEC Program*. The report highlighted OPSEC's vulnerabilities during US theater operations in Vietnam. Operation Purple Dragon was a joint effort by the Department of Defense and the National Security Agency that evaluated how sensitive but unclassified information collected by the Viet Cong and North Vietnamese created risk for US campaigns in the Vietnam War. The joint effort combined tactical and strategic intelligence assets to identify elements of friendly information the United States needed to protect. The operation

27. Kelley M. Sayler and Laurie A. Harris, *Deep Fakes and National Security*, CRS Report IF11333 (Washington, DC: CRS, 2021), 1.

28. Sayler and Harris, *Deep Fakes*, 1.

compiled an assessment of how information leaks impacted the field and developed a theater strategy to combat the collection of critical, unclassified information on units and operations.[29] This effort was highly successful at protecting theater military operations, intentions, and servicemembers. Operation Purple Dragon was a concerted effort to reduce risk to mission and forces through the combined resources of strategic intelligence, military service leadership, operational staffs, and individuals. Now is the time for the United States to expand these measures, with a focus on protecting the services and operations by protecting individuals in the digital domain. The exposure of global covert and clandestine intelligence operations reinforces the need for a dedicated effort to understand enemy capabilities and intelligence priorities as well as US capabilities and to examine what the US military and servicemembers' "digital dust" says about them or reveals about US intent. The Joint Force requires an increased level of intensity and focus to combat new OPSEC and CI challenges that result from intelligence derived from advanced analysis of unclassified information. Increasing its focus on intelligence would enable the United States to maintain its competitive advantage and ability to project power.

The ubiquity of data and the resulting CI and OPSEC vulnerabilities present complex challenges that cut across the Joint Force and the interagency. Adversaries' technical capabilities to aggregate and analyze data will impact the United States' ability to project military power and conduct the full spectrum of operations to win in conflict. China is a major supplier of artificial intelligence surveillance globally. By exporting the data infrastructure through advancements in cellular 5G technologies built by state-affiliated companies such as Huawei, China is poised to create a global apparatus designed to identify threats and deter adversaries' activities.[30] These evolutions highlight the importance of updated US military doctrine. General Charles C. Krulak, the 31st CMC, wrote in his preface to Marine Corps Doctrinal Publication 1, *Warfighting*, "Doctrine must continue to evolve based on growing experience, advancements in theory, and the changing face of war itself. . . . It requires judgment in application."[31]

29. Central Security Service, *United States Cryptologic History*, series VI, vol. 2, *PURPLE DRAGON: The Origin and Development of the United States OPSEC Program* (Fort Meade, MD: Center for Cryptologic History, 1993).

30. Steven Feldstein, "The Global Expansion of AI Surveillance" (working paper, Carnegie Endowment for International Peace, Washington, DC, September 2019), https://carnegieendowment.org/2019/09/17/global-expansion-of-ai-surveillance-pub-79847.

31. HQMC, *Warfighting*, Marine Corps Doctrinal Publication 1 (Washington, DC: HQMC, updated April 2018), 3–4.

Expeditionary advanced base operations (EABO) is the evolution of doctrine for the modern Marine Corps. But this evolution of doctrine and capability must incorporate threats to CI and OPSEC. Units conducting EABO will face strategic intelligence capabilities that were not possible in the past. The digital world is EABO's connective tissue. Although it offers many advantages, the digital world also opens new vulnerabilities the Marine Corps must address. The Marine Corps must take measures to conceal operations in the current environment of ubiquitous data.

The Joint Force must know an enemy's capabilities and collection priorities to help the Joint Force identify when to move, when to mass, when to strike, and how to obscure its movement. The Joint Force will require intelligence capabilities that focus on providing a competitive advantage in a data-centric environment. The military and the intelligence services will need to innovate and build a cyber CI tool kit that has been adapted for use by operations and units. Military services cannot focus on protecting units without also taking measures to protect individuals. Although the Marine Corps has released messages about the importance of protecting personal data, the service must continue taking steps to protect its marines.[32]

In addition, the Joint Force will need to understand the challenges advanced data analytics and peer adversaries' strategic intelligence capabilities will pose for the organization's ability to project force. Taking measures like Operation Purple Dragon would help the Joint Force to support a wide range of operations, protect US forces, and identify adversary attempts to uncover information about US personnel and operations. As cutting-edge technology advances and the United States' adversaries enhance their ability to target individual soldiers, sailors, airmen, and marines, the Joint Force must continue making significant advances to protect its servicemembers and turn the services' future operating concepts into a reality.

32. HQMC, *Cybersecurity Tips for Marines and Their Families*, Marine Administrative Message 063/22 (Washington, DC: HQMC, February 22, 2022); and HQMC, *Antivirus Home Use Programs*, Marine Administrative Message 067/22 (Washington, DC: HQMC, February 23, 2022).

— 8 —

Conclusion

Dr. Gregory L. Cantwell and Major Justin M. Magula

The preceding chapters provide a wide-ranging analysis of how the nation can address future threats and pursue its interests through the application of Strategic Landpower during cooperation and competition. As shown here, Strategic Landpower encompasses more than just fighting large-scale wars. The US Army and the Joint Force engage adversaries and allies in competition and cooperation in a manner not seen since the Cold War, and these conditions will likely continue in the future. These studies offer some key insights to help inform senior Army leaders.

First, the Army must improve coordination across each priority theater in the way it engages allies and partners. As shown here, a number of forces like special operations units, security forces assistance brigades, conventional rotating brigades and divisions, Army National Guard units under the State Partnership Program, and other units routinely engage allies and partners. These units should not only perform missions that improve the host nation's military capabilities, but also serve as a means to further strengthen ties with those nations. In addition, the Army should build sufficient command and control structures that allow for information and intelligence sharing in a timely and streamlined manner. The Army can leverage its theater armies, along with military attaches, to help synchronize these efforts in a way that builds toward long-term goals of regional stability and a more cohesive "Landpower network" of allies and partners.

Second, the Army and the Joint Force must continue modernizing sustainment capabilities to address challenges presented in both the European and Pacific theaters. Each theater presents unique conditions for the Army to

provide Army support to other services adequately. The services can enhance relations with host nations during competition to improve basing, transport, and sustainment capacity so the Joint Force's sustainment capabilities can operate effectively during crisis and conflict. The Army must also ensure its sustainment modernization keeps pace with its ever-progressing combat capabilities. As the historical case studies in this volume illustrate, sustainment in the early stages of a conflict presents a significant challenge. By harnessing new technologies and developing comprehensive doctrine, the Army can ensure it meets the sustainment needs of its forces in the future.

Lastly, the Department of Defense must continue developing its ability to influence and operate in the information environment, and to protect its forces from an opponent's actions. China and Russia have outpaced the United States over the past two decades in competition in the gray zone. The United States must close this gap. The Army must invest in its theater armies' ability to operate in the information environment through training of its staffs and investing in technological capabilities. More broadly, the Department of Defense must find ways to protect its units and individuals from adversaries who can collect personal data and exploit intelligence about it. As operations in Ukraine have shown, adversaries can exploit personal and unit information in ways that impact battlefield operations.

The aforementioned examples of the military's role in competition demonstrate the importance of these activities in setting the conditions that can help to deter an adversary or to enable credible military responses should deterrence fail. Numerous additional activities must be performed in the gray zone for the military to be able to compete effectively against a near peer on a global scale. Further study and creative solutions should be explored in all areas to enable the Joint Force to modernize the role of Strategic Landpower now and in the future. We encourage other scholars and practitioners to continue expanding the dialogue and research on this important topic.

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