

Unified Quest 2014



Executive Report

Win in a Complex World

Participating Organizations

Joint and Interorganizational Partners

U.S. Department of State
U.S. Agency for International Development
U.S. Department of Energy
Defense Advanced Research Projects Agency
Office of the Secretary of Defense Office of Net Assessment
Joint Staff Logistics Directorate (J4) and Joint Force Development Directorate (J7)
U.S. Special Operations Command
U.S. Transportation Command

Services

U.S. Navy
U.S. Marine Corps
U.S. Air Force
U.S. Coast Guard
U.S. Army Reserve
U.S. Army National Guard

Service Schools and Academia

Army Science Board
Army War College
Navy War College
U.S. Military Academy
College of William and Mary
U.S. Combat Studies Institute
U.S. Army Command and General Staff College
Logistics Innovation Agency
Los Alamos National Lab
Lawrence Livermore National Lab
Johns Hopkins University Applied Physics Lab

Army Organizations

Headquarters, Department of the Army
Chief of Staff of the Army Strategic Studies Group
U.S. Army Training and Doctrine Command
U.S. Army Materiel Command
U.S. Army Corps of Engineers
U.S. Army Africa
U.S. Army North
U.S. Army Special Operations Command
U.S. Army Cyber Command

U.S. Army Space and Missile Defense Command
U.S. Army Medical Command
U.S. Army Research Institute
U.S. Army Research Laboratory
Army Research Office
U.S. Army Logistics Innovation Agency
U.S. Army Engineer Research and Development Center
U.S. Army Tank and Automotive Research, Development, and Engineering Center
U.S. Army Aviation and Missile Research, Development, and Engineering Center
U.S. Army Natick Soldier Research, Development, and Engineering Center
U.S. Army Heritage Center

International Partners and Organizations

Australia
Canada
Czech Republic
Denmark
France
Germany
Great Britain
Israel
Italy
Japan
Netherlands
Norway
Singapore
Spain
Turkey
NATO Allied Command Transformation

Other Organizations and Agencies

Defense Language Institute
National Geospatial Intelligence Agency
RAND Corporation
New York City Police Department



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Unified Quest 2014

At the leading edge of concept and capability development, the Army Chief of Staff's Title 10 future study plan, Unified Quest, is a primary component of Force 2025 Maneuvers: the Army Campaign of Learning. Through Unified Quest, Future Warfare Division, Concepts Development and Learning Directorate, Army Capabilities Integration Center (ARCIC) defines a vision of future conflict and informs concept to capability development for future Army forces to win in a complex world.

2014 Purpose. Explore challenges and opportunities in the operational environment of 2030-2040 and identify implications for the Army to conduct joint operations promptly, in sufficient scale, and for ample duration to prevent conflict, shape security environments, and win wars.

Force 2025 Maneuvers

The Army conducts a multi-year effort of intellectual and physical activities to develop, refine, and validate requisite Force 2025 and Beyond concepts, operational and organizational plans, and doctrine, organization, training, materiel, leadership and education, personnel, facilities and policy requirements. This effort aims to achieve the Army's force vision in the near- (2020), mid- (2025), and far-term (2040), to realize Army Operating Concept ideas in a constrained resource environment.¹

The Army Operating Concept

The Army Operating Concept describes how future Army forces must operate to accomplish campaign objectives and therefore provides a framework for the study's insights. The future operational environment will be complex – unknown,

unknowable, and constantly changing. To win in a complex world, Army forces as part of the joint force must provide national leaders with multiple options, integrate the efforts of multiple partners, operate across multiple domains, and present our enemies and adversaries with multiple dilemmas.

Army Warfighting Challenges

Army Warfighting Challenges provide the analytical framework for the concepts-to-capabilities process and frame the study's recommendations for the Army. Army Warfighting Challenges² are enduring first order problems, the solutions to which improve the combat effectiveness of the current and future forces. These first order problems require development of second order learning demands that will drive research, experimentation, and study throughout the Campaign of Learning.

Study Overview

Problem Statement. How does the future force conduct unified land operations in response to an international crisis, under the demands of a megacity environment? This strategic challenge provided the intellectual baseline for enabling events and the capstone Deep Future Wargame.

Sequence of Events

Scenario Workshop (11-12 Dec 13)

The workshop assembled experts from a variety of intelligence agencies. Over two days they developed a scenario framework in 2030-2040 centered on the employment of Army forces in a megacity. The workshop identified specific strategic and operational problems necessitating a U.S. military response in a megacity.

¹ U.S. Army Training and Doctrine Command, *Force 2025 and Beyond, Unified Land Operations: Win in a Complex World*, 7 October 2014.

² For definitions and discussion of Army Warfighting Challenges, see the website at <https://www.milsuite.mil/wiki/AWFC>. A common access card is required to access the site.

Strategic Trends Seminar (7-10 Jan 14)

The College of William & Mary hosted experts from the Army, sister services, multinational partners, think tanks, industry, and academia. Participants explored trends and plausible conditions in the future operational environment, and their implications for the Army. Seminar participants provided insights on future threats for technology overmatch research and for the intelligence and concept development communities.

Focused Environment (3-7 Feb 14)

Seminar participants explored how U.S. and allied military forces might conduct the range of military operations in and around a megacity in 2030-2040. The event provided a comprehensive assessment of the megacity environment and the impacts on future forces. The results were force concepts of employment for further development in the Deep Future Wargame.

Deep Future Wargame (17-22 Aug 14)

The Deep Future Wargame was the Unified Quest 2014 future study plan's capstone event. A joint, interorganizational, and multinational team conducted 10 days of wargaming and discourse at the Army War College in Carlisle Barracks, Pennsylvania. The event comprised of three components.

Operational Wargame

Three operational working groups – Blue (U.S.-led coalition forces), Green (host nation forces, regional governments, and international institutions), and Red (non-monolithic, regional insurgency empowered by technology advancements) – conducted

independent and interactive wargaming spanning 180 days. A notional regional power, closely aligned to the United States, faced internal security challenges, while a catastrophic flood displaced millions and killed nearly 500,000. The United States responded to a host nation request for security forces to lead coalition operations aimed at supporting their government and managing international humanitarian assistance.

Future Force Innovation Teams

Two innovation planning teams functioned as a “skunk works” for ideas about the future Army. Starting from a “blank sheet of paper,” teams developed force designs and employment approaches for further development in the Campaign of Learning.

The Starry Innovation Planning Team used a top-down perspective and developed approaches to influence future organizational structures combined with employment ideas.

The DePuy Innovation Planning Team worked from the ground up to propose new formations and operational concepts.

Strategic Working Group

Senior leaders from across government and academia studied opportunities and challenges inherent in fielding a future force. Through panel discussions and deliberation, the group considered six proposals developed by the innovation planning teams and assessed benefits and risks of future capability, including reducing sustainment demands and exploring proposals to increase military effects.

Insights and Implications

Scouting the concepts and capabilities needed to win in a complex world. The following insights are derived from over 2,000 observations developed during the aforementioned seminars and post-game analysis with defense partners, national security agencies, and academia.

The Army Operating Concept A Complex World

Five major implications for the Army:

- (1) ***Increased velocity and momentum of human interaction and events.*** The speed at which information diffuses globally increases the velocity, momentum, and degree of interaction among people.
- (2) ***Potential for overmatch.*** Overmatch is the application of capabilities or use of tactics in a way that renders an adversary unable to respond effectively. Potential enemies invest in technologies to obtain a differential advantage and undermine U.S. ability to achieve overmatch.
- (3) ***Proliferation of weapons of mass destruction.*** Proliferation to diverse state and nonstate actors in the form of chemical, biological, radiological, nuclear, and high-yield explosive weapons poses an increased threat to U.S. and international security.
- (4) ***Spread of advanced cyberspace and counter-space capabilities.*** The cyberspace and space domains grow in importance as global and regional competitors as well as nonstate actors invest in capabilities to protect their access and disrupt or deny access to others.
- (5) ***Demographics and operations among populations, in cities, and in complex terrain.*** The percentage of the world's population in urban areas will rise to sixty percent by 2030.

These implications require Army and joint force investment now to achieve the

capabilities necessary to provide the joint force with multiple options, integrate the efforts of multiple partners, operate across multiple domains, and present our enemies and adversaries with multiple dilemmas.

Multiple Dilemmas

Reduced forward basing inhibits the joint commander's ability to project Army forces capable of sustained land operations. The force requires joint solutions to enable rapid entry of heavy formations. Proposed Army austere-entry capabilities and future vertical lift aviation provide an interim solution for increasing Army global response force effectiveness.

The Army must shift the operational deployment paradigm from *strategic movement* and *deployment to maneuver across strategic distances* to improve global responsiveness. Joint combined arms air-ground teams maneuvering strategically are able to gain, retain, and exploit the initiative without operational pause or loss of momentum.

Austere entry capabilities, including seabasing, shallow-draft ships, and self-deploying Army aviation enable joint combined arms air-ground maneuver while reducing Army reliance on strategic lift assets. Unmanned distribution systems, ultra-heavy vertical lift, precision air delivery, and joint logistics over-the-shore capabilities are essential to future unified land operations.

Self-deployable Army future vertical lift capabilities and joint shallow-draft systems must be capability development priorities. These efforts are essential to future strategic, operational, and tactical maneuver and enable dispersed forces to maintain mutually supporting functions.

Multiple Options

Military problems involving a megacity are not unique, but demographic trends in urbanization, littoralization (population migration from interior to coastal regions), and connectedness (through information technology, commerce, and global migration) indicate increased probability of Army force employment in and around a megacity. Unified Quest evaluated how U.S. forces cope with the tyranny of scale during operations in and around megacities. For comparison, a megacity (by definition 10 million people) is 30 times larger than Fallujah, Iraq and one and a half times the size of Baghdad, Iraq.

The megacity's multi-layered features – air, surface, subsurface, human, information – generate new requirements for understanding operational environments and drivers of conflict.³ Army forces require human terrain mapping and modeling; advanced intelligence, surveillance, and reconnaissance capabilities; long-term engagement; and staff expertise to develop understanding of a megacity prior to expeditionary action.

Megacities hinder access to entire regions, requiring new approaches to sustaining operations. Army deployments depend on improved ports and intermediate staging bases as well as secure, extended lines of communication. Joint combined arms operations require new approaches to gain access to regions where improved ports are part of megacities. Congestion, security, and persistent threats prohibit staging, movement, maneuver, and sustainment within operational reach of key terrain.

Combined arms air-ground maneuver within megacities requires operating simultaneously through multiple, interconnected domains. Combined arms air-ground teams require advanced multi-role ground mobility

systems to rapidly transition to offensive operations in severely restricted mobility environments. These systems can execute combined arms air-ground maneuver as well as combat support and service support tasks. A fighting vehicle able to simultaneously destroy enemy forces, clear routes and transport supplies increases operational flexibility. Improved communications and vertical lift, augmented by extended fires, will allow widely dispersed operations of mutually supported formations.

Urban operations doctrine will need to account for the unique challenges of entering a megacity under permissive and nonpermissive conditions. Training and Doctrine Command (TRADOC) will develop a concept centered on small units dispersed across large distances conducting multi-dimensional maneuver in and around a megacity.

Multiple Domains

Future Army forces responding to threats in multiple domains and influencing layers of networks and populations require innovative solutions. Fires and effects (lethal and nonlethal) must integrate financial and information operations. These multi-domain effects require extensive systems analysis and targeting across multiple dimensions.

The Army will incorporate cyberspace insights into the emerging Joint Concept for Cyberspace, and focus on the application of effects in other domains. The Defense Department must develop policies that allow Army cyberspace forces to defend partner networks and integrate maneuver in cyberspace with other forms of maneuver.

³ Charles Ehlschlaeger, ed. *Understanding Megacities with the Reconnaissance, Surveillance, and Intelligence Paradigm* (2014).

Multiple Partners

Army operations include multiple partners, in multiple domains, and create multiple dilemmas for adversaries across contested and congested environments. The Army fights for information in close contact with the enemy and civilian populations to establish and maintain shared situational understanding for national leaders.

Adversaries in 2030-2040 will employ information campaigns to generate international support quickly and inexpensively. The Deep Future Wargame highlighted the need to rapidly counter “weapons of mass misinformation.”

Future Army forces provide an integrating capability required to coordinate coalition operations. While unity of command applies to military forces, the Army must also have the means (technical and conceptual) to improve unity of effort for the dynamic and often complex coalitions of 2035 (military and nonmilitary partners).

Mission command must account for partners who do not operate under a common command structure or have access to a common operational picture. Success requires interoperable systems and synchronized actions among all partners.

A hybrid 2- or 3-star headquarters such as the 1st Special Forces Command could facilitate multi-partner operations and achieve consistency in inter-regional relationships. As the Army aligns division headquarters to geographic combatant commands, these units must be enabled across warfighting functions to gain continuity and improve interoperability with allies and partners.

The role of a joint task force headquarters element in a megacity requires reevaluation of organizational structures and necessary enablers. A division

headquarters, augmented by joint personnel and trained to plan with interorganizational partners, provides the joint force commander a capability to address complex megacity operations. Coordination structures may also be required at unit levels below brigade.

Advanced technology may enable command, control, and connectivity over extended distances; mission command must ensure widely dispersed units retain freedom of maneuver and an ability to conduct mutually supported operations.

General purpose forces, in combination with special operations forces, not only provide regional awareness now but offer potential solutions through enhanced integration to gain better understanding of the strategic environment in 2030-2040.

The regionally aligned forces policy⁴ includes special operations forces that are enduringly aligned and routinely conduct theater security cooperation, security assistance, and foreign internal defense missions.

The regionally aligned forces policy is an organizing construct designed to improve the Army’s ability to prepare and provide versatile, responsive, and consistently available Army forces to meet combatant commanders’ theater campaign (steady state) objectives. Both special operations and regionally aligned forces conduct engagement activities in theater, primarily aimed at developing trust necessary for sustainable and resilient relationships.

However, the regionally aligned forces policy must evolve to build personnel continuity, establish realistic planning timelines, and incorporate a larger contribution from critical enablers across all warfighting functions.

Lack of access across multiple networks prevents information and intelligence

⁴ Headquarters Department of the Army Execute Order (EXORD) Regionally Aligned Forces (RAF), 21 December 2012 (FOUO) and FRAGO 1, 17 October 2013 (FOUO).

sharing. Interoperability with future interorganizational and multinational coalition partners requires access across multiple networks and ability to enhance information and intelligence sharing. Cross-domain, multi-layer communications and network solutions are feasible in the near-term. Improved capabilities will be critical in future environments where adversaries have multiple means to disrupt communications.

The Army's clear dependencies on space assets for communications; positioning, navigation, and timing; and intelligence, surveillance, and reconnaissance are well documented. In the future, these dependencies will increase making space augmentation a high priority. High altitude technologies to augment communications and positioning, navigation, and timing will be essential enablers in urban environments.

Force 2025 and Beyond

Develop Leaders

The Army must develop Soldiers who “understand how to understand” and leaders who capitalize on this asymmetric advantage. Given a complex environment that is not only unknown, but unknowable and constantly changing,⁵ the joint force must balance early force flows into theater with force protection and reconnaissance capability. The Deep Future Wargame highlighted the tension between achieving interim policy objectives with protection requirements of forces.

The character of warfare demands the Army train Soldiers with critical thinking and decision-making skills necessary to operate in complex situations. The Army needs a balanced approach for equipping its Soldiers cognitively as well as physically. Future investments in materiel must coincide with investments in cognitive

development for Soldiers and leaders. The pace of information dissemination and required assimilation demand Army investments in cognitive, physical, and social training techniques that compress the time required for mastery of Soldier and leader skills. Advancements in decision sciences allow faster, better-informed decisions in increasingly complex environments.

Defining the megacity’s unique characteristics and complexities will be essential to future operations. The Army should develop virtual, constructive, and live training that presents the complexities of dense urban environments at the appropriate scale for tactical to joint combined arms air-ground teams.

Additionally, professional military education and training curricula, internal unit programs of instruction, and leader development programs should integrate applicable knowledge of megacities. The next Worldwide Joint Training Conference will discuss megacities and integrate them into the framework of the Next Generation Training Strategy.

Develop Capable Formations

In 2040, land forces must have the ability to operate in three realms of conflict: physical, informational, and human. TRADOC will continue to assess the innovation planning team force-design approaches to help shape force development initiatives across the Army. The Army Operating Concept’s future force development first principles will guide this effort.

Describing Army Force Structure. The commonly used descriptive ratios of operational-to-support forces do not adequately express Army force capabilities. The Army requires a new, more accurate,

⁵ TRADOC Pamphlet 525-3-1, *The U.S. Army Operating Concept: Win in a Complex World, 2020-2040*, 31 October 2014.

paradigm when describing its force structure capabilities and capacity, and the balance and synergies it requires between the operating force and the institutional Army. The new paradigm must consider all missions the Army must accomplish to support achieving national security objectives. The 2015 Army Science Board will use Unified Quest 2014 findings and further develop a descriptive and analytic paradigm toward a capabilities, core competencies, and mission-oriented approach for describing the future Army force structure.

Future Technology

Application of technology greatly enhances the conduct of military operations.

However, technology does not replace the Soldier as the centerpiece of Army formations. Technologies must continue to operationalize concepts, achieve overmatch, and conform to the abilities of our Soldiers. The Army must continue to develop technologies that Soldiers can apply to achieve tactical and operational advantage.

Synthetic Biology. An underdeveloped megacity in 2030-2040 is a source of numerous health and biological threats, which may expand to present a global pandemic. The Army's response to the international Ebola crisis in Western Africa amplifies this concern. The Army should support advanced research in synthetic biology methods that generate needed vaccines quickly in theater to counter biological and environmental threats.

Intelligent Systems. Unmanned air and ground platforms that enhance soldier decision-making and action with self-planning, self-navigation, and mission execution capabilities will have significant potential to change the future battlefield. The Army must develop concepts of employment for future autonomous and unmanned systems in the near-term to

integrate them efficiently into the force in the far-term (2030-2040).

Defensive Cyber and Networks. Cyber defenses provide the Army's network with the capability to withstand an attack while maintaining continuity of service. Army cyber forces must be able to defend local tactical networks, and should be able to defend partner networks in support of coalition operations.

In conjunction with joint partners, the Army must invest in flexible information-sharing networks that allow relevant interorganizational and multinational partners to effectively share information internally and externally using a common operating framework.

Operations in complex environments, including a megacity, require assured positioning, navigation, and timing independent of the global positioning system. The Army should continue to support programs developing positioning, navigation, and timing across all warfighting functions.

Assuring Access to Space. Army forces require satellite communications and positioning, navigation, and timing capabilities in all urban areas including megacities. The Army must advocate for ground systems synchronized with Air Force and other acquisition programs.

High-altitude technologies to augment communications and positioning, navigation, and timing will be essential enablers in large urban environments.

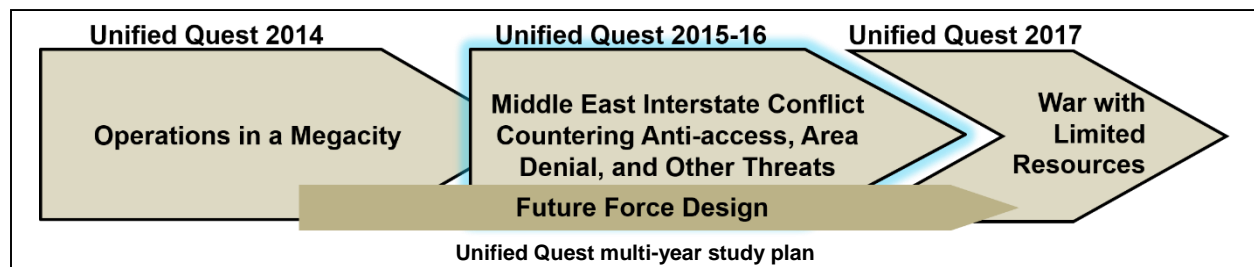
Operational Energy. Increased sustainment demands inhibit the Army's expeditionary capability during operations. Alternative energy sources with the capability to provide power to the force and local populations offer great potential to reduce demand for bulk fuel delivery and storage. TRADOC will continue to explore these initiatives within Force 2025 Maneuvers.

Way Ahead

Unified Quest 2015-2016

Unified Quest will continue to build relationships and collaborate internally and externally to the Army in order to sharpen our thinking, analyze learning, and explore options for developing the future Army.

Moving forward, TRADOC will develop and begin execution of Force 2025 Maneuvers. Force 2025 Maneuvers is the Army's Campaign of Learning; with both intellectual (concept development, studies, analyses, wargaming, modeling and simulations) and physical (experimentation, evaluation, exercises) activities that help leaders innovate to develop future capabilities and interim solutions to warfighting challenges.



Problem Statement

The National Intelligence Council's Global Trends 2030 report, and similar publications examining future trends, indicate the continued spread of advanced technology threatens U.S. military advantages across the air, sea and land domains as adversaries obtain anti-access and area-denial systems. Adversary employment of advanced trajectory-shaping fires and other area-denial threats would have significant impact on U.S. military operations and could result in catastrophic mission failure. The Unified Quest 2015-16 two-year study plan evaluates the Army's ability to execute unified land operations as part of a joint campaign to achieve sustainable results in support of U.S. national security objectives, against a rising regional actor, executing a complex anti-access and area denial strategy in 2030-2040. For more information on Unified Quest please contact the Future Warfare Division at 757-501-5507.

Unified Quest 2014 Supporting Studies

Future Warfare Division maintains the following summaries from Unified Quest 2014 in electronic format. Summaries are available on line at <http://www.arcic.army.mil/Library/documents.aspx>.

- Scenario Workshop Event Summary
- Strategic Trends Seminar Report
- Focused Environment Seminar Report
- Deep Future Wargame Event Summary



For Additional Information on Unified Quest or the Army Campaign of Learning
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