
Transforming the Legions:
The Army and the
Future of Land Warfare

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by

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Andrew Krepinevich

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EXECUTIVE SUMMARY

This study assesses the US Army's transformation initiative. Its goal is principally diagnostic, rather than prescriptive. That is, this assessment examines the Army's approach to transformation in light of the challenges it will likely confront over the mid- to long-term future (i.e., 2013–2018). It is not intended to be prescriptive (i.e., to offer an alternative to the Army's transformation initiative). This assessment concludes that the Army's transformation vision, if realized, would yield revolutionary results and displace the combined arms, mechanized operations that have dominated since the dawn of blitzkrieg. However, it also finds that there are substantial risks inherent in the Army's approach to transformation, and that the Service is likely proceeding down a transformation path that is too narrow to account for the full range of missions it will likely confront in the post-transformation era.

The first question posed to those who advocate major changes in Army organization, doctrine and force structure is obvious: Why transform the world's best army? Army transformation is the product of ongoing changes in the geopolitical and military-technical environment. They have created new challenges for the US military, and for the Army in particular. These challenges are:

- Projecting dominant land power against an anti-access/area-denial threat;
- Urban control and eviction operations;
- Stabilizing failed states, to include large failed states and failed states possessing nuclear weapons;
- Waging the war on terrorism; and
- Providing for defense of the US homeland.

These missions require a balanced force among four Army types:

The Territorial Army: This Army, concerned primarily with homeland defense, characterized the US Army during the early part of the nation's history.

The Constabulary Army: This Army, concerned primarily with stability operations, has seen its role wax and wane throughout the nation's history. The Constabulary Army experienced a dramatic decline following the Vietnam War, but the demand for its services increased following the Cold War's end, and has jumped dramatically following the US-led invasions of Afghanistan and Iraq.

The Expeditionary Army: This is the Army that dominated during the world wars, when the United States projected the bulk of its ground combat power from the continental United States. Its role declined during the Cold War but has increased again with the shift in focus away from Europe and toward the "Arc of Instability" that stretches from the Middle East across South and

Central Asia, through Southeast Asia up into Northeast Asia.

The Frontier Army: This forward-deployed Army dominated the Cold War era, but has declined with the withdrawal of substantial US forces from overseas following the Soviet Union's collapse.

While today's Army is primarily a legacy of the Frontier Army that manned the western alliance's perimeter during the Cold War, there is clearly a need for an increase in Territorial, Constabulary and Expeditionary Army forces, with a corresponding decline in the Frontier Army. Given the Service's current dominance in land warfare, the Army leadership could have taken an attitude of "If it isn't broken, why fix it?" The fact that the Army has decided to remake itself before the emerging threats materialize speaks well for the institution. The Army is undertaking a transformation of its forces to better reflect the new conditions under which it must operate. However, the Service has focused the bulk of its efforts on enhancing an Expeditionary Army, while underemphasizing the Constabulary Army, and perhaps the Territorial Army as well.

The Army's vision seizes upon opportunities made possible by rapidly advancing technologies, with particular emphasis on information-related technologies. The Army's vision of "See first, understand first, act first and finish decisively" is truly transformational. This warfighting concept would eclipse the combined arms, mechanized, heavy forces that have dominated land warfare since the advent of blitzkrieg in favor of far more dispersed, yet highly networked, forces that fight the decisive battle not at close range but at extended ranges.

The Army's transformation is designed to proceed along multiple force-structure paths. It plans to upgrade a portion of the Current (formerly Legacy) Force as a hedge against its transformation proceeding more slowly than anticipated, and to deal with near-term contingencies. The Army also is fielding an Interim (now referred to as Stryker) Force not only to support near-term requirements, but also to serve as a bridge to the fully transformed Objective, or Future Force.

The Army's vision, while revolutionary, is also to a great extent circumstantial; that is to say, it is focused primarily on what might be termed the conventional, or "open" battle—engagements between regular, or conventional, forces in relatively unrestricted terrain. To this is added the ability to deploy forces from the Expeditionary Army very rapidly, in an anti-access/area-denial (A2/AD) threat environment. This is a desirable characteristic. By demonstrating that it is not only dominant in open battle against conventional forces in this era, but that it intends to maintain this dominance in the post-transformation era, the Army may dissuade enemies from creating ground forces to challenge the US military directly. Moreover, by seeking to field a dominant ground force that can deploy and operate in an A2/AD environment, the Army is trying to ensure that the current US dominance in power-projection operations is sustained in a post-transformation conflict environment. Indeed, the Army, because of its potential ability to disperse its combat capability more widely than any of its sister Services, is potentially the force most capable of operating underneath an enemy's A2/AD threat umbrella.

While impressive, the Army's transformation effort is also incomplete in that it does not take

into sufficient account the need to prepare for other significant missions that are already emerging as a consequence of its current success in large-scale conventional warfare. Would-be enemies that cannot wage open battle are forced to seek less direct means for achieving their objectives. Indeed, the threats to the nation's security are, in many cases, decidedly unconventional. This is, in part, a product of the US military's overwhelming dominance in land, sea, air and space power. It has led adversaries to pursue asymmetrical approaches to warfare, including nontraditional threats to the homeland, the use of weapons of mass destruction/disruption, and modern forms of irregular warfare. Army transformation must, therefore, do more than redefine the conventional (or "open") battle against regular forces.

Any attempt to effect large-scale organizational change entails risks. The key questions are: Are these risks necessary? Are hedges built in should these risks not be overcome? The Army confronts risks, or barriers, to realizing its transformation vision. These barriers have manifested themselves in the form of significant gaps associated with the desired deployment, employment and sustainment of the Stryker and Future Force. There is considerable uncertainty with respect to the Army's ability to surmount these barriers, which run the gamut from leadership and personnel to the technical and fiscal. Failure in any of these areas could delay the Army's transformation, or even frustrate it entirely.

Perhaps most important, there is the risk associated with irrelevancy. The Army Future Force will likely prove most effective in cases where an A2/AD threat has precluded the Air Force from staging out of forward air bases and forced the Navy outside the littoral. However, under these circumstances, it is difficult to see how the Future Force can be deployed and sustained in the first place. Ironically, if the US air and maritime forces are able to defeat the A2/AD challenge, they will be enabling the Future Force's deployment while at the same time marginalizing its importance.

What is to be done? This issue is beyond the scope of this paper, whose focus is diagnostic rather than prescriptive. A good starting point, however, would involve the Army assessing how its vision and its associated Future Force concept might be modified to reduce risk and adapted to enable the Army to meet the full range of emerging threats and challenges that stimulated the call for transformation in the first place. For example, it is not clear that the Army needs to hew slavishly to its current ambitious deployment metrics (i.e., a brigade deployed in 96 hours, etc.). The Army might revisit these metrics to determine whether they are, in fact, inviolable, or whether they can be relaxed without incurring too great a penalty in terms of increased risk. In areas where risk cannot be reduced to more acceptable levels, the Army might explore opportunities to develop strong hedges against failure. To succeed in an era of joint warfare, this effort must be supported by integrating the transformation plans of the other Services with the Army's. Finally, all this will require substantial resources. Some might be identified internally by the Army. Ultimately, however, it is incumbent upon senior Defense Department leaders to either provide these resources or to accept the risks associated with the inadequate funding of Army transformation. In any event, the time to address these risks is now, as a new Army leadership team takes charge and while the opportunity still exists to shape the Future Force.

I. INTRODUCTION

TRANSFORMING THE LEGIONS

Today the United States Army (hereafter referred to as “the Army”) finds itself in a period of great transition, or transformation. This is remarkable, given that it is by all accounts the world’s premier land fighting force. Indeed, its level of superiority relative to any other army is so great that it evokes comparisons with Rome’s legions and Napoleon’s Old Guard. Nevertheless, the Army is convinced that it must undertake a transformation of its doctrine, forces and institutions to remain relevant in a rapidly changing world.

For more than a century following its creation, America’s Army was essentially a Territorial Army, focusing its efforts predominantly on what is today called homeland defense. This changed toward the end of the nineteenth century. During the period from the Spanish-American War through World War II, the Army became very much an Expeditionary Army, as the United States struggled to reconcile its isolationist roots with its growing great power status. Following World War II, the Army entered another era, which saw it supporting a US national security strategy of containment that relied heavily on forward-deployed forces in Europe and Asia. Hence the Army became a Frontier Army, with troops stationed for extended periods along the outposts of freedom’s frontier, and the main war it prepared to fight was open battle against Soviet and East European mechanized forces.¹ Nevertheless, for much of its history, the Army has also been a Constabulary Army, meaning that it has been engaged in a long string of what today are referred to as peacekeeping or stability operations. These constabulary actions run from the Indian wars of the nineteenth century and a long-term involvement in the Philippines and Vietnam to today’s engagements in places like Bosnia, Afghanistan and Iraq.

Following the Cold War, the Army encountered a new environment, stimulated by the geopolitical revolution that coincided with the collapse of the Soviet Union and the rise of new regional powers and militant Islam. This environment, combined with an emerging military revolution, led to a growing need for a more Expeditionary Army, with less emphasis accorded to the Frontier Army. At the same time, while the Army was inclined to focus on open battle against large, mechanized opponents, the emerging security environment has demanded more of a constabulary role. This combination of new requirements and changing capabilities stimulated the call for Army transformation.

In response, the Army is pursuing what might be termed a three-track approach. The first track involves sustaining and modernizing a significant portion of the so-called Current Force—the Frontier Army that endured the Cold War and won the Gulf Wars. This Army is characterized by heavy, mechanized forces that proved their worth in deterring aggression while forward deployed in Europe, and in routing the Iraqi Republican Guard in 1991 and again in 2003.

¹ I am indebted to Robert Work for this concept of institutional eras.

The second and third tracks are directed primarily at fielding an Expeditionary Army. The second track's centerpiece involves creating a force comprising Stryker Brigade Combat Teams (SBCTs)—rapidly deployable medium-weight units possessing more punch than comparable light formations, such as those in the Army's light infantry divisions and airborne division, but not nearly as firepower-heavy (or logistics-intensive) as brigades in the Service's armored and mechanized infantry divisions.

The SBCT force is intended to serve as a bridge to the Future Force, the third track of Army transformation. The Future Force will comprise units that can deploy as rapidly as SBCTs, and have similar mobility, but that also have the lethality and survivability of today's heavy formations. Once the Future Force has been fielded, the Army's current formations will be restructured along Future Force lines. After this phase of the Army's transformation is completed, the SBCTs will be reorganized into Future Forces.²

WHAT THIS STUDY IS—AND IS NOT

This study focuses on the changing competitive environment in land warfare and its implications for the Army. The emphasis is more diagnostic than prescriptive. The principal effort here is to provide a good diagnosis of the future competitive environment in which the Army will have to operate. The strategic implications of this diagnosis will be discussed as well. In particular, the emphasis is on assessing the congruence between the future conflict environment and the Army's transformation efforts. However, this assessment does not provide a detailed prescription of possible alternatives with respect to the Army's transformation force structure and program initiatives.

The time frame for this assessment is 2013–2018, the period in which the Army plans to field the Future Force. This time frame is sufficiently far in the future to consider major changes in Army transformation strategy, but not so distant that it renders informed speculation about the competitive environment of land warfare difficult, if not impossible. Thus, this study does not examine in detail contemporary Army issues, such as how the Service will address the challenge of stability operations in Afghanistan and Iraq. Given that major changes in military organizations take years, and typically more than a decade to bring about, the Army will have to conduct these campaigns with today's forces and capabilities, or with those that are already well along in their development.

Finally, it is not possible to determine with any degree of precision what the US national security strategy will be during that time frame. It is, however, reasonable to assume that the enduring

² The Army was recently directed to substitute the words Current Force for Legacy Force, and Stryker Force for Interim Force. The Objective Force has been rechristened the Future Force. Frank Tiboni, "US Army's Keane Pins New Labels on 'Legacy,' 'Interim' Forces," *DefenseNews.com* (June 17, 2003); and Matthew Cox, "'Objective Force' Likely to Become Known as the 'Future Force,'" *Defense News* (September 23, 2003). Given that the name changes were not associated with any major changes in the three initiatives, that the overwhelming majority of the discussion of Army transformation (to include official Army documents) has employed the terms Legacy, Interim and Objective Force, and that this study cites frequently from these documents, the discussion that follows uses these terms interchangeably.

interests the United States has manifested since it assumed the role of an active global power will still remain 10 to 15 years hence.

JOINT AND COMBINED OPERATIONS

This assessment takes into account the efforts of the Army's sister Services in considering the future warfare environment for land forces. In an age of joint operations and rapid advances in military-related technology, each of the Services has found itself operating outside its traditional battle space—or, to put it another way, the Services find themselves crowding into one another's areas of operation. Moreover, the Army has long relied on Air Force and Navy transportation assets. Given these factors, the Army's ability to continue to dominate the battlefield will be influenced to a significant degree by what the Air Force, Marine Corps and Navy do—or fail to do—over the next decade or two in developing capabilities for joint operations and providing the Army with strategic and tactical lift.

The Army must also consider the role of its allies in future land warfare operations. While over the last century the Army typically fought its major campaigns as part of a combined land operation, it cannot be assumed that this will continue to be the case. Indeed, recent events suggest that the durability and reliability of America's allies may be eroding. Consequently, the Army may find itself fighting alongside unanticipated coalition partners (e.g., the Afghan Northern Alliance) or perhaps even alone.

CURRENT STATE OF THE COMPETITION

By almost any measure, today's Army is the world's preeminent land combat force. It is the best-trained, best-equipped and best-supported of all the world's armies. The US Army excels at a wide range of missions, from high-intensity conventional mechanized operations to special operations. It is the standard by which all other armies are measured.

With the collapse of the Soviet Union more than a decade ago, no army has risen to challenge the American Army in terms of its proficiency in traditional, or conventional, forms of warfare. The Army's magnificent performance in the First and Second Gulf Wars not only served to reinforce this fact, but it also seems to have dissuaded other armies whose regimes are hostile toward the United States from even contemplating a challenge to American dominance in combined arms, mechanized ground operations.³ In this regard, the Army was practicing the dissuasion element of the Bush Administration's newly formulated defense strategy even before that strategic pillar was introduced.

³ This is not to say that other militaries have abandoned conventional forces, which can still prove useful in securing objectives against powers other than the United States. Taking that as a given, for the foreseeable future (i.e., the next decade or so), it seems very unlikely that a state can reasonably hope to pose a direct (or symmetrical) challenge to the United States military (for example, by building a blue-water fleet to challenge the US Navy for control of the world's oceans, or a combined-arms ground force to challenge the US Army in land warfare, or a manned air force to challenge the US Air Force for air supremacy).

To be sure, other armies might still invest in enhancing their ability to dominate their neighbors in traditional forms of land warfare. However, the militaries of rogue states and would-be regional adversaries seem far more attracted to offsetting, or asymmetric, strategies than to challenging the US military's strengths. This fact has not escaped the attention of either the Joint Chiefs of Staff (JCS) or the Army leadership.

The Army also benefits considerably from the comparable dominance enjoyed by the US Navy, Air Force and Marine Corps over the corresponding forces of any other military. By contrast, Napoleon's Grand Armée had to operate in a world in which Britain's Royal Navy clearly surpassed the French Navy. At present, the Army does not have to compensate for a sister Service's inferiority. Army deployments are not constrained by another power's command of the seas, nor does the Army have to invest heavily in air defenses to offset an inferiority in air power. As Operation Iraqi Freedom vividly demonstrated, America's adversaries must contend with a US Army that is enabled and supported by overwhelming air, space and sea power.

Thus, from a competitor's perspective, competing asymmetrically against the US Army makes eminent sense. Faced with an ultimate dead end should they try to compete directly with the Army in mechanized, air-land combat operations, would-be adversaries have two basic alternatives. One is to attempt to leapfrog the Army's dominance by moving to the next land warfare regime. The second is to pursue asymmetric approaches to land warfare within the existing warfare regime. Given the United States' clear advantages in technology and in the scale (or size) of its defense funding, the former approach appears unpromising. Certain adversaries have pursued the latter approach over the past half-century, with some success. The North Vietnamese Army and Viet Cong pursued an asymmetric People's War against the United States and its allies in South Vietnam to a successful conclusion. Irregular operations also posed problems for the US military in Lebanon in the 1980s and Somalia in the 1990s.

How prospective adversaries view these alternatives may change over time, particularly if the United States is confronted with the rise of a peer competitor or a formidable coalition of hostile powers.⁴ At present, America's competitors are focused primarily on asymmetric warfare, attempting to offset the Army's dominance by emphasizing nontraditional or novel capabilities and operations. They also have been looking for ways to exploit what they perceive to be America's Achilles' heel; for example, by posing, as the North Vietnamese did, the prospect of high US casualties or a protracted conflict. In the post-Cold War era, with the possible exception of the US withdrawal from Somalia, such strategies have yet to succeed. If history is any guide, however, America's adversaries persist in their efforts, as can be seen by the ongoing resistance in Afghanistan and Iraq.

⁴ A peer competitor can be defined as a state (or coalition) that is capable of devoting a level of resources to a military competition that is roughly comparable to the resources being devoted by the United States.

KEY TRENDS INFLUENCING LAND WARFARE

Geopolitical—The Rise of Regional Powers, Radical Islam and Nuclear Proliferation

What rising great powers might the United States encounter over the next two decades or so? Europe, for one. By 2025, an economically integrated European Union is projected by some to have an economy 20 percent greater than that of the United States.⁵ However, while America's European allies may not remain as close as they were during the Cold War era, it is difficult to conceive how a unified Europe would emerge as a hostile competitor to the United States. China's gross domestic product (GDP) may grow to more than half that of the United States, something that no other power has achieved for nearly a century.⁶ Japan will almost certainly remain a major economic power. Over the next quarter-century, some projections see India emerging as the world's most populous state, with the largest middle class and with a GDP that could rank behind only that of the European Union, the United States and China. In short, the world will likely become increasingly multipolar economically, with the United States' relative share of the global economy slipping somewhat in relation to that of rising regional powers. This, of course, has significant implications for the relative military potential of these states, the military balance of power within their regions, and Army calculations with respect to its long-term ability to dominate land warfare across the entire conflict spectrum.

Army requirements may also be shaped by the perturbations created from discontinuous shifts in economic power that may accompany the information revolution and the rising global economy. States that are particularly adept at exploiting the information and biotechnology revolutions may experience rapid economic growth, perhaps reminiscent of how Great Britain's rise to global power status can be linked, at least in part, to its being among the first and best at exploiting the industrial revolution.⁷ Neither the information nor the biotechnology revolutions are much dependent for their implementation upon industrial age economic measures of merit (e.g., coal reserves, steel production, a large blue-collar workforce); rather, they depend on human resources, with the emphasis being on human intellect—that is, more on brain power than manpower. Consequently, the potential of even relatively small states, such as Israel, Singapore and Taiwan—which are poor in material resources, but potentially rich in human intellectual resources—to substantially increase their economic power (and hence their military potential) cannot be discounted.

While the United States may experience a relative decline in power, it may also find itself with additional interests to defend. For example, following the attacks of 9/11, the United States has

⁵ *The World in 2025: Towards a New Global Age* (Paris: Organization for Economic Co-Operation and Development), p. 92.

⁶ Some methodologies, notably those employing the purchasing power parity (PPP) standard, conjure up scenarios in which China's GDP actually approaches America's. However, more conventional measures indicate a substantially more modest rate of Chinese economic growth. See Murray Weidenbaum, "China's New Economic Scenario, The Future of Sino-American Relations," *Orbis* (Spring 1999), pp. 223–24.

⁷ Britain's relative share of world manufacturing output leaped from 4.3 percent in 1800, to 9.5 percent in 1830, to 19.9 percent in 1860. Paul Kennedy, *The Rise and Fall of the Great Powers* (New York: Random House, 1987), p. 149.

become involved in the security affairs of Central Asia, countering radical Islamic elements in Afghanistan. Moreover, the boom in energy development that is now under way in Central Asia may make the region a major source of oil and gas for the global economy. For these reasons, the United States may have an increasingly strong interest in the area's stability and in the independence of its constituent states. Indeed, Central Asia could become the focus of increased geopolitical competition. It is possible that Russia, or more likely China—and perhaps India as well—could seek to expand its influence there.⁸ Owing to their proximity to the region, Iran and Turkey might also exert significant influence on Central Asian affairs.⁹ As recent operations in Afghanistan have demonstrated, absent allies in the region (and perhaps even with them), projecting and sustaining significant US military forces (both as currently configured and as currently envisioned) into that region presents major challenges.¹⁰

As events of the past decade have shown, the Army must be prepared to undertake operations in remote areas, such as Central and East Africa and the Balkans, where vital American interests may not be at stake. As America is the world's leading democracy, these operations may be viewed as "policing democracy's global empire." Following the radical Islamic attacks on the United States in September 2001, such operations are justified not only in terms of engaging Third World states and enlarging democracy, but also of dealing with the threat that radical terrorist groups pose to US security.

This trend toward "absent-minded empire building" has proved most worrisome for those concerned with land force requirements. For, despite the protestations of several US administrations, both Republican and Democratic, over the need for exit strategies from involvement in Third World conflicts, the decade following the Berlin Wall's collapse found US forces—ground forces, in particular—involved in protracted stability operations.

The growth in stability operations has several causes. One stems from humanitarian concerns over the fate of populations in failed or failing states, such as Somalia in the early 1990s. More recently, the need for stability operations has emerged out of conflicts where the US objective was regime change. Such is the case in Afghanistan and Iraq, where the US military is engaged in major stability operations and in need of a Constabulary Army.

The need for Constabulary Army forces seems likely to grow. Terrorist groups may gain access to highly destructive capabilities that pose a threat not only to US forces and interests abroad, but

⁸ China's demand for energy is projected to double over the next several decades. Oil pipelines from Central Asia (and Russia) could end up providing much of Beijing's economic lifeblood. Chinese efforts to secure such important energy sources could bring China into competition with other powers having interests in that region. Erica Strecker Downs, *China's Quest for Energy Security* (Santa Monica, CA: RAND, 2000), p. 4.

⁹ Indeed, a recent Army transformation wargame conducted at the Service's War College at Carlisle Barracks, Pennsylvania, explored the implications of a Central Asian conflict on Army requirements.

¹⁰ To be sure, in the fall of 2001 the US military was able to project significant force into Afghanistan on relatively short notice, and in the face of severe basing and logistics challenges. However, this was accomplished with difficulty. If the region grows in importance, it may prove necessary to project power into the region on a significantly greater scale. This is recognized by the Army in both its draft warfighting concepts and in its major war-gaming exercises.

to the American homeland as well. To date, these threats emanate predominantly from groups associated with radical Islamic fundamentalism who view themselves as engaged in a civil war with moderate Islamic regimes. The forces of radical Islam see the United States as an important ally (and, in a number of cases, a controlling influence) of these regimes. Other groups hostile to the United States or its allies may copy their form of warfare, should it prove successful. Terrorist and insurgent organizations also have grown increasingly fond of establishing links with transnational criminal organizations to help underwrite their operations and boost their capabilities in ways that pose significant challenges to US security interests.¹¹ If these movements are enabled by hostile states or failed states, the US military may be committed to effect regime change or exert control. In either case, there will be a need to impose order and stability. Furthermore, if the danger posed by the spread of nuclear weapons to hostile Third World regimes precipitates military action to effect regime change, the Army may be confronted with a stability operations requirement on the scale of that following the Second Gulf War in Iraq.

Military-Technical

For more than a decade now, since the First Gulf War and the Soviet Union's demise, there has been a spirited debate in defense circles over the prospect of a fundamental change in the character of conflict—a military revolution.¹² In some respects, the ongoing debate and the various schools of thought on the ultimate character of a new warfare regime are a reflection not only of the rapid advances in, and diffusion of, military-related technologies, but also of the considerable uncertainty as to how and when their influence will be felt.

The consequences of an emerging military revolution must be considered along with the political and economic forces driving the future competitive environment. Military revolutions have occurred periodically for centuries. Often they are stimulated by major surges in technology that facilitate a discontinuous leap in military effectiveness over a relatively short period of time. The last military revolution in conventional forces occurred between the world wars of the twentieth century, when mechanized armored forces came of age on land, aircraft carriers supplanted battleships at sea and strategic aerial bombardment was established as a new way of war. After 1945, the introduction of nuclear weapons once again led strategists to rethink, in fundamental ways, the calculus of war.

¹¹ For example, there is evidence that both Islamic terrorist organizations like al Qaeda and insurgent groups such as FARC (Revolutionary Armed Forces of Colombia) in Colombia, rely on organized criminal activity to help support their operations. James Mack, Deputy Assistant Secretary of State for International Narcotics and Law Enforcement Affairs, Testimony, House Committee on International Relations, Subcommittee on the Western Hemisphere (October 10, 2001).

¹² For a more detailed treatment of the military revolution, see Andrew F. Krepinevich, *The Military-Technical Revolution: A Preliminary Assessment* (Washington, DC: CSBA, 2002); Andrew F. Krepinevich, "Keeping Pace With the Military Technological Revolution," *Issues in Science and Technology* (Summer 1994), pp. 23–29; Andrew F. Krepinevich, "Cavalry to Computers: The Pattern of Military Revolutions," *The National Interest* (Fall 1994), pp. 30–42; Andrew F. Krepinevich, "The Military Revolution: Restructuring Defense for the 21st Century," Testimony, Senate Armed Services Committee, Subcommittee on Acquisition and Technology (May 5, 1995); and Michael G. Vickers, *Warfare in 2020: A Primer* (Washington, DC: CSBA, October 1996).

Just as dramatic technological advances in mechanization, aviation and radio stimulated a transformation in the character of land combat between the two world wars, today the Army is confronted by the challenge of interpreting and exploiting the impact of a revolution in information and information-related technologies. They offer advanced military organizations like the Army the potential to know much more about their adversaries than they ever have before, assuming they can achieve information dominance over them. This capability implies being able to locate, identify and track a far greater number of enemy forces and supporting elements, over a far greater area and for far longer periods of time, than has ever before been possible. It also confers great importance on denying the enemy similar information concerning friendly forces through such means as stealthy systems and dispersed operations supported by extended networks of systems and forces. The current military revolution also is characterized by the advent of precision weapons capable of engaging their targets with far greater lethality, precision and discrimination over a broader geographic area than is possible with non-precision or “dumb” munitions.¹³

Military revolutions have a way of transforming existing military operations and of also creating new forms of military operations. For example, the naval revolution of the late nineteenth century saw battle fleet operations oriented on sea control change dramatically, as metal-hulled, steam-propelled ships armed with long-range rifled guns supplanted the wooden sailing ships-of-the-line armed with short-range, smooth-bore cannons. The development of long-range submarines and extended-range torpedoes led to the advent of the strategic submarine blockade.

Owing to the unusually high level of geopolitical and military-technical uncertainty, it is difficult to predict with high confidence the character of the military competition a decade or two into the future. Simply put, the Army cannot know exactly which state (or coalition) will pose the next major challenge to US security, when that challenge will occur, or how it will manifest itself. Similarly, the Army does not know when key military technology breakthroughs will occur, who will effect these breakthroughs, how they will be applied to military systems and doctrine, and what form they will take. For example, in the early 1920s it was not possible to know with a high degree of confidence how rapid advances in emerging technologies pertaining to mechanization, aviation and radio would play out two decades later. Nor was it clear which paths military organizations would take to exploit them (i.e., that Germany would pursue blitzkrieg, Japan carrier aviation, Great Britain strategic aerial bombardment, etc.). Currently, the technology area with the greatest potential to change how wars are conducted is directed energy, which could revolutionize communications as well as weaponry. Whether this technology will mature sufficiently to do so by 2018, however, is anyone’s guess.

¹³ For example, in 1943, the US Eighth Air Force struck more than fifty strategic targets in Germany. By 1991, however, during the Persian Gulf War, coalition air forces (overwhelmingly dominated by US air forces) struck more than three times as many targets in the first day of the war—a two-orders-of-magnitude increase in conventional strategic strike capability. Thomas A. Keaney and Eliot A. Cohen, *Gulf War Air Power Survey*, vol. 1, *Planning and Command and Control* (Washington, DC: GPO, 1993), p. 189. Since 1991, the US military has come to place an even greater reliance on precision fires. In the Second Gulf War, for example, the ratio of smart to dumb munitions employed by US air forces increased by roughly one order of magnitude over First Gulf War levels.

Any vision of the emerging new warfare regime has two characteristics: assumptions concerning when emerging technologies will mature sufficiently to enable capabilities that will influence military competitions in a dramatic way, and assumptions about how these new capabilities will be applied. A clear statement of the assumptions that will drive the new military regime's character is essential, for two reasons. First, it provides the transparency needed for a constructive debate as to the vision's plausibility. Second, and perhaps more important, it allows Army planners to hedge against the possibility that, however attractive and persuasive a particular vision might be, some of its driving assumptions could prove wrong, or be unrealized during the time frame envisioned for them.¹⁴

KEY ASSUMPTIONS (C. 2013–2018)

Any discussion of land warfare that looks 10 to 15 years into the future must acknowledge considerable uncertainty with respect to how military competitions will develop over time. Over the past century, the US military experienced several major shifts in warfare that could not have been easily predicted fifteen years in advance. For a discussion of Army transformation to be productive, it is necessary both to identify the principal uncertainties that will most influence the future competition in land warfare and to be explicit about the assumptions as to how these critical uncertainties will be resolved.

The Missile/Anti-Missile Regime Will Remain Offense Dominant

The missile age has been with us since the latter part of World War II. Since that time, despite significant advances in a range of technologies relating to missile attack and missile defense, the competition has consistently favored the attacker. That is to say, assuming each side has equal resources, missile attacks have maintained a wide advantage over missile defenses. A large-scale US effort to develop effective defenses has been under way for two decades. The overall effort dates back more than half a century. However, it has yet to produce the kind of missile defense systems that would overturn the existing regime. Indeed, there are doubts as to those systems' prospective effectiveness against even the modest missile arsenals of rogue state military powers.¹⁵ To be sure, the maturing of missile defenses, especially those based on advances in directed energy, could obviate this assumption. However, the enduring offensive-dominance in this key area of military competition argues strongly for the Army to assume (as it has) that the status quo will prevail.

¹⁴ For example, air power enthusiasts in the 1920s envisioned that warfare would be radically transformed by advances in aviation technology. In their view, future conflicts would be dominated by air forces, whose bombardment of the enemy centers of gravity would produce an early end to conflicts. This vision of rapid victory through air power is still awaiting confirmation. Another example, albeit on a far more modest scale, would be Admiral Jackie Fisher's willingness in 1904 to support the design of British fast battle cruisers that traded armor protection for speed and the ability to strike at long range. Fisher bet heavily on the ability of British range-finding technology to track moving targets (i.e., the enemy's battleships) at extended ranges. As it turned out, he was about ten years off in his estimates of the fleet's ability to perform this task to a high level of proficiency.

¹⁵ Even small powers like North Korea have ballistic missiles that number in the hundreds. It is not unusual—and indeed, it seems quite appropriate—for Defense Department war games to depict adversaries 10 to 15 years hence with ballistic and cruise missile forces numbering in excess of 1,000.

Current Forms of Stealth Will Endure

The competition in identifying stealthy systems—be they aircraft or submersibles—appears generally to favor those seeking to avoid detection. This regime here, however, seems less stable than that of missile attack and defense. It does seem likely, however, that over the foreseeable future, these forms of stealth will continue to afford significantly greater protection from detection than nonstealthy aircraft, surface ships and land combat systems. Hence, stealth will likely remain an attractive capability.

Identifying and Defeating Critical Mobile and Deep Underground Targets Will Remain Difficult

The US military has not yet succeeded in solving the challenges involved in identifying, tracking and neutralizing critical, time-sensitive targets, such as Scud missile transporter-erector-launchers (TELs) encountered in Operation Desert Storm, al Qaeda and Taliban leaders in Operation Enduring Freedom, or Saddam Hussein and other key Iraqi leaders in Operation Iraqi Freedom. Despite the significant progress made in recent years, dramatic improvements seem unlikely in the near- to mid-term future. As critical enemy mobile targets, such as mobile ballistic and cruise missile launchers, continue to proliferate, the challenge may grow much more formidable. The reason is that such systems will likely be able to hold forward air ports of debarkation (APODs) and sea ports of debarkation (SPODs) at high risk of destruction. This may force key elements of any US capability for defeating the critical mobile threat to operate at greatly extended ranges, thereby extending engagement cycle times and further complicating efforts to defeat the critical mobile challenge.

Detecting and destroying deep underground targets also seems destined to remain difficult. No matter how accurate US precision weapons may become, and despite improvements in explosives and weapon penetration, their ability to destroy hardened underground targets is almost certain to be trumped by an enemy who can bury key facilities ever deeper underground. Assuming the United States rules out the use of nuclear weapons, it may be possible to neutralize these sites through effects-based operations (EBO), which will be discussed presently). But this is far from certain. Of course, ground forces could physically occupy the site; but this may take a level of effort that makes the prompt destruction of these sites impossible. Finally, while the United States has a number of initiatives under way to address this problem, considerable uncertainty exists as to the location of critical weapons of mass destruction (WMD) facilities in countries like Iran and North Korea.

Sanctuaries Will Grow in Importance

Enemies will find ways to exploit the potential of sanctuaries, while at the same time denying the United States the relative sanctuary it has long enjoyed from most forms of attack. The growth of sanctuaries seems likely to stem from interrelated factors pertaining to scale, WMD proliferation and the “death of distance.” Despite the Cold War’s end and the rise of a *Pax Americana*, the United States still finds itself having to deter regional powers (preventing China from seizing Taiwan, for example). Depending on the character of the conflict, should deterrence fail, an aggressor’s territory might be accorded sanctuary status, as was the case, for example, with

China during both the Korean and Vietnam wars, to avoid escalating the conflict. Sanctuary status may also be accorded to lesser powers, especially if they possess nuclear weapons.

If history is any guide, the weaponization of space will likely occur at some point in the future. However, it is assumed here that space will remain a sanctuary throughout this assessment's planning horizon. However, efforts may well be made to deny adversaries the use of space through such means as jamming, or attacks against terrestrial elements of an enemy's space infrastructure.

The growth of states accorded sanctuary status owing to their acquisition of nuclear weapons and/or the capacity to inflict serious damage on the US homeland (e.g., through covert introduction of biological agents) could call into serious question some current US warfighting concepts, such as rapid decisive operations (RDO) and EBO, which call for extensive strikes on an adversary's homeland. The diffusion of nuclear and biological capabilities to America's adversaries could render warfare more limited in scope than even those major US wars of the past half-century. Put another way, seizing the enemy's capital city and unseating his regime has long been viewed as the culmination of a decisive military campaign. Would the US-led coalition have marched on Baghdad if Saddam Hussein had possessed even a few nuclear weapons? This possibility should exert a significant influence on US military planning in general, and Army and Air Force planning in particular.

Finally, enemy militaries also seem likely to seek sanctuary from superior US military forces by deploying in urban areas, or by positioning forces and materiel in areas that have traditionally been viewed as "out of bounds" (i.e., schools, houses of worship, hospitals, etc.). For a range of reasons that will be discussed presently, US joint operations in urban environments are likely to prove considerably more challenging than those conducted in open terrain.

The Sanctuary Factor Will Not Extend to the United States

Ironically, the United States is less likely to enjoy the kind of sanctuary status from attack in the future than it has in the past. The reasons for making this assumption are relatively clear, and the trends that underlie them fairly compelling. The world is witnessing the proliferation of the means for mass destruction beyond states to radical groups (e.g., Aum Shinrikyo), as well as the means for delivering them over extended ranges (e.g., ballistic and cruise missiles).¹⁶ These trends seem particularly worrisome for the United States, whose combination of long borders, democratic form of government, emphasis on individual rights, and links to an expanding global transportation network makes it increasingly susceptible to covert WMD strikes.¹⁷ Moreover, as the United States leads the world further into the information age, it finds itself becoming perhaps the most vulnerable target of attacks on its national information infrastructure. Hence,

¹⁶"Global Proliferation of Weapons of Mass Destruction: A Case Study on the Aum Shinrikyo," Staff Statement. Senate Government Affairs Permanent Subcommittee on Investigations, October 31, 1995. http://www.fas.org/irp/congress/1995_rpt/aum/index.html

¹⁷ Andrew F. Krepinevich, *The First War of the New Century: A First-Blush Assessment* (Washington, DC: CSBA, September 2001).

the need for Territorial Army forces focused on homeland security is likely to grow, perhaps significantly.

Information Operations, in and of Themselves, Will Not Be Decisive in Warfare

There is enormous uncertainty regarding the potential of information warfare (IW) operations (IWO) to achieve strategic results as an independent form of warfare. In this respect, debates over strategic IW resemble those over air power's potential in the 1920s and 1930s. To be sure, air power proved indispensable for waging modern warfare. However, it did not achieve rapid, decisive results independently during World War II. A similar assumption is made here with respect to the ability of information operations to dominate future conflicts independent of other forms of military operation.

Highly Distributed, Highly Networked Military Operations Are Possible in the Next Decade

If they prove feasible, highly distributed, highly networked military operations will probably offer substantial gains in military effectiveness in nearly every conflict contingency. Thanks to rapid advances in information-related technologies, integrated operations are becoming possible on a scale and level of effectiveness far greater than ever before. Information-related technologies have transformed war in the past, and they are transforming war now. For example, the telegraph greatly enhanced the command and control of land forces in both the American Civil War and the wars of German Unification. The development of radio further facilitated the coordination—and thus the effectiveness—of widely dispersed forces, and was crucial to the development of blitzkrieg.

New information systems, ranging from global positioning system (GPS) satellites, to unmanned aerial vehicles (UAVs), to tactical internets, promise similar leaps in effectiveness. Combined with the growing ability to conduct precision fires at ever-greater ranges, new information systems offer the prospect of an Army that can violate the principle of mass to disperse its forces (thereby reducing their vulnerability to detection and destruction) without suffering the traditional penalty of loss of effectiveness. Land warfare conducted in this manner presents two major competitive advantages. First, it moves the Army beyond the heavy, mechanical air-land era of warfare that began with the blitzkrieg, enabling the Expeditionary Army. Second, highly distributed and networked forces may be the antidote to the growing A2/AD threat (which will be elaborated upon presently). Thus, the Army's ability to develop distributed, networked forces will likely be critical to its long-term dominance.

There is no doubt this assumption can be characterized as a big bet for the US military, and the Army in particular. Networking forces is proving to be more difficult than some people realized, and the demands for bandwidth may greatly exceed projected capacity. It may ultimately make more sense for the Army to assess how far it can move along the path toward networked forces within the 2013–18 planning horizon assumed here than to plan on achieving a completely networked force with a highly robust architecture.

Joint Transformation Will Yield Significant Gaps

One clear trend in modern warfare is the integration of operations at progressively higher levels as technology permits the Services both to operate outside of their traditional warfighting domains and to coordinate them efficiently. For this reason, and because the Army has long relied on the Navy and Air Force for support in key areas, its ability to dominate future land operations will likely be influenced to an unprecedented degree by the transformation paths pursued by its sister Services. Will they follow paths that basically enhance existing forms of operation, or will they—like the Army—attempt to create new kinds of operations characterized by substantial, if not radical, changes in their systems, doctrines and force elements? Will they follow their own paths, or coordinate their transformation journey with one another?

At present, it appears that the Services' transformation trajectories will find them primarily emphasizing improvements in existing forms of operations, despite the best efforts of senior defense leaders and organizations, like Joint Forces Command, which are designed to facilitate inter-Service cooperation. For example (as will be discussed later), the Air Force's transformation efforts seem unlikely to provide for either the prompt neutralization of enemy anti-access forces or sufficient air lift to support Expeditionary Army deployment requirements. Similarly, the Navy's transformation plans are subject to serious doubts concerning the fleet's ability to seize rapid control of littoral areas to enable Army deployment and sustainment. Nor is the Navy likely to provide fast sealift in quantities sufficient to support Expeditionary Army operations as currently envisioned. In short, despite the significant progress that has been made and that may yet be made in terms of US joint military operations, given the present planning environment, it is assumed that the Army's sister Services will not make the major deviations in their programs that would be needed to enable key elements of the Army's post-transformation operational concepts.

II. THE ARMY'S CHALLENGE

The Army's dominance in the existing conventional warfare regime gives would-be adversaries an enormous incentive to adopt asymmetric forms of land warfare. Moreover, with the Soviet Union's collapse, the Army is confronted with a somewhat different set of prospective competitors, with different geographies, resources, strategic cultures, warfighting traditions and engagement timelines. Finally, adversaries will look to exploit to their advantage (albeit in different ways and with different skill levels) the rapid advance and diffusion of military-related technologies that are laying the groundwork for a military revolution. What does all this mean for the Army?

CURRENT STRATEGIC IMPERATIVES

Shortly after the attacks of 9/11, the Bush Administration presented its new defense strategy.¹⁸ At its most fundamental level, it corresponds quite closely with that of the Clinton Administration. This should not be terribly surprising, as US vital interests have not changed significantly over the years, and there remains a national consensus on the desirability of the United States maintaining its role as an active global power.

However, there are some major differences between the Bush Administration's defense posture and that of the Clinton Administration. For example, the Bush Administration emphasizes dissuading competition from would-be adversaries.¹⁹ This pillar of the administration's strategy might be seen as its "don't-even-think-about-it" element. Dissuasion moves beyond deterring adversaries from threatening US interests. Specifically, it comprises actions taken to increase the adversary's perception of the anticipated costs and/or decrease its perception of the likely benefits of developing, expanding, or transforming a military capability that is undesirable from a US perspective. As noted earlier, it can be argued that would-be adversaries have been dissuaded from fielding capabilities to compete directly, or symmetrically, with the US military.

Second, the Bush Administration continues redirecting the United States' principal geostrategic focus from Europe to Asia. During the Cold War, the principal weight of US overseas military deployments was in Europe. Under the Clinton Administration, the United States adopted a more balanced posture, pledging to maintain 100,000 troops in both Europe and Asia. In its Quadrennial Defense Review (QDR), the Bush Administration continues that shift in orientation by giving primary emphasis to an "arc of instability" stretching on a long band from the Middle East to Northeast Asia.²⁰ Relative to Cold War Europe, the arc of instability encompasses

¹⁸ *Report of the Quadrennial Defense Review* (Washington, DC: U.S. Department of Defense, September 2001). Hereafter cited as *QDR Report*.

¹⁹ *QDR Report*, p. 12.

²⁰ *QDR Report*, p. 4.

enormous distances, is far more maritime in orientation, is poor in allies, and possesses far fewer advanced US bases.

The Second Gulf War and the war in Afghanistan notwithstanding, by moving away from the so-called two-war posture the Bush Administration's QDR places relatively less emphasis on military campaigns whose ultimate objective is the overthrow of a regime.²¹ Moreover, in the wake of the 9/11 terrorist attacks, the administration, in both word and deed, seems to have added a fifth pillar to its defense strategy—that of preemption or preventive attack/war.²² This could have significant implications for the structure and mix of US forces, given that such wars tend to emphasize surprise and that, as the Second Gulf War demonstrated, it may be far easier to win international support for military operations following an act of aggression by an enemy than to win such support when it is the United States that intends to initiate overt military operations.

The Bush Administration accepts the argument that the US military must be transformed to reflect the new security environment. Its QDR directs the US military to orient its transformation efforts on the new challenges to America's security (and the opportunities to improve its capabilities) at the operational level of war. These critical operational goals are summarized as follows:

- Protecting critical bases of operation, at home and abroad, and defeating chemical, biological, radiological, nuclear and high explosive (CBRNE) weapons and their delivery systems;
- Prevailing in IW, both in offensive and defensive operations;
- Projecting and sustaining US forces in an A2/AD environment, and defeating A2/AD threats;
- Denying enemies sanctuary from US attack;
- Preserving the US ability to operate effectively in space; and

²¹ *QDR Report*, p. 21.

²² There has been no small confusion over the meaning of “preemptive” and “preventive” attack in the recent debate over whether the United States should go to war against Iraq. The Bush Administration's rhetoric has confused “preemption” with “prevention.” Traditionally, states have undertaken a preemptive attack against an adversary when it appeared that an attack by that adversary was *imminent*—a matter of only days, or perhaps even hours. Thus, Israel's attack on Egyptian and Syrian forces that were massing for attack in June 1967 is accurately described as a preemptive attack. Preventive attacks, and preventive wars, have traditionally been undertaken by states that, while not anticipating an attack in the immediate future, believe that a rising enemy will pose an unacceptable threat if it is not dealt with in the near term. The Third Punic War is thus a preventive war. Following the devastation of the first two Punic Wars between Rome and Carthage, Rome believed it could not risk seeing Carthage rise again. Consequently, Rome went to war to destroy Carthage. Similarly, Israel's attack on Iraq's nuclear facilities at Osirak in 1981 was a preventive attack.

- Leveraging information technologies and innovative operational concepts to develop an interoperable, joint C4ISR²³ architecture.²⁴

These six critical operational goals or challenges can be organized around two fundamental missions: protecting the US homeland, to include the American information infrastructure; and projecting power overseas in an A2/AD environment. They also highlight two warfare dimensions: the need to protect space and information assets and to conduct IW operations against the enemy. Denying enemies sanctuary also comes under power-projection operations. To these should be added at least one critical challenge at the operational level of war—evicting enemy forces from urban areas and/or exercising control over urban terrain.²⁵ Lastly, it is interesting to note that one of the administration’s six operational challenges is more aptly described as an opportunity. It concerns establishing a joint C4ISR architecture. Such an architecture is seen as a critical enabler of highly distributed, highly networked forces.

These operational challenges portend potentially major shifts in joint and Service doctrines focused at the operational level of war. Thus, it is worth exploring those critical operational challenges that are of greatest relevance to the future of land warfare.

HOMELAND DEFENSE

An enduring source of competitive advantage for the United States has been its geographic insularity. It has often enabled the United States to devote the vast majority of its defense resources to maintaining forces overseas in forward-deployed positions, or to organizing continental United States (CONUS)-based forces for expeditionary operations. However, in recent years the global transportation network has made long-distance travel increasingly routine. America’s borders are both long and porous, as evidenced by the growing numbers of illegal aliens and the drug trade. As the 9/11 attacks demonstrate, the rise of radical Islam has produced an implacable enemy willing and able to attack the US homeland. The spread of ballistic and cruise missile technology, combined with the diffusion of WMD, could enable rogue states or even nonstate actors to pose a significant threat to the continental United States. These trends are eroding the value of America’s geographic remoteness and placing the US homeland at much greater risk of significant attack.

²³ C4ISR refers to command, control, communications, computers, intelligence, surveillance and reconnaissance. The term seeks to encompass those information-related elements that are key to the effective operation of US forces.

²⁴ *QDR Report*, p. 30. These challenges are echoed in the Army’s plans for its Objective Force. As the Army’s Training and Doctrine Command (TRADOC) states, “Additionally, the nation’s military strategy, military objectives, and defense policy goals drive six critical transformation goals for our forces: Protecting critical bases of operation; Protecting and sustaining US forces; Denying enemies sanctuary; Assuring information systems; Enhancing capability and sustainability of space-based systems; and Leveraging information technology.” US Army Training and Doctrine Command, TRADOC Pamphlet 525-3-90/O&O, *The United States Army Objective Force—Operational and Organizational Plan for Maneuver Unit of Action* (Fort Monroe, VA: TRADOC, July 22, 2002), p. 5. Hereafter cited as “TRADOC, *US Army Objective Force*.”

²⁵ The Army also includes in this discussion the challenge of evicting the enemy from, and controlling, other kinds of complex terrain, such as mountainous regions.

To be sure, the United States was, for much of the Cold War, under the threat of a catastrophic attack from the nuclear forces of the Soviet Union. However, a combination of faith in the US nuclear deterrent and a realization that effective defense against large-scale nuclear attack was not feasible led to a relatively modest effort on active (e.g., ballistic missile) and passive (e.g., civil) defenses. Within the planning horizon of this assessment, America will likely find itself at significant risk of attack from a range of enemies, both state and nonstate. The events of 9/11 indicate that at least some of these enemies cannot be easily deterred through traditional means. Washington is now diverting substantial resources to the defense of the homeland. While in some respects this mission for the Army is as old as the American Revolution itself, both the form of the threat and the potential intensity of the attacks are certainly new. A comprehensive national strategy for defending the homeland has yet to be devised.²⁶ Thus, it is difficult to ascertain what the role the Territorial Army will be asked to play.

Consistent with its history, it seems reasonable to assume that the Army could be called upon to support air and missile defense operations in defense of the homeland. During the early phases of the Cold War, for example, the Army Air Defense Command (ARADCOM) maintained an extensive air defense network comprised of early warning radars and surface-to-air missile batteries.²⁷ Plans to expand this network were short-circuited by the growth of Soviet missile forces and the Anti-Ballistic Missile (ABM) Treaty, which severely limited ballistic missile defenses. This situation changed dramatically over the last decade. With the Soviet Union's collapse and the diffusion of ballistic and cruise missile technology to rogue states, the United States is no longer confronting one major adversary with large numbers of missiles, but rather a range of prospective adversaries possessing small numbers of missiles. Moreover, the United States has withdrawn from the ABM Treaty and is pursuing plans to deploy a national missile defense (NMD) system. Given its traditional responsibilities, the Army will likely play a major role in national air and missile defense.

The Army also seems destined to play a significant role in helping to defend the country from other forms of attack not involving a traditional assault by enemy armies or air forces, such as the covert introduction of chemical, biological or radiological weapons. The Army—and the National Guard, in particular—has played an important role in disaster relief operations, such as those following hurricanes, floods and large-scale forest fires. In these operations, the Army deploys sizeable forces promptly to the disaster scene and conducts a range of activities, among them support for civilian authorities, population control, logistical support (e.g., providing potable water to the local populace), and medical support. Similar assistance might be required in so-called consequence management operations in the wake of a significant attack on the US homeland.

²⁶ The Bush Administration has promulgated a number of strategies that address different aspects of homeland defense. However, it has yet to make public a comprehensive strategy. Andrew F. Krepinevich, "Combating Terrorism: A Proliferation of Strategies," Testimony, House Government Reform Committee, Subcommittee on National Security, Emerging Threats, and International Relations (March 3, 2003).

²⁷ A substantial number of these air defense missile batteries were manned full-time by the National Guard, whose performance often surpassed that of the Army's active forces.

Although for much of its history, including its recent history, the United States has been blessed with friendly neighbors to its north and south, in recent years both terrorist organizations and transnational criminal elements have exploited America's long borders and open, democratic society to enter the country illegally or under false pretenses. While safeguarding America's borders from illegal entry is formally the responsibility of federal agencies such as the Immigration and Naturalization Service (INS), Border Patrol and Coast Guard, they may require augmentation in times of crisis. Indeed, recent years have seen them relying on the armed forces for support. The Army may be called upon to help seal the nation's land borders in the event of a threat to the homeland.

The increased focus on homeland defense and the growing requirement for a Territorial Army also imply a diversion of resources away from the other Armies—Frontier, Expeditionary and Constabulary—and their missions. For much of the Army's recent history its resources have been devoted almost exclusively to the power-projection mission in its various forms, but this is no longer the case. Put another way, the effort to build up the Territorial Army will come at the expense of resources for the Expeditionary, Constabulary, and Frontier Armies. In this respect, the recent attacks on the United States represent an effective cost-imposing strategy for America's enemies, in that they have compelled the Army to pay a "homeland defense tax." Finally, as they consider their transformation requirements, Army planners cannot lose sight of the fact that, in the event of war, forces earmarked for overseas contingencies may be withheld to support the homeland defense mission.

POWER PROJECTION

The US Cold War defense posture called for substantial Army forces to be deployed overseas at well-established bases as part of a strategy of deterrence and forward defense. During this period, the United States maintained primarily a Frontier Army, with its soldiers manning the front lines of freedom in Europe and Korea and being rotated periodically back to the rear area in the United States. As time went on, reinforcing units of the Expeditionary Army often had their equipment prepositioned with elements of the Frontier Army.²⁸ This posture was both effective and possible for a variety of reasons, the most important being a network of durable and reliable allies and confidence about the principal threats to US security, as well as where major acts of aggression were most likely to occur.

These conditions no longer exist. The collapse of the Soviet Union has led to a substantial reduction in the number of overseas US bases. Moreover, America now finds itself in an age of ad hoc coalitions or "coalitions of the willing." Even long-term allies have recently been unwilling to permit US operations to be conducted from their soil. This trend seems likely to continue. Uncertainty with respect to which state, collection of states, or nonstate actors will pose the next major threat to US interests is greater than during the Cold War. Consequently, defense planners are far less certain as to how to optimize the forward basing of US ground forces. Since 1989, the Army has engaged in major deployments to places such as Panama, Haiti,

²⁸ For example, by the Cold War's end, the Army had pre-positioned some nine brigades' worth of equipment in western Europe to facilitate the rapid movement of its reinforcing units. GAO, "Army War Reserves - DoD Could Save Millions by Aligning Resources with the Reduced European Mission" (GAO/NSIAD-97-158, July 1997), p. 1.

Somalia, Turkey, Kuwait, Saudi Arabia, Afghanistan, Uzbekistan, Bosnia and Albania. While hot spots remain in places like the Persian Gulf and the Korean Peninsula, it is no longer possible to predict with high confidence where the Army will find itself deploying. Plausible scenarios abound, and neither the resources at home nor the political support abroad are sufficient to create an army capable of being based so extensively as to be immediately on hand to address every plausible threat.

This is not to say that the Frontier Army no longer exists; it does, albeit in reduced numbers. Moreover, preserving a significant Frontier Army is critical for two reasons. First, it is needed to reassure allies and friends in areas of vital US interest. As the history of the past half-century shows, there is no stronger form of reassurance for America's friends and allies than to have the US Army's "boots on the ground" in their region.²⁹ Second, the Frontier Army can play an important, and perhaps critical, role in enabling the Expeditionary Army. As will be discussed presently, growing enemy A2/AD capabilities will make it increasingly difficult to project traditional (or Current) land forces into a threatened region. To the extent Frontier Army units are deployed forward before A2/AD capabilities are brought to bear, they can not only assist in blunting aggression in its initial phases, but can also relieve some of the pressure for rapid deployment of Expeditionary Army units. Finally, depending on the deployment concept, Frontier Army formations can facilitate the insertion of Expeditionary Army units. For example, Frontier Army air and missile defense units may be critical to the success of Expeditionary Army distributed insertion operations.

Despite the continued relevance of the Frontier Army, the fact remains that the Army is, in large measure, returning to its pre-World War II expeditionary roots, but under very different circumstances. First, unlike the neo-isolationist United States that existed prior to Pearl Harbor, today's America is an active global power. Consequently, today's Army does not have the luxury of adopting a mobilization strategy, as it had prior to the Cold War. Like the Roman legions of yore, the Expeditionary Army must have forces in a high state of readiness so they can deploy quickly, whether in response to a major conflict or to police democracy's empire in small-scale contingencies, such as peacekeeping, stability, or humanitarian assistance operations. Just as the Roman legions depended on the empire's superb road network to enable superior strategic mobility, the Army depends increasingly upon Air Force airlift and Navy rapid sealift assets.

Anti-Access and Area Denial

The United States' ability to maintain stability in key regions around the globe rests on its capacity to project power, rapidly and decisively, where it is needed. However, the US military's traditional method of deploying and sustaining air and ground forces at or through major ports and airfields is almost certain to be put at risk as a consequence of major shifts in the geopolitical and military-technical environment. As one Army general officer concluded,

Potential adversaries have studied current American deployment requirements and identified our need for a major, developed air- or

²⁹ See, for example, Barry M. Blechman and Stephen S. Kaplan, *Force Without War* (Washington, DC: Brookings Institution, 1978).

seaport. Absent these, they have concluded, we cannot deploy a force with significant combat punch and tactical mobility. Nor can we sustain that force.³⁰

Unlike during the Cold War, it cannot be assumed that allies will provide base access whenever and wherever it is needed. Instead, ad hoc coalitions must be cobbled together depending on the situation. For example, during Operation Desert Fox in 1998, both Saudi Arabia and Turkey refused to allow US air strikes on Iraq to originate from bases on their soil. Similarly, in 1999, Greece, America's long-time North Atlantic Treaty Organization (NATO) ally, refused to permit US forces to operate from its bases during Operation Allied Force. Recently, the United States found unfettered forward base access difficult to come by in the war against al Qaeda terrorist forces and the Taliban regime in Afghanistan. Most states in the region either denied the US military access to bases or placed severe restrictions on their use, especially in the case of strike operations. During the Second Gulf War, Saudi Arabia greatly restricted the ability of US forces to use its bases. At the eleventh hour before the war Turkey refused base access, introducing significant complications to the US war plan.

Nor can the US military be confident that adequate basing facilities will be available in the event access is granted. During the Cold War, the United States developed modern base facilities in Western Europe and Northeast Asia, and fielded forces that became dependent on these well-developed facilities. But the Cold War is over, and the US military has confronted the harsh reality that basing facilities in many other parts of the world—in places such as Somalia, Rwanda, Albania and Afghanistan—are austere in the extreme compared to their Cold War era counterparts. As two eminent Army strategists noted,

...the United States can no longer afford to rely on forces designed to operate from established theater infrastructure, or that require the prior development of such an infrastructure as a precondition for launching operations....future joint operations will have to be mounted and to a large extent sustained directly from the United States, its territories and those of allies choosing to support us, creating minimal essential theater support facilities.³¹

The Army's current transformation efforts seem driven, to a significant degree, by this challenge and, in particular, by its inability to deploy forces rapidly to the Albania-Kosovo border during Operation Allied Force in 1999.³² Major General James Dubik, one of the intellectual fathers of Army transformation, who commanded an early version of what became a Stryker Brigade

³⁰ James M. Dubik, *The Army's "Twofer": The Dual Role of the Interim Force* (Washington, DC: Institute of Land Warfare, October 2001), p. 2.

³¹ Huba Wass de Czege and Richard Hart Sinnreich, *Conceptual Foundations of a Transformed US Army* (Washington, DC: Institute for Land Warfare, March 2002), p. 6.

³² The principal metric employed by the Army to define its Stryker Brigade Combat Teams (SBCTs) and comparable Objective Force Units concerns their ability to deploy to a forward base within four days. The principal problem encountered by the Service's Task Force Hawk during Operation Allied Force was its inability to deploy quickly. Reference has also been made by Army leaders to the Service's need to rely on light ground forces (i.e., airborne troops) during the early stages of Operation Desert Shield, following Iraq's invasion of Kuwait in 1990.

Combat Team, recalled the Army's frustration with trying to move heavy units quickly to Albania and deploy them to the border with Kosovo:

How many class-70 bridges (bridges capable of holding a 70-ton vehicle like the M1 tank) exist, for example, between Germany and Bosnia? In Bosnia? How many between Albania and Kosovo? Perhaps more to the point: How many are there in any of the potential deployment areas around the world? The answer: few, if any.³³

Dubik and other Army leaders viewed the Service's problems in Allied Force as a precursor of future deployment challenges. As Dubik noted, potential flash points, such as the Asian subcontinent, Spratly Islands and Taiwan Straits, lie in regions that seem geographically bereft of even modest local basing facilities to accommodate the US military's short-range fighter aircraft and medium/heavy ground forces.

Even more disconcerting is the proliferation of national and commercial satellite services and missile technology. Increased access to space will allow even regional rogue states both to pretarget key fixed facilities and to monitor US deployments into forward bases.³⁴ Unless one makes heroic assumptions regarding advances in missile defense effectiveness—which this assessment does not—these facilities can be held at risk through the employment of large numbers of ballistic and cruise missiles.

Moreover US maritime forces will also confront new challenges to their ability to project power. The US Navy will increasingly find itself operating in the littoral (i.e., along enemy coastlines, or in "green" waters), for two reasons. First, no navies can challenge the US fleet on the high seas. Second, with forward bases coming under increased risk of effective attack from ballistic and cruise missiles, the fleet will have to move closer to shore to support efforts to defeat anti-access forces and project power against other enemy forces ashore. The fleet must also move to rapidly secure the littoral to enable the resupply of forward-deployed ground forces.

As this happens, the fleet will encounter so-called area-denial forces in the form of sophisticated anti-ship mines, coastal submarine fleets, onshore high-speed anti-ship cruise missiles and other enemy capabilities that may place the carrier-centric US fleet at high risk of destruction.³⁵ In

³³ Dubik, *The Army's "Twofer,"* p. 2.

³⁴ For an elaboration on the growing anti-access threat, see Christopher J. Bowie, *The Anti-Access Threat and Theater Air Bases* (Washington, DC: CSBA, 2002), pp. 37–51. In particular, Bowie cites the continued growth in Chinese, North Korean, Iranian, Indian and Pakistani ballistic missile programs and improvements in missile guidance. He also cites the growing threat from cruise missile forces, both against air bases and maritime forces (e.g., anti-ship cruise missiles); the willingness of countries, such as Russia, to share advanced missile technology; and the threat of enemy irregular forces to forward bases. Finally, Bowie notes that operations from fixed forward bases may become more difficult still if the proliferation of weapons of mass destruction continues apace. The ability of the world's militaries to tap into the commercial satellite architecture for targeting purposes is reflected in the Chinese military's use of US commercial satellite imagery to identify targets in Taiwan for missile attack. See, for example, Bill Gertz, "China Buys US Satellite Data to Target Taiwan," *Washington Times* (February 7, 2002), p. 1.

³⁵ During the US military's major joint field exercise, Millennium Challenge 2002, the US fleet suffered major damage in attempting to exercise rapid sea control in the littoral of a Third World enemy presenting a small-scale contingency threat. The enemy employed ASCMs in large numbers. The simulated Navy task force destroyed 16

short, as the fleet moves from Cold War-era blue-water sea control to focus increasingly on green-water littoral sea control, it will come within range of more of the enemy's military capabilities. Making matters worse, the screening elements that protect the carrier, the Navy's core strike element, will begin to collapse back on the carrier as they encounter the coastline.³⁶ Thus, not only will maritime forces come within range of more enemy systems, their warning time of attack will be reduced as well. The diffusion of weapon systems such as high-speed anti-ship cruise missiles will reduce warning time even further.³⁷ Again, the implications for the Expeditionary Army are both clear and disquieting.

These concerns have not been lost on either the Defense Department leadership or the Army. As Secretary of Defense Rumsfeld noted, "[P]otential adversaries . . . see that our ability to project force into the distant corners of the world where they live depends, in some cases, on vulnerable foreign bases."³⁸ Deputy Secretary of Defense Paul Wolfowitz, expanding on Secretary Rumsfeld's observation, stated,

US forces depend on vulnerable foreign bases to operate—creating incentives for adversaries to develop “access denial” capabilities to keep us out of their neighborhoods. We must, therefore, reduce our dependence on predictable and vulnerable base structure, by exploiting a number of technologies that include longer-range aircraft, unmanned aerial vehicles, and stealthy platforms, as well as reducing the amount of logistical support needed by our ground forces.³⁹

Their concerns are reflected in the QDR's critical operational goals, challenges, and also in its elaboration on the kinds of capabilities required to defeat the challenge:

These joint forces . . . must be lighter, more lethal and maneuverable, survivable, and more readily deployed and employed in an integrated fashion. They must be not only capable of conducting distributed and

ships, including an aircraft carrier, Aegis cruiser, and five amphibious ships. “Ex-General: War Game Rigged,” *Washington Post* (August 17, 2002), p. A6; Jason Ma, “In Simulation, Navy Suffers Heavy Losses, Including Aircraft Carrier,” *Inside the Navy* (August 26, 2002), p. 1; and “Fixed War Games?” *Inside the Army* (August 26, 2002), p. 8.

³⁶ The anti-air warfare (AAW) and anti-submarine warfare (ASW) ships that protect the carrier obviously cannot operate on land. As the carrier maneuvers closer to shore in order to strike targets inland, the protective “bubble” provided by these ships will begin to collapse as they encounter the shoreline. It is important to note that these escorts typically operate at great distances from the carrier when in a warfighting environment. For the sake of example, if a carrier were positioned in Washington, DC, anti-air escorts (such as Aegis cruisers and destroyers) would be positioned as far away as Harrisonburg, Pennsylvania; Trenton, New Jersey; and Norfolk, Virginia. This example is taken from Admiral James D. Watkins, *The Maritime Strategy* (Annapolis, MD: Naval Institute Press, January 1986), p. 13.

³⁷ For a discussion of the area-denial threat, see VADM Arthur K. Cebrowski and Captain Wayne P. Hughes (USN, Ret.), “Rebalancing the Fleet,” *Proceedings* (November 1999); and Captain Wayne P. Hughes (USN, Ret.), *Fleet Tactics and Coastal Combat* (Annapolis, MD: Naval Institute Press, 2000), pp. 145–68.

³⁸ Donald Rumsfeld, Secretary of Defense, Speech before The National Defense University, Washington, DC (January 31, 2002).

³⁹ Paul D. Wolfowitz, Deputy Secretary of Defense, Testimony, House Budget Committee, Washington, DC (February 12, 2002).

dispersed operations, but also able to force entry in anti-access or area-denial environments.⁴⁰

US forces . . . must have the ability to arrive quickly at non-traditional points of debarkation to mass fire against an alerted enemy and to mask their own movements to deceive the enemy and bypass its defenses.⁴¹

The effort by adversaries to adopt this indirect approach to defeating or deterring US power-projection operations seems well under way. According to a recent Defense Science Board (DSB) study, a regional power's development of this kind of anti-access capability by 2010 is quite plausible, even given relatively severe resource constraints.⁴² A commander in chief of US forces in Korea declared that forward base access is not a problem for the US military of 2010, but one that has existed in embryonic form in Korea for much of the 1990s, and that will only worsen over time.

Defeating the anti-access threat promises to be a very challenging proposition. States developing A2/AD forces are doing so in such a way as to make them more difficult to target. To this end they are likely to emphasize the following:

- Mobility and dispersion (e.g., mobile TELs for ballistic missiles; mobile launchers for ballistic and cruise missiles);
- Stealth (e.g., diesel submarines; low-observable cruise missiles; mines);
- Hardening of fixed targets (e.g., deep-underground WMD production and storage facilities; command centers; leadership bunkers);
- Deception (e.g., coastal combatants masquerading as commercial vessels; irregular forces posing as noncombatants);
- Integrated air defense networks;
- “Hostages” (e.g., positioning military forces and supplies in noncombatant neighborhoods);
- Geography (e.g., deploying forces far inland to stress US forces' range and targeting capabilities); and

⁴⁰ *QDR Report*, p. 32.

⁴¹ *QDR Report*, p. 43.

⁴² Defense Science Board, *Final Report of the Defense Science Board Task Force on Globalization and Security* (Washington, DC: Office of the Under Secretary of Defense for Acquisition and Technology, December 1999), p. vi.

- Sanctuaries (e.g., neutral-party space assets; the threat of WMD attacks to create a national sanctuary; positioning military forces very close to cultural landmarks, hospitals, and related structures to create a local sanctuary effect).

To the extent that they must operate outside of the enemy's A2/AD envelope, US forces will find their reconnaissance, surveillance, and target acquisition (RSTA) timelines stretched, making destruction of critical mobile A2/AD targets even more difficult.

Of course, such timelines can be compressed, and the opportunities for defeating the A2/AD threat enhanced, by US forces operating underneath the enemy's A2/AD umbrella. This will likely require forces that can insert themselves in a distributed manner, and that can operate and sustain themselves in a highly dispersed, highly networked manner. It also favors forces that further minimize their risk of detection through various forms of stealth—including signature reduction, cover, concealment and deception—as well as mobility. It appears that Army formations—given their relative advantage over their sister Services in the ability to operate dispersed—have the greatest potential to operate underneath the enemy's A2/AD umbrella. This seems particularly true given the Air Force's heavy emphasis on relatively short range combat aircraft that are intended to be positioned at major forward bases. The Army's emphasis on these kinds of capabilities in its transformation plans will be elaborated upon presently.

In summary, enemy asymmetric strategies—such as threatening nontraditional attacks on the American homeland and A2/AD—are designed to offset the US military's dominance in traditional forms of warfare. They also represent cost-imposing strategies in that the US military in general, and the Army in particular, will likely incur substantially greater costs to offset these asymmetric strategies than America's enemies will incur to generate them. While such a cost imbalance may not pose a problem for the Army as long as the United States confronts adversaries whose resources are greatly inferior to its own (e.g., rogue states), the advantage of scale may be eroded over time should the United States find itself in military competitions with regional powers, or against multiple adversaries. In particular, as current Army operations reveal, manpower limitations are likely to be felt much sooner than fiscal constraints. Hence, in its efforts to address the A2/AD challenge, the Army must ensure that its warfighting concepts are also valid against adversaries capable of competing on a substantially greater scale than, say, Iran or North Korea, and for periods that far exceed the rapid conquests of Afghanistan and Iraq.

Urban Eviction and Control

As enemies from the Republican Guard to the Serbian Army to the Taliban have discovered over the past decade, to engage the US military in open battle is to court a rapid, one-sided defeat. Future adversaries can be expected to adapt in ways that minimize the US military's advantages in precision firepower. One way to do this is to move into complex terrain such as urban areas, which have increasingly have become focal points for military operations. Urban combat offers an inferior enemy the prospect of offsetting, to a significant extent, the US military's technological advantages, while also creating an environment that has traditionally required manpower-intensive operations and a willingness to sustain relatively high casualties. The

Army's concerns here are clear, and are reflected in its concerns over the effectiveness of its Future Force Unit of Action (UA) formations⁴³:

Complex urban environments, ranging from modern skyscraper jungles, to huge shantytowns are...an increasingly predominant feature of the operational environment. These environments will challenge the [Army's] Unit of Action in a complex 3D fashion—elevated, surface and subsurface. Subways, sewers and tunnels will be prominent in threat urban operational patterns. Wires, overhead cables, towers, and other obstructions will challenge the Unit of Action's aerial ISR suite [The enemy's] preferred tactical venue is complex terrain—urban areas will be the scenes of much, if not most, future tactical action. Future threats will seek battle in complex and urban terrain as a way of offsetting UA advantages, particularly in its operating construct of standoff/long-range precision fires Finally, the enemy will employ hugging tactics to present danger—close fires and the risk of civilian causality problems.⁴⁴

Demographic experts predict that by 2025, more than 85 percent of the world's population will reside in cities. Thus, not only will adversaries have more incentive to fight in urban environments, there will also be more urban terrain than ever before in which to seek sanctuary.⁴⁵

Both the Army's White Paper, *Concepts for the Objective Force*, and its Training and Doctrine Command (TRADOC) pamphlet, *The United States Army Objective Force: Operational and Organizational Concept*, confirm the need for the Army to master the mission of evicting enemy forces from urban terrain, and to control urban terrain against low-end threats in conjunction with stability operations. The QDR alludes indirectly to this mission in its critical operational challenge of denying the enemy sanctuary. As TRADOC concludes,

In the future, simply avoiding complex [urban] terrain will not be possible. Future adversaries are likely to exploit the sanctuary offered by such terrain. Objective [Future] Force units therefore must be trained, equipped, and psychologically prepared for urban warfare.⁴⁶

⁴³ Objective Force Units of Action are roughly analogous to today's brigade formations.

⁴⁴ TRADOC, *US Army Objective Force*, pp. 18–20.

⁴⁵ General Accounting Office, *Military Capabilities: Focused Attention Needed to Prepare US Forces for Combat in Urban Areas* (Washington, DC: February 2000), p. 6. Furthermore, 95 percent of the population growth over the next 10 years or so will occur in developing countries, with almost all of this increase taking place in urban areas. See also Central Intelligence Agency, *Global Trends 2015: A Dialogue About the Future with Non-governmental Experts*, GPO #041-015-00211-2 (Washington, DC: NIC 2000-02, December 2000).

⁴⁶ US Army Training and Doctrine Command, TRADOC Pamphlet 525-3-0, *The United States Army Objective Force Operational and Organizational Concept* (Draft) (Fort Monroe, VA: TRADOC, December 18, 2001), p. 34. Hereafter cited as "TRADOC, *Objective Force*." This "pamphlet," which is the size of a sizeable town's telephone directory, was updated in July 2002. See US Army Training and Doctrine Command (TRADOC), TRADOC Pamphlet 525-3-90/O&O, *The United States Army Objective Force—Operational and Organizational Plan for Maneuver Unit of Action* (Fort Monroe, VA: TRADOC, July 22, 2002). The Army's White Paper on the Future Force concurs, stating that Future Force units must be prepared to conduct operations in "close, complex, or urban

OTHER CHALLENGES

Are there additional plausible challenges for US land forces that did not find their way into the United States' defense strategy? And if there are, what might the implications be for tomorrow's Army? The following situations, which could require American ground forces, suggest themselves.

Large Critical State Failure

To a remarkable extent, the recent history of the Army is one of conducting operations in places that would have been viewed by most defense planners as highly unlikely only a few years in advance of their execution. Who would have thought, ten years in advance, that the Army would be conducting large-scale combat operations in Korea, Vietnam or Iraq?

During the 1990s, the Army's force requirements were driven principally by the need to fight two major theater conflicts, on the scale of Desert Storm, in overlapping time frames. This situation yielded the current active Army force of ten divisions. The Army has generally been successful in recruiting and retaining quality men and women into the force, which numbers roughly 480,000 in the active component. Moreover, the current Army modernization effort seemed to provide for a reasonable, if not optimal, recapitalization of the ten-division force.

However, recent years have seen the Army engaged in a range of operations in failed or failing states, such as Rwanda, Somalia and Bosnia, or in operations designed to induce regime change, such as in Haiti, Yugoslavia, Afghanistan and Iraq. One consequence of regime change operations is the need to restore stability once the regime had been displaced. Given the ongoing and likely protracted war on terrorism and a declared willingness to confront states that either sponsor Islamic terrorist movements or threaten to acquire nuclear weapons, the Army may have to undertake contingency operations in failed states, or to induce state failure through regime change operations. This implies an ability to conduct prolonged stability operations.

The most demanding of those contingencies would likely involve dealing with terrorist and separatist groups in a large failed state, with Indonesia being perhaps the contingency of greatest immediate concern. A failed Indonesian state that proved a congenial host to terrorist organizations with global reach could lead to a US military intervention requiring ground forces in substantially greater numbers than in any recent Third World low-intensity contingency. Even if the terrorist factor were not present, US intervention might be dictated on economic or humanitarian grounds. Almost all of East Asia's imported energy supplies pass through the Strait of Malacca and the South China Sea. The strait, which at its narrowest point is but 1.5 miles wide, is among the world's busiest shipping lanes. Roughly 10 million barrels of oil pass through the strait daily, a figure expected to double over the next two decades.⁴⁷

terrain throughout the battlespace." United States Army White Paper, *Concepts for the Objective Force* (Washington, DC.: US Army, November 2001), p. 6. Hereafter cited as "White Paper, *Objective Force*."

⁴⁷ US Department of Energy, Energy Information Administration Country Analysis Brief on the South China Sea Region, <http://www.eia.doe.gov/emeu/cabs/schina.html>

Should the United States choose to intervene, Army forces could confront the challenge of conducting widely dispersed operations against elements of transnational terrorist organizations, perhaps (as was the case in Afghanistan) in league with local factions hostile to friendly indigenous forces. Army forces would likely find themselves taking the lead in bringing at least the major urban centers under control, and might well be involved with supporting the Army's sister Services' efforts to maintain maritime commerce through Indonesia's key choke points and with defending key national economic assets (e.g., the Natuna gas fields).

If this sounds familiar, much of what is described here is already being played out in Iraq. Stability operations in Iraq have stretched the Army force structure to its limits. However, similar operations in Indonesia might have to be conducted on a substantially greater scale. Indonesia is the world's largest Muslim state, comprising some 17,000 islands that stretch over 3,000 miles from east to west and some 1,200 miles from north to south. The demands on troop levels, intra-theater mobility, and specialized troops (e.g. Special Forces, military police, civil affairs), among other things, to support Army operations would be formidable, to say the least.

It is quite plausible that stability operations may come to dominate Army operations over the foreseeable future. The rapid growth in stability operations not only threatens to tax the Army in terms of the demands they place on its rotation base, but they challenge the Army to accelerate the development of Constabulary Army units, as opposed to trying to re-role units of the Current Force.⁴⁸

What is less clear is how the Army would fare should it need to expand to deal with greatly increased stability operational requirements. In this case, the scale of effort required of the Army would be substantially greater than in the period prior to 9/11 or immediately thereafter in Afghanistan. While the United States has increased its defense budget estimates substantially since 9/11, it is far from clear that the Army can easily increase its force structure, in terms of the number of soldiers in either the Active or Reserve components, or ramp up its procurement of the equipment needed to field additional formations.⁴⁹ The matter of the Army's rotation base and its potential effect on transformation prospects will be addressed later in this paper.

Nuclear State Failure and a Second Nuclear Age

A particularly challenging—and increasingly plausible—contingency for future land operations concerns nuclear state failure. With the collapse of the Soviet Union and the continued proliferation of weapons of mass destruction, nuclear weapons are no longer the exclusive province of large, stable powers. At present, nuclear states such as North Korea and Pakistan are

⁴⁸ Re-roling refers to reassigning soldiers and units to roles for which they are not principally trained, organized or equipped. For example, during the Vietnam War, some Army air defense Vulcan gun units were “re-rolled” to conduct convoy operations and provide fire support for ground forces.

⁴⁹ Congressional Budget Office, “Structuring the Active and Reserve Army for the 21st Century” (December 1997), p. 36.

far more volatile than the Cold War–era nuclear powers.⁵⁰ Indeed, during the initial phase of the Global War on Terrorism (GWOT), the US military faced the prospect of having to secure Pakistan’s nuclear arsenal if it collapsed under the internal and external pressures brought on by the conflict. Within the 10- to 15-year planning horizon assumed in this paper, states that are both hostile to US interests and relatively unstable—such as Iran—could come into possession of nuclear weapons.

In cases of nuclear state failure, the US military may be called upon to secure (or perhaps destroy) the state’s nuclear weapons, and perhaps other WMD stocks as well. These operations could require significant ground forces. Where a failed state’s nuclear arsenal is rather modest and concentrated, such forces could be small, specialized in penetrating highly secured areas (including hardened, deeply buried facilities), well-versed in dealing with nuclear materials, and capable of rapid, stealthy deployment and extraction. In cases where a relatively large nuclear arsenal is involved, ground units specialized in securing nuclear materials may need to be supported by larger, general-purpose forces from the Expeditionary Army.

Moreover, in the longer term, the Cold War nonproliferation regime fashioned in the 1960s might give way to a world in which a number of lesser states hostile to the United States either overtly acquire nuclear weapons or else develop “call options” to field them in relatively short periods (months to a year or two). To date, the United States has not mounted significant conventional operations against any nuclear-armed adversary. The prospect obviously poses new risks and complications for which none of the US military services are well prepared. A second nuclear age, in which the US military would have to confront a world containing many more nuclear players than in the past, could materialize by 2018. If it did, there would certainly be implications for the US Army.

⁵⁰ States that are believed to have developed nuclear weapons during the Cold War include the declared nuclear powers—the United States, Soviet Union, Britain, France, and China—as well as a number of undeclared nuclear powers, including India, Israel and South Africa (and perhaps Pakistan, as well).

III. ASSESSING ARMY TRANSFORMATION

How does the Army propose to deal with the changing conflict environment? Is the Army's plan for transforming itself realistic? Will it produce a more relevant Army? These are the central issues to be addressed in this section and those that follow.

VISION

All transformation efforts need to be informed and guided by a compelling vision of how future military competitions will be different from those that dominate warfare today. Put another way, the Army leadership must answer the question, "Why should the world's best Army transform itself?"

Military organizations that successfully transform benefit greatly from a clear statement of how the post-transformation conflict environment will differ from the pre-transformation environment. For instance, in outlining his vision of future warfare, General Hans von Seeckt rejected the German Army's World War I experience on the Western Front after the onset of trench warfare when he declared that mass armies had become "cannon fodder for a small number of technicians on the other side." Consequently, he argued, "The goal of modern strategy will be to achieve a decision with highly mobile, highly capable forces, before the masses have begun to move."⁵¹ Thus were the roots of blitzkrieg established. Similarly, the US Navy's Admiral William S. Sims left little doubt as to the how the character of warfare at sea would undergo a transformation when he predicted in 1925 that a "high-speed carrier alone can destroy or disable a battleship [T]he fast carrier is the capital ship of the future."⁵²

Regrettably, the current Joint Chiefs of Staff (JCS) vision statement does not present a similar compelling vision to inform the Army's transformation efforts. The JCS vision, set forth in *Joint Vision 2010* and sustained in *Joint Vision 2020*, speaks in general terms of the need to achieve positional advantage over an adversary ("dominant maneuver"), engage the enemy effectively ("precision engagement"), and support such activities efficiently and effectively ("focused logistics") while protecting friendly forces ("full-dimensional protection").⁵³ Although these are eminently desirable qualities for the US military to pursue, they offer little guidance as to how they are to be achieved in light of changes in the character of key military competitions over time

⁵¹ Robert M. Citino, *The Evolution of Blitzkrieg Tactics: Germany Defends Itself against Poland, 1918–1933* (New York: Greenwood Press, 1987), p. 71.

⁵² Clark G. Reynolds, *The Fast Carriers* (Annapolis, MD: Naval Institute Press, 1968), p. 1.

⁵³ Joint Chiefs of Staff, *Joint Vision 2020* (Washington, DC: Department of Defense, 2001), pp. 4–5, 13, 20–27. To be sure, *Joint Vision 2020* notes the risks from changes in the conflict environment brought about by adversaries pursuing asymmetric strategies. The Joint Chiefs go on to say that such strategies are "perhaps the most serious danger the United States faces," that asymmetric advantages may be pursued on any level of warfare—strategic, operational or tactical—and that "adversaries may pursue a combination of asymmetries . . ." The reader is further instructed that "asymmetric threats are dynamic and subject to change, and the US Armed Forces must maintain the capabilities necessary to deter, defend against, and defeat any adversary who chooses such an approach." Yet despite these general statements of concern there is little in the way of detailed discussion as to what form (e.g., anti-access, area denial) asymmetric threats might take, or how the US military proposes to deal with them.

(e.g., projecting power against an A2/AD threat, defending against covert WMD attacks on the US homeland, etc.). Indeed, stripped of their adjectives, the characteristics of effective “maneuver,” “engagement,” “logistics” and “protection” would be those desired by *any* military organization, in *any* era.

On a more positive note, the Army is, arguably, the most aggressive of the four Services in pursuing transformation. However, while the Army’s stated vision, “Soldiers on point for the Nation . . . persuasive in peace, invincible in war,” may be seen as a general mission statement or slogan, it is not a vision of how warfare will be different in the future. As will be discussed in detail presently, the Army’s vision is presented in documents pertaining to operational and organizational concepts. An examination of these documents reveals an Army vision that sees land warfare changing in the following ways:

- Operations will shift from linear to nonlinear;
- Formations will operate much more dispersed;
- Operations will be conducted at a much higher tempo, leading to greater reliance on speed of mobilization and deployment, and of combat operations themselves;
- Advanced information technologies will allow ground forces to form networks, enabling them to violate the principle of mass to better protect themselves by dispersion, while losing little of their ability to coordinate or mass combat capability;
- Although close combat will remain a key element in land warfare, advanced information capabilities and munitions will enable ground forces to conduct decisive engagements at far greater ranges than has historically been the case;
- Adversaries that cannot compete effectively in open battle will gravitate toward combat in complex terrain (urban areas in particular);
- Operations will be much more dependent on maritime and air forces for their success than has been the case—in short, land warfare will become even more of a joint endeavor than it is today; and
- The spectrum of land warfare will become blurred, with various forms of warfare merging, requiring unprecedented levels of flexibility from land forces.⁵⁴

Assuming this is the Army’s vision, it must be stated clearly and directly. Failure to do so risks undermining Army transformation in two ways. An ambiguous vision provides neither a clear, persuasive justification for change nor guidance to inform change. Absent a clear vision

⁵⁴ These observations are drawn from TRADOC, *Objective Force*; TRADOC, *US Army Objective Force*; Wass de Czege and Sinnreich, *Conceptual Foundations of a Transformed US Army*; Dubik, *The Army’s “Twofer”*; and White Paper, *Objective Force*.

statement, “transformation” can lead the Army to focus on improving current forms of operations to meet enhanced variations of existing threats, when the threat is actually changing in substantial and perhaps fundamental ways. Thus, not only must the Army present a clear vision of how land warfare is changing, but it must also define how this change will influence land warfare at the operational level—the level at which campaigns are fought, and the centerpiece around which doctrine is written.

OPERATIONAL CONCEPTS

As noted above, the Bush Administration has set down six critical operational goals for the military. Of those six, the most relevant for the Army are those pertaining to defending the homeland from traditional (e.g., ballistic missile) and nontraditional (e.g., terrorist covert insertion of WMD) attacks; projecting power against an A2/AD threat; denying enemies sanctuary from attack; and developing a joint C4ISR architecture.

To these were added several others, such as providing the long-term ground presence to deal with failed states, operations involving a failed nuclear state, alterations in the character of conflict should the United States find itself in a second nuclear regime, and urban eviction and control operations. The Army, recognizing the increasing need for Expeditionary Army units, and in conformance with its vision that the tempo of warfare is increasing dramatically, places a premium on the ability to deploy forces rapidly to threatened theaters. While reasonable people can debate whether the Army should include the additional challenges discussed above (which argue for greater emphasis on the Territorial and Constabulary Armies), the Army presents a clear answer not only to the question, “Why transform the world’s best Army?” but also to the question, “To what end?”

The next step along the transformation path is to identify point-of-departure concepts of operation that set forth, in significant detail, how the Army sees itself meeting these challenges. Here the Army’s transformation efforts encounter several barriers. First, given its vision that land warfare, which is now dominated by joint operations, will become ever more joint in the future, the Army must, to a greater extent than in the past, derive its concepts of operations from joint point-of-departure operational concepts. But such concepts have either not been formulated or are severely flawed.

Rapid Decisive Operations and Effects-Based Operations

The concepts of operation currently under consideration by Joint Forces Command (JFCOM) and some Services for dealing with the A2/AD challenges do not appear particularly promising. Take JFCOM’s centerpiece operational concept—rapid decisive operations (RDO). While the concept has as its goal the worthwhile objective of waging campaigns that are brief in duration and that result in clear victories, the concept provides little detail as to how the joint force will accomplish the mission of defeating the enemy’s A2/AD threat.

The RDO concept essentially continues the elusive (albeit worthwhile) quest to pinpoint an adversary’s center of gravity to facilitate its prompt neutralization or destruction. To be sure, opportunities should be sought to improve the military’s capabilities for such operations, *but*

within a post-transformation threat environment. It does little good, for example, to base RDO concepts and capabilities on assured access to in-theater bases when political access may be problematic and before the means and methods to defeat A2/AD threats have been identified and established.⁵⁵

Strong links exist between RDO and effects-based operations (EBO), which are a derivative of concepts dealing with the strategic bombardment of the enemy's center of gravity. As one prominent Air Force strategist notes, “[a]ctions to induce specific effects rather than simply destruction of the subsystems making up each of these strategic systems or ‘centers of gravity’ is the foundation of the concepts of parallel war, rapid decisive operations, or any other concept that seeks to achieve rapid dominance over an adversary.”⁵⁶

In brief, effects-based targeting is premised on the belief that it is possible to reduce dramatically the time it takes to disable an adversary's strategic center of gravity. The idea is simply to move from focusing on the physical effects generated against individual targets to the effects of individual strikes on an adversary's overall political, economic, social and military structures. This can be accomplished through two means. First, a greatly enhanced understanding of the cause-and-effect relationship between targets destroyed and the effect this has on “vital enemy systems” that “are relied on by an adversary for power and influence—leadership, population, essential industries transportation and distribution, and forces.”⁵⁷ Second, the ability of precision weapons to disable many types of targets much more rapidly at much lower cost than is possible with nonprecision weapons. While there may be cause to believe that precision weapons may partially enable one element of EBO, it is far from clear that the concept's other key element—identifying those elements that comprise the enemy's center of gravity—can be accomplished, or that they can be neutralized *promptly* with precision weapons.⁵⁸ In summary, EBO (which began as an Air Force doctrinal concept and has been adopted by the Joint Staff) does not seem particularly helpful as a guide to Army transformation.

In summary, if the Army is compelled to support a flawed joint approach to future conflict, it cannot help but incur deleterious effects to its transformation efforts. Moreover, since the Army plans on fighting as part of a joint force, it cannot but suffer from the negative effects of such an operational concept on the other Services.

⁵⁵ JFCOM's official definition of RDO is “A concept to achieve rapid victory by attacking the coherence of the enemy's ability to fight. It is the synchronous application of the full range of our national capabilities in timely and direct-effects based operations. It employs our asymmetric advantages in the knowledge, precision, and mobility of the joint force against his critical functions to create maximum shock, defeating his ability and will to fight.” Otto Kreisher, “The Quest for Jointness,” *Air Force Magazine* (September 2001), p. 74.

⁵⁶ Major General David A. Deptula, *Effects-Based Operations: Change in the Nature of Warfare* (Arlington, VA: Aerospace Education Foundation, 2001), p. 6.

⁵⁷ Deptula, *Effects-Based Operations*, p. 6.

⁵⁸ For a critique of EBO, see Richard Hart Sinnreich, “An Operating Concept in Search of Modesty,” *Lawton Constitution* (July 6, 2003), p. 4. For a discussion of some of the practical problems of translating RDO and EBO concepts into practice, see Andrew F. Krepinevich, *Operation Iraqi Freedom: A First-Blush Assessment* (Washington, DC: CSBA, 2003), pp. 21–23.

Army Transformation Concepts of Operation: An Overview

The extent to which the Army's approach to developing operational concepts for meeting these emerging challenges has been hobbled by the difficulties encountered in developing joint operational concepts is unclear. However, it can be said that, as with concepts developed at the joint level, Army operational concepts tend to focus heavily on large-scale power-projection operations, and on open battle against conventional enemy forces in particular, while according less emphasis to the other critical challenges presented above, such as stability operations and failed state WMD operations.

While the Service is devoting significant time and resources to address urban control and eviction operations, it has thus far shied away from its own conclusions that forces specially organized, trained and equipped for this mission are required. While the Army has increased its investment in urban training facilities, they still pale in comparison to the fidelity accorded to open battle training at the Army's National Training Center (NTC).

The Army has yet to elaborate on its role in addressing WMD or IW attacks against critical US domestic infrastructure targets, and may benefit from thinking through what role it might be called upon to play in the event the US homeland is under attack, and where it might be most effective.⁵⁹ Moreover, the Army's concepts of operation contain potentially fatal flaws that risk undermining other aspects of its transformation efforts.

In summary, the Army's principal focus for decades—power-projection operations against a conventional military power—remains the primary object of its attention (albeit against an A2/AD threat). A strong argument can be made that this mission should have first priority for the Army. But, as will be discussed presently, an equally strong argument can be made that the range of challenges that confront the Army mandates a more comprehensive approach. However, since this study is an assessment of the Army's approach to transformation, much of the following discussion centers on the Service's power-projection operations in a major theater war. Yet, as will also be made clear, several important contingencies noted above, such as stability operations, counter-terror operations, WMD control operations and urban operations, are not given the attention they merit in the Army's transformation efforts.

Anti-Access/Area-Denial

As two eminent military strategists have observed, "Today's Army was designed primarily to defeat a numerically superior mechanized threat backed by strong air and naval forces, on the territory of an ally, and from a forward-deployed posture in which essential ground support and sustainment infrastructure already was in place."⁶⁰ The First Gulf War and the two-war posture

⁵⁹ American military leaders have taken the lead at times developing warfighting concepts in the absence of clear guidance from senior political leaders. During the 1920s and 1930s, for example, the US military developed both the concepts and much of the capability that would enable it to wage a strategic bombing campaign, even though civilian leaders accorded it little emphasis.

⁶⁰ Wass de Czege and Sinnreich, *Conceptual Foundations of a Transformed US Army*, p. 9.

that informed military requirements for much of the 1990s reinforced this orientation. The First Gulf War presented the US Army with—

...circumstances uniquely favorable for the style of warfare in which it had trained for more than a decade, and against an enemy far less capable than those it was organized and equipped to confront. Required to deploy into an undeveloped theater, Army forces were able for nearly four months to assemble and prepare for combat unhampered by enemy interference. That same leisure, together with the open topography of the battle area and virtually continuous overhead surveillance, enabled the Army to conduct an intelligence preparation of the battlefield far more extensive than most attackers have ever enjoyed. Once committed to battle, it confronted and attrited operationally static enemy formations in largely open ground in conditions of unchallenged air supremacy and with overwhelming advantage in information, mobility, firepower and protection.⁶¹

The same can be said of the Second Gulf War, save that the conditions were arguably even more favorable than in 1991. But the power-projection challenge is changing, and the Army presents a clear and sobering picture of the challenges the Expeditionary Army will confront in future power-projection operations against an enemy possessing A2/AD capabilities. For the Army, the A2/AD threat comprises “theater ballistic missiles, cruise missiles, long-range rockets and artillery, weapons of mass destruction and other unconventional means, and information operations.”⁶² The Army warns that it must prepare for enemies that will “seek to physically thwart US intervention through strikes against forward operating bases, entry points, command and control nodes, and the forces themselves extending all the way back to the CONUS base.”⁶³

Moreover, through its war games, the Army has concluded that the longer an enemy can delay effective US response, the greater his chances for success.⁶⁴ Since an “enemy could seek to accomplish its initial objectives quickly by an aggressive, territorial move with conventional forces against a neighbor, leaving [the enemy with] sufficient time to prepare for and deny external intervention,” the Army believes its forces must be capable of deploying rapidly, along much shorter timelines than are possible at present.⁶⁵ The Army’s leaders also recognize that its deploying ground force must not only deal with the A2/AD threat, but must also carry out its other missions upon arriving in the threatened theater.⁶⁶

⁶¹ Ibid, p. 3.

⁶² White Paper, *Objective Force*, <http://www.army.mil/features/WhitePaper/default.htm>

⁶³ Ibid., p. 1.

⁶⁴ Ibid., p. 1.

⁶⁵ Ibid., p. 2.

⁶⁶ As Wass de Czege and Sinnreich, *Conceptual Foundations of a Transformed US Army*, p. 14, note, “As soon as it becomes clear that deterrence has failed, the priority of the multidimensional campaign will shift to preclusion—the effort to halt or delay the enemy’s offensive while concurrently shaping the theater battlespace for early and decisive counteroffensive operations.” Key elements of this campaign include:

- Information superiority;
- Theater air supremacy;

Put another way, rapidly deploying expeditionary ground forces in an A2/AD threat environment is not viewed as an end in itself; the forces that arrive must be capable of conducting the full range of combat operations.⁶⁷ The Army believes that such combat may involve engagements in open terrain, but that the enemy will more likely “disperse and operate from areas of physical and moral sanctuary often located in complex, urban terrain, shielded by civilians and culturally significant structures” to reduce his exposure to US precision fires, while also creating discrimination problems for US targeting.⁶⁸

For the reasons elaborated upon above, the Army has established very ambitious deployment timelines for its forces. The design of its future forces is driven by its goal to deploy a brigade combat team anywhere in the world in 96 hours after liftoff, have a division on the ground in 120 hours, and five divisions in theater in 30 days.⁶⁹ However, unless they are predeployed in advance of a conflict, the Army’s current heavy, mechanized divisions are far too heavy to meet these deployment timelines under any plausible contingency. Since the Service also believes that its rapidly deployable, light divisions lack the combat capability to conduct the full range of ground force missions, a near-term solution is being sought in the form of medium-weight formations that can deploy rapidly but that also have significant combat and maneuver capabilities.⁷⁰

Meeting the A2/AD challenge requires a *joint* solution. The Army has it to deal with its portion of the A2/AD threat, but if the Air Force cannot gain early, rapid air control, to include suppression of enemy anti-access missile forces, and if the Navy cannot open up the littoral against enemy area-denial forces, then Army, even if it can deploy, probably cannot sustain its forces beyond a few days absent extensive prepositioned stocks or large-scale support from the host government.⁷¹ Moreover, the Army’s deployment timeline goals inherently increase its dependence on airlift and rapid sealift, both strategic and in theater.

-
- Air and missile defenses; and
 - Early air-ground ops [i.e., operations] to bolster indigenous forces.”

⁶⁷ “Army formations must be adaptable to a broad range of operational tasks without major reconfiguration, but also without forfeiting the cohesion essential to effective combat performance.” Wass de Czege and Sinnreich, *Conceptual Foundations of a Transformed US Army*, p. 18.

⁶⁸ “Operations will occur day and night, in open, close, complex, or urban terrain throughout the battlespace.” White Paper, *Objective Force.*, p. 6.

⁶⁹ *Ibid.*, p. 9. Typically, three brigades comprise a division.

⁷⁰ *Ibid.*, p. 11. The Army has ten active divisions. The 1st Infantry (Mechanized), 3rd Infantry (Mechanized), 4th Infantry (Mechanized), 1st Cavalry and 1st Armored divisions are considered “heavy” divisions, owing to their preponderance of heavy armored vehicles, such as the 70-ton Abrams main battle tank. Light formations include the 82nd Airborne Division, and the 25th Infantry, and 10th Mountain divisions. The 101st Airborne Division (Air Assault) is the Service’s only helicopter-intensive division, and is not considered light. The 2nd Infantry Division is regarded as a medium-weight division. The Service also has several independent brigades and regiments.

⁷¹ As for the ability of friendly indigenous forces to stay the enemy’s advance, “surrogate forces may not always be available, and even when they are, there are not guarantees that their campaign objective and ours will coincide.” Thus, “time therefore is critical to successful aggression, and the more nearly the latter can be conducted as a *coup de main*, the more likely it is to succeed, at least to the extent of confronting the United States and its allies with the

Ultimately, the Army's transformation plan seeks to create a Future Force that "will possess the lethality, speed and staying power associated with heavy forces and the agility, deployability, versatility, and close combat capability of today's light forces."⁷² At present, however, the Future Force is more concept than reality. To bridge the gap between today's heavy (or Current) forces and the Future Force, the Army is beginning to field a force of Stryker Brigade Combat Teams (SBCTs).⁷³ However, while these brigades are roughly as deployable as the Future Force units are projected to be, they are nowhere near as lethal as today's heavy formations. Thus, the Army's transformation plan is counting heavily on its Future Force units, which it intends to begin fielding in 2012.

Deploying the Force

With the emergence of A2/AD threats, force deployment is likely to prove far more challenging in future major conflicts than it was in any of the Army's four major wars since 1950. Simply put, the Army can no longer count on being able to deploy forces into secure aerial ports of debarkation (APODs) and sea ports of debarkation (SPODS) in its target theater of operations. Consequently, force deployment becomes a key part of the Service's concept of operations. The Army's best public statements as to how it envisions operating in this post-transformation conflict environment are found in several TRADOC publications on the Future Force, and the Army leadership's White Paper. As TRADOC states, "The Objective [Future] Force Concept describes how Army forces will conduct prompt and sustained combat incident to operations on land."⁷⁴ Furthermore, "If deterrence fails, Objective [Future] Force units may conduct forcible entry operations, rapidly overwhelming any anti-access defenses and decisively attacking and defeating the center of gravity of any adversary."⁷⁵

The Army's White Paper, in outlining the operational concept for the Future Force, states that "[i]n order to overcome an aggressor's A2 capabilities, entry into areas of operations must be enabled without reliance on conventional APODS and SPODS where denial efforts will be focused."⁷⁶ This approach is necessary because of the anticipated threat of large-scale enemy missile attacks against major transportation hubs, or nodes. Consequently, the Army plans to—

. . . introduce units at multiple points of entry other than traditional fixed APODs and SPODS. This capability is required to ensure unpredictability

requirement to reverse rather than thwart it." Wass de Czege and Sinnreich, *Conceptual Foundations of a Transformed US Army*, pp. 7–11.

⁷² Wass de Czege and Sinnreich, *Conceptual Foundations of a Transformed US Army*, p. 11.

⁷³ The Army has converted two units to Stryker configuration. It also plans to convert the 172nd Infantry Brigade (Forts Richardson and Wainwright, Alaska); the 2nd ACR (Fort Polk, Louisiana); the 2nd Brigade, 25th Infantry Division (Schofield Barracks, Hawaii); and the 56th Brigade of the 28th Division (Mechanized) of the Pennsylvania Army National Guard. (The two brigades now being converted are the 3rd Brigade, 2nd Infantry Division (Medium), and the 1st Brigade, 25th Infantry Division (Light).)

⁷⁴ TRADOC, *Objective Force*, p. 21.

⁷⁵ *Ibid*, p. 6.

⁷⁶ White Paper, *Objective Force*, p. 10.

in how forces arrive in theater and counters the growing trend in anti-access investments by potential threats. Austere points of entry, not reliant on large runways, port facilities, and infrastructure, are more readily available in most theaters. They are also more difficult to target, and can be used in combination.⁷⁷

In order to deploy in this way, the Army intends to rely on a strategic mobility triad comprising sealift, airlift, and prepositioned stocks, which is viewed as “critical to protecting and sustaining US forces in distant anti-access and aerial [sic] denial environments.”⁷⁸

Setting the lift issue aside for the moment, the Army concept of operations states that to “win quickly and decisively” in an A2/AD environment, an effective US ground force deployment will be characterized by some or all of the following actions, which will see the Service doing the following:

- Take immediate steps to strengthen and prolong the resistance of indigenous forces;
- Attempt to deter aggression through repositioning of prepositioned equipment, and redeployment of forward-stationed air, ground, maritime, and amphibious forces;
- Secure key homeland and regional deployment facilities from sabotage and disruption; and
- Conduct entry operations through multiple points of entry with combat-configured forces able to fight immediately upon arrival.⁷⁹

Army war games have come to similar conclusions as to what is required for ground forces to succeed against an A2/AD threat. The Army’s spring 2001 transformation war game also found the following:

- “An assured access campaign plan for joint and coalition forces is required to enable force protection, entry, shaping, and decisive operations.
- The ability to bypass major ports and airfields is critical for entry in an anti-access environment.

⁷⁷ TRADOC, *US Army Objective Force*, p. 15.

⁷⁸ Shinseki and White, *Army Roadmap*, p. B-4. The Army’s *Objective Force* document states that “Deployment transformation counters our adversaries’ strategies of anti-access and AD [area denial]. The successful transformation of air and sealift platforms, pre-positioning, deployment organizations, training, processes, and infrastructure has enabled the Objective [Future] Force to meet our deployment objectives.” Department of the Army (DA), *Objective Force Final Draft*, p. 32. The conclusions of the Army’s major transformation war games “consistently bear out the critical importance of strategic and intra-theater lift enablers for deployment, operational maneuver, and sustainment of the joint Objective Force.” DA, *Army Transformation Wargame 2001, April 22–27, 2001* (Carlisle Barracks, PA: undated), pp. 13–14. Hereafter cited as “DA, *Army Wargame 2001*.”

⁷⁹ TRADOC, *Objective Force*, pp. 17–18.

- The use of shallow-draft high-speed ships is required for entry into multiple austere locations.
- Joint force protection measures (such as theater air and missile defense and nuclear, biological, and chemical defense) are key enablers for opening the theater.
- Assured access is enduring throughout the campaign requiring Future Force capabilities.⁸⁰

However, it is unclear how these objectives are to be attained. For example, will the resistance of indigenous forces be prolonged by US long-range precision-strikes informed by early inserted Army Special Operations Forces (SOF)?⁸¹ Or by efforts to build up their forces in peacetime through foreign military assistance? Or by some other means? Of course, the ultimate question is, How much time does this buy relative to the enemy's ability to achieve his objectives? Similarly, the issue of how the Army intends to secure deployment facilities abroad is left unaddressed. Nor is the substantial cost incurred in procuring additional sets of SBCT and UA equipment to create prepositioned stocks addressed.

Take another example. In one transformation war game, the Red (Enemy) Team operated in accordance with A2/AD principles. It used the threat of WMD to deter direct US involvement.⁸² It possessed A2/AD capabilities and employed the full range of options for reducing its forces' vulnerability to US precision strikes, to include distributed operations and defending aggressively in complex (i.e., urban) terrain. But the report on the war game does not explain how the enemy's A2/AD defenses were overcome. One of its insights, however, was that accomplishing this mission "demands a capability to enter with combined arms combat formations that do not require Air Points of Departure (APODs) and Sea Points of Departure (SPODs) for entry and that can go directly into action on arrival."⁸³ As will be discussed presently, however, while the Army has correctly diagnosed the challenge to its power-projection forces, it is not likely to have the capability to deploy significant forces rapidly to a threatened theater of operations, absent APODs and SPODs.

Defeating enemy anti-access efforts also requires—

...establishing robust air and missile defenses and security forces able to protect both indigenous forces and US and allied entry points, lodgments and critical facilities; gaining control of air, land, and sea approaches to

⁸⁰ DA, *Army Wargame 2001*, p. 13.

⁸¹ Of course, as Wass de Czege and Sinnreich point out, "...surrogate forces may not always be available, and even when they are, there are no guarantees that their campaign objective and ours will coincide." *Conceptual Foundations of a Transformed US Army*, p. 7.

⁸² DA, *Army Wargame 2001*, p. 6.

⁸³ *Ibid.*, p. 12.

the theater; and dismantling the reconnaissance, surveillance and special operations networks supporting his anti-access efforts.⁸⁴

Here the Army makes some very important assumptions concerning how successful its sister Services might be in an A2/AD environment, and how quickly they might achieve success. But there is little support for these assumptions. Take missile and air defenses as an example. How quickly will they be provided, and by whom? How will they deploy rapidly in the face of A2/AD defenses? Take another example: that of gaining control of the littoral waters in the face of the enemy's area-denial forces. At present, the Navy's concept for littoral warfare seems to call for maritime forces to take a rather deliberate approach to clearing the littorals, working their way in gradually against a potential array of enemy mines, submarines, anti-ship cruise missiles, and other area-denial forces. This approach could seriously compromise the rapid deployment timelines needed to sustain the Army's operational concept, to say nothing of the need for rapidly deploying forces to be resupplied within a week. While the Army's desire to see the best in its sister Services is laudable, it must also recognize, as one former Army chief of staff has noted, that "Hope is not a method."⁸⁵

The Army also assumes the "destruction of the enemy's capabilities for long-range precision engagement," rightly acknowledging enemy ballistic and cruise missile forces as perhaps the key strike element in the enemy's A2/AD arsenal.⁸⁶ To accomplish this mission, the Army notes that "As future wargames have consistently demonstrated, long-range precision engagement is particularly important to overcome anti-access measures and shape the battlespace to support entry operations by landpower."⁸⁷ But while games may demonstrate that long-range precision strike offers the best potential means for dealing with anti-access forces, the US military's ability to target and destroy these critical, mobile forces over extended ranges is, again, much more of a hope than it is a reality.⁸⁸

In summary, when it comes to gaining entry against an A2/AD force, the Army appears to be counting heavily both on its sister Services and on major leaps in technology (i.e., highly effective missile defenses; destruction of critical mobile targets at extended ranges) for its concept of operations to remain viable. Given the risks involved, however, it would seem prudent to hedge against these assumptions proving false or overly optimistic. Finally, as shown above, the Army's operational concept is rather opaque on some of its key aspects (e.g., enhancing the capabilities of indigenous forces).

⁸⁴ TRADOC, *Objective Force*, p. 22.

⁸⁵ The remark is attributed to General (Ret.) Gordon Sullivan. Gordon R. Sullivan, and Michael V. Harper, *Hope is Not a Method: What Business Leaders Can Learn from America's Army* (New York: Broadway Books, October 1997).

⁸⁶ TRADOC, *Objective Force*, p. 22.

⁸⁷ *Ibid.*, p. 23.

⁸⁸ See Andrew Krepinevich, Barry Watts, and Robert Work, *Meeting the Anti-Access and Area-Denial Challenge* (Washington, DC: CSBA, 2003) pp. 11–28.

Combat Operations

Assuming Army units can deploy rapidly into a threatened theater and arrive in good order, they can then undertake combat operations. The Army's transformation goal is not merely to deploy forces in an A2/AD environment, but to prevail decisively against an adversary anywhere along the entire conflict spectrum. As TRADOC declares,

Unlike previous designs, optimized for action against an echeloned enemy on open rolling terrain, the [Future Force] Unit of Action must fight and win across a wide range of conflict situations, from high to low ends of the operational spectrum, from Major Contingency Warfare to Stability and Support Operations. The terrain, weather and enemy will remain at the forefront of the challenging set of variables in the future operational environment.⁸⁹

To summarize, the Army has established three main transformation requirements as they pertain to the A2/AD problem: forces that can deploy rapidly; deploy at acceptable cost in an A2/AD threat environment; and accomplish their warfighting mission once they have deployed. In an effort to address the first two challenges, the Army is "lightening up" the force. At the same time, the Service intends for its Future Force units to be as lethal and survivable as today's far heavier Current Force, and far more flexible across a range of mission types. The SBCTs are clearly a transition force. Consequently, the initial focus of the following discussion will be on the Future Force.

The Future Force is very much a product of the information age, and its vision of "See first, know first, act first and finish decisively" speaks to a true revolution in land warfare. Simply stated, Future Force formations will not seek to close with and destroy the enemy, but rather conduct the decisive phase of the engagement at extended range. As the Army's White Paper on the Future Force notes,

Operations will be characterized by developing situations out of contact; maneuvering to positions of advantage; engaging enemy forces beyond the range of their weapons; destroying them with precision fires; and, as required, by tactical assault at times and places of our choosing. Commanders will accomplish this by maneuvering dispersed tactical formations of Future Combat Systems units linked by web-centric C4ISR capabilities for common situational dominance.⁹⁰

TRADOC notes the dramatic change in warfighting planned for the Future Force:

In the past, uncertainty about enemy and friendly conditions on the battlefield often dictated cautious movements to contact, expenditure of time and resources to develop the situation in contact, followed by the initiation of decisive action at times and places not necessarily of the

⁸⁹ TRADOC, *US Army Objective Force*, p. 17. The two basic force elements of the Objective Force are Units of Action, which correspond roughly to today's brigades, and Units of Employment, which are comparable to today's divisions.

⁹⁰ White Paper, *Objective Force*, p. 6.

commander's choosing Objective [Future] Force capabilities turn this pattern on its ear, permitting future commanders to develop the situation before making contact, maneuver to positions of advantage largely out of contact, and when ready, initiate decisive action with initiative, speed and agility.⁹¹

On this battlefield, Army “[g]round and air platforms will leverage the best combination of low observable, reduced electronic signature, ballistic protection, long-range acquisition, [and] early discrete targeting [capabilities], ...[to effect] target destruction each time we pull the trigger.”⁹² In addition to stealth and fighting from extended ranges, Army forces will exploit superior mobility and situational awareness to ensure their survivability, and depend far less on armor plating than in the past.

The Army plans to utilize both its superior information capabilities and its ability to strike at extended ranges not only to wage nonlinear operations (where extended-range reconnaissance elements and fires can be used to cover gaps), but also to fight principally outside the enemy's engagement envelope. This makes eminent sense. Picture two boxers. If the first boxer is blindfolded and the second has a reach advantage over him, the second boxer has no incentive to fight in the clinches (i.e., “close with the enemy”). He does, however, have great incentive to stand back and exploit his superior reach and information advantage. Only after his adversary is fatally weakened will the second boxer close in for the knockout punch. As Army leaders are wont to repeat, this is not a fair fight—but they are not seeking a fair fight.

Of course, this approach places heavy demands on forces that can “see first,” in Army parlance. Great emphasis is placed on developing the engagement at extended distances, to include identifying the location of enemy forces, relaying that information quickly, and then coordinating precision strikes at long range. To see first and to exploit that information, the Army concept requires a range of reconnaissance, surveillance and target acquisition (RSTA) capabilities, to include the following:

- Organic sensors that are robotic, multispectral, and disposable;
- Unmanned aerial vehicles (UAVs) and other forms of aerial reconnaissance (e.g., Comanche helicopters);
- Embedded C4ISR; and
- SOF and long-range surveillance detachments (LRSD) for extended-range reconnaissance.⁹³

The Army will need to tap into the RSTA assets of the other Services as well.

⁹¹ TRADOC, *US Army Objective Force*, pp. 50–51.

⁹² White Paper, *Objective Force*, p. 14.

⁹³ TRADOC, *US Army Objective Force*, p. 7.

Assuming the Army can field such capabilities, this “scouting” advantage will enable the Army’s “mobile strike” concept. One way to think about mobile strike is to conceive of Army formations that attack, yet never fire an organic weapon. “You have the linkages necessary so that you can direct precision munitions—[both] line-of-site and beyond-line-of-site—onto a target and not have to give away your position by firing a missile of your own.”⁹⁴ Again, this presents a picture of Army formations that use a combination of information and screening forces, combined with organic and (perhaps primarily) nonorganic precision fires to enable the decisive engagement to take place at extended ranges, where the enemy is both relatively blind and punchless. To some extent, this concept appears to have been realized in the Second Gulf War with Army Current Forces operating in conjunction with the surveillance and precision-strike capabilities of its sister Services, particularly the Air Force.⁹⁵ The challenge will be to accomplish this with joint forces that can deploy rapidly and operate effectively in an A2/AD environment, as opposed to the highly permissive environment US forces encountered in the Second Gulf War. Creating this capability, of course, is a key Future Force goal, and a formidable one.

A Retreat from the Vision?

This Army vision of a dramatic departure from the warfare regime characterized by the blitzkrieg form of air-land warfare to one dominated by extended-range elements has been tempered somewhat recently. A key TRADOC publication, for example, states that “The hallmarks of UA [Unit of Action] operations will be the significant ability to develop situations out of contact, come at the enemy in unexpected ways, use teaming with leader initiative, maneuver to positions of advantage with speed and agility, engage enemy forces beyond the range of their weapons, destroying them with enhanced fires, and assaulting at times and places of our choosing.”⁹⁶ Yet TRADOC appears to hedge its bet on its vision in declaring:

Through the conduct of multiple decisive tactical actions, executed at high tempo, UE [Unit of Employment] operations will lead quickly to the enemy’s operational disintegration and the successful achievement of campaign objectives. *Within this framework of decisive operations, the Army’s ability to close with and destroy enemy forces will remain critically important.*⁹⁷ [Emphasis in the original]

⁹⁴ Ann Roosevelt, “Army Ponders Its Future in Aviation,” *Defense Week* (January 14, 2002), p. 6.

⁹⁵ It is estimated that the Iraqi Army possessed roughly 800 tanks at the beginning of the Second Gulf War. It appears as though the vast majority of those tanks were rendered inoperable either because their crews abandoned them or because of coalition air strikes preceding the arrival of advancing US ground forces. Andrew F. Krepinevich, *Operation Iraqi Freedom: A First-Blush Assessment* (Washington, DC: CSBA, September 2003), p. 20.

⁹⁶ White Paper, *Objective Force*, p. 6; and TRADOC, *US Army Objective Force*, p. 11.

⁹⁷ TRADOC, *US Army Objective Force*, p. 8.

TRADOC goes on to restate the importance of the close battle, declaring that “The Army’s ability to dominate the tactical level of war—the short sword fight—is essential for Joint Force success,”⁹⁸ and—

The Unit of Employment employs Units of Action to achieve tactical decision. The Unit of Action integrates organic and supporting ISR, fires, and maneuver to *close with and destroy the enemy*.⁹⁹ [Author’s emphasis]

In this context, it appears that the decisive engagement occurs not at extended range, but at close quarters. Indeed, at one point, TRADOC appears to abandon the Army vision entirely and accord primacy to the close battle when it declares, “Ultimately, all Objective [Future] Force decisive operations are based on success in close combat: the ability of the Objective [Future] Force to seize and control key terrain and to close with and destroy enemy forces.”¹⁰⁰

What is the officer corps, charged with realizing the Army’s new warfighting concept, to make of this? One could interpret these statements by TRADOC as a way of restraining those who might place too much faith in extended-range engagements, seeing them as a panacea rather than a key—indeed, central—new capability. This certainly has historic precedent in its favor. The appearance of large armored formations on the battlefield more than threescore years ago enabled the rapid and deep penetration operations, along with a marked increase in the tempo of operations, that characterized the blitzkrieg form of warfare. Yet the need for close-range, combined arms combat remained. Similarly, while the Army’s new warfighting concept may place primary emphasis on extended-range engagements, the Service must maintain the capability to wage the close battle, since it cannot be certain how effective the new concept will be when executed, and because the enemy may position his forces where close combat is unavoidable (e.g., urban terrain). What is badly needed is some elaboration on this point. Absent clarity, TRADOC risks muddying the transformation waters when it needs to be focusing the talents of its soldiers toward making its vision of future operations a reality.

The Nonlinear Battlefield

Aside from an apparent emphasis on engagement at extended range, the Future Force also differs from Current Forces in its emphasis on nonlinear operations:

In contrast to the phased, attrition-based, linear operations of the past, this approach is focused on disrupting the integrity of the enemy’s battle

⁹⁸ White Paper, *Objective Force*, p. 6.

⁹⁹ TRADOC, *US Army Objective Force*, p. 12. “Tactical engagement will be characterized by development of the situation out of contact and the integration of standoff fires, skillful maneuver and close combat assault to achieve tactical decision simultaneously at multiple locations across the Joint Operations Area (JOA). Objective force tactical commands will direct the continuous integration of powerful sub-elements, moving along multiple, non-contiguous axes to objective areas, while engaging the adversary with organic, overmatching, and precise fires.” White Paper, *Objective Force*, pp., 7, 14.

¹⁰⁰ TRADOC, *Objective Force*, p. 33.

plan by exposing the entire enemy force to air/ground attack, rather than rolling his forces up sequentially. Non-contiguous operations will have a dramatic impact on the architecture of the battlefield and in the relationship between combat, combat support and combat service support formations. Superior situational understanding, based on advanced C4ISR capabilities embedded at all levels, enables ground commanders to operate non-linearly¹⁰¹

Hence, just as their deployment concepts must change to address changes in the threat, Army units will have to change their warfighting concepts to reflect the transition to a nonlinear battlefield. Consistent with its vision, the Army believes that “The widespread proliferation of . . . new technologies and advanced capabilities are [sic] clearly leading to a rapidly expanding, non-linear, multi-dimensional battlespace.”¹⁰² This leads to a provocative conclusion: “In many ways, therefore, the theater may resemble that of the Vietnam conflict more than that of the Korean or Persian Gulf Wars”¹⁰³ The shift toward nonlinear ground operations appears to be already under way, as evidenced by the effective use of Special Forces in both Afghanistan and in Iraq, and by the Army V Corps’ spearhead advance on Baghdad during the Second Gulf War.

FORCE STRUCTURE

How will Army units that deploy rapidly to threatened regions and conduct operations in ways dramatically different from all earlier armies be organized and structured? To accomplish the full spectrum of missions, today’s Army draws from nine combat formations: special operations forces (i.e., Special Forces groups and the Ranger Regiment), airborne, light infantry, the Stryker Brigades of the Stryker Force, heavy forces comprised of mechanized infantry, armor and armored cavalry, and air assault units (figure 1). (These units are listed in general sequence of their strategic responsiveness, from high to low.)¹⁰⁴ The Future Force’s UA is intended to cover the mission sets of all Current Force units, except the Special Forces, Ranger, and airborne forces.¹⁰⁵

Stryker Brigade Combat Teams

The Army plans to field six medium-weight brigades, or SBCTs. The first brigade has recently been certified as operational ready for deployment to Iraq.¹⁰⁶ The 2nd Infantry Division and 25th

¹⁰¹ Ibid., p. 13.

¹⁰² White Paper, *Objective Force*, p. 3.

¹⁰³ TRADOC, *Objective Force*, p. 39. This observation is echoed in Wass de Czege and Sinnreich, *Conceptual Foundations of a Transformed US Army*, p. 26.

¹⁰⁴ TRADOC, *US Army Objective Force*, p. 11.

¹⁰⁵ Ibid., p. 11.

¹⁰⁶ The Army’s first Stryker Brigade Combat Team completed its field certification exercise (CERTX) on May 27, 2003. The exercise was conducted at the Joint Readiness Training Center (JRTC) at Fort Polk, Louisiana. Scott Gourley, “Stryker Brigade Passes Latest Milestone,” *Jane’s Defence Weekly* (June 4, 2003).

Infantry Division are each providing one brigade for conversion to the SBCT structure. Under current plans, the next units to be converted to SBCTs will be the 172nd Infantry Brigade at Fort Wainwright, Alaska; another brigade of the 25th Infantry Division at Schofield Barracks in Hawaii; the 2nd Armored Cavalry Regiment at Fort Polk, Louisiana; and a brigade of the Army National Guard's 28th Infantry Division (Mechanized), headquartered in Harrisonburg, Pennsylvania.¹⁰⁷

Figure 1: The Objective Force—Active Component Planned to 2019

Light Forced Entry	Stryker Units	Units Earmarked for FCS in Increment 1	Modernized Counter Attack Force
7 Airborne & Air Assault Brigades	5 SBCTs (2008)	14 Brigades or Units of Action	7 Digitized Brigades
82 nd Airborne (3) 101 st Airborne (3) 173 rd Airborne (1)	Washington (1) Alaska (1) Hawaii (1) Louisiana (1) Germany (1)	1 st Armored (3) 1 st Infantry (3) 2 nd Infantry (2) 3 rd Infantry (3) 10 th Mountain (2) 25 Infantry (1)	1 st Cavalry (3) 4 th Infantry (3) 3 rd ACR (1)
Army Special Operations Forces			

Source: Larry Welch, *FCS Independent Assessment Panel Final Report* (Alexandria, VA: Institute for Defense Analyses, May 4, 2003), p. 11.

In December 2000, the Army selected the 19-ton, wheeled Light Armored Vehicle III, christened the “Stryker,” to serve as the SBCTs’ primary combat vehicle.¹⁰⁸ The Army intends to buy more than 2,000 Strykers. The Stryker program’s four principal requirements are that it must be transportable by a C-130; carry a nine-man infantry or engineer squad and a crew of two; have communications interoperability among the ten Stryker vehicle variants; and that its 105mm cannon be capable of destroying bunkers.¹⁰⁹

¹⁰⁷ Frank Tiboni, “Most New Armored Vehicles Exceed US Army’s Medium-Weight Needs,” *Defense News* (March 4-10, 2002); and Neil Baumgardner, “Army Unfunded Requirements List Includes \$2.4 Billion for Force Modernization,” *Defense Daily* (March 14, 2002), p. 4. At this time, the Army has been given authority to field the first four SBCTs. DoD News Release 044-03, “Fiscal 2004 Department of Defense Budget Release,” February 3, 2003. The final two SBCTs are expected to look substantially different from the initial four, reflecting the Army’s progress toward creating Objective Force units and the SBCT’s role as a bridge to the Objective Force. Despite their clear orientation as units of the Expeditionary Army, two of these brigades may join the Frontier Army. The Bush Administration’s QDR calls for one SBCT to be forward deployed in Germany. The Army may also deploy an SBCT to South Korea to replace one of the 2nd Infantry Division’s two existing brigades as early as 2007. Sohn Suj-joo, “USFK To Deploy New Brigade in 2007,” *Korea Times* (March 13, 2002).

¹⁰⁸ Department of the Army, *Army Modernization Plan 2003* (Washington, DC: Department of the Army, February 2003), p. D-24.

¹⁰⁹ Tiboni, “Armored Vehicles,” and Glenn W. Goodman, Jr., “Futuristic Army Vision,” *Armed Forces Journal* (May 2001), pp. 26–34.

The Stryker comes into two basic vehicle types: a mobile gun system and an infantry carrier. The infantry carrier vehicle has eight configurations, including command, reconnaissance, and nuclear/chemical/biological detection vehicles. The first SBCT, however contains three substitute vehicles, as the mobile gun system, the support systems for the nuclear, biological and chemical (NBC) reconnaissance vehicle, and the fire support vehicle are not ready for deployment. In fact, the Army does not expect to field an SBCT comprising all Stryker vehicle configurations until 2005.¹¹⁰

Concerns have been expressed that, while the wheeled Stryker can travel at speeds up to 60 mph on highways, it lacks the off-road mobility of tracked vehicles, and thus risks getting bogged down in mud and in rugged terrain.¹¹¹ Moreover, despite their relatively light weight for armored combat vehicles, there are doubts that the Strykers can be readily transportable on C-130 aircraft.

The SBCTs will comprise more than Strykers. They are structured as combined arms units, and as such will incorporate line-of-sight anti-tank (LOSAT) missiles;¹¹² tactical unmanned aerial vehicles (TUAVs); a range of digitized communications equipment; high-mobility artillery rocket systems (HIMARS) armed with brilliant anti-tank (BAT) and other smart munitions; lightweight 155mm howitzers; and smart mortar rounds.¹¹³

Reflecting the Army's intention to rely more on indigenous ISR assets to enhance its operational effectiveness, and on UAVs as a major source of that information, Hunter UAVs have been employed by SBCT units at Fort Lewis, Washington. In addition to operating the system with units at Fort Lewis, the Army deployed Hunters in the Balkans, where they have proved to be a valuable intelligence and reconnaissance asset to US forces. The Hunter is also operated at the Joint Readiness Training Center at Fort Polk, Louisiana.¹¹⁴ The Army also intends to employ the AAI Shadow-200 UAVs, which have flown more than 2,000 hours so far.¹¹⁵

¹¹⁰ The first Stryker Mobile Gun and NBC Recon Vehicles are scheduled for delivery in 2004. General Accounting Office, *Military Transformation* GAO-02-442, pp. 19–20; also see Neil Baumgardner, "GD Official: Stryker Mobile Gun System Testing on Track for LRIP Decision," *Defense Daily* (July 10, 2003); and Jack Kelly, "Army's New Wheeled Armored Vehicle Criticized," *Pittsburgh Post-Gazette* (March 20, 2002).

¹¹¹ Goodman, "Army Vision," p. 34.

¹¹² The Army is considering either canceling LOSAT or reducing the anticipated procurement level substantially. LOSAT is intended to deal with enemy bunkers as well as armor. The move may be a consequence of the Army's interest in the Compact Kinetic Energy Missile (CKEM), which is lighter, smaller and more lethal than the LOSAT. While CKEM is a more attractive alternative than the LOSAT, it is also far less mature in its development. Emily Tsu, "Army Discusses Termination of Line-of-Sight Anti-Tank System," *Inside the Army* (September 29, 2003), p. 1.

¹¹³ John G. Roos, "Tools of Transformation," *Armed Forces Journal* (October 2001), p. 60.

¹¹⁴ Marc Strass, "Army Seeks To Deploy New Hunter UAV Unit with XVIII Airborne Corps," *Defense Daily* (February 21, 2002), p. 3.

¹¹⁵ Robert Wall, "Iraq-Bound: Army Plans to Field a new UAV and Buy Additional Hunters, Shadow-200s," *Aviation Week & Space Technology* (September 22, 2003), p. 57. According to the SBCT fact sheet for the 3rd Brigade, 2nd Infantry Division, the SBCT going to Iraq has three Shadow UAVs in its Cavalry Squadron. However, other sources state that the SBCT will deploy with four UAVs. Sydney J. Freedberg Jr., "Army's Lightweight Stryker Brigade to Get Tested in Iraq," *National Journal* (October 10, 2003).

Several issues come to mind in considering the SBCTs' function as a bridge to the Army's Future Force. Of the first four brigades selected by the Army for conversion to SBCT configuration, three are light and one is medium.¹¹⁶ The only heavy brigade of the projected six SBCT brigades selected comes from the Reserve Component. The other SBCT brigade will be formed from the Army's 2nd Armored Cavalry Regiment, which is hardly a light unit, but neither is it among the Army's heaviest formations. In short, an Army that has declared it must become less a Frontier Army and more an Expeditionary Army will actually get heavier as it fields its six SBCTs, not lighter.

Second, in describing the SBCT, the Army states that its "two core qualities are high mobility . . . and its ability to achieve decisive action through dismounted Infantry assault."¹¹⁷ While the first quality conforms to the Army's concept for the Future Force, the second seems quite at odds with the TRADOC concept of a force that exploits its ability to "see first, understand first, act first, and finish decisively." Given the US military's overwhelming preponderance in air power, the Army's future warfighting vision, and the SBCT's role as a bridge to the Future Force, why would an SBCT close with the enemy through dismounted infantry assault, save as a last resort? There are also concerns over the SBCT's lack of organic air-defense support, especially if called upon to deploy quickly into an A2/AD threat environment.¹¹⁸

Finally, TRADOC's operational concept for the Future Force states that "Objective [Future] Forces must have the organic capability to conduct vertical envelopment and tactical air assault . . ."¹¹⁹ This capability seems consistent with the concept's emphasis on a nonlinear battlefield and highly mobile forces capable of executing rapid maneuver to achieve positional advantage. The Army today relies on the AH-64 Apache attack helicopters, UH-60 Blackhawk helicopters, OH-58D Kiowa Warrior Scout helicopters, and CH-47 Chinook heavy-lift helicopters to achieve this kind of mobility. There are, however, no organic air assault assets in the SBCTs. Given the SBCT deployment timelines and relative paucity of high-speed air and sealift assets, if these formations do not have organic aviation assets assigned to them, it is difficult to see how they will be provided early in a campaign.

A Bridge to the Future Force?

Overall, what can be said about the Stryker Brigades? Are they likely to perform up to the standards the Army has set for them? If they do, are they likely to be an effective part of the future Army? Based on early returns, it appears the units may come up short in terms of deployability, sustainability, lethality, and survivability. They may also experience problems in the area of mobility.

¹¹⁶ Roos, "Tools of Transformation," p. 56.

¹¹⁷ Department of the Army, Army Modernization Plan (Draft) (Washington, DC: Department of the Army, unpublished paper), p. 18.

¹¹⁸ Roos, "Tools of Transformation," p. 59.

¹¹⁹ TRADOC, *Objective Force*, p. 38.

The SBCT's deployability and sustainability will be discussed presently. Here the discussion focuses on lethality and survivability. With respect to lethality, the SBCTs will initially deploy without several of their variants responsible for providing much of the brigade's firepower.¹²⁰ Concerns have also been raised with respect to the Strykers' ability to withstand enemy fire.¹²¹ The vehicles are designed to withstand the impact of 14.5mm ammunition, but the Army continues to experience difficulty in meeting this requirement.¹²²

In light of their lack of armor protection, SBCTs are designed to exploit an advantage in information over their adversaries to gain a combat advantage—locating and engaging the enemy before he is aware of the Stryker forces' presence. To this end, the SBCTs have been structured to “see first, know first, and act first.”¹²³ Stryker units are capable of receiving feeds from satellites, airborne ISR assets, and even from intelligence centers based in the United States.¹²⁴ Moreover, scouts are embedded in every squad.

The SBCT's reconnaissance, surveillance, and target acquisition (RSTA) squadron, which will also be known as the cavalry squadron, is intended to provide the SBCTs with dominant battlespace awareness.¹²⁵ The SBCT's multisensor troop boasts unmanned aerial vehicles, electronic warfare assets, and radar and ground sensors. The squadron is linked electronically internally and with each of the other organizations within the brigade combat team. While these capabilities sound impressive, some have yet to be fielded. Nor is it clear how effective the

¹²⁰ “Stryker Test Shows Vehicles Can Be Transported by C-130 Airlifters,” *Inside the Army* (April 28, 2003), p. 1.

¹²¹ TRADOC Analysis Center, *Final Report for the Army Transformation Experiment 2002 (ATEx02)* (Fort Leavenworth, KS: US Army Training and Doctrine Command, April 2003), p. 2-C-1. TRADOC's evaluation of the Stryker concluded:

To achieve strategic mobility (C-130 transport capable), the IAV armor is limited to protection from enemy small arms and machine gun fire, artillery shrapnel and, in some cases, hand-held anti-armor rockets (such as the RPG-7). In Millennium Challenge 2002, Stryker Interim Armored Vehicle (IAV) losses occurred when the Stryker unit maneuvered into direct fire range of previously undisclosed enemy anti-armor systems.

¹²² The Army has had to conduct a new series of live-fire tests of the Stryker's armor plate after discovering that the vehicles were being fitted with armor plating that had not been approved. Each Stryker is fitted with 132 ceramic tiles, all of which must withstand up to a 14.5mm round. Rowan Scarborough, “US Questions Stryker Armor by German Firm,” *Washington Times* (September 8, 2003), p. 1.

¹²³ This observation was confirmed in Millennium Challenge 2002, following which TRADOC concluded that “‘movement to contact’ operations are extremely dangerous for a Stryker-equipped unit; success or failure of Stryker operations hinge on superior situational understanding, and supporting assets to gain and act upon this situational understanding.” TRADOC Analysis Center, *Final Report for the Army Transformation Experiment 2002 (ATEx02)* (Fort Leavenworth, KS: US Army Training and Doctrine Command, April 2003), p. 2-C-1.

¹²⁴ Ray Rivera, “Stryker Team Still Weeks Away,” *Seattle Times* (April 4, 2003).

¹²⁵ Dubik, *The Army's “Twofer,”* p. 10. Dubik, who led the Stryker development effort, states that the RSTA squadron “is an entirely new organization; nothing like it now exists.”

RSTA squadron will be against irregular forces or in urban terrain, where enemy forces are likely to know the ground better than the Army units trying to deal with them, or in stability operations, where the enemy typically seeks to mix with the civilian population. This is not to say that technical RSTA means are not worth having; rather, they may not be the most important thing to have.

In peacekeeping and stability operations, human intelligence (HUMINT) is often the key to success. For the SBCTs, which rely on information as a key to their overall effectiveness, this could pose problems, as HUMINT has not been a US military strong suit. Because they mix with the indigenous population, enemy forces would be more likely to avoid detection and find it easier to get within engagement range of the Strykers than conventional enemy ground forces. When stability operations must be conducted in an urban environment, as in Iraq, keeping irregular enemy forces at a distance can be even more difficult. Compounding the problem, the Strykers also were not designed to deal with attacks by rocket-propelled grenades (RPGs) of the type that have been plaguing US occupation forces in Iraq. The Army is attempting to remedy this defect by fitting the Strykers with slat armor, which is made of ballistic steel and fits around the perimeter of the vehicle in a cage-like manner, providing 360-degree protection. The armor, however, weighs some two-and-a-half tons (or roughly 5,000 pounds).¹²⁶ Thus configured, the Stryker's ability to be transported on C-130 aircraft becomes problematic.¹²⁷

Because they have wheels and not tracks, Strykers may suffer from other vulnerabilities. For example, while the Strykers are capable of moving at high speeds (as much as 60 mph) on roads, their cross-country capability has yet to be thoroughly tested. Consequently, mobility outside of urban environments may pose problems. The Army has had to order large number of tires to replace those damaged on its wheeled vehicles operating in Iraq. Cost considerations aside, if Stryker vehicles find it difficult to operate cross-country, their effectiveness may be significantly reduced. Should Strykers gravitate toward road nets, irregular forces will make it a point to avoid them—and to mine them.

If the SBCTs encounter problems at the lower end of the conflict spectrum as part of the Constabulary Army, what can be said about their ability to perform at the higher end? Although the SBCTs are designed to deploy rapidly as part of an Expeditionary Army to counter aggression, the Service seems to have mixed feelings about the ability of Stryker units to operate effectively against conventional enemy forces. For example, TRADOC states that the SBCT “is

¹²⁶ Ann Roosevelt, “General Dynamics to Provide Stryker Vehicles with RPG Protection,” *Defense Daily* (September 8, 2003), p. 5. General Dynamics, which manufactures the Stryker, is also working on reactive armor for the Stryker vehicles. Other reports peg the additional weight at 4.5 tons. See “US Army Planning Modifications for Stryker Vehicle Configurations,” *Aerospace Daily* (May 23, 2003).

¹²⁷ Of course, the slat armor could arrive on a different aircraft. However, this reduces the number of aircraft available to move SBCTs, exacerbating the deployment challenge. It also means that the Strykers will not arrive ready for combat, as desired by the Army.

optimized for smaller scale contingency (SSC). It is capable of winning decisively in major combat operations (MCO) *only with significant augmentation.*¹²⁸ [Author's emphasis]

The Army Modernization Plan says as much when it declares that SBCTs are “Designed and optimized primarily for employment in SSCs in complex and urban terrain, confronting low-end to mid-range threats that may combine both conventional and asymmetric qualities, the SBCT is also capable of fighting at the higher end of the spectrum with augmentation.”¹²⁹ According to a respected strategist, this means that under such circumstances, “[T]he [S]BCT will probably be the first brigade to deploy as part of a heavy division in order to consolidate and extend the security of air and sea ports of debarkation, thus facilitating the reception, staging, and onward integration of the remainder of the division.”¹³⁰

But if, as the Army says, the SBCTs are “designed and optimized” primarily for SSCs (i.e., peacekeeping and stability operations), why do they seem ill suited to urban operations, cross-country maneuvering, and close combat against irregular forces armed with RPGs and small arms? Why do they appear better structured to exploit technical RSTA systems to gain an information advantage when the true advantage is likely to come from HUMINT? And if the SBCTs are “optimized primarily for employment in SSCs in complex and urban terrain,” why is the Stryker vehicle itself “not designed to be leading with its chin through the cities?”¹³¹ If SBCTs cannot be deployed to deal with higher end threats without “significant augmentation,” how is this to be reconciled with the Army’s desire to field a force that can deploy quickly and stand up to an enemy pursuing aggression at the higher end of the conflict spectrum? Finally, if they are to be deployed in tandem with heavier forces, do SBCTs really need to be C-130 transportable when their sister brigades cannot be so deployed?

The Future Force

The Future Force is, at this point in time, more a concept than a reality. It is to comprise some 18 new ground and air systems all linked by an electronic network. The TRADOC operational concept states that its “...Unit of Action must fight and win across a wide range of conflict situations, from Major Contingency Warfare to Stability and Support Operations.” However, while “the Objective [Future] Force must be designed for success in any type of operation, ...[it is] optimized for major theater war.”¹³² This may seem a bit odd, given the Army’s growing concerns over asymmetric challenges such as homeland defense, urban warfare and stability

¹²⁸TRADOC, *US Army Objective Force*, p. 11.

¹²⁹ DA, *Army Modernization Plan 2003*, pp. 26–27. This conclusion was also borne out in Millennium Challenge 2002, which led TRADOC to conclude that “Additional Army aviation and artillery support is required to increase the lethality and survivability of the SBCT against a mechanized opponent.” TRADOC Analysis Center, *Final Report for the Army Transformation Experiment 2002 (ATEX02)*, p. 2-6-10.

¹³⁰ David Jablonsky, “Army Transformation: A Tale of Two Doctrines,” *Parameters* (Autumn 2001), pp. 43–62.

¹³¹ Eli Sanders, “A Nimble Vehicle Embodies the Army’s New Tactics,” *Boston Globe* (September 7, 2003).

¹³² TRADOC, *US Army Objective Force*, p. 17.

operations. Still, an argument can be made that conventional theater warfare is the Army's core power-projection operation, in which it must remain unchallenged. Having said that, given the new challenges that confront the Service, or that may confront it in the not-too-distant future, it would seem that Army should seek to create a more balanced set of capabilities.

Just as the Stryker Force is centered around SBCTs, the Future Force's focal point is the Unit of Action (UA), roughly analogous to today's Army brigade. Like the SBCT, the UA is designed to be "strategically responsive": rapidly deployable anywhere in the world in 96 hours after liftoff, while also "providing overmatching lethality with advanced survivability against any threat," and "able to transition rapidly between missions, tactical engagements and battles with minimal organizational adjustment."¹³³ Like the Stryker Brigade, a UA deploys with 3 to 7 days of supplies, and is designed to be C-130 deployable.¹³⁴

A basic Unit of Action is envisioned to comprise some 2,245 soldiers and 369 ground vehicles.¹³⁵ The Army is also counting on its Comanche helicopter, now in development, to be a "revolutionary cornerstone of the Objective [Future] Force and this networked C4ISR systems architecture."¹³⁶ This being said, the UA Brigade design is modular, and UAs will have the capability to command and control up to six maneuver battalions, including Combined Arms Maneuver Battalions and Non-Line of Sight Battalions.¹³⁷ Specifically, the UA is being designed to command and control up to three Future Combat System (FCS) combined arms battalions, one aviation detachment, one artillery battalion, and one forward support battalion, and to employ additional enabling forces from higher headquarters.¹³⁸

The Combined Arms Maneuver Battalion will fight the close battle as it "closes with the enemy by means of combined arms fire and maneuver and tactical assault to destroy the enemy, repel his assaults, or to seize terrain."¹³⁹ The Non-Line of Sight (NLOS) Battalion "coordinates and provides full spectrum Army and joint fires and effects in time, space, and purpose in support of

¹³³ Ibid., p. 6.

¹³⁴ Ibid., p. 6.

¹³⁵ The Army's objective is a manning range of 2,145 to 2,245 soldiers. At Full Operational Capability (FOC), estimated by FY 2014–2018, the UA brigade manning objective is 2,100 personnel. Thus, UA brigades will have substantially fewer troops than today's brigade combat teams. However, the Army believes that the UA's "revolutionary qualities" will yield a "significant increase in capabilities and operational effectiveness." TRADOC, *US Army Objective Force*, p. 28, and Sandra I. Erwin, "Army's Future Combat System Shakes Up Procurement Culture," *National Defense* (January 2003), p. 24.

¹³⁶ General Eric Shinseki, Speech, Dwight D. Eisenhower Luncheon, Association of the United States Army, Washington, DC (October 22, 2002).

¹³⁷ TRADOC, *US Army Objective Force*, pp. 12, 25.

¹³⁸ Ibid., p. 6. It is not clear how a UA with these characteristics could meet the Army's deployment time lines. Again, for example, SBCTs do not possess manned aviation assets—primarily, it seems, because of the difficulty in transporting them rapidly to a distant theater of operations.

¹³⁹ TRADOC, *US Army Objective Force*, p. 33.

the UA to enable the UA to conduct decisive operations.”¹⁴⁰ To conduct extended-range engagements, the NLOS Battalion will employ networked fires, to include HIMARS/MLRS, “missiles-in-a-box” (also known as “NetFires”), and joint fires available throughout the area of operation.¹⁴¹

At the next higher echelon of the Future Force are the Units of Employment (UEs), which command and control the UAs. The UEs are similar to today’s divisions and corps, and are “the basis of [a] combined arms air-ground task force,” focusing on battles, major operations, and decisive land campaigns.¹⁴² Thus, UEs are designed to “orchestrate continuous shaping operations with deception, information operations, extended-range precision fires and selected air-ground maneuver operation for tactical and operational-level effects.”¹⁴³ In contrast to the “phased, attrition-based, linear operations of the past,” Future Force operations will reflect the Army vision of a nonlinear battlefield in which superior situation awareness and extended-range fires expose “the entire enemy force to air/ground attack.”¹⁴⁴

As the Stryker is central to the SBCTs, the Future Combat System is at the heart of the Future Force. The family of combat vehicles comprising the FCS is intended to combine the capabilities of current howitzers, main battle tanks, and infantry fighting vehicles—exceeding their lethality and survivability while coming in at a weight not to exceed 20 tons, or slightly above that of the 19-ton Stryker.¹⁴⁵ As with the Stryker, however, it is unclear whether the FCS can meet these weight limitations. The FCS vehicle variants currently range between 18 and 22 tons.¹⁴⁶ Although the FCS is viewed as a critical component, the Future Force is envisioned as comprising a networked, combined-arms team of manned and unmanned ground and air systems.

¹⁴⁰ Ibid., p. 43.

¹⁴¹ TRADOC, *US Army Objective Force*, p. 43. The “missiles in a box” concept centers around a lightweight cargo container loaded with a variety of precision-guided weapons capable of engaging targets at extended ranges (i.e., dozens or even hundreds of kilometers away). The Army’s “NetFires” program, which is being pursued in conjunction with the Defense Advanced Projects Agency (DARPA), is designed to field a containerized launch unit that houses 15 vertically launched missiles. One anti-armor missile being developed would have a range of 40 kilometers. Another missile, the Loitering Attack Missile, would be capable of loitering for 30 minutes at 40 kilometers range, or of striking targets in excess of 200 kilometers through direct flight. The NetFires design calls for ten missile fire units to fit on a C-130, for a total of 150 missiles per aircraft. Andrew Koch, “DARPA Works on Missiles for Possible Use on FCS,” *Jane’s Defence Weekly* (September 20, 2000), p. 12; and Dr. Jane Alexander, Acting Director of the Defense Advanced Projects Agency, Testimony Before Subcommittee on Emerging Threats and Capabilities of the Senate Armed Services Committee (June 5, 2001), p. 16.

¹⁴² TRADOC, *US Army Objective Force*, p. 7; and DA, *Objective Force Final Draft*, p. 5.

¹⁴³ TRADOC, *US Army Objective Force*, p. 8.

¹⁴⁴ White Paper, *Objective Force*, p. 13.

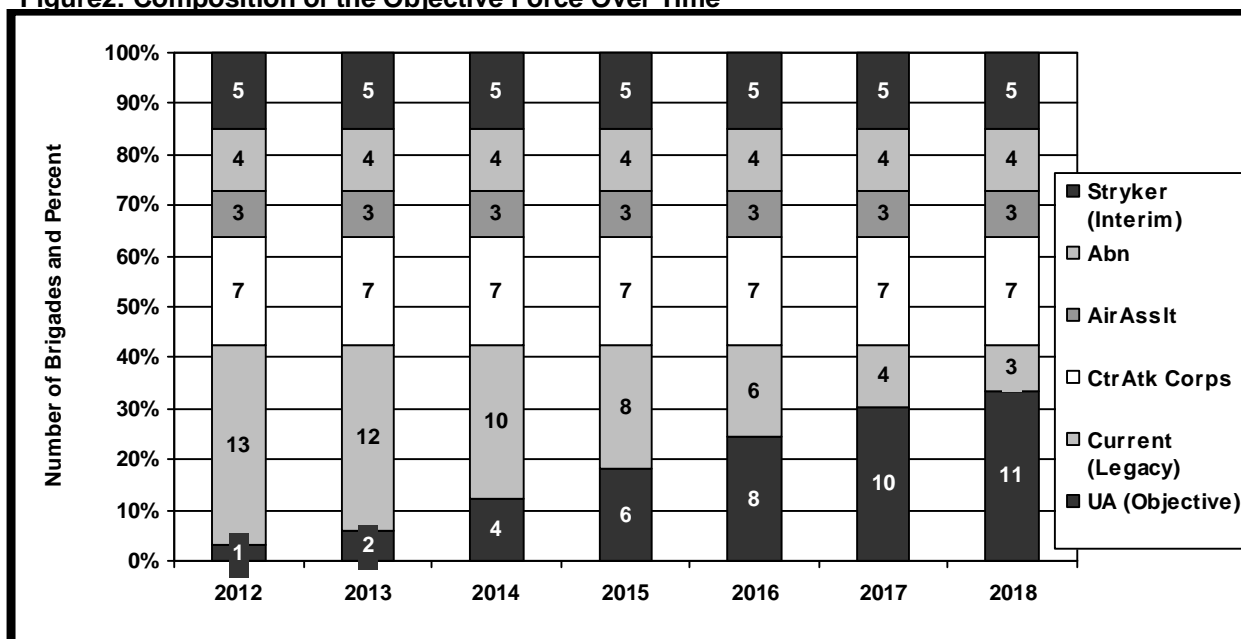
¹⁴⁵ David Jablonsky, “Army Transformation: A Tale of Two Doctrines,” p. 50.

¹⁴⁶ Matthew Cox, “Future Combat System Enters Development/Demonstration,” *ArmyTimes.com* (May 19, 2003). Some estimates put the heaviest FCS variants at 24 tons. “Army ‘Future Combat System’ Secures OK From Pentagon,” *Washington Times* (May 20, 2003), p. 4; and Vago Muradian, “US Army Chief: Rethink FCS,” *Defense News* (October 6, 2003), p. 1.

Once the FCS proves itself, it will be adopted by the Current and Stryker Forces, which will eventually merge into the Future Force.

The Army has been pursuing an extremely aggressive plan to bring the FCS program into the system development and demonstration phase in FY 2006, to begin production in FY 2008, and to field the FCS in FY 2010.¹⁴⁷ The rapid pace is driven by a sense among the Army leadership that, in the words of General Shinseki, “If we don’t have these systems fielded by the end of this decade, we begin to lose relevancy.”¹⁴⁸ However, owing to technical and funding constraints, the Army has recently delayed the fielding of the first Future Force units until 2012.¹⁴⁹

Figure2: Composition of the Objective Force Over Time



Source: Larry Welch, *FCS Independent Assessment Panel Final Report* (Alexandria, VA: Institute for Defense Analyses, May 4, 2003), p. 10.

The FCS’s development is driven by three principal performance metrics. Like the SBCT’s Stryker, it must be transportable in a C-130-type aircraft. Unlike the Stryker, the FCS must also be as survivable and as lethal as the Army’s 70-ton M1A2 Abrams main battle tank.¹⁵⁰ The FCS design has stimulated a major shift in Army thinking with respect to the conduct of operations, particularly the armor community it most directly affects. Mandating a 70 percent reduction in weight from the Abrams tank and a 50 percent reduction in internal volume (to under 20 tons and

¹⁴⁷ Roos, “Tools of Transformation,” p. 58.

¹⁴⁸ Goodman, “Army Vision,” p. 28.

¹⁴⁹ The Army has insisted that funding shortfalls alone drove the decision to delay fielding the first UA. Megan Scully, “Riggs: Affordability Driving Force Behind FCS Schedule,” *Inside the Army* (May 12, 2003), p. 1.

¹⁵⁰ Dr. A. Michael Andrews, “Army S&T and the Objective Force...Accelerating the Transformation,” Briefing (Washington, DC: AUSA Future Combat System Symposium, June 27, 2000), p. 7.

between 300 and 400 cubic feet, respectively) to accommodate C-130 cargo capacity limitations runs directly counter to the historical trends of ever-increasing size, weight, and volume in ground combat vehicles.

Projecting such a radical weight loss forced the Army to abandon its long-held belief that heavy armor is key to survivability, and moved it toward a network-centric view of combat. As Col. Ellis Golson, Director of Combat Development at the Army's Aviation Center in Fort Rucker, Alabama, stated, "A lighter force in the future, without a 70-ton tank will depend on information to survive."¹⁵¹ This view also seems consistent with the Army's concept of "see first, know first, act first" at extended ranges. But the FCS will also depend increasingly on vehicle mobility and active defenses for its survival.

While attractive conceptually, the FCS, like the Stryker, has its detractors. The FCS program faces major challenges with respect to its abilities to create a C4ISR network, field a range of robotic systems in a relatively short time, and provide Abrams-like survivability to a much lighter combat vehicle.¹⁵²

Relatively high risk also seems to characterize the Army's efforts to ensure that the Future Force's Future Combat Systems first-generation (Block I) direct-fire FCS variant, which is expected to defeat enemy main battle tanks, is as lethal as an Abrams tank. This variant is expected to be armed with hypervelocity LOSAT missiles. Although LOSAT promises to be highly effective, at 9 feet, 9 inches in length and a weight of 175 pounds, it is both too large and too heavy for the FCS.¹⁵³ The Army hopes that new propellants and materials will permit smaller caliber penetrators, and to be able to field a Compact Kinetic Energy Missile (CKEM) 4 feet in length and weighing 50 pounds.¹⁵⁴ However, as Dr. Kenneth J. Oscar, the Acting Assistant Secretary of the Army for Acquisition, Logistics and Technology, observed, barring an unexpected technological breakthrough, "there's probably going to come a point when it [the anti-tank round] doesn't go quite as fast, and it might not have the bulk needed to be overpowering, so you'll get less lethality."¹⁵⁵

The FCS's ability to "act first" with its anti-tank munitions is predicated on the Future Force's ability to "see first" and "understand first." As one senior Army officer put it, physics "does not allow us to make a lightweight vehicle as impenetrable as a heavy-weight vehicle." To achieve

¹⁵¹ Ann Roosevelt, "Army Ponders Its Future in Aviation," *Defense Week* (January 14, 2002), p. 6.

¹⁵² Goodman, "Army Vision" and "Army Considering International Involvement in Future Combat Systems," *Inside The Pentagon* (March 14, 2002), p. 3.

¹⁵³ Roos, "Tools of Transformation," p. 60.

¹⁵⁴ White Paper, *Objective Force*, p. 13. Again, the reader should recall that Army is considering either canceling LOSAT or reducing the anticipated procurement level substantially. Emily Tsu, "Army Discusses Termination of Line-of-Sight Anti-Tank System," *Inside the Army* (September 29, 2003), p. 1.

¹⁵⁵ Roos, "Tools of Transformation," p. 60.

survivability, “we have to use all sensors and the network, our mobility, [and] our active protection systems.”¹⁵⁶

In addition to the Future Combat System, the Future Force will rely on a number of key information systems and capabilities that are being developed in the SBCTs, including C4ISR architectures, unmanned aerial vehicles, robotic ground vehicles and a range of sensors. The Army’s operational concept involving highly distributed, yet highly networked Future Forces on a nonlinear battlefield poses an enormous technical challenge in terms of C4ISR requirements. As the TRADOC concept paper notes, “Traditionally, the major obstacles to such dispersed and autonomous maneuver have been loss of tactical control and mutual support, risk of fratricide, difficulty in synchronizing both organic and supporting fires, and the danger of enemy infiltration of the empty space among moving elements.” Hence, “Reliable, jam-resistant, high-bandwidth communications, easily digestible information displays, and advanced tactical decision aids clearly are vital.”¹⁵⁷

Although the Army anticipates fielding three major systems—the Joint Tactical Radio System (JTRS), the Warfighter Information Network-Tactical (WIN-T), and the Multiband Integrated Satellite Terminal (MIST)—it is still projected to be woefully short of the bandwidth required, even if it spends the billions of dollars it has projected on these systems for addressing the problem.¹⁵⁸ There are also difficulties with respect to the interface between the UE echelon and the rest of the Future Force.¹⁵⁹ Thus, while building mobile command and control technologies to augment the FCS ranks among the Army’s top priorities, it also remains one of its biggest challenges and, by extension, one of the riskiest aspects of its warfighting concept.

Similarly, the security of the US military’s space assets is a key concern of the Army. “For the Objective [Future] Force, long-range communications, missile [attack] warning, terrestrial and space weather information, positioning and navigation, intelligence, reconnaissance, and space

¹⁵⁶ Roxana Tiron, “Future Combat Systems Under Tight Scrutiny,” *National Defense* (September 2003), p. 29.

¹⁵⁷ TRADOC, *Objective Force*, p. 36.

¹⁵⁸ The Congressional Budget Office Study concludes that the shortfall will be greatest at the brigade (UA) level, where demand is as much as 30 times greater than the supply. Even more severe problems could be encountered over time at the division and corps level, according to the report. Buying additional equipment (e.g., WIN-T) is seen as too expensive. The WIN-T program estimates alone are between \$4 and \$9 billion. See “CBO: New Systems Won’t Solve Army’s Bandwidth Shortfall,” *Aerospace Daily* (September 3, 2003). It is worth noting that 80 percent of the satellite communications bandwidth used by the US military in Operation Iraqi Freedom was provided by commercial systems, contrasted with 30 percent during the First Gulf War. Yet it is far from clear that the commercial sector can accommodate substantial increases in demand over Gulf War II levels. Iridium satellites, for example, which were under contract to the Defense Department, are expected to reach the end of their service life late in this decade. However, owing to Iridium’s failure to attract a sizeable commercial market, it is encountering difficulties in convincing investors to launch a second generation of satellites. In the words of one senior US military leader dealing with the problem, the US military needs a “bandwidth appetite suppressant.” For the Army, this may take the form of developing ways to use its limited bandwidth more efficiently. Warren Ferster, “Military Bandwidth Demand Energizes Market,” *Space News* (August 25, 2003), p. 1; and Jason Bates, “US StratCom Chief Says Bandwidth Not Unlimited,” *Space News* (September 8, 2003), p. 21.

¹⁵⁹ “Objective Force and Future Combat Systems Independent Assessment Panel,” Briefing (May 2, 2003), p. 25.

and terrestrial surveillance increasingly rely on space assets to provide the rapid real time support required by a strategically responsive force.” However, the Army leadership cautions that “Future military operations can assume neither uninterrupted nor sole access to space products,” implying the need for alternatives to space-based support for the Future Force.¹⁶⁰ Thus the Future Force must be prepared to address several potential problems. One is the potential threat posed by enemies to satellite communications.¹⁶¹

Another, more likely, problem is that commercial bandwidth capacity may not keep pace with increased demand from the military. Finally, it is not clear that the US military will be able to field “alternatives to space-based support” should it prove insufficient to meet requirements. The consequences of failing to field alternatives to space-based systems could be critical to the Army’s transformation plans. According to General Paul Kern, head of the Army Materiel Command, Army logisticians will not be able to rely on terrestrial communications systems on future nonlinear battlefields. The limitations of these systems became evident in the rapid advance of Army ground forces in a nonlinear environment in the Second Gulf War, when line-of-sight communications systems proved incapable of handling the distances between units and the rapid pace of operations.¹⁶²

Unmanned aerial vehicles are intended to serve as a key element of the Future Force’s C4ISR architecture. The Army plans to exploit extensively the potential of UAVs to conduct beyond-line-of-site reconnaissance and surveillance. Four classes of UAVs are envisioned. Class 1 UAVs will be small, platoon-level air craft; Class 2 UAVs will be assigned to companies; Class 3 UAVs to battalions; and Class 4 UAVs will be brigade-level assets. Early estimates assign each Unit of Action 100 UAVs: 36 Class 1, 36 Class 2, 12 Class 3 and 16 Class 4.¹⁶³

At present, the Defense Advanced Research Projects Agency (DARPA) has two UAV research programs under way linked directly to the FCS.¹⁶⁴ One is the A-160 Hummingbird UAV, a rotorcraft with 30-foot-diameter rotor blades. The second is a much smaller UAV that would have a shorter range, but that could be launched off FCS vehicles. DARPA is also investigating even smaller UAVs, or Micro Air Vehicles (MAVs), one with a diameter of only 3 feet.¹⁶⁵ Recently the Army decided to proceed with the Fire Scout helicopter UAV program for use as a

¹⁶⁰ White Paper, *Objective Force*, pp. 16–17.

¹⁶¹ Donald Rumsfeld, *Report of the Commission to Assess United States National Security Space Management and Organization* (Washington, DC: January 2001), pp. viii and xii–xv.

¹⁶² Nick Jonson, “Army Must Overhaul Commo, Distribution Systems, Kern Says,” *Aerospace Daily* (September 9, 2003).

¹⁶³ Tiron, “Future Combat Systems Under Tight Scrutiny,” p. 29.

¹⁶⁴ DARPA is also working with the Army on the development of the FCS itself, as well as on Future Force capabilities such as robotic ground vehicles and remote missile pods.

¹⁶⁵ Goodman, “Army Vision.”

reconnaissance aircraft with the Future Force.¹⁶⁶ Finally, the Army envisions that by the end of this decade it will be able to control unmanned aerial vehicles from the cockpit of an aircraft. This could lead the way toward a combined Army aviation reconnaissance and strike fleet comprising both unmanned systems and helicopters.

A key element in the Future Force operational concept is the Army's Comanche helicopter. General Shinseki declared Comanche to be the "quarterback of whatever we see offensively in terms of deep-armed reconnaissance [and] armed escort for ground forces."¹⁶⁷ The Comanche is particularly important for the Future Force. According to LTG John Riggs, Director of the Future Task Force, the Army's current fleet of helicopters has neither the range nor the reaction time to keep up with the projected Future Force. General Jack Keane, then serving as the Army's Vice Chief of Staff, confirmed this when he declared that "Comanche is integral of the Objective [Future] Force of the Army, and we see it working hand in glove with the Future Combat System, our centerpiece ground component We don't have any plans to do anything else but that."¹⁶⁸

Unfortunately, despite the strong endorsement from Army leaders, the Comanche program has been restructured and delayed six times over the past 15 years.¹⁶⁹ The performance of Army Apache helicopters in the Second Gulf War raised more doubts over the potential value of the Comanche.¹⁷⁰ In October 2002, the Defense Acquisition Board cut the Comanche program by

¹⁶⁶ David A. Fulghum, "Fire Scout Joins the Army," *Aviation Week & Space Technology* (October 20, 2003), p. 66. The Army is also exploring the possibility of arming the Fire Scout.

¹⁶⁷ Ann Roosevelt, "Comanche Helicopter Still Top Army Program Despite Problems," *Defense Week* (March 4, 2002), p. 6.

¹⁶⁸ Frank Wolfe and Marc Strass, "Keane: Comanche Vital to Objective Force, Army Has No Plans for Alternatives," *Defense Daily* (July 25, 2002), p. 1.

¹⁶⁹ *Ibid.*

¹⁷⁰ The Army's 11th Aviation Regiment and its AH-64 Apache Longbow helicopters suffered significant damage by small arms fire and air defense artillery from the Iraqi Republican Guard's Medina Division on March 24, 2003. One Apache crash landed, and most others were damaged. Apache tactics were then revised from conducting independent deep-strike operations to operating with US Air Force strike aircraft. The Apaches were also employed in armed reconnaissance missions and close air support of ground forces. Kim Burger, "US Army Reviews the Way it Operates the Apache," *Jane's Defence Weekly* (May 21, 2003), p. 6. "Following the mission, at least 27 of the 34 Apaches were not fit to fly. The 11th Aviation Regiment was not combat ready....The crucial mistake appears to have been not including Air Force aircraft to provide air cover and neutralize enemy air defenses....The next time Army attack helicopters appeared on the battle field in significant numbers, they were accompanied by Air Force A-10 aircraft. The Apaches, from the 101st Airborne Division, drew fire from the Medina Division and pulled back, whereupon the A-10s began suppressing the division's air defenses. As that proceeded, the Apaches reentered the fray, destroying significant numbers of Iraqi armored vehicles." Rowan Scarborough, "Apache Operation a Lesson in Defeat," *Washington Times* (April 22, 2003), p. 1. Reflecting the difficulties encountered by the Apaches, LTG William Wallace, the V Corps commander, stated that Army attack aviation "performed a significant role during the fight, but I must admit it didn't perform the same role I had envisioned for [it]." Kim Burger, "US Army Reviews the Way it Operates the Apache," *Jane's Defence Weekly* (May 21, 2003) p. 6. See also Steve Liewer, "Tank-Killing Apache Copters Found New Task After Early Setbacks," *European Stars & Stripes* (May 27, 2003); and "Comanche—Critical Enabler for the Objective Force," *Association of the United States Army Institute of Land Warfare* (July 2002).

nearly half, from 1,213 to 650 helicopters.¹⁷¹ The latest restructuring delays the initial operational capability of the aircraft until 2009.¹⁷²

Problems are being encountered with UAVs as well, especially pertaining to the pace of technological maturity. For example, MG Joseph Yakovac, program executive officer for Army ground combat systems, noted that—

...the problem is that some of those [Future Force UAV] classes are not far enough [along] in technology. When you compare the UAV with the sensor, there is a mismatch right now. For example, I can provide a Class 2 UAV but when I marry it up with the sensor, the sensor package the user wants may be too heavy for that vehicle.¹⁷³

Recently, Army FCS and program officials have concluded that UAV technology is not sufficiently mature to proceed with some elements of the Future Force UAV program. At present, of the four UAV classes envisioned for the Future Force, only one development contract has been awarded.¹⁷⁴ The Service is, however, moving ahead with plans to equip current forces with hand-launched systems while pursuing the Shadow 200 and Hunter (RQ-5A) programs. As noted above, the sole Future Force UAV being advanced at this time is a version of the Fire Scout vertical takeoff and landing (VTOL) aircraft.¹⁷⁵

BEYOND THE OPEN BATTLE

Urban Operations

Army forces must not only deploy rapidly and sustain themselves in an A2/AD environment, they must also be able to accomplish a range of missions. Although the Army recognizes the need to conduct a wide range of operations, the Future Force is optimized for conventional theater warfare in general, and maneuver warfare in relatively open terrain in particular. The Army's contention that a single basic force element can be task organized to dominate across the full spectrum of conflict appears to court significant risk. For example, the challenge of urban control and eviction operations is likely to increase. These operations are likely to demand a significantly different force mix than one that is optimized for extended-range, nonlinear ground warfare in open terrain.

¹⁷¹ "Comanche Procurement Cut Threatens Objective Force Schedule, Army Official Says," *Aerospace Daily* (October 23, 2002).

¹⁷² The first Comanches will be fielded in 2009. Frank Wolfe and Marc Strass, "Keane: Comanche Vital to Objective Force, Army Has No Plans for Alternatives," *Defense Daily* (July 25, 2002), p. 1.

¹⁷³ Tiron, "Future Combat Systems Under Tight Scrutiny," p. 29.

¹⁷⁴ Nick Jonson, "Some Design Features of FCS to Be Decided in 2004-05," *Aerospace Daily* (October 8, 2003).

¹⁷⁵ Kim Burger, "US Army Adjusts Drone Plans," *Jane's Defence Weekly* (September 24, 2003).

Enemy forces would likely seek cover in urban terrain in order to avoid having to operate in the open, where they would find themselves at a severe disadvantage against US air power and Army forces optimized for open battle.¹⁷⁶ Urban conflict complicates matters for the Future Force, and it is far from clear that units organized, trained and equipped for optimal performance in open terrain will be optimal as well for operations in urban environments. Urban operations are not only extremely manpower intensive, but forces attempting to evict enemy forces from urban terrain historically suffer much higher casualty rates than forces operating in open terrain.¹⁷⁷ For these reasons, the Army—despite its concept of operations—may not want to put Future Force units into an urban meat grinder. Indeed, in several major Army transformation war games, while enemy commanders typically concentrate their forces in cities, the Army commanders have often relied on *allied* ground forces to conduct urban eviction operations.¹⁷⁸ It is not surprising, then, that a panel of experts concluded that “Urban operations may be [the] toughest scenario for [the] FCS” and the Army’s Future Force.¹⁷⁹

Making matters worse, two of the pillars of US military dominance—air superiority and systems-derived intelligence—are vastly degraded in urban terrain.¹⁸⁰ On the other hand, tactical HUMINT is often crucial to providing the extremely specialized intelligence necessary to operate on the urban battlefield (e.g., from the direction doors open in buildings, to the various utility portals in the sewer systems, to the disposition of enemy regular and irregular forces). Yet HUMINT has long been a weakness of the US military.

Moreover, the US military’s superiority in signals intelligence (SIGINT) may also be reduced in an urban environment, as adversaries can use nontraditional means to communicate (e.g., human runners). Similarly, the Army’s advantage in being able to draw upon the joint force’s imaging intelligence (IMINT) also counts for less in an urban setting, as enemy forces often operate inside buildings or in below-ground escarpments beyond the sensor reach of satellites and UAVs.

Air strikes and other forms of bombardment, even those employing precision munitions, also have greater limitations in an urban environment, where the enemy can take advantage of the opportunity to position his forces among the population, making them extremely hard to identify, let alone to destroy. Adversaries can also be expected to co-locate their forces in and around targets that may be difficult to strike for humanitarian or cultural reasons, such as hospitals and religious shrines, respectively. Army attack helicopters, with their increased loiter time and

¹⁷⁶ TRADOC, *US Army Objective Force*, p. 20. [Author’s emphasis]

¹⁷⁷ Army and Marine Corps estimates that urban operations require up to *nine times* the number of personnel than open terrain operations of a similar scope. General Accounting Office, *Military Capabilities*, p. 7.

¹⁷⁸ One war game set in the Persian Gulf region found German ground forces tasked with the urban eviction mission, while another game set in the Caucasus region saw the Turkish Army performing the mission.

¹⁷⁹ “Objective Force and Future Combat Systems Independent Assessment Panel,” Briefing (May 2, 2003). Among the panel’s membership are Gen. (Ret.) Larry Welch (Chair), ADM (Ret.) Dennis Blair, Gen. (Ret.) William Hartzog, Gen. Pete Schoomaker, and Gen. (Ret.) John Tilelli.

¹⁸⁰ Here “systems-derived intelligence” refers to intelligence provided by systems—such as satellites, UAVs, and reconnaissance aircraft—as opposed to human-derived intelligence, or HUMINT.

lower operating altitudes, may prove highly capable in such situations, although experiences in Somalia and in the Second Gulf War suggest such optimism may be unwarranted. Helicopters may be highly vulnerable to man-portable air defense systems (MANPADS), anti-aircraft fire, and massed small arms and rocket-propelled grenade (RPG) fire as well.¹⁸¹

Having said this, it is clear that the Army is attempting to structure and train its SBCTs with an eye toward the urban mission. For example, roughly half of SBCT collective training has dealt with urban operations. The base unit of employment for both the SBCT and the Future Force is a combined arms mechanized/motorized infantry unit—historically, the type of unit well structured for urban operations. The SBCTs also have substantial infantry, which often prove necessary for the house-to-house fighting so prevalent in urban operations.¹⁸² Furthermore, the Future Force system-of-systems envisions the integration of robotic ground and aerial vehicles (i.e., UAVs), which will provide both sensor and shooter capabilities to reduce the risk to personnel in the high-threat tactical situations that characterize urban operations.¹⁸³ These efforts, if successful, may lead to the proliferation of robotic vehicles, including very small, or micro, aerial vehicles (MAVs), so that almost every unit, down perhaps even to the squad or individual level, would have its own “eyes and ears.”¹⁸⁴ Moreover, recognizing the importance of snipers in urban combat, the Army has placed a sniper section in every company of the SBCT’s three infantry battalions and a sniper squad in the headquarters company.

Yet the use of robotics, light infantry, sniper teams, and reconnaissance units says nothing about the Stryker combat vehicles themselves. Despite their substantial cost, given their vulnerability to mines and RPGs, the Strykers may be of only marginal utility in urban eviction and control

¹⁸¹ United States Army, *Transformation Campaign Plan* (Washington, DC: HQ, Department of the Army, April 10, 2001), p. 3.

¹⁸² Huba Wass de Czege and Jacob Biever, “Maximizing the Army’s Competitive Edge: Close Combat Soldiers,” *Army Magazine* (July 2001), pp. 9–12. The authors note:

The Army must remember that its unique contribution to the fight is the assurance of decisive campaign results by closing with the enemy and assuming control of populations and territory The enemy will avoid open terrain, and will move to complex terrain and an urban environment—therefore, larger numbers of squads and vehicle crews will be necessary. We must maximize their numbers while reducing the amount of overhead as well.

¹⁸³ LTG Paul Kern, “Army Transformation,” Briefing (Washington, DC: Association of the US Army [AUSA] Conference, October 17, 2000, pp. 29, 37. According to the Defense Department’s Master Plan for Joint Urban Operations, among the capabilities being investigated for urban operations are: sensors and radars that see through walls; three-dimensional maps that feature an urban area’s subterranean features, as well as the interiors of buildings; UAVs and micro UAVs; systems that detect and neutralize mines and booby traps; exoskeletons; penetrating PGMs; and a range of nonlethal weapons, to include directed-energy weapons, chemical agents, soft projectiles, and sticky and slippery items. Sean D. Naylor, “Futuristic Force of Urban Warriors Would Take the Fight to the Streets,” *Army Times* (December 30, 2002), p. 13.

¹⁸⁴ Roxana Tiron, “Future Combat Systems Under Tight Scrutiny,” *National Defense* (September 2003), p. 29.

operations. As one Army officer put it, “This vehicle is not designed to be leading with its chin through the cities.”¹⁸⁵

In addition to providing Future Force soldiers with ground robots and UAVs, the Army plans to enhance the individual soldier’s equipment through the Objective Warrior program. The program is intended to enhance the individual soldier’s capabilities, particularly in the urban environment. Assuming its products can be provided in a rugged and lightweight form, Objective Warrior soldiers will benefit from increased situational awareness, lethality and survivability. The hope is that netted communications, collaborative situational understanding, and netted fires can produce a Future Force Warrior 20 times more capable than the 2004 Land Warrior.¹⁸⁶ Netted communications and netted fires are seen as the key to this dramatic increase in soldier effectiveness.¹⁸⁷ As a panel of experts concluded,

Emerging information technology provides the means to leverage the full range of combat multipliers inherent in the Future Combat System and those of joint service systems. A robust C4ISR architecture is the common thread that links the Objective [Future] Force Warrior to the fully netted communications and fires of the Objective [Future] Force and provides the essential situational awareness to greatly increase lethality and enhance survivability Extended range redundant communication and networked beyond line of sight fires will extend the Objective [Future] Force Warrior’s reach and influence over an exponentially expanded battle space. Improved organic and joint sensor-shooter linkages will reduce response time and expand the means and rapidity with which targets can be engaged with the massed effects of the entire force.¹⁸⁸

Other key Objective Warrior components are a robotic load carrier (or “mule”), advanced power sources, and integrated embedded training capabilities.¹⁸⁹ It is hoped that “as this capability for netted communications and netted fires is achieved, we [will] see fewer and fewer instances where the soldier actually has to ‘close with’ the enemy to defeat him.”¹⁹⁰ Unfortunately, the

¹⁸⁵ Eli Sanders, “A Nimble Vehicle Embodies Army’s New Tactics,” *Boston Globe* (September 7, 2003).

¹⁸⁶ National Security Directorate, “Objective Force Warrior: Another Look” (Oak Ridge, TN: Oak Ridge National Laboratory, December 2001), pp. 13, 26. The Land Warrior program comprises five subsystems: computer/radio, weapons, integrated helmet assembly, and protective clothing and individual equipment. The program has been delayed twice because of system interoperability problems. However, some Land Warrior mobile communications equipment is now being provided to soldiers in the field. This is the produce of the Army’s effort to field the mature technologies emerging from Land Warrior as soon as possible. Other Land Warrior equipment fielded with US soldiers in Iraq include the multifunctional laser—a range and direction-finding device mounted on a rifle—and handheld digital assistants and electronic data managers. They facilitate mission planning and situational awareness, in part through access to the Global Positioning System. Frank Tiboni, “Future is Now for Army Tech,” *Federal Computer Week* (October 13, 2003).

¹⁸⁷ “Objective Force Warrior: Another Look,” p. 4.

¹⁸⁸ *Ibid.*, p. 7.

¹⁸⁹ *Ibid.*, p. 13.

¹⁹⁰ *Ibid.*, p. 17.

Objective Warrior program has been delayed by a combination of technical and fiscal problems.¹⁹¹

Finally, despite its assertion that the homogenous SBCTs and Future Force will be sufficient to achieve dominance in land warfare across the spectrum of conflict, the Army's concept of operation acknowledges the unique requirements of urban operations. Specifically, it states that "wherever possible, urban clearing should be treated as an independent operational task, assigned to forces designated, prepared, and resourced specifically for the clearing mission under separate command and control."¹⁹² This implies units specially oriented, trained and equipped for urban operations.¹⁹³ It also seems clear that the Army should at least experiment extensively with such units. This issue will be explored further in the discussion of field exercises.

Homeland Defense and Stability Operations

The Army is clearly concerned over the growing threat to the US homeland and the demand for troops to conduct stability operations. In developing its concept of operations for the Future Force, TRADOC warns that, "To the familiar clash of conventional armies on the battlefield therefore must be added the even more difficult challenge of combat against nontraditional adversaries employing the tools of terror, and willing without hesitation to exploit the shelter of civilian populations to evade detection and destruction."¹⁹⁴

Little detail is provided, however, in either the Army's White Paper or TRADOC's discussion of Future Force operational concepts as to how the Army sees its role in the homeland defense mission or in stability operations, let alone how it plans to conduct operations to accomplish its portion of the mission.

To some extent, the Army might be excused for the stark brevity of its discussions on these missions. Efforts to raise the homeland defense mission prior to the 9/11 attacks generally aroused indifference on the part of government and outright hostility from civil liberties groups. Moreover, as noted above, the Bush Administration has yet to produce a comprehensive strategy

¹⁹¹ Erin Q. Winograd, "Army Scraps Plan to Field Objective Force Warrior with FCS Block I," *Inside the Army* (January 27, 2003), p. 1. The Army dropped its plans to field the advanced soldier system known as Objective Force Warrior with the first block of the Future Combat System in 2008, and is now pursuing a less ambitious variant. Early variants of the capability, known as Land Warrior Initial Capability and Land Warrior Stryker Interoperability, will be deployed with Army Ranger units in FY 2004 and Stryker brigades, respectively. In 2008 the Army now intends to field the "Land Warrior SI+."

¹⁹² TRADOC, *Objective Force*, p. 24.

¹⁹³ The Defense Department's draft document, *DOD Master Plan for Joint Urban Operations*, circulated in November 2002, specifically addressed the need issue when it called on force planners to "evaluate the concept of establishing one type of force that focused on urban combat and another type that focuses on the consolidation and transition phases." According to the draft plan, these forces might be quite different from those that operate on open terrain. Sean D. Naylor, "Futuristic Force of Urban Warriors Would Take Fight to the Streets," *Army Times* (December 20, 2002), p. 13.

¹⁹⁴ TRADOC, *Objective Force*, p. 8.

to inform the US military's response to the threat.¹⁹⁵ Some might say that, in the absence of such a strategy, any effort by Army to develop its own strategy would be presumptuous.

On the other hand, there is much the Army can do as part of its transformation efforts to develop capabilities to conduct effective homeland defense operations. It is clear, for example, that the Army believes it will have a role in such homeland defense missions as missile and air defense, the security of certain critical facilities (e.g., key embarkation points such as airports and seaports) and consequence management in the event of a WMD attack on a major urban area. Despite the Army's assertion that forms of conflict are merging in such a way as to support its approach to fielding one type of force—the Future Force—these missions seem to imply heavy reliance on particular kinds of forces, such as air and missile defense units; military police for port security; and medical, transportation, and WMD detection and decontamination units to address consequence management. (Interestingly, many of these units may also prove important in stability operations, implying a significant linkage between requirements for the Territorial Army and the Constabulary Army). Finally, until the Army addresses this issue and the “homeland defense tax” it will incur in organizing, training and equipping forces for this mission—which is the primary mission of all armies—it may prove difficult to make informed judgments regarding the pace and orientation of its other transformation initiatives.

Just as the Army has been generally discouraged from thinking about the Territorial Army and the homeland defense mission, so too has it found little support for planning large-scale, protracted Constabulary Army stability operations, such as it now confronts in the Balkans, Afghanistan and Iraq. This institutional amnesia can be traced back to the Vietnam era. The Army's—indeed, the nation's—experience in that conflict proved so traumatic that the United States resolved to avoid all future large-scale, protracted stability operations. “No More Vietnams” became the slogan of America's political elite. It was one the Army was only too ready to accept. Hence the Weinberger and Powell Doctrines of the 1980s, and the “exit” strategies of the 1990s, which called for the US military to be committed only under circumstances that permitted the application of overwhelming US force within a brief time span. However, following 9/11 the United States is unable to avoid protracted stability operations in failing or failed states that may harbor radical Islamic fundamentalists. With the Bush Administration relying more heavily on preempting perceived threats, such as that posed by Saddam Hussein's Iraq, large-scale stability operations may be required. Despite the benign neglect shown to stability operations over the past 30 years, the Army now finds it must become proficient in this form of warfare, and quickly. Unfortunately, although perhaps understandably, little thought along those lines appears to have gone into the design of either the Stryker or Future Force.

¹⁹⁵ Andrew F. Krepinevich, “Combating Terrorism: A Proliferation of Strategies,” Testimony, House Government Reform Committee, Subcommittee on National Security, Emerging Threats, and International Relations (March 3, 2003).

IV. KEY ENABLERS: LIFT, LOGISTICS AND THE RESERVES

STRATEGIC LIFT AND RAPID DEPLOYMENT

No other performance metric for either the Stryker Brigade Combat Teams or the Future Force Brigades has achieved the primacy of, or matched the attention given to, rapid deployment. As the Army's White Paper states, "At the operational warfighting level, Objective [Future] Force units as part of joint teams will conduct operational maneuver from strategic distances, creating diverse, manifold dilemmas for adversaries by arriving at multiple points of entry."¹⁹⁶ The White Paper goes on to declare that,

The Army goal is to deploy a brigade combat team anywhere in the world in 96 hours after liftoff, a division on the ground in 120 hours, and five divisions in theater in 30 days. *This will drive system and capability parameters.*¹⁹⁷ [Author's emphasis]

This metric seems appropriate given the diagnosis of the changing conflict environment presented earlier in this assessment. But it also suffers from a serious flaw. While a strong case can be made for a rapidly deployable Expeditionary Army, why a brigade in 96 hours? Or a division in 120 hours? Or five divisions in 30 days?¹⁹⁸

Some may argue that while these timelines may be arbitrary, they do move the Service away from its emphasis on the forward-deployed Frontier Army and in the direction of an Expeditionary Army. But as the Army is being forced to make very tough decisions at the expense of other design parameters—such as force lethality, mobility, survivability and sustainability—to meet these very ambitious timelines, the drawbacks to adopting somewhat arbitrary performance metrics may well exceed the benefits.

One only has to look at the design of the SBCTs to see the potentially pernicious effects of the force deployment performance metrics. To accommodate them, the SBCT's organic logistics support capabilities are quite lean. The brigades have no self-propelled artillery.¹⁹⁹ The SBCTs

¹⁹⁶ White Paper, *Objective Force*, p. 6.

¹⁹⁷ *Ibid.*, p. 9.

¹⁹⁸ Recall that the Army's rapid deployment timelines are driven to a significant extent by concerns that an aggressor may conduct a blitzkrieg-style campaign, seizing territory rapidly and then deploying A2/AD capabilities. Wass de Czege and Sinnreich argue that "Time therefore is critical to successful aggression, and the more nearly the latter can be conducted as a *coup de main*, the more likely it is to succeed, at least to the extent of confronting the United States and its allies with the requirement to reverse rather than thwart it." Wass de Czege and Sinnreich, *Conceptual Foundations of a Transformed US Army*, p. 11. Yet, even if one accepts this line of reasoning, it is not clear that the Army's requirement establishes the proper balance between rapid deployment and other key factors, such as sustainability, lethality and mobility.

¹⁹⁹ The SBCT relies on 60, 81, and 120mm mortars, JAVELIN and TOW II-B rockets, and M198 towed howitzers for the bulk of its organic fire support.

also lack organic air assets. This is somewhat perplexing, as the SBCTs are intended to serve as a bridge from the Current Force to the Future Force,²⁰⁰ which intends to rely heavily on the Comanche helicopter and intra-theater lift for its effectiveness. Again, given the prospect of a robust enemy cruise missile threat, the absence of organic air defense units within the SBCTs is disconcerting, and there is little discussion of air and missile defense forces in the Future Force operational concept. This could spell trouble for a force designed to dominate combat operations in an A2/AD environment (i.e., against an enemy employing large numbers of ballistic and cruise missiles).

STRATEGIC LIFT

Assuming the Army can configure its SBCTs and Future Force units for rapid deployment while meeting their combat effectiveness requirements, it also confronts issues with respect to both their ability to be deployed by strategic lift assets and the quantity of these assets that would likely be made available to support Army force deployments. Moreover, as the Future Force operational concept states, “For the Army, the first consideration argues for maximum early reliance on strategic mobility assets capable of delivering forces at *unimproved points of entry* over the shore or at *austere inland aerial ports* of debarkation.”²⁰¹ [Author’s emphasis] This adds the A2/AD element to the mix. The Army requires strategic lift that can avoid being targeted by enemy A2/AD forces (i.e., lift that can both avoid enemy air defenses, as well as debark without recourse to large ports and major air bases). This requirement is substantiated by the Army’s major transformation war games, which “consistently bear out the critical importance of strategic and intra-theater lift enablers for deployment, operational maneuver, and sustainment of the joint Objective [Future] Force.”²⁰²

Unfortunately, this combination of rapid deployment and the A2/AD threat places heavy demands on the military’s lift assets. The Army candidly notes that vessels—

...capable of delivering forces over the shore are in short supply and travel slowly. Strategic airlifters travel quickly but have limited ability to use unimproved fields, and the larger their size and weight, the fewer sorties any such unimproved arrival site will tolerate.²⁰³

As one senior Army official succinctly put it, “[T]here’s not enough lift, period . . . [and we] don’t think that’s going to change much in the future.”²⁰⁴ Army logisticians are even more blunt in their assessment: “Despite significant improvements in US strategic mobility capabilities since

²⁰⁰ The Army modernization plan states: “Although SBCTs are an important bridge to the Objective [Future] Force, and will inform Objective Force design and doctrine, they do not possess Objective [Future] Force qualities.” Department of the Army, *Army Modernization Plan 2003*, p. 26.

²⁰¹ TRADOC, *Objective Force*, p. 42.

²⁰² DA, *Army Wargame 2001*, p. 4.

²⁰³ TRADOC, *Objective Force*, p. 42.

²⁰⁴ “C-130 Will Provide Airlift for FCS: No Role for Future Transport Rotorcraft,” *Aerospace Daily* (March 12, 2002).

Desert Storm, the Army Vision of moving one Brigade in 96 hours, one Division in 120 hours, and five Divisions in 30 days to a theater of operations remains out of reach.”²⁰⁵ Similarly, a recent RAND study sponsored by the Air Force concluded that a “force with more than 1,000 vehicles [i.e., an SBCT] cannot be deployed by air from CONUS to the far reaches of the globe in four days.”²⁰⁶ The US General Accounting Office (GAO) also reached the same conclusion, stating “[i]t is questionable whether the Army will be able to deploy its first brigades anywhere in the world in 96 hours.” GAO further noted that “[w]hile this is now only a goal for the IBCTs [Interim Brigade Combat Teams], it is a requirement for units entering the force after 2008.”²⁰⁷

In the process of exploring options, an Army study determined that deploying an SBCT to Kosovo’s Pristina airfield from McChord Air Force Base near Fort Lewis, Washington, would take 12.7 days using current airlift capabilities. *If* the Pristina airfield were improved to be capable of handling all-weather, round-the-clock operations, and *if* the throughput capacity of en route air bases were doubled, and *if* maximum use were made of commercial aircraft, the best deployment time that could be achieved was 7.5 days, almost twice the Army’s target deployment time length of 4 days.²⁰⁸

According to yet another study, this one by Boeing, which manufactures the C-17 cargo aircraft, deploying an SBCT over a substantial distance within 96 hours would require between 103 to 168 C-17s dedicated solely to this mission, assuming the aircraft were to fly at greater than normal mission completion success rates.²⁰⁹ Assuming the Boeing figures are correct,²¹⁰ it would

²⁰⁵ US Army Logistics Integration Agency, *Industry’s Role in Logistics Transformation: Final Report* (January 16, 2002), p. 8. Hereafter cited as “USA LIA, *Logistics Transformation*.”

²⁰⁶ Alan Vick, David Orletsky, Bruce Pirnie, and Seth Jones, *The Stryker Brigade Combat Team* (Santa Monica, CA: RAND, 2002), p. xvi. The study did note that, with some mobility enhancements, it is possible to achieve brigade deployment time lines on the order of one to two weeks. While impressive, this is far short of the Army’s deployment metrics that call for three brigades (or a full division) to be deployed within five days. The study finds that “Prepositioning of equipment or overseas basing of forces is the single most effective way to increase the responsiveness of US Army forces for operations in key regions.” Yet, prepositioning entire unit sets of equipment is likely to prove too costly, and perhaps too risky as well. Equipment prepositioned ashore may be vulnerable to attacks by anti-access forces. If such equipment were positioned afloat, the Army would likely want it on ships capable of avoiding traditional SPODs, adding still further to the cost of prepositioning.

²⁰⁷ General Accounting Office, *Military Transformation: Army Actions Needed to Enhance Formation of Future Interim Brigade Combat Teams* (Washington, DC: General Accounting Office, May 2002), p. 3. The term IBCT refers to Interim Brigade Combat Teams. The IBCTs were renamed Stryker Brigade Combat Teams when the brigades’ light armored vehicles were christened with the name Stryker, to honor two Army enlisted Medal of Honor winners. Hereafter cited as “GAO, *Military Transformation*.”

²⁰⁸ USA LIA, *Logistics Transformation*, p. 8. A key factor in determining airlift deployment time lines is the airfield maximum on ground (MOG) limit, a measure of airfield throughput. Although this term literally refers to the maximum number of aircraft that can be accommodated on the airfield (usually the parking MOG), it can also refer to the working MOG, or number of aircraft that can be serviced. When the working MOG limit is combined with the amount of time that each aircraft requires on the ground to complete necessary functions (e.g., load and unload, refuel, etc.), an airbase’s cargo throughput can be determined. Unfortunately, save for Japan, North America, and Western and Northern Europe, the capacity of ports and airfields is generally quite limited. John Gordon and David Orletsky, “Moving Rapidly to the Fight,” in Lynn E. Davis and Jeremy Shapiro, eds., *The Army and the New National Security Strategy* (Santa Monica, CA: RAND Arroyo Center, 2003), p. 195. See also Bowie, *The Anti-Access Threat and Theater Air Bases*.

²⁰⁹ Leonard Tavernetti, “Deploying a Brigade Combat Team,” Briefing, The Boeing Company (undated), p. 3.

be impossible for even the entire planned inventory of C-17s to deploy the remaining two SBCTs in the following day (to meet the goal of three SBCTs deployed in 120 hours). Nor does this analysis take into account the A2/AD threat to degrade forward operating air bases, or the fact that the nation's strategic lift assets are typically split to cover a number of high-priority missions.²¹¹ In summary, this analysis has led Army officials to conclude that "with all the competing demands for these aircraft, the Air Force currently does not possess sufficient numbers of them to meet the 96-hour goal for the [S]BCTs."²¹²

The C-130

Although the Army plans to rely on strategic airlift to move SBCTs and UAs over long distances, it anticipates using C-130 aircraft to deploy rapidly into an A2/AD environment.²¹³ Given its ability to land at fairly austere airfields, the C-130 has been adopted by the Army as its best bet for deploying forces rapidly in an A2/AD environment. The C-130 has been in the US military's inventory since 1956, although it has undergone a number of modifications over the years. To be sure, in choosing the C-130, the Army selected a system that is likely to be in service for many years to come. However, the number of C-130s that the Air Force will dedicate to Army missions "probably will not increase."²¹⁴ This is important, as an SBCT requires approximately 653 C-130s to deploy.²¹⁵ The Air Force has roughly 700 C-130s of various types, including tankers, most of which are in its Reserve components. Some 100 of them are dedicated to special operations.²¹⁶ Furthermore, the C-130 fleet's relatively small payload, short range,

²¹⁰ Army transportation planners have determined that it would take 201 C-17s and 51 C-5s to transport all of the SBCT's equipment to a distant theater. Again, the number of aircraft required depends on several factors, to include the distance between the points of embarkation and debarkation and airfield MOG limits. Thus, depending upon the assumptions made, both estimates could be correct.

²¹¹ RAND's analysis explored one favorable deployment scenario and still could not devise a movement option that would meet the Army's objective. The scenario involved a 15,000-ton Army brigade, located in Germany, deploying to Saudi Arabia. The scenario was favorable in that the distance between Germany and Saudi Arabia is far less than what "anywhere in the world" could mean. Saudi Arabia also boasts numerous APODs so MOG limits would pose fewer problems than in many less developed countries. The RAND analysis found that "this mission could be accomplished in four days (or 96 hours) by devoting about 80 C-17 equivalents to the deployment operation or about 40 percent of the strategic airlift fleet (C-5s, C-141s, and C-17s) projected for the middle of this decade." In Operation Desert Shield, the Army received roughly 35 percent of the transport aircraft that landed in Saudi Arabia in August 1990 and somewhat lower percentages in September and October 1990. Because the SBCT lacks some critical elements, such as helicopters and extensive logistical support, the joint force commander might elect to reduce the airlift to the SBCT in order to deploy these other capabilities. Gordon and Orletsky, "Moving Rapidly to the Fight," pp. 195–97.

²¹² GAO, *Military Transformation*, p. 23.

²¹³ "The Unit of Action will be C-130 deployable to support key capabilities described in the Objective [Future] Force operational concept that will improve UA characteristics of responsiveness, deployability, agility, and versatility." TRADOC, *US Army Objective Force*, p. 14.

²¹⁴ Joseph F. Cassidy, *C-130 Transportability of Army Vehicles* (Newport News, VA: Military Traffic Management Command, Transportation Engineering Agency, March 15, 2001), p. 6.

²¹⁵ TRADOC, *Final Report for the Army Transformation Experiment 2002*, pp. 4–7.

²¹⁶ Gordon and Orletsky, "Moving Rapidly to the Fight," p. 209.

slow speed, and limited air-refueling capability make it far less suitable than C-17s and C-5s for strategic deployments, but suitable for intra-theater airlift missions.²¹⁷

The Army seems to be contemplating deploying its forces to intermediate staging bases (ISBs) by employing strategic airlift assets, transloading these forces onto C-130 aircraft, and then inserting them into the threatened theater of operations. Assuming access to ISBs is not an issue (a big assumption indeed), there is still the matter of transloading SBCT/Future Force equipment from C-17 to C-130 aircraft, a process that will further delay the deployment of these forces.²¹⁸ Moreover, the C-130, like other US cargo aircraft, is not stealthy. This could pose severe problems for C-130s attempting to deploy units against an enemy possessing integrated air defenses.

The C-130 has a maximum range of 2,800 nautical miles (nm), which implies a maximum ingress and egress route from the intermediate staging base of approximately 1,400 miles. But it seems quite possible—indeed likely—that in the time frame addressed in this assessment, even a rogue state enemy could deploy ballistic missile systems with ranges that exceed 1,400 miles.²¹⁹ Thus, projecting power rapidly through ISBs may well prove untenable for purely military reasons, in addition to the problems associated with getting political access to such ISBs in the first place.

Of course, the C-130s will not fly empty; they must carry the Stryker payload. The aircraft's maximum payload is 45,000 pounds, or 22.5 tons. But a full payload reduces the C-130's combat range dramatically. Worse still, these figures do not take into account operational conditions or aircraft structural limitations. For example, once the cargo exceeds 36,500 pounds (18.25 tons), the aircraft must land with additional fuel in order to remain within its center-of-gravity limits. This further reduces aircraft range. If one assumes a Stryker weight of 19 tons, a C-130 can fly this payload *one way* up to 1,000 nm onto a 5,000-foot improved runway on a standard day, at sea level, with no correction for weather (e.g., wind, rain), runway slope, or other factors. If conditions are less than ideal, then the cargo-carrying capacity is reduced.²²⁰ As of April 2003, the Stryker infantry carrier variant weighed 39,940 pounds, or just 60 pounds shy of 20 tons. Moreover, the total load weight for seven of the eight Stryker variants exceeded the preferred 19-ton airlift weight, when their crews and supplies were included (figure 3).

²¹⁷ Ibid., p. 215.

²¹⁸ Of course, as recent US military operations in Afghanistan and Iraq have shown, gaining political access to ISBs may involve protracted negotiations, with no guarantee of success.

²¹⁹ North Korea already has in production a ballistic missile, the Taepo Dong 2 missile, with a range of 3,600 miles.

²²⁰ Cassidy, *C-130 Transportability*, p. 3.

Figure 3: Weight of Stryker Vehicle Variants

<u>Vehicle Type</u>	<u>Weight (lbs.)</u>	<u>Vehicle Type</u>	<u>Weight (lbs.)</u>
Recon Vehicle	38,350	Infantry Carrier	39,940
Command Vehicle	38,310	Engineer Squad Vehicle	39,500
Fire Support Vehicle	37,850	ATGM Vehicle	42,820
Medical Evacuation Vehicle	38,570	Mortar Carrier Vehicle	39,990

Source: “Stryker Test Shows Vehicle Can Be Transported by C-130 Airlifters,” *Inside the Army* (April 28, 2003).

In short, the 38,000-pound benchmark was set by the Army to enable a C-130 to travel 1,000 nautical miles under ideal conditions. As the weight exceeds 38,000 pounds, range drops dramatically. At 40,000 pounds, for example, the C-130’s range is reduced to 500 nautical miles under ideal conditions.²²¹

Landings on short, austere runways are possible, and may be quite desirable in Third World areas with austere basing structures or if large, well-developed bases are targeted by A2/AD forces. However, short runways also reduce cargo capacity, again for structural reasons. For example, conducting an assault landing could reduce the C-130’s payload to 36,500 pounds, or below the weight of either the Stryker or the anticipated weight of the FCS. If range is sacrificed to increase the C-130’s cargo capacity, then intermediate fuel stops are necessary. But this assumes the availability of secure airfields in an A2/AD environment. Of course, this would also lengthen deployment times.²²²

The situation does not look any better for the FCS, whose requirements allow the system to weigh roughly 40,000 pounds, or 2,000 pounds more than the Stryker.²²³ The heaviest Army C-

²²¹ The Army, which had set a 1,000 nm Stryker range requirement for C-130 transportability, has reduced its range requirements downward to 750 nm. “Stryker Test Shows Vehicle Can be Transported by C-130 Airlifters,” *Inside the Army* (April 28, 2003), p. 1. It is important to note that unless the C-130s can be refueled upon landing—a prospect that seems problematic given that they are deploying forces into an austere (and perhaps hostile) forward base area—the aircraft’s effective range would be reduced even more, as it would need to husband fuel to recover to its base of origin.

²²² Cassidy, *C-130 Transportability*, pp. 3–6. Even assuming tanker aircraft were made available to support C-130 operations, with the exception of some special mission aircraft, the C-130 does not have an aerial refueling capability. The C-130J was designed with the internal piping required to support aerial refueling, but there are no current plans to field such a capability, and the Army is apparently not strongly advocating this be done. This leads to another key issue: under these circumstances, will fuel be available for the C-130 when it arrives at its force insertion point?

²²³ The requirements of the FCS program are that its platforms weigh fewer than 20 tons, although some sources indicate a weight as high as 24 tons. Currently the Manned Ground Vehicle (MGV) is less than 30 tons and that

130 certified armored vehicle had been the M9 Armored Combat Earthmover (ACE), which, at 35,500 pounds, is certified for C-130 transport at 38,000 pounds.²²⁴ Recently, however, the Air Mobility Command has granted a permanent waiver to deploy the Infantry Combat Vehicle variant of the Stryker on C-130 aircraft, with a maximum of four crew members. (The vehicle normally carries nine troops, not including the crew of two.)²²⁵

Given these factors, the Military Traffic Management Command has concluded that,

If one considers maximum transportation flexibility to be of paramount importance, the maximum C-130 air transport weight of future vehicles should be in the 29,000-32,000 pound range. These weights ideally would include the crew, ¾-tank of fuel, and full ammunition, armor, and equipment. If the vehicle's mission allows the aircraft to be refueled at the payload's destination, then the maximum C-130 assault landing air transport weight could be as high as 36,500 pounds.²²⁶

Advanced Airlift and Sealift

Advanced Airlift

The difficulties in meeting the Army's deployment goals with the projected airlift fleet leads one to the ineluctable conclusion reached in a recent Army large-scale transformation war game:

Advanced sealift and airlift capability investments are required now. These include: shallow-draft high-speed ship (vital future capability), advanced theater transport, and joint transport rotorcraft.²²⁷

According to the Army's logistics community, accomplishing this will require substantial investments over and above those that are currently projected.²²⁸

Setting the matter of funding aside for the moment, the Army has found that a number of strategic lift technologies show promise. One option being explored involves lighter-than-air ultra large airlifters (ULA). These airships have very large cargo capacities.²²⁹ According to the

weight is expected to come down, with the employment of different system packages in armor and structure. Neil Baumgardner, "Army Converging on Approaches, Tackling Weight for FCS Manned Vehicles," *Defense Daily International* (May 16, 2003).

²²⁴ Cassidy, *C-130 Transportability*, p. 7.

²²⁵ Andrea Shalal-Esa, "Arm Sees No Challenge to Stryker Combat Vehicle," *Reuters.com* (August 27, 2002); and Roxana Tiron, "Stryker Not Up to Speed in Some Areas, Soldiers Claim," *National Defense* (October 2002).

²²⁶ *Ibid.*, p. 13. The Army is reportedly examining whether Strykers can be at least partially made out of titanium to save on weight, and whether it is cost-effective to do so. Kerry Gilda, "Aldridge Reports Stryker Weight Potential Problem for Deployability," *Defense Daily* (April 3, 2003).

²²⁷ DA, *Army Wargame*, p. 12.

²²⁸ USA LIA, *Logistics Transformation*, p. 8.

²²⁹ For example, the Advanced Technologies Group's SkyCat 1000 could carry more than 700 short tons of cargo, vice 61 short tons for a C-5 cargo aircraft, the largest in the US air fleet.

Army, they are “no more vulnerable than any other high value transportation asset” to anti-aircraft fires, and their failure modes are more benign than aircraft, as they tend to settle to ground rather than crash.²³⁰ They are capable of landing on water or on large flat areas ashore. However, there are other issues relating to vulnerability, such as the ULA’s radar signature, that need to be explored before the Army can be sanguine about its ability to operate in an A2/AD environment.²³¹

Ultra-large airlifters might help solve some of the Army’s demand for large lift volumes. However, ULAs move significantly slower than cargo aircraft, although they do move more quickly than ocean-going ships. Hence, their ability to support the rapid deployment of Expeditionary Army forces would appear to be quite limited. In any event, a substantial investment is required to support full development of the ULA, and the cost of infrastructure is relatively high. For example, ULAs require very large hangars. While there may be a commercial market for such craft, it is not clear it will mature along the timelines required to sustain the Army’s vision of force transformation. At present, however, the Army appears content to monitor the commercial sector’s progress on ULAs rather than commit to the kind of funding necessary to accelerate their development.²³²

As for intra-theater lift, the Army’s 2001 and 2002 transformation war games concluded that these assets are “essential enablers” for the Future Force, for both maneuver and sustainment.²³³ However, the Army has concluded that “none of the [current] airlift platforms are suitable for air sustainment” of the Future Force, “nor can they support rapid shift of maneuver forces and sustainment across the breadth and depth of the battlespace.”²³⁴ Rather, “larger capacity Super Sort Take Off and Landing (SSTOL) and/or Heavy Lift Vertical Take Off and Landing (HLVTOL) platforms are required in substantial quantities.”²³⁵ Unfortunately, the Army has found that it “cannot develop, procure and field such systems due to both budgetary and regulatory constraints.”²³⁶

At one time, the Army’s Future Transport Rotorcraft (FTR) program (itself a descendent of the Joint Transport Rotorcraft, or JTR) was intended to provide the Future Force with intra-theater lift capability. Until 2002, the system was scheduled for program definition and risk reduction

²³⁰ USA LIA, *Logistics Transformation*, p. 10.

²³¹ For example, nonstealthy, high-value transportation assets may prove quite vulnerable should US forces encounter an enemy with an integrated air defense system.

²³² The Army, and more broadly the Department of Defense, is encouraging the commercial sector to explore ULAs as a viable middle ground between cargo ships and airfreight. Rick Barnard, “Speed, Huge Payloads are Attractive but Experts Remain Wary of Uncertain Costs,” *Sea Power* (July 2003).

²³³ DA, *Army Wargame 2001*, p. 14; and DA, *Army Wargame 2002*, pp. 14–15, 18.

²³⁴ DA, *Army Modernization Plan 2003*, p. D-20.

²³⁵ *Ibid.*, pp. D-20, D-21.

²³⁶ *Ibid.*, p. D-21. The regulatory constraints refer to the fact that the Air Force, and not the Army, is responsible for providing the Army’s strategic and fixed-wing intra-theater lift.

during FYs 2008–2011, followed by engineering and manufacturing development (EMD) from 2012 to 2017, and then production.²³⁷ In the spring of 2002, the Army announced it would not fund the development of a heavy-lift FTR to address FCS requirements. Instead, the Service chose to rely on C-130 cargo aircraft for the mission. The Army has left open the possibility that it may resurrect the program at some future date.²³⁸

Recently, however, the Army has tried to resurrect its efforts to provide vertical lift for Future Force units through the Air Maneuver Transport (AMT), a successor to the JTR that could employ tilt-rotor, tilt-wing and rotorcraft technologies. The AMT is projected to carry up to 20 tons and be capable of flying 310 miles round trip.²³⁹ Given the Service’s funding woes and the teething problems associated with tilt-rotor and related technologies, the Army seems likely to continue relying on the C-130s for much, if not most of its intra-theater lift. This may pose additional problems if the FCS is unable to accommodate the aircraft’s weight limitations, which have proven difficult for the Stryker to meet.

Advanced Sealift

Rapidly deployable Expeditionary Army units may deploy by air, and airlift assets may provide some initial sustainment. However, in any significant ground force operation, the great majority of Army units and most of their supplies will almost certainly arrive by sea. Hence the Army’s keen interest in advanced, fast sealift. Today, most modern fast military cargo ships can each carry well over 20,000 tons, while the Air Force’s *entire fleet* of C-17s and C-5s can carry a maximum of roughly 23,000 tons, and then only under ideal conditions.²⁴⁰

While sealift capacity dwarfs airlift capacity, US sealift assets are not without their drawbacks. To state the obvious, sealift ships move at only a small fraction of a cargo aircraft’s speed, a critical shortcoming given the Army’s rapid deployment metrics. Moreover, the Large Medium-Speed Roll-on/Roll-Off (LMSR) ships and the Fast Sealift Ships (FSS) in the US Military Sealift Command are so large that many Third World ports are too small to handle them.²⁴¹ And even if they could, enemy A2/AD forces would likely have them well targeted.

²³⁷ “C-130 Will Provide Airlift for FCS; No Role for Future Transport Rotorcraft,” *Aerospace Daily* (March 12, 2002).

²³⁸ Jefferson Morris, “Army Funding for New Heavy-Lift Helo Will Remain Scarce, Official Says,” *Aerospace Daily* (January 9, 2003).

²³⁹ Frank Tiboni, “US Airlift Programs Advance,” *Defense News* (May 12, 2003), p. 32. At present the Army is finding it difficult to fund the AMT. Neil Baumgardner, “Army Struggling to Find Funding for Air Maneuver Transport,” *Defense Daily* (October 31, 2002), p. 3.

²⁴⁰ Ideal conditions include employment of all aircraft, and all aircraft carrying their maximum load. Typically, however, 10 to 15 percent of these aircraft are undergoing maintenance and upgrades, and are not available to support deployment operations. In addition, as noted above, cargo aircraft rarely carry their maximum load.

²⁴¹ Gordon and Orletsky, “Moving Rapidly to the Fight,” p. 206.

There are two broad areas of interest with respect to high-speed sealift. One is focused on developing an ocean-going vessel capable of carrying tonnage similar to today's LMSR vessels, but at speeds between 40 and 90 knots. However, the High Speed Sealift Steering Group, chaired by the US Transportation Command (TRANSCOM), estimates the technology required to produce such a craft is "at least 10 years away" and would cost well over a billion dollars to develop.²⁴² This is time and money the Army does not have, given current requirements and funding levels.

A potentially more promising approach centers on commercial off-the-shelf technology and involves the Theater Support Vessels (TSV). Both the Marine Corps and the Navy have experimented with such a high-speed vessel—a leased, commercially designed Australian catamaran, which has been christened the *WestPac Express*. The *WestPac Express* displaces 10,054 tons and is 331 feet long. Its cargo capacity is the equivalent of roughly nine C-17 aircraft. It can carry 417 tons of equipment and 970 passengers. It can travel at speeds approaching 50 mph for 48 hours (or some 2,400 miles) before refueling. Following a "proof of concept" charter period, the craft has been leased for three years.²⁴³

The Navy has conducted experiments with a high-speed catamaran it calls the *Joint Venture* (HSV-X1). The twin-hulled ship, also made in Australia, was originally designed as a car ferry. In 2002, following Navy experiments with the vessel, the Army deployed the *Joint Venture* to the Persian Gulf to support the war on terrorism.²⁴⁴ More recently, the Army deployed the *Joint Venture* to the Persian Gulf in support of Operation Iraqi Freedom. The Army is also experimenting with another high-speed vessel, the *Spearhead*. In addition to its speed of 40 knots when fully loaded, the *Spearhead* can move 1,250 short tons up to 4,700 nautical miles. Importantly, the *Spearhead* is a shallow draft vessel, which enables it to unload its cargo at multiple points along the littoral.²⁴⁵ These are important characteristics for supply craft operating in an anti-access environment. Of course, as noted earlier in this study, TSVs like the *Spearhead* may still be highly vulnerable to an adversary with area-denial capabilities. Finally, while the TSV's potential is significant, it is unclear how many TSVs the Army will be able to procure, or when they will become available.²⁴⁶

Army studies exploring the potential of using these Australian-designed commercial high-speed catamarans (HSCs) as TSVs are encouraging. One such study concluded that it would take 12.71

²⁴² USA LIA, *Logistics Transformation*, p. 10.

²⁴³ "Sealift in the Fast Lane," *Jane's Defence Weekly* (October 8, 2003).

²⁴⁴ Emily, Hsu, "Army Deploys Ship to Test Transport Capabilities, Aid War Efforts," *Inside the Army* (April 15, 2002).

²⁴⁵ Sheila R. Ronis, "Army Will Deploy Faster with Theater Support Vessels," *National Defense* (October 2003).

²⁴⁶ The Navy has recently chartered another high-speed vessel, the *Swift* (HSV-2) as an interim replacement for a mine countermeasures ship. The Army has also awarded a contract for another theater support vessel, to be named *Arrowhead* (TSV-SBCT), to be leased for up to a year. "Sealift in the Fast Lane," *Jane's Defence Weekly* (October 8, 2003).

days to move an SBCT from Langley Air Force Base in Virginia to an APOD at Tirana-Rinas, Albania, using C-17 aircraft. However, if the brigade were airlifted to an APOD at Sigonella, Sicily, and then transshipped by 12 TSVs to an SPOD at Durres, Albania, the SBCT deployment could be accomplished in 10.1 days.²⁴⁷ While even several dozen of these vessels would still not enable the Army to meet its deployment metrics, the potential demonstrated by these ships to speed deployments is undeniable.

In the final analysis, it remains unclear how large airlifters and high-speed sealift craft would fare in an A2/AD environment, given that they are not anticipated to be stealthy, yet are still required to deploy early in a conflict. Nor is it clear how either ULAs or fast sealift would resolve the challenge of rapid SBCT or Future Force deployment. As Army studies show, even with these assets it remains difficult to deploy one brigade in 4 days, let alone three brigades in 5 days, or fifteen brigades (i.e., five divisions) in 30 days. Recall also that these formations are projected to arrive with only 3 days of supplies. Hence, the demand for lift to sustain these forces is likely to be substantial.

Beyond the Current Deployment Metrics

It is easy to sympathize with the dilemma of fielding a more capable and robust Expeditionary Army that can deploy rapidly in an A2/AD threat environment, but that can also maintain the most desirable characteristics of the heavy, forward-deployed mechanized Army forces that characterized the Cold War era. Unfortunately, the Army's current approach may yield the worst of both worlds—a force that cannot be deployed as quickly as required, but that has fatally sacrificed other design parameters (e.g., lethality, survivability, sustainability) at the altar of rapid deployability.²⁴⁸

On the other hand, the Army is creating a force that, at first blush, appears to be capable of deploying along much shorter timelines than the Current Force. Given the US military's overwhelming advantage in military capability against most conventional adversaries, it may be

²⁴⁷ USA LIA, *Logistics Transformation*, p. 10. The Service estimates that it would take 12 TSVs to deploy a single SBCT. DA, *Army Wargame 2002*, p. 14.

²⁴⁸ It is worth citing the findings of a recent RAND report on deployment issues:

A 20-ton C-130-sized vehicle may be the right choice for deploying to operations in countries where the infrastructure is less developed and air and ground threat environment is limited. It is questionable, however, in the near to midterm, whether medium-weight vehicles could provide the full range of combat capability currently provided by heavily protected and armed vehicles. Seeking a complete transformation of all future units to medium-weight combat vehicles on the basis of enhancing strategic responsiveness is not justified. A mix of heavy and light vehicles would provide greater flexibility allowing the future Army to most effectively tailor force packages to the crisis situation. The utility, suitability, and feasibility of potential operational concepts under various conditions and threat environments should be demonstrated before specific weight and size limits are imposed on future combat vehicles.

Gordon and Orletsky, "Moving Rapidly to the Fight," p. 215.

appropriate to trade lethality and survivability for speed of deployment. Perhaps the proper question is whether the Army is striking the right balance in accepting reduced combat capability in exchange for an enhanced expeditionary capability.

How can the Army get answers to these questions? What is needed is a means for reducing the uncertainty surrounding the prospective effectiveness of the Stryker Force and the Future Force. This may be best accomplished through a series of joint field exercises, or in the course of ongoing military operations. Unfortunately, the US military has no joint high-fidelity training centers comparable to the facilities built by the individual Services. Current operations, focused overwhelmingly on stability operations, present a different set of problems than force deployment and operations against a conventional adversary in an A2/AD threat environment. As will be discussed, the Army, through TRADOC, is exploring ways to improve its ability to conduct field exercises to provide better insights as to the ultimate configuration of the SBCTs and the Future Force.

LOGISTICS

It is an old truism among military professionals that “amateurs talk strategy, while professionals talk logistics.” The Army clearly recognizes the importance of logistics in its concept of operations. As Wass de Czege and Sinnreich note, “Simply as a matter of force protection, continuity of sustainment may be even more important than deployment momentum.”²⁴⁹ Moreover, they make a persuasive case that an Expeditionary Army deploying in an A2/AD environment and waging nonlinear warfare will have to rethink traditional methods of deploying and protecting its sustainment elements:

Future operational maneuver clearly implies discontinuous logistical operations. Maintaining secure ground lines of communications to committed tactical formations often will not be practical. Instead, organizational design and operational planning must provide for cyclic logistical replenishment and reconstitution. In turn, that will require that tactical formations be designed from the outset with enough subordinate units to rotate them regularly into and out of action without diminishing engagement tempo and intensity. The sustainment system itself will have to support across greater distances²⁵⁰

The Army appears to agree, concluding that it must “aggressively reduce its logistics footprint and replenishment demand,” both to support its objective to speed force deployment and because, at a minimum, in an A2/AD environment its ability to rely on major ports and air bases early in a conflict will likely be highly problematic.²⁵¹ However, while the goal of substantial reductions in logistics footprint and replenishment demand is certainly congruent with Army force deployment and operational goals, it is difficult to see how this goal will be realized, for several reasons.

²⁴⁹ Wass de Czege and Sinnreich, *Conceptual Foundations of a Transformed US Army*, p. 29.

²⁵⁰ *Ibid.*, p. 25.

²⁵¹ White Paper, *Objective Force*, p. 14.

First, as noted in the Army White Paper and by TRADOC, while Stryker brigades and UAs will deploy capable of conducting independent operations for 3 to 7 days, the Army's combat support and service support organizations—

...historically have been far heavier consumers of strategic and theater transport than its combat formations. Moreover, the more widely future combat operations are dispersed, the more heavily they will need to rely on both direct aerial and ground resupply of smaller units to accelerate replenishment, [and] avoid vulnerable lines of communication while retaining operational momentum.²⁵²

Yet as noted above, aerial resupply is likely to prove difficult, given that the Army is unlikely to have new intra-theater lift aircraft at any time in the foreseeable future, let alone stealthy airlifters that can operate with high effectiveness on a nonlinear battlefield in an A2/AD environment.

Furthermore, “the need to resupply widely separated small units and assure rapid casualty treatment and evacuation will require greater tactical unit self-sufficiency and a more responsive and adaptable sustainment system.”²⁵³ The Army's sustainment system will have to support units across greater distances while also being capable of refocusing “the sustainment effort smoothly and rapidly form one discontinuous line of operations to another.”²⁵⁴

Given these requirements, the shortage of airlift, and the need to resupply SBCTs and UAs within 3 to 7 days after their arrival, there are concerns over resupply efforts.²⁵⁵ It may be that a major reduction in support requirements will have to occur in Army Combat Support (CS) and Combat Service Support (CSS) formations, so as to focus sustainment efforts on the maneuver brigades. But it is not clear how such major reductions in support levels can be effected in Army CS units providing air defense, missile defense and aviation support. Reductions in CSS seem equally problematic given that such formations will be supporting more widely dispersed maneuver formations than is currently the case. This is especially true since direct aerial resupply of such units is not consistent with the Army's modernization plan, which has backed away from its early support of the Future Transport Rotorcraft.²⁵⁶

²⁵² Ibid., p. 17; and TRADOC, *Objective Force*, p. 25.

²⁵³ TRADOC, *Objective Force*, p. 36.

²⁵⁴ Ibid., p. 37.

²⁵⁵ The period prior to replenishment may be extended if the operating tempo is reduced. The Army Objective Force White Paper states: “Units will organically sustain themselves for three days of high tempo operations without replenishment from external sources in continuous combat in mid-to-high intensity conflict or be self-sustainable for up to seven days in low-end conflict and peacetime military engagement.” White Paper, *Objective Force*, p. 15.

²⁵⁶ The Army is engaged in an effort to increase the ratio of combat arms soldiers to support troops in its Stryker brigades to 6:1 from the current ratio of 2.5:1. “Army Leadership Gives Green Light to Logistics Transformation Plan,” *Inside the Army*, (September 9, 2002), p. 1. The results, thus far, have not been encouraging. As a GAO study noted, “Fort Lewis [where the SBCTs are stationed] has had to assume an increased maintenance workload because the IBCT [i.e., SBCT] was designed with fewer maintenance personnel in order to deploy quickly.” To facilitate their rapid deployment, the SBCTs have been limited to an austere support battalion that contains fewer mechanics to support and maintain its vehicles. However, even though the number of mechanics has been reduced by two

Second, the high operational tempo under which Future Force units are intended to operate will require more frequent rotations of maneuver formations than are currently practiced. Echoing Wass de Czege and Sinnreich, the TRADOC operational concept paper notes:

[D]ispersed, autonomous tactical maneuver increases the physical and psychological demands on soldiers and small unit leaders. Lacking the inherent robustness provided by mass, Objective [Future] Force tactical operations instead must provide for the routine cycling of units into and out of action. ...This requires that tactical formations be designed with enough subordinate units to rotate them into and out of action without diminishing engagement tempo and intensity.²⁵⁷

While the implications of the “routine cycling” of Future Force Units for logistical support are unclear, they could be significant if the Army plans on employing a greater number of Future Force units (which are also operating at a higher rate of intensity) than would be the case if Current Forces were employed, to be able to rotate them frequently into and out of action. Such rotations seem plausible, as the concept of operations posits maneuver formations performing at very high operational tempo rates on historically short campaign timelines (i.e., conducting “rapid decisive operations”).

There is also the matter of communications. As the Army discovered during the nonlinear ground operations in the Second Gulf War, logistics unit communications were inadequate for matching and delivering needed supplies to units that were constantly on the move. As one Army general put it, the logistics units were “trying to chase moving targets.”²⁵⁸ The limitations on terrestrial communications in such an operational environment are substantial; line-of-sight communications systems simply could not keep pace with the US combat maneuver units’ rate of advance or their spatial distribution.²⁵⁹ It is not clear how the Army will resolve this challenge to its vision of future warfare.

Finally, and perhaps most important, are the consequences of nonlinear warfare on logistics support. As the recent Army transformation wargame report concluded, “The increasing distances between noncontiguous units in an expanding battlespace necessitate improved

thirds, the number of vehicles to support remains the same. GAO, *Military Transformation*, p. 3. One way to assess the risk associated with the logistical dimension of the Army’s efforts to meet the A2/AD challenge through transformation is to examine the Service’s SBCTs, which are rough surrogates for the Objective Force in terms of their deployment and sustainment metrics. With respect to sustainment, the SBCTs, like the Objective Force units, are designed to carry limited supplies and after 72 hours to “reach” for needed logistical support. TRADOC, *US Army Objective Force*, p. 29. Under the Army’s transformation concept of “reach” logistics, deployed Stryker Brigades are expected to receive logistics support through an integrated distribution system by a linked communications network that will include a foreign country’s commercial systems. However, to date the Army has not yet determined how this approach will enable SBCT replenishment. GAO, *Military Transformation*, pp. 3, 28.

²⁵⁷ TRADOC, *Objective Force*, pp. 36–37.

²⁵⁸ Kim Burger, “Iraq Campaign Raises New Logistics Concerns,” *Jane’s Defence Weekly* (September 10, 2003).

²⁵⁹ Nick Jonson, “Army Must Overhaul Common, Distribution Systems, Kern Says,” *Aerospace Daily* (September 9, 2003).

methods for protecting and securing sustainment forces.”²⁶⁰ This view is reflected in the Service’s concept of operations, which cautions that in a nonlinear conflict environment—

...rearward positioning will offer no guarantee of safety, while a routine collocation of combat and support units, especially in the early days of a campaign, would unacceptably drain offensive combat power. Instead, every combat support unit and sustainment facility, including those associated with reception of follow-on forces into the theater, must be furnished with enough local assets to protect against air, missile, and unconventional threats, and in some cases, conventional ground attack.²⁶¹

These concerns are shared by Wass de Czege and Sinnreich:

In future operations . . . there no longer will be any distinction between communications and combat zones. Assigning stability and support responsibilities routinely to major tactical formations effectively would tie them to geography, forfeiting operational agility. Instead, routine responsibility for stability and support must be assigned on an area basis to security organizations specifically designed and resource-tailored for the purpose.²⁶²

In short, in a nonlinear warfare environment against an A2/AD threat, there are a number of outstanding issues with respect to the Army’s operational concept that call its plausibility into question. Army logistics elements must find a way not only to support the rapid deployment of forces, but also to sustain such forces when widely dispersed. They must accomplish this in a situation where there is no rear-area sanctuary from which to base sustainment operations. In such an environment, security requirements will be heightened. Thus, additional forces will likely be needed to support the logistics effort. Indeed, if future theater conflicts take on more the aspects of Vietnam than Desert Storm, one must recall that in the former conflict substantial combat forces were required to protect US rear areas, including APODs, SPODs and supply centers.²⁶³

But this means diverting supplies from combat units. Moreover, it is unclear how supplies will move to Future Force combat units in a conflict environment without front lines. Will supply

²⁶⁰ DA, *Wargame 2002*, p. 16.

²⁶¹ TRADOC, *Objective Force*, p. 38. Moreover, reacting to the difficulty experienced in attempting to deploy and support the Army’s Objective Force through forward bases in an A2/AD environment, a Blue (US/allied) Air Component Commander in one Army Transformation Wargame declared it would take “the Olympic rings time ten” in terms of the density of air and missile defense coverage for Army forces to sustain themselves effectively.

²⁶² Wass de Czege and Sinnreich, *Conceptual Foundations of a Transformed US Army*, p. 27.

²⁶³ The Second Gulf War evidently also presented substantial logistic challenges for ground forces operating without a secure rear area. Initial reports indicate that supply convoys operating in unsecured areas were quite vulnerable to attack. In order to support rapidly advancing forces operating at high tempo, fuel, ammunition and water were given priority. Consequently, spare parts were in short supply. This led to units cannibalizing equipment for parts. Combat units had to be diverted to escort supply convoys. This not only took them out of the main scheme of maneuver, but it also added greatly to the wear and tear on escort forces, such as the M2 Bradley Fighting Vehicle. All this after the Army had months to build up its logistics stocks in theater prior to the initiation of hostilities. Kim Burger, “Iraq Campaign Raises New Logistics Concerns,” *Jane’s Defence Weekly* (September 10, 2003).

trains providing logistical support require convoy protection? If so, this will further dilute logistics efforts to support the rapid deployment of the Future Force and its sustainment in battle. One comes away from all this with the feeling that despite the Army's laudable efforts to reduce its logistical requirements dramatically, it will likely realize only a fraction of its goal, and perhaps a small fraction at that.

ARMY TRANSFORMATION AND THE RESERVE COMPONENT

The Army National Guard and the Army Reserve are accorded important roles in the Service's transformation plans. However, those roles are, for the most part, ill-defined. The Future Force concept of operations states that "The distribution of Objective [Future] Force capabilities between the active and reserve components must accommodate requirements for immediate strategic responsiveness as well as the maintenance of a strategic reserve for extended campaigns and multiple global engagements."²⁶⁴ However, there are few details concerning the Reserve component's transformation, or the role it will play in enabling the Army to meet emerging challenges and exploit new warfighting concepts and opportunities.

For example, it seems highly implausible that part-time National Guard and Reserve organizations can achieve the same level of strategic responsiveness (96 hours to deploy a full brigade) that full-time active units will have difficulty meeting. Furthermore, given the multi-spectrum dominance mantle the Army leadership has placed on its Future Force units, it is hardly conceivable that National Guard and Reserve units will be able to sustain the increased training requirements necessary to attain an adequate multi-spectrum dominance capability, especially if their deployment timelines are reduced significantly from what they have been in the past.

Indeed, because of the determination to make its forces more expeditionary and compress deployment timelines, the Army plans to shift from an "alert, train, deploy" posture to a "train, alert, deploy" posture. What this means is that elements of the Expeditionary Army—SBCTs in particular—will maintain high levels of training to be ready to deploy at a moment's notice. This makes eminent sense. After all, it does no good to field equipment capable of being rapidly transported to a global hotspot unless the troops that go with it are ready to conduct operations. While the National Guard will continue to play an important role in US ground force operations, rapid deployment has not been—and given the short SBCT deployment timelines, will not be—one of its defining characteristics. Hence, it seems to make little sense to field National Guard SBCTs as part of the Expeditionary Army, or at least that segment called upon to deploy rapidly.

The Reserve Component (RC) does have a major role to play as part of the Territorial and Constabulary Armies. The RC has long engaged in relief operations associated with natural disasters. Following 9/11, it must prepare to deal with manmade (i.e., terrorist) disasters as well. The RC will also need to continue supporting stability operations overseas for the foreseeable future. While the Army and the nation have strenuously sought to avoid such missions since the Vietnam War, the US-led efforts to effect regime change in Yugoslavia, Afghanistan and Iraq have made them unavoidable. Stability operations generally favor light, mobile forces. But it is

²⁶⁴ TRADOC, *Objective Force*, p. 48.

not clear that they require rapidly deployable forces. In this context, National Guard SBCTs would make sense if these units proved highly effective in stability operations, rather than operations against a conventional enemy. While such prowess has yet to be demonstrated, the Army's first SBCT is deploying to Iraq to participate in stability operations. Thus, the Army should have a good idea as to whether it makes sense to stand up one (or more) National Guard brigades to SBCT configuration prior to 2006, when the first Guard unit is scheduled for conversion.

Finally, if one assumes that a principal role for Reserve Component forces is to engage in homeland defense operations—operations that are highly congruent with their “Minuteman” heritage—it is far from clear that they should be organized along Future Force lines.²⁶⁵ To be sure, it may be prudent to convert some National Guard units to Future Force units in the event a conflict becomes protracted and additional forces must be deployed to a threatened theater. However, as the Army readily acknowledges, the Future Force is optimized for conventional theater warfare, not homeland defense. The Service's relative lack of attention to the homeland defense mission, and to the potential that exists in the Reserve Component for addressing this Territorial Army requirement, represents a significant shortcoming in the Army's approach to transformation.

²⁶⁵ The Army National Guard may be moving toward fielding more Territorial and Constabulary Army units. Recently, Lieutenant General Steven Blum announced that the Guard will convert 5,000 artillery soldier billets to military police, which are in high demand to guard military bases in the United States and also to maintain order in places like Iraq. Dave Moniz, “General Tells of National Guard's Transformation,” *USA Today* (October 13, 2003), p. 5.

V. BARRIERS TO TRANSFORMATION

Aside from technological, operational and geographic barriers to achieving its transformation goals, the Army also faces other potential barriers. The Army's ability to address these issues will likely have a significant bearing on its ability to achieve its vision of a Future Force dominant across the full spectrum of conflict.

LEADER TENURE: THE CHIEF OF STAFF'S DILEMMA

By its nature, dramatic change in large military organizations almost inevitably involves a long-term process that spans a decade or more. However, the US military's institutional practices typically find senior leaders rotated out of their assignments every three or four years. This rotation cycle may work well for leaders whose responsibilities are near-term oriented (for example, the regional combatant commander who is responsible for the immediate warfighting mission in his area of operation). However, it is much less desirable in situations where a senior leader is tasked with the mission of effecting transformation.

Recent history shows that military organizations that have successfully transformed have almost always had a few key senior leaders—who understood both the new vision of the future conflict environment and how to bring about change in large, complex military organizations—serve an extended tour of duty, often double or even triple the length of a typical flag (i.e., general or admiral) officer tour in today's US military. During the German Army's transformation to blitzkrieg, for example, the head of its shadow general staff, General Hans von Seeckt, served seven years in that position. Moreover, the in-depth analysis of World War I experience he oversaw enabled him to inculcate his vision in the minds of key general staff officers he was able to retain in the *Reichswehr* under the provisions of the Versailles treaty.²⁶⁶ The American Navy's exploitation of naval aviation was shepherded by Vice Admiral William Moffett, who remained head of the Navy's Bureau of Aeronautics for 12 consecutive years. The absence of extended tours of service for transformation-minded senior US military leaders in key positions does not bode well for the Army's transformation efforts.

Consider, for example, the dilemma confronted by General Shinseki, the Army's Chief of Staff from 1999 to 2003. He set forth his vision for Army transformation in October 1999, but his tenure ended only four years later, hardly enough time to bring his vision to reality. Moreover, Shinseki could not know so early in the transformation process whether his vision would prove out. Thus, it was important for the general to maintain downstream options as a hedge against an uncertain geopolitical and military-technical environment. Hence General Shinseki's dilemma, and that of his successor, General Peter Schoomaker: those in charge of transformation must balance the need to maintain options as to the final form of the transformed force against the danger that, as long as options remain open, it is easier for opponents of transformation to lead a

²⁶⁶ James S. Corum, *The Roots of Blitzkrieg: Hans von Seeckt and German Military Reform* (Lawrence, KS: University of Kansas Press, 1992), p. 37.

counterrevolution to retain the existing way of doing business. This is particularly true when an institution believes it can wait out the tenure of those championing transformation. In Shinseki's case, it appears he felt it necessary to sacrifice downstream options in favor of locking the Army into a certain transformation path, thereby making it much more difficult, institutionally, to reverse course after his departure. The price to be paid for this is a substantial reduction in institutional agility. Put another way, it appears the general was reluctant to entrust transformation to his successors.

This risk of locking the Army in to a particular approach to transformation manifests itself most clearly with respect to the SBCTs. As the Army willingly concedes, these formations do not represent a true transformation to a different form of warfare, for example, on the order of what the panzer divisions did to transform land warfare in the early stages of World War II. Creating SBCTs, however, can be viewed in a more sympathetic light: as an attempt to lock the Army into a path that may lead to a truly transformed Army centered on the Future Force. There is, however, a cost. The SBCT force will absorb billions of dollars out of tight Army budgets. Of even greater concern is the price in terms of lost institutional agility. By proceeding down a relatively narrow transformation path, the Army is betting that it can predict the future conflict environment with a high degree of precision. As recent events in Afghanistan and Iraq have demonstrated, this can be a risky proposition. Should Shinseki's vision prove off the mark, the end result may be that the Army will have spent a substantial amount of its modernization budget and, perhaps even more important, considerable time—neither of which can be recovered later—to field an Army optimized for the wrong future. Indeed, the Army's proposed fielding of six SBCTs puts it at odds with several earlier successful transformation efforts.

OPERATIONAL ISSUES

The Future Force is optimized for conventional theater warfare, and this may be appropriate. However, the Army's contention that a single basic force element can be task organized to dominate across the full spectrum of conflict assumes significant risk. The urban conflict environment is likely to demand a significantly different force mix than the one optimized for extended-range, nonlinear ground warfare in open terrain. Forces performing homeland defense missions and those involved in stability operations would likely require still further different configurations than those envisioned for the Future Force UAs.

As for Army transformation's principal area of focus—rapid, decisive power-projection operations against an A2/AD threat and open battle against conventional enemy forces—several operational risks demand attention.

Joint Risk

The Army is counting heavily on its sister Services to support its transformation. "The Army's Transformation strategy must, therefore, be harmonized with similar efforts of other Services."²⁶⁷ In fact, the Future Force concept of operations includes important assumptions concerning joint

²⁶⁷ White Paper, *Objective Force*, p. 1.

C4ISR, to include joint operational and tactical sensor-shooter linkages, integrated logistics and strategic and operational lift. The strategy also makes major assumptions with respect to the kind of support the Army will get from the Navy, Air Force and Marine Corps in an A2/AD environment, to include “a comprehensive joint force protection umbrella that includes air and missile defense, provides security of air and sea ports of debarkation, and enables uninterrupted force flow, against a diverse variety of anti-access threats, *including weapons of mass effects*.”²⁶⁸

Unfortunately, Army assumptions with respect to the capabilities that its sister Services will have to support the Future Force seem excessively optimistic.²⁶⁹ In nearly all cases, they run counter to the relatively conservative planning assumptions that underlie this assessment. Moreover, these assumptions often involve sister Services providing support capabilities critical to the Army’s transformation vision.

For example, which Service (or Services) will provide the strategic lift of the type and in the quantities required by the Future Force? Can other Services provide effective missile defenses? Can they rapidly defeat the enemy’s anti-access forces? Will they rapidly clear the littoral and establish sea control over coastal areas to facilitate the rapid resupply of Expeditionary Army units? Will they provide their respective elements of a joint C4ISR architecture? It is far from clear that the Navy, Air Force and Marine Corps either plan to, or can, develop the capabilities needed to execute these key enabling missions of Army transformation as quickly or effectively as the Army requires. In brief, the Army has taken on considerable risk in assuming that its sister Services will provide key enabling capabilities to support the Future Force.

Strategic Mobility

A driving force behind Army transformation is the conviction that the Service must become principally a rapidly deployable Expeditionary Army, and that it must be able to do so even in the face of A2/AD threats. In attempting to field such a force, the Army is incurring several significant risks. One clear risk is that, given current projections with respect to airlift and sealift, the Army is very unlikely to meet its deployment timelines even in a benign threat environment. The reader will recall that the Army, at least in the near term, will actually get heavier as it fields its SBCTs, not lighter.

Rapid deployment becomes an even riskier proposition in an A2/AD environment. The kind of lift that might enable distributed insertion of Army Future Force units, such as shallow draft, high-speed sealift, or C-130 cargo aircraft, is either nonexistent or in short supply. Even if these lift assets were available in the numbers required, it is far from clear that they could operate effectively against even modest, competently employed A2/AD capabilities, such as ballistic and cruise missiles, integrated air defenses, and anti-ship mines and cruise missiles. Moreover, nonstealthy lift is not projected to increase to the level desired by the Army over the planning

²⁶⁸ TRADOC, *Objective Force*, p. 20. [Emphasis in original]

²⁶⁹ For a discussion of the Services’ approach to dealing with the A2/AD threat, see Krepinevich, Watts, and Work, *Meeting the Anti-Access and Area-Denial Challenge*.

horizon (i.e., through 2013–2018), while stealthy airlift and sealift will appear only in small numbers, if at all.

Sustainment

In a nonlinear warfare environment against an A2/AD threat, there are serious risks with respect to the Army's ability to sustain its Future Force maneuver formations. Army logistics elements must find a way not only to support the rapid deployment of the Future Force, but to sustain them as well, as they conduct highly distributed operations on a fluid, nonlinear battlefield. In this environment there is no rear area offering sanctuary for lift and sustainment operations. Consequently, it may be necessary to devote substantial combat resources to protect resupply convoy operations, complicating efforts to deploy Future Force maneuver units and increasing support requirements.

In an A2/AD environment, the Army's ability to avoid establishing main supply points with "iron mountains" of supplies is also problematic. In short, the Service faces a significant challenge in determining how it will sustain its rapidly deploying forces. One suspects that, as with its force design, the Army will need to experiment with several approaches. Finally, the Army does not appear to have developed a hedge against the failure of its efforts to reduce its sustainment requirements dramatically.

TECHNICAL

As in any transformation, the Army is incurring technology risk. As the Army's concept for the Future Force notes, "Technology is not a panacea, and it brings its own set of unique challenges and vulnerabilities."²⁷⁰ The Army's challenge is to surmount formidable technological challenges on a range of capabilities key to its transformation strategy—from novel forms of strategic lift, to system weight and support reductions, to new forms of munitions, to novel forms of propulsion, to the integration of a wide array of information systems.

At present, it appears the Army's exposure to technical risk is substantial. For example, the Army Science Board concluded that, of the 32 technologies required to support the fielding of the Future Force, 16 will not be ready by the time the initial units of the force are being fielded.²⁷¹ The recent Report of the Independent Assessment Panel for the Future Combat System (on which General Schoomaker, the Army's Chief of Staff, served as a member) concluded that of 31 technologies identified as critical to the FCS, only 7 achieved a "green" rating.²⁷² Given what appear to be significant, and perhaps formidable, technological barriers, a

²⁷⁰ White Paper, *Objective Force*, p.15.

²⁷¹ Office of Program Analysis and Evaluation, *Army Transformation*, Briefing (July 26, 2001).

²⁷² "Objective Force and Future Combat Systems Independent Assessment Panel," Briefing (May 2, 2003), pp. 59–60. The ratings are used to determine technology readiness levels for the Technology Readiness Assessment (TRA) required for a program to enter Milestone B. The most recent DoD acquisition guidelines call for key technologies to be rated at TRL 6—"demonstration in a relevant environment"—or "green"—prior to initiation of system development and demonstration (SDD). Despite its technological immaturity, the FCS program has proceeded to Milestone B (i.e., the start of the SDD phase), which means its constituent technologies have demonstrated an "affordable increment of military-useful capability . . . in a relevant environment." Two of the critical technologies

case can be made that the Army may experience a significant lag in its fielding of the Future Force. This could have profound implications for the Army if one accepts General Shinseki's statement that the Army risks becoming irrelevant if it cannot begin the transition to the Future Force as originally scheduled.

MODERNIZATION STRATEGY AND TRANSFORMATION

An Army modernization strategy that supports military transformation must account for the fact that transformations typically take several decades to play out. Indeed, today even those military systems that are placed on a fast track for development and fielding often take ten years or more to reach forces in the field. The Army, for example, may be taking a high-risk approach in attempting to field its Future Combat System by 2012.²⁷³ As elaborated upon earlier, a substantial number of issues need to be addressed before the Army can field a force with the capabilities it desires for the Future Force. If history is any guide, considerable additional time will be required to determine how best to employ these new military systems, how to structure the UA and UE C4ISR networks, and how to develop the leader and troop skill sets required to realize their full potential.

Moreover, periods of military revolution also are characterized by an increased risk of strategic surprise, such as that which occurred with submarine warfare early in this century, and which might occur again with the onset of new competition in areas involving anti-access capabilities and the proliferation of WMD. The Army's Future Force vision also gives short shrift to the problems associated with stability operations, and perhaps to urban operations as well. Given these considerations, senior Army leaders might consider adopting a different—or at least a more flexible—modernization strategy if the Service is to meet its goal of dominating military operations along the entire conflict spectrum over the long term.

What would such an alternative strategy look like? Military revolutions complicate modernization strategies in that they typically find the effectiveness of certain military systems in rapid decline. The displacement of the battleship by the aircraft carrier is but one example. However, it is far from clear in advance which military systems, operational concepts, or new force structures will prove effective and which will not. Put another way, not only must a transformation strategy be initiated well in advance of the actual fielding of the transformed force, it also must take into account both military-technical uncertainties and those stemming from changes in the security environment. How might the Army's modernization strategy account for this?

were rated "red," meaning that "no acceptable sources were identified to meet the need for these technologies." On a more positive note, the panel notes the Army has developed "risk mitigation plans" for each of the technologies that failed to achieve a "green" rating.

²⁷³ Indeed, the Army recently found it necessary to slip the date for fielding the first Future Force UA from 2010 to 2012, apparently for both fiscal and technical reasons.

On a positive note, the Army is attempting to tap rapidly advancing technologies to develop new military systems that can be applied within the framework of new operational concepts (e.g., highly distributed, highly networked ground forces emphasizing ranged-fire engagements on nonlinear battle fronts) executed by new kinds of military organizations. It is this combination of technology, emerging military systems, new operational concepts and force restructuring that often produces the discontinuous leap in effectiveness characteristic of military revolutions. However, this effort is primarily focused on the open battle against a conventional enemy. The Army will also likely need to accord substantially greater effort to the conduct of operations against irregular forces, particularly in urban environments and in protracted counterinsurgency situations. Thus, one would expect to see the Army according greater emphasis to research and development (R&D) efforts that support “wildcatting”—experimenting with a limited (but operationally significant) number of a wide variety of military systems, as well as operational concepts and force structures. The goal here would be to identify those systems capabilities that will prove relevant to solving the *full range* of emerging strategic and operational problems (or to exploit opportunities), while eliminating those that are not.

Wildcatting has been a hallmark of successful modernization transformation strategies. For example, the nineteenth-century military transformation at sea saw wooden ships powered by sail yield to ships with metal hulls and powered by turbine engines. During that transformation, among the 30 vessels of the Royal Navy fit to take a place in the line of battle in 1870, there were 3 types of steam engines, 4 screw arrangements, 16 varieties of armor protection, 18 hull models, and no fewer than 20 scales of armament.²⁷⁴ Similarly, during the rapid advances in aviation technology that occurred in the 1920s and 1930s, the U.S. military developed and flight-tested 12 medium and heavy bombers and nearly 70 attack, fighter and trainer aircraft.²⁷⁵ None, however, were produced in great numbers.

This reveals a second element of a successful strategy for transformation: to avoid being locked in. Lock-in occurs when limited resources are spent to purchase a system in large numbers—such as the Stryker—that represent only marginal improvements over existing capabilities, rather than leaps in military effectiveness. Perhaps even more important, the issue is not only that Stryker may offer only marginal improvements, but that the resources it consumes may close the doors to more promising capabilities (i.e., those planned for the Future Force).²⁷⁶ Locking in both narrows the range of options (as fewer *types* of systems are procured) for dealing with emerging challenges and risks freezing the force into the current state of technological advancement. Resources that could have supported exploring a wider range of systems and sustaining continued advances in technology are, instead, siphoned off by a relatively large interim force.

²⁷⁴ Jon Tetsuro Sumida, *In Defence of Naval Supremacy* (Boston: Unwin Hyman, 1989), p. 10.

²⁷⁵ Andrew F. Krepinevich, *The Air Force of 2016* (Washington, DC: CSBA, 1996), p. 35.

²⁷⁶ For example, the dominance of Microsoft’s Windows operating system in the personal computer world, or the “QWERTY” keyboard, illustrate choices that have been reinforced over time because, once people became familiar with Windows or with QWERTY keyboards, there was an increasingly high cost to switch to better technologies.

As noted above, the end result may be a happy one—if the Army guesses right (i.e., if the fielded force serendipitously turns out to be the right force to meet the post-transformation challenges), or if the threat changes far more slowly than anticipated. If not, the Army risks having committed itself to a single-point solution in a very uncertain world. It will either have bought the wrong systems, or the right systems prematurely—before the rapidly advancing technologies that enable them to realize their potential have matured.

The US Navy experienced this phenomenon in the 1920s and 1930s, during the transformation from a fleet centered around battleships to one focused on fast carrier task forces. It was unclear what kind of carrier would be optimal. Consequently, the Navy created options for itself by wildcatting. It invested in four different classes of carriers, *but only produced six carriers in all*. It also experimented with aircraft on carriers and on surface ships, and even built airships. The Navy did not lock itself into producing a class of carriers in large numbers until war was upon it.

On the other hand, Great Britain, which emerged from World War I with a dominant lead in carrier aviation, chose to lock itself in to existing technology by insisting on such things as very slow landing speeds, which ultimately precluded developing carrier aircraft able to carry weapons large enough to sink major combatants. Moreover, the desire to retain its existing carriers put the Royal Navy in the position of spending too much to retain older platforms. A good analogy would be stockpiling current Pentium-chip personal computers in defiance of Gordon Moore’s “law” that the number of transistors on a microchip doubles every 18 months. The result of Royal Navy’s decision to retain its entire carrier fleet absorbed operations, maintenance and personnel costs, which limited funding for R&D on naval aviation (which was progressing rapidly) and on new carriers that might have optimized the potential of air power at sea. Royal Navy carriers depreciated rapidly in effectiveness as more powerful naval aircraft (requiring bigger carriers) came on the scene. The Royal Navy eventually saw the US Navy and the Imperial Japanese Navy, relative latecomers to the competition in naval aviation, dominate this new form of warfare.

These wildcatting efforts create strategic options on a range of military capabilities. These options could be used both to dissuade prospective adversaries from resuming a high level of military competition and, in the event dissuasion or deterrence failed, exercising those options to prevail in the competition itself. It is important to note that creating such options need not involve a defense budget “train wreck.” Recall that the US military developed the foundation for strategic aerial bombardment, the carrier navy, modern amphibious warfare, and mechanized air-land operations during the relatively lean budget years of the 1920s and 1930s. What such options do imply, however, is a different set of strategic—and budget—priorities that balance near-term and long-term requirements.

For example, the Army has developed a rough draft operational concept for dealing with the A2/AD challenge to power projection. Yet it remains unclear how extensively this concept will have to be modified to accommodate changes in the character and scale of the A2/AD threat, developments in military-related technologies, and the capabilities developed by the Army’s sister Services. The joint warfighting concept that is ultimately adopted may (as the Army concept apparently does) rely heavily on Air Force long-range precision-strike operations to

defeat rapidly critical mobile enemy anti-access forces. If this proves unfeasible for whatever reason, it could have a major effect on Army transformation.²⁷⁷ For example, it would exert a major influence on Army deployment rates, and on its need for organic extended-range precision fires (owing to the prohibitive cost of forward-basing Air Force tactical fighters before enemy anti-access forces had been neutralized). Other examples abound, reinforcing the need for the Army's modernization strategy to hedge against this kind of uncertainty by preserving options wherever possible.

There are several promising options that the Army is not exploring. One centers around concepts advanced by Colonel Douglas Macgregor in his book, *Breaking the Phalanx*. Macgregor describes a brigade-based Army whose maneuver units are somewhat heavier than the SBCTs, but that have substantially more combat power than the Stryker units and that can deploy more rapidly than the Army's current heavy units.²⁷⁸ LTG Richard Cody, the Army's G-3, or operations chief, has advanced an innovative concept for exploiting the Service's potentially formidable future aviation arm—including the Comanche, UAVs and unmanned combat aerial vehicles (UCAVs).²⁷⁹ The author has written on the potential of Deep Strike Brigades that are designed to exploit fully the Army's belief that its networked ground forces will be able "see first, understand first, act first and finish decisively."²⁸⁰ It is worth noting that in developing the blitzkrieg form of warfare, the German Army experimented with seven different types of regiments, brigades and divisions. By making more tools available to its commanders, the Army can better tap the expertise of the officer corps to craft innovative operational concepts to address the challenges of this new era.

This is not to say that production of all so-called legacy systems should end, or that every new system or capability will fulfill the promise of its advocates. Nor does this modernization strategy place absolute emphasis on wildcatting. What is required is a modernization strategy that focuses less on single-point solutions and takes a more balanced approach to both near- and long-term circumstances. If, as the Army vision appears to assume, the long-term threat is more formidable than the immediate threat, and if future threats present significantly different kinds of warfighting challenges than those the current force has been optimized to address, and if the pace of technological change is both rapid and relatively unpredictable, the Army may want to emphasize a modernization strategy that places substantially greater emphasis on wildcatting and creating capability options.

A strong argument can be made that these conditions exist to a much greater extent today than they did during the Cold War era. Yet, at its broadest level the Army's modernization strategy

²⁷⁷ Krepinevich, Watts, and Work, *Meeting the Anti-Access and Area-Denial Challenge*, p. 19.

²⁷⁸ Douglas A. Macgregor, *Breaking the Phalanx* (Westport, CT: Praeger, 1997).

²⁷⁹ LTG Richard Cody, "Air Assault 2010," Briefing (undated).

²⁸⁰ See, for example, Andrew F. Krepinevich, *Restructuring for a New Era: Framing the Roles and Missions Debate* (Washington, DC: DBP, 1995), p. 62.

today remains essentially the same as during that era, with its emphasis on large-scale, serial production of relatively few types of military systems and capabilities. The solution is not to adopt the same “buy-in-bulk” approach with respect to emerging systems. Where possible, the Army should avoid premature large-scale production of new systems, be they legacy or transformational, until they have clearly proven themselves. With respect to systems that are characterized as transformational, it is important to avoid the pitfalls of false starts and dead ends.

False Starts

In periods of transformation, military organizations run the risk of buying large quantities of a promising system too early, and the Army is no exception. The risk of committing to a false start is demonstrated in the US Navy’s affection for its first carrier designed from the keel up, the *Ranger*, which was commissioned in 1934. Although some Navy leaders had pressed for construction of five *Ranger*-class carriers, war game analysis and fleet problems soon indicated that, at roughly 14,000 tons, the *Ranger* was far too small to meet many of the demands of future fleet operations. As it turned out, the larger *Essex*-class carriers formed the backbone of the Navy’s fast carrier task forces in World War II. Each displaced nearly twice as much tonnage as the *Ranger*.²⁸¹ The Army is running the risk that, should the FCS develop as hoped for, its Stryker Interim Armored Vehicles (IAVs)—more than 2,000 systems—could represent a very expensive false start.

Dead Ends

Military systems or capabilities that appear promising, or even revolutionary, sometimes fail to live up to expectations. In this case, the challenge of those leading the transformation effort is not to avoid buying them too early, but to avoid buying them *at all*. The experience of the US Navy during the development of naval aviation in the interwar period provides an example of how rigorous experimentation and field exercises can help avoid dead ends. In 1930 the Navy’s Bureau of Aeronautics proposed the construction of eight 10,000-ton flying-deck (or flight-deck) cruisers. The ships—half cruiser and half flight deck—were subjected to war game analysis at the Naval War College and some experiments employing surrogates in the fleet. Both painted a distinctly unfavorable picture of the hybrid ship, and it quickly sank beneath the Navy’s programmatic waves. If, as is assumed in this paper, the US military does not, over the planning horizon under consideration, effect major breakthroughs in missile defense system capabilities or in the operational concepts governing their employment, then Army ballistic missile defense systems, such as its Theater High Altitude Air Defense (THAAD) system, could represent a dead end investment.²⁸²

Arguably, the Army modernization plan does not accord sufficient priority to reducing the risk associated with modernizing a force during a period of military transformation. With some

²⁸¹ Andrew F. Krepinevich, *Revolution at Sea: The US Navy and Carrier Aviation* (unpublished paper).

²⁸² For a discussion of the modernization strategy pursued by the US Navy during its transformation from a battleship-dominated fleet to one centered on carrier-based aviation, see Krepinevich, *ibid*.

notable exceptions, such as the Army's experimenting with the theater support vessel, the overall emphasis remains on procuring relatively few systems in relatively large numbers. This applies even to systems that are closely associated with the Army's transformation initiative. For example, the Stryker could be viewed as an *intentional* effort on the Army's part to pursue a false start, given its projection that the FCS—which is intended to displace the Stryker—will be fielded only a few years after the last of its SBCTs becomes operational.

While the Army does not have the mission of providing strategic airlift or sealift, the absence of potential hedges against the A2/AD threat is disconcerting, to say the least. While some might argue that the C-130 represents such a hedge, it must rely on problematic access to intermediate staging areas and has nowhere near the lift capacity that the Future Force will require, and its range is likely to be greatly attenuated by the combat load the Army envisions it carrying. Moreover, C-130s are not likely to fare well against enemy integrated air defenses. In summary, the Army is incurring substantial risk in this area.

Another area where hedging will likely be crucial is in the development of the C4ISR architecture that will enable the Future Force to operate as intended by the Army vision, especially if the architecture cannot keep pace with ever-increasing requirements for bandwidth. For example, the Army has rightly expressed concerns over the need to develop hedges against overreliance on US space assets, but it is not clear what those hedges might be. A proper hedging strategy in this critical capability area might involve exploring prototype multiple C4ISR architectures, to include the implications of varying levels of bandwidth, and different approaches to force echelonment (e.g., reducing dramatically or even eliminating a command layer). Much of the potential—and the pitfalls—of relying more heavily on information systems and architectures to realize substantial leaps in military capability remain shrouded in uncertainty. Given the heavy reliance on information in the Army's operational concept, one would expect its modernization program to have built in some firewall hedges against the possibility that these new capabilities will either not be realized as quickly as possible or not live up to expectations.

When should the Army's modernization strategy commit fully to transformation? In the end, it will be a judgment call. Once the research, development, testing, and evaluation (RDT&E) process has bought access to post-transformation capabilities, the question then arises, Should the Army buy these capabilities now, or keep them on the shelf (and improve upon them) until they are needed in large numbers? Issues of risk, strategic warning time, and the inevitable resource limitations should weigh heavily in such a decision. Once any system (or systems) is fielded in large numbers, however, the Army's gains in capability will come at the expense of organizational flexibility.²⁸³

²⁸³ There is, however, a rub. Few modern systems can be put on the shelf and then quickly produced in large numbers on short notice. For one thing, advanced military systems are increasingly software intensive, and software development takes substantial time. Thus, a changed modernization strategy would require changes in government regulations and processes, and in industry processes as well. An acceptable middle ground might be one that emphasized small buys and a spiral development approach. Unfortunately, according to this issue the attention it merits is beyond the scope of this assessment.

TRAINING: THE IMPORTANCE OF FIELD EXERCISES

One important way to narrow the range of uncertainty associated with transformation is to engage in a vigorous program of field exercises and experiments focused on emerging challenges and opportunities. Such a program would enable the Army to explore—alone and in combination with its sister Services—a number of systems, force structures and warfighting concepts.²⁸⁴ The ultimate expression of such efforts will likely be the conduct of Army and joint exercises at the operational level of warfare. This is because joint operations will almost certainly dominate future military operations, and because the operational level of war is the level at which military campaigns are conducted.²⁸⁵

Following the Cold War, the Army undertook several studies and activities designed to support efforts to develop forces better suited for the new conflict environment. These included the Louisiana Maneuvers, a series of simulations and exercises conducted in 1992. They were followed by the Force XXI series of warfighting experiments, which led to the Army After Next effort, centered on a series of war games, analyses and conferences whose purpose was to help the Army determine its niche in the so-called Revolution in Military Affairs. More recently, the Army has conducted transformation war games.

Such planning exercises, simulations and war games can be important analytic tools that greatly enhance the effectiveness of field exercises by identifying promising capabilities that require prototyping, new force elements that should be established and operational concepts that merit the detailed evaluation that only field exercises can provide. This is critical as field exercises are far more costly to undertake (and thus are conducted far less frequently) than war games, simulations or planning exercises. Nevertheless, field exercises conducted at the operational level of war offer the best opportunity to obtain high-fidelity feedback on the likely value of new force designs, capabilities and operational concepts. They also represent the ultimate training opportunity for soldiers.

During the latter stages of the Cold War, the US military invested in a number of high-fidelity training facilities that greatly enhanced the value of its field training. For example, the Army's National Training Center (NTC) at Fort Irwin, California, prepared brigade-size units for combined-arms mechanized warfare against a Soviet-style adversary. Similarly, the Air Force and Navy put their air crews through Red Flag exercises and provided greatly improved "postgraduate" combat training such as the Air Force Fighter Weapons School, Top Gun, and Strike University. Currently, the Army's SBCTs, along with various Current Force units, are conducting a series of exercises to assess the value of new capabilities and force structures.

²⁸⁴ For a discussion of the role of field exercises in transformation strategies, see Andrew F. Krepinevich, *Lighting the Path Ahead: Field Exercises and Transformation* (Washington, DC: CSBA, 2002).

²⁸⁵ The Joint Chiefs of Staff have gone so far as to declare that "The joint force, because of its flexibility and responsiveness, will remain the key to operational success in the future To build the most effective force for 2020, we must be fully joint: intellectually, operationally, organizationally, doctrinally, and technically." Joint Chiefs of Staff, *Joint Vision 2020* (Washington, DC: Department of Defense, 2001), p. 2.

The Army, however, may incur significant risk with respect to training and field exercises/experimentation. If current deployment patterns persist, both Stryker or the Future Force units will be challenged to achieve the high standards of training mandated by the Army's warfighting concept. In conjunction with the Army's "train, alert, deploy" concept, the current SBCT units have replaced the traditional red/green/amber training cycle to a modified "green always" training cycle, in which the unit has vastly more time, resources, and money to train along the full spectrum of operations—from stability operations skills and tasks, to urban combat, to open and restricted terrain high-intensity combat. This approach is historically consistent with the training demands placed on new force elements experimenting with new capabilities and new operational concepts. It also conforms to the Army's Future Force operational concept, which places heavy demands on highly trained soldiers who can deploy quickly and operate at higher levels of independence, on shorter timelines, and in more distributed formations.

As for field exercises/experimentation, the Army currently lacks the infrastructure to support realistic long-term training against emerging threats—such as A2/AD and urban warfare—and to enable the high-fidelity feedback necessary to refine warfighting concepts, system requirements, and alternative force structure designs. Again, the current deployment levels for Army brigades are so high that little time is left for training.

Current Forces—the Army's hedge against a slower-than-expected development of the Future Force—are involved in the process as well. For example, a division capstone exercise (DCX I) took place in May 2001 at the NTC to test the first capabilities of a fully fielded digitized brigade against an opposing force. A follow-up exercise, DCX II, was conducted in October 2001 at Fort Hood, Texas. This exercise was designed to test a digitized division for the first time.²⁸⁶

While impressive in many respects, the Army's field exercise program begs several key questions. Will the Army be able to sustain this level of training, given the dramatic increases in its global commitments? Are these forces going to be training realistically—against a live "Red" opposing force (OPFOR) and at training facilities that are designed for the critical operational challenges the Army confronts, such as A2/AD? Finally, will Army units have the opportunity to train as part of a joint team with the other Services to determine whether they can actually provide the kind of support called for in the Army's warfighting concept (and, correspondingly, whether the Army can provide the support assumed in Navy and Air Force transformation concepts)?

Currently, facilities comparable to the Army's NTC do not exist to support high-fidelity field exercises focused on the A2/AD threat. A Joint National Training Center (JNTC), is needed to enable both Army and joint transformation field exercises. In its report to the Secretary of Defense, the National Defense Panel (NDP) recommended that such a facility be established as

²⁸⁶ Note that these exercises involved the Army's 4th Infantry Division (Mechanized), which employs current Army echelonment and operational formations. However, their principal purpose was to test the viability of a fully digitized battlefield.

part of any transformation strategy.²⁸⁷ Unfortunately, while the recently completed QDR promises to explore the need for such a center, the Bush Administration has not aggressively pursued its creation.²⁸⁸ This may retard Army transformation. As General Schoomaker has noted:

Our Combat Training Centers [are] . . . vital in the development of relevant and ready forces. These Combat Training Centers are the cultural drivers in the Army. And while they are the best in the world, they must adapt to . . . future challenges.²⁸⁹

Several potential concerns arise from the absence of training facilities capable of supporting field exercises focused on preparing Army and joint forces for emerging challenges at the operational level of warfare. One is that it promotes emphasis on training at the tactical level of warfare. To be sure, such training is both necessary and desirable, but it should also be strongly informed by the warfighting concepts that are developed based on what is learned while training at the operational level of warfare. Absent significant training at the operational level—especially in a period of transformation—tactical-level training may suffer.

A second concern rests with the Army's ability to determine the viability of its Future Force operational concept, in which information architectures play a major role. If the Army is precluded from exercising its C4ISR architectures at the operational level of warfare, it may prove difficult to determine, with any great degree of confidence, the progress being made (or not made) in realizing such critical concepts, or their viability in campaigns against threats that involve C4ISR efforts spread over large areas (e.g., extended-range strikes against critical mobile targets).

There is also the matter of a Joint Urban Warfare Training Center (JUWTC). Since 1993, Army units have undergone urban warfare training at the Joint Readiness Training Center at Fort Polk, Louisiana. Units train at the Military Operations on Urbanized Terrain (MOUT) area, centered on a 29-building complex known as Shugart-Gordon, named for two Medal of Honor winners killed in Somalia. Roughly 11 brigades train at the center each year, and the Army is increasing substantially its spending on urban warfare training centers.²⁹⁰ Fort Lewis recently erected two live-fire urban training ranges for the SBCT units stationed there, while at Fort Knox, Kentucky, the Army constructed the Zussman Village to facilitate urban training for East Coast units.²⁹¹

Fort Lewis is also building what will be the Army's largest urban combat training center, called Leschi Town. It is the first effort in a six-year, \$400 million effort to create 14 villages to

²⁸⁷ NDP, *Transforming Defense*, pp. 68–70.

²⁸⁸ *QDR Report*, p. 36.

²⁸⁹ General Peter Schoomaker, Speech, AUSA Eisenhower Luncheon, Washington, DC (October 7, 2003).

²⁹⁰ Ann Roosevelt, "Army Confident in Urban Warfighting Skills," *Defense Week* (December 2, 2002), p. 5.

²⁹¹ General Accounting Office (GAO), *Military Capabilities: Focused Attention Needed to Prepare US Forces for Combat in Urban Areas* (Washington, DC: GAO, February 2000), p. 33; and Roxana Tiron, "Army Training Site Brings to Life the Horrors of War," *National Defense* (July 2001), pp. 20–23.

improve the Army's urban combat training capability.²⁹² Leschi Town will comprise some 54 buildings, including a five-story office building, a three-story city hall and a simulated power station, and will accommodate a battalion for training.²⁹³

These urban warfare training initiatives are important, since the Army's high-level war gaming exercises (specifically, the transformation game series conducted at the Army War College every spring) often find enemy forces gravitating to urban areas to avoid the overwhelming advantage the US military can bring to bear in open battle. To some extent, this scenario was played out during Operation Iraqi Freedom in cities like Basra. Although effective Iraqi resistance collapsed before US forces entered Baghdad, the prospect that Republican Guard forces would concentrate inside the city and mount an urban defense was high on the list of US commanders' concerns. Moreover, ongoing stability operations in Iraq have reinforced the importance of urban control against irregular enemy forces. Thus, both war games and recent military operations provide further evidence of the need for serious professional discussion and field experimentation on the problems associated with urban combat, which include extremely high casualties, widespread collateral damage, massive refugee flows, combatant and noncombatant disease, logistics vulnerability, and comparatively poor situational awareness.

Although the Army is making substantial improvements in its urban training facilities, most of those currently in place handle only battalion-sized elements and below, and only a few have live-fire capability.²⁹⁴ Moreover, only an extremely small amount of the training is performed as a combined-arms exercise, let alone as a joint or combined exercise (i.e., with the other Services or with other nations).²⁹⁵

Some experts have argued that troops need exposure to more realistic scenarios than the Army's mock small towns can provide.²⁹⁶ Current urban training centers represent neither the scale encountered when operating in an urban environment nor many of a city's unique terrain features (e.g., clusters of high-rise buildings, sewer and subway systems, etc.). A JUWTC should be created along the lines called for by the NDP.²⁹⁷ Such a center could also be employed to

²⁹² Michael Gilbert, "'Town' Will Give Soldiers Urban Warfare Training," *Tacoma News Tribune* (December 23, 2002).

²⁹³ Ibid.

²⁹⁴ GAO, *Combat in Urban Areas*, p. 32.

²⁹⁵ Ibid., p. 15. The Marine Corps is the only Service to have a live-fire urban close air support range. The Army lacks an organic capability to exercise these skills under semi-realistic conditions.

²⁹⁶ "US Urban Warfare: Fighting in the Streets," *Jane's Defence Weekly* (November 20, 2002).

²⁹⁷ National Defense Panel, *Transforming Defense* (Washington, DC, December 1997), pp. 68–70. Interestingly, given recent military operations in the Middle East, the Israeli Defense Force (IDF) has announced it is creating an urban digital battlefield in the Negev Desert to meet the growing likelihood that its forces will be engaged in urban conflict. The center will expand the IDF's current urban warfare school, known as "Chicago," which comprises only a few streets. The new urban warfare center will comprise four sections: a downtown area, a rural village section, a marketplace with narrow alleys, and urban outskirts, and be incorporated into the IDF's main tactical training center at Tze'elim. While the IDF effort may be relatively modest in terms of the Army's training facilities, it does demonstrate two important points. First, that the IDF concurs with the Army that urban warfare is becoming

conduct high-fidelity exercises to prepare a wide range of governmental and non-governmental organizations to deal with terrorist attacks on US urban centers, especially those involving the covert use of chemical, biological or radiological weapons.

Finally, despite the Army's significant efforts to enhance its urban training, it is not clear that soldiers will receive sufficient training time to hone their skills. Marine analysts believe, for example, that infantry battalions require at least four to five weeks of training to achieve proficiency in urban operations. Some prefer six to eight weeks.²⁹⁸ Even prior to their commitment to Afghanistan and Iraq, Army units were unable to achieve anything like this level of training.

FUNDING TRANSFORMATION

No army has ever had sufficient resources to accomplish all the tasks before it, and the US Army is no exception. Establishing funding priorities is ultimately a judgment call, involving weighing a range of issues such as the risks posed by near- and long-term threats, the prospects for surprise, assumptions made with respect to long-term budget levels and risks associated with technological development.

This report is replete with examples of opportunities the Army is unable to pursue owing to resource limitations. Initiatives relating to a range of options for improving both strategic and intra-theater lift have been scaled back, put on indefinite hold, or gone unfunded. Although the QDR has made basing SBCT in Europe a requirement, the Army is unsure of its ability to resource it.²⁹⁹ Technological development is lagging in a number of key areas relating to Army transformation. The upgrading of training facilities is underfunded, and it is far from clear the Army will be able to fund the ambitious training regimen called for in its design of the SBCTs and the Future Force. Finally, the large increase in Army overseas deployments threatens to confront the Service with recruitment and retention problems, shortfalls in training opportunities and increased budget woes.³⁰⁰ All this threatens Army transformation.

The Army's budget problems are not new. In 2001, the Army cited a \$390 million funding shortfall for the FCS, the core system of its Future Force. An additional \$190 million in

increasingly important; and second, that it is willing to accord a high funding priority to creating a major urban warfare training center. In short, it would seem consistent with the Army's diagnosis of the future warfighting environment to establish a high-fidelity urban warfare training center comparable to its National Training Center. Amos Harel, "IDF Set to Build Training Base Modeled on Palestinian City," *Ha'aretz* (February 5, 2002); and Arie O'Sullivan, "IDF Preparing for Urban Battlefield," *Jerusalem Post* (February 6, 2002).

²⁹⁸ "US Urban Warfare: Fighting in the Streets," *Jane's Defence Weekly* (November 20, 2002).

²⁹⁹ Neil Baumgardner, "Shinseki: Affordability an Issue for European-Based BCT," *Defense Daily* (March 7, 2002), p. 6.

³⁰⁰ Vernon Loeb, "Protests Grow Over Year-Long Army Tours," *Washington Post* (September 20, 2003), p. A13; Tony Capaccio, "Pentagon's \$65 Billion Request Assumes More Reserves, No Force Cut," *Bloomberg.com* (September 29, 2003); and Dave Moniz, "Army Reserve Fears Troop Exodus," *USA Today* (September 30, 2003), p. 1.

unfunded requirements related to the FCS included science and technology (S&T) programs centered primarily on manufacturing and integration technologies.³⁰¹

In March 2002 the Army submitted a \$9.5 billion list of unfounded requirements to Congress, including \$2.4 billion for force modernization and \$1.1 billion for emerging bills such as those pertaining to the FCS program and the SBCTs.³⁰² At the time, the Army declared that it required approximately \$1 billion more per year to execute a full recapitalization program.³⁰³

While the Army's decision to recapitalize a slice of the Current Force may be an appropriate hedge against near-term threats, given the Army's overwhelming success in the Second Gulf War, it is difficult to conjure up a near-term threat that could even remotely challenge Army dominance in heavy, mechanized air-land warfare. When one contrasts this situation with the dire consequences that General Shinseki believes will befall the Army if Future Force formations cannot be fielded by the end of this decade, the Army's recent funding shifts in favor of transformation seem appropriate.

Indeed, the Army has taken steps to increase its support for transformation. In the FY 2000–03 budgets it terminated 29 programs and restructured others; this was followed with 24 terminations in the FY 2004 budget.³⁰⁴ The Service is increasing its science and technology investments by more than 10 percent, to \$10.76 billion. The Army's top R&D priorities are also reflected in its funding, with the FCS ranking first (\$1.8 billion in FY 04), Comanche second (\$1.07 billion), and the Stryker third (\$1.01 billion).³⁰⁵ Nearly 98 percent of the Army's S&T funding over the current Future Years Defense Plan (FYDP), which runs from FY 2004 through FY 2009, is devoted to the Future Force.³⁰⁶ The Army has also increased the funding for the overall Future Force program by nearly \$15 billion.³⁰⁷ Again, however, despite these efforts, the Future Force program has slipped by two years. Key enabling capabilities, such as those pertaining to lift and UAVs, are either being delayed or remain unfunded.³⁰⁸

³⁰¹ Neil Baumgardner, "Army Unfunded Requirements List Includes \$2.4 Billion for Force Modernization," *Defense Daily* (March 14, 2002), p. 4.

³⁰² Baumgardner, "Unfunded Requirements," p. 4.

³⁰³ "Army Recapitalization Efforts Require \$1 Billion More Per Year," *Inside the Army* (February 18, 2002), p. 1. The Army plans to spend some \$4.8 billion in FY 2003 for recapitalization.

³⁰⁴ "Objective Force and Future Combat Systems Independent Assessment Panel," Briefing (May 2, 2003), p. 54.

³⁰⁵ Erin Q. Winograd, "Objective Force Funds Boosted at the Expense of Legacy Efforts," *Inside the Army* (February 3, 2003), p. 14.

³⁰⁶ In its FY 04 budget request, the Army reduced procurement spending by \$2.3 billion while increasing R&D funding by nearly \$2 billion, with much of the increase going to the FCS. Nick Jonson, "Army Budget Request is Trade-Off for Long-Term Gain, Officials Say," *Aerospace Daily* (February 13, 2003).

³⁰⁷ DA, *Army Modernization Plan 2003*, p. 2.

³⁰⁸ For example, estimates are that the Army would have to spend nearly \$1.2 billion on R&D between now and FY 09 to field the Future Transport Rotorcraft (FTR) sometime in the next decade; however, no funding is currently allocated toward this objective. To cite another case, the Cooperative Enhanced Performance for Unmanned

This picture may not get any brighter. Despite its efforts to shield the Future Force from the budget squeeze, the Army still confronts a \$2.1 billion shortfall for the FCS during the period FY 2005–07.³⁰⁹ While the Army intends to adjust its budget to cover the near-term shortfall, given the recent round of cuts enacted to shore up the Future Force program and the growing need for funds to support the dramatic increase in Army operations, this may not be possible. One must remember that, despite these cuts, the reason the Future Force program is not suffering an even greater shortfall is that fielding the first UA has been delayed by two years.³¹⁰

Moreover, if history is any guide, the continued real growth now forecast in the Defense Department's top line is unlikely to continue through FY 2009. As Figure 4 shows, the longest period of year-by-year real growth in the Defense Department's 051 total obligation authority since 1945 is the six years of the Reagan buildup. Currently the Defense Department is projecting an unprecedented *eleven* consecutive years of real growth. If history proves any guide, real growth will end in FY 2005 or FY 2006. If so, there will be even greater fiscal pressure on key Army transformational programs, starting with FCS.

Adding to transformation's fiscal woes, the Army's Chief of Staff, General Schoomaker, is looking for ways to adopt promising Future Force technologies into today's force.³¹¹ This may make sense, given the demands imposed by current operations. However, difficult choices loom. Procuring near-term capabilities to support today's operations will ineluctably pull funding from the R&D accounts supporting Future Force development.³¹² In short, there is no free lunch. Given this, it is difficult to argue with the conclusion reached by RAND's Arroyo Center, an Army-sponsored research center, which concluded, "The Objective [Future] Force may be affordable, but only if [A]rmy budgets grow significantly and steadily, if the Objective [Future]

Systems (CEPUS) project is focused on developing cooperative control behaviors and other unmanned systems technologies. But this effort is not currently funded. Erin Q. Winograd, "Dozens of Key Army Transformational Efforts Inadequately Funded," *Inside the Army* (December 16, 2002), p. 1. The Army is also facing a shortfall in funding for its UAV systems. As a result, the Service may be faced with pursuing only two of the four UAV classes for which it had planned. "US Army Foresees 6,000-plus UAVs for Future Combat Systems," *Jane's International Defense Review* (September 2003), p. 3.

³⁰⁹ "Objective Force and Future Combat Systems Independent Assessment Panel," Briefing (May 2, 2003), pp. 55–56. This is true for both the Army's cost estimates and those done by the Office of the Secretary of Defense (OSD), Office of Program Analysis and Evaluation's (PA&E) Cost Analysis Initiatives Group (CAIG). The program is fully funded in the FY 08–09 budget projection.

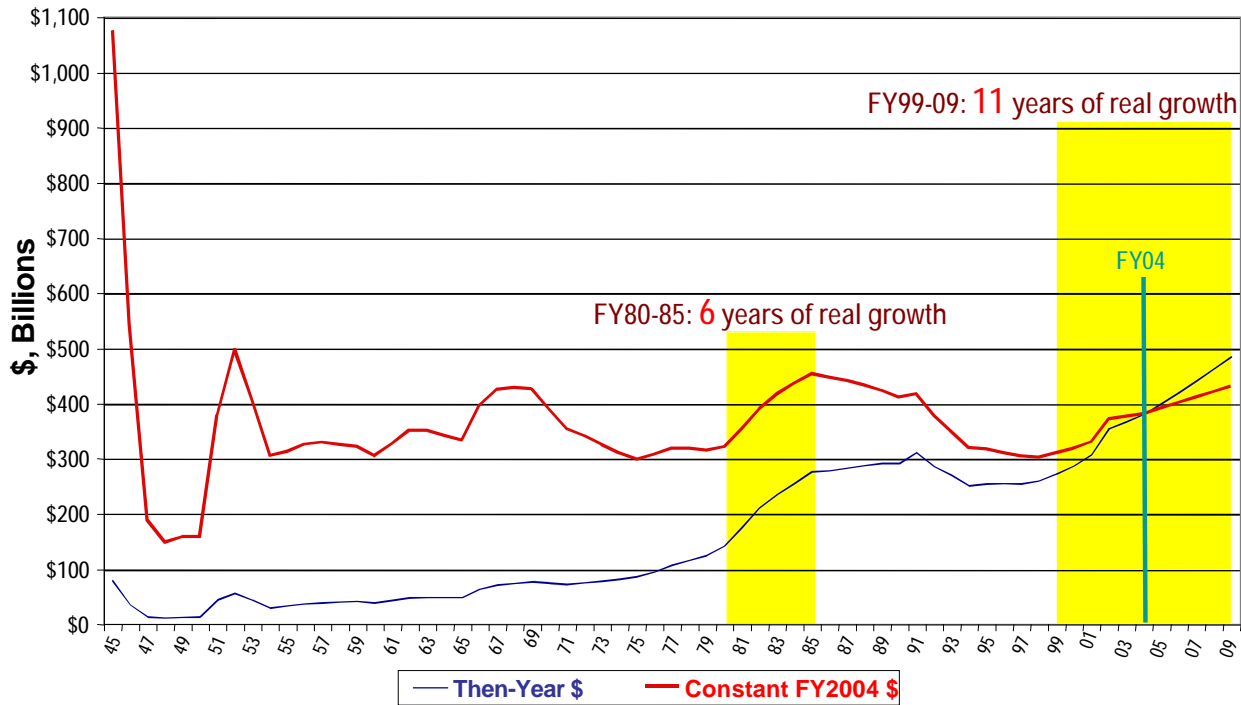
³¹⁰ The Army notes that, despite the obvious technical challenges, it could have fielded a UA on its original date of 2010, but that would have required adding at least another \$3 billion to the program. Megan Scully, "Riggs: Affordability Driving Force Behind FCS Schedule Changes," *Inside the Army* (May 12, 2003), p. 1.

³¹¹ Vago Muradian, "US Army Chief: Rethink FCS," *Defense News* (October 6, 2003), p. 1. Indeed, the demands of the Global War on Terrorism and the Second Gulf War have seen the Army shift modernization funds to better equip soldiers engaged in current operations. One example is the Army's fielding of Blue Force Tracking, which is designed to provide units with a common operating picture of the battle field, and also reduce the risk of friendly fire casualties. This has produced shortfalls in programs such as Land Warrior and the Aerial Common Sensor. Ann Roosevelt, "Army Spent More than \$3 billion to Speed Up Fielding of Systems," *Defense Daily* (September 9, 2003), p. 3.

³¹² Matthew Crupi, "AUSA Forum—Army Future Force," Executive Summary, DACS-ZAA (October 8, 2003).

Force systems costs are controlled, and if [A]rmy leaders give high priority to Objective [Future] Force procurement.”³¹³ In short, the increased demands on the Army to support the war on terrorism and conduct stability operations in the Balkans, Afghanistan and Iraq, combined with existing budget shortfalls, seem likely to put its transformation plans at great fiscal risk.³¹⁴

Figure 4: Department of Defense 051 Total Obligation Authority (TOA)



Source: CSBA based on DoD data.

³¹³ Lynn E. Davis and Jeremy Shapiro, eds., *The Army and the New National Security Strategy* (Santa Monica, CA: RAND Arroyo Center, 2003). Cited by Kim Burger, “The Global Battlefield: Briefing—Future Combat Systems,” *Jane’s Defence Weekly* (August 27, 2003), p. 26.

³¹⁴ There are indications that Congress, which has expressed concerns over the FCS program’s ability to surmount fiscal and technical hurdles, may break the program into three or more components: FCS, which would cover the majority of systems and capabilities; Networked Fires and Objective Force Networked Fires. The latter component would include the non-line-of-sight cannon vehicle, which is being built by United Defense Technologies, the firm that had been building the cancelled Crusader artillery system. Frank Tiboni, “Future Weapon Program Could Be Broken Up,” *Defense News* (August 4, 2003), p. 20.

PERSONNEL

Manning the Force

As noted earlier in this study, the changing security environment mandates that the Army increase its emphasis on the Expeditionary, Constabulary and Territorial Armies relative to the Frontier Army. At present, the overwhelming emphasis of Army transformation is on the Expeditionary Army and on large-scale conventional war. The Expeditionary Army, as depicted in Army planning documents, is oriented on deploying quickly, winning quickly and decisively, and leveraging technology both to increase effectiveness and reduce manpower requirements.

It is perhaps not surprising, therefore, that the most formidable challenges to this approach to warfare would likely come from enemies who are able to create a conflict environment that deemphasizes technology, drives up manpower requirements, and presents the specter of a protracted conflict. The Army has confronted just such a challenge following its recent campaigns in Afghanistan (Operation Enduring Freedom) and Iraq (Operation Iraqi Freedom, or the Second Gulf War). Even absent SBCTs and Future Force UAs and UEs, today's Frontier Army was able to deploy with sufficient speed and to win decisively; however, it has been saddled with the primary responsibility for stability operations, a task for a Constabulary Army. Absent some dramatic change in the conflict environment, the Constabulary Army mission in Afghanistan and Iraq is likely to last years. Moreover, defeating the insurgent elements that threaten the new order in these countries is a relatively manpower-intensive operation, one that is not accorded anywhere near the attention given to the open battle or even urban operations in Army transformation documents and planning. Nor is this a mission for which the Frontier Army was structured. Perhaps most important, stability operations on the scale being conducted today are not likely sustainable by today's Army.

The reason stems from the Army's insufficient rotation base. Following the end of conscription during the latter Cold War era, forward deployments were, with some noteworthy exceptions, characterized by soldiers deploying with their families to stable, relatively advanced countries that were America's allies (e.g., Germany, Italy). With the recent deployments to the Balkans, Afghanistan and Iraq, today deployments are dominated by unaccompanied troops moving into underdeveloped areas around the globe, where the reception is likely to be indifferent at best and, as the Army is discovering, often quite hostile. Again, owing to the character of the threat, Army deployments are likely to be protracted. The result has been a growing strain on the Army's rotation base, to the point where the Service may soon face a recruitment and retention crisis that could not only jeopardize the success of its mission, but also hobble efforts at transformation.

What is a rotation base? In simplest terms, it is the number of units in the force that must be maintained in order to sustain a given level of deployment. Owing to concerns over being able to recruit and retain soldiers into a volunteer military, the Army has argued that it must maintain a rotation base ratio of no less than 3:1, with 4:1 being about right.³¹⁵ The ratio means that in order

³¹⁵ *An Analysis of the US Military's Ability to Sustain an Occupation of Iraq* (Washington, DC: Congressional Budget Office (CBO), September 3, 2003), p. 11. CBO considers an acceptable rotation base ratio to be somewhere between 3.2 and 4.0:1. The Army may be exploring a rotation ratio as high as 5:1 for the active component and 10:1 for the reserve component.

to maintain one unit deployed abroad, three or four units must be fielded to serve as a rotation base to ensure that hardship deployments do not become so frequent that troops will begin to “vote with their feet,” causing an exodus from the Army as well as difficulties in recruitment.

Thus a 4:1 rotation base would see the Army maintaining four brigades to keep one forward deployed at all times. To extend the example, assuming six-month deployments, a 4:1 rotation base would see a soldier deployed, on average, 6 out of every 24 months. For the Army, which has 33 active brigades, to sustain a 4:1 ratio, it would be able to keep no more than 8 brigades on deployment at any given time. Yet the Army currently has some 20 brigades on deployment (16 in Iraq, and 2 each in Afghanistan and Korea).³¹⁶ Hence, maintaining a 4:1 rotation base would require an Army of 80 brigades, not 33.³¹⁷

The Army also can draw upon roughly 36 National Guard brigade combat teams (BCTs) to support its deployments. However, the rotation base ratio for NG units is probably closer to 6:1 or greater. Assuming this rotation base ratio means that roughly six Guard BCTs would be available at any given time to support active Army deployments.³¹⁸ Two National Guard BCTs are being committed to the Balkans mission. According to a Congressional Budget Office study, the Army could call upon between 1 2/3 and 2 1/3 additional National Guard BCTs to support missions elsewhere.³¹⁹ When added to the 8 active brigades that can be sustained with the Current Force structure, this yields about 10 to 11 brigades available to meet current deployment requirements—roughly half the number required under current conditions. To be sure, current conditions might soon change; but this is hardly guaranteed. If conditions do not change in the near future, the Army may confront a personnel crisis that could potentially disrupt current operations, and also divert badly needed resources away from its transformation initiatives.³²⁰

³¹⁶ The Army also has roughly one brigade each in Bosnia and Kosovo. Currently the mission in Bosnia is being met by a National Guard brigade combat team (BCT). An additional National Guard BCT is projected to assume the Kosovo mission in the spring of 2004. CBO, *Occupation of Iraq*, pp. 9–10. See also General Jack Keane, “An Army Update,” Briefing (July 23, 2003).

³¹⁷ The Army Chief of Staff, General Peter Schoomaker, recently announced that two Army divisions, the 3rd Infantry (Mechanized) and the 101st Airborne (Air Assault), would be reconfigured, with each having their three brigades split into five brigades that can operate independently as self-contained formations. These smaller brigades, according to reports, would be capable of rapid deployment, and could be augmented by assets from higher headquarters (e.g., aviation, engineer, artillery). If the concept works, the Army could end up expanding to 48 brigades. It is important to note, however, that this would not necessarily mean a larger Army; rather, it seems the Army would have more, but smaller, brigades. Thus, the net effect of this on relieving the Army’s force rotation problem may not be significant. Nor is it clear that these new brigades would be restructured so as to be optimized for urban or stability operations. Andrew Koch, “US Army Chief Looks at Dramatic Restructure,” *Jane’s Defence Weekly* (October 15, 2003).

³¹⁸ However, less than six brigades would be available for *deployment*. The reason is that upon mobilization, National Guard BCTs require several months of training prior to shipping out, and also require time upon return from their deployment to demobilize. Hence as much as 3 to 6 months of a National Guard’s year-long activation may be spent preparing to deploy or recovering from a deployment. CBO, *Occupation of Iraq*, p. 15.

³¹⁹ *Ibid.*, p. 15.

³²⁰ For example, in order to recruit and retain soldiers to serve under increasingly arduous conditions, the Army might have to offer enlistment inducements and re-enlistment bonuses. Unless these costs were covered through

Recruiting and Retaining the Future Force

Not surprisingly, military transformations typically lead to substantial shifts in the skill sets required of soldiers. According to the Army White Paper on the Future Force,

Ultimately, it will be the excellence of Soldiers and leaders that will realize . . . the full potential of the Objective [Future] Force . . . The quality, maturity, experience, and intellectual development of Army leaders and Soldiers become even more critical in handling the broader range of simultaneous missions in the is complex operational environment.³²¹

With its heavy emphasis on exploiting the potential of information systems and networks, the Future Force demands soldiers who are “mentally agile, intuitive, self-aware and adaptive” and who are “educated for rapid synthesis of information . . .”³²² The risks inherent in making these demands should not be discounted. It is often every bit as challenging—and as risky—to count heavily on an ability to transform the soldier skill set as it is to alter radically an army’s equipment. For example, limitations in Germany’s manpower base with respect to what Americans would call “mechanical literacy” imposed significant limitations on its army’s ability to ramp up the size of its mechanized forces during World War II.³²³

Will the Army be able to recruit and retain a much more “information-literate” force? Will it be able to significantly expand the size of the Future Force without encountering limitations on its ability to recruit and train soldiers in the right skill sets? If the Future Force units sustain significant casualties, how quickly will the Army be able to recruit and train replacements? What if the Army needs to increase in size? Will it be able to recruit and retain the soldiers needed to support a substantially larger ground force? Finally, given the increased emphasis likely to be placed on the Territorial and Constabulary Armies and the demands they make upon the Service’s Guard and Reserve units, can the Army recruit and retain sufficient Reserve Component soldiers even as deployments are high and transformation is under way? To be sure, it is difficult, if not impossible, to provide confident answers to these questions nearly a decade in advance of the Future Force being fielded. Yet there appears to be significant personnel risk in transforming the Army.

Of immediate concern is the Army’s ability to overcome the recruitment and retention crisis that may emerge if it is unable to reduce substantially the rate of overseas deployments. Should a personnel crisis materialize, it would not only compromise the Army’s ability to execute near-term missions, but could prove fatal to its transformation plans, both in terms of the increased difficulty attracting and retaining the people who would comprise the Future Force, and in terms

increases in the Army’s personnel budget accounts, funds would have to be diverted from other priorities. High deployment levels also reduce training time. This could slow the Army’s adaptation of new equipment and development of new doctrine.

³²¹ White Paper, *Objective Force*, p. 3.

³²² *Ibid.*, p. 7.

³²³ Krepinevich, *Transformation to Blitzkrieg*, pp. 19, 52.

of the funding that might have to be diverted from transformation initiatives to solve more immediate challenges.

THE VISION THING

The final, and perhaps most important, area of risk concerns the Army vision itself. The Army's vision of how its Future Force will operate is truly revolutionary. It displaces the combined arms mechanized operations that have dominated major conventional warfare since the introduction of the blitzkrieg in the early days of World War II with a network-centric force whose focus is not to "close with and destroy the enemy," but rather to fight the decisive engagement at extended ranges, using information and precision to "see first, understand first, act first, and finish decisively." However, several serious risks remain associated with this vision.

The greatest risk is in creating an Army for the "wrong" future. The Service's vision focuses heavily on open battle against an enemy with conventional forces, even though the Army is far more likely to confront irregular forces operating in complex or restricted terrain. This overly narrow vision courts risk by not adequately balancing the Future Force to account for the full range of operational contingencies the Army is likely to confront.

There is also the risk associated with irrelevancy. It is highly unlikely that the Army's sister Services will provide the key enablers necessary for the Expeditionary Army to deploy rapidly and be sustained adequately in an A2/AD threat environment. Moreover, if the Air Force and Navy were able to suppress promptly an enemy's A2/AD capabilities so as to enable the Army vision, it is *not clear that a transformed ground force along the lines envisioned by the Army would be necessary*. What does this mean? Simply this: as long as the US military maintains the air superiority that enables persistent reconnaissance, surveillance and target acquisition and on-call precision strikes, it can "see first, understand first, act first, and finish decisively." This capability was demonstrated in the Second Gulf War, when US air power proved so effective that the Army was denied the opportunity to engage in any significant tank battles with Iraq's Republican Guard.³²⁴

Hence the irony: the Army Future Force will likely prove most effective against an A2/AD threat that has precluded the Air Force from staging out of forward air bases and forced the Navy outside the littoral. However, under these circumstances, it is difficult to see how the Future Force can be deployed and sustained. Solving the A2/AD challenge enables the Future Force while marginalizing it at the same time.

³²⁴ Andrew F. Krepinevich, *Operation Iraqi Freedom: A First-Blush Assessment* (Washington, DC: CSBA, 2003), pp. 20–21.

VI. SUMMARY AND CONCLUSIONS

AN AZIMUTH FOR TRANSFORMATION

Despite its current status as the world's dominant land fighting force, the US Army has embarked on a major effort to transform itself in response to newly emerging challenges and opportunities, the product of concurrent geopolitical and military-technical revolutions. The major new challenges confronting the Army center on—

- Defending the US homeland from the increased risk of both missile and terrorist attacks, to include the covert employment of weapons of mass destruction;
- Projecting power rapidly against an enemy possessing robust A2/AD capabilities; and
- Denying enemies sanctuary from US land power, to include the use of urban terrain.

To this one might add the following:

- Conducting stability operations in the event of large-state failure and
- Dealing with the consequences of nuclear state failure.

Moving beyond the dominant land warfare paradigm that that has held sway since the dawn of blitzkrieg, and that centers on heavy, mechanized formations, the Army envisions that land warfare will take on the following characteristics:

- Operations will shift from linear to nonlinear;
- Formations will deploy and conduct operations in a much more distributed, dispersed manner;
- Operations will be conducted along more compressed timelines, and Army units will have to deploy over greater distances, leading to greater reliance on speed of mobilization and deployment;
- Advanced information technologies will enable ground forces to violate the principle of mass to better protect themselves by dispersion, while losing little of their ability to coordinate or mass combat capability (e.g., fires);
- Although close combat will remain a key element in land warfare, advanced information capabilities and munitions will enable ground forces to conduct the decisive engagement at far greater ranges than has historically been the case;

- Operations will be much more dependent on maritime and air forces for their success than in the past—in short, land operations will become more joint and more multidimensional than they are today; and
- The spectrum of land warfare will become blurred, with various forms of warfare merging, requiring unprecedented levels of flexibility from land forces.

ARMY TRANSFORMATION: AN OVERLY RISKY PROPOSITION?

Large-scale innovation that leads to a different land warfare regime is not easily accomplished; rather, it is often opposed vigorously by defenders of the status quo. Furthermore, while the Army offers a compelling vision for why it needs to transform, the transformation path it has chosen to pursue is characterized by considerable risk. To be sure, there is always risk associated with transformation. However, those shepherding the transformation process must take risk into account by developing hedges designed to mitigate its potential consequences. The path the Army has chosen is uncomfortably narrow, focusing on fielding what appear to be relatively homogenous new units that are oriented principally on only one aspect of the Service's future mission set: conventional warfare and the open battle.

Even given this narrow focus, the Army's transformation effort, whose ultimate focus is on fielding, beginning in 2012, a Future Force that conducts operations that are dramatically different and far more effective from those that characterize the Current Force, and that will be dominant across the entire spectrum of conflict, is a highly risky proposition, from multiple perspectives.

Despite this high level of risk, the Army has done relatively little within the framework of its transformation strategy to provide hedges. This is somewhat understandable, given funding limitations and deployment demands. However, the resources to develop hedges may exist. For example, the Army plans to spend roughly \$10 to \$15 billion to field six SBCTs, whose value is, at least at this point, rather problematic. At a minimum, it may be worth finding out how well the first two SBCTs perform before committing to the next four.

There is also the risk associated with irrelevancy. In its desire to field a force that is optimized for conventional theater war, the Army seems to have assumed that this force will also be highly effective in addressing other emerging threats and challenges—such as those associated with urban operations, postwar stability operations, large state failure, nuclear state failure, and homeland defense. However, given the absence of a sufficiently detailed elaboration by the Army as to how the Future Force concept of operations would address these threats and challenges, it is difficult to estimate the level of risk incurred. Moreover, if the Air Force and Navy were able to suppress an enemy's A2/AD capabilities promptly so as to enable the Army vision, it is *not clear that a transformed ground force along the lines envisioned by the Army would be necessary*. As was demonstrated in the Second Gulf War, so long as the United States military maintains the air superiority that enables persistent reconnaissance, surveillance and target acquisition and on-call precision strikes, the US military can effectively “see first, understand first, act first, and finish decisively.”

In summary, the Army Future Force will likely prove most effective when the A2/AD threat has precluded the Air Force from staging out of forward air bases and forced the Navy outside the littoral. However, under these circumstances, the Future Force will find it difficult to deploy and be sustained. Solving the A2/AD challenge would thus enable the Future Force—while marginalizing it at the same time.

What is to be done? This issue is beyond the scope of this paper, whose focus is diagnostic rather than prescriptive. A good starting point, however, would involve the Army assessing how its vision and its associated Future Force concept might be modified to reduce risk, and adapted to enable the Army to meet the full range of emerging threats and challenges that stimulated the call for transformation in the first place. For example, it is not clear the Army needs to hew slavishly to its current ambitious deployment metrics (i.e., a brigade deployed in 96 hours, etc.). The Army might revisit these metrics to determine whether they are, in fact, inviolable, or whether they can be relaxed without incurring too great a penalty in terms of increased risk. In areas where risk cannot be reduced to more acceptable levels, the Army might explore opportunities to develop strong hedges against failure. To succeed in an era of joint warfare, this effort must be supported by integrating the transformation plans of the other Services with the Army's. Finally, all this will require substantial resources. Some might be identified internally by the Army. Ultimately, however, it is incumbent upon senior Defense Department leaders to either provide these resources or accept the risks associated with the inadequate funding of Army transformation. In any event, the time to address these risks is now, as a new Army leadership team takes charge and while the opportunity still exists to shape the Future Force.

VII. GLOSSARY

A2/AD	Anti-Access Area-Denial
AAW	Anti-Air Warfare
ABM	Anti-Ballistic Missile
ACE	Armored Combat Earthmover
AMT	Air Maneuver Transport
APOD	Air Port of Debarkation
APOD-F	Air Port of Debarkation-Forward
ARADCOM	US Army Air Defense Command
ASW	Anti-Submarine Warfare
ATT	Advanced Theater Transport
BAT	Brilliant Anti-Tank
BCT	Brigade Combat Team
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance
CAIG	Cost Analysis Initiatives Group
CBO	Congressional Budget Office
CBRNE	Chemical, Biological, Radiological, Nuclear, or Enhanced Conventional Weapon
CERTEX	Certification Exercise
CKEM	Compact Kinetic Energy Missile
CONUS	The Continental United States
CS	Combat Support
CSS	Combat Service Support
Current Force	Legacy Force
DA	Department of the Army
DARPA	Defense Advanced Research Projects Agency
DCX	Division Capstone Exercise
DoD	Department of Defense
DSB	Defense Science Board
EBO	Effects-Based Operations
EMD	Engineering and Manufacturing Development
ER/MP	Extended-Range Multipurpose
FCS	Future Combat System

FSS	Fast Sealift Ship
FTR	Future Tilt-Rotor
Future Force	Objective Force
FY	Fiscal Year
GAO	General Accounting Office
GDP	Gross Domestic Product
GPS	Global Positioning System
GWOT	Global War on Terrorism
HIMARS	High-Mobility Artillery Rocket System
HLVTOL	Heavy-lift Vertical Takeoff and Landing
HSC	High-Speed Catamaran
HUMINT	Human Intelligence
IAV	Interim Armored Vehicle
IBCT	Interim Brigade Combat Team (Replaced by SBCT)
ICBM	Intercontinental Ballistic Missile
IMINT	Imaging Intelligence
INS	Immigration and Naturalization Service
ISB	Intermediate Staging Base
IW	Information Warfare
IWO	Information Warfare Operation
JCS	Joint Chiefs of Staff
JFCOM	Joint Forces Command
JNTC	Joint National Training Center
JOA	Joint Operations Area
JRTC	Joint Readiness Training Center
JRTC	Joint Readiness Training Center
JTR	Joint Transport Rotorcraft
JTRS	Joint Tactical Radio System
JUWTC	Joint Urban Warfare Training Center
LMSR	Large, Medium-Speed Roll-on/Roll-off
LOSAT	Line-of-Sight Anti-Tank
LRIP	Low-rate Initial Production
LRSD	Long-Range Surveillance Detachments
MANPADS	Man-Portable Air Defense System
MAV	Micro-Aerial Vehicles
MCO	Major Combat Operations

MGV	Manned Ground Vehicle
MIST	Multiband Integrated Satellite Terminal
MLRS	Multiple Launch Rocket System
MOG	Maximum on Ground
MOUT	Military Operations on Urbanized Terrain
NATO	North Atlantic Treaty Organization
NBC	Nuclear, Biological and Chemical
NDP	National Defense Panel
NLOS	Non-Line of Sight
NMD	National Missile Defense
NTC	National Training Center
OPFOR	Opposing Force
OSD	Office of the Secretary of Defense
PA&E	Program Analysis and Evaluation
QDR	Quadrennial Defense Review
R&D	Research and Development
RC	Reserve Component
RDO	Rapid Decisive Operations
RDT&E	Research, Development, Testing and Evaluation
RPG	Rocket-Propelled Grenade
RSTA	Reconnaissance, Surveillance, and Target Acquisition
S&T	Science and Technology
SBCT	Stryker Brigade Combat Team
SDD	System Development and Demonstration
SIGINT	Signals Intelligence
SOF	Special Operations Forces
SPOD	Sea Port of Debarkation
SSC	Small-scale Contingency
SSTOL	Super-Short Takeoff and Landing
Stryker Force	Interim Force
TEL	Transporter-Erector-Launcher
THAAD	Theater High Altitude Air Defense System
TRADOC	US Army Training and Doctrine Command
TRANSCOM	US Transportation Command
TSV	Theater Support Vessel

TUAV	Tactical Unmanned Aerial Vehicle
UA	Unit of Action
UAV	Unmanned Aerial Vehicle
UE	Unit of Employment
ULA	Ultra-Large Airlifters
VTOL	Vertical Takeoff and Landing
WIN-T	Warfighter Information Network--Tactical
WMD	Weapons of Mass Destruction