U.S. Army Stryker brigade combat team patrolling Mosul, February 2006

1st Combat Camera Squadron (John M. Foster)

Secretary of Defense testifying before House Armed Services Committee

Fleet Combat Camera, Pacific (Chad J. McNeeley)

Implementing the Transformation Vision

By WALTER P. FAIRBANKS

In January 2001, newly elected President George W. Bush made transformation a pillar of national defense strategy and described a broad vision for the Armed Forces. By the time Secretary of Defense Donald Rumsfeld established the Office of Force Transformation (OFT) in the immediate aftermath of 9/11, the urgent need for transformation was widely understood within the Armed Forces and the defense community. In October 2001, Secretary Rumsfeld appointed the late Vice Admiral Arthur Cebrowski, recently retired from the Navy, the first Director of Force Transformation.[1]

In President Bush's second term, military transformation remains a vital component of U.S. defense strategy, and the President's vision is gradually being realized. Some foreign and domestic observers assume the transformation process is complete or nearing completion while critics argue that the dividends of transformation have been disappointing and lack real substance.

The current state of defense transformation is somewhere between these two extremes. In the present dynamic security environment and amid rapid advances in technology, transformation should be viewed as a continuing process rather than a set of platforms or new organizations to be deployed by certain dates. The process is continuous in part because adversaries adapt as they identify U.S. vulnerabilities. On the whole, considerable progress has been made since 2001.

What Is Transformation?

In the Secretary's *Transformation Planning Guidance*, transformation is described as "a process that shapes the changing nature of military competition and cooperation through new concepts, capabilities, people, and organizations that exploit our Nation's advantages and protect against our asymmetric vulnerabilities to sustain our strategic

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position, which helps underpin peace and stability in the world."

There are, of course, other ideas about what defense transformation is or should be, but the main objectives of the Department of Defense (DOD) transformation process are clear: support the U.S. defense strategy, and sustain and enhance the Nation's competitive advantage in warfare. To achieve these objectives, transformation advocates aim to anticipate and create the future rather than react to a future that adversaries seek to impose. While the coevolution of military concepts, processes, organizations, and technology is not entirely new, the current DOD approach to transformation recognizes that a profound change in one of these areas can trigger a change in the others, creating both new competencies and new competitions (see figure 1).

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Implementing the process of transformation involves changing human behavior and creating a culture of innovation within DOD. Leaders at all levels—particularly senior leaders—must encourage innovation and reward those responsible for transformational developments in leadership, tactics, operations, strategy, concept development, experimentation, training, doctrine, organization, personnel management, education, business process, science, and technology. No system or capability, no matter how technologically advanced, is transformational until Service members learn to use it in ways that affect operating concepts, organizations, and processes. As Secretary Rumsfeld said in his fiscal year 2006 budget testimony before Congress, "Perhaps most important, more important than any particular line item or program, is that the culture of the Department and uniformed military is changing from one of risk avoidance to a climate that rewards achievement and innovation."[2]

Managing Transformation

The management of the DOD transformation process is decentralized by design. At the highest level, the President, Secretary of Defense, and Chairman of the Joint Chiefs of Staff guide and direct defense transformation. In managing the process, the Secretary and Chairman are assisted by the Office of the Secretary of Defense (OSD), Joint Staff, Services, defense agencies, and combatant commands. Within OSD, the Director of Force Transformation is charged with advising the Secretary on all defense transformation matters and serving as the advocate and catalyst for transformation within the Department.

A frequent question is how much DOD spends on transformation. That is hard to say, because transformation is far more than a list of programs. The concepts, capabilities, and organizations developed through innovative ideas, experimentation, major training exercises, and assessment of lessons learned on the battlefields of Afghanistan and Iraq cannot be categorized under a transformation line item in the defense budget.

It is not enough to transform forces and develop new warfighting capabilities. We must also transform the defense business and planning processes. These are the means by which leaders exercise management control and guidance over the DOD activities. Capabilities-based planning is a new tool to aid in this correlation of means, ways, and ends.

Capabilities-Based Planning

Capabilities-based planning (CBP), a new and evolving approach, is one of DOD's most important transformational initiatives in responding to the changing security environment. It provides a means for reducing institutional risk while allowing the greatest flexibility for transforming the force. CBP helps leaders create strategies that impose the greatest costs on potential adversaries while lowering costs of acquiring new capabilities and reducing the risk of failure. It addresses four challenges to national security that describe how adversaries might fight: traditional, irregular, catastrophic, and disruptive.

Traditional challenges entail military competition through conventional military operations with legacy and advanced military capabilities (for example, conventional land, sea, and air forces, along with nuclear forces of established nuclear powers). *Irregular* challenges are those in which adversaries aim to erode American influence and power through unconventional or irregular methods of waging war (terrorism, insurgency, civil war, and "unrestricted warfare"). *Catastrophic* challenges are aimed at paralyzing American leadership and power by employing weapons of mass destruction (WMD) or WMD-like effects in surprise attacks on critical, symbolic, or other high-value targets (for example, homeland missile attacks, proliferation from state to nonstate actors, and devastating WMD attacks on allies). *Disruptive* challenges seek to usurp American power and influence by acquiring breakthrough capabilities that put U.S. security at

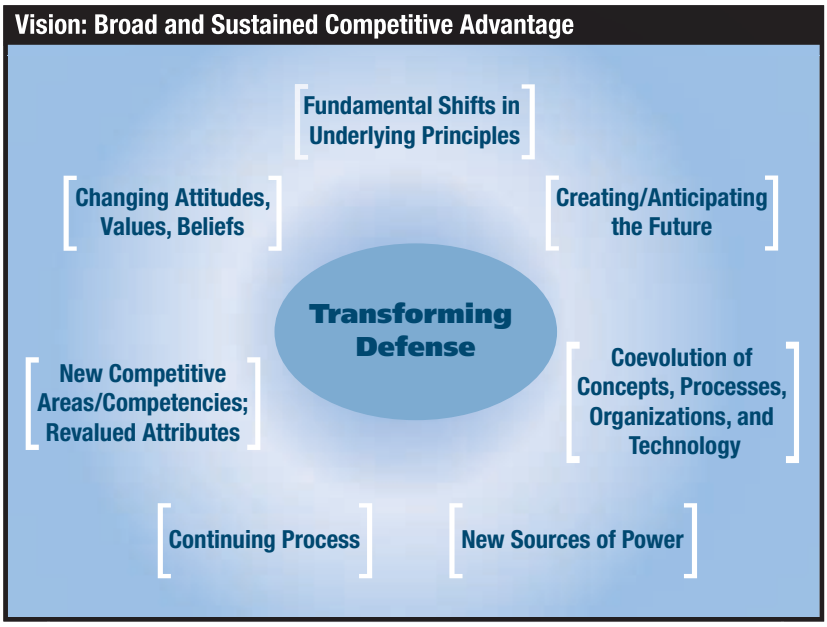

Figure 1

Lockheed Martin

F–35C Joint Strike Fighter

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risk (sensors, information warfare, biological warfare, cyberwarfare, ultraminiaturization, space, and directed energy).

The CBP process, by establishing a new analytical basis for the development of future U.S. military capabilities, is already providing DOD decisionmakers and planners with powerful advantages. This kind of planning is more dynamic and flexible than the threat-based planning of the past and much broader in scope (see figure 2). It affords planners the ability to:

- link DOD resource allocation decision-making to the *National Defense Strategy*
- balance risk across the four security challenge areas
- identify joint capability gaps, redundancies, and opportunities
- facilitate capability portfolios that hedge against uncertainty and increase costs to adversaries while suppressing American costs.

In addition, CBP is more joint-oriented than its predecessor because it uses a common conceptual framework with common definitions and identifies broad security challenges to the Nation rather than to a particular Service.

CBP also takes into account that the budget is not limitless. DOD cannot afford excessively redundant capabilities for one part of the spectrum, leaving capability gaps elsewhere. This kind of planning more effectively supports the creation of military capabilities to address every part of the conflict spectrum by continually analyzing the extent and composition of that spectrum. It also compels the Services to weigh risks in a joint context, take stock of what capabilities each Service already has, and consider trade-offs between existing capabilities and risks. Through capabilities-based planning, the path toward improved jointness not only has been improved, but it also has made operating jointly a necessity. Finally, CBP results in more objective judgments of national security challenges by using intelligence assessments to inform the entire process in a joint context.

Strategic Transformation Appraisal

One DOD tool for tracking overall progress each year is the *Strategic Transformation Appraisal*. Preparing the appraisal and presenting it to the Secretary of Defense are important responsibilities of the Director of Force Transformation; the document assists the Secretary in evaluating progress across DOD in the implementation of transformation, both in direction and balance. In developing the appraisal, the OFT reviews the annual Service transformation roadmaps and the joint roadmap prepared by U.S. Joint Forces Command and assesses the direction of transformation. These roadmaps are compared with broad guidance contained in key DOD documents such as the *Quadrennial Defense Review Report*, *Transformation Planning Guidance*, and *Strategic Planning Guidance*.

The Office of Force Transformation employs three sets of qualitative metrics to analyze roadmaps. The first set, derived from the *National Defense Strategy*, reviews the four strategic challenges facing the United States (traditional, irregular, catastrophic, and disruptive) as the first step in a top-down CBP effort. The second set focuses on capabilities described in the four approved joint operating concepts (JOCs).[3] The joint interdependencies the Services have identified in their transformation roadmaps form the third set of qualitative metrics used in the analysis. The OFT analysis identifies capability gaps and shortfalls that have not been addressed in the transformation roadmaps and generates conclusions and recommendations concerning the state of transformation in DOD.

For example, the *2004 Strategic Transformation Appraisal* observes that the Army, as evidenced by its 2004 roadmap, is becoming more mobile and flexible in its operations and organization.[4] To take full advantage of this transformation, DOD must be able to move the Army's new brigade combat teams quickly across the noncontiguous battlespace. Yet OFT found no major joint effort in the roadmaps to develop new forms of battlefield mobility or reduce existing demands on air transport capabilities.

Another key area OFT did not see in the roadmaps was the camouflage, cover, and concealment of forces. Given the expected proliferation of inexpensive sensors and their ready availability to potential enemies, the advantage U.S. forces have long enjoyed in this area may erode significantly. To close this gap, DOD must find new capabilities to deny the use of sensors against its land- and sea-based surface forces.

A major conclusion of the *Strategic Transformation Appraisal* resulted from a

comparison of the capabilities required by two of the four JOCs (stability operations, homeland defense and support operations) with the Service and joint transformation roadmaps. This comparison revealed an unmet need for horizontal integration across Federal agency boundaries and vertical integration across Federal, state, and local governments and agencies. Just as the Services have moved from deconfliction to interoperability, and are now moving toward joint interdependence, the agencies of the executive branch need "interdependence with coherence." This will not be easy or quick, but it is essential to winning the war on terror.

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The *Strategic Transformation Appraisal* also identified a future need to match the strategic, operational, and tactical reach of U.S. forces with the ability to sustain them across great distances with materiel and intelligence. These are but a few of the insights provided by the most recent appraisal, an assessment that reveals gaps that might otherwise have been overlooked.

Strengthening the Transformation Process

Four key areas—new metrics, an integrated sensor strategy, battlespace mobility and operational maneuver, and a broader approach to national security—offer great potential for strengthening the ongoing implementation of the President's defense transformation vision and ensuring the competence and relevance our forces will need to meet future security challenges.

New Metrics. In both force building and force operations, new metrics are needed to assess military capabilities, but care must be taken in their selection and application. In transitioning from the industrial age to the information age, we have been using a set of "initial" metrics, suitable to the information age, as the basis for measuring and ultimately enhancing the *competence* of the Armed Forces—access, speed, maneuver, distribution, sensing, and networking. To ensure that forces are both competent and *relevant* as the transformation process continues, at least four additional overarching metrics are needed to assess future military capabilities and guarantee force relevancy (see figure 3).

Create and preserve options: In uncertain times, creating, analyzing, and testing options are essential to military operations and force-building activities such as training, developing new joint and Service organizations, and designing and procuring new equipment. Creating, analyzing, testing, and preserving options in these areas can complicate a potential enemy's decisionmaking processes, broaden the base of choices, and reduce risk. When U.S. forces are operating in the battlespace, the enemy is compelled to contend with multiple options, increasing his cognitive burden. In the procurement process, we should avoid practices that narrow options too early. A strong research and development program emphasizing basic research is one component of a strategy that increases the number and variety of ideas that may be applied to military operations and force-building activities.

Employ higher transaction rates: The transaction rate increases as the number of both actors and interactions with the competition and environment increases. The quality and quantity of these interactions will increase the likelihood of learning and success over time. The speed with which information is collected, communicated, processed, and acted on by U.S. forces powerfully accelerates the transaction rate. In turn, the ability to compete based on cycle time is a powerful advantage that reduces the time required to create or execute an option. The employment of higher transaction rates, assuming the quality of the transactions involved, can enable us to seize and hold the initiative in either force building or force operations. The high speed of joint and combined operations during *Iraqi Freedom* and the new transactional dynamics that enabled that speed, such as those made possible by network-enabled forces, completely outpaced the enemy's ability to respond, resulting in his rapid defeat during the major combat operations phase.

Achieve higher learning rates: Achieving high learning rates is important for preserving relevance in the information age and is closely coupled with high transaction rates. If the United States is to take full advantage of what the information age offers, fast institutional learning is critical, both in force building and force operations. The information age offers great opportunities to increase learning rates, but increased access to information is only part of the solution. To

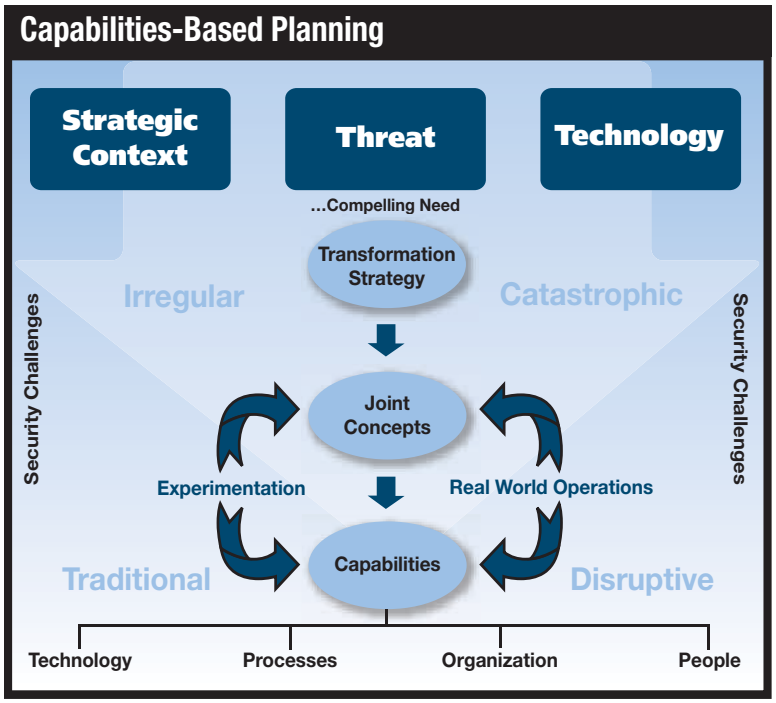

Figure 2

create an environment where high learning rates will flourish, robust experimentation and a culture of innovation must become commonplace. Once established, such an environment will pay dividends during exercises, where prototypes can be experimented with and technological possibilities exploited more rapidly. If forces can sustain a high rate of learning in combat, their ability to outfight the enemy increases.

Create overmatching complexity: Complexity involves the number, variety, and interaction patterns of entities within a system. The goal of U.S. forces is to present overmatching complexity, including at scale, to the enemy. Thus, if the enemy is using individuals and small units that employ guerrilla tactics, we must employ small, mobile, and flexible units to defeat them. One of the main objectives in designing the future force structure and conducting operational planning should be to complicate planning and actual operations for adversaries, giving our forces a powerful advantage. Creating complexity relative to the enemy is one of the key design principles emphasized in a recent OFT report to Congress presenting alternative future fleet architectures for the Navy.[5]

Integrated Sensor Strategy. The growing interoperability and interdependence of U.S. forces are important elements of DOD transformation. To this end, all elements of the joint force must be able to share the same understanding of the current tactical and operational situation simultaneously. This is accomplished, in part, through the continual updating, disseminating and tailoring of the common operational picture (COP). The interoperability of data-exchanging systems, particularly sensors, is essential to effective military operations, whether these systems are updating the COP or feeding information directly to weapons systems. Because of the rapidly increasing capabilities of sensors and their critical role in the conduct of military operations, an integrated sensor strategy is needed to guide sensor employment at the tactical, operational, and strategic levels.

Potential of integrated sensors: Today's sensors collect data concerning current enemy and friendly force dispositions and activities, as well as personnel, logistic, medical, and environmental data, all to create the information the warfighter needs. A wide range of sensors operating throughout the battlespace, when networked, properly tasked, and effectively integrated, can provide a vast amount of continuously updated information to the warfighter at the tactical and operational levels. The types of data that can be collected by sensors in the future will be limited by available technology, battlespace survivability, affordability, and the capability of individuals and military organizations to task and operate the sensors and use the information they collect.

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Requirement for integrated sensor strategy: The increasing number of sensor suites operating in the battlespace and the growing demand for real-time sensor data underscore their importance to the warfighter. The integrated sensor strategy should address and resolve the tradeoffs stemming from tactical, operational, and strategic sensor interactions and interdependences. When fully developed and executed, an integrated sensor strategy will enable forces to operate more effectively in a networked environment.

Elements of an integrated sensor strategy: One of the first considerations in developing an integrated sensor strategy should be a careful examination of existing DOD strategies that can support or impact it in some way.[6] The strategy might also include an enterprise operating framework, an organizing principle for sensor integration and employment, an organizational construct that identifies responsibility for developing and implementing the strategy, a supporting architecture, and a methodology for conducting continuous sensor concept and technology pairing assessments through experimentation.

Information superiority: Information superiority is a key element for a force that substitutes the massing of effects for massing forces. To achieve the greatest effects, forces must be able to receive, react to, and even anticipate the need to move and engage based on queuing from persistent sensors that provide extensive coverage and relevant, accurate, and timely data. The availability of such information, coupled with increased mobility, will allow a small U.S. force to assume responsibility for a large geographical area.

Flexibility: Finally, an integrated sensor network should accommodate the "many-to-many" data exchanges required when operating within a network-centric environment. The "sensor web" of the National Aeronautics and Space Administration is an example of

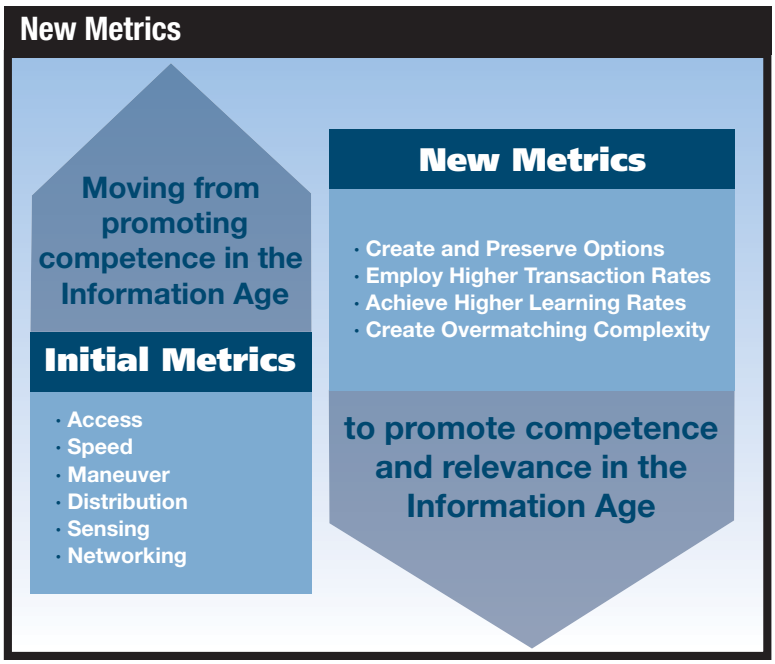

Figure 3

Ultra armored patrol vehicle prototype with ballistic and mine protection technologies

U.S. Navy (John F. Williams)

a sensor network that includes flexibility of deployment, low power consumption, and low cost. Overall, the sensor environment should eventually provide operators with a significant awareness of the battlespace and the ability to assess and monitor the military situation from the tactical to the strategic level, while maintaining the precise locations and operational status of units, weapons systems, and materiel. It will require connectivity, communications, and sustainment for these sensor grids to maximize benefits from the generated data. As this sensor integration strategy is created, it should be based on the central theme that every person, system, and platform is a potential sensor within the overall network.

Battlespace Mobility and Operational Maneuver. In the ongoing implementation of network-centric warfare, the Armed Forces have made great strides in developing shared awareness of American forces in the battlespace,[7] but there is a gap between the rapidly improving ability to maintain and share a common operational picture and the ability to act quickly and decisively on this information in the pursuit of tactical, operational, or strategic objectives. To realize the full potential of network-enabled capabilities and enhance power projection capabilities, U.S. forces must become more adaptive and agile than ever before. The ability of our forces to adapt to changing situations faster and more decisively than the enemy will require not only reliable and timely intelligence, shared awareness, and the close synchronization of fires with maneuver, but also enhanced battlespace mobility.

Relationship between networking and shared awareness: There is a direct correlation between a robustly networked force and the ability of all elements of the force to enjoy a high degree of shared situational awareness. As we have continued to build a collaborative network of networks within the joint force, we have seen increasing evidence of the power of this relationship on the battlefields of Afghanistan and Iraq, from the results of major joint and Service exercises, and in the findings of a series of case studies sponsored by the Office of Force Transformation on network-centric operations across a broad range of mission areas, including allied and coalition operations.

Mobility: Integrated sensors, good intelligence, networking, and shared awareness alone cannot win battles or campaigns. They can enable the precise application of force and the conduct of effects-based operations, but U.S. forces will not be able to defeat a determined, well-trained enemy unless it possesses an overwhelmingly superior capability to apply force, especially ground maneuver elements and precision firepower, at precisely the right time and place to gain the desired effects. In other words, we must strive to improve the ability to conduct rapid, decisive maneuver at the tactical and operational levels. To do this, ground forces must be provided with an even greater mobility advantage over potential enemies.

Operational and tactical maneuver: Increasing the speed at which forces can be deployed at the strategic level is important, but ways also must be found to increase the speed of maneuver of ground forces at the tactical and operational levels of war once they arrive in the theater. If ground forces do not have a decisive edge in maneuver speed to complement advantages in observation, data distribution, analysis, and firepower, DOD may be forced to conduct attrition-style warfare, leveling the playing field for future adversaries. The creation of an operational and tactical maneuver force that can move rapidly by air offers one means of providing the desired speed advantage on future battlefields.

Broader Approach to National Security. To deal effectively with the four security challenges, especially the irregular, catastrophic, and disruptive challenges, the United States must adopt a broader approach to national security. For example, the necessity of civic assistance at home, as well as during and after major combat operations overseas, dictates a need for transformation in virtually every domain of national security, not only within the purely military province of the Department of Defense. The importance of civilian first responders in crises such as 9/11 and of nongovernmental organizations and private companies in rebuilding countries such as Afghanistan and Iraq demonstrates that DOD is only one component of national security. There are several ways to develop a broader approach.

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Military power should be integrated with other elements of national power. At every level, DOD and the Armed Forces are increasingly coordinating with civilian organizations, including executive branch departments such as State, Homeland Security, Justice, Energy, and Transportation. Such collaboration must become institutionalized, and tools such as those presented through network-centric solutions must be distributed to other executive departments, states, and localities.

The establishment of a National Security University should be considered to matriculate selected mid- and senior-level officials from every relevant Federal and state agency. Together, the students would gain and nurture a holistic understanding of national security rather than a view that, historically, has focused on a military-centered national defense.

As the military continues to transform, the capabilities gap between it and many allied and coalition partners is widening. Some longtime allies, having operated closely with U.S. forces for many years, have received preferential treatment for the release of technology. Those with strong economies can afford the expenditures necessary to keep pace. However, some of both our newer and longtime North Atlantic Treaty Organization allies have relatively weak economies. We must work to close these gaps or create bridges to take maximum advantage of these allies' strengths.

To help fight the war on terror, the United States may decide to participate in combined military operations with nontraditional partners. In preparing for antiterrorism operations with the forces of these new strategic partners, the challenges grow exponentially in terms of technology release, equipment interoperability, and a common language for communication. Some level of intelligence–sharing, operational and tactical planning, and perhaps command post or field exercises will be essential to ensure adequate preparation.

A great deal has been accomplished over the past 4 years in regard to defense transformation, including the creation of a new strategic framework, a valuable transformation roadmap process, promising new concept and technology pairings, and the endowment of a generation of commissioned and noncommissioned officers with the education, training, and experience to understand, appreciate, and adopt these changes. Yet transformation is a continual process, and much remains to be accomplished. We should view this prospect as both necessary and exciting. Today's national security challenges demand nothing less than an uncompromising commitment to continue improving the DOD planning and budgeting process, the roadmap process, concept/technology pairings, and cooperation and coordination among defense components, Government agencies, and multinational partners. **JFQ**

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NOTES

[1] The ideas expressed in this article, especially in the section entitled "Strengthening the Transformation Process," were inspired by Admiral Cebrowski.

[2] Secretary of Defense Donald H. Rumsfeld, Fiscal Year 2006 Budget Testimony, March 2005, 18.

[3] There are four approved joint operating concepts: major combat operations, stability operations, strategic deterrence, and homeland defense and civil support (formerly homeland security).

[4] Due to the DOD focus on the 2005 Quadrennial Defense Review process last year, Service and joint transformation roadmaps were not submitted to the Office of Force Transformation (OFT) in 2005, nor did the OFT prepare a *2005 Strategic Transformation Appraisal* (STA) for the Secretary of Defense. Transformation roadmaps are being developed by the Services and Joint Forces Command this year, and OFT will prepare a 2006 STA for the Secretary.

[5] Office of the Secretary of Defense, Report for the Congressional Defense Committees, *Alternative Fleet Architecture Design,* Washington, DC, January 2005. In addition to the notion of creating overmatching complexity relative to the enemy, three other major design principles used in this Office of Force Transformation study were network-centric warfare, modularity, and smaller ships and improved payload fractions.

[6] Some of the relevant strategies include the DOD Net-Centric Data Strategy, Global Information Grid Enterprise Service Strategy, DOD/Intelligence Community Horizontal Integration Initiative, DOD Information Assurance Strategic Plan, DOD Logistics Strategy, and National Geospatial-Intelligence Agency Integration Strategy.

[7] For a description of the emerging theory of network-centric warfare, its central place in force transformation, and its ongoing implementation in DOD, see *The Implementation of Network-Centric Warfare* (Washington, DC: Office of Force Transformation, Office of the Secretary of Defense, January 5, 2005).

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