

CRS Report for Congress

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Air Force Transformation: Background and Issues for Congress

Christopher Bolkcom
Analyst in National Defense
Foreign Affairs, Defense, & Trade Division

Summary

Many believe that the Department of Defense (DoD) — including the Air Force — must transform itself to ensure future U.S. military dominance. The Air Force has a transformation plan that includes advanced technologies, concept development, and organizational innovation. Issues for Congress include the efficacy of this plan, its feasibility, and the attendant costs. This report will be updated as events dictate.

Introduction

Over the past several years, defense analysts and decision makers have increasingly discussed the need for the Department of Defense (DoD) to transform itself in light of rapidly changing geo-military circumstances.¹ DoD and the military services have developed transformation plans and, to varying degrees, embarked upon them.² Yet, questions remain about cost, schedule, and the need to balance transformation objectives with near term modernization needs.

Definition and Impetus. One obstacle to transformation is that there is no single, approved, definition. However, a 1999 Defense Science Board study on warfighting transformation generated a useful working definition:

Transformation is a process that seeks fundamental change in how an enterprise conducts its business....the intent of this transformation is to foster discontinuous

¹ For instance: The 1997 Quadrennial Defense Review; The National Security Strategy of the United States; The Secretary of Defense's Annual Report to the President and Congress; The 1998 National Defense Panel; P.L. 105-261, Title IX, Subtitle A, Sec. 903.

² For Army and Navy transformation efforts, see CRS Reports RS20787 and RS20851.

change in the nation's capabilities to conduct (military) operations – one or more revolutions in military affairs (RMAs).³

Transformation will require not just new technologies, but also new operational concepts and organizational innovation. Transformation is not modernization, which aims primarily at improving existing capabilities. Transformation and modernization efforts may often be contradictory, especially when they compete with each other for funding and priority.

Although they disagree on some details, senior leaders in both the Clinton and Bush administrations describe the need for the United States to embark on a transformation path today, to meet a range of security challenges from 2010 to 2020.⁴ Many defense thinkers agree, saying that while the world has changed greatly over the past 15 years, the Services have not. Generally, today's military looks too much like that of the Cold War, they say. While the United States is today's dominant military power, past dominant powers have been surprised by changing circumstances and unforeseen threats.⁵

Transformation Process(es) and Desired Output. In May 1996 the Chairman of the Joint Chiefs of Staff published *Joint Vision 2010 (JV2010)*: a conceptual template for how America's armed forces may leverage technological opportunities to achieve new levels of effectiveness in joint military operations. This transformation guide was updated, expanded and published in May 2000 as *JV2020*.⁶

While exact transformation processes are still being developed, it is generally believed that implementing transformation will require greater emphasis on 1) service and joint concept development and experiments, 2) science and technology efforts, tied closely to warfighters, 3) processes that identify and quickly operationalize promising concepts, and 4) interoperability efforts critical for effective coalition operations.⁷

It is hoped that these transformation processes will generate a new military that can dominate a broad spectrum of potential threats. A transformed Air Force, for example, may be able to execute global attacks from the United States that would be effective (e.g. high probability of kill, low cost per kill and no collateral damage) against fixed, buried, and time-critical targets that are intermingled with civilians

Air Force Transformation Activities

Efforts to Date. Air Force leaders believe that the Air Force has already achieved a military transformation, and that their current activities are a continuation of this

³ Report of the Defense Science Board Task Force on DoD Warfighting Transformation. September 1999. Office of the Under Secretary of Defense For Acquisition and Technology. p.3.

⁴ 2001 Annual Report to the President and the Congress. William S. Cohen. Secretary of Defense. George W. Bush "A Period of Consequences" The Citadel. September 23, 2000.

⁵ For instance: Cohen, Eliot. Defending America in the Twenty-first Century. *Foreign Affairs* November/December 2000. p. 40-56.

⁶ Report of the Quadrennial Defense Review. William S. Cohen. Secretary of Defense May 1997. Section VII. p. 1. *JV2010* has been updated, and is now called *JV2020*.

⁷ 2001 Annual Report to the President. OpCit (Chap.11: A Strategy for Military Transformation).

process.⁸ Air Force officials contend that in the 1991 war with Iraq (Operation Desert Storm) the Air Force demonstrated two of the three required elements of a military transformation: The use of new technologies (stealth and precision guided munitions) to enable novel operational concepts (effects-based planning, and parallel warfare) and “leap-ahead” capabilities (the total destruction of Iraq’s air power capabilities).

Following Operation Desert Storm, the Air Force launched organizational changes (the melding of the Strategic and Tactical Air Commands, and the introduction of the Expeditionary Aerospace Force (EAF)), that represented the final piece of this first phase of Air Force transformation. Whether the Air Force view on its state of transformation is accurate or not, it appears that the Air Force has taken steps aimed at transformation, and has established processes designed to guide these efforts. Initiatives appear to address most if not all facets of the air power enterprise. The Air Force has borrowed a concept from the Army –called DOTMLPF – that reflects its desire to improve doctrine, organization, training, material, leadership, personnel, and facilities in a coordinated manner.

The Air Force’s transformation process is encapsulated in a vision – *Global Vigilance, Power and Reach* – that describes transformation goals and methods. Six functional Battle Labs were established to develop new ideas and concepts to refine this vision. The Air Force also annually conducts wargames and experiments such as the Expeditionary Force Experiments. An Innovation Steering Group was established to guide transformation activities, and ensure “warfighter” inputs and feedback into the process. Changes have also been made to weapon acquisition and budget development and allocation processes. For example, the Air Force Resource Allocation Process – initiated in October 2000 -- is designed to give the Major Commands (e.g. Air Combat Command, Space Command, and Air Mobility Command) a greater voice in the budgeting process.

Continuing Activities. While Air Force officials express satisfaction with their achievements to date, they say that Air Force transformation is not complete, and that they are continuing the transformation process by pursuing advanced technology, new operational concepts, and organizational innovation.

The Air Force is pursuing technologies that it believes could enable it to develop new operational concepts, and dominate air, space, and cyberspace. These include high performance stealthy aircraft (such as the F-22 and Joint Strike Fighter (JSF)), unmanned combat aerial vehicles (UCAVs), directed energy weapons (such as the airborne laser), miniaturized munitions, and advanced command, control, communications, computers and intelligence (C⁴I). The Air Force’s space-related programs are in varying states of maturity, and include space-based radars, space-based lasers, micro satellites, “next generation” missile defense, and space operations vehicles. Air Force efforts in the area of cyberspace include computer network attack, computer network defense, and information assurance activities. Both space and cyberspace capabilities are expected to become increasingly important as the Air Force and the other services leverage U.S. information technology assets in numerous warfighting applications.

⁸ Roos. John. “Effect-Based Operations.” *Armed Forces Journal International*. March 2001. p. 66. and Brig Gen David Deptula. *U.S. Air Force Transformation Review*. March 9, 2001. p.5.

The impact of new technologies is limited if they do not create, or are not embodied, in new warfighting approaches. The Air Force appears to be developing new operational concepts designed to exploit emerging technologies and enable new capabilities. These operational concepts are in varying stages of maturity and they often overlap. They range from very narrowly focused ideas to broad philosophies. They include:

- **Effects-based Operations (EBO)** is a framework for planning, executing, and assessing military operations. Its goal is to achieve desired effects through the tailored application of joint combat power. EBO may depend heavily on new capabilities such as “predictive battlespace awareness.”
- **Global Reconnaissance Strike/Global Strike Task Force (GSTF)** is an initial power projection employment concept, designed to defeat adversary anti-access threats (weapons like surface-to-air, cruise, and ballistic missiles, that make it difficult to operate in a foreign theater). It would consist of a “kick down the door” force (B-2s, F-22s and other assets) that would make room for “persistence forces” like the JSF. A GSTF could employ Effects-based Operations.
- **Rapid Halt Operations** would capitalize on precision, reach, advanced C⁴I and reconnaissance to rapidly employ tailored joint forces to control adversary actions and seize the initiative by isolating, incapacitating, and rapidly halting aggression.

The final facet of the Air Force’s transformation effort is organizational innovation. Organizational changes can be the most difficult and most important piece of the transformation puzzle. Organizational change is difficult because it involves human factors; non-quantifiable, social and psychological issues, such as tradition, culture, and mind set. However, organizational change is central to transformation, because it codifies and institutionalizes new capabilities and ways of doing business.

Refining the EAF appears to be the Air Force’s main effort in the area of organizational change. The purpose of the EAF is to provide a structure and schedule to effectively meet contingency demands. The EAF will organize much of the Air Force into 10 Aerospace Expeditionary Forces (AEFs) that will include combat, mobility, and combat support forces that rotate on a 15-month training and deployment cycle. Each AEF includes approximately 175 aircraft and 20,000 people from both the active and reserve components. AEFs (and two rapid-reaction Aerospace Expeditionary Wings) form the heart of the EAF, but strategic mobility forces and so-called low density/high demand (LD/HD) forces (such as U-2s and JSTARS) are also key elements. The Air Force hopes to deploy an AEF in 48 hours, and up to five AEFs within 15 days. Each AEF is tailored to the regional commander’s needs.

The Air Force completed its first full 15-month AEF rotation and began its second on December 1, 2000. The Air Force learned some lessons from this first cycle, and has made refinements to the concept. For example, it has created additional LD/HD crews and linked them to the AEFs. Although this does not reduce the burden high deployment rates place on aircraft, it does help reduce the stress on people.

Issues for Congress

Congress may, as part of its defense oversight function, assess the merits of the Air Force’s transformation program: Is it aggressive enough? Is it politically or economically feasible? Will it achieve the desired effect? Are transformation goals balanced with

important modernization needs? The debate over the F-22 and JSF programs may offer an example of how transformation questions intersect, and may increasingly vie for Congressional attention. Evident in this debate are contrasting views on which technologies to pursue, how aggressively to pursue them, and the difference between transformation and modernization.

Critics of USAF plans to acquire 339 F-22s and 1,763 JSFs argue that these aircraft are modernization, or recapitalization programs, and that the Air Force's requirement for new fighters would be adequately satisfied in the near term by upgrading and procuring F-15s and F-16s. They argue that the effectiveness of today's fighter and attack aircraft can be maintained through upgrades to their radars, command and control systems, and weapons. Future adversaries, they argue, will increasingly employ mobile cruise, ballistic and surface-to-air missiles that will jeopardize the forward operating bases that shorter range military aircraft – such as the F-22 and JSF – will require to generate significant sortie rates. By cancelling or truncating the F-22 and JSF, critics argue, the Air Force can free up substantial funding that can be used to more aggressively pursue programs such as space-based assets, directed energy weapons, information operations, UCAVs, or long range bombers. Such programs are more likely to overcome tomorrow's anti-access threats, and offer more transformation potential.

Supporters of the Air Force's transformation plan counter that while the F-22 and JSF do modernize today's fighter and attack aircraft force, they will also transform air operations. Their combination of stealth and high aeronautical performance (e.g. maneuverability, speed, and endurance), will enable radical capabilities and operational concepts. Further, they argue, along with long-range bombers, stealthy high-performance aircraft offer the best potential for overcoming tomorrow's anti-access threats. Air Force supporters also contend that F-15s and F-16s are nearing the end of their useful lifetimes. Spending today's money perpetuating 1970s-era technology, they argue, is not wise. Finally, supporters note that the Air Force is already pursuing space-based assets, cyberspace operations, directed energy weapons, and UCAVs. The Air Force's current budget makes it difficult to spend more on these programs, given other pressing priorities.

An issue implicit in the debate described above, is the pace and aggressiveness with which the Air Force should pursue potentially high-payoff technologies such as space-based assets and unmanned aerial vehicles (UAVs and UCAVs). Many analysts argue that exporting many Air Force operations from the atmosphere to outer space could increase their effectiveness and survivability, and should therefore be pursued aggressively; perhaps at the expense of other programs. Others, including many in Congress, strongly support an increased use of UAVs and UCAVs to engender new warfighting capabilities, and to reduce the risk of U.S. casualties. In addition to setting aggressive goals for fielding UAVs, congressional UAV advocates also find fault with the recent decision not to accelerate procurement of the Global Hawk UAV, the Air Force's next generation airborne intelligence, surveillance and reconnaissance (ISR) platform.⁹ This perspective argues that the Air Force is prone to sacrificing transformation opportunities for modernization needs, and that a balance between modernization and transformation requirements must be found.

⁹ See: CRS Report RL30727, The U-2 Aircraft and Global Hawk UAV Programs.

Air Force officials argue that they are pursuing transformation programs – such as space and UAVs – as aggressively as is prudent within projected budgets. Current readiness shortfalls make Air Force modernization a tangible and high priority, that should not be sacrificed for transformation programs that may or may not pay off years hence. If the Air Force is asked to more aggressively lead DoD’s efforts in these transformation areas, they argue, this effort should be funded in addition to modernization. Perhaps a re-examination of the traditional division of DoD’s budget among the Services is appropriate, they argue.

Air Force organizational activities are also an issue. The Air Force believes that refining and implementing the EAF will have a transformational effect. Air Force officials say that the EAF compels the Air Force to organize and think about itself in terms of composite teams, not along functional “stove pipes.” It also ensures that the units deployed to conduct a mission are at the peak of their training and readiness. Furthermore, Air Force officials believe that the EAF creates an expeditionary mind set and provides an effective mechanism for reducing personnel tempo, which in turn could ameliorate recruitment and retention problems. Finally, the Air Force believes that the EAF provides a basis for additional organizational innovation. As an example, Air Force officials cite the GSTF, which will be composed of the first two or three AEFs deployed to a theater.

Critics suggest that while a useful force management tool, the EAF concept is not transformational. The EAF, they argue, is a more modest organizational change (like changes instituted by the Navy many years ago) that simply facilitates rotational forward deployments of forces. To transform the Air Force’s warfighting capabilities, the EAF, or other organizations, must inherently leverage new technologies and enable new operational concepts. These characteristics are not evident in the EAF, they argue.

A great debate also revolves around some of the Air Force’s transformation operational concepts, such as Rapid Halt Operations. While many in the Air Force believe that air power alone can defeat or at least stalemate enemy ground forces, many other analysts – including many in the Army and Marine Corps – maintain that only ground forces can capture and control enemy territory and forces.

Many studies suggest that a final issue for Congress may be a review of its own role in transformation. Leading transformation thinkers argue that military transformation faces powerful status quo opposition, and will be infeasible without close congressional coordination. They describe a need for new working arrangements between the Services and Congress. These studies assert that to achieve transformation, Congress should consider modifications to current budgetary oversight mechanisms, such as bi-annual budget authority, giving DoD managers more flexibility to shift funds between accounts, and removing statutory barriers to a greater private role in areas such as defense depot maintenance. They also say that Congress must play a role in managing the defense industrial base, in part by devising new rules and procedures that encourage technology development, rather than large weapon production quantities.¹⁰

¹⁰ National Defense Panel. OpCit. p. vi, 67, 82. DSB on Transformation OpCit. p.28.