

An hourglass-shaped graphic with a globe inside. The top bulb is dark blue, and the bottom bulb is light blue. The globe is centered in the narrow neck of the hourglass. The top bulb is filled with a dark blue color, and the bottom bulb is filled with a light blue color. The globe is centered in the narrow neck of the hourglass.

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*Army Transformation and Modernization: Overview and  
Issues for Congress*

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**Abstract.** The U.S. Army has begun an ambitious program intended to transform itself into a strategically responsive force dominant in all types of ground operations. As planned, its Objective Force will eventually mend all ongoing initiatives into a force based on a high- tech Future Combat System. This report describes the program and discusses issues of feasibility, viability, and affordability of potential interest to Congress.

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# CRS Report for Congress

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## Army Transformation and Modernization: Overview and Issues for Congress

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### Summary

The U.S. Army continues an ambitious program intended to transform itself into a strategically responsive force dominant in all types of ground operations. As planned, its Future Force will eventually meld all ongoing initiatives into a force based on a high-tech Future Combat System (FCS). Its Current Force is beginning to provide a new combat capability, based on current-technology armored vehicles, for the mid-intensity combat operations that seem prevalent in today's world. Its current "legacy force" of existing systems is being modernized and maintained to ensure effective light and heavy force capabilities until the Future Force is realized. This short report briefly describes the program and discusses issues of feasibility, viability, and affordability of potential interest to Congress. It will be updated as events warrant.

### Background

Modernization is not a new issue or objective for U.S. military forces, but it has taken on new urgency because of: the post-Cold War downsizing and procurement reductions, the new global environment and unexpected requirements, and the promise of a "revolution in military affairs" (RMA) suggested by rapid developments in computers, communications, and guidance systems. The last notable surge in modernization culminated during the "Reagan build-up" of the 1980's. Weapons and doctrines developed and fielded in that era made fundamental contributions to United States successes in the Cold War, the Gulf War, and Kosovo. For the Army, such weapons included the M1 Abrams tank, M2 Bradley armored fighting vehicle, Apache attack helicopter, Blackhawk utility helicopter, and Patriot air defense system.

During post-Cold War downsizing, the Army greatly decreased purchase of new equipment and largely deferred development of a next generation of weapons, with notable exceptions being R&D for a howitzer, the Crusader, and a reconnaissance

helicopter, the Comanche.<sup>1</sup> Much older equipment was retired. Modernization was approached through upgrading and inserting new technologies into previously acquired “legacy,” systems. Information technology was seen as the most immediate, promising aspect of RMA. It exploited Desert Storm successes such as pinpoint targeting and navigation, while addressing problems such as friendly fire casualties. A major initiative was launched in the 1990's to create Army Force XXI, based on the “digitization” of the battlefield, now dubbed “network-centric warfare.” Modern computers and communications systems would connect all weapons systems and give U.S. soldiers and commanders advantages in situational awareness and speed of decisions.<sup>2</sup> One heavy, mechanized division at Fort Hood, TX was so equipped in 2001 and was battle tested in Iraq in 2003. Other units were at least partially equipped and trained with this capability before commitment in Iraq.

Even before Desert Storm, the “battlefield” was changing as the Army was called upon to respond to numerous, lengthy operations short of war rather than occasionally to defeat a large army. Near-term readiness became a problem as fewer troops were asked to cover more missions, and operation and maintenance (O&M) funds were diverted from fixing aging equipment and facilities to pay for unbudgeted deployments such as Bosnia (funds eventually replaced in part by emergency supplemental appropriations). The problem of rapidly projecting heavy forces had been highlighted beginning with the long buildup required for *Desert Shield/Desert Storm* in 1990-91. In 1999, it was suggested that an Army task force inserted into Albania for potential action in Kosovo was too heavy for rapid air insertion and the unimproved roads and bridges found there. The Army determined that a new capability was needed in addition to mobile, light forces and heavy, lethal forces – a medium, lethal force.

### Army Transformation<sup>3</sup>

In October 1999, the Army announced its priority program to transform into a force that could better meet future requirements to be both rapidly deployable and lethal. The first step was near-term fielding of a new unit, first called the Interim Brigade Combat Team but now called the Stryker Brigade Combat Team (SBCT), based on a wheeled armored vehicle much lighter than the standard M2 Bradley. For the long-term, the Army is developing a Future Combat System (FCS) based on new technologies that would equip very mobile formations with lethality and survivability equal or greater than that of present heavy units. Until the FCS is fielded, the Army believes it must also continue to maintain and upgrade legacy weapons systems (e.g., M1, M2, etc.) and equipment in units that can meet any potential foe across the spectrum of conflict. These Legacy, Interim, and Objective Forces would eventually meld into the transformed Objective Force of the future. In Summer of 2003, the new Army Chief of Staff emphasized that the Army was at war and transforming. The Current Force would incorporate usable technology and other ideas being developed for the Future Force without waiting, moving towards the Future Force while fighting the Global War on Terrorism. He also began a

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<sup>1</sup> Both have now been cancelled. See CRS Report RS21218 and CRS Report RS20522.

<sup>2</sup> See General Gordon R. Sullivan and Colonel James M. Dubik. *War in the Information Age*, Strategic Studies Institute, Carlisle Barracks, PA, June 6, 1994, 23 pp.

<sup>3</sup> On defense-wide transformation, see CRS Report RL32238, February 24, 2004, 40 pp.

short term reorganization of the active Army from 33 to 48 combat brigade modules using existing resources and a temporary increase of 30,000 in soldier end strength.<sup>4</sup>

**Stryker Force.** The Army is fielding a new capability based on the SBCT. This unit is designed for maximum strategic and operational mobility in that its equipment can be airlifted inter-theater in all U.S. cargo aircraft, including the comparatively small C-130 Hercules. All vehicles weigh less than 20 tons. The goal is that a SBCT could be completely moved to a combat zone within 96 hours. It is an infantry brigade of about 3,500 soldiers with the armored mobility needed to fight on a mid-intensity battlefield. Particular strengths are an included reconnaissance and intelligence battalion and “network-centric” command, control, and communications (C3) systems. The effort began early in 2000 at Fort Lewis, WA, where two existing brigades were converted, using temporary, borrowed equipment.

In November, 2000 the Army selected the Light Armored Vehicle III (LAV III), built by General Motors Defense and General Dynamics Land Systems, as its “interim armored vehicle” under a six year contract worth \$4 billion.<sup>5</sup> Some 2,131 LAV III’s, now called Strykers, will be procured. They will include two vehicle variants, an infantry carrier with eight additional configurations and a mobile gun system with a 105 mm cannon. The vehicle can negotiate flat surfaces at 62 mph, convert to 8-wheel drive off-road, and self-recover with its winch if needed. As of early 2004, the first Stryker Brigade was conducting stability operations in a sector of Iraq. Plans also include procurement of the Joint Lightweight 155 mm Howitzer for the Brigade’s included field artillery — an Army-Marine program, with an estimated cost of about \$1.1 billion, aiming for Army initial operating capability (IOC) at the end of 2004.

**Future Force.** For the long-term, the Defense Advanced Research Projects Agency and the Army began work on some 25 critical technologies for incorporation into R&D of new systems to be selected as early as 2006, with fielding to begin by 2008 and IOC by 2010.<sup>6</sup> A key component is expected to be a Future Combat System (FCS) that could, as one capability, assume the role currently held by the Abrams tank. It is intended to be as transportable and mobile as the Stryker, with lethality and crew survivability equivalent to or greater than that of today’s tanks. The FCS may, however, bear little or no resemblance to today’s tanks and could feature advanced technologies such as robotics and electric guns and facilitate new operational doctrines. The FCS currently encompasses some 18 subsystems and the network to tie them together. Boeing Company and Science Applications International Corp. were selected as the lead system integrator. As of September 2002, the Army had budgeted \$20 billion to develop FCS. Future Force units will also incorporate ongoing developments in information technology. They should respond to all requirements from stability operations to high-intensity conflict.

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<sup>4</sup> See HASC Hearing, “Operation Iraqi Freedom Force Rotation Plan,” January 28, 2004; and, CRS Report RS21754, March 2, 2004, 6 pp., for details.

<sup>5</sup> Kim Burger. “GM-GDLS Team Awarded \$4 Billion Interim Armored Vehicle Contract,” *Inside the Army (Special Report)*, November 17, 2000, p. 1.

<sup>6</sup> Projected dates first provided by Army Transformation Office, ODCSOPS, on March 15, 2001, reaffirmed by the Army Objective Force Task Force on December 8, 2002.

**Current Force.** Until the Future Force exists, the Army must be prepared to fight with legacy equipment, whether on low or high-intensity battlegrounds. According to Army planners, programs to replace and/or upgrade older equipment must continue if forces other than or additional to 6 new Stryker Brigades are to be ready for combat. The ongoing program to replace old trucks will continue. Older models of the Abrams tank and the Bradley fighting vehicles will continue to be rebuilt and upgraded. The current force will have many M1A2 SEP (for Systems Enhancement Package) and M1A1D tanks and M2A3 and M2A2ODS with applique Bradley's. Inserting these vehicles into the force will aid the whole Army in converting to a digitized force. Although modernization of the current force is important, the Army sacrificed many previously desired programs to free funds for transformation priorities. Examples are a dedicated Command and Control vehicle, the Grizzly Breacher engineer vehicle, and the Wolverine assault bridge vehicle.

## Issues for Congress

The 107<sup>th</sup> and 108<sup>th</sup> Congresses gave strong support to Army modernization and transformation initiatives. At the same time, Congress showed caution by pressing a requirement to compare the wheeled LAV III with similar tracked vehicles already in inventory. The Army believes its evaluation demonstrated that buying Stryker was more desirable than converting the M113A3 APC.<sup>7</sup> Whether the 108<sup>th</sup> Congress will continue to support Army transformation as a high priority will depend on its evaluation of issues such as those discussed below.

**Desirability.** All Services have felt pressures to “transform,” or at least adapt to current circumstances and experiences with the post-Cold War world. These include opportunities and challenges from a rush of technological advances, unexpected numbers and types of missions (particularly peacekeeping and urban warfare requirements), new threats from potential enemies with nuclear, chemical, or biological weapons, and, for the Army, criticism that it was not “nimble” enough during 1999 allied operations in Kosovo.

The broadest long-term question is whether current transformation plans will yield the military force capabilities the United States requires 20 years from now. Should they include a power projection Army capable of fighting equally well across the full spectrum of ground combat; or, should other services or entities assume some parts of that mission? Will Army plans over-stress DoD airlift assets, or would more reliance on fast sealift yield greater flexibility and economies? Internally, has the Army sought the right approach to transformation with its emphasis on medium-weight formations? Does the Army's plan strike the right balance in allocating resources between modernizing the current legacy force and developing and fielding the Future Force?

For the short term, it is projected that some amount of modernization for current forces is needed to prevent further aging and degradation. The average age of the M1 tank fleet is now 11.9 years and an estimated 11.7 years for support vehicles.<sup>8</sup> Many of these vehicles may not be able to remain in service beyond 2030 without some form of service life extension. Deciding the proper allocation of resources is made more complex

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<sup>7</sup> Erin Q. Winograd. Congressionally mandated report completed, *Inside the Army*, January 13, 2003, p. 1.

<sup>8</sup> *Defense News*, October 23, 2000.

by the large numbers and diverse types of vehicles and weapons systems in the Army, which makes it difficult to gather and present desirable data, that is both comprehensive and aggregated, on equipment age, condition, and potential combat effectiveness. The Navy, in managing a fleet of about 315 ships, may have an easier job describing the level of investment needed to maintain a fleet of a given size over time.<sup>9</sup> Congress may consider recommending that the Army attempt to develop some aggregate portrayal of its fleet capitalization status and implications of various funding strategies.

**Feasibility.** The Army plan for transformation is considered aggressive. But, by using largely off-the-shelf materiel, the “interim Stryker force is fairly low risk for meeting technology objectives. After an initial slip of 16 months, a contractor’s protest, and initial hesitation by the incoming Bush Administration, deliveries of Strykers are now supporting the fielding of 6 SBCTs, to be completed by May 2010.<sup>10</sup>

Plans for the Future Force involve higher risk in both technology and time. It is possible that integration of all the specific FCS technologies into a leap-ahead system will experience some problems. The goal of fielding the first unit of this system of 18 systems by 2010 is very ambitious.<sup>11</sup> Previous system-development efforts of this kind have often encountered technical problems, schedule problems, or both. The need for the Comanche helicopter, for example, was identified in 1979 and it had not yet entered production when cancelled in 2004. The original target date proposed for FCS, 2023, may be more realistic but it also raised concerns regarding duration of development. Congress will likely influence the priority and speed with which the FCS becomes reality.

**Affordability.** Some question the Army’s ability to finance its transformation plan, particularly given an inability in recent years to finance many procurement programs at desired rates. Can the Army adequately finance all three elements of its plan at once, while also providing adequate funds for necessary non-transformation priorities such as readiness and pay and benefits? The life-cycle cost for equipping 6 brigades with LAV III’s has been estimated by program officials at \$9 billion through FY2032.<sup>12</sup> This will only be part of the total cost to transform and modernize the Army; some have estimated that the Army requires a sustained increment of \$10 billion annually beyond its average post-Cold War expenditures for R&D and procurement. The Army is not alone in claiming a need for more investment funds. Other Services cite even higher numbers.<sup>13</sup>

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<sup>9</sup> See charts presented by Ronald O’Rourke to House Armed Services Committee, Subcommittee on Military Procurement in hearings on Navy shipbuilding programs, February 29, 2000.

<sup>10</sup> See Kim Burger, “Army Pushing to Speed Interim Armored Vehicle Delivery Schedule: Contract protest might upset program pace,” *Inside the Army*, December 11, 2000, p. 8; and,

<sup>11</sup> *Inside the Army*, “Sufficient resources’ needed to test FCS,” January 26, 2004, p. 1.

<sup>12</sup> *Inside the Army*, “Integration of Army Systems brings Interim Vehicle Cost to \$6 Billion: LAV III will require \$9 billion over lifetime,” December 4, 2000, p. 1. and “Acquisition Board Reviews Plan to Buy Three More Stryker Brigades,” February 23, 2004, p.2.

<sup>13</sup> Christopher Jehn, CBO Testimony before the Subcommittee on Military Procurement, House Armed Services Committee, September 21, 2000. CBO estimates for a sustaining procurement budget in billions of dollars above that appropriated in FY2000: Army, 5; Navy and Marine Corps, 12; and Air Force, 17.

An issue that will confront Congress is whether to fund Army transformation and modernization efforts at levels proposed by the Bush Administration, or higher or lower. If Congress ascribes a higher priority to Army transformation, will necessary funds be provided by adding to overall DoD appropriations, subtracting from DoD programs in other services, or reducing deployments?

During the FY2003 budget cycle, DoD expressed its intent to cut acquisition programs that do not meet its definition of “transformational” in favor of those that do. Its prime example was the Army’s Crusader Howitzer program. DoD cut Crusader and allocated the savings to several other advanced fire support systems in development. Congress reluctantly endorsed the action with the proviso that Crusader expertise be rolled into the FCS program. As part of its appropriations responsibilities, the 108<sup>th</sup> Congress may choose to enforce DoD’s implied promise to support adequately fire support throughout the FCS development program.<sup>14</sup>

**Wheels or Tracks and How Many Stryker Brigades?** An early issue to confront the Army was whether the Interim Force should use tracked or wheeled armored vehicles, or some combination.<sup>15</sup> Traditionally, the U.S. Army has favored tracks for its combat vehicles; with their low ground pressure and greater traction, they generally perform better off roads on difficult terrain. Wheels generally perform better on roads in terms of speed, agility, and quietness. After reviewing proposals, the Army selected the wheeled LAV III from General Motors, and named it Stryker. Critics of the decision, including some current and former members of Congress, continue to argue for a reversal or curtailment of the Stryker decision.<sup>16</sup> The Army defends its case strongly and DoD has not intervened. The question of whether the FCS will be based on wheels, tracks, or a combination remains open.

DoD has, however, raised questions about the ultimate number and stationing of SBCT’s. In the past, it requested the Army consider stationing one of the six units in Europe and the first one is now on station in Europe. More recently it suggested that units five and six not be funded unless they could be “spiral developed” into much more transformational formations. It appears, however, that funding for all 6 SBCT’s will now be requested. The combination of these events and considerations could, however, open prior decisions to station SBCT’s in Hawaii and Alaska to debate and thus create political complications.<sup>17</sup> The 108<sup>th</sup> Congress may play an important role in resolving the ultimate disposition of the proposed SBCT Force.

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<sup>14</sup> Edward F. Bruner and Steve Bowman. *Crusader XM2001 Self-Propelled Howitzer: Background and Issues for Congress*, CRS Report RS21218, June 25, 2002, 6 pp.

<sup>15</sup> For a technical discussion of this argument, see Paul Hornback, “The Wheel Versus Track Dilemma,” *Armor*, March-April 1998, pp. 33-34.

<sup>16</sup> Winograd. “Stryker Criticism Continues as Army, OSD Work Out SBCT Compromise,” *Inside the Army*, December 9, 2002, p. 1.

<sup>17</sup> Winograd. “Units’ home stations could change,” *Inside the Army*, December 23, 2002, p.1.