

# CRS Report for Congress

Received through the CRS Web

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

Edward F. Bruner  
Specialist in National Defense  
Foreign Affairs, Defense, and Trade Division

### Summary

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 meld all ongoing initiatives into a force based on a high-tech Future Combat System. Its Interim Force will 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 Legacy Force of existing systems will be modernized and recapitalized to ensure effective light and heavy force capabilities until the Objective 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 fighting vehicle, Apache attack helicopter, Blackhawk utility helicopter, and Patriot air defense system.

During the 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, or “legacy,” systems. Information technology was seen as the most immediate and promising aspect of the 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 is now so equipped and will test the concept in early 2001. The post-Desert Storm Army, although smaller, is more modern and technically capable than its Desert Storm predecessor.

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 forces based on major Army weapons systems had been highlighted beginning with the lengthy 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, once on the ground, was too heavy for 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

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 is near-term fielding of new units, Interim Brigade Combat Teams (IBCT), equipped with an existing armored vehicle much lighter than the standard M2 Bradley Armored Fighting Vehicle. For the long-term, the Army envisions development of 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. All three of the above efforts would eventually meld into the transformed Objective Force of the future.

**Interim Force.** The Army began with plans to field a new capability based on the IBCT. 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

---

<sup>1</sup> Christopher Bolkcom. *Army Aviation: The RAH-66 Comanche Helicopter Issue*, CRS Report RS20522, updated as developments warrant.

<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.

comparatively small C-130 Hercules – also used for intra-theater movements. All vehicles weigh less than 20 tons. The goal is that an IBCT could be completely moved to a combat zone within 96 hours. It would be an infantry brigade of about 3,500 soldiers with the armored mobility needed to fight on a mid-intensity battlefield. Particular strengths would be 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>3</sup> Original plans called for the first of six planned brigades to be fielded by December 2001. Some 2,131 LAV III’s 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 when needed. Plans also include procurement of the Joint Lightweight 155 mm Howitzer for the Brigade’s included field artillery. This gun is an Army-Marine program, with an estimated cost of about \$1.1 billion, aiming to start production in September 2002.

**Objective Force.** For the long-term, the Defense Advanced Research Projects Agency is working with the Army on some 25 critical technologies. This is intended to lead to research and development of new systems to be selected as early as 2006, with fielding to begin possibly by 2008 with an initial operating capability by 2010.<sup>4</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 LAV, 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. Units will also incorporate today’s ongoing developments in information technology and systems such as the Comanche helicopter. The resulting Army should be responsive to requirements ranging from operations short of war to high-intensity conflict.

**Legacy Force.** Until the Objective Force exists, the current Army based on legacy equipment must remain prepared to fight whether called to low-intensity 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 5-8 new, medium-weight IBCT’s are to be ready for combat. The ongoing program to replace old trucks with new will continue. Older models of the Abrams tank and the Bradley fighting vehicles will continue to be rebuilt and upgraded. The legacy force will largely consist of 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 Army in converting to a fully digitized force. One heavy division at Fort Hood has made this conversion, and, with all combat vehicles electronically connected, is expected to be more combat effective than previous divisions. Although modernization of the legacy force is important, the

---

<sup>3</sup> Kim Burger. “GM-GDLS Team Awarded \$4 Billion Interim Armored Vehicle Contract,” *Inside the Army (Special Report)*, November 17, 2000, p. 1.

<sup>4</sup> Projected dates provided by Army Transformation Office, ODCSOPS, on March 15, 2001.

Army has proposed sacrificing some 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 – the latter two have continued, so far, to be funded by Congress from the Army’s Unfunded Priorities List.

## Issues for Congress

The 106<sup>th</sup> Congress was involved in both modernization and transformation matters, including a \$2.7 billion increase above what the Administration requested for FY2001. At the same time, Congress showed caution with a requirement to compare the wheeled LAV III with similar tracked vehicles already in the inventory. Whether the 107<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), and new threats from potential enemies with nuclear, chemical, or biological weapons. The Army, in particular, suffered criticism that its current units and systems were not “nimble” enough to respond effectively during 1999 allied operations in Kosovo.

The broadest long-term question is whether current transformation plans will yield a desirable outcome, i.e, what military force capabilities will the United States require 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 Interim and Objective Forces? It is expected that many of these issues will be addressed in the DoD Quadrennial Defense Review report due in September 2001.<sup>5</sup>

For the short term, it is projected that some amount of modernization for existing legacy forces would be needed if policymakers decide 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>6</sup> Many of these vehicles may not be able to remain in service beyond 2030 without some form of service life extension work. Deciding on the proper allocation of resources is made more complex 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

---

<sup>5</sup> See Jeffrey Brake. *Quadrennial Defense Review (QDR): Background, Process, and Issues*, CRS Report RS20771.

<sup>6</sup> *Defense News*, October 23, 2000.

ships, may have an easier job describing the level of investment needed to maintain a fleet of a given size over time.<sup>7</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 Force is fairly low risk for meeting technology objectives. On the other hand, for fielding the force, serious problems have surfaced in meeting the time schedule. Original plans called for the first IBCT with new IAV's to be available by the end of CY2001. The selection of the LAV III, however, has caused a slip of some 16 months, delaying delivery of the first brigade's vehicles until March 2002. A further complication, a contractor's protest, has temporarily stopped work on the LAV III contract for up to 100 days. The Army has stated that it does not consider this delay excessive.<sup>8</sup>

Plans for the Objective Force involve higher risk in both technology and time. Since the specific technologies to form the FCS have not yet been chosen, it is possible that their integration into a leap-ahead system will experience some problems. The goal of having this system ready to produce by 2008 is very ambitious. 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; a contractor was selected for development in 1991; and, it is not yet ready for production. The original target date proposed for the FCS, 2023, may be more realistic but it has also raised concerns regarding duration of development. Congress, through its eventual levels of support, will 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>9</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>10</sup>

---

<sup>7</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>8</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.

<sup>9</sup> Kim Burger, "Integration of Army Systems brings Interim Vehicle Cost to \$6 Billion: LAV III will require \$9 billion over lifetime," *Inside the Army*, December 4, 2000, p. 1.

<sup>10</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? In ascribing priorities that will ultimately determine the shape of U.S. military forces in the future, Congress will utilize normal procedures such as hearings and committee meetings. For budgets beyond FY2002, they may gain some additional insight from the forthcoming recommendations of the QDR.

**Wheels or Tracks.** An early issue to confront the Army was whether the Interim Force should use tracked or wheeled armored vehicles, or some combination.<sup>11</sup> Traditionally, the Army has favored tracks for its combat vehicles. Representative vehicles of both types were tested quickly against interim armored vehicle standards. Tracks, with their low ground pressure and greater traction, generally perform better off roads on difficult terrain. Wheels generally perform better on roads in terms of speed, agility, and quietness. Other possible factors, such as reliability and maintenance costs, were less clearly favorable to one or the other. After reviewing proposals, the Army selected the wheeled LAV III from General Motors, justifying it on the basis that its 60- mph road speed and smooth ride would deliver more rested troops to the fight. It appears to be suitable for many urban, peacekeeping missions. Potential problems off-road are partly ameliorated by a winch that will allow crews to self-recover stuck vehicles.

The Army's selection was immediately challenged by a losing firm, United Defense L.P. Its tracked contenders, primarily the Mobile Tactical Vehicle Light (descended from venerable M113 Armored Personnel Carrier), they said, had met all criteria, were much cheaper -- by some \$2 billion overall -- and could be delivered in one to two years less time. In particular, UDLP contended its Armored Gun System was a proven, existing vehicle while General Motors' had not yet demonstrated a compliant LAV-based 105 mm gun system. GAO is currently adjudicating this issue.

One view is that the wheel versus track selection should be measured carefully, particularly in light of the huge inventory of tracked vehicles already owned by the Army. The Senate Armed Services Committee included language in the FY2001 Defense Authorization Act that requires the Army to include comparison evaluation of on-hand equipment (though not specified, the M113 Armored Personnel Carrier, now up to an M113A3 model, is the logical and expected candidate) with the LAV III during operational testing.<sup>12</sup> The upcoming tests will be of great interest to proponents of both sides in the long-term debate about wheels and tracks on the battlefield.

---

<sup>11</sup> For a technical discussion of this argument, see Paul Hornback, "The Wheel Versus Track Dilemma," *Armor*, March-April 1998, pp. 33-34.

<sup>12</sup> For details, see Kim Burger, "DOT&E says comparison testing of IAV should include live units, M113s" and "Initial testing of IAVs must include two live companies, top tester says," *Inside the Army*, November 13, 2000, p. 11.