The Army's Ground Combat Vehicle (GCV) and Early Infantry Brigade Combat Team (E-IBCT) Programs: Background and Issues for Congress

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Summary

In April 2009, Secretary of Defense Gates announced that he intended to significantly restructure the Army's Future Combat System (FCS) program. The FCS was a multiyear, multibillion dollar program that had been underway since 2000 and was at the heart of the Army's transformation efforts. In lieu of the cancelled FCS Manned Ground Vehicle (MGV), the Army was directed to develop a Ground Combat Vehicle (GCV) that would be relevant across the entire spectrum of Army operations and would incorporate combat lessons learned from Iraq and Afghanistan. As part of the FCS program, the Army had been "spinning out" selected FCS technologies to brigade combat teams (BCTs) that were deploying to Iraq and Afghanistan. Secretary Gates's April 2009 restructuring decision included provisions to continue these efforts, and the Army decided that initially these technologies would be provided to Infantry Brigade Combat Teams (IBCTs); the Army designated this effort as the Early Infantry Brigade Combat Team (E-IBCT) program.

The Army reissued a request for proposal (RFP) for the GCV on November 30, 2010, and plans to begin fielding the GCV by 2015-2017. The first E-IBCT capabilities package (Increment One), consisting of an unmanned aerial and ground vehicle, unattended sensors, and a network integration kit, was tested in September 2009 and demonstrated poor performance and reliability. Because of the test results, Increment One was judged not ready to field and the Army was required to repeat the limited users test in September 2010. On February 3, 2011, the Department of Defense (DOD) cancelled the E-IBCT program but permitted the limited development of two of its systems—the Small Unmanned Ground Vehicle (SUGV) and the Network Integration Kit (NIK).

The FY2012 budget request for the GCV is $884.37 million for Research, Development, and Technology (RDT&E), reflecting a seven-month delay in the program. The FY2012 E-IBCT budget request is for $243 million for Procurement and $506 million for RDT&E. The House Armed Services Committee HASC has recommended full funding for the GCV program, contingent on the Army meeting a number of provisions. The HASC has also recommended fully funding E-IBCT procurement, but it is not clear if all E-IBCT RDT&E efforts will be funded because surviving E-IBCT RDT&E efforts have been placed under other Army programs.

There are potential issues for Congress. Some believe that based on (1) beliefs that fewer armored forces might be required in the future and (2) the Army's poor acquisition track record, there is not a compelling need to develop and acquire the GCV in seven years. Some critics contend that the Army has not yet adequately established a requirement for the GCV, and others question the need to have all nine soldiers of an infantry squad to be transported in a single GCV. Another concern is that the NIK, which has fared poorly in testing and has received a variety of criticisms from the soldiers that have used it in testing, might not be a viable option for the future. Although Army leaders have indicated that the current NIK will only serve as a interim step to a more enhanced version of the NIK, it can be argued that using the NIK as a basis for future versions is "building on failure." Reports suggesting that alternatives to the NIK are being developed by various companies might provide the Army with other options if the NIK continues to be both costly and unreliable. This report will be updated.

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Introduction

In April 2009, Secretary of Defense Robert Gates announced that he intended to significantly restructure the Army's Future Combat System (FCS) program. The Future Combat System (FCS) was a multiyear, multibillion dollar program that had been underway since 2000 and was at the heart of the Army's transformation efforts. It was to be the Army's major research, development, and acquisition program, consisting of 18 manned and unmanned systems tied together by an extensive communications and information network.

Secretary Gates also recommended cancelling the manned ground vehicle (MGV) component of the FCS program, which was intended to field eight separate tracked combat vehicle variants built on a common chassis that would eventually replace combat vehicles such as the M-1 Abrams tank, the M-2 Bradley infantry fighting vehicle, and the M-109 Paladin self-propelled artillery system. As part of this restructuring, the Army was directed to develop a Ground Combat Vehicle (GCV) that would be relevant across the entire spectrum of Army operations and would incorporate combat lessons learned in Iraq and Afghanistan.

As part of the FCS program the Army had been "spinning out" selected FCS technologies to brigade combat teams (BCTs) that were deploying to Iraq and Afghanistan. Secretary Gates's April 2009 restructuring decision included provisions to continue these efforts, and the Army decided that initially these technologies would be provided to Infantry Brigade Combat Teams (IBCTs); the Army designated this effort as the Early Infantry Brigade Combat Team (E-IBCT) program.

Congressional interest in these two programs has been significant, as both the GCV and E-IBCT programs directly impact 64 of the Army's 73 BCTs and could be expanded to other types of units if they prove successful.

Background

FCS Program and Spin Outs

Origins of the FCS. In October 1999, Chief of Staff of the Army (CSA) General Eric Shinseki introduced the Army's new transformation strategy to convert all of the Army's divisions (called Legacy Forces) into new organizations called the Objective Force. General Shinseki wanted to make the Army lighter, more modular, and—most importantly—more deployable. As part of this transformation, the Army adopted the Future Combat System (FCS) as a major acquisition program to equip the Objective Force.[1]

This transformation, due to its complexity and uncertainty, was scheduled to take place over the course of three decades, with the first FCS-equipped unit becoming operational in 2011 and the entire force transformed by 2032. General Shinseki's vision for the FCS was that it would consist of smaller and lighter ground and air vehicles—manned, unmanned, and robotic—and would

[1] James Jay Carafano, "The Army Goes Rolling Along: New Service Transformation Agenda Suggests Promise and Problems," *Heritage Foundation*, February 23, 2004, p. 5.

employ advanced offensive, defensive, and communications/information systems to outsmart and outmaneuver heavier enemy forces. In May 2000, four contracts were awarded to industry teams to develop FCS designs and in March 2002, the Army chose Boeing and Science Applications International Corporation (SAIC) to serve as the lead systems integrators to oversee certain aspects of the development of the FCS's 18 systems. The Army's objective was to field 15 FCS BCTs equipped with FCS MGVs and provide selected FCS communications, sensors, and unmanned vehicle technologies to all 43 of its IBCTs by FY2025.

FCS Program Criticisms. The FCS program was subject to a wide range of criticisms. First and foremost was the inability to agree on total program cost. In March 2006, the Government Accountability Office (GAO) estimated that the current total cost for the FCS program was $160.7 billion (then-year dollars)—an increase of 76% over the Army's first estimate.[2] In July 2006, the Department of Defense's Cost Analysis Improvement Group (CAIG) estimated that the total cost for the development, procurement and operations of FCS had increased to more than $300 billion.[3] Throughout the FCS program, the Army maintained that the total cost for the FCS program would be roughly $160 billion and the MGV component was to be the most expensive part of the overall program.

Other program criticisms were immaturity of program technologies and an overly ambitious timeline. In 2008 GAO testified that:

> Today, the FCS program is about halfway through its development phase, yet it is, in many respects, a program closer to the beginning of development. This portends additional cost increases and delays as FCS begins what is traditionally the most expensive and problematic phase of development. In the key areas of defining and developing FCS capabilities, requirements definition is still fluid, critical technologies are immature, software development is in its early stages, the information network is still years from being demonstrated, and complementary programs are at risk for not meeting the FCS schedule. It is not yet clear if or when the information network that is at the heart of the FCS concept can be developed, built, and demonstrated. Yet, the time frame for completing FCS development is ambitious; even if all goes as planned, the program will not test production-representative prototypes or fully demonstrate the system of systems until after low rate production begins.[4]

MGV Criticisms.[5] FCS MGVs were originally intended to be transportable by C-130 aircraft and, as such, the Army established a 20 ton weight limit for the vehicles. Prototype MGVs were from seven to nine tons over the 20 ton weight limit and, in order to not only make the weight limit but also so MGVs could fit on the aircraft, armor and other components would have to be removed and transported on other aircraft to be reassembled once the vehicle landed. Another criticism was that MGVs were to be overly reliant on a hit-avoidance system[6] as well as an active

[2] Government Accountability Office (GAO) Report "Acquisitions: Business Case and Business Arrangements Key for Future Combat System's Success," GAO-06-478T, March 1, 2006, p. 8.

[3] Megan Scully, "Army Sticks to its Guns, Rejects New FCS Cost Estimates," *National Journal's Congress Daily AM*, July 13, 2006.

[4] Testimony Before the Subcommittee on Air and Land Forces, Committee on Armed Services, House of Representatives, "Defense Acquisitions: 2009 Review of Future Combat System is Critical to Program's Direction," April 10, 2008, p. 1.

[5] Information in this section is taken from Stew Magnuson, "Future Combat Vehicles Will Fall Short of Preferred Weight," *National Defense*, June 2007 and Office of Management and Budget, "Terminations, Reductions , and Savings: Budget of the U.S. Government, Fiscal Year 2010," May 7, 2009.

[6] A hit- avoidance system is intended to use a variety of sensors and information technologies to detect the presence of (continued...)

protection system[7] in lieu of traditional armor protection. The issue of the MGV's relevancy was also a point of contention. Some critics suggested that MGVs—even with modular armor—would be ill-suited in an improvised explosive device (IED) environment and that prototype designs failed to take into account lessons learned in developing and fielding the Mine-Resistant, Ambush Protected (MRAP) vehicle.[8] Questions were also raised about how relevant the MGV would be in an irregular warfare[9] environment that many defense analysts believe could characterize future conflicts.

Spin Outs

On June 26, 2008, primarily in response to both congressional and DOD concerns about getting FCS technologies to forces in the field sooner and overall program affordability, the Army restructured the FCS program. In an official press release, the Army announced the restructuring, characterizing it as an effort "to accelerate FCS deliveries to IBCTs."[10] The Army planned to field (referred to by the Army as spin outs) the following technologies to 43 IBCTs during the 2011 to 2025 time frame:[11]

- Tactical and Urban Unattended Ground Sensors;
- Non-Line of Sight Launch System (NLOS-LS);
- Network Integration Kits for High Mobility, Multi-Wheeled Vehicles (HMMWV);
- Class I Unmanned Aerial Vehicles (UAVs); and
- Small Unmanned Ground Vehicles (SUGVs).

The Army conducted a Preliminary Limited User Test (P-LUT) focused on infantry units at Ft. Bliss, TX, in July 2008, and the Army hoped to spin out these technologies to IBCTs beginning in FY2011. IBCT Spin Out One equipment was planned to be fielded to both Active and National Guard IBCTs, based on when the units were scheduled to deploy to Iraq or Afghanistan.[12]

(...continued)

mines, IEDs, and enemy forces so that these threats can be avoided.

[7] An active protection system is a vehicle-mounted system which is intended to first detect incoming enemy anti-tank or anti-vehicle missiles and/or grenades and then engage and destroy these threats by means of a kinetic device.

[8] For additional information on MRAPs see CRS Report RS22707, *Mine-Resistant, Ambush-Protected (MRAP) Vehicles: Background and Issues for Congress*, by Andrew Feickert.

[9] DOD Joint Publication 1-02, dated July 2010, defines Irregular Warfare as " a form of warfare that has as its objective the credibility and/or legitimacy of the relevant political authority with the goal of undermining or supporting that authority. Irregular warfare favors indirect approaches, though it may employ the full range of military and other capabilities to seek asymmetric approaches, in order to erode an adversary's power, influence, and will."

[10] U.S. Army News Release, "Army to Accelerate Future Combat Systems Deliveries (FCS) to Infantry Brigade Combat Teams," Army Public Affairs Office, Washington D.C., June 26, 2008.

[11] Ann Roosevelt, "Army Tightens FCS Focus on Infantry and Current Fight," *Defense Daily*, June 26, 2008; U.S. Army News Release, "Army to Accelerate Future Combat Systems Deliveries (FCS) to Infantry Brigade Combat Teams," Army Public Affairs Office, Washington D.C., June 26, 2008; Daniel Wasserbly, "Bringing Soldiers Into the Network: Army to Align Ground Soldier Program with FCS Spin Out 1 Fielding," *InsideDefense.com*, June 30, 2008; and a FCS Acceleration Briefing provided to CRS on July 21, 2008.

[12] Daniel Wasserbly, "Testing Pushed Back to Next Summer: Army to Reprogram Funding in FY 08, FY 09 for FCS Spin Out 1 Changes," *InsideDefense.com*, June 30, 2008.

Secretary of Defense Gates's April 2009 FCS Restructuring Decision

On April 6, 2009, Secretary of Defense Gates announced that he intended to significantly restructure the FCS program.[13] The Department of Defense planned to accelerate the spin out of selected FCS technologies to BCTs, but recommended cancelling the MGV component of the program. Secretary Gates was concerned that there were significant unanswered questions in the FCS vehicle design strategy and, despite some adjustments to the MGVs, that they did not adequately reflect the lessons of counterinsurgency and close quarters combat in Iraq and Afghanistan. After reevaluating requirements, technology, and approach, DOD would then re-launch the Army's vehicle modernization program, including a competitive bidding process.

On June 23, 2009, DOD issued an acquisition decision memorandum that formally implemented Secretary Gates's FCS program decisions.[14] This memorandum, inter alia, directed the Army to "spin out the initial increment of the FCS program to seven infantry brigades in the near term [E-IBCT program] and additional programs for information and communications networks, unmanned ground and air vehicles and sensors, and an integration effort aimed at follow-on spin outs to all Army Brigades."[15] In addition, the acquisition decision memorandum reaffirmed the establishment of a new ground combat vehicle acquisition program in 2010.

GCV Program

The GCV Concept[16]

The Army's 2009 Modernization Strategy focused on quickly developing a new GCV in a technologically versatile approach. This approach, termed the Incremental Development Approach, features a modular design intended to accommodate vehicle growth in size, weight, power, and cooling requirements so that as technologies matured, they could be incorporated into new versions of the GCV with little or no modification to the basic vehicle.

The GCV concept, in short, is to

- field the GCV by 2015-2017;
- design the platform with sufficient margin for future capabilities;
- incorporate only mature technologies for vehicle integration;
- maintain a continuous armor development; and

[13] Information in this section is taken from a transcript of Secretary of Defense Robert M. Gates Budget Press Briefing, Arlington, VA, April 6, 2009.

[14] Information in this section is taken from a DOD News Release, "Future Combat Systems (FCS) Program Transitions to Army Combat Brigade Team Modernization," No. 451-09, June 23, 2009.

[15] Ibid.

[16] Information in this section is from the Army Capabilities Integration Center, *The Ground Combat Vehicle Strategy: Optimizing for the Future*, October 2009, available at http://www.g8.army.mil.

- design the vehicle to accept current and future network capabilities (for example, radios, sensors, and jammers).[17]

Army leadership has indicated that the GCV could be either a tracked or wheeled vehicle. The Army has also suggested that it saw "a lot of value in common chassis in terms of logistics support," and that it might pursue a common chassis for GCV variants.[18] Other possible GCV features discussed by the Army included a V-shaped hull and side armor to protect against IEDs.[19] The Army has also suggested that the new GCV would be fuel efficient.[20] The air transportability of the GCV has been discussed as a key design consideration, and the Army had said that the GCV must be able to fit on C-17 transports.[21] In order for the GCV to be a "full spectrum" combat vehicle, the Army reportedly had required that non-lethal weapon systems be incorporated into vehicle design. While the GCV is to have some military equipment directed by the Army, such as radios and chemical protection systems, Army officials are leaving most of the specific solutions to industry recommendations.[22]

The Initial GCV Request for Proposal (RFP)[23]

On February 25, 2010, the Army released the RFP for the GCV as described in the following DOD press release:

Army Ground Combat Vehicle Request for Proposal Released[24]

> The Army released last Thursday a RFP for the technology development phase[25] of the Infantry Fighting Vehicle being developed under the GCV effort. The Army has worked extensively with the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics to develop this program. The GCV acquisition program will follow DOD best acquisition practices and be a competitive program with up to three contract awards. The GCV development effort will consist of three phases: technology development, engineering and manufacturing design and low rate initial production. The Army anticipates awarding the first contracts for the technology development phase in the fourth-quarter of fiscal 2010.

[17] Department of the Army, *2009 Army Modernization White Paper*, p. 5.

[18] Emelie Rutherford, "Army Casting Wide Net for Post-FCS Vehicles Coming in Five to Seven Years," *Defense Daily*, May 13, 2009.

[19] Ibid.

[20] John T. Bennett, "Carter: FCS Successor Effort Could Have Many Primes," *Defense News*, May 18, 2009.

[21] Marjorie Censer and Kate Brannen, "Army Assessing Brigade Combat Modernization in Plan Due to OSD," *InsideDefense.com*, May 18, 2009.

[22] Daniel Wasserbly, "Testing Pushed Back to Next Summer: Army to Reprogram Funding in FY 08, FY 09 for FCS Spin Out 1 Changes," *InsideDefense.com*, June 30, 2008.

[23] DOD defines Request for Proposal (RFP) as a solicitation used in negotiated acquisition to communicate government requirements to prospective contractor and to solicit proposals.

[24] DOD News Release, "Army Ground Combat Vehicle Request for Proposal Released," No. 161-10, March, 2, 2010.

[25] From the November 2009 Defense Acquisition University Glossary of Defense Acquisition Acronyms & Terms, the Technology Development (TD) Phase is the second phase of the Defense Acquisition Management System and the purpose of this phase is to reduce technology risk and to determine the appropriate set of technologies to be integrated into the full system.

The technology development phase involves risk reduction, identification of technology demonstrations, competitive prototyping activities, and planned technical reviews. Industry will have 60 days to submit proposals to the Army for this development effort.

The Ground Combat Vehicle effort is part of a holistic Army plan to modernize its combat vehicle fleet. This includes incorporating Mine-Resistant Ambush Protected (MRAP) vehicles into the fleet while modernizing current vehicle fleets including Stryker. The first GCV will be an Infantry Fighting Vehicle offering a highly-survivable platform for delivering a nine-man infantry squad to the battlefield. The GCV is the first vehicle that will be designed from the ground up to operate in an IED environment. It is envisioned to have greater lethality and ballistic protection than a Bradley, greater IED and mine protection than an MRAP, and the cross country mobility of an Abrams tank. The GCV will be highly survivable, mobile and versatile, but the Army has not set specific requirements such as weight, instead allowing industry to propose the best solution to meet the requirements.

Prior to the release of the RFP, the Army engaged with industry through a series of industry days to inform them of the government's intent for GCV development and gain their feedback from potential contractors about GCV requirements and emerging performance specifications. In response to these initiatives the Army received significant feedback and insights on requirements, growth, training, test and the program at large thereby informing the requirements process and indicating the potential for a competitive contracting environment.

Preliminary GCV Criticisms

After the release of the RFP and subsequent program-related briefings and discussions, a number of criticisms emerged as analysts began to examine the GCV RFP and program in greater detail. These criticisms are categorized as follows:

Programmatic

In order to avoid past criticisms of events outpacing relevancy and decades-long acquisition programs, Army leadership stipulated that the first GCVs would be delivered seven years after the program was initiated. While this decision was relatively well-received, in order to achieve this ambitious timeline, modifications to the traditional acquisition process were required. One criticism was that the Army chose to issue the RFP prior to the completion of the Analysis of Alternatives[26] phase of the defense acquisition process.[27] In response to this criticism, DOD and Army officials maintained that running the Analysis of Alternatives phase during the RFP phase

[26] From the November 2009 Defense Acquisition University Glossary of Defense Acquisition Acronyms & Terms, The Analysis of Alternatives (AoA) is defined as follows: "The AoA assesses potential materiel solutions to satisfy the capability need documented in the approved Initial Capabilities Document (ICD). It focuses on identification and analysis of alternatives, measures of effectiveness (MOEs), cost, schedule, concepts of operations, and overall risk, including the sensitivity of each alternative to possible changes in key assumptions or variables. The AoA is normally conducted during the Materiel Solution Analysis (MSA) phase of the Defense Acquisition Management System (DAMS), is a key input to the Capability Development Document (CDD), and supports the materiel solution decision at Milestone A."

[27] Unless otherwise noted, information in this section is taken from Kate Brannen, "Army Launches Ground Combat Vehicle Contest," *Army Times*, February 26, 2010. For additional information on the defense acquisition process see CRS Report RL34026, *Defense Acquisitions: How DOD Acquires Weapon Systems and Recent Efforts to Reform the Process*, by Moshe Schwartz.

would give the Army more time to consider industry's proposals and evaluate alternatives to a new vehicle. Traditionally, the Analysis of Alternatives occurs before an RFP is initiated. Another concern is that the Army chose to use a cost-plus and not a fixed price contract during the Technology Development phase of the program. The Administration is said to favor fixed price contracts, as critics of cost-plus contracts say that they "invite abuse because they allow companies to charge the government costs plus a fixed profit, no matter how poor their performance."[28] The Army, on the other hand, defended its use of cost-plus contracts during the technology phase, as it allowed for more innovation and risk-taking.[29] Reports suggest that Army officials involved in the GCV program are having difficulty agreeing on performance requirements and how they should be prioritized.[30] The use of cost-plus contracts as well as constantly changing requirements were both points of contention in the FCS program.

Vehicle Weight

The Army has made soldier survivability the most important performance requirement for the GCV. Because the Army has also left it up to industry to determine the GCV design, there are no specific vehicle weight constraints. In May 2010, senior Army leaders reportedly stated that estimates at that time projected that the GCV could weigh up to 70 tons, making it the world's heaviest infantry fighting vehicle.[31] The Chief of Staff of the Army, General George Casey, has remarked that he believes that the GCV must be much lighter, noting that "soldiers who have served in Iraq and Afghanistan have told him that big, heavy vehicles just aren't practical in urban combat" and that the Army "stopped using tanks and Bradleys on the streets of Baghdad just because of the size."[32] One expert suggests that "given what transports, supply lines, and bridges in developing countries can bear, an optimal weight for a vehicle in an irregular warfare environment is 40 to 45 tons."[33] A counterargument contends that the irregular warfare environment has become so lethal that only 70 ton vehicles can survive.[34] In addition to operational considerations, a 70 ton GCV weight would also have an impact on how the vehicle is transported by air and by sea and, therefore, how quickly it could be deployed in the event of a conflict.

Reliance on Immature Technologies

Some critics noted that the initial GCV RFP contained provisions that the GCV would have requirements for a hit-avoidance system[35] as well as an active protection system[36] that were problematic developmental sub-systems of the cancelled FCS MGV program.[37] Critics of these

[28] Ross Colvin, "Obama Takes Aim at Costly U.S. Defense Contracts," *Reuters*, March 4, 2009.

[29] Kate Brannen, "Army Launches Ground Combat Vehicle Contest," *Army Times*, February 26, 2010.

[30] John T. Bennett, "U.S. Army Delays Ground Combat Vehicle," *DefenseNews.com*, August 25, 2010.

[31] Matthew Cox, "U.S. Army Chief Casey: Make GCV Lighter," *DefenseNews*, June 14, 2010, p. 16.

[32] Sydney J. Freedberg, Jr., "Army Tries Again for a New Tank," *National Journal*, August 7, 2010.

[33] Ibid.

[34] Ibid.

[35] A hit avoidance system is intended to use a variety of sensors and information technology to detect the presence of mines, IEDs, and enemy forces so that these threats can be avoided.

[36] An active protection system is a vehicle-mounted system which is intended to first detect incoming enemy anti-tank or anti-vehicle missiles and/or grenades and then engage and destroy these threats by means of a kinetic device.

[37] Sebastian Sprenger and Tony Bertuca, "Some Officials See FCS's Long Shadow in Army's Move to Revisit GCV," (continued...)

programs maintained that by employing these systems on armored fighting vehicles, the Army was sacrificing armored crew protection for an over-reliance on technologically questionable systems. The Army noted that if these systems could be developed, it would result in lighter, more fuel-efficient vehicles. Another criticism of these systems was that they would drive up the per-vehicle cost—an important factor when the Army is considering buying at least a thousand or more GCVs in its initial procurement.

The GCV—An FCS Redux?

Given these criticisms, some observers questioned if the Army's "new" GCV program was merely a continuation of the cancelled MGV program and also suggested that the Army had learned little from the FCS program cancellation.[38] The Army's position on these assertions was that, whenever practical, they would incorporate proven FCS technologies in the GCV program as a means of saving money and to facilitate the rapid development of the GCV.

Potential GCV Vendors[39]

In response to the Army's February 2010 RFP, three industry teams submitted technology development proposals to the Army. The first team included BAE Systems and Northrop Grumman; the second consisted of General Dynamics, Lockheed Martin, Raytheon, and MTU Detroit Diesel; and the third team, SAIC, Boeing, and the German firms of Krauss-Maffei Wegmann (KMW), and Rheinmetall Defence. All three teams also had a number of other firms as part of their teams. The BAE Systems-led team design was an original design, with the team claiming that its design would exceed the survivability of the MRAP and would have enhanced mobility capabilities to allow it to operate in both urban and cross country environments. The General Dynamics team provided no details on its technical approach but stated that its chosen design focused on soldier survivability and operational effectiveness and would incorporate mature technologies. The SAIC-led team stated that its design would be based on the German tracked Puma IFV that was developed based on lessons learned from Iraq and Afghanistan. SAIC also emphasized that all work, including production, would take place in the United States.

Army Cancels the RFP

When the Army released the RFP for the GCV Technology Development (TD) phase in February 2010, it anticipated awarding the first TD phase contracts in the fourth quarter of FY2010.[40] On August 25, 2010, while the Army was reportedly in the process of selecting the winners of the TD RFP, the Army's new Assistant Secretary of the Army for Acquisition, Logistics and Technology [ASA(ALT)], Malcolm O'Neil, cancelled the RFP in order to provide more time for technology integration as well to insure that the Army would use mature technologies in order to develop the

(...continued)

InsideDefense.com, August 31, 2010.

[38] Ibid.

[39] Information in this section is taken from Defence Professionals, "Three Competing Teams to Submit Proposal for Technology Development Phase," *Defpro.com,* May 26, 2010.

[40] Department of Defense (DOD) Press Release, "Army Ground Combat Vehicle Request for Proposal Released," March 2, 2010.

GCV within the established seven year time frame.[41] The Army reportedly planned to reissue the RFP within 60 days of the cancellation.[42] It was expected that the original industry teams will submit new proposals and it is possible that other companies might also submit proposals.

Why the RFP Was Cancelled

The Army, in conjunction with the Pentagon's acquisition office, conducted a Red Team[43] review of the GCV program in order "review GCV core elements including acquisition strategy, vehicle capabilities, operational needs, program schedule, cost performance, and technological specifications."[44] This review found that the GCV had too many performance requirements and too many capabilities to make it affordable[45] and relied on too many immature technologies. In response, the Army pledged that the new GCV RFP would "dial back the number of capabilities the new system must have—as well as significantly reworking the acquisition strategy by focusing on early technology maturity and setting firm cost targets."[46] In particular the Army reportedly planned to set a $10 million per vehicle cost limit in response to reports that initial estimates projected that the GCV would cost more than $20 million per vehicle. The Army reportedly had planned to issue a new RFP in late October 2010, suggesting even though the program has been delayed about six months, that the seven year GCV development goal is still achievable.

Revised GCV RFP Issued

On November 30, 2010, the Army issued a revised GCV RFP.[47] Under this proposal, industry had until January 21, 2011, to submit proposals and the proposed vehicle can be tracked or wheeled. The Army included affordability targets of per unit cost for the vehicle between $9 million and $10.5 million and an operational sustainment cost of $200 per operational mile, with both affordability targets being in FY2010 dollars. In addition, the Army will require that the GCV fit on a C-17 transport but not on a C-130. The Army expected to award technology development contracts to three contractors by April 2011, and the Technology Development (TD) Phase is planned to last 24 months. An early prototype vehicle is expected by the middle of FY2014 and the first full-up prototype is expected by the beginning of FY2016. The Army

[41] Kate Brannen, "Interview: Malcolm O'Neil, Acquisition Executive, U.S. Army," *Defense News*, September 6, 2010, p. 22; and Daniel Wasserbly, "U.S. Army Amends Approach to GCV Programme," *Jane's Defence Weekly*, September 1, 2010, p. 9.

[42] Daniel Wasserbly, "U.S. Army Amends Approach to GCV Programme," *Jane's Defence Weekly*, September 1, 2010, p. 9.

[43] The Army defines Red Teaming as a "structured, iterative process executed by trained, educated and practiced team members that provides commanders an independent capability to continuously challenge plans, operations, concepts, organizations and capabilities in the context of the operational environment and from our partners' and adversaries' perspectives." Taken from Office of the Chief of Public Affairs, U.S. Army Training and Doctrine Command, "Army Approves Plan to Create School for Red Teaming," July 13, 2005.

[44] Roxana Trion, "Army to Re-Start Bidding Process for New $40B Ground Combat Vehicle Program," *The Hill*, August 25, 2010.

[45] Kate Brannen, "Ground Combat Vehicle Delayed; Effort Called Too Ambitious," *Army Times*, September 6, 2010.

[46] Jason Sherman, "Army to Mandate Technology Maturity Levels, $10 Million Price Target for GCV," *InsideDefense.com*, September 16, 2010.

[47] Unless otherwise noted, information in this section is taken from C. Todd Lopez, "Army Issues RFP for Ground Combat Vehicle," Army News Service, December 2, 2010.

reportedly plans for 1,874 GCVs initially, with the first production vehicle rolling off the assembly line in early April 2018 and the first unit should be equipped with GCVs in 2019.

The new RFP is a fixed price incentive fee contract versus the cost-plus fixed fee contract of the previous RFP.[48] The new contract has a ceiling of $450 million per contractor for the TD Phase. An incentive fee would split 80% to the government if the cost comes in under the negotiated $450 million ceiling cap, with 20% going to the contractor. If the cost comes in over the cap, the contractor assumes 100% of the additional cost.

Defense Industry Concerns with the Revised RFP[49]

Reports suggest that the defense industry has a number of concerns with the revised RFP. According to one report "industry still doesn't get what the Army is looking for,"[50] suggesting that many of the technical specifications that the contractors expected the Army to spell out were left open-ended and that industry would have to propose many of the vehicle's technologies and features. Another concern was that industry was not clear on how many vehicles the Army intended to build and questioned whether the Army could afford the production in the long run. According to the Army, the GCV is intended to replace infantry fighting vehicles in heavy brigade combat teams (HBCTs), which would be 50% of the Bradleys in the HBCT. Some analysts suggest that the GCV's $10 million price tag per vehicle could make it vulnerable to future budget cuts, with one analyst noting that the $10 million cost was so high that "the program is sure to be politically controversial and therefore suffer much the same fate the Marine Corps Expeditionary Fighting Vehicle has."[51]

Because of concerns that the GCV program will not make it to production, issues regarding sustaining the industrial base have been raised. Analysts contend that there are very few new combat vehicles currently in production, noting that Bradley A3 production ends in 2012; the last Stryker armored personnel carrier in 2013; and the M-1 Abrams tank remanufacturing program comes to an end after 2014, leaving the improved Paladin self-propelled howitzer in production until the GCV starts production in 2017. Defense industry analysts are concerned that with so few opportunities to develop and manufacture armored fighting vehicles, that some long-standing U.S. defense firms might drop out of the business, thereby limiting bidding on any future armored fighting vehicle programs to foreign manufacturers.

Current GCV Issues

Congressional Questions Regarding the Requirement for the GCV

According to the House Armed Service Committee's (HASC's) 112th Congress Oversight Plan:

[48] Information in this section is taken from Ann Roosevelt, "New Ground Combat Vehicle RFP Offers Affordability Targets," *Defense Daily*, December 1, 2010.

[49] Information in this section is taken from Kate Brannen, "U.S. Army: Budgets Allow $9 – 10.5 Million GCV," *Defense News*, December 13, 2010; and Grace V. Jean, "Army's Ground Combat Vehicle Stirs Confusion in Industry," *National Defense*, January 2011 edition.

[50] Kate Brannen, "U.S. Army: Budgets Allow $9 – 10.5 Million GCV." Ibid.

[51] Ibid. For additional information on the Expeditionary Fighting Vehicle see CRS Report RS22947, *The Marines' Expeditionary Fighting Vehicle (EFV): Background and Issues for Congress*, by Andrew Feickert.

> Based on long-standing committee concerns stemming from the Future Combat Systems program's requirements, cost increases, and schedule delays, the committee will continue aggressive efforts to oversee and shape the evolving Ground Combat Vehicle (GCV) program. In the 112th Congress, these oversight efforts will focus on understanding the basis of GCV requirements as they pertain to the Analysis of Alternatives, containing program costs, and ensuring appropriate and thorough testing. The committee will also continue to work closely with the Government Accountability Office and the Congressional Budget Office to conduct continuous oversight and evaluation of the GCV program.[52]

Based on the HASC oversight plan and reported comments by various Members, many believe that congressional oversight of the GCV program will continue to be aggressive. As an example, during a March 3, 2011, Senate Armed Services Committee (SASC) hearing a Member reportedly questioned Army leadership if "the use of research and development funds being spent on the Ground Combat Vehicle was going to transform the battlefield capability…. and will the Ground Combat Vehicle be superior to the Bradley enough to justify the costs associated with developing and fielding it?"[53] Some Members have also expressed concern that the Army has yet to deliver a GCV Analysis of Alternatives report to Congress that was mandated under the FY2011 National Defense Authorization Act (H.R. 5136) and have reportedly put a hold on a portion of GCV Research, Technology, Development and Evaluation (RDT&E) funding until the report is provided to Congress.[54]

In testimony to House Subcommittee on Tactical Air and Land Forces on March 9, 2011, GAO noted that:

> Questions remain about the urgency of the need for the GCV. In its August 2010 report, the Red Team that was convened by the Army questioned the urgency of the need for the GCV within 7 years. The report concluded that the funds that have migrated from the FCS program were driving the events and activities of the program, versus a true capabilities gap. Further, the team reported that the Army had not provided the analysis supporting the need to rapidly replace the Bradley vehicle. The Army is currently conducting portfolio reviews across many of its missions. The results of the combat vehicle portfolio review should be available soon and should be able to answer questions about urgent need, related questions about the capability needs the GCV is intended to fulfill, and establish the vehicle's priority relative to other weapons systems being reviewed. Decision makers will have to decide if the Army has made a convincing case for the GCV before allowing it to proceed into the technology development phase.[55]

Given these concerns, it might be a reasonable conclusion that the Army has yet to build a compelling case for the requirement to develop and acquire the GCV. Without such a case, it might prove difficult for the Army—particularly in light of anticipated budgetary limitations—to convince congressional decision makers to support the GCV program. Another factor that could influence decision makers is that the Army reportedly has yet to settle on a total quantity of GCVs to procure, although Army officials indicate that they would develop a revised total cost estimate

[52] United States House of Representatives Committee on Armed Services 112th Congress Oversight Plan, p. 19; http://armedservices.house.gov/index.cfm/files/serve?File_id=468b7b96-c2ba-4c10-aad6-b5798b5ae77a.

[53] Ann Roosevelt, "GCV A Prototype for Process Change, Dempsey Tells SASC," *Defense Daily*, March 4, 2011.

[54] Lance M. Bacon, "Some GCV Funds on Hold Until Congress Sees Report," *Army Times*, January 24, 2011, p. 17.

[55] GAO Report, Testimony Before the Subcommittee on Tactical Air and Land Forces, Committee on Armed Services, House of Representatives, "Defense Acquisitions: Key Questions Confront the Army's Ground Forces Modernization Initiatives," GAO-11-425T, March 9, 2011, p. 6.

as well as total quantities of vehicles required during the next Program Objective Memorandum (POM) cycle.[56]

Secretary of Defense Gates's West Point Speech and the Need for Armor Forces

On February 25, 2011, Secretary of Defense Robert Gates addressed the Corps of Cadets and, among other observations, noted the following:

> The need for heavy armor and firepower to survive, close with, and destroy the enemy will always be there, as veterans of Sadr City and Fallujah can no doubt attest. And one of the benefits of the drawdown in Iraq is the opportunity to conduct the kind of full-spectrum training – including mechanized combined arms exercises – that was neglected to meet the demands of the current wars. Looking ahead, though, in the competition for tight defense dollars within and between the services, the Army also must confront the reality that the most plausible, high-end scenarios for the U.S. military are primarily naval and air engagements – whether in Asia, the Persian Gulf, or elsewhere. The strategic rationale for swift-moving expeditionary forces, be they Army or Marines, airborne infantry or special operations, is self-evident given the likelihood of counterterrorism, rapid reaction, disaster response, or stability or security force assistance missions. But in my opinion, any future defense secretary who advises the president to again send a big American land army into Asia or into the Middle East or Africa should "have his head examined," as General MacArthur so delicately put it.
>
> By no means am I suggesting that the U.S. Army will – or should – turn into a Victorian nation-building constabulary – designed to chase guerrillas, build schools, or sip tea. But as the prospects for another head-on clash of large mechanized land armies seem less likely, the Army will be increasingly challenged to justify the number, size, and cost of its heavy formations to those in the leadership of the Pentagon, and on both ends of Pennsylvania Avenue, who ultimately make policy and set budgets.[57]

Secretary Gates's speech was perceived by some as directly questioning the need for a large number of tanks and armored fighting vehicles and, by association, the GCV. Others suggest that because Secretary Gates reportedly plans to step down as Secretary of Defense in the near future, his belief that there might not be a requirement for large numbers of heavy forces might not be shared by his successor.

Some Members, however, seemingly share Secretary Gates's view. One Member during a March 2, 2011, HASC hearing reportedly asked Army Chief of Staff General George Casey "what Secretary Gates' speech would mean for the $40 billion GCV, which is meant to replace vehicles in the Army's heavy units?"[58] General Casey responded that the GCV was being developed for a full range of scenarios, "not just tank warfare."[59]

While Secretary Gates's views on the need for mechanized units might not have an impact on Army force structure or operational focus, it seemingly raises the issue of future requirements for

[56] Sebastian Sprenger, "Army Still Tweaking the Total Number of Ground Combat Vehicles Required," *InsideDefense.com*, February 28, 2011.

[57] DOD Transcript: Secretary of Defense Robert M. Gates' Speech at the United States Military Academy, West Point, NY, Friday February 25, 2011.

[58] Kate Brannen, "Echoing Gates, Congress Questions U.S. Army GCV," *Defense News*, March 7, 2011, p. 10.

[59] Ibid.

armored and mechanized forces, which could have in impact on the GCV program. If a decision is made for fewer heavy units, then it is likely that fewer GCVs would be needed, which might have an impact on the program as a whole. Also, a de-emphasis on heavy forces could result in further questioning the need for the GCV and make it that much more difficult to build support for the program.

Current Status of the GCV Program[60]

The Army's GCV program office is reportedly waiting for an independent cost estimate from the Office of the Secretary of Defense's Cost Assessment and Program Evaluation Agency (CAPE).[61] CAPE officials noted that the estimate was ongoing and that no firm date had been set for the estimate's completion. The Army has also reportedly rescheduled a Milestone A Defense Acquisition Review Board for June 13, 2011. A Milestone A decision would permit the GCV program to enter a 24-month Technology Development phase. At the completion of the Technology Development phase, up to two vendors are planned to be selected to compete in the Engineering Manufacturing and Development phase and at the completion of that phase, one vendor will be chosen to produce and deploy the GCV.

The E-IBCT Program

The E-IBCT Concept

The E-IBCT Program is part of the Army's Brigade Combat Team (BCT) Modernization Program and is essentially a continuation of the FCS Program's spin out efforts to provide network technology, sensors, and unmanned aerial and ground vehicles to Army units. According to the Army,[62] the E-IBCT program is the first increment of the Army's long-term BCT Modernization Program and, beginning in 2011, the following systems were planned to be delivered to nine as opposed to the original seven IBCTs:

- Urban and Tactical Unattended Ground Sensors (U/T-UGS);
- Class I (Block 0) Unmanned Aerial System (UAS);
- Small Unmanned Ground Vehicle (SUGV) Block 1; and

[60] Tony Bertuca, "Ground Combat Vehicle Program Awaits Independent Cost Estimate," *InsideDefense.com*, May 13, 2011, and "PEO Open to Incentive Innovation with Ground Combat Vehicle Contract," *InsideDefense.com*, May 20, 2011.

[61] CAPE's mission is described as follows: To analyze and evaluate plans, programs, and budgets in relation to U.S. defense objectives, projected threats, allied contributions, estimated costs, and resource constraints: review, analyze, and evaluate programs, including classified programs, for executing approved policies: provide leadership in developing and promoting improved analytical tools and methods for analyzing national security planning and the allocation of resources; ensure that the costs of DOD programs, including classified programs, are presented accurately and completely; assess effects of DOD spending on the U.S. economy, and evaluate alternative policies to ensure that DOD programs can be implemented efficiently. http://www.cape.osd.mil/.

[62] Information in this section is taken from the Army's Fact Sheet "Modernizing the Army's Brigade Combat Team Increment 1 Capabilities," September 13, 2010.

- Network Integration Kit (NIK) mounted on HMMWVs and MRAPs to enable data sharing and command and control (C2) of all systems.

These systems are the same systems included in the first FCS spin out, less the Non-Line of Sight Launch System (NLOS-LS) which was cancelled in May 2010 because DOD determined that it would "not provide a cost-effective precision-fire capability" as the system's missiles were estimated to cost about $316,000 apiece.[63] Prior to the NLOS-LS cancellation, GAO valued the cost of Increment One for nine BCTs at about $3.5 billion.[64] Under the current E-IBCT program each brigade would be fielded 81 Network Integration Kits (NIKs), 29 sets of Urban Unattended Ground Sensors, 13 sets of Tactical Unattended Ground Sensors, 23 Class 1 Unmanned Aircraft Systems, and 38 Small Unmanned Ground Vehicles.[65]

Prime Contractors[66]

The E-IBCT prime contractors include the following:

- Prime: The Boeing Company, Integrated Defense Systems, St. Louis, MO.
- Class I UAS: Honeywell, Aerospace Division, Albuquerque, NM.
- NLOS-LS: Raytheon Missile Systems, Tucson, AZ (*program cancelled*).
- UGS: Textron Defense Systems, Wilmington, MA.
- SUGV: iRobot, Burlington, MA.

Boeing's role as prime contractor is to integrate all of the other systems and manage the E-IBCT process. There is no prime contractor for the NIK however, because it consists of a suite of computers, radios, and sensors from different vendors.

Testing and Reliability Problems

From August to September of 2009, a Limited Users Test (LUT) of the E-IBCT systems was conducted at Ft. Bliss, TX, by the Army Evaluation Task Force (AETF)—an Army unit that had previously been formed to test FCS technologies. This test was the first operational test of E-IBCT systems and involved four 96-hour test scenarios. The Army's intent at that time was to begin low-rate initial production of these Increment One systems after the LUT so that fielding could start in the FY2011-2012 timeframe. The results of the LUT, however, revealed pervasive performance and reliability shortcomings for all Increment One systems. The Pentagon's Director of Operational Test and Evaluation (DOT&E) reported that, inter alia:[67]

[63] Sebastian Sprenger, Tony Bertuca, Debbie Siegelbaum, " Army Breaks Up Remnants of Post-FCS Suite, Girds for New Contract Plan," *InsideDefense.com*, May 17, 2010.

[64] GAO Testimony Before the Subcommittee on Airland, Committee on Armed Services, U.S. Senate, "Defense Acquisitions: Opportunities and Challenges for Army Ground Force Modernization Efforts," April 15, 2010.

[65] Kate Brannen, "U.S. Army to Weigh Buying More FCS Gear," *Defense News*, November 18, 2010.

[66] From the Army's 2009 Program Book, January 2009, p. 65.

[67] Memorandum For Principal Deputy Under Secretary of Defense (Acquisition, Technology and Logistics), Subject: State of Reliability, June 30, 2010.

- **Urban Unattended Ground Sensors**—Demonstrated a mean time between system aborts (MTBSA)[68] of 25 hours vs. a 105 hour requirement. The system developer had predicted a MTBSA of 4,187 hours.
- **Tactical Unattended Ground Sensors**—Demonstrated a MTBSA of 52 hours vs. a 127 hour requirement. The system developer had predicted a MTSBA of 1,258 hours.
- **Class I Block 0 Unmanned Aerial System—**Demonstrated a MTSBA of 1.5 hours versus a 23 hour requirement.
- **Small Unmanned Ground Vehicle Block 1**—Demonstrated a 5.2 hour MTSBA versus a 42 hour requirement.
- **Network Integration Kit**—Demonstrated a 33 hour MTBSA versus a 112 hour requirement. The system developer had predicted a MTSBA of 1,615 hours.
- **Non Line of Sight Launch System** (cancelled by the Army in May 2010)—Two of six missiles fired achieved target hits; four missed their targets with two of those missiles impacting 14 or more kilometers short of the target.

Given these findings, as well as difficulties with E-IBCT systems operating at expected ranges and delivering less than satisfactory results, the Director of Operational Test and Evaluation concluded that the "reliability desired for E-IBCT Increment One systems is not achievable without an extensive design-for reliability effort."[69] Given these findings, the Army—with significant pressure from DOD and Congress—concluded that Increment One was not ready to be fielded and agreed to an extensive redesign effort and to conduct a subsequent LUT in the fall of 2010.

Fall 2010 LUT—Mixed Results Reported

In September 2010, the Army started its second Increment One LUT at Ft. Bliss under the scrutiny of the Pentagon and GAO. Indications are that while some improvement has been made, that some of the systems tested might not have performed well enough and, based on their cost, might not be fielded to units as originally planned.[70] Reports suggest that the NIKs are still affected by "lengthy wait times for start-up and data transfer" with some suggesting that because the NIK plays such a central role in the network and the joint tactical radio system, that it might be "too important to terminate."[71] In addition, the utility of the unattended ground sensors and the continued high cost of the Class I UAV are also of continued concern. [72] It was also reported that

[68] The November 2009 Defense Acquisition University Glossary of Defense Acquisition Acronyms & Terms defines MTSA as the statistical mean time or mileage between system aborts of systems in a new or like-new condition. A system abort is an incident that, due to its severity, would cause a system not to start a mission, to be withdrawn from a mission, or be unable to complete a mission. System aborts give rise to essential unscheduled maintenance activities intended to correct the failure.

[69] Memorandum For Principal Deputy Under Secretary of Defense (Acquisition, Technology and Logistics), Subject: State of Reliability, June 30, 2010.

[70] CRS discussion with the Army, November 1, 2010.

[71] Tony Bertuca, "NIK Too Big to Fails?: Army Eyes E-IBCT Utility and Affordability, Preps for December DAB," *InsideDefense.com*, November 29, 2010.

[72] Ibid.

DOT&E concluded that only the SUGV is "operationally suitable" and that the other systems are not ready to be fielded.[73]

DOD Cancels the E-IBCT Program[74]

On February 3, 2011, the Under Secretary of Defense for Acquisition, Technology, and Logistics, Ashton Carter, informed congressional leadership that he had decided to continue low rate production of two individual elements of the E-IBCT program—the SUGV and the NIK. Secretary Carter authorized the Army to procure one additional brigade set of NIKs (quantity up to 100) and two additional brigade sets of SUGVs (up to an additional 90 units), and upon the completion of these actions, the Army was directed to cease developmental efforts on all other elements of the E-IBCT program, effectively cancelling the program. Secretary Carter requested that the Army establish a separate acquisition program for further SUGV procurement but stated that there would be no additional NIK acquisitions after the FY2011 procurement.

Continuing Concerns with the NIK

Secretary Carter noted that the NIK was "not considered a viable, affordable, long term solution," but instead could serve as the "first step in the Army's long-term strategy of fielding interoperable, non-proprietary waveform sets."[75] He further indicated that NIK testing in 2011 would be used to determine if the NIK should be fielded to one BCT and if BCTs would be better off with or without the NIK. In addition to continuing cost concerns, reports suggest that:

> The NIK was complex to operate, and the soldiers expressed little confidence in it, frequently turning it off or putting it in a standby when they went on offensive missions.[76]

Reports suggest that the current NIK would form the basis of a new version of the NIK that would retain current functionality but would employ a more incremental design permitting the NIK to be updated every couple of years.[77] It is not known if the next NIK version will be cheaper than the current NIK, which has been valued at around $800,000 per kit, including associated radios.[78]

[73] Jason Sherman, "On Eve of Major Review, Top DOD Tester Finds E-IBCT Not Operationally Suitable" *InsideDefense.com*, December 10, 2010.

[74] Letter from Ashton B. Carter, Under Secretary of Defense for Acquisition, Technology, and Logistics, to Senator Carl Levin, Chairman, Committee on Armed Services, United States Senate, February 3, 2011.

[75] Ibid.

[76] Kate Brannen, "Unsettled Plans Imperil Network Tests," *Defense News*, March 14, 2011p. 12.

[77] Daniel Wasserbly, "U.S. Army Plans to Field NIKs," *Jane's Defence Weekly*, March 2, 2011, p. 13.

[78] GAO Report, Testimony Before the Subcommittee on Tactical Air and Land Forces, Committee on Armed Services, House of Representatives, "Defense Acquisitions: Key Questions Confront the Army's Ground Forces Modernization Initiatives," GAO-11-425T, March 9, 2011, p. 11.

FY2012 Legislative Activity

GCV

The FY2012 Budget Request for the GCV is $884.387 million for Research, Technology Development and Evaluation (RDT&E).[79] These funds are almost $1 billion less than previously estimated due to the seven-month delay in the program and subsequent delay in awarding Technology Development contracts.

E-IBCT

The FY2012 Budget Request for the E-IBCT is $243 million for Procurement and $506 million for RDT&E for a total of $749 million.[80] Procurement funding is intended to buy 100 NIKs for one brigade set and two brigade sets (an additional 78 units) of SUGVs. RDT&E funds are intended to continue the development of the NIK and associated subcomponents.

National Defense Authorization Act for FY2012 (H.R. 1540) Report of the Committee on Armed Services, House of Representatives[81]

GCV

The House Armed Services Committee (HASC) recommended fully funding the $884.4 million RDT&E budget request but included a number of provisions. Noting the role that the findings from the Army's "Red Team" had in the revision of the original GCV RFP, the HASC recommends that another Red Team assessment be conducted to examine if the changes to GCV requirements are "sufficient to place it on a path to success within a 7-year timeframe."[82] This Red Team, which should be established prior to the Milestone B decision, will assess the cost, schedule, and technical risks of the GCV acquisition strategy.[83]

Regarding the initial GCV Analysis of Alternatives (AoA), the HASC noted that compared with other alternatives, the GCV presented a high affordability risk. Under the revised RFP, the affordability risk decreased, but the supporting analysis was based on large part on qualitative assessments of subject matter experts as opposed to a more rigorous analytical methodology employed in the preliminary AoA. Because the new GCV design has substantial design changes, the HASC would like to see the revised GCV compared to the full range of vehicle alternatives using the same analytical methodology used in the original AoA.[84]

[79] The Army Budget Request - Fiscal Year 2012, Justification Book Volume 5B, Research, Development, Test and Evaluation, Army, February 2011, p. 483.

[80] Department of Defense FY 2012 Program Acquisition Costs by Weapon System, February 2011, pp 2-3.

[81] National Defense Authorization Act for FY 2012 (H.R. 1540) Report of the Committee on Armed Services, House of Representatives, Report 112-78, May 17, 2011.

[82] Ibid., p. 49.

[83] Ibid., p. 50.

[84] Ibid.

Based on these recommendations, the HASC restricted the use of FY 2012 funds, limiting the obligation or expenditure of funds to not more than 70% until the Secretary of the Army provides a report to the defense committees including an updated AoA that includes a quantitative comparison of the current upgraded Bradley fighting vehicle and the other alternative vehicles included in the preliminary AoA.[85]

E-IBCT

The House Armed Services Committee (HASC) recommended funding $119.8 million of the E-IBCT's $243 million Procurement request—a 51% reduction. Because the Army aggregated its E-IBCT RDT&E budget request as a result of placing surviving E-IBCT programs in a variety of Army Program Executive Offices (PEOs), it is difficult to determine the HASC fully funded the $506 million RDT&E budget request without a breakdown of where the surviving E-IBCT programs were transferred.

The HASC expressed concern that, in addition to FCS, it did not have sufficient visibility of E-IBCT efforts that were continuing and termination costs associated with cancelled FCS and E-IBCT systems.[86] In order for Congress to make informed funding decisions, the HASC directs the Army to submit a report to congressional defense committees by April 1, 2012, detailing all current and projected funding for FCS legacy efforts.[87] The report is to include the status of all terminated and pending contract actions resulting from the termination of the FCS and E-IBCT programs.[88]

Potential Issues for Congress

Has the Requirement to Develop the GCV Been Adequately Established?

Based on comments and questions from a number of different sources, it can be inferred that the Army has not yet built a compelling case for the development of the GCV. Secretary Gates's February 2011 West Point speech questioning, among other things, the need for a large number of heavy BCTs can be seen as setting the context for this discussion. Reports suggest that during recent congressional hearings, Army leadership was repeatedly asked to respond to Secretary Gates's comments as well as study findings on the Army's poor acquisition track record.[89] In addition, Members noted a recent Army study that found that between 1990 and 2010, the Army terminated 22 major programs, wasting $3.3 to $3.8 billion annually since 2004, asking the question "how would the GCV program be different?"[90] In testimony, GAO noted that the Army's own Red Team analysis estimated that it would take 10 to 12 years to develop a "new and very

[85] Ibid., p. 88.

[86] Ibid., p. 53.

[87] Ibid.

[88] Ibid.

[89] Kate Brannen, "U.S. Army Pressed to Justify Size," *Defense News*, March 7, 2011, p. 1.

[90] Kate Brannen, "Echoing Gates, Congress Questions U.S. Army GCV," *Defense News*, March 7, 2011, p. 10.

different vehicle from what is currently in the force."[91] Some suggest that significance of these comments and questions—some of which are coming from internal Army studies—portray an underlying lack of confidence in the Army's ability to develop the GCV as currently envisioned.

In terms GCV-specific requirements, aforementioned GAO testimony noted that the Army's GCV Red Team questioned the urgency of the need for the GCV within seven years and that it was the prospect of losing FCS funds that had been migrated to the GCV program that drove events, as opposed to a true capabilities gap.[92] GAO also further noted that the Army has not yet provided analysis that supports the need to rapidly replace the Bradley fighting vehicle.[93]

The Nine-Soldier GCV Requirement

Army leadership's position is that "the service needs a new, next-generation Ground Combat Vehicle able to accommodate new technologies as they emerge, defend against a wide range of current and future threats and deliver a full nine-man squad under armor into the full spectrum of military operations."[94] When asked by a Member why upgrades to the Bradley Fighting Vehicle would not be sufficient, Army leaders stated that "an upgraded Bradley does not have the capacity to deliver a nine-man infantry squad into battle a critical requirement, given how the Army conducts operations."

The HASC has also questioned the need to put an entire squad in a single vehicle, noting:

> The committee understands the Army wants the GCV to carry three additional soldiers, but the committee believes that should not be the primary attribute that drives the decision on continuing the project on its current path. The committee believes that the GCV program should not proceed beyond the technology development phase unless the committee's issues and concerns are addressed.[95]

If this report language is eventually included in the FY2012 National Defense Authorization Act, the Army will be required to convince Congress that the need to carry an entire nine-soldier infantry squad is an absolute tactical necessity that fully merits a potential $30 billion investment in the GCV. If the Army cannot make a successful argument for the nine-man requirement, then it will need to highlight other GCV attributes to justify the continuation of the GCV program.

In terms of Army's justification for the GCV, the ability to carry a full nine-man squad is the only specific requirement mentioned and appears to be the crux of the Army's argument for the GCV. If the ability to carry a nine-man squad in one vehicle is to be the central requirement for the GCV, it might be useful to examine its link to how the Army conducts operations. What would be the impact on the ability of the Army to conduct tactical operations if the GCV is not developed?

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[91] GAO Report, Testimony Before the Subcommittee on Tactical Air and Land Forces, Committee on Armed Services, House of Representatives, "Defense Acquisitions: Key Questions Confront the Army's Ground Forces Modernization Initiatives," GAO-11-425T, March 9, 2011, p. 7.

[92] Ibid., p. 6.

[93] Ibid.

[94] Information in this section is taken from Kris Osborn, "Army Leaders Stress Need for Ground Combat Vehicle," *U.S. Army News Service*, March 16, 2011. http://www.army.mil/-news/2011/03/16/53361-army-leaders-stress-need-for-ground-combat-vehicle/.

[95] National Defense Authorization Act for FY2012 (H.R. 1540) Report of the Committee on Armed Services, House of Representatives, Report 112-78, May 17, 2011, p. 88.

How have past tactical operations been adversely affected because the Bradley cannot accommodate a nine-man squad? While the Army views having an entire nine-man squad in one vehicle as essential, it can be argued that in the event the GCV is totally destroyed, an entire squad is lost as opposed to a similar hit to a Bradley, which would result in the loss of only half a squad. While the requirements "to accommodate new technologies as they emerge and defend against a wide range of current and future threats" might also be crucial, some believe that the Army has not yet provided sufficient specific examples to warrant investment in the GCV.

Is the NIK a Viable Option?

There are continuing questions about the viability of the NIK. In recent testimony, GAO noted that:

> The Army maintains that the kit is needed to capitalize on waveform, radio, and integrated computer system efforts to deliver the networking capabilities for company and platoon use. However, for a program currently in production, a number of critical technologies key to the kit's performance remain immature. The Army and the Director, Defense Research and Engineering have both assessed a critical technology key to the kit's performance—the Wideband Networking Waveform—at a maturity level well below what would be expected of a program in the production stage of development. The Director also indicated that there is a high risk that the technology will not mature as expected and also considers the technology to be potentially flawed. Additionally, the Director has assessed another key critical technology for the kit—the Soldier Radio Waveform—at a technology maturity level well below what would be expected of a program in production.[96]

In addition to the aforementioned assessments, comments from soldiers that have used the NIK during testing might also be viewed as questioning the viability of the NIK. It was reported that during testing, the Ground Mounted Radio (GMR), a component of the NIK, did not work about 70% of the time.[97] In addition, as previously mentioned, soldiers using the NIK found it complex to operate and expressed little confidence in its ability to function properly.[98] While statements from Army leadership suggest that the current NIK will serve as the basis for a new, and, hopefully, improved version, reports suggest that other companies have approached the Army with alternative technologies.[99]

In light of cost and performance concerns and what might be described as less than enthusiastic support from senior DOD leadership, Congress might wish to further examine if continued investment in the NIK is warranted. It can be argued by critics that using the NIK as the basis of a newer NIK version is simply "building on failure." If there are viable alternatives available from different vendors, it might be in the Army's best interest to fully examine these proposals before committing to the NIK. Because of the criticality of this decision, Congress may decide to also examine industry proposals that provide an alternative to the NIK.

[96] GAO Report, Testimony Before the Subcommittee on Tactical Air and Land Forces, Committee on Armed Services, House of Representatives, "Defense Acquisitions: Key Questions Confront the Army's Ground Forces Modernization Initiatives," GAO-11-425T, March 9, 2011, p. 11.

[97] Kate Brannen, "Unsettled Plans Imperil Network Tests," *Defense News*, March 14, 2011p. 12.

[98] Ibid.

[99] Tony Bertuca, "Carter Formally Axes Two FCS Spin-Outs as Army Preps NIK for Testing," *InsideDefense.com*, February 4, 2011.

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