The Army brigade combat team (BCT) modernization strategy will build a versatile mix of mobile, networked BCTs that will leverage mobility, protection, information and precision fires to conduct effective operations across the spectrum of conflict.

BCT Modernization Plan

The BCT Modernization Plan is informed by the comprehensive lessons learned from more than eight years of war, focuses on the evolving needs of our warfighters in a rapidly changing security environment, and exploits the knowledge and technologies developed under the Future Combat Systems program. Instead of making one modernization decision and then applying it across the Army over two or more decades as was typically done in the past, the BCT Modernization Plan recognizes that modernization decisions must be made incrementally to stay ahead of the demands of the security environment and the needs of our warfighters. The Army’s new plan emphasizes the role of battle-tested soldiers in the development of new equipment, provides for the incremental delivery of the network, incorporates mine resistant ambush protected (MRAP) vehicles into formations, accelerates the fielding of capability packages across all BCTs, and initiates a new ground combat vehicle program as an element of a holistic plan for all combat vehicles.

The Army’s BCT Modernization Plan is closely linked with the Army force generation model (ARFORGEN), which continuously supplies warfighters within both the active and reserve components. ARFORGEN-based equipping is the main effort by which the Army manages equipment based on defined equipping goals linked to each phase (reset, train-ready, available) of the ARFORGEN cycle. Equipping resources are allotted to units to meet their mission during each stage of this cycle. This strategy allows the Army to build a versatile mix of tailor and networked organizations, operating on a rotational cycle, to provide a sustained flow of trained and ready forces for full spectrum operations and to hedge against unexpected contingencies at a sustainable tempo for the all-volunteer force.
Capability packages are a key element of the Army’s BCT modernization strategy, and they provide the Army a regular process to strengthen units with the latest materiel and nonmaterial solutions to meet the evolving challenges of the operating environment. This allows the Army to get the capabilities in highest demand to the soldiers who need them, when they need them most. Accelerating proven solutions, these packages will upgrade units every few years. These bundles of capabilities include doctrine, organization and training in conjunction with materiel to fill the highest priority shortfalls and mitigate risk for soldiers. The incremental deliveries will build upon one another as the Army continually adapts and modernizes. The Army has solidified contents of the first capability package (CP 11-12) and is finalizing stages of the next capability package (CP 13-14).

Testing and evaluation of materiel solutions that make up the first capability packages are ongoing at Fort Bliss, Texas, and other Army test and evaluation locations and laboratories. Increment 1 Early Infantry brigade combat team equipment and network, a portion of CP 11-12, is in final evaluation by soldiers of the Army Evaluation Task Force at Fort Bliss. Increment 1 has also entered low-rate initial production and will be fielded to the 3rd Infantry Brigade Combat Team, 1st Armored Division, for initial operational test and evaluation in 2011. Other capabilities in CP 11-12 include: human terrain teams (at battalion level), advanced precision mortar rounds and the ground soldier system (GSS). Capability packages are aligned with the Army’s ARFORGEN cycle; they are adaptive and will be delivered to units preparing for deployment.

A critical practice of the BCT modernization strategy is the continued use of soldier feedback on emerging capabilities. The Army Evaluation Task Force (AETF)—a brigade-size unit created in 2006 at Fort Bliss—provides immediate feedback during the testing and evaluation of new technologies, organization and training initiatives. These battle-tested soldiers are not shy about telling Army combat developers and industry designers what works and what doesn’t. Constant feedback from soldiers—operating in units as they would on the battlefield—is vital to ensuring that new systems meet operational needs.

This process informs the development and integration of enhanced capability packages as well as tactics, techniques, and procedures for the current and future force. Combat-experienced soldiers at AETF test emerging systems to failure and provide instant feedback to product manufacturers, which helps drive the delivery of a better product to the warfighter. Soldier-in-the-loop participation in the development reduces the risks associated with developing new systems and focuses the collective effort on providing new capabilities that perform as intended from the outset.

Increment 1, Capability Package 11-12 (CP 11-12)

The current modernization strategy will deliver CP 11-12 to nine Infantry brigade combat teams (IBCTs) starting in 2011. Remaining BCTs will receive incremental release of upgraded capabilities. Army force generation (ARFORGEN) will determine if and when these IBCTs will be upgraded to a post-Early IBCT (E-IBCT) configuration based upon warfighting requirements.

Numerous operational needs statements (ONS) from theater reflect IBCT requirements for additional robotic capability for air and ground, more responsive precision fires at lower levels, and better situational awareness (SA) and situational understanding (SU) of friendly and enemy locations in complex terrain, like urban environments. IBCTs are the most often deployed and most vulnerable formations, thereby warranting the increased demand in lower-level unit intelligence, surveillance and reconnaissance (ISR). The Increment 1 program provides the Army the opportunity to field high-demand, techno-
logically advanced capabilities to operational forces that address many of the needs discussed above. Increment 1 provides enhanced warfighter capabilities in two primary areas. First, it provides enhanced situational awareness, force protection, and lethality through the use of unattended and attended sensors and munitions. Second, it provides a communications network backbone for E-IBCT and battalion command networks.

The E-IBCT Increment 1 will consist of the following systems: the urban and tactical unattended ground sensors (U/T UGS), Class 1 (Block 0) unmanned aerial vehicle (UAV) and small unmanned ground vehicle (SUGV) Block 1. The Early IBCT systems will be fully integrated and networked through a network integration kit (NIK), enabling data sharing and command-and-control (C2) of systems. All E-IBCT systems are currently under evaluation and testing by the soldiers of the AETF.

The Network
The Army will continue development and fielding of an incremental ground tactical network capability to all Army BCTs. This network is a layered system of interconnected computers and software, radios and sensors within the brigade combat team. The network is essential to enable unified battle command and will be delivered to the Army’s BCTs in increasing capability increments. The first increment is currently finishing SDD developmental and operational testing and will be delivered to IBCTs in the form of Network Integration Kits (B-kits) with E-IBCT.

The soldier at every echelon from brigade to squad will be connected to the proper sensor data and communication relay to ensure proper battlespace situational awareness. The network is being tested and evaluated in a joint service operating environment to ensure the ability to integrate communications with joint service agencies and with our allies.

Network Integration Kit (NIK)
The NIK is an integrated suite of equipment on a Humvee that provides the network connectivity and battle-command software to integrate and fuse sensor data into the common operational picture displayed on the Future XXI Battle Command Battalion Brigade and Below. The Network Integration Kit consists of an integrated computer system that hosts the battle-command software and the systems-of-systems common operating environment software, along with the joint tactical radio system, ground mobile radio to provide the interface to the sensors and unmanned systems, as well as voice and data communication with other vehicles and soldiers.

Soldiers will be able to communicate with the battalion tactical operation center (TOC) by sending reports on enemy sighting, activity and location, utilizing the NIK via the network, allowing for split-time tactical decisions.

XM1216 Small Unmanned Ground Vehicle (SUGV)
The XM1216 small unmanned ground vehicle (SUGV) is a lightweight, soldier-portable unmanned ground vehicle (UGV) capable of conducting military operations in urban terrain, tunnels, sewers and caves. The SUGV aids in the performance of urban intelligence, surveillance and reconnaissance (ISR) missions, chemical/toxic industrial chemicals (TIC) and toxic industrial materials (TIM) reconnaissance.

Working to minimize soldiers’ direct exposure to hazards, the SUGV’s modular design allows multiple payloads to be integrated in a plug-and-play fashion. Weighing less than 30 pounds, it is capable of carrying up to 6 pounds of payload weight.

The SUGV is part of Early IBCT fielding and is in current evaluation by the Army Evaluation Task Force. It will be fielded to all BCTs by 2025, and as additional sensor capabilities mature, they will be added during future incremental SUGV fielding.

XM156 Class I Unmanned Aerial System (UAS)
The XM156 Class I unmanned aerial system (UAS) is a platoon-level asset that provides the dismounted soldier with surveillance, surveillance, and target acquisition (RSTA) and laser designation. Total system weight, which includes the air vehicle, a control device and ground support equipment, is less than 51 pounds and is back packable in two custom modular lightweight load-carrying equipment (MOLLE)-type carriers.

The air vehicle operates in open, rolling, complex and urban terrains with a vertical takeoff and landing capability. It is interoperable with select ground and air platforms and controlled by mounted or dismounted soldiers. The Class I uses autonomous flight and navigation, but it will interact with the network and soldier to dynamically update routes and target information. It provides dedicated reconnaissance support and early warning to the smallest echelons of the brigade combat team in environments not suited to larger assets.

The Class I system provides a hover-and-stare capability that is not currently available in the Army UAS inventory for urban and route surveillance. The Class I system also fills known gaps that exist in force operations, such as: force protection in counterinsurgency (COIN) operations, soldier protection in COIN environment, ability to conduct joint urban operations, enhanced ISR/RSTA capabilities and hover-and-stare operations.

The Class I Block 0 UAS is part of Early IBCT fielding and is in current evaluation by the Army Evaluation Task Force. It will be fielded to all BCTs by 2025, and as additional sensor capabilities mature, they will be added during future incremental Class I UAS fielding.

Unattended Ground Sensors (UGS)
Unattended Ground Sensors (UGS) are divided into two major subgroups of sensing systems: AN/GSR-9 (V) 1 Tactical-UGS (T-UGS), which includes intelligence, surveillance and reconnaissance (ISR), UGS and chemical, biological, radiological and nuclear (CBRN)-UGS; and AN/GSR-10 (V) 1 Urban-UGS (U-UGS), also known as urban military operations in urban terrain (MOUT) advanced sensor system (UMASS).

The UGS are used to perform mission tasks such as perimeter defense, surveillance, target acquisition and situational awareness, including chemical, radiological, nuclear and early warning. A UGS field will include multimode sensors for target detection, location and classification, and an imaging capability for target identification. The sensor field also includes a gateway node to provide sensor fusion and a long-haul interoperable communications capability for transmitting target or situational awareness information to a remote operator or the common operating picture through the JTRS network.

The U-UGS provide a low-cost, network-enabled reporting system for SA and force protection in an urban
setting. U-UGS also enable residual protection for cleared areas of urban MOUT environments. They are hand-employed by soldiers or robotic vehicles either inside or outside buildings and structures.

U-UGS support BCT operations by monitoring urban choke points such as corridors and stairwells as well as sewers, culverts and tunnels. U-UGS gateways provide the urban situational awareness data interfaced to JTRS networks. Soldiers involved in the testing of the UGS have provided invaluable feedback, which was incorporated into new versions (form factors) that are now in final development and fielding.

Both urban and tactical UGS are part of Early IBCT fielding and are in current evaluation by the Army Evaluation Task Force. They will be fielded to all BCTs by 2025, and as additional sensor capabilities mature, they will be added during future incremental BCT fielding.

Follow-On Capabilities

The Common Controller (CC) serves as a controller for many different BCT unmanned systems. Today the Army does not have a networked central control device for various unmanned platforms and sensors within the BCT. Still in development, this common controller will provide that capability and will be incrementally fielded to the BCTs as it technologically matures.

The CC consolidates control of numerous systems into one integrated networked controller, reducing the logistics footprint on the battlefield and empowering the soldier with enhanced intelligence, surveillance and reconnaissance capability. Being networked, it will also simplify training. The CC controls Class I unmanned aerial systems (UAS), the armed robotic vehicle-assault-light (ARV-A-L), the small unmanned ground vehicle (SUGV) and urban unattended ground sensors (U-UGS). The CC will communicate via the Network in Spiral 2/3/4, and will perform selected training, logistics/maintenance, medical and other soldier functions.

The Armed Robotic Vehicle-Assault-Light (ARV-A-L) (XM1219) will feature an integrated weapons and reconnaissance, surveillance and target acquisition (RSTA) package to support the dismounted infantry’s efforts to locate and destroy enemy platforms and positions. The ARV-A-L will support both antitank and antipersonnel weapons platforms that will be remotely operated by network-linked soldiers.

The ARV-A-L vehicle is a 2.5-ton unmanned ground vehicle that will support dismounted and air assault operations. The ARV-A-L is slingloadable under military rotorcraft and features a common chassis. As the systems’ centerpiece, the common mobility platform (CMP) chassis provides superior mobility built around advanced propulsion and an articulated suspension system. This system gives the ARV-A-L the ability to negotiate the complex terrain, obstacles and gaps that a dismounted BCT squad will encounter. The ARV-A-L’s unique, highly advanced 6x6 independent articulated suspension, coupled with in-hub motors powering each wheel, provides extreme mobility in complex terrain, far exceeding that of vehicles utilizing more conventional suspension systems. It will climb at least a 1-meter step, far exceeding requirements, and provides the vehicle with the mobility performance and surefootedness required to safely follow dismounted troops over rough terrain, through rock and debris fields, and over urban rubble. This technology also allows the ARV-A-L to cross 1-meter gaps, traverse side slopes greater than 40 percent, ford water to depths greater than 0.5 meter and overpass obstacles as high as 0.5 meter, while compensating for varying payload weights and center of gravity.

The Ground Combat Vehicle (GCV) program is designed to develop the next-generation infantry fighting vehicle (IFV) for the Army, making the program a key effort in Army modernization. GCV IFV will have greater survivability, infantry-carrying ability and lethality than current force vehicles. The Army was scheduled to enter the technology development (TD) phase of the GCV program. Technology development is an iterative process to develop a balanced design and refine user requirements, and the 27-month TD phase will allow integration of the appropriate set of requirements into a full system design and demonstrate critical technology elements using test assets. This would mark the beginning of the formal source selection process. As of September 1, the Army anticipated a revised request for proposal by the end of the current calendar year.