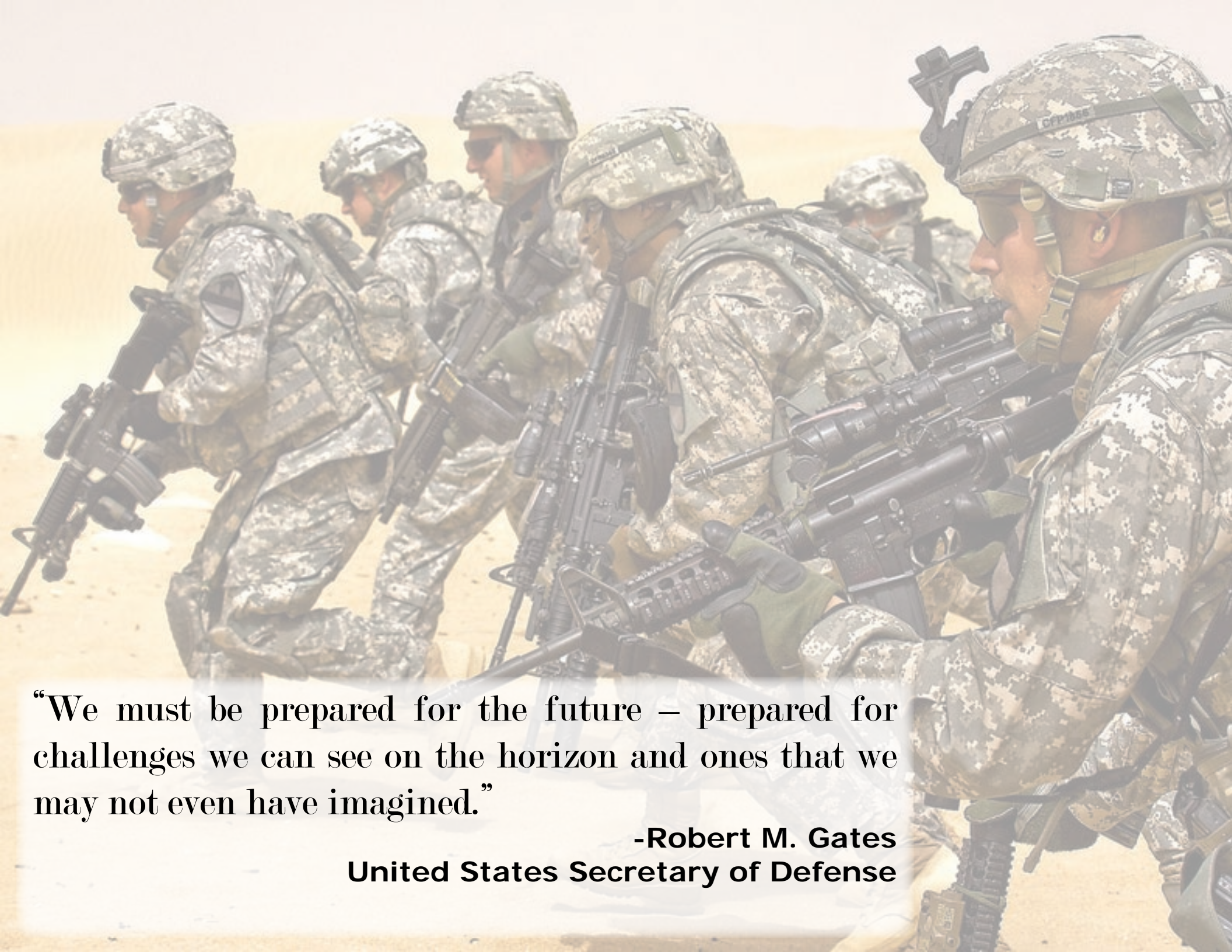




Modernizing the Army's Brigade Combat Teams

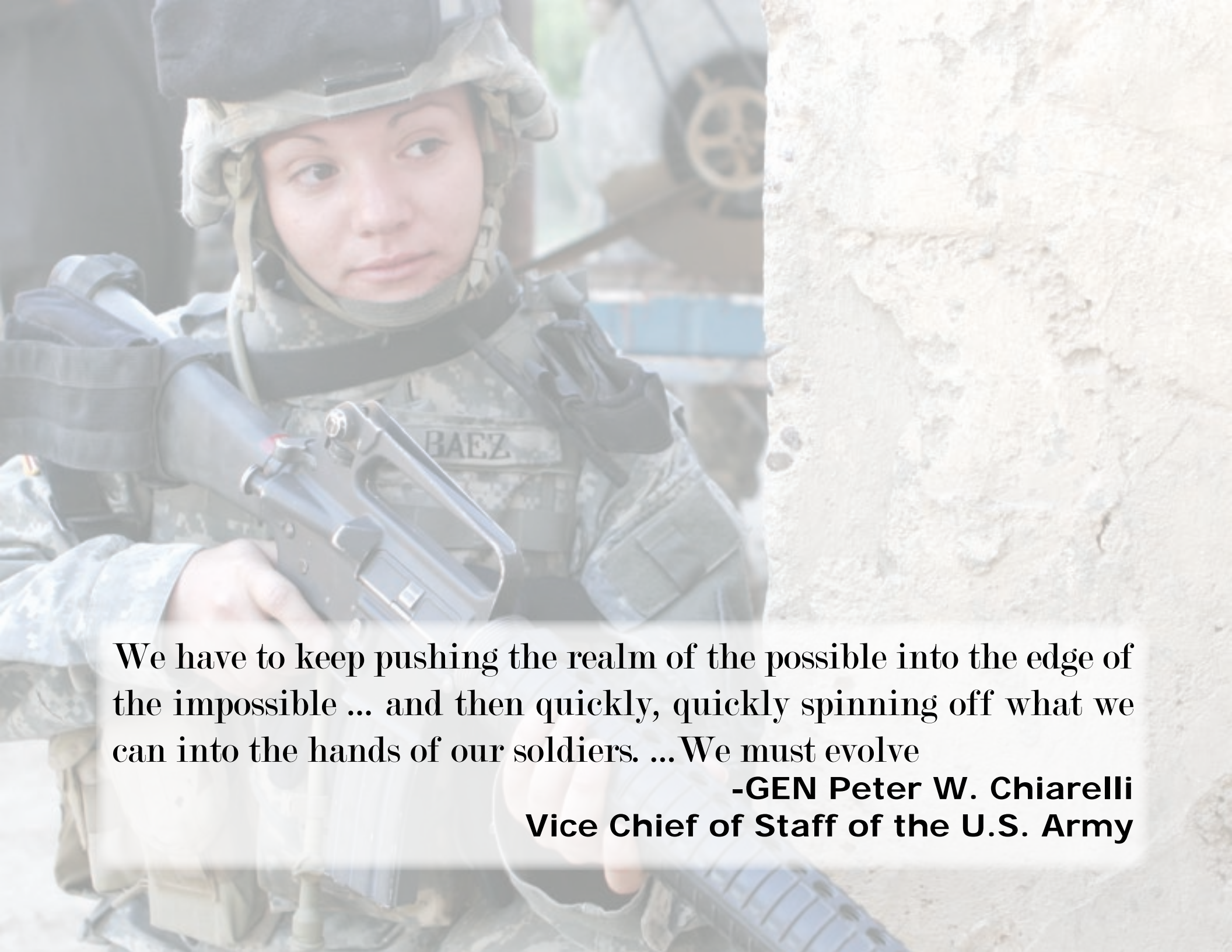


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“We must be prepared for the future – prepared for challenges we can see on the horizon and ones that we may not even have imagined.”

**-Robert M. Gates
United States Secretary of Defense**



We have to keep pushing the realm of the possible into the edge of the impossible ... and then quickly, quickly spinning off what we can into the hands of our soldiers. ... We must evolve

**-GEN Peter W. Chiarelli
Vice Chief of Staff of the U.S. Army**

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INTRODUCTION

The Army is working to build a versatile mix of tailorable 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 our All-Volunteer Force. We seek to speed the incremental fielding of successes from our research and development base to meet the challenges of the current fight, while leveraging what we have learned during eight years of war to develop future capabilities. We foresee three broad goals:

UPGRADE AND MODERNIZE SELECTED SYSTEMS TO BEST PREPARE SOLDIERS FOR COMBAT. The Army's objective is to ensure that every Soldier, in every theater, receives the proper training and equipment needed to accomplish their full spectrum of missions. We will reset and upgrade vehicles capable of accepting new capabilities in appropriate numbers, and divest ourselves of platforms whose size, weight, and power constraints limit their ability to accept new capabilities at reasonable costs.

INCORPORATE NEW TECHNOLOGIES INTO OUR BRIGADE COMBAT TEAMS. We have developed a Brigade Combat Team

Modernization Plan to incrementally field integrated capability packages to all 73 BCTs. Capability integration recognizes that fielding a materiel solution is only part of the effort to adapt and modernize the force.

Incremental capability packages fielded in synchronization with ARFORGEN provide sustainable forces fully integrated across Doctrine, Organization, Training, Materiel, Leader development, Personnel and Facilities (DOTMLPF) and allow the Army to field capabilities required for the current fight more quickly.

BETTER ENABLE ALL OF OUR FORMATIONS THROUGH CONTINUOUS UPGRADES AND MODERNIZATION. The Army is working to modernize all our formations, both Active and Reserve. We are applying the lessons of war to build a more versatile, more readily deployable mix of networked formations to better leverage mobility, protection, information, and precision fires to improve operational effectiveness and provide Soldiers the capabilities required for full spectrum operations.



ARMY EVALUATION TASK FORCE (AETF)

The Army Evaluation Task Force (AETF) at Fort Bliss continues to perform its enduring mission to provide feedback during the evaluation of future capabilities as well as to develop tactics, techniques, and procedures. The AETF is currently evaluating the Early Infantry Brigade Combat Team (E-IBCT) capability packages. As the operational environment evolves and new capabilities are available, the AETF will evaluate and prioritize future capability packages with hands-on assessments by combat veterans in realistic operational settings.



EARLY INFANTRY BRIGADE COMBAT TEAM CAPABILITIES



“The sensors and systems we are currently testing are going to be saving Soldiers lives in the near future. I believe that these sensors and these unmanned ground vehicles and micro air vehicles will definitely enhance the capabilities and situational awareness they will have in the current force.”

**-SFC Joseph Hardy
Scout Platoon SGT, 2nd Combined Arms Battalion
5th Brigade, 1st Armor Division.**

OVERVIEW OF EARLY INFANTRY BRIGADE COMBAT TEAM (E-IBCT) CAPABILITIES

CAPABILITY PACKAGES

Capability packages provide the Army a regular process to strengthen our units with the latest materiel and non-materiel solutions to the evolving challenges of the operating environment. This allows the Army to get the capabilities in highest demand to the Soldiers that need them, when they need them most.

By fielding capabilities in alignment with the way BCTs are structured and trained, the Army is ensuring that our Soldiers have the right capabilities to fight effectively as a system in the environments they are facing.

Capability packages are a key element of the Army's transition to a Brigade Combat Team (BCT) Modernization Strategy to build a versatile mix of mobile, networked and combat effective BCTs. Accelerating proven solutions, these packages will upgrade our units every few years. The best capabilities available at that time go to the Soldiers who need them most, based on the continually evolving combat environment. 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.



4 One Team - Equipping our Joint Warfighters with the World's Best Capabilities.

E-IBCT CAPABILITIES

The current modernization strategy will deliver Increment 1 capability to seven Infantry Brigade Combat Teams starting in 2011. Remaining BCTs will receive incremental release of upgraded capabilities. Army Force Generation (ARFORGEN) will determine if and when Increment 1 E-IBCTs will be upgraded to a post E-IBCT configuration based upon war fighting requirements.

Numerous Operational Needs Statements (ONS) from theater reflect IBCTs requirements for additional robotic capability for air and ground, more responsive precision fires at lower levels, as well as 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). Increment 1 program provides the Army the opportunity to field high demand, technologically advanced capabilities, to operational forces that address many of the needs discussed above.

Increment 1 provides enhanced war fighter capabilities in two primary areas. First, it provides enhanced situation 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 package will consist of the following systems: the Non Line of Sight-Launch System (NLOS-LS), 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 the Command and Control (C2) of systems except for NLOS-LS which is controlled through Advanced Field Artillery Tactical Data System (AFATDS). All E-IBCT Systems are currently under evaluation and testing by the Soldiers of the AETF.



ARMY E-IBCT MODERNIZATION CAPABILITIES

3) By using a NIK equipped HMMWV and the CL1 BLO UAS, Soldiers identify an armed enemy vehicle.

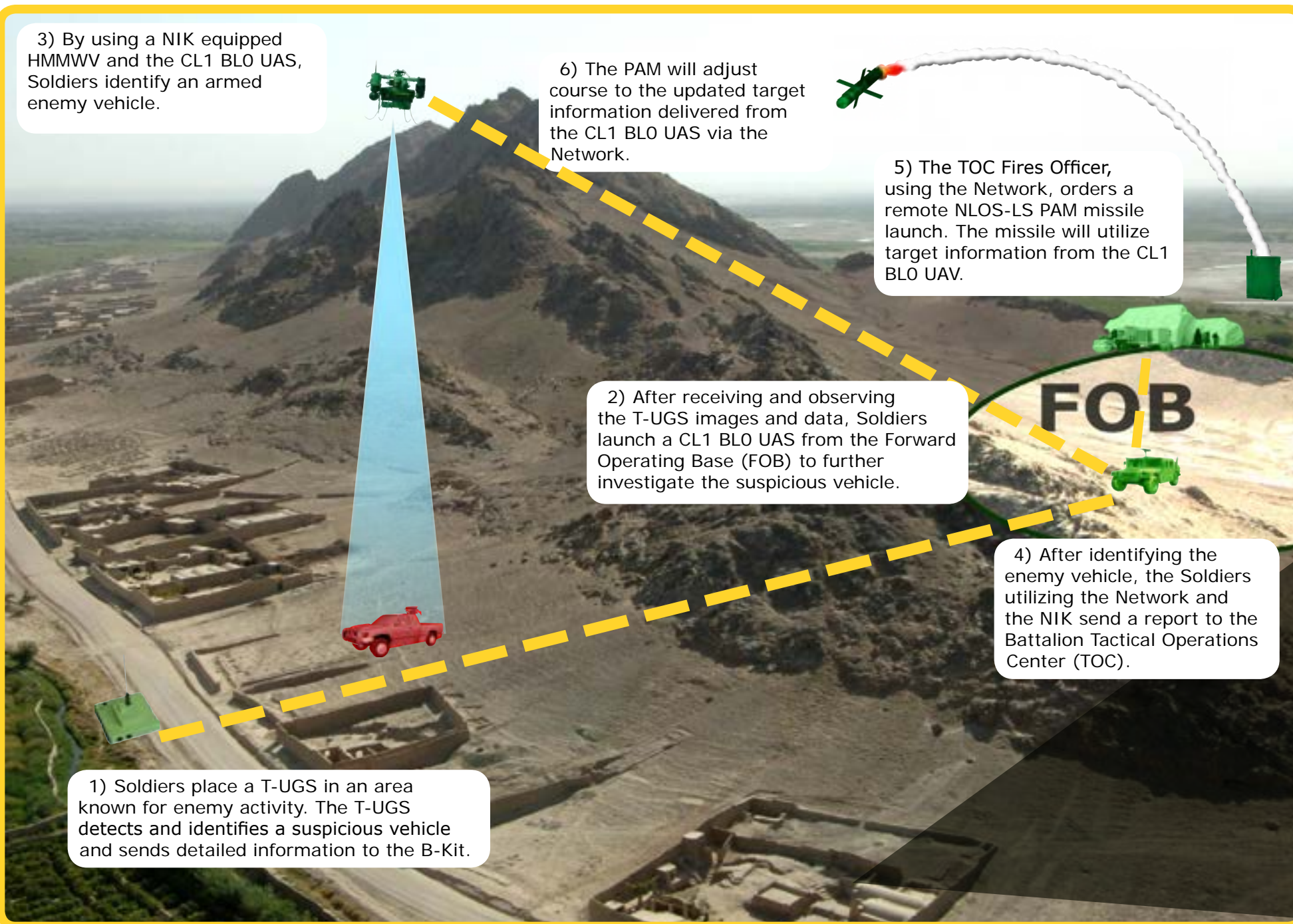
6) The PAM will adjust course to the updated target information delivered from the CL1 BLO UAS via the Network.

5) The TOC Fires Officer, using the Network, orders a remote NLOS-LS PAM missile launch. The missile will utilize target information from the CL1 BLO UAV.

2) After receiving and observing the T-UGS images and data, Soldiers launch a CL1 BLO UAS from the Forward Operating Base (FOB) to further investigate the suspicious vehicle.

4) After identifying the enemy vehicle, the Soldiers utilizing the Network and the NIK send a report to the Battalion Tactical Operations Center (TOC).

1) Soldiers place a T-UGS in an area known for enemy activity. The T-UGS detects and identifies a suspicious vehicle and sends detailed information to the B-Kit.



ARMY E-IBCT MODERNIZATION CAPABILITIES

XM156 Class 1 Block 0 Unmanned Aerial System (CL1 BLO UAS)

The CL1 BLO UAS provides squad or platoon sized elements with Reconnaissance, Surveillance and Target Acquisition (RSTA) in areas suited for smaller units. It uses autonomous flight and Network connectivity to interact with the Soldier and provide dedicated RSTA and early warning while maintaining constant surveillance.



Network Integration Kit (NIK)

The NIK provides initial network connectivity to transfer sensor and communication data to and from existing tactical wheeled vehicles. The NIK consists of an integrated computer system hosting the latest communications and radio systems, limited battle command and Systems of Systems Common Operating Environment (SoSCOE) software. It will be initially integrated onto the HMMWV platform.



AN/GSR-9/10 Tactical/Urban Unattended Ground Sensors (T/U-UGS)

The UGS provide the Soldiers of the BCT with increased situational awareness and early warning. Tactical and Urban UGS (T/U-UGS) can be deployed by the Soldier or by robotic vehicle. Multi-mode sensors identify targets, report the location, classification and images via the Network.



XM501 Non-Line Of Sight Launch System (NLOS-LS)

The NLOS-LS will provide the BCT Soldier with a networked, unmanned, extended range targeting and precision attack platform. The highly deployable Container Launch Unit (CLU) contains fifteen Precision Attack Missiles (PAM). The PAM receives target information prior to launch then receives and responds to target update information.



XM1216 Small Unmanned Ground Vehicle (SUGV)

The SUGV is a lightweight, man-portable Unmanned Ground Vehicle (UGV) capable of conducting operations in urban terrain, tunnels, sewers, and caves. The SUGV performs hazardous missions without directly exposing the Soldier to the dangers found in manpower intensive or high risk missions.



SUGV IN ACTION

Soldiers on a mission to clear known enemy strongholds use the SUGV to locate the enemy. Greatly enhancing the Soldiers situational awareness, the SUGV is a vital tool for the BCT. Allowing for increased awareness and lowering the risk for casualties by alerting the Soldiers of their enemies upon entering a building.



The Army's Brigade Combat Team (BCT) modernization strategy will build a versatile mix of mobile, Networked BCTs that can leverage mobility, protection, information and precision fires to conduct effective operations across the spectrum of conflict. Key to modernizing the Army BCTs is to empower Soldiers with increased Intelligence, Surveillance and Reconnaissance (ISR) capabilities. Soldiers of the Army's Brigade Combat Teams will receive capability packages that will provide much needed Networked ISR and lethality capabilities. Today, Soldiers at Fort Bliss, Texas are part of the acquisition process, testing and evaluating the equipment to ensure a better product.

OVERVIEW OF EARLY INFANTRY BRIGADE COMBAT TEAM (E-IBCT) CAPABILITIES

THE SOLDIER

The Brigade Combat Team Soldier will be connected via the network to other Soldiers, via manned and unmanned systems. This connectivity provides the Soldier increased Intelligence, Surveillance and Reconnaissance capability while both mounted and dismounted, enabling effective performance of Battle Command functions while maximizing Soldier and Force lethality and survivability.

Network connectivity also enables the Soldier to more effectively employ and control unmanned ground and aerial systems. These network-enabled capabilities are executed when mounted via Network Integration Kits (NIK), as part of the follow-on capabilities effort, and when dismounted via the Common Controller (CC).

In order to connect the Soldier to Battle Command and to increase battlefield awareness, Soldiers of the Infantry Brigade Combat Teams will be provided the Ground Soldier System (GSS). The centerpiece of GSS, managed by Program Executive Office Soldier is the ability to graphically display the individual Soldier location on a digital geo-referenced image. Additional Soldier locations will be graphically displayed on the digital medium through the Army Battle Command System (BCS), connected through the Rifleman's Radio system to send and receive information and connect the dismounted Soldier to the network. These radios will also connect the Soldier to higher-echelon data and information products to assist in decision making and situational understanding. All of this will be integrated on a user-defined graphical interface, allowing the Soldier to easily see, understand, and interact in the method that best suits the user and the particular mission.



THE NETWORK

The Army will continue development and fielding of an incremental ground tactical network capability, fielded 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 Brigade Combat Teams in increasing capability increments. The first increment is currently finishing Software Development and Demonstration (SDD) developmental and operational testing and will be delivered to Infantry Brigade Combat Teams in the form of Network Integration Kits (NIK) with E-IBCT.

The Soldier at every echelon, from Brigade to Squad will be connected to the proper sensor data and communication relays to ensure proper battlespace situational awareness. The network is being tested and evaluated in a Joint Service operating environment to ensure ability to integrate communications with Joint Service Agencies and with our allies.



THE NETWORK INTEGRATION KIT (NIK)

The NIK is an integrated suite of equipment on a HMMWV that provides the Network connectivity and battle command software to integrate and fuse sensor data into the common operational picture (COP) displayed on the Future XXI Battle Command Battalion/Brigade and Below (FBCB2). The NIK consists of an integrated computer system (ICS) that hosts the Battle Command software and the Systems of Systems Common Operating Environment (SOSCOE) software, along with a JTRS GMR radio to provide the interface to the sensors and unmanned systems, as well as voice and data communications 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.



XM501 Non Line of Sight-Launch System (NLOS-LS)

The XM501 Non Line of Sight-Launch System (NLOS-LS) consists of a platform-independent Container Launch Unit (CLU) with self-contained technical fire control electronics and software for remote and unmanned operations. Each CLU consists of a computer and communications system and 15 Precision Attack Missiles (PAM). The NLOS-LS provides a rapidly deployable and network-linked precision guided munitions launch capability that is currently not available within the Army.

PAMs are modular, multi-mission, guided missiles with two trajectories: (1) a direct-fire or fast-attack trajectory, and (2) a boost-glide trajectory. The missile receives target information prior to launch, and can receive and respond to target location updates during flight. The PAM supports laser-designated, laser-anointed and autonomous operation modes. The missiles are capable of transmitting near-real-time information in the form of target imagery prior to impact. PAMs are designed to defeat high-payoff light and heavy armored targets, either moving or stationary. The NLOS-LS, which has also successfully completed airdrops from a C130, and will provide superior organic, non line of sight fire support capability and for Airborne units, Special Operations Forces, dismounted and mounted soldiers in any field.

The NLOS-LS is currently under evaluation by the Army Evaluation Task Force (AETF). Successful PAM launches and CLU evaluations have recently taken place. Additionally, NLOS-LS is currently being tested by the US Navy on its Littoral Combat Ship.



XM156 CLASS I BLOCK 0 UNMANNED AERIAL VEHICLE (UAV)

The XM156 Class I Block 0 Unmanned Aerial Vehicle (UAV) is a platoon level asset that provides the dismounted soldier with Reconnaissance, 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 MOLLE-type carriers.

The air vehicle operates in open, rolling, complex and urban terrains with a vertical take-off 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 lowest echelons of the Brigade Combat Team (BCT) 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 UAV inventory for urban and route surveillance. The Class I system also fills known gaps that exist in force operations, such as: Protect Force in Counterinsurgency (COIN) Operations, Soldier Protection in COIN environment, Ability to Conduct Joint Urban Operations, Enhanced ISR/RSTA Capabilities, hover and stare operations.



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 and inspecting suspected booby traps and improvised explosive devices without exposing Soldiers to these hazards.

The SUGV's modular design allows multiple payloads to be integrated in a plug-and-play fashion that will minimize the Soldier's exposure to hazards. Payloads to be fielded are the manipulator arm, tether capability, chemical/radiation detection and a laser target designator. Weighing 32 pounds, the SUGV is capable of carrying up to four pounds of payload weight.



AN/GSR-9/10 TACTICAL/URBAN UNATTENDED GROUND SENSORS (T/U-UGS)

The Unattended Ground Sensors (UGS) program is divided into two major subgroups of sensing systems: AN/GSR-9 (V) 1 Tactical-UGS (T-UGS), which includes Intelligence, Surveillance & Reconnaissance (ISR) - UGS and Radiological & Nuclear 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 radiological, nuclear, and early warning. An UGS field will include multi-mode 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 situational awareness and force protection in an urban setting. U-UGS also enable residual protection for cleared areas of Urban Military Operations in Urban Terrain (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 recent testing of the UGS provided invaluable feedback, which was incorporated into new versions (form factors) that are now in testing.



FOLLOW-ON BRIGADE COMBAT TEAM (BCT) CAPABILITIES

The E-IBCT package will serve as the baseline for the first increment. Ongoing Army analysis continues to identify items that add value to our BCTs and are both ready and affordable as they build upon the E-IBCT baseline for the first increment. Follow on increments will include effective combinations of doctrine, organization, training and leader development as well as materiel systems that continue to provide improvements to our Soldiers and the formations in which they fight.

GROUND COMBAT VEHICLES

The Army will be using the knowledge gained from the Future Combat Systems' Manned Ground Vehicle development combined with the seven years of lessons learned in combat to create a new Ground Combat Vehicle (GCV). The networked GCV will offer superior survivability, while embracing the state-of-the-art in mobility, lethality and power management functions. Today, the Army is developing requirements for the Ground Combat Vehicle Program. The Army's objective is to successfully hold a Material Development Decision in FY 2010.



For additional information about the program please visit our web site:

<http://www.bctmod.army.mil>