



**Torchbearer  
National Security Report**

**Key Issues Relevant to**

***The U.S. Army's  
Transformation  
to the  
Objective Force***

VOLUME II



**An AUSA Torchbearer Issue**  
August 2002





# Preface

Since AUSA's Torchbearer on Army Transformation (Volume I, Issues 1-4) was published in September 2001, the topic has expanded in pertinence and priority. For more than a decade, Army Transformation has been developing from theoretical brainstorming to tangible achievements. This second assessment of the Army's vision for the future delves into the evolving Interim Force structure and assets and tomorrow's Transformed Objective Force.

Modernized systems enhanced with the latest information technologies are the backbone of Army Transformation. Speed, efficiency, flexibility and joint operations set the new criteria for success. Themes or "threads" of awareness, lethality and efficiency reappear throughout this issue. More than simply improving weapons and strategy, Transformation requires changes to doctrine, organization, training and leadership. People are central to this revolution in military affairs.

This volume discusses the multidimensional capabilities of the Interim and Objective Forces. Building on lessons learned from the Louisiana Maneuvers and the Advanced Warfighting Experiments of the 1990s, the Interim Force has already begun revamping the Army's rapid deployment framework. The **Stryker Brigade Combat Teams** (SBCTs), already formed and training at Fort Lewis, Washington, have rearranged the traditional light infantry unit structure to include additional combat support assets, digitized information equipment and a lightened logistical tail to hasten global rapid reaction in a joint environment. The **Stryker** vehicle, a featured player in Millennium Challenge 2002, is an integral element of the SBCTs. It is designed as a sustaining, offensive go-between for light forces lacking armor support. Stryker, like the SBCTs, addresses near-term necessities for the Army to maintain its strategic advantage today and in the next several years. These units and assets will also serve as a springboard for the development of the Objective Force.

The long-term goal of the Objective Force is to dominate, as part of a joint force, the future battlefield through integration and effective, concentrated firepower. The **Future Combat Systems** (FCS), scheduled for initial fielding in 2008, will exploit the total battlefield picture, integrating the combatants and commanders, while concentrating overwhelming power against enemy forces. More than communicating the situation and reacting as it unfolds, FCS will allow disparate elements to see the same targets, to determine enemy actions beyond the line of sight and prevent tactical surprise or strategic defeat. FCS will permit commanders to shape the battlefield in advance. The **Objective Force Warrior** (OFW), an integral part of the Future Combat Systems, uses technology to bolster human performance. In distributing and receiving real-time battlefield information through OFW, the infantry soldier remains a honed weapon but also becomes both a platform and a system for integrated sensors.

The Army faces a range of threats in a multitude of environments. Rapid, informed actions using calculated and proportionate force are requisites for victory in future combat scenarios. Army Transformation seeks to dominate the field by employing a combined capability of superior information flow, dominant battlefield awareness, top-tier hardware and, most important, the soldiers to execute the missions.

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## The SBCT: A Combat Force for Today, A Proving Ground for Tomorrow

### Why the Stryker Brigade Combat Team?

The Stryker Brigade Combat Team (SBCT) serves two primary roles. In the near term, it satisfies today's strategic requirements. Current light units can rapidly deploy but lack staying power and firepower. Current heavy forces are extremely lethal and survivable, but slow to deploy. While these forces are well-adapted for some contingencies, others require a force that is both deployable and survivable while remaining sufficiently lethal. The SBCT is a medium-weight force that will bridge this capability gap until the Objective Force is a reality. It is tailored to serve as the land combat element in a joint task force and will meet a number of increasingly necessary contingencies, from peacekeeping operations and low-intensity conflicts to high-intensity conflicts when properly augmented.



In the long run, the SBCT will serve as a proving ground for developing the doctrine, tactics and techniques of the Objective Force. The SBCT will also train junior officers and noncommissioned officers (NCOs)—tomorrow's battalion commanders and command sergeants major—in a style of deploying, fighting and sustaining that in many ways resembles the Objective Force of the future.

### Structure of the SBCT



At the core of the SBCT are three infantry battalions, but it also incorporates a variety of units not normally part of a traditional Army brigade: military intelligence, signal and medical companies all form organic parts of the SBCT. The SBCT also incorporates an entirely new unit, the Reconnaissance, Surveillance, Target Acquisition (RSTA) squadron, which uses

ground reconnaissance troops, unmanned aerial vehicles (UAVs), electronic warfare assets, radar and ground sensors to collect intelligence and provide precision-strike capabilities.

### Location

The first two SBCTs are currently organizing and training at Fort Lewis, Washington. Four more brigades will shortly begin the transition at Forts Richardson and Wainwright in Alaska; Schofield Barracks, Hawaii; Fort Polk, Louisiana; and Harrisburg, Pennsylvania (56<sup>th</sup> Brigade, 28<sup>th</sup> Infantry Division [Mechanized], an Army National Guard unit). The 2001 Quadrennial Defense Review recommends an SBCT be stationed in Europe by 2007.



## The SBCT (continued)

### Timetable

The transformation to the SBCT design is expected to take a little more than a year for an active component brigade, longer for a reserve component brigade. The cost of transformation is more than \$1 billion per brigade combat team. The first of the brigades with the Stryker will be combat-capable in 2003.

### Equipment and Capabilities

In order to create the SBCTs quickly and inexpensively, the Army will outfit them with off-the-shelf equipment with enhanced technology.

The primary combat platform of the SBCT is the Stryker, a modified and improved version of the eight-wheeled Light Armored Vehicle (LAV-III). The Stryker can travel up to 62 mph, has a 300-mile cruising range and is equipped with armor able to withstand 14.5mm heavy machine gun fire and artillery fragments. Most important, the Stryker is designed to be deployed by C-130, the Air Force's primary intratheater cargo aircraft, capable of landing on short, rough airstrips, or the C-17 in its intratheater role. The SBCT will employ two primary variations of the Stryker: an infantry carrier in nine configurations and a mobile gun system (MGS). Using one platform to fill this variety of roles creates a commonality of equipment that will significantly reduce the logistical footprint of the SBCT.

**STRYKER CONFIGURATIONS**

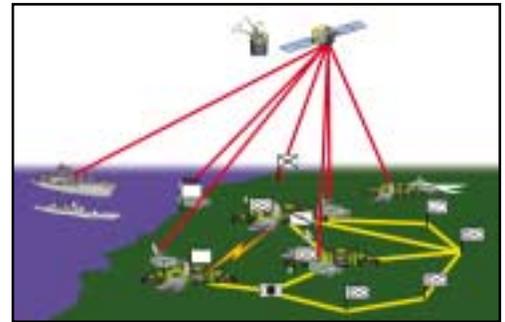
**Infantry Carrier Vehicle**

- Mortar Carrier
- Antitank Guided Missile Vehicle
- Reconnaissance Vehicle
- Fire Support Vehicle
- Engineer Support Vehicle
- Commander's Vehicle
- Medical Evacuation Vehicle
- Nuclear-Biological-Chemical (NBC) Reconnaissance

**Mobile Gun System**



In addition to a lighter, more mobile weapon platform, the SBCT will also be equipped with a variety of recently developed communications and intelligence technologies—such as UAVs and a tactical internet—that will provide the information dominance it needs to carry out its mission at all points on the spectrum of operations. A combination of advanced sensors and a robust, redundant, reliable, internetted information network will allow the SBCT to see first, understand first, act first and finish decisively. These highly developed data networks will connect combat units with support units and with one



*Tactical Internet with "Reachback" Capabilities*

another. They will also allow the SBCT to "reach back" to the United States or to other U.S. forces in the area (such as U.S. Navy or U.S. Air Force units) for long-range fires, up-to-date intelligence, and logistics support.

### SBCT—Bridge to the Objective Force

The ultimate goal of Army Transformation is the Objective Force, a fully networked, rapidly deployable combat force with the lethality and survivability of current forces, but with reduced logistic footprint and improved sustainability. The centerpiece of the Objective Force is the Future Combat Systems (FCS), a networked system of vehicles, weapon platforms and sensors that will look significantly different from today's M1 Abrams tanks and M2 Bradley infantry fighting vehicles. Although the FCS does not yet exist, developing doctrine and training methodologies for the FCS have begun. Like the SBCT, the Objective Force capitalizes on information dominance to defeat the enemy and survive on the battlefield. Junior leaders of today trained in the SBCT's methods of deploying, fighting and sustaining will be well positioned to lead the Objective Force when the FCS comes on line. In addition, creating, training and leading the SBCTs will teach the Army how to prepare and use the Objective Force.





## *Stryker: Closing the Gap Between Today's Needs and Tomorrow's Objective Force Operations*

The Stryker provides the Army with a mobile weapon system that can fill immediate tactical requirements and adapt to the demands of future missions. As the flagship asset of the medium-weight Stryker Brigade Combat Team (SBCT), Stryker's multiple configurations, common components, flexible field performance and operational mobility enhance its utility for the Army of the future. Already, the Army has deployed 14 Stryker vehicles with 5<sup>th</sup> Battalion, 20<sup>th</sup> Infantry, 2<sup>nd</sup> Infantry Division for Millennium Challenge 2002 (MC02), the Joint Forces Command field experiment and demonstration. Soldiers participating in MC02 were impressed by Stryker's speed and mobility, as well as its deployability from C-130 and C-17 aircraft.



*Stryker Infantry Carrier Vehicle (ICV)*



*Stryker Mobile Gun System (MGS)*

### The Stryker Mission

General Dynamics and General Motors designed the Stryker to meet limited threats across a range of contingencies. Stryker does not replace the tank. It fills the current capability void between light infantry soldiers (such as the 82<sup>nd</sup> Airborne Division) deploying globally within 18 hours and heavy-deploying mechanized units. Stryker serves as the principal system for early-entry SBCTs to support forces already on the ground until more robust and lethal assets arrive. SBCT's goal is to deploy within 96 hours. The C-130, C-17 and C-5 transport planes can deliver various load configurations of combat-ready Stryker vehicles.



*Stryker at the National Training Center, Fort Irwin, California, during Millennium Challenge 2002*

### The Stryker Advantage

The wheeled 8x8 design enables Stryker to operate with speed and maneuverability in combat terrain and in urban areas where tracked vehicles' effectiveness often suffers. The ten variants of Stryker permit configurations ranging from its primary missions as an Infantry Carrier Vehicle (ICV) or Mobile Gun System (MGS) to more specific roles, such as Fire Support and Engineer vehicles. Stryker's common chassis across the ten variants results in an 85 percent parts commonality, which simplifies repairs and reduces logistical support requirements.



ICV



MGS



CV



MEV



ESV



NBC RV



RV



FSV



MC



ATGM

*(from top, left to right)*  
 Infantry Carrier Vehicle, Mobile Gun System,  
 Commander's Vehicle, Medical Evacuation Vehicle,  
 Engineer Squad Vehicle,  
 Nuclear-Biological-Chemical (NBC)  
 Reconnaissance Vehicle, Reconnaissance Vehicle,  
 Fire Support Vehicle, Mortar Carrier,  
 Antitank Guided Missile

## The Stryker Future

The Army plans to equip six SBCT brigades with more than 300 Strykers each. The 3rd Brigade, 2nd Infantry Division and the 1st Brigade, 25th Infantry Division, both at Fort Lewis, Washington, will be combat-capable by May 2003 and 2004, respectively.



**SBCT soldiers in action (above);**  
**Stryker aboard a C-17 aircraft (right).**



## The Stryker Punch

Stryker has a maximum speed of 62 mph and a 300-mile range. Its armor protects the occupants against 14.5mm rounds, artillery fragments and—with the addition of plates—against various shaped-charge weapons. Reduced thermal and acoustic signatures also improve survivability.

Weapons configurations include the M2 .50-caliber machine gun; MK19 40mm automatic grenade launcher; 105mm cannon; antitank guided missiles; and various mortars.

## Specifications

**Weight:** 19 tons

**Max Speed:** 62 mph

**Max Range:** 300 miles

**Max Trench Crossing:** 6.5 feet

**Forward Slope:** 60 percent

**Side Slope:** 30 percent

**Step Climbing:** 23 inches

### Weapons Options:

Kongsberg Remote Weapons Station (MK 19 40mm or .50-caliber or 7.62mm), Low Profile Turret M68A1 105mm Cannon, Antitank Guided Missile, Elevated Tube-launched, Optically-sighted, Wire-guided (TOW) System, 120mm, 81mm, 60mm mortars

### Protection:

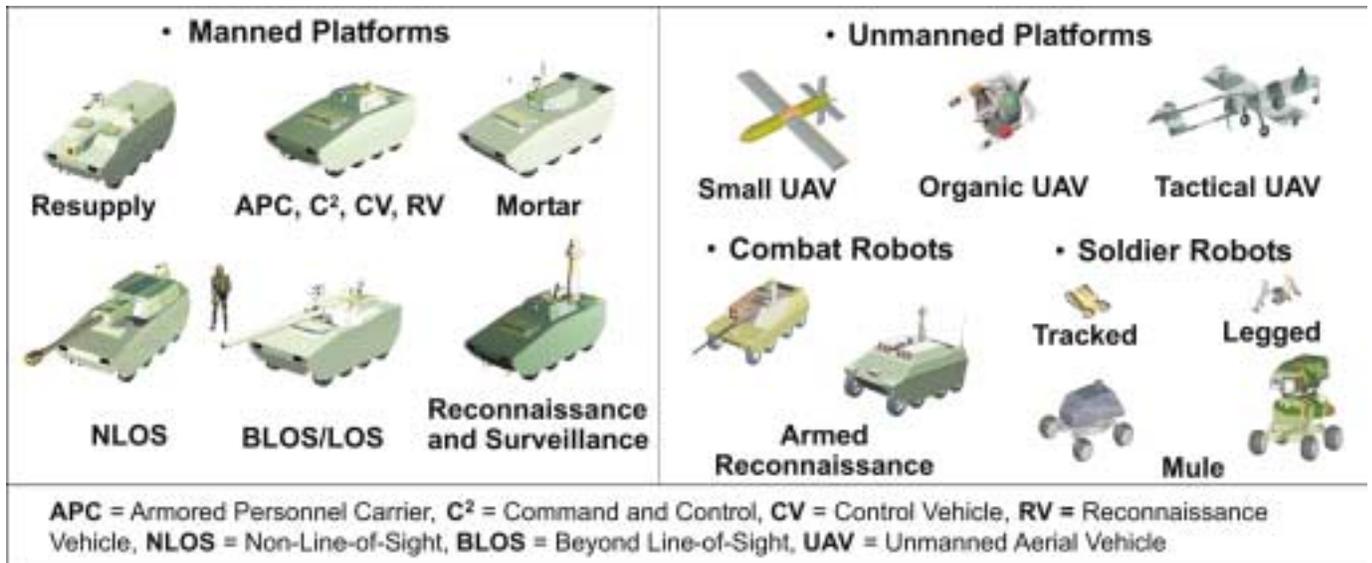
Integral all-around 14.5mm armor, Appliqué RPG-7 Overhead 152mm High Explosive (HE) Airburst, NBC Detection Package, Individual Crew Respirators, Reduced Signature Thermal and Acoustic



## Future Combat Systems—Enabling Soldiers to Meet Tomorrow's Challenges

Work on the Future Combat Systems (FCS)—scheduled for initial fielding in 2008—is progressing rapidly. This family of systems will equip the Army of the future—the Objective Force. FCS-equipped forces will provide the Army with a rapidly deployable yet highly lethal and survivable combat force. Since the end of the Cold War, the Army has completed a series of studies, hands-on experiments and wargames to create the vision for the land combat force of the 21<sup>st</sup> century. The Army was recently joined in its endeavor by the Defense Advanced Research Projects Agency (DARPA); thanks to the Army/DARPA team, the capabilities of the FCS will play a critical part in the realization of this vision.

### FCS—The Concept of an Integrated Family of Highly Capable Combat Systems



The FCS is in the concept and technology development (CTD) stage. As a result, while no hardware has been constructed yet, a concept of the final form of the FCS is beginning to emerge. This vision foresees a mix of manned and unmanned vehicles, sensors and weapons tied together by an advanced communications network. Various UAVs and robotic platforms will play a key role in the FCS, serving in reconnaissance, combat and combat support roles. The vehicles and equipment of the FCS will enable well-trained U.S. soldiers to fight, survive and win on the battlefields of the future while also dramatically reducing deployment time and logistics requirements.

### FCS—Reducing the Logistics Footprint

Today's Army forces require a significant logistics tail to provide spare parts, fuel, food, ammunition and other supplies. A key goal for the FCS is to dramatically reduce the size of this support force, making U.S. Army forces easier to deploy and sustain. Initial analysis has already demonstrated the potential support requirement reductions that the FCS could make possible (e.g., 72 percent less ammunition required; see chart).

FCS Brigade Concept Compared to Current Armored Cavalry Regiment (ACR)*	
Shooter Vehicles	110%
Soldiers	60%
Support Unit Soldiers	55%
Lift Required for Transport	38%
Water Usage	60%
Fuel Usage	5%
Ammunition Usage	18%
*Minus aviation assets	



## FCS—Enabling Situational Understanding for Soldiers

A key part of the FCS is the creation of an “information sphere”—an operational environment in which U.S. soldiers will know not only their own location but also the locations of friendly and enemy forces. This knowledge advantage over an enemy force will allow the FCS-equipped Objective Force to operate in entirely new ways while retaining the ability to close with and destroy enemy forces and seize key terrain when required. To enable this new kind of fighting, intelligence and surveillance sensors must be integrated into a seamless web that provides a continuous, accurate flow of knowledge to U.S. troops and their multinational and interagency allies.

**Individual soldier system**  
Vehicle mobility/weapon sight

- LWIR FLIR, EO

Vehicle warning and defensive aids

- MWS, EO, glint, LRF, laser warning

5m RSTA mast for R&S vehicle

- LWIR/MWIR FLIR, EO, LRF, laser warning, K<sub>a</sub> band radar

2m RSTA mast for ARV

- LWIR FLIR, EO

Modular payloads for UAVs

- MWIR, IICCD, LRF, gated SWIR
- SIGINT
- SAR/MTI radar
- NBC, hyperspectral

**FCS Sensor Network  
(Projected for 2008)**

- Joint STARS
- U2 Aircraft
- Global Hawk

**Legend:** LWIR=Long Wave Infrared, FLIR=Forward Looking Infrared, EO=Electro-Optical, MWS=Millimeter Wave Sensor, LRF=Laser Range Finder, RSTA=Reconnaissance, Surveillance, Target Acquisition, R&S=Reconnaissance and Surveillance, MWIR=Medium Wave Infrared, ARV=Armed Reconnaissance Vehicle, UAV=Unmanned Aerial Vehicle, IICCD=Image Intensified Charged Couple Device, SWIR=Short Wave Infrared, SIGINT=Signals Intelligence, SAR=Side-looking Aperture Radar, MTI= Moving Target Indicator, NBC=Nuclear-Biological-Chemical, Joint STARS=Joint Surveillance Target Attack Radar System, OAV=Organic Aerial Vehicle, UGV=Unmanned Ground Vehicle, UGS=Unmanned Ground Sensor

## Putting It All Together—The Lead Systems Integrator (LSI)

The FCS is being developed using an entirely new model for defense procurement: the Lead Systems Integrator (LSI). Rather than a single platform (such as a tank or helicopter), the FCS will include many systems that, by operating together, will produce combat power in excess of today’s forces. To accomplish this integration, an LSI is an essential part of developing the FCS. In 2002, the FCS LSI contract was awarded to a Boeing/SAIC team.

The LSI is not a type of contract; it is a new way of operating. Unlike a traditional lead contractor, the LSI will focus on systems engineering, system integration, system planning and control. At the same time, the LSI will rely on various industry team members to develop the requisite technology to tackle the most difficult technical challenges with the individual pieces of the FCS. The LSI will be the integrator, not the builder, of the various parts of the FCS family of vehicles and equipment. The new approach is necessary due to the compressed schedule and fully integrated nature of the FCS.

**Why the LSI? The LSI is responsible for**

- a new way to develop defense systems: a partnership between government, the LSI and the best of industry;
- maintaining the focus on enabling soldiers, not just building “hardware”;
- rapid development and insertion of new technology and systems;
- seamless integration of the multiple pieces of the Future Combat Systems.



### *Land Warrior/Objective Force Warrior will transform individual soldiers and small units into a lethal networked fighting force for the future.*

Uniting the strategic and operational role of the Objective Force with the tactical role of individual soldiers and small units, the Objective Force Warrior (OFW) program is a fundamental asset of the Future Combat Systems (FCS)-equipped unit. OFW will use a “human-centric” approach in integrating technology to create a soldier and small team that is netted with Objective Force platforms and is a lethal, vigilant, mobile and survivable fighting system. The OFW has evolved over a decade of development.



**Soldier in OFW mock-up**

While variants of the OFW system will ultimately be developed for all soldiers within FCS units, the infantrymen will be the first to gain radically new capabilities. The major components include a weapon subsystem with various target-sighting aids; a helmet assembly containing numerous sensor displays; a computer and communications element that links soldiers with their squad-members, leaders, vehicles and support assets; and a protective uniform shielding the soldier from environmental hazards and hostile fire.



Infantrymen traditionally have been loaded down with combat equipment. The “two-legged mule” concept of burdening the soldier by hanging additional items on him like a Christmas tree has given way to viewing him as more than a platform for high-tech weapons and communication and protective gear. With OFW, the soldier becomes a system integrated with technology to increase his lethality, survivability and overall combat capability.

### Developing the Soldier System

The Soldier System evolution began in 1991 as a concept study called Soldier Integrated Protective Ensemble (SIPE). This concept resulted in Land Warrior (LW). LW prototypes were developed and tested at the U.S. Army Infantry Center at Fort Benning, Georgia, in January 1996. The Army pushed development and, by 1999, suppliers had lightened the Land Warrior’s weight and improved its operation.

In a September 2000 field training exercise at Fort Polk, Louisiana, a platoon of Land Warrior (Version 0.6) systems was evaluated. The ability of LW-equipped infantry troops to rapidly navigate terrain day and night was clearly demonstrated. The experiment proved that Land Warrior would improve the effectiveness and survivability of infantry soldiers in close combat.



**Land Warrior System indirect-view target engagement**



## Land Warrior/Objective Force Warrior (continued)

The results of the field training exercise have propelled development of the LW initial version, which is slated for fielding with the 75th Ranger Regiment in 2004. LW Stryker integration will then undergo testing and improvement with a targeted delivery to the Stryker Brigade Combat Teams (SBCTs) in 2005. LW Block III is the OFW. The Army intends to field OFW with FCS units in 2008, pending funding availability.

### Developing the Technologies

The developments made in weapons, communications, digitization and personal protective items directly benefit the combat effectiveness of LW/OFW. Armament upgrades provide the infantryman with an array of target information through helmet-mounted displays. Laser range-finders, night-vision and thermal imaging are linked to a video system providing non-line-of-sight perspective by peering around corners and over obstacles.

With OFW, the soldier's role of "trigger-puller" will continue as he also becomes an information hub—receiving, distributing and acting on an increased perspective of the battlefield as it occurs. Networked radio and internet communications among squad-members, key leaders and combined arms team elements support the Objective Force vision. The digitally linked battlefield allows information to flow quickly and accurately to elicit timely, sound decisions at all levels. Global Positioning System (GPS) sensors and displays contribute to situational awareness. Having real-time friendly force locations can assist small-unit leaders, pilots and combat vehicle crews in making timely tactical choices and avoiding casualty-causing errors.



*Land Warrior prototype with modified M-4 rifle*

### OBJECTIVE FORCE WARRIOR

Combat uniform protects against biological/chemical contaminants and provides camouflage

Full integration with Future Combat Systems components for total battlefield awareness



Helmet-mounted video display feeds tactical imagery and real-time data

Communications, GPS and software subsystems integrated into combat uniform

Integrated body armor and load carriage

### Developing the Solutions

The drivers for both LW and OFW have been weight and power. To conduct long-range quick-reaction force missions for 24 hours without resupply, lighter and more economical components are mandatory. The goal is to keep the infantryman's fighting load near fifty pounds. This can be achieved by reducing the weight of the materiel components and by off-

loading to a robotic mule. OFW's electronics demand a reliable supply of power. Development of lightweight, fuel-efficient solutions is underway to prevent infantrymen from lugging the additional weight of bulky batteries needed to drive the system. The Army's goal is to have a power source that can sustain for up to 48 hours.



# Torchbearer Message

Army Transformation has become a reality. It is moving rapidly, asserting the Army's near-term strategic superiority around the world and developing long-range solutions for information dominance on the future battlefield. Transformation is more than quick-fix improvements in systems, hardware and weaponry. It has been an investment, unfolding throughout the last decade, requiring revolutionary changes to doctrine, organization, materiel, training and leadership. Modernized systems enhanced with the latest information technologies are its backbone, with speed, efficiency and flexibility the new criteria for success. Progress made in developing the Interim Force will propel the smooth transition to the Objective Force. The Army is advancing Transformation from theory to practical application. Soldiers remain at the crux of that change.

This Torchbearer volume is the second series of issue papers devoted to Army Transformation. These articles address major developments in Transformation since publication of the first volume in September 2001. Key points:

- Stryker Brigade Combat Teams have initiated the near-term Transformation with a revamped force structure, rapid reaction capabilities and improved digital assets to ensure the Army maintains its strategic dominance as part of a joint force in the coming decade.
- The Stryker vehicle characterizes the streamlined efficiency and strategic and tactical flexibility of the Interim Force with its common parts and variant configurations. Stryker not only bridges a gap between light and mechanized units but also facilitates transition from current to future capabilities.
- The Future Combat Systems—a mix of manned and unmanned vehicles, sensors and weapons tied together by an advanced communications network—will, by 2008, begin providing the Army with the flexibility, battlefield awareness and increased lethality necessary to ensure soldier survivability and to dominate the 21<sup>st</sup> century combat zone in a joint environment. At the same time, FCS will dramatically reduce the logistics requirements and deployment time required by today's Army force.
- Objective Force Warrior and its forerunner, Land Warrior, already have begun revolutionizing the infantry's combat role. Integrating the infantrymen and their squads into digitized battle networks will add an unprecedented dimension of information and effectiveness to soldiers and the force.

Whether addressing near-term readiness for the Interim Force or long-term dominance for the Objective Force, the soldier remains the pivotal influence for Transformation. The technology and weapon advancements will not override the importance of soldiers—the centerpiece of Army Transformation—making decisions and seizing the initiative in battle.

*The soldier, not the equipment, is the centerpiece  
for transforming to a 21st century Army  
in a 21st century world.*



*The Objective Force is more than new combat systems . . .  
it includes new organizational designs, warfighting concepts, training  
and leader development approaches, and a system of systems.*

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